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September 28, 2011

Ms. Bimla Rhinehart
Executive Director
California Transportation Commission
1120 N Street
Room 221 (MS-52)
Sacramento, CA 95814

Dear Ms. Rhinehart:

On behalf of MTC, I am pleased to submit the enclosed application for consideration by the California Transportation Commission (CTC). MTC approved this application at its September 28 meeting.

The application, submitted in cooperation with the California Department of Transportation, requests authority, pursuant to Section 149.7 of the Streets and Highways Code, to develop and implement 285 miles of high occupancy toll lanes (referred to in our application as the Express Lanes "Facility") on the following Bay Area freeways:

- I-80 in Solano, Contra Costa and Alameda counties
- I-680 in Solano and Contra Costa counties
- I-880 in Alameda County
- State Route 92 and State Route 84 in Alameda County

The Express Lanes Facility, when combined 280 miles of express lanes that are already statutorily authorized in Alameda and Santa Clara counties, would constitute a robust network of Express Lanes in the Bay Area. This approach consistent with the region's adopted long-range transportation plan, *Transportation 2035*, which envisions a seamless network of express lanes in the Bay Area. Project goals include increasing connectivity by closing gaps and completing the region's HOV system, improving efficiency by optimizing use of freeway capacity, and improving reliability by offering a congestion-free travel option. These benefits will accrue to carpoolers and express bus riders, both of which are heavy users of the existing HOV system, as well as to single-occupant drivers.

The application demonstrates the operational and financial feasibility of a facility that will be built over a period of 20 or more years. As such, CTC's approval would

represent an important pre-requisite to implementing the Network but it is only the first step. MTC and our regional partners will need to undertake additional steps to develop more detailed information and establish policies and procedures to implement the network. Furthermore, actual implementation would be phased to manage and mitigate risks by pursuing lower-cost projects first and to provide opportunities to assess subsequent phases prior to embarking on major commitments.

In closing, I want to express my thanks to CTC staff, which has been extremely helpful throughout the application process. I look forward to the Commission's consideration of our application.

Sincerely,

Steve Heminger
Executive Director

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Attachments

Bay Area Express Lanes Public Partnership Application *For* High Occupancy Toll Lanes

Submitted to the

California Transportation Commission

On

September 28, 2011

Submitted by the

Metropolitan Transportation Commission

In cooperation with the

California Department of Transportation

Table of Contents

Tables and Figures

List of Attachments

Attachment 1: Acronyms and Abbreviations

Attachment 2: Project Fact Sheets

Attachment 3: Department Letter of Support

Attachment 4: Project Study Report

Attachment 5: Regional Letters of Support

Attachment 6: Operational Plan

Attachment 7: Pro Forma Cash Flows

Attachment 8: Detailed Financial Plan Assumptions

Attachment 9: Benefit-Cost Analysis

Attachment 10: Resolution Authorizing Application: MTC Resolution No. 4030

Attachment 11: Bay Area Infrastructure Authority (BAIFA) Joint Exercise of Powers (as amended on September 28, 2011 by MTC Resolution No. 3769 and BATA Resolution No. 70)

Executive Summary

With this application the Metropolitan Transportation Commission ("MTC") seeks authority from the California Transportation Commission ("CTC") as a "regional transportation agency" to develop and implement a high-occupancy toll ("HOT") lane facility (called hereinafter "Express Lane Facility" or "Facility"). Express lanes allow vehicles that do not qualify as a high-occupancy vehicle ("HOV") to use HOV lanes for a fee and maintain free use of the lanes by qualifying carpools and buses. The Facility is comprised of five freeway routes: Interstate 80 ("I-80") in Alameda, Contra Costa and Solano counties, Interstate 880 ("I-880")in Alameda County, Interstate 680 ("I-680") in Solano and Contra Costa counties, State Route 84 ("SR-84") in Alameda County and State Route 92 ("SR-92") in Alameda County. These corridors are shown in green in Figure 1.

This application is consistent with the region's adopted long-range transportation plan, *Transportation 2035*, which envisions a seamless, regionally managed network of express lanes in the Bay Area. The following benefits are demonstrated throughout this application:

- **Connectivity**: Express lane toll revenue, at a time of constrained federal and state budgets, can help close gaps in the existing HOV lane system to increase travel time savings for carpools and buses.
- **Efficiency**: Express lanes will optimize throughput on freeway corridors to better meet current and future traffic demands, using excess capacity in the existing HOV system to improve mobility.
- **Reliability**: Express lanes provide a reliable, congestion-free transportation option, building upon the current solid foundation of existing HOV lanes.

The Express Lane Facility described in this application, along with two value pricing high-occupancy vehicle express lane programs authorized by Streets and Highways Code ("S&H") Section 149.5 (called hereinafter "Legacy Programs") will constitute a regional express lane network (called hereinafter "Express Lane Network" or "Network"). The Legacy Programs are on I-680 and I-580. The Network is shown outlined in yellow in Figure 1. MTC intends to operate the Network, including both the Express Lane Facility and the Legacy Programs, as a "value pricing program", as authorized by S&H Code § 149.7, subject to agreements to be developed and entered into by MTC, Alameda County Transportation Commission ("ACTC") and Sunol Smart Carpool Lane Joint Powers Authority ("Sunol JPA"). The financial analysis includes the two corridors in the Legacy Programs, reflecting ACTC's and Sunol JPA's expressed interest in entering into an agreement with MTC to include the Legacy Programs in the Network.

A third agency, Santa Clara Valley Transportation Authority ("VTA") is also authorized to conduct, administer and operate two value pricing high-occupancy vehicle express lane programs on State Route 237 and U.S. 101/State Route 85. VTA has indicated that it intends for its programs to remain financially independent. However, MTC and all of the agencies authorized to develop and operate express lanes in the region are committed to seamless operation of the region's express lanes as a single system.

Hereinafter, "Express Lane System" or "System" refers to the combination of the Express Lane Network and the authorized express lanes in Santa Clara and San Mateo counties.

MTC will develop and operate the Express Lane Network in collaboration with a number of entities. MTC may enter into agreement with the Bay Area Infrastructure Financing Authority ("BAIFA") to exercise certain responsibilities outlined under this application. BAIFA is a joint exercise of powers agency formed by the Metropolitan Transportation Commission ("MTC") and the Bay Area Toll Authority ("BATA") to plan, develop, operate and finance transportation and related projects, including high-occupancy toll lanes. In addition, MTC must, according to statute, enter into agreements with Bay Area Toll Authority ("BATA") to operate and manage the toll collection system, with Caltrans for other aspects of design, construction, maintenance and operations, and with the California Highway Patrol for enforcement. Finally, as noted above, MTC may enter into agreements with one or more county congestion management agencies (CMAs) with regard to the Legacy Programs or for certain project development or delivery responsibilities.

This application includes a Project Study Report ("PSR") and a Letter of Finding from the California Department of Transportation ("Department") certifying that the application is consistent with the state highway system requirements. The PSR establishes engineering feasibility and a cost range and demonstrates operational benefits associated with express lanes, including benefits to transit from closing gaps in the region's existing HOV lane system. Individual projects will undergo required project development and environmental documentation processes.

The facility for which this application is requesting authority would ultimately add 285 directional miles of express lanes to the Bay Area freeway system, with complete implementation taking 20 or more years. As such, the financial plan developed as part of this application demonstrates the Network's feasibility under a range of circumstances. The Network's feasibility is further enhanced by the flexibility to calibrate its implementation based on factors such as actual performance, costs, revenue, and available resources and financing instruments in the future. To illustrate this flexibility — and to address potential questions regarding the impacts of adverse assumptions on future build-out – this application presents both a baseline financial plan (the "Base Case"), representing the set of assumptions supported by current projections and estimates, as well as a downside sensitivity showing the impacts of greatly reduced revenue (the "Conservative Case") resulting from adjusted tolling policies. These two cases represent the "bookends" of the analysis.

The performance of the Network, both financially and operationally, and the pace at which it would be implemented, are significantly affected by tolling policies. The different tolling policies assumed in the range of financial cases recognize that many of the existing HOV lanes will already reach their capacity with eligible carpools at some point in the future. Consequently, the minimum occupancy requirement for HOVs will need to be raised at some point in time in order to maintain the operational advantage of the lanes. In addition, as more of the Network changes to a higher HOV definition to maintain operational benefits, establishing network-wide consistency will become more important. The Base Case assumes that all express lanes would switch from a HOV2+ to a HOV3+ minimum HOV occupancy in 2020 (or upon opening if they begin operation after 2020). The Conservative Case assumes that all

express lanes would increase to a HOV3+ policy no later than 2035, and those lanes in which HOV demand reaches capacity (i.e., Level of Service C is no longer assured) earlier would increase HOV occupancy accordingly.

The Base Case also assumes an expansion of the period of operation beyond the current "peak period only" operation of HOV lanes in the Bay Area. In the Base Case the express lanes would be operated in the daytime hours (6 AM-7 PM) on weekdays and partial daytime hours (12-7 PM) on weekends. The Conservative Case assumes more limited hours of tolling operation (6-10 AM and 3-7 PM on weekdays, consistent with current HOV lane hours of operation, and 12-7 PM on weekends). Policies related to HOV occupancy requirements and hours of operation are within the purview of the responsible agencies and the Department and therefore can be modified as needed. These policies will be established in consultation with the Department, congestion management agencies, the California Highway Patrol and other stakeholders.

The financial plan shows the Network generates revenues that facilitate HOV lanes being added to the freeway system much faster than would otherwise be feasible. In this analysis, the Network can be completed by 2030 under the Base Case or by 2035 under the Conservative Case. The financial plan contemplates multiple issuances of toll revenue bonds and TIFIA loans over 20 years (or 25 under the Conservative Case) in conjunction with local funding already committed, pay-as-go-you funds mainly generated from toll revenues, and capital grants assumed to be contributed over this period. Table 1 shows how capital costs are financed under the two analysis cases. Table 2 summarizes operating Network cash-flows for each case through year 2040. Both cases show a requirement for supplemental capital grant funding to complete construction but also show modest amounts of net excess revenue accruing after the Network’s construction is fully complete.

Table 1: Uses and Sources of Funds for Network Capital Expenses through Completion

	BASE CASE		CONSERVATIVE CASE	
Amounts in millions of year-of-expenditure dollars	through Network completion (2030)		through Network completion (2035)	
	Amount	%	Amount	%
Sources				
Total Debt	2,100	*60%*	2,377	*56%*
Local Funding for Projects	96	*3%*	96	*2%*
Grant Funding	384	*11%*	796	*19%*
Pay-As-You-Go Funds*	902	*26%*	1,011	*24%*
Total	**3,482**	*100%*	**4,280**	*100%*
Uses				
Capital Costs	2,980	*86%*	3,594	*84%*
Financial Fees and Funding of Reserves	131	*4%*	221	*5%*
Interest during Construction	370	*11%*	464	*11%*
Total	**3,482**	*100%*	**4,280**	*100%*

*Includes reinvestment from operating network cashflow (generated by express lane toll revenue) and interest income on escrowed balances

Table 2: Operating Network Summary Cash-flow through Year 2040

	BASE CASE	CONSERVATIVE CASE
Amounts in millions of year-of-expenditure dollars		
Partial Operations	***15 years (2015-30)***	***20 years (2015-35)***
Full Operations	***10 years (2030-40)***	***5 years (2035-40)***
Express Lane Toll Revenue	6,490	4,396
Operations and Maintenance Expenses	(1,270)	(1,024)
Rehabilitation Costs	(270)	(232)
Debt Service (Principal and Interest)	(2,989)	(1,845)
Other*	132	84
Net Operating Network Cashflow	**2,093**	**1,380**
Reinvested as Construction Funding	(750)	(769)
Potential Net Revenue**	**1,343**	**611**

* Operating period financing fees, reserves releases, & interest income on debt service reserves

** These at-risk surpluses emerge after completion of the Network (2030 under the Base Case, 2035 under the Conservative Case)

In addition to the Conservative Case downside sensitivity, various other sensitivity tests have been performed to analyze whether the Network is still financially feasible under a variety of adverse circumstances. Cooperative agreements for funding contributions for pavement rehabilitation costs will be developed as the projects are implemented. Neither Caltrans or CTC has the authority to approve any contribution to pavement rehabilitation, which is subject to legislative action. While the financial plan assumes pavement rehabilitation costs would be shared with 20 percent borne by the Network and 80 percent borne by the State, a financial sensitivity analysis demonstrates the Network remains feasible if the Network bears 100 percent of the pavement rehabilitation costs. Other sensitivity tests included: the unavailability of TIFIA loans; and not including Alameda County Legacy Program in the Network. It was determined that the Network remains financially feasible under each of these circumstances, though, in some cases, the phasing of implementation would look more similar to the Conservative Case than the Base Case.

Table 3 provides a definition of the uppercase terms defined above and used throughout this application. The directional mileage associated with each of these definitions is also shown. Directional miles are used throughout this application when describing the length of express lanes. A directional mile refers to one lane-mile in one direction. As shown in Table 3, the Facility is made up of approximately 55 percent conversion of existing HOV lanes and 45 percent construction of new express lanes. The conversions, which will be operational by approximately 2020 in the Base Case and 2025 in the Conservative Case, represent approximately 8% of the total capital cost, while the new lanes represent 92% of the capital costs.

Table 3: Glossary of Terms and Mileage

	Existing Express Lanes	Conversions	New Lanes	Operational Gap Closure*	Total
Facility: I-80, I-880, I-680, SR-84 and SR-92	0	149	116	20	285
Legacy Programs: Authorized lanes in Alameda County on I-580 and I-680	14	24	54	0	91
Network: Facility plus Legacy Programs	14	173	170	20	376

* Tolling is not proposed on this segment of I-880 from the San Francisco/Oakland Bay Bridge to Hegenberger as part of this application; operational strategies could include enhanced ramp metering, increased incident management capabilities, and improvements to major parallel arterials.

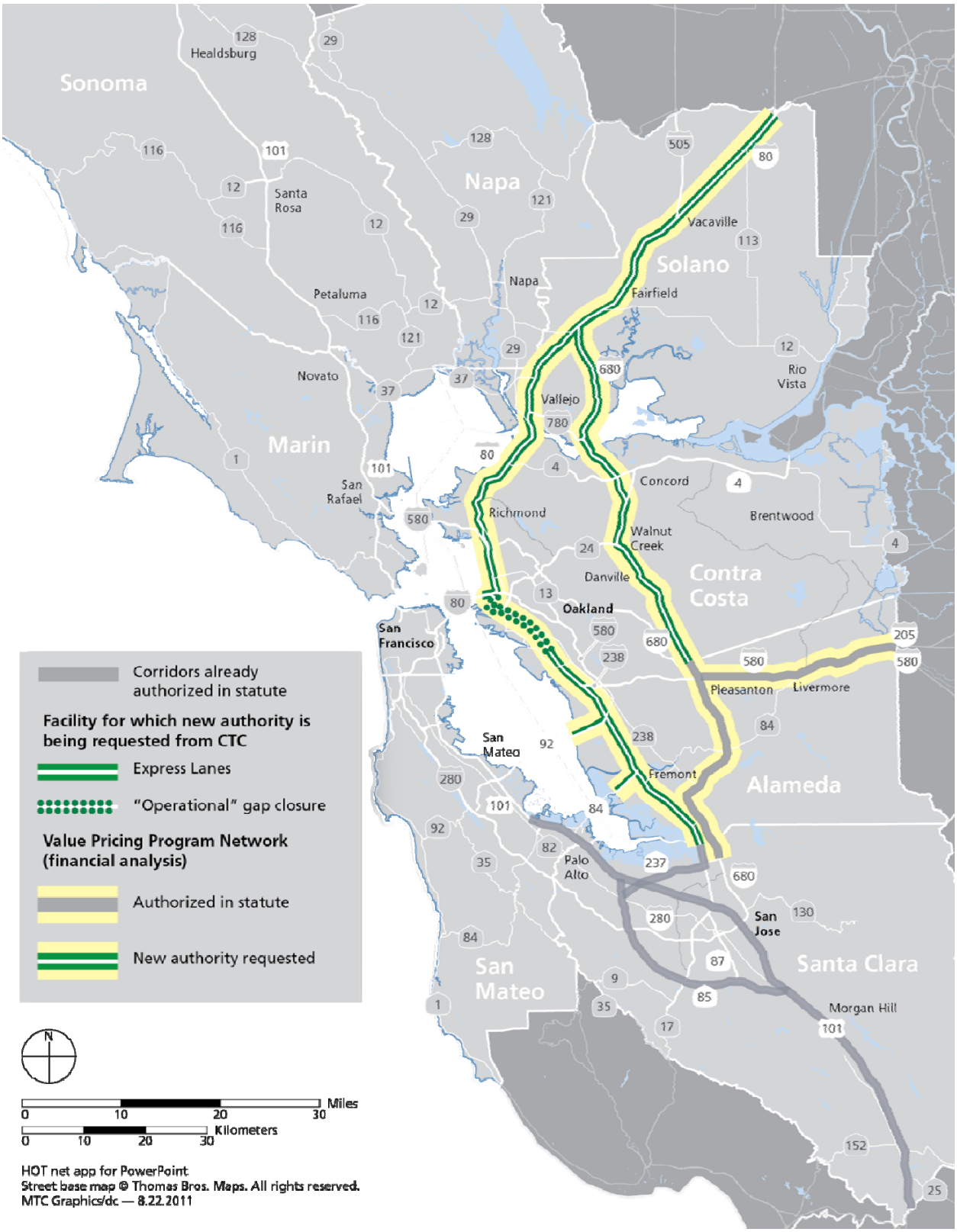

Figure 1: Bay Area Express Lanes Map

Definitions

Bay Area Infrastructure Financing Authority (BAIFA)	A joint exercise of powers authority, as defined in Government Code Sections 6500 *et seq.,* formed by the Metropolitan Transportation Commission (MTC) and the Bay Area Toll Authority (BATA)to plan, develop, operate, and finance transportation and related projects, including express lanes.
Facility (also, Express Lane Facility)	Corridors for which authority is being sought from California Transportation Commission to develop express lanes
Legacy Programs	Express lane programs on I-680 and I-580 authorized by Streets and Highways Code Section 149.5
Network (also, Express Lane Network)	Facility plus Legacy Programs
System	Network plus authorized express lanes in Santa Clara and San Mateo counties
Directional mile	One lane-mile in one direction
Construction project	Phased express lane segment assumed for the purpose of cost estimating, traffic analysis and the financial plan
Base Case	Baseline financial plan
Conservative Case	Sensitivity representing a downside financial scenario
Transportation 2035	The region's current Regional Transportation Plan, which was adopted in April 2009.

Part A - Compliance with Streets & Highways Code

A.1: Provide evidence to support that the proposed project is consistent with the established standards, requirements, and limitations that apply to those facilities in Sections 149, 149.1, 149.3, 149.5, 149.6 and 149.7 of the Streets and Highways Code.

MTC is applying under Streets and Highways Code Section 149.7 to develop and operate the Express Lane Facility, including the administration and operation of a value pricing program that will include the Express Lane Facility and, subject to execution of agreements with ACTC and the Sunol JPA: the Legacy Programs. MTC is a "regional transportation agency", as defined in Government Code Section 143(a)(4)(A). Among other requirements, pursuant to Section 149.7(a), MTC must demonstrate that the Facility is consistent with the established standards, requirements, and limitations that would be applicable to the Facility in Sections 149, 149.1, 149.3, 149.5, 149.6 and 149.7 of the Streets and Highways Code. Each entry in this Part A.1 includes a reference to the provision of the Streets and Highways Code (or multiple references if a requirement / similar requirement appears in more than one section), a description of the standard, requirement or limitation in italics and how MTC's proposal is consistent with that standard, requirement or limitation.

As described in the executive summary to this application, Section 149 *et seq*. of the Streets and Highways Code authorizes various public agencies to develop high occupancy toll lanes and operate value pricing programs within their jurisdictions. Sections 149.1 and 149.4 provide this authority to the San Diego Association of Governments ("SANDAG") for HOV lanes on Interstate Highway Route 15 and two additional transportation corridors in San Diego County. Section 149.5 provides this authority to the Sunol JPA for the HOV lanes on the Sunol Grade portion of Interstate 680 ("I-680") in Alameda and Santa Clara Counties. Section 149.5 also provides this authority to ACTC for a second corridor in Alameda County and mandates that Sunol JPA and ACTC coordinate with the MTC. Finally, Section 149.6 provides this authority to the VTA, in coordination with MTC, for any two transportation corridors included in the HOV system in Santa Clara County.

Section 149

"The department may construct exclusive or preferential lanes for buses only or for buses and other high occupancy vehicles and may authorize or permit such exclusive or preferential use of designated lanes on existing highways that are part of the State Highway System. Prior to constructing such lanes, the department shall conduct competent engineering estimates of the effect of such lanes on safety, congestion, and highway capacity."

Consistent with Section 149, MTC will coordinate with the Department to construct the Express Lane Facility, which will allow for use of the Facility by buses and other HOVs. Prior to construction, additional operational studies will be done.

Sections 149.1(a), 149.4(a), 149.5(a) and 149.6(a)

Agency may conduct, administer, and operate a value pricing and transit development program utilizing a high occupancy vehicle expressway and may direct and authorize the entry and use of the high occupancy vehicle lanes by single-occupant vehicles for a fee to be established by Agency.[Exact language varies among the statutes]

MTC will operate a value pricing program throughout the Network consistent with these statutes, including the Legacy Programs, subject to finalization of cooperative agreements with Sunol JPA and ACTC. The proposed value pricing program will allow SOVs to use the Express Lane Facility and Legacy Programs for a fee. In addition, as part of the measures to maintain Level of Service C throughout the Network while achieving operational consistency among corridors, this fee would be extended to vehicles with two occupants in the future when necessary. Qualified HOVs will be allowed entry at no cost.

Sections 149.1(a), 149.4(a)(2), 149.5(a)(2) and 149.6(a)(1)

The high-occupancy toll lanes shall be operated during specified time periods, provided that HOV lanes may only be operated as high-occupancy toll lanes during the hours that the lanes are otherwise restricted to use by HOVs. [Exact language differs.]

The statutes provide three different approaches to establishing Express Lane Facility operating hours and thereby the hours the agency can impose tolls. Section 149.1 (SANDAG – I-15) limits operations to "peak periods" that SANDAG is authorized to define. Sections 149.5 (Sunol JPA and ACTC – the Sunol Grade and two corridors in Alameda County) and 149.6 (VTA – two corridors in Santa Clara County) limit Express Lane Facility lane operations to the hours that the lane is otherwise restricted to use by HOVs. Section 149.4 (SANDAG – two corridors in San Diego County) uses a combination of these two approaches. Hours of operation for the Network will be established in cooperation with the Department and, pending execution of cooperative agreements, Sunol JPA and ACTC, in furtherance of the goal of developing a single connected system that is a seamless experience for the customer.

Sections 149.1(b), 149.4(b), 149.5(b) and 149.6(b)

"Implementation of the program shall ensure that Level of Service C, as measured by the most recent issue of the Highway Capacity Manual, as adopted by the Transportation Research Board, is maintained at all times in the high-occupancy vehicle lanes, except that subject to a written agreement between the department and [MTC] that is based on operating conditions of the high-occupancy vehicle lanes, Level of Service D shall be permitted on the high-occupancy vehicle lanes."

The Facility will operate at a minimum of 45 miles per hour which is equivalent to Level of Service C. In the event that MTC cannot meet this standard (not currently anticipated), MTC will seek an exception from the Department.

Sections 149.1(b), 149.4(b), 149.5(b) and 149.6(b)

"Unrestricted access to the lanes by HOVs shall be available at all times."

Consistent with the description above regarding HOV occupancy requirements during the express lane operation hours, qualified HOVs shall have unrestricted access to these lanes.

Sections 149.4(d), 149.5(d) and 149.6(d)

"[MTC] shall carry out the program in cooperation with the department pursuant to a cooperative agreement that addresses all matters related to design, construction, maintenance, and operation of state highway system facilities in connection with the value pricing… program."

MTC and the Department will execute a cooperative agreement related to the program. Pursuant to these statutes, the cooperative agreement will address matters related to design, construction, maintenance and operation of the relevant Facility.

Sections 149.1(e)(1), 149.4(e)(1), 149.5(e)(1) and 149.6(e)(1)

"Agreements between Agency, the Department of Transportation, and the Department of the California Highway Patrol shall identify the respective obligations and liabilities of those entities and assign them responsibilities relating to the program. The agreements shall provide for reimbursement of state agencies, from revenues generated by the program, federal funds specifically allocated to SANDAG for the program by the federal government, or other funding sources that are not otherwise available to state agencies for transportation-related projects, for costs incurred in connection with the implementation or operation of the program."

MTC will establish agreements with the Department and California Highway Patrol ("CHP") that identify their respective obligations, liabilities and responsibilities relating to the Facility and provide for reimbursement as described in Part D.10.

Sections 149.1(e), 149.4(e), 149.5(e) and 149.6(e)

The revenue generated from the program shall be available to Agency for the direct expenses related to the operation (including collection and enforcement), maintenance, construction, and administration of the demonstration program (note that Section 149.1 is silent on this issue). Program-related planning and administrative expenses shall not exceed 3 percent of the revenues. The statutory requirements related to use of "remaining revenues" (also called "net revenues") are not entirely consistent, but generally require the Agency to adopt an expenditure plan that will outline the use of these revenues (note that Section 149.1 does not mention an expenditure plan).

MTC shall use toll revenues from the Express Lane Facility and Legacy Programs participating in the value pricing program for direct expenses related to the operation (including collection and enforcement), maintenance, construction and administration of the value pricing program. Reimbursement for program-related planning and administrative costs shall not exceed 3 percent of the total revenues.

Consistent with the statutes and any cooperative agreements that MTC will execute with ACTC and Sunol JPA, MTC shall invest any remaining revenues within the Network for transportation improvements / services, including, but not limited to, costs related to HOV and transit projects. MTC

will adopt an expenditure plan that will govern the allocation of these revenues for permitted uses within the Network.

Sections 149.4(g), 149.5(g) and 149.6(g)

"Not later than three years after Agency first collects revenues from any of the projects, Agency shall submit a report to the legislature on its findings, conclusions, and recommendations concerning the demonstration program. The report shall include an analysis of the effect of the HOT lanes on the adjacent mixed-flow lanes and any comments submitted by the department and the department of the California Highway Patrol regarding operation of the lane."

MTC will submit the required report to the legislature in accordance with this requirement.

Sections 149.5(a)(3), and 149.6(a)(2)

"The Agency shall enter into a cooperative agreement with the Bay Area Toll Authority to operate and manage the electronic toll collection system." (Sections 149.1 and 149.4, which relate to SANDAG projects, do not contain similar requirements).

MTC will enter into a cooperative agreement with BATA, which will operate and manage the electronic toll collection system throughout the Network.

Section 149.7(a) and (d)

"A regional transportation agency, as defined in Section 143, in cooperation with the department, may apply to the commission to develop and operate high occupancy toll lanes, including the administration and operation of a value pricing program and exclusive or preferential lane facilities for public transit, consistent with the established standards, requirements, and limitations that apply to those facilities in Sections 149, 149.1, 149.3, 149.4, 149.5, and 149.6. A regional transportation agency that develops or operates a facility, or facilities, described in subdivision (a) shall provide any information or data requested by the commission or the Legislative Analyst."

S&H Code Section 143(a)(4)(A) defines "regional transportation agency " to include a transportation planning agency as defined in Government Code Section 29532.1. . MTC is the transportation planning agency for the San Francisco Bay Area, pursuant to Government Code Sections 29532.1(a) and 66500 *et seq.*. By MTC Resolution No. 4030 (Attachment 10),scheduled for consideration and approval by MTC on September 28, 2011, MTC authorizes its submission of this application pursuant to the requirements in S&H Code Sections 143(a)(4)(A) and 149.7. The application process has included cooperation with the Department and adherence to CTC processes and guidelines. MTC will provide the CTC and Legislative Analyst with any information or data that they request.

A.2: Provide the reason for pursuing this project.

MTC is pursuing this Facility in cooperation with the Department as a means of development of an integrated Bay Area Express Lane System to enhance mobility and afford greater user flexibility of the transportation system within the San Francisco Bay Area.

The application is consistent with the region's adopted long-range transportation plan, *Transportation 2035*, which envisions a seamless, regionally managed network of express lanes in the Bay Area.

This application and the accompanying Project Study Report ("PSR") represent the culmination of several years of planning and study related to a Bay Area Express Lane System, including both conversions of existing HOV lanes and construction of new lanes. While MTC and the Department have taken the lead on these efforts, significant contributions and invaluable participation has come from the CHP and the various Congestion Management Agencies ("CMAs") within the Bay Area.

Formal statements of the project purpose and need included in the PSR are summarized as:

Need

1. Major peak-hour congestion exists on significant portions of existing Bay Area freeway corridors and will worsen with projected growth in the area,
2. Gaps persist in key elements of the freeway HOV lanes, limiting travel time savings and trip reliability
3. Many HOV lanes are underutilized during peak hours, and
4. Funding to close gaps in the HOV lane network is severely limited.

Purpose

1. Optimize capacity utilization on the existing freeway corridors,
2. Close gaps in the HOV lane system to improve travel times and trip reliability for HOVs and buses,
3. Provide a funding mechanism to accelerate HOV lane gap closure.

Part B - Department of Transportation Cooperation & Highway Compatibility

B.1: Provide evidence that the Department of Transportation supports this project and that the project application was submitted in cooperation with the Department.

See letter of support from the Department, included in Attachment 2, and approved Project Study Report ("PSR"), included in Attachment 3. Note that the PSR studied a larger "backbone network" of express lanes that includes the "Network" referenced in this application.

B.2: Provide evidence that the Department determined the project to be consistent with State Highway System requirements.

See letter of support from the Department, included in Attachment 2, and approved Project Study Report, included in Attachment 3.

Part C - Technical Feasibility

C.1: Type and Size of the project, the location, all proposed interconnections with other transportation facilities, the communities that may be affected, and alternatives (e.g., alignments) that may need to be evaluated.

The Express Lane Facility, the subject of the new express lane authority requested in this application, includes single lanes in the following corridors in Alameda, Contra Costa and Solano counties. As used in this application, one "directional mile" is one lane for one mile in one direction.

- Interstate 80 ("I-80")—from San Francisco/Oakland Bay Bridge (Ala-080-1.9) to Solano/Yolo County Line (Sol-080-R44.8), a total of 129.7 directional miles

- Interstate 880 ("I-880")—from Hegenberger Road (Ala-880-25.5) to State Route (SR) 237 (SCl-880-8.4), a total of 52.7 directional miles plus an operational gap closure of 19.9 directional miles in both directions from the San Francisco/Oakland Bay Bridge (Ala-880-R35.5) to Hegenberger Road (Ala-880-25.5) through Oakland. The application does not assume tolling on this segment, which has no existing HOV lane and no ready, affordable express lane solution. To enhance mobility on this segment, operational strategies will be employed; these could include enhanced ramp metering, increased incident management capabilities, and improvements to major arterials that parallel the I-880 corridor. All of these strategies are being investigated in a separate ongoing study.

- Interstate 680 ("I-680")—from I-80 (Sol-680-13.2) to the Contra Costa/Alameda County Line (CC-680-0.0), a total of 76.8 directional miles. This includes a 4.3-mile northbound stretch between Livorna Road (CC-680-R11.3) and North Main Street (CC-680-15.6) in Walnut Creek. While tolling is assumed on this segment, it is a longer-term construction project and is not included in the full financial plan. As with the I-880 segment through Oakland, operational strategies will be used in the interim to enhance mobility on this segment.

- State Route 84 ("SR-84") – from Dumbarton Bridge Toll Plaza (Ala-084-R3.2) to I-880 (Ala-084-R6.0), a total of 2.8 miles in the westbound direction

- State Route 92 ("SR-92") – from San Mateo Bridge Toll Plaza (Ala-092-R2.6) to Hesperian Boulevard (Ala-092-R5.8), a total of 3.2 miles in the westbound direction

Although this application is only seeking authority for those corridors comprising the Express Lane Facility that will be part of the Network, the financial plan developed in support of this application (see Part D) includes the Legacy Programs authorized in Streets and Highways Code Section 149.5, reflecting ACTC's and Sunol JPA's expressed interest in entering into an agreement with MTC to include the Legacy Programs in the Network.

The PSR developed to support this application includes authorized corridors within Santa Clara and San Mateo counties, which are not considered as part of this application or included in the supporting

financial plan. These Santa Clara express lanes, including an extension into San Mateo County, when combined with the Network described above, comprise the Express Lane System.

Table 4 summarizes the mileage totals for each of the defined express lane groupings.

Table 4: Directional Mileage Totals for Bay Area Express Lanes

	Existing Express Lanes	Conversions	New Lanes	Operational Gap Closure*	Total
Facility: I-80, I-880, I-680, SR-84 and SR-92	0	149	116	20	285
Legacy Programs: Authorized lanes in Alameda County on I-580 and I-680	14	24	54	0	91
Network: Facility plus Legacy Programs	14	173	170	20	376

* Tolling is not proposed on this segment of I-880 from the San Francisco/Oakland Bay Bridge to Hegenberger as part of this application; operational strategies could include enhanced ramp metering, increased incident management capabilities, and improvements to major parallel arterials.

Figure 2 on the following page shows portions of the Network that will convert existing HOV lanes to express lanes and portions that will require widening to add new express lanes.

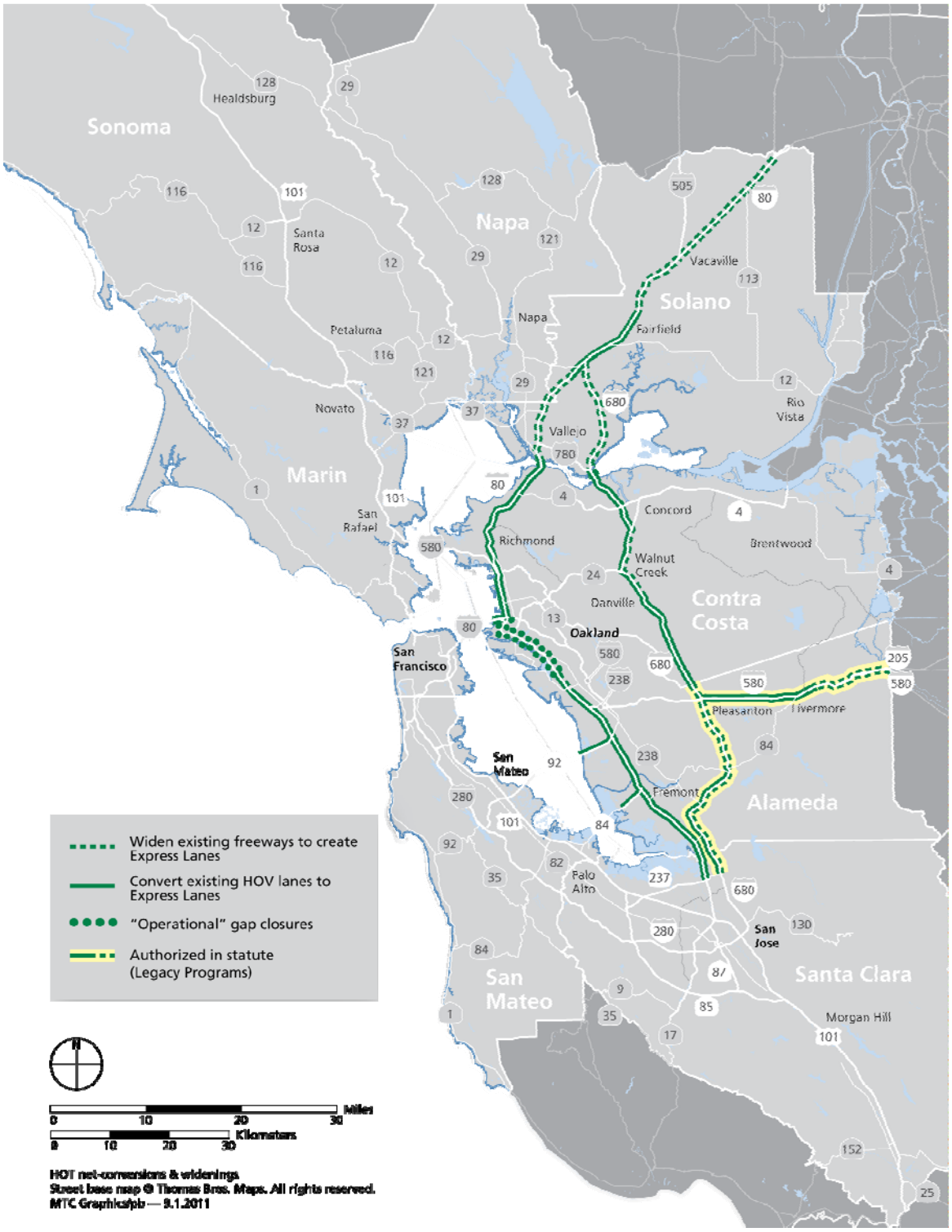

Figure 2: Bay Area Express Lane Network – Conversion of existing HOV lanes and Widening

The Express Lane Network will be implemented through phased construction projects identified in Table 5. These construction projects are a subset of those identified in the attached PSR and represent the construction projects considered in the financial plan. For the purpose of cost estimating, traffic analysis and the financial plan, preliminary construction project limits have been assumed. However, actual construction project limits will be determined in subsequent project development phases.

Table 5: Bay Area Express Lane Construction Projects Included in the Network[1]

Construction Project No. in PSR	Route[2]	County	Begin	End	Directional Miles	Type of Improvement
1	I-80	Solano	Solano/Yolo County Line	I-505	32.7	New lanes
2	I-80	Solano	I-505	Airbase Pkwy	18.4	New lanes
3	I-80	Solano	Airbase Pkwy	Red Top Rd	15.6	HOV conversion
4	I-80	Solano	Red Top Rd	SR-37	11.5	New lanes
5	I-80	Solano	SR-37	Carquinez Bridge Toll Plaza	10.1	New lanes
6	I-80	Solano/ Contra Costa	Carquinez Bridge Toll Plaza	SR-4	9.3	HOV conversion
7A	I-80	Contra Costa/ Alameda	SR-4	San Francisco/Oakland Bay Bridge HOV bypass Lane	30.2	HOV conversion
7B	I-80WB	Alameda	Bay Bridge HOV bypass Lane		1.9	HOV conversion
8	I-80/ I-680	Solano	I-80/I-680 Direct Connectors (I-80WB to I-680SB and I-680NB to I-80EB)		5.6	New lanes
9	I-680	Solano	I-80	I-780	20.2	New lanes
10	I-680 NB	Solano/ Contra Costa	Benicia-Martinez Bridge and HOV bypass Lane		2.1	HOV conversion
11	I-680 NB	Contra Costa	Marina Vista	N. Main St	8.9	New lane and HOV conversion
N/A[3]	I-680 NB	Contra Costa	N. Main St	Livorna Rd	4.3	New lane
13	I-680 SB	Contra Costa	Marina Vista	Livorna Rd	13.3	New lane and HOV Conversion
14	I-680	Contra Costa	Livorna Rd	Alcosta Blvd	22.5	HOV Conversion
15*	I-680	Alameda	Alcosta Blvd	SR-84	20.1	New lanes
16*	I-680 NB	Alameda/ Santa Clara	SR-84	SR-237	13.7	New lane
17*	I-680 SB	Alameda/ Santa Clara	SR-84	SR-237	13.7	Existing express lane
18*	I-580/ I-680	Alameda	I-580/I-680 Direct Connectors (I-580 WB to I-680 SB and I-680 NB to I-580 EB)		3.1	New construction

Table 5: Bay Area Express Lane Construction Projects Included in the Network[1]

Construction Project No. in PSR	Route[2]	County	Begin	End	Directional Miles	Type of Improvement
19*	I-580	Alameda	Greenville Rd	Alameda/San Joaquin County Line	16.8	New lanes
20*	I-580 EB	Alameda	Hacienda Dr	Greenville Rd	10.6	New lane and HOV conversion[4]
21a*	I-580 WB	Alameda	San Ramon Rd	Greenville Rd	13.2	HOV conversion
22a	I-880 NB	Alameda/ Santa Clara	Lewelling Blvd	SR-237 Direct Connector	21.1	HOV conversion
22b	I-880 NB	Alameda	Hegenberger Rd	Lewelling Blvd	5.2	New lane
23a	I-880 SB	Alameda/ Santa Clara	Hegenberger Rd	SR-237 Direct Connector	26.5	HOV conversion
32	SR-84 WB	Alameda	Dumbarton Bridge Toll Plaza	I-880	2.8	HOV conversion
33	SR-92 WB	Alameda	San Mateo Bridge Toll Plaza	Hesperian Blvd	3.2	HOV conversion

[1] Does not include the operational gap closure on I-880 between the San Francisco/Oakland Bay Bridge and Hegenberger (19.9 miles)
[2] Both directions unless otherwise specified
[3] Long-term express lane construction project; not included fully in financial plan.
[4] This segment is proposed to convert existing HOV lane and to add a second express lane from Tassajara Rd to Vasco Rd
* Already authorized under existing law ("Legacy Programs")

C.2: The timeframe for project completion.

As further described in Part D (Financial Feasibility), the Network can be completed by 2030 under the Base Case, representing the set of assumptions supported by current projections and estimates, or by 2035 under the Conservative Case, a sensitivity test assuming greatly reduced revenues. As noted in Part C.1, the I-680NB gap closure falls outside the implementation timeframe for the rest of the Network (2040 or later).

Ordinarily, the scheduled delivery of a construction project is the result of how much time is needed to design and construct it and when the funds required to pay for it are available. To facilitate the modeling of the Express Lane Network with an appropriate level of detail, the construction projects were grouped into 5-year delivery phases. The initial placement of a construction project within a particular 5-year phase was based upon the following:

1. The first two phases, ending in 2015 and in 2020, contain primarily construction projects in which existing HOV lanes will be converted to express lanes that cost less to implement and can be delivered faster;
2. The third, fourth and fifth phases include construction projects that must add lanes and these were scheduled taking into account the following:

a. How much connectivity and/or operational benefits are derived;
b. How financially feasible the combined cost and revenue stream is; and
c. The degree of environmental, right of way and/or constructability issues that are likely to require an increased amount of time to address.

The phasing of the individual construction projects within the Express Lane Network is shown in Part D.1, which discusses the financial plan.

C.3: How the proposed schedule is reasonable given the scope and complexity of the project

For the purposes of planning the work required to build out the Facility, assumptions were made about how the environmental, design and construction work would take place. A differentiation was made between construction projects that would convert existing HOV lanes to express lanes and construction projects that would build new lanes to serve as express lanes. Within each of these two categories, assumptions appropriate to the specific type of work were then made, which are detailed in Attachment 8.

Construction projects that will convert existing HOV lanes into express lanes are assumed to take 4 years to implement. Construction projects that will build new lanes, 6 years is the assumed duration for implementation.

These implementation timeframes fit within the delivery phases described in Part C.2 so that the Facility is delivered within the years specified. The first 5-year phase will be effectively 4 years at the time of approval, so the construction projects scheduled in this time period are all 4-year construction projects. For all of the succeeding 5-year phases, there is sufficient time available to accommodate the 6-year duration of the new lanes construction projects.

As is typically the case with a set of program level assumptions, few of the construction projects will actually align perfectly with the assumptions. However, the overall delivery of the Facility is likely to be achieved consistent with the combined time developed through these assumptions.

C.4: The methods expected to be followed to assure that the project will be completed and will be completed on time.

There are several planning decisions that will help expedite delivery of the Facility. Planning to construct the conversion construction projects first enables the earliest generation of revenue with the least amount of upfront investment. This strategy addresses the concern over delayed funds slowing delivery. While developing the PSR documents for each of the construction projects, plans to contain costs and to expedite delivery should be assessed and a determination made on how to proceed with development. In the case of the conversion construction projects, there are not likely to be multiple alternatives requiring full preliminary design. As a result, many of these construction projects (except for those involving federal funds), could have the design occur concurrently with the environmental studies, thus minimizing the amount of time required to get them to the point of advertisement.

For the Facility, MTC and the Department entered into a Cooperative Agreement in August 2010 outlining their respective responsibilities and relationship with regard to this application. The Agreement includes provisions for preparation of a Delivery Strategy Report. The report will consider the range of delivery options, including traditional approaches as well as alternative delivery approaches, such as design-build and public-private partnerships available with recent changes in state law, which could be used to expedite construction. Once the traffic operational analysis and environmental clearance is in hand, risks to the design are greatly minimized because much of the layout of the overhead signs and the tolling equipment will be standardized throughout the Network. Another way to assure on-time, and possibly expedite, delivery would be to contract with a single system integrator to implement the electronic tolling system for the entire Network. This would create an economy of scale and avoid increased costs required to coordinate different software and hardware setups and make coordination with highway contractors consistent.

C.5: The plan for operation of the facility.

This section identifies the general concept for the operation of the Express Lane Network by MTC. The operational plan is included in Attachment 6.

The implementation and operation of express lanes requires several significant changes to the manner in which HOV lanes are operated and the way motorists currently use the lanes.

1. Until technology allows operation of a continuous access express lane, changing from continuous access HOV design to limited access express lane design.
2. Use is granted to vehicles that do not meet the prevailing occupancy requirements by requiring them to carry an active FasTrak® transponder connected to a valid account.
3. The minimum occupancy requirement may be raised on some facilities or corridors at some future date, either during peak hours only or full-time in order to allow for effective operation.
4. All express lane users may be required, at some point in the future, to self-declare occupancy by means of a switchable transponder. This flexibility to the user also will allow greater automation of tolling enforcement and ease of use of the express lanes (which may have different occupancy requirements in various corridors). Regulations and statutes may need to be updated to require the use of switchable tags by carpoolers
5. Express lanes may operate every day of the week, rather than only during peak periods only on weekdays as the current HOV system operates, provided HOV benefits on the express lanes are realized throughout all operational times.

No changes will be made to the eligibility, as established in statute, of vehicles to use HOV lanes.

As the implementation moves into the project scoping phase, MTC will continue to work closely with the Department to develop Express Lane System solutions that will be consistent throughout the region and in agreement with the Caltrans Traffic Operations Policy Directive (“TOPD 11-02”).

Pricing of Toll-Based Users

In order to maintain minimum travel speeds of 45 miles per hour (Federal SAFETEA-LU Section 1121 standard) and Level of Service C in the express lanes, the applicable toll rate will vary based upon observed traffic demand. Termed “dynamic pricing,” this tolling approach is currently in operation on I-

680 in Alameda County and on I-15 in San Diego County, and will be implemented in Los Angeles County on I-10 and I-110 in 2012.

Facility Design

The majority of the Bay Area Express Lane Network involves conversion of existing continuous access HOV lanes to express lanes. For this application and the related PSR, express lanes would have limited access and be buffer separated similar to HOV lanes found throughout southern California. Cross-section standards include the provision of 2- to 4-foot painted buffers separating the express lane from the adjacent general purpose lanes. Access will be provided in designated locations where ingress and egress movements are signed appropriately. The actual configuration will be one of several designs allowed for under the Department TOPD 11-02.

In addition to the buffer and limited access, the express lanes require the addition of tolling infrastructure and related signage, closed circuit television monitoring, lighting, vehicle detection, and other features as deemed necessary for the safe operation and enforcement of such facilities.

C.6: The technology that will be used to maximize interoperability with relevant local and statewide transportation technology.

The Bay Area Express Lane System operating rules can provide a seamless operation throughout the Bay Area, regardless of the implementing agency. The intent, from a customer service perspective, is to have the express lanes function as one regionally understood and reliable travel option for customers. BATA will handle all customer service, by agreement with MTC, regardless of which facilities the customers utilized.

Two forms of toll collection will be possible:

- Electronic toll collection ("ETC") from registered motorists who carry in-vehicle-mounted FasTrak® (Title 21-compliant) transponders. This is the primary means of toll collection envisioned for the System.
- In the future, MTC may collect tolls through license plate recognition ("LPR") systems (often called "pay-by-plate"), which are linked to the state license plate database. This system for toll collection is beginning to be used on priced express lane and toll systems throughout the U.S., although it is already being used on Bay Area bridges. It is permitted under California Vehicle Code Section 23302.

C.7: How the proposed project is consistent with applicable state and federal statutes and regulations and standards. Document the applicable state and federal standards and provide evidence that the proposed design meets the standards.

MTC's implementation of the Facility will comply with applicable federal and state statutes, regulations, and standards. Part A.1 details the subsections of California Streets and Highways Code Section 149 that apply to the Express Lane Facility and then describes how the overall program will comply with these

sections. This Part C.7 looks at the same subsections of Section 149 along with other legal requirements as they pertain to the design and construction of the Facility.

Consistent with Section 149, which states, "the department shall conduct competent engineering estimates of the effect of such lanes on safety, congestion, and highway capacity," project development work will adhere to the Department's requirements as provided in manuals and memoranda for Project Initiation Documents ("PIDs"), the Project Approval and Environmental Document ("PA&ED") phase, the Right of Way phase, the Plans, Specifications and Estimate ("PS&E") phase, and the Construction phase. All applicable federal and state statutes will be adhered to, including National Environmental Policy Act ("NEPA") and California Environmental Quality Act ("CEQA") (also see Part E.4).

During development of project-specific PIDs, areas with critical physical constraints will be carefully examined. If exceptions from established standards are indicated in those locations, any exceptions will be investigated for safety and practicality, carefully documented, and approved by the Department prior to approval of the PID. If a determination cannot be made at the PID phase, it will be pursued during PA&ED phase.

Sections 149.5(a)(2) and 149.6(a)(a) state that the HOT lane operator "may direct and authorize the entry and use of the high-occupancy vehicle lanes in the corridors identified … by single-occupant vehicles for a fee." To do this, MTC will make sure that newly constructed express lanes and changes to existing HOV lane access will be developed in conformity with Department standards such as TOPD 11-02, Federal Highway Administration ("FHWA") requirements and the Streets and Highways Code. The basis of design for all construction projects will be the Department's Highway Design Manual. Interstate Routes will be further governed by the FHWA 13 controlling criteria.

Sections 149.5(b) and 149.6(b) require MTC to "ensure that Level of Service C … is maintained at all times in the high-occupancy lanes…" The programmatic PSR developed in support of this application included this requirement in its planning and assessment and follow-on work will continue to do so.

There are a host of federal requirements applicable to contracts entered into by MTC and its contractors, including federal authorization to issue requests for proposal or other procurement solicitations with respect to those portions of the Express Lane Facility that are receiving federal funding. Required contract provisions such as non-discrimination/EEO, payment of prevailing wage and the avoidance of conflicts of interest, will be included. Also, any right-of-way acquisitions and utility relocations needed for the Express Lane Facility will be undertaken in compliance with applicable federal law and regulations.

Privacy Provisions

All toll transactions and accounts will be processed and maintained by BATA. Since 2004, BATA has published an explicit privacy policy, with revisions in 2004, 2005, 2008, 2010, and 2011. The most current privacy policy, published on January 6, 2011, complies with Senate Bill 1268 (2010), which added *Chapter 8: Electronic Toll Collection Systems* to Division 17 of the Streets and Highways Code. The current, complete privacy policy may be viewed here: (http://www.bayareafastrak.org/static/privacy/).

Similar to Part A.1 of this Application, there are other parts of this application in which specific reference is made to Federal, State and/or local standards and statutes. In each case, MTC's implementation of this Facility will comply with these requirements.

C.8: Whether the project is outside the purview of federal oversight, or whether it will require some level of federal involvement due to its location on the National Highway System or Federal Interstate System or because federal permits are required.

FHWA coordination and concurrence is required due to the fact that Interstate routes are involved. Much of the existing HOV lane network has been constructed using federal funding, and additional federal funding is anticipated.

Imposition of tolling on federal highways requires FHWA authorization as provided under the various interstate tolling provisions authorized under SAFETEA-LU. MTC already has submitted a statement of interest to the FHWA tolling team with regard to seeking tolling authority for the interstate portions of the network of express lanes included in the *Transportation 2035 Plan*. Furthermore, MTC and FHWA will need to enter into an agreement regarding the use of toll revenues from the Facility due to the use of federal funds to develop the Facility.

Changes to Interstate highway mainline access require FHWA approval of a New Connection Report ("NCR") or Modified Access Report ("MAR"), depending on whether a change is a new connection or modification of an existing access point. It is anticipated that impacts to existing local road interchanges resulting from implementation of express lanes will be minimal, but addition or modification of freeway-to-freeway direct connectors are expected. In instances where these changes add new connections or modify existing ones on Interstate highways, a NCR or MAR will need to be prepared. Two construction projects (8 and 18) involve direct connectors that are likely to require NCR/MAR approval. Exceptions to Mandatory Design Standards proposed on the Interstate System would also require FHWA approval. Approvals from FHWA will be sought in conjunction with the PA&ED phase of the specific construction projects rather than through the current PSR effort.

C.9: Evidence that the project has received environmental clearance. If environmental clearance was not yet received, explain whether the project is likely to receive environmental clearance to meet the timeline set forth in the project proposal.

The PSR includes discussions of the levels of environmental documents and technical reports anticipated in order to comply with NEPA and CEQA requirements as the construction projects move toward programming and then PA&ED. As agreed to with the Department, the specifics of the individual construction projects are not yet sufficiently detailed to allow preparation of environmental documents, including technical reports and there are insufficient details available at this time to prepare a Preliminary Environmental Assessment Report ("PEAR"). In MTC's opinion, the project is likely to

receive environmental clearance to meet the timeline set forth in assumptions for the financial plan outlined in Attachment 8.

C.10: The required state and local permits and the schedule to obtain them.

During implementation, Federal, State and local permit requirements for individual construction projects will be determined during the respective PA&ED phase. More precise scheduling of permits will be defined in the construction project level PID phase refined in the Project Report phase.

C.11: All negative impacts known for the project. For each negative impact, document whether there is a mitigation plan identified.

Concerns about potential negative impacts of the Facility have been raised by some stakeholders but have not been established to date in environmental documentation. Several of these concerns (summarized below) are also addressed in other parts of this application. It is also important to note that project-specific impacts will be addressed in the individual project development and environmental processes for each construction project.

- *Availability and use of express lanes only by the affluent members of society, not low-income persons.* Based on experience with express lanes elsewhere, express lanes are a voluntary option and are used by persons in diverse economic circumstances. Absent express lanes, no persons, including the less affluent, would have the option to obtain the time savings and trip reliability that are made possible by express lanes. This option is often of particular value to low-income persons who may not have the schedule flexibility enjoyed by higher-income or retired persons. Many drivers of all income groups do not have the option of forming a carpool to take advantage of HOV lanes, due to personal, geographic or time constraints. Express lanes provide them with a choice they would not otherwise have. (Also see Parts E.13 and E.14). If it is later determined that there is a negative impact on low-income persons, special provisions, such as discounts for low-income travelers, may be considered at a future time.
- *Impact on adjacent general purpose lanes.* Pricing provides a tool for managing demand on all the lanes, both express lanes and general purpose lanes. Because the price can be set to adjust to actual freeway conditions, the express lanes can be managed to maximize throughput and minimize congestion on the entire freeway. Absent the express lanes, it is possible for the HOV lanes to be either overutilized—thereby negating any time savings or reliability benefits—or underutilized—thereby reducing efficiency and creating a public perception of "empty space" and reducing public support for HOV lanes. (Also see Part E.3 and PSR in Attachment 3).
- *Air quality and increased emissions.* The benefit/cost analysis indicates the Facility will reduce emissions, not increase emissions(see Parts D.7 and D.8).
- *Increased traffic congestion in the urban core.* Through use of careful pricing mechanisms, the Express Lane Network will decrease traffic congestion (see Parts D.7 and D.8 regarding reduced vehicle-hours of delay). The greatly enhanced incentive for travelers to use HOVs or buses, due to the much more connected and extensive HOV lanes, could have the impact of reducing the number of vehicles that would otherwise be using the freeway. There may be specific "hot spots" where there is a potential for increased congestion. These will be addressed in project-specific analysis, and tailored mitigation measures (e.g., auxiliary lanes, ramp metering, adjusted access locations, etc.) will be developed.

- *Encouragement to "sprawl" development.* This asserted impact is somewhat contradictory to the one above regarding "increased traffic congestion in the urban core." Future land patterns are governed by a multitude of land use decisions made by local jurisdictions, with guidance from the Sustainable Community Strategies currently being fashioned by and within the region. The purpose of the transportation system is to provide maximum mobility for movement of people and goods in the most efficient and cost-effective manner. The project contributes to that mobility through offering an additional option for travel, while at the same time providing a substantially more extensive HOV lane system, sooner than would otherwise be possible with current and projected resources. The additional HOV lanes that will result from the build-out of the Facility will provide more incentives and opportunities for carpools, vanpools and buses.

C.12: If not too early to determine, the method by which the operator proposes to secure all property interests required for the transportation facility.

The State of California will own the right of way for the Facility. Preliminary estimates of right of way requirements will be established during preparation of PIDs for individual construction projects. During a construction project's PA&ED phase, required parcels or portions thereof will be identified, including temporary easements if applicable. All parcels or portions thereof will be acquired in the State's name according to the cooperative agreements as referenced in Part D.10.

Parcel acquisition will not normally occur until the construction project ROD has been signed and will then proceed in accordance with guidelines in the Department Right of Way Manual, which is in conformance with applicable federal regulations. If hardship cases dictate a need for acquisition of a parcel prior to the ROD, procedures are available in the Right of Way Manual to accommodate such cases.

Property other than right of way, such as the toll collection equipment, will be owned by MTC, and will be installed, operated and maintained pursuant to an easement or encroachment permit and an operations and maintenance agreement with the Department.

C.13: Whether there is a process in place to develop a maintenance plan with the Department. Specifically, whether there is a process to clearly define assumptions or responsibilities during the operational phase including law enforcement, toll collection and maintenance.

In general, it is anticipated that the Department will be responsible for roadway and signage maintenance, subject to subsequent agreements. MTC will be responsible for tolling equipment maintenance and back-office operations, and CHP will be responsible for enforcement, subject to subsequent agreements.

For the operation of the I-680 Express Lane over Sunol Grade, the Department in conjunction with the Sunol JPA, has drafted an Operations and Maintenance Agreement. This agreement calls for two additional documents: the Maintenance Management Plan and the Incident Management Plan. These two documents define the roles, responsibilities and operating procedures for maintenance and incident

management. Together, all three documents memorialize the understanding between the Department and the Sunol JPA as the operator of the express lane. Lane enforcement is governed by a reimbursable services agreement between the Sunol JPA and the CHP. Toll collection is conducted by BATA under a cooperative agreement with the Sunol JPA consistent with the Section 149.5(a)(3) of the Streets and Highways Code.

This same set of documents is now under development for the SR 237/I-880 Express Connectors in Santa Clara County. This facility will be operated by the VTA.

The agreements developed for the first two Bay Area express lanes can serve as the model for the agreements to be developed between MTC as operator and the Department, the CHP and BATA (as toll collector). The O&M Agreement will serve as the legally binding agreement for operation and maintenance, leaving the specific details to the Maintenance Management Plan and the Incident Management Plan. A separate agreement with the CHP Golden Gate Division will establish the basis for enforcement. Toll collection will be conducted by BATA on behalf of and pursuant to an agreement with MTC.

Additional agreements between MTC and the operating agencies of the Legacy Programs will be needed to define when and how the transfer of operations will occur (see Part D.10).

Part D - Financial Feasibility

D.1: Provide information relative to the project financial plan and feasibility.

The following financial plan for the Express Lane Network demonstrates its feasibility under a range of circumstances. The implementation of the Network will span 20+ years and so the Network's feasibility is further enhanced by the flexibility to calibrate the implementation of the Network based on factors such as actual performance, costs, revenue, and available resources and financing instruments in the future. To illustrate this flexibility – and to address potential questions regarding the impacts of adverse assumptions on future build-out – MTC has provided both a baseline financial plan (the Base Case), representing the set of assumptions supported by current projections and estimates, as well as a sensitivity showing the impacts of greatly reduced revenue (the Conservative Case). Significantly reducing annual revenue has a larger impact on feasibility than other reasonably likely risk factors, so the Conservative Case can be seen as representative of a spectrum of downside scenarios (such as increases in cost of financing or capital construction). An optimistic case has not been provided, but would allow for reduction of grants, acceleration of build-out and/or other permissible uses of Network funds, consistent with regional priorities at that time.

The financial plan includes the Alameda County I-580 and I-680 corridors in the Legacy Programs, reflecting ACTC's and Sunol JPA's expressed interest in entering into an agreement with MTC to include the Legacy Programs in the Network. While the terms of agreement have not yet been specified, sensitivity analysis demonstrates that, everything else being equal, omitting the Legacy Programs from the Network does not adversely affect the financial feasibility of the remaining portions of the Network. Specifically, it does not require delaying the implementation schedule or increasing the grant funding for the construction projects in the Express Lane Facility.

This financial plan concerns construction and financing that will be undertaken over a number of years. It is anticipated that the actual financing mechanisms used at those times will be optimized given market conditions, availability of grant and loan programs and the actual performance of the growing Network.

Overview of Base and Conservative Cases

The Base Case financial plan of the Express Lane Network provides for completion of development by 2030 and relies on a set of traffic and toll revenue forecasts, capital and operating cost estimates, construction project prioritization and phasing choices, and financing assumptions described below. While MTC believes that all assumptions made under the Base Case are reasonable (refer to Part D.5 and Attachment 8 for more details), it recognizes that many cost or revenue economic drivers will undoubtedly change through the long-range implementation of the Express Lane Network.

The Conservative Case stress test demonstrates the financial feasibility of the entire network (and still delivers mobility benefits) under more financially challenging assumptions. Under the Conservative Case, the effect of the constrained revenues associated with more conservative tolling policy are mitigated through the deferral of construction projects and increased capital grants. MTC considers this downside scenario to be quite conservative and sufficient to demonstrate the financial plan's ability to

weather a variety of stressed economic scenarios located on the continuum between the Base Case and the Conservative Case.

The phasing, toll policy, toll revenues, capital and operations, maintenance and rehabilitation expense assumptions, net operating cash flow (before financing and funding), capital funding sources and uses, operating system cash flow are described below for both the Base and Conservative Cases.

Phasing

The financial plan models the delivery of the various construction projects in up to 5 phases of implementation (Phase I through Phase V), with the following constructions periods:

Table 6: Summary of Implementation Phases*

	Phase I	Phase II	Phase III	Phase IV	Phase V
Construction Project Delivery Timeframe	Through 2015	2014-2020	2019-2025	2024-2030	2029-2035
Base Case: Service Commencement	2015	2020	2025	2030	
Conservative Case: Service Commencement	2015	2020	2025	2030	2035

*The northbound stretch of I-680 in Walnut Creek is considered a longer-term construction project and is not reflected in the phases of the financial analysis shown here.

Table 7 below shows each construction project's individual phasing under the Base and Conservative Cases.

Table 7: Phasing of Express Lane Network Construction Projects[1]

Construction Project Number in PSR	Route[2]	Limits	Base Case Delivery	Conservative Case Delivery
1	**I-80**	SOL/YOLO County Line to I-505	2030	2035
2	**I-80**	I-505 to Airbase Pkwy	2020	2025
3	**I-80**	Airbase Pkwy to Red Top Rd	2015	2020
4	**I-80**	Red Top Rd to SR-37	2020	2025
5	**I-80**	SR-37 to Carquinez Bridge Toll Plaza	2020	2020
6	**I-80**	Carquinez Bridge Toll Plaza to SR-4	2020	2020
7A	**I-80**	SR-4 to Bay Bridge HOV bypass Lane	2020	2020
7B	**I-80 WB**	Bay Bridge HOV bypass Lane	2015	2015
8	**I-80/I-680**	I-80/I-680 Direct Connectors (I-80WB to I-680SB and I-680NB to I-80EB)	2020	2030
9	**I-680**	I-80 to I-780	2020	2030
10	**I-680 NB**	Benicia-Martinez Bridge and HOV bypass	2020	2025
11	**I-680 NB**	Marina Vista to N. Main St	2020	2025
N/A[3]	**I-680 NB**	N. Main St to Livorna Rd	post 2040	post 2040

Table 7: Phasing of Express Lane Network Construction Projects[1]

Construction Project Number in PSR	Route[2]	Limits	Base Case Delivery	Conservative Case Delivery
13	**I-680 SB**	Marina Vista to Livorna Rd	2020	2025
14	**I-680**	Livorna Rd to Alcosta Blvd	2015	2015
15*	**I-680**	Alcosta Blvd to SR-84	2025	2030
16*	**I-680 NB**	SR-84 to SR-237	2020	2020
17*	**I-680 SB**	SR-84 to SR-237	open	open
18*	**I-680/I-580**	I-580/I-680 Direct Connectors (I-580 WB to I-680 SB and I-680 NB to I-580 EB)	2025	2035
19*	**I-580**	Greenville Rd to ALA/SJQ County Line	2025	2035
20*	**I-580 EB**	Hacienda Dr to Greenville Rd	2015	2015
21a*	**I-580 WB**	San Ramon Rd to Greenville Rd	2015	2015
22a	**I-880 NB**	Lewelling Blvd to SR-237 Direct Connector	2015	2015
22b	**I-880 NB**	Hegenberger Rd to Lewelling Blvd	2020	2025
23a	**I-880 SB**	Hegenberger Rd to SR-237 Direct Connector	2015	2015
32	**SR-84**	Dumbarton Bridge Toll Plaza to I-880	2015	2015
33	**SR-92**	San Mateo Bridge Toll Plaza to Hesperian Blvd	2015	2015

* Already authorized under existing law
[1] Does not include the operational gap closure on I-880 between the San Francisco Bay Bridge and Hegenberger
[2] Both directions unless otherwise specified
[3] Long-term express lane construction project; not included fully in financial plan.

Tolling Policy and Toll Revenues

While HOV tolling policy will be the subject of future analysis and decision-making based on actual traffic and congestion and policy priorities, the Base Case assumes the following:

- Tolling exemptions for HOVs will follow current occupancy policy on existing HOV lanes. Where the current occupancy policy is 2 or more occupants per vehicle (HOV 2+),the toll exempt occupancy policy for new express lanes will allow HOV2+vehicles to use the lanes without paying a toll, with an increase to an HOV3+ occupancy policy once capacity is reached on the express lane (i.e., level of service C is not ensured any longer), but in any case no later than 2020. Current HOV3+ lanes will keep an HOV 3+ occupancy requirement.
- Express lanes tolling would be operated during daytime hours during weekdays plus weekend afternoons (6AM-7PM on weekdays, 12-7PM on weekends)

The following tolling policy assumptions are made under the Conservative Case:

- Tolling exemptions for HOVs will follow current HOV occupancy policy (new express lane construction projects will initially follow an HOV2+ toll exemption policy), with an increase to HOV3+ once capacity is reached on the express lane (i.e., level of service C is not ensured any longer), but in any case no later than 2035. Current HOV3+ lanes will keep an HOV3+ toll exemption policy.

- Express lanes tolling reduced window of operations during standard peak periods plus weekend afternoons (6-10AM & 3-7PM on weekdays, 12-7PM on weekends). Note there are a number of other tolling hours' configurations which are equivalent in terms of revenue.

Capital and Operations, Maintenance and Rehabilitation Expenses

The same underlying cost estimates (in 2010 dollars) are used under both Cases (with the exception of reduced variable tolling operational costs attributed to reduced traffic in the express lanes); however, the phased build-out of the Express Lane Network is assumed to occur at a slower pace under the Conservative Case. This results in a shift of the start-up of the operations and maintenance costs and rehabilitation cycles for the delayed construction projects, along with associated cost indexation.

Figure 3 on the following page summarizes operating cash flows before taking into account debt financing or grant funding for both the Base and Conservative Cases.

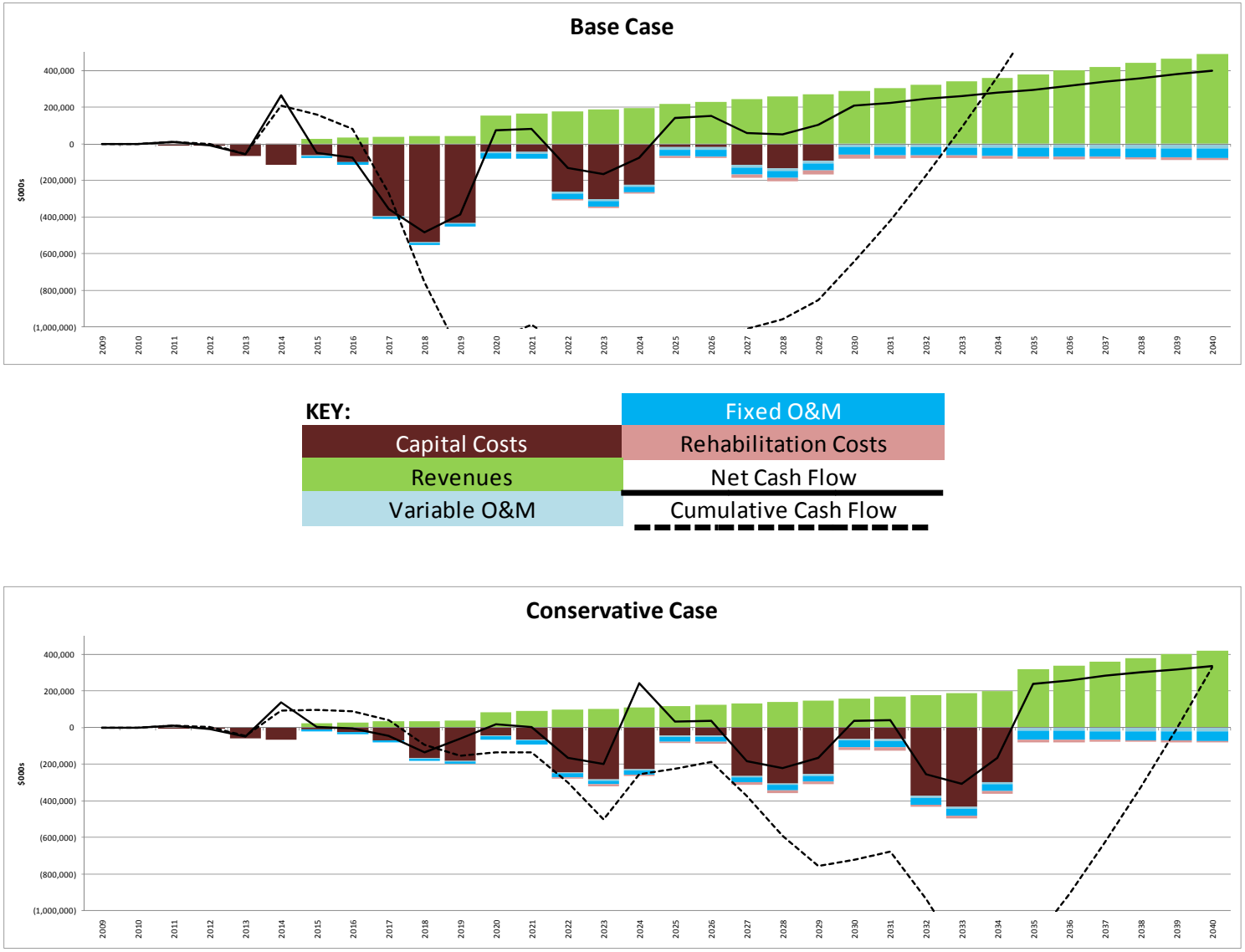

Figure 3: Net Operating Cash-Flow (excludes funding and financing cash-flows)

Capital funding

To address the mismatches in timing and availability of revenues versus expenses demonstrated in the Figures above, the financial plan meets capital funding requirements through a combination of:

- Pay-as-you-go toll revenues from the existing system;
- Multiple toll revenue current interest bonds ("CIBs") issuances;
- Several Transportation Infrastructure Finance and Innovation Act ("TIFIA") loans structured in up to five series; and
- Capital grant contributions

Please refer to Part D.2 for more information regarding these funding sources. Table 8 and Table 9 on the following pages show the sources of uses of funds for each construction phase of the network under the Base and Conservative Cases. Although the nature and role of the various funding sources still holds under the Conservative Case, the grant capital funding requirement is higher in the later construction phases of the Conservative Case (resulting in about a 50% increase in grant requirements on a present value basis).

Table 8: Construction Sources and Uses of Funds - Base Case

SOURCES & USES - CONSTRUCTION (millions of nominal dollars)	PHASE I			PHASE II			PHASE III			PHASE IV			PHASE V		
	Amt	% of Debt	% of Ttl	Amt	% of Debt	% of Ttl	Amt	% of Debt	% of Ttl	Amt	% of Debt	% of Ttl	Amt	% of Debt	% of Ttl
Sources															
CIBs Debt	79.3	*57%*	*44%*	595.0	*50%*	*33%*	319.5	*53%*	*31%*	138.7	*84%*	*30%*	-	*0%*	*0%*
TIFIA Debt (excl cap. Interest)	59.0	*43%*	*33%*	595.2	*50%*	*33%*	286.9	*47%*	*28%*	26.7	*16%*	*6%*	-	*0%*	*0%*
Total Debt	138.3	*100%*	*77%*	1,190.2	*100%*	*66%*	606.4	*100%*	*59%*	165.4	*100%*	*36%*	-	*0%*	*0%*
Local Funding for Projects	23.4		*13%*	72.5		*4%*	-		*0%*	-		*0%*	-		*0%*
Grant Funding	16.8		*9%*	367.0		*20%*	-		*0%*	-		*0%*	-		*0%*
Pay-As-You-Go Funds	0.6		*0%*	174.3		*10%*	429.5		*41%*	297.2		*64%*	-		*0%*
Total	**179.1**		*100%*	**1,804.0**		*100%*	**1,035.9**		*100%*	**462.7**		*100%*	**-**		*0%*
Uses															
Capital Costs	155.4		*87%*	1,543.1		*86%*	888.4		*86%*	393.2		*85%*	-		*0%*
Upfront Fees	1.1		*1%*	6.3		*0%*	3.5		*0%*	1.7		*0%*	-		*0%*
Annual Fees	0.2		*0%*	0.3		*0%*	0.4		*0%*	0.4		*0%*	-		*0%*
DSRAs	9.3		*5%*	60.9		*3%*	31.8		*3%*	15.3		*3%*	-		*0%*
CIBs Interest during Construction	13.1		*7%*	193.4		*11%*	111.8		*11%*	52.0		*11%*	-		*0%*
Total	**179.1**		*100%*	**1,804.0**		*100%*	**1,035.9**		*100%*	**462.7**		*100%*	**-**		*0%*

Table 9: Construction Sources and Uses of Funds - Conservative Case

SOURCES & USES - CONSTRUCTION (millions of nominal dollars)	PHASE I			PHASE II			PHASE III			PHASE IV			PHASE V		
	Amt	% of Debt	% of Ttl	Amt	% of Debt	% of Ttl	Amt	% of Debt	% of Ttl	Amt	% of Debt	% of Ttl	Amt	% of Debt	% of Ttl
Sources															
CIBs Debt	63.5	*55%*	*41%*	63.3	*46%*	*14%*	282.5	*51%*	*28%*	157.9	*53%*	*16%*	715.6	*56%*	*42%*
TIFIA Debt (excl cap. Interest)	51.1	*45%*	*33%*	73.1	*54%*	*16%*	271.3	*49%*	*27%*	141.7	*47%*	*14%*	556.9	*44%*	*33%*
Total Debt	114.5	*100%*	*74%*	136.4	*100%*	*30%*	553.7	*100%*	*55%*	299.6	*100%*	*31%*	1,272.6	*100%*	*75%*
Local Funding for Projects	23.4		*15%*	20.0		*4%*	52.5		*5%*	-		*0%*	-		*0%*
Grant Funding	16.8		*11%*	194.7		*43%*	87.5		*9%*	387.3		*39%*	110.0		*7%*
Pay-As-You-Go Funds	0.4		*0%*	105.4		*23%*	305.4		*31%*	293.8		*30%*	305.6		*18%*
Total	**155.2**		*100%*	**456.5**		*100%*	**999.2**		*100%*	**980.7**		*100%*	**1,688.2**		*100%*
Uses															
Capital Costs	136.5		*88%*	425.5		*93%*	865.5		*87%*	896.2		*91%*	1,270.7		*75%*
Upfront Fees	1.0		*1%*	1.0		*0%*	3.2		*0%*	1.9		*0%*	7.5		*0%*
Annual Fees	0.2		*0%*	0.3		*0%*	0.4		*0%*	0.4		*0%*	0.4		*0%*
DSRAs	6.1		*4%*	7.5		*2%*	31.3		*3%*	19.1		*2%*	141.2		*8%*
CIBs Interest during Construction	11.4		*7%*	22.2		*5%*	98.9		*10%*	63.2		*6%*	268.4		*16%*
Total	**155.2**		*100%*	**456.5**		*100%*	**999.2**		*100%*	**980.7**		*100%*	**1,688.2**		*100%*

Operating system cash-flow

As the delivery of the Network progresses through the various phases of implementation, toll collection on the operating system begins in 2015, and expands to newly delivered Network elements as they come online through 2030 (or 2035 under the Conservative Case). Figure 4on the next page shows the operating system cash flows under both Cases, taking into account local/grant funding and debt financing. Please refer to Attachment 7 for full details.

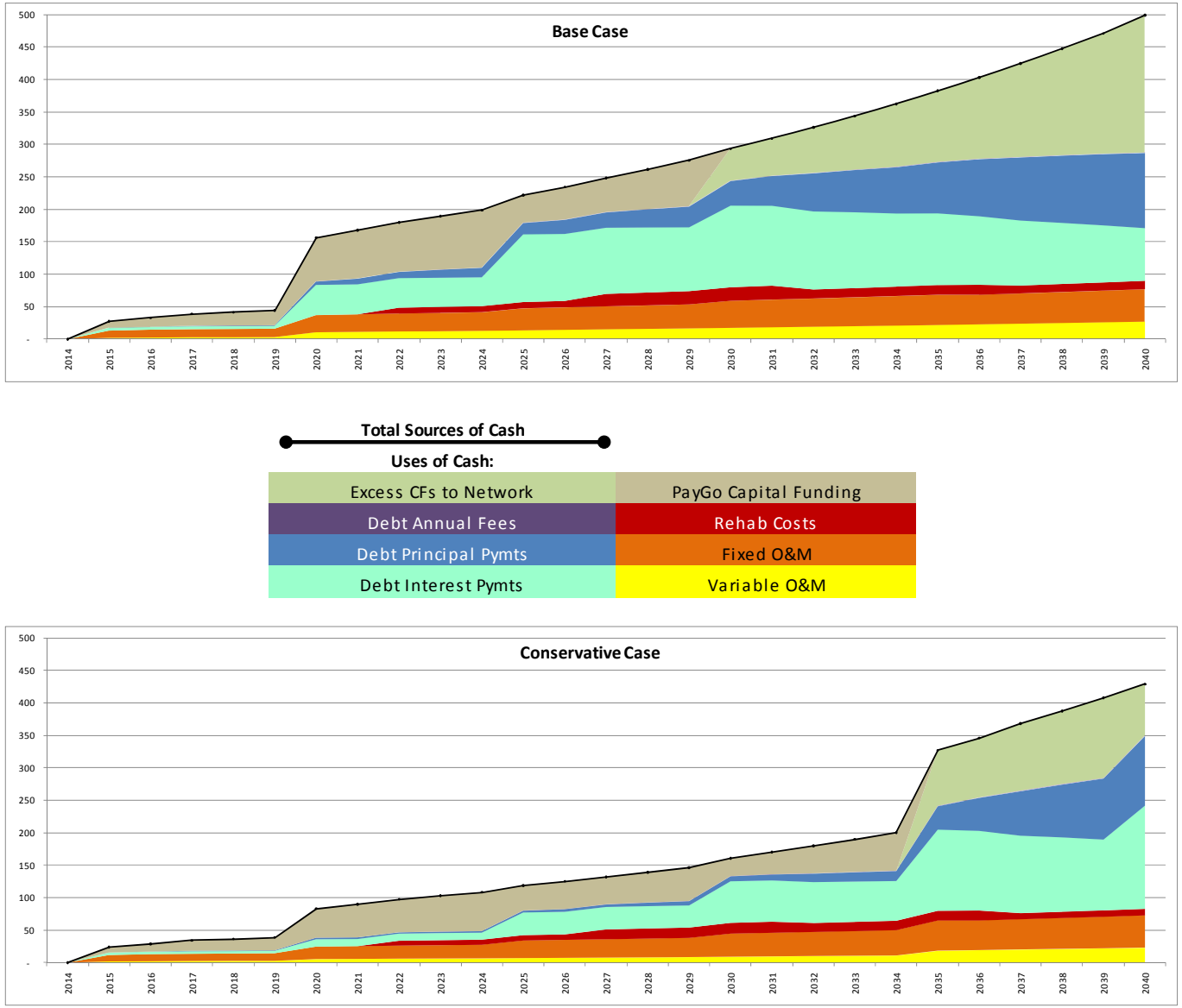

Figure 4: Annual Operating Network Cash-Flow (millions of nominal dollars)

Note the "Excess CF to Network" shown results from the anticipated lenders' requirements to have a cushion of cash flow available to service the debt interest and principal payments, i.e., to meet minimum 2.0x and 1.1x coverage ratios, respectively, for the senior toll revenue bonds and the subordinated TIFIA loan. Through 2030 (or 2035 under the Conservative Case), these funds are anticipated to be used to fund on a subordinated, pay-as-you-go basis some of the capital expenditures necessary to complete the Network (phase II onwards), and are referenced in Table 8 and Table 9.

I-680 Network Gap and I-880 Operational Gap

The delivery of the I-680 northbound express lane at the I-680/SR-24 interchange is not envisioned before a 2040 (or later) timeframe. As such, this segment has not been included in the financial modeling exercise. At this time, the order of magnitude of the capital costs is estimated at around $200M in 2010$, or $500M in 2040$. Potential future funding sources include Network pay-as-you go funds, toll revenue bonds and capital grants. In addition, please note that the I-880 operational gap closure is not included in the financial analysis.

D.2: Document a financial plan and financial guarantees which will allow for access to the necessary capital to finance the facility.

As described in Part D.1, both the Base Case and the Conservative Case involve selected construction projects being financed, constructed and brought into operation progressively in 5-year phases. Operations are scheduled to commence on the first phase (Phase I) in 2015, with the subsequent Phases II through V (if applicable) commencing operation in 2020, 2025, 2030 and 2035.

The financing plan assumes that a "system credit" pledge will be offered to lenders or bondholders – i.e., that all borrowing will be on a Network-wide basis and that the overall strength of the Express Lane Network, as it grows progressively, will be available to make any required payments on the debt facilities they have extended.

The sources of capital available to fund the Network's many construction projects include:

- Senior toll revenue bonds, in the form of CIBs, placed through multiple issuances;
- Transportation Infrastructure Finance and Innovation Act (TIFIA) loans, structured as up to five separate, sequential loans (similar to the three TIFIA loans provided to the Miami Intermodal Center);
- Committed local funding for selected construction projects;
- Pay-as-you-go funds generated from the existing Network – which represent excess net operating cash-flows arising from toll revenues on the Express Lane Network's construction projects in operation – i.e., residual annual cash flows after meeting debt service and other lender requirements (e.g., maintenance of reserve balances, etc.); and
- Capital grant contributions.

An overview of the timing and amount of these funding sources being applied in the financing plan, under the Base Case and the Conservative Case, respectively, is set out in Table 10 below and more

detailed descriptions of these sources follow. As stated in Part D.1, the capital funding requirement is higher under the Conservative Case due to its deferred delivery and thus additional cost indexation.

Table 10: Summary Funding Sources for the Network Delivery

	Total Uses of Funds – Capital Expenses and Financing	Source of Funding Applied				
		Senior CIBs	TIFIA	Local Funding	Capital Grants	Pay-as-you-go Funds
Base Case	$3,482M *(100%)*	$1,133M *(33%)*	$968M *(28%)*	$96M *(3%)*	$384M *(11%)*	*$902M (26%)*
Conservative Case	$4,280M *(100%)*	$1,283M *(30%)*	$1,094M *(26%)*	$96M *(2%)*	$796M *(19%)*	*$1,011M (24%)*

Senior Toll Revenue-Backed Current Interest Bonds (CIBs)

As illustrated above, senior CIBs comprise around 30% of the required funding under both Cases (see Part D.3 for discussion of bonding authority).

In each construction phase, the financial plan model very conservatively assumes that the entire CIBs requirement for such phase is issued at the outset, with the proceeds deposited into escrow. The actual utilization of the CIBs proceeds each year during construction is then applied generally after exhausting all available local funding, grant funding and excess net operating cash-flows in such year – but prior to any TIFIA facility draws.

Each series of CIBs is assumed to have a maximum maturity of 30 years (slightly shorter in certain phases), with a principal repayment grace period of 1 year from completion of construction. The schedule of principal repayments has been tailored to achieve a minimum senior system debt service coverage ratio ("Senior DSCR") of 2.0x, with the outturn Average Senior DSCRs being significantly higher.

The projected interest rates on the CIBs issuances have been derived using forward Municipal Market Data ("MMD") curves and assuming a low investment grade system credit (with an assumed credit spread of 180bps). No improvement to the assumed system credit has been reflected in the modeling of later phases, despite there being some logic for this arising from the Express Lane Network revenues and performance becoming increasingly proven. The CIBs interest rates modeled range between 5.5%-8.0% p.a. (per annum). Upfront fees of 1.00% and an annual fee of $35,000 have been modeled.

A Senior DSRA equating to 12 months' maximum debt service is funded upfront from the CIBs proceeds and then maintained over the life of the facilities through the retention of net cash flows.

TIFIA Loans

MTC has assumed that federal credit assistance will be made available for the Express Lane Network through a series of Transportation Infrastructure Finance and Innovation Act, 23 U.S.C. §§ 601 *et seq.* ("TIFIA") loans for each phase of the Network or a future form of programmatic TIFIA commitment as

envisioned in re-authorization proposals. Precedents for the former include three successive TIFIA loans to the Miami Intermodal Center.

As illustrated in Table 10 above, TIFIA loans in total comprise slightly more than 25% of the required funding under both Cases. Each TIFIA loan is assumed to be borrowed based on a pledge of system revenue, with the Network construction comprising eligible construction project costs, with one issuance for each phase of construction. The sizing of the TIFIA facilities is consistent with current TIFIA statute, policies and recent loans closed – i.e., no more than 33% of eligible costs, and not to exceed the amount of senior debt funding (note that the latter assumption may prove conservative because as the network matures, the credit rating of the TIFIA loan may become investment grade, in which case the size of the TIFIA loan can exceed the senior debt total under current TIFIA statute).

The drawdown of the TIFIA facilities in each phase of construction follows the complete utilization of the CIBs proceeds from escrow.

Each series of TIFIA debt is assumed to have a maximum tenor of 35 years, with a principal repayment grace period of 10 years from completion of construction. The schedule of TIFIA principal repayments has been back-ended and tailored to achieve a minimum total system DSCR ("Total DSCR") of 1.1x, with the resulting Average Total DSCRs being significantly higher.

The projected interest rates on the TIFIA facilities modeled range between 5.0-7.0% p.a. It is assumed that interest is capitalized for 5 years. Upfront application and processing fees of $350,000 and an annual fee of $11,500 have been modeled.

Please refer to Part D.5 for a discussion on the impact of the unavailability of TIFIA credit assistance.

Local Funding

Local funding of approximately $96M has been assumed in both the Base and the Conservative Cases, constituting 2-3% of the overall funding requirement. This comprises existing sales tax, local, Regional Measure 2 and Federal funding commitments to HOV or express lane projects (i.e., I-680 in Alameda County and Contra Costa County, I-580 in Alameda County and I-80 in Solano County).

Project Generated (pay-as-you-go) Funds

The Express Lane Network is implemented in several phases over an extended period. As such, excess net operating cash flows from the early phases of implementation (as well as interest income on escrowed balances) can be applied to fund subsequent construction projects and expand the network.

These excess net cash-flows will only be available to the extent that all of the requirements of the lenders for prior phases of development have been satisfied (e.g., debt service coverage ratio tests, the maintenance of debt service and other reserve balances at their required levels, etc.).

In optimizing the Base Case and the Conservative Case models, the stronger construction projects have generally been implemented earlier, subject to a variety of operational and practical constraints. This has been done so as to enable a greater proportion of the overall funding requirement for the Express Lane Network to be financed from excess operating cash-flows.

As illustrated in Table 10 above, pay-as-you-go sources comprise around 25% of the required funding in the Base Case and the Conservative Case, respectively.

Capital Grants

The funding sources for the network are anticipated to include capital grants. In the Base Case financial plan, grants total $384M in year of expenditure dollars, equivalent to $334M in present value dollars (assuming a 5% discount rate). In the Conservative Case sensitivity, grants total $796M in year of expenditure dollars, equivalent to $495M in present value dollars. Potential sources for grants include one or more of the following:

- New or extended local sales taxes not yet enacted;
- New or future federal, state or local programs to the extent funding is available and prioritized; and/or
- BATA bridge tolls, which would only be available for capital outlays on certain eligible construction projects as defined in statute and in the cooperative agreement between BATA and the Department.

For simplicity, grant subsidies are represented in the CTC application financial plan as direct, lump-sum funding. However, these subsidies ultimately would be structured in accordance with the requirements and preferences of their provider(s). For example, in lieu of lump sums, some funding might be in the form of economically equivalent annual commitments, subordinated, low-cost loans and/or provided on a contingent basis depending on factors such as the Network's actual net revenue.

D.3: Provide evidence of the proposer's ability and commitment to provide sufficient equity in the project as well as the ability to obtain the other necessary financing.

MTC is responsible for programming, allocating, and monitoring over $1 billion annually in federal, state, and local transportation funds. MTC's sister agency, BATA, shares MTC's staff and board members. BATA administers all toll revenue on the San Francisco Bay Area's seven state-owned toll bridges and, with the Department and the CTC, oversees the toll bridge seismic retrofit program; BATA is one of the largest issuers of toll revenue-backed debt in the country. While BATA will not be issuing or guaranteeing MTC's debt, BATA's expertise and market knowledge will be available to support MTC.

BAIFA is a joint exercise of powers authority formed pursuant to Government Code Section 6500 *et seq.* by MTC and BATA. BAIFA's joint exercise of powers agreement is included in this application as Attachment 11. According to the agreement (Sections 1, 4 and 5, among others), BAIFA may exercise any power common to its members. In addition, Government Code Section 6584 et seq. (Marks Roos Bond Pooling Act) grants BAIFA a variety of independent powers related to project financing and delivery, including the authority to accept financial assistance from any source, contract for project-related services and pledge toll revenues to secure the obligations of BAIFA relating to project financing. MTC and BATA have amended BAIFA's original joint exercise of powers agreement to permit BAIFA to

participate in developing and operating a high-occupancy toll lane facility, should the CTC approve MTC's application.

The financial plan does not assume that financial equity, per se, will be invested in the Express Lane Network. However, it is anticipated that annual excess subordinate cash flow after debt service will remain in the Network and be rolled over for subsequent capital investments and operations, maintenance and rehabilitation expenses. Please refer to Part D.2 for details regarding potential sources and nature of financial contributions to the Network. Note that capital grants have not been assumed for any construction projects that would be ineligible to receive them under statute.

As described in previous parts of this application, MTC intends to finance a portion of the capital costs using a combination of toll revenue bonds and TIFIA loans. The financial plan assumes a conservative current interest bond structure and multiple TIFIA loans for other financing. However, at the time each financing is undertaken, the optimal mix of financing sources will be evaluated and utilized. Likewise, the Network can still be delivered with the necessary financing, if there is an adverse change in the current financing assumptions. Please refer to Part D.2 and Attachment 8 for details regarding financing assumptions.

From a legal perspective, the following are possible sources of statutory authority to borrow money for the Network.

1. The California Transportation Financing Authority Act (Government Code section 64100 et seq.) authorizes the California Transportation Financing Authority ("CTFA") to make loans to MTC for the Network. The loans would be funded with nonrecourse bonds or other obligations issued by the CTFA.

2. The CTFA is authorized by Government Code section 64111(c) to delegate its borrowing authority to a project sponsor (MTC), which would enable MTC to issue bonds or other obligations to fund the Network.

3. BAIFA could issue bonds to fund the Network based on an interpretation of Government Code section 6546(t) and Government Code section 53313.5 to the effect that the Network is a public capital improvement that can be financed by a joint exercise of powers authority.

4. The Bergeson-Peace Infrastructure and Economic Development Bank Act (Government Code section 63000 et seq.) authorizes the California Infrastructure and Economic Development Bank ("I-Bank") to make loans to MTC for the Network as a state highway (Government Code section 63010(q)(15)). The loans would be funded with nonrecourse bonds or other obligations issued by the I-Bank.

5. MTC is authorized to accept federal funding, including TIFIA.

D.4: Explain how shortfalls will be funded if revenues do not meet projections.

A variety of tools are available to MTC and its stakeholders to maintain the financial feasibility of the Express Lane Network. Adverse changes in financial, revenue and/or cost assumptions can be mitigated by one or more of the following parameters (please note that the list is non-exhaustive):

- **Phasing** – with a build-out anticipated over 20+ years, the flexibility to postpone by a few years (or longer under extreme circumstances) the development of revenue negative construction projects[1] is a very efficient way to ensure the Network will actually maintain sound financial condition. Conversely, if actual operational conditions and the environmental/pre-development activities schedules progress favorably, low capital, high revenue construction projects might be advanced sooner and fuel earlier phases of the operating Network with additional positive cash flow.
- **HOV policy** – HOV3+ tolling exemption could be advanced for some or all of the Network more quickly (e.g., difference between 2020 and 2035 Network conversion is $1.2B in nominal dollars over that period). This option would be contemplated based on full consideration of operational impacts.
- **Hours of Tolling** – could be expanded as is common on other HOT lane projects nationally (e.g., difference between Base Case toll revenue and 24-hour tolling would be $5.1B in nominal dollars through 2074). This option would be contemplated based on full consideration of operational impacts.
- **Toll-rate setting** – in managed lanes projects, there typically is some flexibility to adjust the toll rate setting algorithm to produce somewhat enhanced revenue (current approach is throughput maximization rather than revenue maximization). This option would be contemplated based on full consideration of operational impacts.
- **Reduction of contingencies** – the cost assumptions for the construction project are relatively conservative and it is possible that contingencies could be reduced as planning progresses for certain construction projects. Design change (scope or variation) might also be pursued if necessary. Please see Part D.5 for additional details
- **Financial structuring** –depending on the availability and market for various sources of debt at the time of issuance, a more optimal approach can be devised (including the use of refinancing, subordination, capital appreciation and/or other public or private debt options potentially involving contractor financing)
- **Timing of bond issuances** - capital grants and existing system-wide operating cash-flow can be first used to fund capital costs. Debt issuances can be deferred and/or structured as multiple series for each phase to reduce the cost of borrowing and "negative carry"associated with the early,full drawdown on the bond proceeds
- **Increasing and/or accelerating capital grants** – opportunities will arise during the 20+ year implementation to accelerate the disbursement schedule, or use bridge loans/grant anticipation borrowing instruments to manage cash requirements and mitigate potential funding shortfalls
- **Local Sales Tax** – sales tax measures extensions or enactments could be pursued by local agencies to preserve and/or accelerate given construction projects and/or accelerate them

Note the Conservative Case illustrates the high economic value of implementation phasing adjustments. It shows how a deferral of several construction projects can be used to ensure delivery of the Network despite an adverse change in revenue, while minimizing the requirement for additional grant funding (the Conservative Case results in a one-third reduction in revenues through 2040 - $2.1 billion on a

[1] e.g., Projects #1, 4, 8, 9, 15, 18, 19 have a combined capital cost of $1.3B in 2010$

nominal basis, with an increase of approximately $150M in present value grants given a 5% discount rate).

D.5: Explain how the financial plan demonstrates a reasonable basis for funding project development and operations.

The financial plan is reasonable because it is built on reasonable assumptions for projected revenue and for the costs of development, operations and finance of construction projects in the Network. In addition, the Conservative Case demonstrates how, despite a significantly adverse change in assumptions, the Network will still be funded and realized. A description of the reasonable basis for each category of key assumption follows below.

Revenue assumptions

Certain factors could leverage additional revenues or mitigate a decrease in the actual traffic demand / tolled traffic share:

- Revenue projections are based on latest economic projections (ABAG Projections 2009 Update) and do not assume induced demand.
- The effect of peak-hour spreading was not considered (may increase revenues 5%)
- A 20% and 10% ramp-up adjustment during the first and second years was assumed for each construction project
- Baseline revenues were reduced to account for violations (5% through 2020, 2% thereafter)
- Toll rates are generally consistent with I-680 Sunol Express Lane (14 miles)
    - Current rate: maximum $7.50; average peak $3.00
    - 2020: maximum $7.90; average peak $6.00
    - Compare with $1.00/mile for State Route 91 Express Lanes in Orange County ($10 for 10 miles)
- Toll rates are set to maximize travel time savings, not toll revenue
- A straight-line revenue growth rate between 2020 and 2035. Growth rates after 2035 were reduced:
    - Current HOV policy baseline revenue curve: 3.2% over 2020-2035, then 2.9% through 2074
    - HOV3+ baseline revenue growth curve: 2.9% over 2020-2035, then 2.7% through 2074

Cost contingencies

- A 40% contingency factor was applied to capital costs and a 25% contingency to O&M costs.
- A substantial level of detail lies behind the capital cost estimates:
    - Each corridor analyzed in 1/5th mile segments
    - Detailed estimates based on unit cost data averaged from active and planned express lanes
- O&M cost were estimated from active and planned express lane facilities

Financing assumptions

- Conventional toll revenue bonds were assumed with current interest payment (as opposed to capital appreciation bonds) and a one year grace period on the principal payments
- Interest rates from derived forward curves – used July 2011 rates before recent financial market events and increased volatility (compare with 20-year historical averages and current rates).

Rates are consistent with 20-year historical averages and factor in the market's expectations for future borrowing rates.

- Minimum DSCRs: 2.0x senior; 1.1x total (averages much higher)
- A more optimized issuance timing and potential for serial bond issuances could be explored to mitigate negative carry
- The Network will establish a financial performance history over time, which could strengthen its credit – but the financial plan assumes a low investment grade credit (and associated pricing) for all bond issuances
- The assumed total TIFIA loans have an aggregate loan amount of up to $1.2B over 20 years. TIFIA loans can be structured and authorized for a program with separate facilities or projects constructed over time. For example, the Miami Intermodal Center has relied on an initial $433M TIFIA loan authorization under which separate loan agreements were executed and various draws made to fund separate program elements or projects, such as right-of-way acquisition and roadway improvements, but also construction work for the consolidated rental car facility carrying a different credit backed by a separate stream of customer facility charges revenue. The loan amount sizing relied on the overall program's eligible costs, rather than looking at each separate project or sets of improvements.
- The TIFIA loan assumptions are consistent with current TIFIA Joint Program Office ("JPO") statute, policies and recent loans closed since 2009.
- Note that the TIFIA loans in combination with CIBs are assumed in lieu of more aggressively structured and back-ended capital appreciation forms of borrowing. In addition, a sensitivity analysis of the Base Case without a TIFIA loan and a debt package of 100% CIBs was modeled (without incorporating subordinated debt instruments as a replacement to TIFIA borrowing) whereby the Conservative Case's 2035 slower phasing could easily be achieved and with less capital grant funding overall than would be required in the Conservative Case. (i.e., the Conservative Case scenario is more economically stressful to the financial plan than a no-TIFIA scenario).
- Note MTC may in the future be able to benefit from low-cost financing programs currently contemplated at the federal and state levels. Several current proposals for the reauthorization of the federal surface transportation legislation envision an expansion of the TIFIA credit assistance or the creation of other loan programs, such as a National Infrastructure Bank. In addition, pending California Senate Bill 867 would authorize the CTFA to issue bonds that would entitle bondholders to California tax credits issued by the state.

D.6: If applicable, describe the nature and amount of the proposer's financial contribution to the project.

Please refer to Part D.2 for a description of the possible BATA contributions to the plan of finance. Note that annual excess subordinate cash-flows after debt service are expected to remain in the Network and used to pay for subsequent capital investments and operations, maintenance and rehabilitation expenses.

D.7: Describe how the estimated cost of the facility is reasonable in relation to the cost of similar projects through a cost/benefit analysis.

The California Life-Cycle Benefit-Cost Analysis Model ("Cal-B/C"), the state standard for evaluating transportation projects, is used to evaluate the economic viability of existing investments in highway

facilities. Specifically, for this analysis the Cal-B/C Corridor Model was used, which is a modification of the original Cal-B/C model to better evaluate highway projects comprising multiple segments.

The Cal-B/C Corridor Model is designed to evaluate a wide range of planned transportation projects. It is designed to use data from the "before" or "without project" case along with projections for future travel demand and information about the proposed project to evaluate whether or not the improvement is an economically efficient use of resources, relative to the case without the improvement. The Model sums the benefits and costs for the construction duration period plus 20 years of operation. For this application, the Base Case of the Express Lane Network was analyzed using the Cal-B/C Corridor Model.

An investment is considered economically feasible if the sum of its quantifiable benefits, measured over a reasonable evaluation period and discounted to their present values, exceed the investment and ongoing costs similarly discounted over the evaluation period. The following metrics are the output of the B/C analysis:

- **Benefit-Cost Ratio ("BCR")**: Defined as the present value of all benefits divided by the present value of all costs. It measures the factor by which benefits exceed (or are below) costs rather than focusing on what those values are. Values greater than 1.0 are considered economically feasible.
- **Net Present Value ("NPV")**: In contrast to the BCR, the NPV is the present value of all benefits less the present value of all costs. Because the result is a dollar amount, both the ratio of the benefits and costs and the size of the construction projects affect the results. Values greater than $0.00 are considered economically beneficial. The NPV is a useful measure for comparing the overall dollar value of net benefits. It is possible for one investment to have a higher NPV but a lower BCR than another construction project, assuming the first construction project is of a larger overall scale.
- **Internal Rate of Return ("IRR")**: IRR gives the real discount rate for which a construction project's evaluation period present value benefits and costs break even (are equal), such that the BCR = 1.0 and the NPV = $0. This measure allows construction projects with different costs, different benefit flows, and different evaluation time periods to be compared.

Results Summary

As seen in Table 11 (which excludes direct freeway connectors and the San Francisco/Oakland Bay Bridge HOV bypass), the results of the Network (Base Case) are positive using conventional measures of investment return. When including the direct freeway-to-freeway connectors and the San Francisco/Oakland Bay Bridge HOV bypass, the overall benefit-cost ratio is 2.94. When these construction projects are not included, the benefit-cost ratio is 3.31, meaning that the expected benefits of completing the network are 3.31 times the costs to build the network. The net present value of the investment in the Network is approximately $3.7 billion. The rate of return on investment for all construction projects combined is 23.9%, meaning that the discount rate used for future benefits could reach 24% before costs and benefits were equal. This is significantly greater than the real discount rate of 4% used in the analysis. The payback period, based on a weighted average of the construction projects in the combined Network, is 12 years. This means that all combined benefits in constant dollars will surpass combined costs in approximately 12 years. Approximately 85% of total benefits come from

travel time savings, with the remaining benefits split between vehicle operating cost savings (12%) and emissions cost savings (4%).

Table 11: Overall Results of B/C Analysis

INVESTMENT ANALYSIS
SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$1,617
Life-Cycle Benefits (mil. $)	$5,347
Net Present Value (mil. $)	$3,730
Benefit / Cost Ratio:	3.31
Rate of Return on Investment:	23.9%
Payback Period:	12 years

ITEMIZED BENEFITS (mil. $)	Average Annual	Total Over 35 Years
Travel Time Savings	$130	$4,555
Veh. Op. Cost Savings	$17	$611
Accident Cost Savings	-	-
Emission Cost Savings	$5	$182
TOTAL BENEFITS	$153	$5,347
Person-Hours of Time Saved	37,657,648	1,318,017,669
Additional CO_2 Emissions (tons)	(196,863)	(6,890,197)
Additional CO_2 Emissions (mil. $)	($2)	($81)

Note 1: Averages and totals computed over 35 year period to accommodate 20 years of operations for all construction projects
Note 2: Does not include freeway-to-freeway direct connectors or San Francisco/Oakland Bay Bridge HOV bypass

A separate methodology was developed to estimate the benefits for the San Francisco/Oakland Bay Bridge HOV bypass and the freeway-to-freeway direct connectors (construction projects 7b, 8 and 18) since only time savings could be estimated for these construction projects. A simplified methodology was developed which only takes into account time savings for drivers in the region (in terms of hours of delay), leaving out any operating cost or emissions savings that could potentially accrue as a result of construction projects 7b, 8, and 18.

Attachment 9 includes a more detailed discussion of the benefit cost analysis.

D.8: Provide an analysis of the projected rate of return and life cycle cost estimate of the proposed project.

See results presented in Part D.7 for a summary of projected rate of return and life-cycle costs.

D.9: Explain how the financial information submitted is sufficient to determine the financial capability to fulfill the obligations described in the project application.

The level of financial analysis presented and accuracy of supporting assumptions are reasonable and appropriate for projects at this early stage of development. The information provided is sufficient to determine all the major cost and revenue elements necessary to implement the Network and general feasibility of doing so.

Economic growth, inflation, traffic patterns, construction costs and commodities escalation, federal transportation programs, financial markets and capital access will certainly evolve over the next 30+ year horizon. The accuracy of the financial plan's individual assumptions will fluctuate over time and will certainly require both downward and upward adjustments as actual conditions and events arise.

Revenue and cost assumptions will be revised over time as each construction project progresses through the pre-development stage, environmental process and into advanced design. Financial assumptions will also be adapted as economic conditions change.

As detailed in Part D.4, the nature of the Express Lane Network program and its envisioned delivery offer a number of tools that can be used to maintain financial feasibility as the implementation of the system progresses should the various contingencies included in the financial plan assumptions prove insufficient to weather adverse developments (please refer to Part D.5 for details). As such, the documentation of a Conservative Case in addition to the Base Case acknowledges the range of uncertainty, while demonstrating that under less favorable economic conditions, the Express Lane Network implementation would still result in a build-out that is feasible and provide benefits.

D.10: Identify the proposed ownership arrangements for each phase of the project and indicate assumptions on legal liabilities and responsibilities during each phase of the project.

As noted previously, the Department will own the rights-of-way for the Facility, and MTC will own other property, including toll collection equipment, that will be installed, operated and maintained pursuant to an operation and maintenance agreement with the Department. MTC anticipates using the following contractual arrangement to govern and allocate the legal liabilities and responsibilities that are involved in the design, construction, operation and maintenance of the Network. The agreements with the Department and CHP will provide for reimbursement of the state agencies of costs incurred in connection with the implementation or operation of the Express Lane Facility out of revenues generated by the Express Lane Facility, federal funds or other funding sources that are not otherwise available to CHP for transportation-related projects.

- **MTC / BAIFA Agreements–** MTC may enter into agreements or other arrangements with BAIFA that provide for BAIFA to assist in various aspects of development, implementation, financing and operation of the Network. Under such agreements or arrangements, MTC may assign to BAIFA certain activities or responsibilities outlined in this application, as allowable under state law and BAIFA's joint exercise of powers agreement. (See Attachment 11.)
- **MTC/ Department Cooperative Agreements** - As described in Part A.1, MTC will enter into a cooperative agreement with the Department that will address matters related to design, construction , maintenance and operation of state highway system facilities related to the value pricing program.
- **Applicant / CHP Agreements** – As described in Part A.1, MTC, the Department and the CHP will enter into agreements that identify their respective obligations and liabilities relating to Express Lane Facility.
- **MTC/ ACTC / Sunol JPA Cooperative Agreements** – MTC's incorporation of the ACTC and Sunol JPA Legacy Programs (authorized by S&H Code Section 149.5) into the Network is dependent on MTC executing cooperative agreements with ACTC and Sunol JPA that would govern the terms of this incorporation. In general, these agreements will discuss governance issues, including the use of toll revenues to fund the Network. Furthermore, the agreements with ACTC and the Sunol JPA will allocate project delivery responsibility for these Legacy Programs, which may

assign the tasks of design, environmental study and procurement of contractors for the portion of the Network represented by the Legacy Programs to the Legacy Program agency.

- **MTC/ CMA Agreements** – MTC and one or more CMAs may enter into agreements that allocate certain project development and delivery responsibilities to the CMAs, for projects that are in the Facility.

D.11: Describe the extent that adequate and transparent procurement policies have been adopted to maximize competitive bidding opportunities for potential contractors and suppliers.

MTC's procurement procedures are set forth in Executive Director's Management Memorandum ("EDMM") No. 352. EDMM 352 is based on MTC's policy that goods and services be procured in a manner that provides full and open competition to the maximum extent feasible, consistent with federal and state statutes and regulations applicable to its funding sources, most notably 49 Code of Federal regulations Section 1836, and that contracts not suitable for selection based on low bid be awarded to the responsible individual or firm whose services are the most advantageous and of the best value. Factors such as the quality of professional personnel, technical design, approach to performance, soundness of the management plan, financials, acceleration of project delivery and cost are relevant to determining the most advantageous and best value offer.

Part E - Regional Transportation Plan & Community Support

E.1: Provide documentation to show that the project is consistent with City and County comprehensive plans and regional transportation plans and with plans and documents for the Regional Transportation Agency's long range plan. If the project is not consistent, please identify the steps proposed that will achieve consistency with such plans.

This application is consistent with the region's adopted long-range transportation plan, *Transportation 2035*, which envisions a seamless, regionally managed network of express lanes in the Bay Area. MTC has worked in close cooperation with the Bay Area CMAs and Regional Transportation Planning Agencies ("RTPAs") to arrive at a solution that meets regional goals and satisfies local requirements. County transportation plans and congestion management programs must be consistent with the Regional Transportation Plan ("RTP").

E.2: Describe how the proposed project includes improvements that are compatible with the present and planned transportation system. Include the methods by which the project provides continuity with existing and planned state and local facilities.

The Express Lane Network builds upon the substantial investment already made in HOV lanes in the region and on prior studies to implement a continuous network of express lanes throughout the region. Implementation of express lanes will use excess capacity within the existing and planned HOV lane network and operate it more efficiently.

The systemwide approach being pursued will insure consistency along corridors and across the Network. The Corridor System Management Plans ("CSMP") that have been, or are being developed, acknowledge the regional express lanes and the potential for conversion of HOV lanes. Specifically, the potential for express lane conversions are discussed in the I-80 (east) CSMP for Napa/Solano Counties, the SR-84 CSMP for Alameda County, the I-880 CSMP for Santa Clara County and the US 101 (south) CSMP for Santa Clara County.

Freeway Performance Initiative

MTC invests in an ongoing Freeway Performance Initiative ("FPI"), whose purpose is to extract more capacity out of the existing transportation system, primarily through employing advanced technology. It helps operate the transportation network as a whole rather than each component in isolation. FPI has a number of elements: (1) Monitoring and surveillance of existing conditions, through fixed equipment and mobile sensors; (2) Traveler information, providing information about optional routes and modes (including incidents and delays in real time), so that the traveler can make fully-informed decisions; (3) Real time adjustments to systems, such as traffic signals and ramp metering. MTC has undertaken FPI activities on I-80 and I-880.

The Express Lane Network will complement and enhance the FPI in several ways. First, the Network will deploy substantially more monitoring equipment on the express lanes, and these will provide rich, updated data to the Department's Traffic Management Center. Second, the extensive changeable message signs will provide opportunities for additional information to help the traveler make informed decisions. Third, the Network provides a powerful tool for actively managing the freeways in response to changing conditions, through pricing mechanisms.

The I-80 Integrated Corridor Management ("ICM") project, funded by the Corridor Mobility Improvement Account ("CMIA"), augments the system management enhancements provided by the FPI. This project will soon be in construction, and will offer a much higher density of traffic monitoring and motorist information elements than on any other corridor in the region. These elements will be particularly useful in better managing and operating an express lane in this highly congested corridor, where the HOV definition is already 3 or more occupants.

E.3: Explain how the proposed project helps to achieve performance, safety, mobility, and air quality or transportation demand management goals.

The Express Lane Network will optimize the capacity of existing and planned HOV lanes. Making maximum use of existing capacity improves system performance, providing greater throughput, time savings, reduced congestion, greater reliability and a choice for travelers that they would not otherwise have.

Specific benefits related to performance and mobility include:

1. **Connectivity Benefits**: Gaps in the in the existing network of HOV lanes could be addressed sooner than could otherwise be done due to funding constraints. These gaps impair connectivity. Congestion frequently occurs in these gaps, and weaving at the HOV lane termini can adversely affect traffic operations.
2. **Capacity Benefits**: The inability to fill HOV lanes with more vehicles during peak periods and optimize use of these lanes leaves excess capacity. This underutilized condition during peak periods represents a real and perceived inefficiency during the hours of greatest overall corridor demand. Augmenting eligibility restrictions with variable pricing creates opportunities to balance the usage of all lanes and move more traffic, thereby easing congestion in the general purpose lanes.
3. **Travel Time Benefits**: Data from the most recent Department HOV lane monitoring report shows that some HOV lane facilities are already reaching capacity in parts of some corridors in the Bay Area. Overutilization in these cases threatens the ability to maintain an acceptable speed and level-of-service on the region's HOV lanes, and variable pricing offers a means of addressing this problem. The key to this strategy is the ability to raise or lower the toll such that express lane demand never exceeds capacity. Tolls can be set to maximize total time savings on the facility.
4. **Reliability Benefits**: The ability for commuters to make a predictable trip is an important attribute of express lanes. Reliability has consistently been ranked in surveys as one of the top reasons for using express lanes. This is true for toll-paying customers, but also important to those using transit and ridesharing. Reliability is lost if HOV lanes become overcrowded and congestion is experienced. Express lanes serve as a "safety valve" for non-recurrent incidents.

5. **Bus Transit Benefits**: Express lanes create more opportunities for bus providers to offer better service. They can guarantee better reliability, reduce headways and maximize the number of bus trips with existing fleets. This makes the bus a more attractive option for current and potential riders.
6. **System Performance Benefits**: Providing a better means of managing the overall freeway system can improve performance and reduce congestion. The ability to more fully utilize existing HOV lanes will alleviate congestion on the adjacent general purpose lanes, as users choose to leave the general purpose lanes for the advantages of the express lanes. With improved management capability, all users will see benefits. The Express Lane Network will work in tandem with the FPI.

With regard to air quality goals, see Part E.5 below. With regard to safety, Department of Transportation and federal guidelines will be followed. For each individual construction project, appropriate project development documents will address safety issues.

Demand Management

Over 20 bus systems serve the region, and at 10.1%, the region's transit mode share for work trips is high compared to other urban areas. Figure 5 presents the regional express bus system service levels throughout the Express Lane System. Benefits to transit providers and bus riders, as described below, will enhance express bus service, reduce reliance on driving and provide congestion relief and air quality benefits:

- Substantially enhanced connectivity of the system makes transit a much more viable regional mode choice. According to the analysis in the operational assessment in PSR Attachment 4, it is estimated that 1,580 daily transit rider hours of delay will be reduced as a result of closing gaps on the existing bus system.
- A more closely monitored and enforced lane system assures better transit schedule adherence, thereby removing unreliability as a major deterrent to transit use
- Ability to reduce headways and maximize the number of bus trips with existing fleets, thereby possibly reducing capital and maintenance facility requirements

MTC will work with the region's transit operators to ensure the Express Lane Network is designed in a way that best serves their operations.

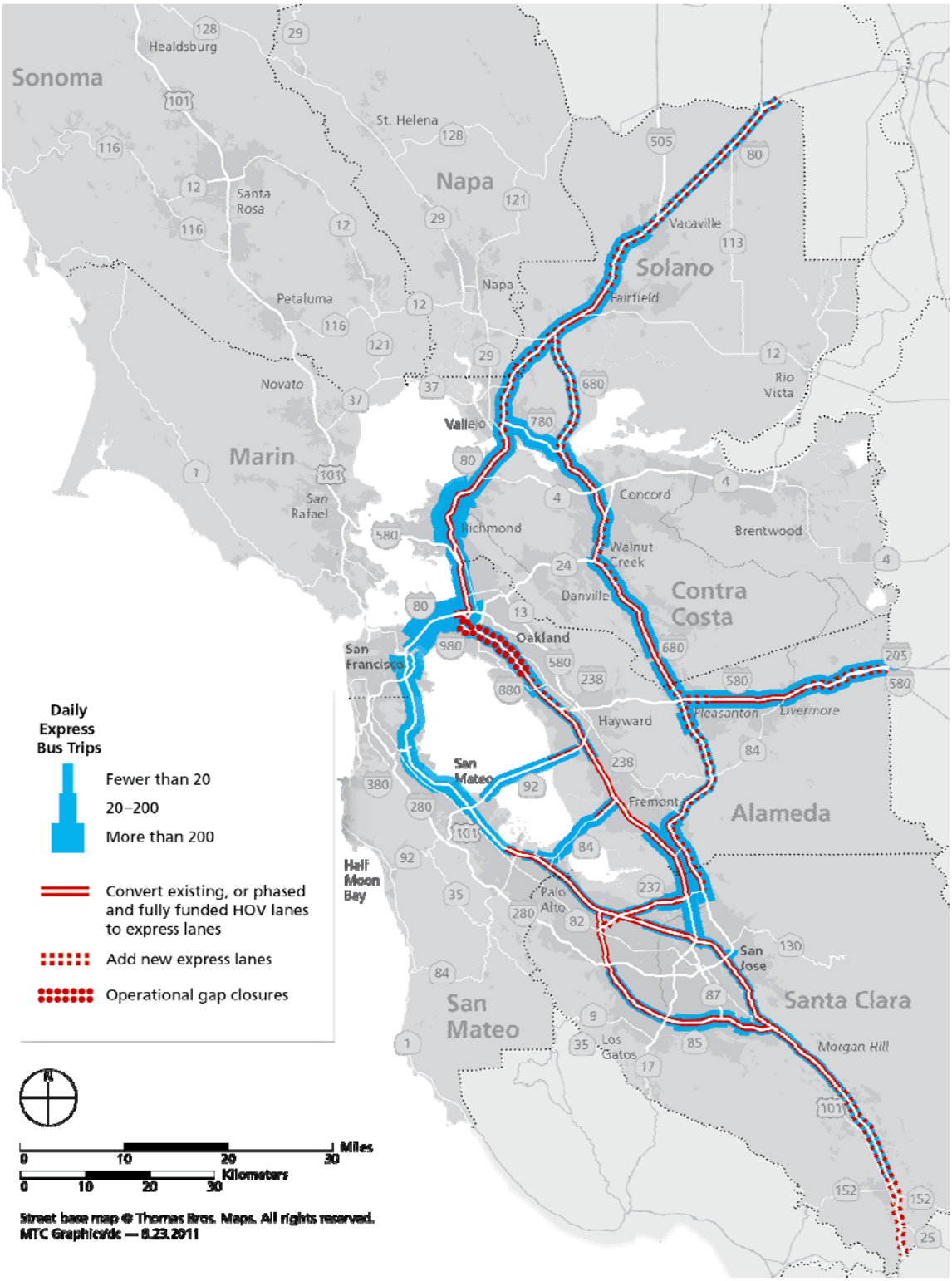

Figure 5: Express Bus System Service Levels on the Express Lane System

The synergy created by an extensive, connected network of express lanes will also provide great benefit and, therefore, incentive for individuals to rideshare. The region currently has several ongoing programs to encourage and facilitate ridesharing, with the goal of increasing the number of travelers who choose travel modes other than SOV. The programs include carpooling, vanpooling, guaranteed-ride-home and (to a lesser extent) transit usage. MTC directly manages a program entitled "511 Rideshare" that offers services regionally; these services include primarily web-based ridematching, vanpooling, customer call center, outreach and support to employer-based programs, bicycling and general marketing. There are also analogous county-based programs that offer more intensive services (principally directly to employers at the worksites) in their jurisdictions; these "delegated" counties are Contra Costa, San Mateo, San Francisco, Solano and Napa. 511 Rideshare collaborates closely with these programs.

E.4: Explain whether the proposed project is consistent with applicable state and federal environmental statutes and regulations, the air quality component of the RTP, and whether the proposal adequately addresses or improves air quality conformity.

The Network will implement a portion of the 800-mile express lane network identified in the adopted *Transportation 2035 Plan*. The *Transportation 2035 Plan* was prepared and adopted in accordance with the applicable environmental regulations, including an Air Quality Conformity analysis as described in more detail below. The Transportation 2035 Draft Environmental Impact Report ("EIR") was circulated in December 2008 and a Final EIR issued in April 2009. As such, the Network is consistent with the assumptions and conclusions of the RTP air quality component and EIR. In addition, express lanes are identified as a Transportation Control Measure ("TCM B-3") in the 2010 Clean Air Plan (Table 4-3, Page 4-8, BAAQMD, 2010).

With regard to air quality conformity, Section 176 of the Clean Air Act ("CAA") specifies that no federal agency may approve, support, or fund an activity that does not conform to the applicable implementation plan. The federal conformity rules, contained in 40 CFR Part 93, were updated in July 2004 to include criteria and procedures for the 8-hour ozone and PM2.5 national ambient air quality standards.

The Bay Area Air Quality Management District ("BAAQMD"), in coordination with MTC and Association of Bay Area Governments ("ABAG"), is responsible for preparing air quality plans pursuant to the federal and California acts. Under the federal CAA, State Implementation Plans ("SIPs") are required for areas that are designated as nonattainment for ozone, CO, NO2, SO2, PM2.5, or PM10. MTC is responsible for establishing that the RTP and Bay Area Regional Transportation Improvement Program ("TIP") conform to the SIP.

MTC adopted the *Transportation 2035 Plan* in April 2009 (MTC Resolution 3893). The FHWA and Fedral Transit Agency ("FTA") approved MTC's conformity determination for the *Transportation 2035 Plan* and 2009 Transportation Improvement Program/Amendment #09- 06 on May 29, 2009. The *Transportation 2035 Plan* was subsequently amended on May 25, 2010 via an administrative modification. This administrative modification did not trigger a new conformity determination, because there are no

changes to project scopes for projects previously identified in the plan and no additions of regionally significant, non-exempt projects to the plan. This conformity analysis served to re-conform the *Transportation 2035 Plan*, particularly with regards to its conformance with the national PM2.5 standard.

The PSR prepared for this application includes a preliminary environmental analysis that identifies the potential environmental issues to be considered during the project-level environmental studies, and the appropriate technical reports that will support the NEPA/CEQA environmental documents. The PSR includes a qualitative assessment of air quality benefits associated with improved operations, reduced congestion and increased transit ridership expected due to travel time and reliability, which will support future project-level environmental studies. This is consistent with the programmatic approach to environmental documentation.

E.5: Identify any emission reductions provided by the proposed project.

Emissions reductions are derived from the Benefit-Cost analysis. This analysis indicates emissions reduction (including CO, CO_2, NO_X, SO_X and VOC) valued at $5 million annually and $182 million over the first 20 years of operation for all construction projects. With regard to CO_2 emissions, the Benefit-Cost model also indicates annual reductions of nearly 197,000 tons and approximately 6,900,000 tons over the first 20 years of operation for all construction projects. See summary table in Part D.5 and Benefit-Cost Analysis in Attachment 9 for further details.

E.6: Explain how the project improves connections among the transportation modes.

The regional nature of the planned Express Lane Network is particularly conducive to connectivity among various transportation modes in the Bay Area. Completion of the Network will improve express bus, taxi, carpool and vanpool access to many Bay Area Rapid Transit ("BART") stations, which will in turn provide easier access to San Francisco and Oakland International airports. There is existing express bus service from Solano and Napa counties to BART stations, and the Express Lane Network will enhance the time savings and reliability of these services.

An extensive network of express lanes will provide carpools and vanpools with the benefit of longer, uninterrupted trips in congestion free conditions. Consequently, they will be able to make easier connection with park-and-ride lots.

MTC will work with the region's transit operators to ensure the Express Lane Network is designed in a way that best serves their operations. Improved transit times on highways are likely to increase utilization of existing express bus service. Having an extensive network of express lanes means that bus service can be greatly improved as a result of more reliable schedule adherence, reduction of headways and greater access to other modes.

E.7: Identify the project benefits to the affected community transportation system and provide an explanation whether this project enhances adjacent transportation facilities.

Benefits to the overall community are detailed in Part E.3 above. The benefit to adjacent facilities has not been quantified, and will be subject to studies for each individual construction project, based on local conditions. The improved, more efficient utilization of freeway capacity on the express lanes could reduce pressure on parallel arterial facilities by providing an attractive option for vehicles to use the express lanes rather than diverting to a parallel facility in order to avoid congestion. Furthermore, the benefits to express bus service may also attract additional riders who would otherwise use parallel facilities.

E.8: Explain whether the proposed project will enhance the state's economic development efforts.

The Benefit-Cost Analysis (see Attachment 9) performed for the Network indicates an annual average benefit of $153 million and a cumulative benefit over the first 20 years of Network operation of $5.4 billion. Approximately 85% of the benefits are attributable to travel time savings, the remainder to vehicle operating cost savings and emissions reductions.

The Texas Transportation Institute's 2010 Annual Urban Mobility Report finds that the Bay Area suffers the fourth-worst levels of congestion in the U.S. As such, there are many trips that are delayed on the regional system. The premise of the Bay Area Express Lane Network is to provide for and maintain congestion-free alternatives on the regional system. The mobility impairment caused by congestion and lack of transportation capacity is demonstrated to have an impact on economic productivity and development. Several studies (Boarnet, 1997 and Fernald, 1999) determined that congestion will degrade economic productivity, and that highly congested areas have a more pronounced role upon productivity. A more recent study (Hymel, 2008) found that congestion significantly reduces employment growth. As congestion per capita increases, jobs decrease at a greater rate. Hymel's study indicates that a 50 percent reduction in congestion in Los Angeles in 1990 would have yielded an additional 100,000 jobs by 2003.

A landmark study in France (Prud'homme and Lee, 1999) isolated the effects upon economic productivity, if there were a 10 percent improvement in access to jobs. With this performance benefit, the model indicated that regional economic productivity increased by 1.3 percent for 22 French cities. A study in the U.S. which replicated the model for 8 metropolitan areas (Hartgen and Fields, 2009), including the San Francisco Bay Area, indicated a one percent increase in economic productivity could result from a similar improvement.

The findings from the studies mentioned above provide evidence that a congestion free alternative on the Express Lane Network will improve economic productivity and, all other factors being equal, contribute to an increase in employment.

E.9: Explain if the project is critical to attracting or maintaining competitive industries and businesses to the region, consistent with state objectives.

Express lanes provide primary benefit to entities (whether individual, such as commuters, or organizational, such as companies dependent upon speedy and reliable travel times) that have a relatively high value of time. Research by Brownstone and Small (2004) evaluated the revealed value of time by express lane users in Orange and San Diego counties – over $20 per hour as determined by the research. Thus, to be of benefit to commuters and organizations, the value of the travel time savings must be higher than the value of the toll payment.

For industries which are especially sensitive to travel delay, the benefits of express lanes can be even greater. Small commercial operators who have direct access to the express lanes may benefit the most from their operations when on-the-clock. This may include couriers, tradespersons (plumbers, electricians, etc.) and local delivery operations. Assuming a value of travel time above $20 per hour, the small commercial operator will find the express lanes enhance business opportunities and income, with reduced loss due to congestion. As operational costs are reduced for these entities, the Bay Area will enhance competitiveness and reduce pass-through costs of congestion (either direct or indirect) to the end consumer.

For larger commercial operations, the benefits of express lanes are readily apparent. The Texas Transportation Institute has estimated that congestion in the San Francisco / Oakland area accounts for $718M annually in direct costs of moving goods (with a corresponding indirect cost of $101B in commodity value), while the San Jose area experiences $197M in direct costs ($40.5B indirect commodity value). Together, the direct cost of congestion alone amounts to almost $1B per year. The Port of Oakland and the businesses and warehousing operations it serves will be major beneficiaries of the implementation of the Network. The manufacturing and distribution operations located in or related to Silicon Valley will benefit from the reduced congestion and increased reliability afforded by the Express Lane Network.

It should be noted that the primary benefit to the business and commuter is travel time reliability. Express lane operations maintain a congestion-free alternative at all times of day. This congestion-free alternative provides a reliable travel time to those trips whose economic value warrant using such an option. This cannot be done with simply adding general purpose lane capacity and, as a result, express lanes may offer a better return on business competitiveness than a comparable expansion of general purpose capacity.

The Bay Area Council's 2004 *Strategic Plan for Bay Area Mobility Improvement* describes HOT lanes as "one of the most promising market-based approaches" to enhancing mobility. The Council cites an anticipated 152 percent increase in congestion by 2025 as "crippling the Bay Area" and through its regional Transportation Initiative puts Bay Area employers squarely behind this and other market-based strategies. Commenting on the current situation, Dr. Sean Randolph, President & CEO of the Bay Area Council Economic Institute, observes that "mobility affects the region's efficiency and productivity, as well as its quality of life. These elements critically support its national and global competitiveness. HOT

lanes are an innovation that can positively contribute to the region's long-term economic environment and its climate for business creation and business growth."

E.10: Explain whether the regional agency governing body has taken action to approve this proposal and whether local impacts have been addressed. Provide the Board or other resolution to document the action taken.

MTC, as a "regional transportation agency" under Streets and Highways Code Section 143(a)(4)(A), has authorized submission of this application through action at the September 9, 2011 meeting of its Planning Committee, and then subsequent adoption by the full Commission on September 28, 2011 (MTC Resolution No. 4030, Attachment 10).

To the extent possible, local concerns raised to date have been addressed through this application. The affected CMAs, which are composed of representatives from local governments throughout the area in which the Network will operate, are scheduled to consider letters of support for this application in September. (These letters will be included in Attachment 5 when approved.) As MTC and partner agencies shepherd individual construction projects through project development and environmental review, MTC will conduct targeted analysis and outreach to identify and address project-specific impacts.

E.11: Explain whether the project will bring significant transportation and economic benefits to the community, the region, and/or the state.

The Bay Area and state of California will benefit from both the reduction in overall congestion and the provision of a reliably congestion-free alternative on the regional freeway network. The Express Lane Network can reduce the level of congestion across all users of the freeway, as consistent with applications elsewhere in the U.S., and reduce the level of congestion experienced by the actual users of the express lanes. Because the Network focuses on the major Interstate freeways in the Bay Area, which carry a substantial portion of the commute and commercial traffic, the economic benefits are direct and demonstrable. I-80 and I-580 are major inter-regional routes to the Central Valley, and I-880 serves the Port of Oakland. Furthermore, these freeways directly intersect with the five of the eight toll bridges in the region.

As shown in Table 12, congestion can have a dramatic impact on the amount of lost productivity and direct cost as a result of congestion:

Table 12: Bay Area Congestion Measures from Texas Transportation Institute (2010)

Measure	2010 San Francisco / Oakland Area	2010 San Jose Area
Congested travel (% of peak period VMT)	78% of peak VMT	78% of peak VMT
Congested System (% of lane miles)	58% of lane miles	63% of lane-miles
Annual gallons of excess fuel consumed per commuter	39 gallons	30 gallons
Annual hours of delay per commuter	49 hours	35 hours
Annual cost of congestion per commuter	$1,112	$774

Because the Express Lane Network constitutes an operational policy change as well as capacity enhancement, the economic development benefits of the Network accrue as both positive benefits and avoided costs. The Express Lane Network will be a critical regional and state transportation asset that provides the value of time savings, reliability and the option for congestion-free travel. Without the Express Lane Network, in order to avoid the potentially severe economic implications of congestion and delay, the Bay Area would otherwise require substantial investment in corridor expansion, many times the size of investment that the Express Lane Network would otherwise require, even in the unlikely event that environmental and right-of-way constraints could be overcome. These avoided costs may be assessed as both opportunity costs (avoiding the dedication of limited transportation resources to more costly endeavors) and as user costs (reduction in monetary cost of delay, either to goods movement or to travelers).

Finally, the implementation of the Express Lane Network would generate a short-term increase in demand for construction- and technology-related labor and materials. Economic multipliers would yield direct and indirect benefits as a result of the increased construction activity. This presents an opportunity for the construction industry, which is currently and in the foreseeable future facing depressed demand and extremely high levels of unemployment.

E.12: Describe any ancillary benefits to the communities because of the proposed project

There are two additional benefits that have not been articulated in previous sections, which include: (1) Value of having travel options and (2) potential for additional revenue.

Travelers will be provided with a travel option that would not exist absent the Express Lane Network. Existing conditions give the traveler only the choices to form a carpool (which is often not possible or convenient for a variety of reasons) or experience congestion and unreliability of travel time. This represents a particular hardship for those travelers and for those trips when being on time to a certain destination is of great importance. Other operators of express lanes have learned that the greatest value for users is actually the certainty of arriving on time when time is money (e.g., the parent dropping off or picking up a child at daycare, the tradesperson's ability to make more calls in a day, the person whose job requires complete punctuality). An extensive network of express lane offers this option, and

the revenues generated by tolling will facilitate the build-out and availability of the network sooner than would be otherwise possible.

With regard to revenue remaining after all expenses are paid, it is important to note that there is neither a guarantee nor any representation in this application and financial plan about whether or when this revenue will be available or how much it may be. However, the Base Case does indicate that "excess subordinate revenues" could be available at some point in the future. These are the express lane toll revenues that remain after all capital costs, debt payments and operations and maintenance have been satisfied. At that point, revenues could be made available for a number of purposes: further build-out of the Express Lane Network, additional transit service, park-and-ride facilities, or other related mobility or quality of life benefits.

E.13: Explain the extent of support or opposition for the project. Explain the national and regional transportation issues and needs, as well as the impacts this project may have on those needs.

National and Regional Transportation Issues and Needs

The two primary factors motivating the implementation of express lanes within the United States are: (1) a need to optimize the throughput on many busy highway corridors in major metropolitan areas; and (2) limited funds available for capital improvements to highways.

The Bay Area is predicted to add approximately 1.7 million people and over 1 million jobs by 2035, increasing the need for transportation and simultaneously enlarging congestion on the constrained highways. This suggests that Bay Area congestion, which is considered 4th worst in the country according to the Texas Transportation Institute ranking, will only grow worse unless action is taken today. Greater congestion adversely affects the distribution of goods and services, especially since the Port of Oakland, which is a regionally and nationally significant freight gateway and the nation's 4th largest container port, relies heavily upon trucks for the landside operation. This pattern is similar in other metropolitan areas in the country, where the operation of an express lane system is underway or is in the planning stage. San Diego, Seattle, Minneapolis and Miami have implemented express lanes in order to help maximize the highway throughput and optimize capacity so that delays are reduced.

Extent of Support or Opposition

To make the most efficient use of the existing highway infrastructure, active management of the current HOV network is needed so that the system provides the maximum benefit.

The Congestion Management Agencies within each of the four counties that will be home to portions of the newly-authorized express lanes are expected to submit letters in support of the Network (see Attachment 5.)

While there is public support for HOV lanes and for express lanes, questions have been raised. One concern that is commonly expressed is that the lanes provide a benefit to only the more affluent members within the community, or that they will increase congestion in the general purpose lanes.

There is also a concern expressed that the addition of any type of lane will encourage drivers to continue to drive rather than persuade them take other modes. This concern about adding lanes is related to desire to attain other goals, such as changing land use patterns, encouraging transit ridership and reducing air emissions.

These concerns are noted but not supported by the actual performance of those lanes in operation around the country. Travelers using and benefiting from express lane facilities are shown to represent all socio-economic backgrounds. The implementation of dynamic pricing facilitates active traffic management of both the express lanes and the general purpose lanes, allowing effective freeway management and an equilibrium of traffic among all lanes through careful pricing mechanisms. The analysis of express bus service (see Part E.3) on the proposed Network indicates that there would be substantial benefits for bus riders, many of whom are transit dependent, and therefore a likelihood that transit ridership would increase. Finally, more than half of the mileage in the Facility would be developed by converting existing HOV lanes. The new mileage, less than 120 lane-miles, added with the Facility is but a fraction of the region's existing freeway system.

E.14: Describe any plans intended to work with the community. List the affected local jurisdictions and provide clear written statements of the extent of support for the project from all affected local jurisdictions, if available. Describe any environmental justice issues or concerns.

Affected Local Jurisdictions

The Facility for which MTC seeks authority passes through three Bay Area counties: Solano, Contra Costa and Alameda. As described in Parts E.10 and E.13, the CMAs for these counties are scheduled to consider letters of support in September(see Attachment 5).

Plans to Work with the Community

Following authorization from the CTC, MTC would undertake, in cooperation with the CMAs and the Department, more detailed planning, engineering, environmental and traffic and revenue studies for each construction project. MTC and its partner agencies are committed to conduct extensive public engagement as part of these more detailed studies. The following venues and vehicles are potential elements of a process to engage communities and the broader Bay Area public:

- Project web site through which the public can submit questions and access fact sheets, answers to frequently asked questions, status updates and studies.
- Focus groups and surveys to understand public concerns and reactions.
- Discussions on broader policy issues with MTC's Policy Advisory Council, which advises MTC on a variety of topics. Membership of the Policy Advisory Council is structured around interests related to the region's economy, the environment and social equity as well as county representation.
- Presentations to city councils and/or community groups.

- Participation in community events, such as celebrations and fairs (as MTC routinely does to promote awareness of customer services programs such as Freeway Service Patrol, FasTrak®, and Clipper).
- Public workshops and open houses, particularly as part of the environmental and construction stages.

Environmental Justice

Environmental justice typically has several dimensions with respect to transportation projects. There is often the stated concern that low-income persons will be adversely affected, either by reduced mobility, higher costs, or by environmental externalities.

In the case of express lanes, travelers of all income groups are presented with an additional choice or option that they did not have previously—to pay a toll to use an uncongested lane, thereby gaining actual travel time savings or greater reliability for their trip. They can either choose to pay a toll on some occasions when being late is costly or highly inconvenient or continue to use the general purpose lanes that were already available to them. They are not denied a mobility choice that they previously had, because exercising the new option is voluntary. Studies of existing express lanes have indicated that users of all income groups take advantage of the lanes on some occasions, indicating they find value in availing themselves of the option.

In the case of converting the minimum occupancy requirement from 2+ to 3+, it could be argued that the 2-person carpools that are no longer eligible for the HOV lane are penalized. However, there is no evidence that 2-person carpools are disproportionately comprised of low-income persons. Furthermore, the efficient management of the system provides benefits to carpools, transit and general purpose lane users alike.

In particular, the ability to build out the network of HOV lanes more rapidly than would otherwise be possible will provide a much more attractive option for express bus transit. Bus service will benefit greatly, in terms of trip times and reliability, from the additional available HOV lane-miles and gap closures. While it cannot be committed as a guarantee, it is logical that a much more accessible and reliably fast freeway system for express bus service will lead to higher ridership, more bus runs with the same amount of equipment and a greater investment in public transit, as bus service becomes a more viable option for travelers. For the transit-dependent, who are disproportionately either low-income or elderly, this is a benefit.

The Express Lane Network does not involve building new “greenfield” freeways. It represents a combination of conversions of existing HOV lanes to express lanes and some new HOV lanes on existing freeways. Right-of-way takes will be minimal and, in most cases, non-existent, so there will be little or no displacement. The increased access to jobs as a result of time savings and reliability will provide additional economic opportunities to low-income users.

Part F - Performance Measures

F.1: Describe the Regional Transportation Agency's performance measures used to track and report annually on the following: Safety, Mobility, Accessibility, Reliability, Productivity, System Preservation, Return on investment/Lifecycle Cost, Emission Reduction

MTC applies performance-based planning in a comprehensive fashion that spans development of the region's long-range transportation plan, submittal of the regional transportation improvement plan ("RTIP"), and annual reporting on system performance.

The current RTP, *Transportation 2035*, includes a set of specific, quantitative performance targets. Further, in developing the plan, MTC conducted a benefit-cost assessment of each major transportation investment under consideration. MTC and ABAG are currently applying a similar framework of performance targets and performance assessment to use in developing the region's Sustainable Communities Strategy ("SCS"), *Plan Bay Area*, which is scheduled for adoption in early 2013.

MTC carries this framework forward in the performance assessment required with the region's RTIP submittals. With each submittal, MTC summarizes in quantitative terms the current performance of the transportation system as well as how the RTIP contributes toward the RTP's goals. MTC incorporates in this analysis both the RTP performance targets and the performance metrics in the State Transportation Improvement Program ("STIP") guidelines.

Since 2001, MTC has regularly reported on the performance of the existing transportation system by posting "State of the System" data on the agency web page. This summary consists of data collected from a number of transportation agencies to characterize performance with respect to safety, mobility, and state of good repair. In the coming year, MTC and ABAG will jointly review this summary with an aim to make it more consistent with the performance targets framework for the region's SCS.

Table 13 summarizes how MTC's performance-based planning process addresses the performance categories listed above [identified in the CTC's Guidelines for HOT Lanes projects]. All of these materials are available on MTC's web site at http://www.mtc.ca.gov/.

Table 13: MTC Performance Measures

CTC Guidelines for HOT Lanes	**Long Range Transportation Plan** (1) Transportation 2035 (2009) (2) Plan Bay Area (expected 2013)	**RTIP Submittal**	**Current System Performance (Reported Annually)**
Safety	• Reduce injuries and fatalities from all collisions, including bicycle and pedestrian (1) & (2)	• Injury and fatality rates • Bicycle and pedestrian injuries and fatalities	• Injury and fatal collisions • Bicycle and pedestrian injuries and fatalities • Transit safety statistics
Mobility & Reliability	• Reduce per-capita delay, including non-recurring delay *(1)* • Decrease average per-trip travel time for non-auto modes *(2)*	• Passenger hours of delay • Travel time by time of day and trip purpose • Travel time variability by corridor • Transit on-time performance	• Freeway congestion • Transit ridership • Carpool lane usage and time savings • Transit on-time performance
Accessibility	• Decrease the share of income spent by low-income households on housing and transportation (1) & (2)	• Share of income spent by low-income households on housing and transportation • Jobs accessible from minority/low-income communities • Population within ¼ mile of transit	
Productivity	• Increase gross regional product *(2)*	• Transit passengers per revenue vehicle hour & mile • Average peak and daily vehicle trips and person throughput by corridor • Average daily truck trips by corridor	• Toll bridge traffic • Airport and seaport usage
System Preservation	• Decrease distressed lane-miles on the State Highway System (1) & (2) • Increase local roadway pavement condition (1) & (2) • Reduce transit asset age (1) & (2)	• Distressed lane miles & smoothness on State Highway System • Pavement conditions of local roads • Average age of transit assets • Miles between transit service calls	• Transit service calls • Distressed lane mile on State Highway Systems • Local roadway pavement condition index
Return on Investment/Lifecycle Cost	• Project-level benefit/cost assessment for all major investments under consideration in the plan (1) & (2)	• Benefit to cost ratio for major projects	
Emissions Reduction	• Reduce CO_2 per capita (1) & (2) • Reduce premature deaths due to particulate emissions (1) & (2)	• CO_2 emissions • Criteria polluant emissions	

Part G - Secondary Evaluation and Project Eligibility Criteria

The project team is not yet known

List of Attachments

1. Acronyms and Abbreviations
2. Project Fact Sheets
3. Department Letter of Support
4. Project Study Report
5. Regional letters of support
6. Operational Plan
7. Pro Form Cash Flows
8. Detailed Financial Assumptions
9. Benefit-Cost Analysis
10. Resolution Authorizing Application: MTC Resolution No. 4030
11. Bay Area Infrastructure Authority (BAIFA) Joint Exercise of Powers (as amended on September 28, 2011 by MTC Resolution No. 3769 and BATA Resolution No. 70)

Attachment 1

Acronyms and Abbreviations

Acronyms and Abbreviations

ABAG	Association of Bay Area Governments
ACTC	Alameda County Transportation Commission
BAAQMD	Bay Area Air Quality Management District
BAIFA	Bay Area Infrastructure Financing Authority
BART	Bay Area Rapid Transit
BATA	Bay Area Toll Authority
BCR	Benefit-Cost Ratio
CAA	Clean Air Act
Cal-B/C	California Life-Cycle Benefit-Cost Analysis Model
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CHP	California Highway Patrol
CIB	Current interest bonds
CMA	Congestion Management Agency
CMIA	Corridor Mobility Improvement Account
CSMP	Corridor System Management Plan
CTC	California Transportation Commission
CTFA	California Transportation Financing Authority
Department	California Department of Transportation
DSCR	Debt Service Coverage Ratio
DSRA	Debt Service Reserve Account
EDMM	Executive Director's Management Memorandum
EEO	Equal Employment Opportunity
EIR	Environmental Impact Report
ETC	Electronic Toll Collection
FasTrak®	Electronic toll collection system used in California
FHWA	Federal Highway Administration
FPI	Freeway Performance Initiative
FTA	Federal Transit Agency
HOT	High-occupancy toll
HOV	High-occupancy vehicle
HOV2+	Vehicles with two or more occupants
HOV3+	Vehicles with three or more occupants
ICM	Integrated Corridor Management
IRR	Internal Rate of Return
JPO	Joint Program Office
LPR	License Plate Recognition
MAR	Modified Access Report
MMD	Municipal Market Data
MTC	Metropolitan Transportation Commission
NCR	New Connection Report

NEPA	National Environmental Policy Act
NPV	Net Present Value
O&M	Operations and Maintenance
PA&ED	Project Approval and Environmental Documentation
PEAR	Preliminary Environmental Assessment Report
PID	Project Initiation Document
PM	Particulate matter
PS&E	Project Specifications and Engineering
PSR	Project Study Report
ROD	Record of Decision
RTIP	Regional Transportation Improvement Plan
RTP	Regional Transportation Plan
RTPA	Regional Transportation Planning Agency
S&H	Streets and Highways Code
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SANDAG	San Diego Association of Governments
SCS	Sustainable Communities Strategy
SIP	State Improvement Program
SOV	Single occupant vehicle
STIP	State Transportation Improvement Program
Sunol JPA	Sunol Smart Carpool Lane Joint Powers Authority
TCM	Transportation Control Measure
TIFIA	Transportation Infrastructure Finance and Innovation Act
TIP	Transportation Improvement Program
TMC	Traffic Management Center
TOPD	Traffic Operations Policy Directive
VTA	Santa Clara Valley Transportation Agency

Attachment 2

Project Fact Sheets

Public Partnership Application
for High Occupancy Toll Lanes
Project Fact Sheet

Lead Agency: Metropolitan Transportation Commission **Fact Sheet Date:** September 23, 2011

Contact Person	Lisa Klein		
Phone Number	510-817-5832	Fax Number	510-817-5848
Email Address	LKlein@mtc.ca.gov		

Project Information:

County	Caltrans District	PPNO *	EA *	Region/MPO/ TIP ID*	Route/ Corridor *	Post Mile Back *	Post Mile Ahead *
Alameda, Contra Costa, Solano	4	N/A	N/A	N/A	I-80,I-680, I-880, SR-84 and SR-92	var.	var.

* NOTE: PPNO & EA assigned by Caltrans. Region/MPO/TIP ID assigned by RTPA/MPO. Route/Corridor & Post Mile Back/Ahead used for State Highway System.

Legislative Districts	Senate: 2,5,7,9,10	Congressional: 1,3,7,9,10,11,13,15	
	Assembly: 7,8,11,14,15,16,18,20		
Implementing Agency (by component)	E&P (PA&ED): MTC	PS&E: MTC	
	R/W: MTC	CON: MTC	Toll Ops: BATA
Project Title	Bay Area Express Lane Facility		

Location - Project Limits - Description and Scope of Work (Provide a project location map on a separate sheet and attach to this form)

See Figure 1 in application for a map of the express lane limits.

Express Lane Facility:

I-80: Construct single express lane in each direction from Yolo County Line to San Francisco-Oakland Bay Bridge

I-680: Construct single express lane in each direction from I-80 Interchange to Alcosta Blvd

I-880: Construct single express lane in each direction from Hegenberger Road to SR-237 plus an operational gap closure from San Francisco/Oakland Bay Bridge to Hegenberger Road

SR-84: Construct single express lane in westbound direction from Dumbarton Bridge Toll Plaza to I-880

SR-92: Construct single express lane in westbound direction from San Mateo Bridge Toll Plaza to Hesperian Boulevard

Description of Major Project Benefits

Daily Vehicle Hours of Delay Saved	See Attachment 9 for Benefit-Cost Analysis

Other:

Connectivity Benefits: Addressing gaps earlier in the existing network of HOV lanes

Capacity Benefits: Underutilization creates opportunities to balance the usage of all lanes and move more traffic, thereby easing congestion in the general purpose lanes

Travel Time Benefits: Overutilization threatens the ability to maintain acceptable level-of-service on the region's HOV lanes, and variable pricing offers a means of addressing this problem

Reliability Benefits: The ability for commuters to make a predictable trip.

Bus Transit Beneiffts: Providing more opportunities to Bay Area transit providers

System Performance Benefits: Providing a better means of managing the overall freeway system can improve performance and congestion

Corridor System Management Plans

Lead Agency: Caltrans

Plan Approval Date: I-80 East (October 2010), I-80 West (November 2010), I-580 East (May 2010), I-880 (October 2010)

Expected Source(s) of Additional Funding if the Current Funding Plan Proves Insufficient

See response to Part D.4 for comprehensive answer

Project Delivery Baseline (Milestones)

See response to Part C.2 for project phasing

Accelerated Delivery: All projects by 2030 (except longer term gap closures on I-680NB through Walnut Creek and I-880 operational gap closure through Oakland)

Extended Delivery: All projects by 2035 (except longer term gap closures on I-680NB through Walnut Creek and I-880 operational gap closure through Oakland)

Public Partnership - HOT Lane Application
Project Fact Sheet - Project Cost and Funding Plan
(dollars in thousands and escalated)

BASE CASE

				Date: 9/2/2011
County	**CT District**	**PPNO***	**EA***	**Region/MPO/TIP ID***
Alameda, Contra Costa, Solano	4	N/A	N/A	N/A
Project Title:	Bay Area Express Lanes Network			

Proposed Total Project Cost

Component	Phase I	Phase II	Phase III	Phase IV	Phase V
R/W	-	19,023	-	-	-
Support	38,907	392,042	222,526	98,502	-
CON	116,529	1,132,070	665,838	294,736	-
TOTAL	155,436	1,543,134	888,365	393,238	-

Funding Source: Toll Revenue Bond Proceeds

Component	Phase I	Phase II	Phase III	Phase IV	Phase V
R/W	-	6,274	-	-	-
Support	17,232	129,304	68,626	29,530	-
CON	51,611	373,381	205,342	88,359	-
TOTAL	68,843	508,958	273,968	117,889	-

Funding Source: TIFIA Loan Proceeds

Component	Phase I	Phase II	Phase III	Phase IV	Phase V
R/W	-	6,276	-	-	-
Support	12,811	129,343	61,643	5,688	-
CON	38,369	373,494	184,445	17,019	-
TOTAL	51,180	509,114	246,088	22,707	-

Public Partnership - HOT Lane Application
Project Fact Sheet - Project Cost and Funding Plan
(dollars in thousands and escalated)

BASE CASE

				Date: 9/2/2011
County	**CT District**	**PPNO***	**EA***	**Region/MPO/TIP ID***
Alameda, Contra Costa, Solano	4	N/A	N/A	N/A
Project Title:	Bay Area Express Lanes Network			

Funding Source: Local Funding

Component	Phase I	Phase II	Phase III	Phase IV	Phase V
R/W	-	765	-	-	-
Support	5,084	15,758	-	-	-
CON	15,226	45,502	-	-	-
TOTAL	20,310	62,024	-	-	-

Funding Source: Capital Grant Funding

Component	Phase I	Phase II	Phase III	Phase IV	Phase V
R/W	-	3,870	-	-	-
Support	3,658	79,759	-	-	-
CON	10,954	230,314	-	-	-
TOTAL	14,612	313,943	-	-	-

Funding Source: Express Lane Network Pay-As-You Go Funds

Component	Phase I	Phase II	Phase III	Phase IV	Phase V
R/W	-	1,838	-	-	-
Support	123	37,879	92,258	63,284	-
CON	369	109,379	276,052	189,358	-
TOTAL	492	149,095	368,309	252,642	-

Public Partnership - HOT Lane Application
Project Fact Sheet - Project Cost and Funding Plan
(dollars in thousands and escalated)

CONSERVATIVE CASE

				Date: 9/2/2011
County	**CT District**	**PPNO***	**EA***	**Region/MPO/TIP ID***
Alameda, Contra Costa, Solano	4	N/A	N/A	N/A
Project Title:	Bay Area Express Lanes Network			

Proposed Total Project Cost

Component	Phase I	Phase II	Phase III	Phase IV	Phase V
R/W	-	-	22,268	-	-
Support	34,116	107,285	222,505	224,482	318,298
CON	102,408	318,259	620,725	671,689	952,403
TOTAL	136,524	425,544	865,498	896,170	1,270,701

Funding Source: Toll Revenue Bond Proceeds

Component	Phase I	Phase II	Phase III	Phase IV	Phase V
R/W	-	-	6,295	-	-
Support	13,946	14,883	62,899	36,145	134,929
CON	41,863	44,151	175,471	108,152	403,731
TOTAL	55,809	59,035	244,665	144,297	538,660

Funding Source: TIFIA Loan Proceeds

Component	Phase I	Phase II	Phase III	Phase IV	Phase V
R/W	-	-	6,046	-	-
Support	11,229	17,169	60,410	32,437	105,010
CON	33,708	50,932	168,526	97,057	314,208
TOTAL	44,937	68,101	234,981	129,494	419,218

Public Partnership - HOT Lane Application
Project Fact Sheet - Project Cost and Funding Plan
(dollars in thousands and escalated)

CONSERVATIVE CASE

				Date: 9/2/2011
County	**CT District**	**PPNO***	**EA***	**Region/MPO/TIP ID***
Alameda, Contra Costa, Solano	4	N/A	N/A	N/A
Project Title:	Bay Area Express Lanes Network			

Funding Source: Local Funding

Component	Phase I	Phase II	Phase III	Phase IV	Phase V
R/W	-	-	1,170	-	-
Support	5,143	4,702	11,693	-	-
CON	15,438	13,947	32,621	-	-
TOTAL	20,580	18,649	45,484	-	-

Funding Source: Capital Grant Funding

Component	Phase I	Phase II	Phase III	Phase IV	Phase V
R/W	-	-	1,951	-	-
Support	3,701	45,766	19,494	88,640	20,740
CON	11,109	135,764	54,384	265,228	62,058
TOTAL	14,810	181,530	75,829	353,868	82,798

Funding Source: Express Lane Network Pay-As-You Go Funds

Component	Phase I	Phase II	Phase III	Phase IV	Phase V
R/W	-	-	6,806	-	-
Support	97	24,765	68,008	67,259	57,619
CON	290	73,465	189,724	201,252	172,406
TOTAL	387	98,229	264,538	268,511	230,025

Attachment 3

Department Letter of Support

Department letter of support provided under separate cover

Attachment 4

Project Study Report

Project Study Report provided under separate cover

Attachment 5

Regional Letters of Support

Letters of Support

(see following pages)

Letter From	Status	
1. Alameda County Transportation Authority	Sent under separate cover	Board approved 9/22
2. Contra Costa Transportation Authority	Attached	Board approved 9/22
3. Santa Clara Valley Transportation Authority	Sent under separate cover	Board Approved 9/1
4. Solano Transportation Authority (attached)	Attached	Board Approved on 9/14
5. Sunol Smart Carpool Lane Joint Powers Authority	Sent under separate cover	Board Approved 9/12

CONTRA COSTA
transportation
authority

2999 Oak Road,
Suite 100

Walnut Creek, CA
94597.

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http://www.ccta.net

September 22, 2011

Mr. Dario Frommer, Chair
California Transportation Commission
1120 N Street, Room 2221 (MS-52)
Sacramento, CA 95814

Dear Chairman Frommer and Commissioners:

The Contra Costa Transportation Authority (Authority), acting as the Congestion Management Agency (CMA) for Contra Costa, is writing in support of the application by the Metropolitan Transportation Commission (MTC) for authority to implement the Bay Area Express Lane Network and urges the California Transportation Commission (Commission) to make a finding of eligibility under Streets & Highway Code Section 149.7. The Authority acted at its meeting on September 21, 2011 to affirm this support.

The express lanes network is a component of the *Transportation 2035 Plan for the San Francisco Bay Area*, the long-range transportation plan for the Bay Area. This request before the Commission represents the culmination of significant efforts to define and study the technical and financial feasibility of moving forward with the express lanes network. High Occupancy Vehicle (HOV) lanes are already an essential part of the regional transportation system, but they could be even more extensive and make a greater contribution to regional mobility, if they were to reach their full potential. Currently, the HOV lanes are a "patchwork" rather than a network. The implementation of the network for which MTC is seeking authority on behalf of the region would be a powerful tool for management of the freeway system. It would yield the following benefits:

- **Capacity Enhancement/System Performance.** Current underutilization of HOV lanes creates the opportunity to balance the usage of all lanes and increase vehicle and person throughput, as a result of careful real-time pricing strategies. Overall system performance can be improved by a more extensive HOV/express lane network that can be fine-tuned through pricing.
- **Connectivity.** Additional HOV lanes would be constructed to close gaps and permit longer contiguous trips on the lanes than are currently possible or foreseeable under current funding circumstances. The network will become a much more attractive and efficient mobility option for travelers when gaps are closed.
- **Travel Time Savings.** Offering travelers the option of using the express lane provides an opportunity to save travel time, especially on those occasions when being on time is of great value to the user.
- **Reliability.** In addition to time savings, reliability is an important value to users. If predictability can be assured, experience with express lanes in other regions has shown

that users will pay the toll, even at times when there is not significant congestion on the adjacent general purpose lanes.

- **Bus Transit improvement.** Substantially enhanced connectivity and improved reliability will make express bus travel much more attractive and thereby lead to increased ridership. This will lead to reduced congestion, energy consumption and air emissions.

Of course, each segment of the express lane network has its own special characteristics. As each project of the network is developed, we understand that there will be detailed analysis of operational and environmental impacts specific to that project. The Authority, as well as affected jurisdictions in Contra Costa, expects to participate in the project development process for those corridors within our county.

The Authority's support for the Bay Area Express Lane Network is predicated on the understanding that the following concerns will be addressed prior to implementation:

- Governance structure: Important policy decisions are needed for both region-wide and corridor-specific implementation. The Authority, as the CMA for Contra Costa, should be involved with our partners at MTC, Caltrans and other Bay Area CMAs in the development of the governance structure that affects Contra Costa corridors and residents.
- Financing options: The MTC application includes costs needed to implement and operate the express lane network, and discusses financing options in limited detail. A more defined financing plan needs to be identified.
- Start-up costs: Contra Costa's Measure J expenditure plan includes funding to construct HOV lanes along I-680. These funds cannot be redirected to implement HOT lanes. Rather, these funds should be supplemented from the network financial plan for this purpose.
- Use of net revenue: The Authority believes that HOT lane implementation should benefit residents and travelers along tolled corridors, and that excess revenue should be used for transit assistance or other capital projects.
- The Authority and local involvement in implementation: Most importantly, the Authority and its affected jurisdictions need to be involved in the continued planning and implementation of the express lane network. This includes participation in operational policy decisions and the development of project development roles for corridors within Contra Costa.

We are pleased to give wholehearted support and endorsement to the MTC application to seek authorization of the Bay Area Express Lane Network as long as the above conditions are met. We urge Commission approval of the application.

Sincerely,

David E. Durant
Chair

Solano Transportation Authority
. . . working for you!

SOLANO TRANSPORTATION AUTHORITY

Member Agencies:
Benicia • Dixon • Fairfield • Rio Vista • Suisun City • Vacaville • Vallejo • Solano County

One Harbor Center, Suite 130, Suisun City, CA 94585-2473 • Telephone (707) 424-6075 / Facsimile (707) 424-6074
Email: staplan@sta-snci.com • Website: sta.ca.gov

September 15, 2011

Mr. Dario Frommer, Chair
California Transportation Commission
1120 N Street, Room 2221 (MS-52)
Sacramento, CA 95814

RE: STA Letter of Support – MTC Application
Authority to Implement a Regional Express Lanes Network

Dear Chairman Frommer and Commissioners:

The Solano Transportation Authority (STA), acting as the congestion management agency for Solano County, is writing in support of the application by the Metropolitan Transportation Commission (MTC) for authority to implement a regional Express Lanes Network and urges the California Transportation Commission (Commission) to make a finding of eligibility under Streets & Highway Code Sections 143(a)(4)(D) and 149.7. The STA Board of Directors acted on September 14, 2011, to unanimously affirm this support.

The regional Express Lanes Network is a component of *Transportation 2035*, the long-range transportation plan for the San Francisco Bay Area. The STA has supported the Implementation of Express Lanes on the I-80 and I-680 Corridors in Solano County since 2009. This request before the Commission represents the culmination of significant efforts to define and study the technical and financial feasibility of moving forward with the Express Lanes Network. High-Occupancy Vehicle (HOV) lanes are already an essential part of the regional transportation system, but they could be even more extensive and make a greater contribution to regional mobility, if they were to reach their full potential. Currently, HOV lanes in the Bay Area are a "patchwork" rather than a network. The implementation of the network for which MTC is seeking authority on behalf of the region would be a powerful tool for management of the California freeway system. It would yield the following benefits:

- **Connectivity.** Additional HOV lanes would be constructed to close gaps and permit longer contiguous trips on the lanes than are currently possible or foreseeable under current funding circumstances. The network will become a much more attractive and efficient mobility option for travelers when gaps are closed.

- **Capacity Enhancement/System Performance.** Current underutilization of HOV lanes creates the opportunity to balance the usage of all lanes and increase vehicle and person throughput, as a result of careful real-time pricing strategies. Overall system performance can be improved by a more extensive HOV/Express Lane Network that can be fine-tuned through pricing.

- **Travel Time Savings.** Offering travelers the option of using the Express Lane provides an opportunity to save travel time, especially on those occasions when being on time is of great value to the user.

- **Reliability.** In addition to time savings, reliability is an important value to users. If predictability can be assured, experience with Express Lanes in other regions has shown that users will pay the toll, even at times when there is not significant congestion on the adjacent general purpose lanes.

- **Bus Transit improvement.** Substantially enhanced connectivity and improved reliability will make express bus travel much more attractive and thereby lead to increased ridership. This will lead to reduced congestion, energy consumption and air emissions.

Each segment of the network has its own special characteristics. As each project of the Express Lane Network is developed, we understand that there will be detailed analysis of operational and environmental impacts specific to that project. The STA is prepared to partner with Caltrans to participate in the project development process for those corridors within our jurisdiction. In the meantime, we are pleased to support and endorse the MTC application for moving ahead with the next steps toward a regional Express Lane Network. We urge Commission approval of the application.

If you have any questions, please contact STA's Executive Director Daryl Halls at (707) 424-6075.

Sincerely,

Harry T. Price, STA Board Chair
Mayor, City of Fairfield

CC: STA Board Members
Malcolm Dougherty, Caltrans Director
Bijan Sartipi, Caltrans District 4 Director

Attachment 6

Operational Plan

Bay Area Express Lanes Operational Plan

Introduction

The Metropolitan Transportation Commission (MTC), with state and local county transportation authorities, intends to implement a network of priced express lanes in the Bay Area, also referred to as High Occupancy Toll (HOT lanes. The express lanes will incorporate tolling in order to improve efficiency, provide another option for travelers and preserve the free-flow operations of the express lanes, while maintaining priority use for carpoolers and express buses.

This Operational Plan provides a high-level understanding of how express lanes would be implemented, operated and maintained in the Bay Area. The term "Express Lane System" is used throughout this document to refer to the seamless regional network of express lanes in the Bay Area, including those that are already authorized under existing law and are not to be operated by MTC. This Operational Plan includes the various components that comprise the express lanes, as well as general stakeholder roles and responsibilities in terms of design, operation, enforcement, and maintenance.

The general design and operational intent of the Express Lane System is to provide a safe and efficient network that can best fit within the existing infrastructure and available freeway right-of-way, while meeting safety and operational objectives and maintaining affordability and effectiveness in service provision. Prior studies have defined a wide range of design and operational settings, and the Department has guidance related to the development of HOV and express lanes in these design and operational settings.

Current Operations

The Bay Area's existing HOV network is comprised of concurrent flow HOV lanes that are restricted to vehicles meeting the minimum occupancy requirement during peak traffic periods. The only delineation between the HOV lanes and general purpose lanes is a painted, dashed marking and ingress and egress to the HOV lane is permitted at any location because the lanes revert to general traffic use during off-peak periods. Lane design generally conforms to the Department HOV Guidelines (2003 as amended).

The Bay Area HOV lanes currently permit the following vehicle types during operational periods:

- Passenger vehicles with two or more occupants or three or more occupants, depending on the corridor.
- Motorcycles
- Vanpools carrying requisite minimum number of occupants
- Buses, including paratransit
- Emergency vehicles (when in response to a qualifying event)

In addition to the HOV lane network, the Bay Area currently has one 14-mile express lane facility in operation on I-680 in Alameda and Santa Clara Counties. The I-680 Express Lane, which opened to traffic on September 20, 2010, is a limited-access facility, incorporating separate ingress and egress locations, which is restricted to HOV lane eligible and single-occupant toll paying vehicles on weekdays between 5 a.m. and 8 p.m. The express lanes are open to all traffic at night and on the weekends.

Express Lane System

The implementation and operation of express lanes requires several significant changes to the manner in which HOV lanes are operated and the way motorists will use the lanes.

1. Until technology allows operation of a continuous access express lane, changing from continuous access HOV design to limited access express lanes.
2. Use is granted to vehicles that do not meet the prevailing occupancy requirements by requiring them to carry an active FasTrak® transponder connected to a valid account, and in the future possibly self-declaring their occupancy status.
3. The minimum occupancy requirement may be raised on some facilities or corridors at some future date, either during peak hours only or full-time in order to allow for effective operation.
4. All express lane users may be required, at some point in the future, to self-declare occupancy by means of a switchable transponder. This flexibility to the user also will allow greater automation of tolling enforcement and ease of use of the express lanes (which may have different occupancy requirements in various corridors). Regulations and statutes may need to be updated to require the use of switchable tags by carpoolers.
5. Express lanes may operate every day of the week, rather than only during peak periods only on weekdays as the current HOV system operates, provided HOV benefits on the express lanes are realized throughout all operational times.

Motorcycles, emergency, and other exempted vehicles meeting state requirements will continue to be exempted from express lane tolls. Beyond the current sunset period associated with hybrid and clean air registrations, such vehicles will not be allowed on the express lanes as toll-free users. Instead, these vehicles will be subject to the same prevailing toll in effect. Trucks, recreational, and other large vehicles as currently defined by the Department with regards to HOV lanes will continue to be prohibited.

Facility Pricing

In order to maintain minimum travel speeds of 45 miles per hour (Federal SAFETEA-LU Section 1121 standard) and Level of Service C / D (with written agreement, as per California Streets and Highways Code Section 149.5) in the express lanes, the applicable toll rate will vary based upon observed traffic demand. Termed *dynamic pricing*, this tolling approach is currently in operation on I-680 in Alameda County and on I-15 in San Diego County, and will be implemented in Los Angeles County on I-10 and I-110 in 2012. Travel speed is measured in real time between entry and exit points on the express lanes, with the price for entry adjusted (typically in 5 – 15 minute intervals) in order to effectively manage traffic demand and maintain minimum speeds at 45 mph or higher. Travel time and vehicle speed is typically measured using remote radar-based vehicle sensors suspended over the express lane or mounted alongside the roadway. The sensor monitors traffic volume, speed, and density at frequent intervals along the lane. This real time travel data is incorporated within the dynamic pricing algorithm, which yields the prevailing toll for display to motorists. The display is provided in advance of a decision point to enter the lane, and the tolling system assigns the prevailing toll charge to the user once a decision is made to use the express lane.

Tolls will be collected along each express lane corridor at specific points (often called the *toll zones*). Tolling infrastructure, described below, reads the FasTrak® transponder within the vehicle, processes a charge to the customer's account, and in cases where a transaction is not successfully completed, may record the license plate of the vehicle for post processing to charge the correct account or to address a potential toll violation. Generally, the system will feature a toll zone every three to five miles depending on demand and location of ingress / egress locations.

System Parameters

Facility Design

The majority of the Bay Area Express Lane System involves conversion of existing continuous access HOV lanes to express lanes. For the application to the CTC and the related program-level PSR, express lanes are assumed to have limited access and be buffer separated similar to HOV lanes found throughout southern California. Cross-section standards include the provision of two to four foot painted buffers separating the express lane from the adjacent general purpose lanes. Access will be provided in designated locations, where ingress and egress movements are signed appropriately. This type of configuration will be one of several designs allowed for under the Department Traffic Operations Policy Directive 11-02.

In addition to the lane separation treatment change, the express lanes require the addition of tolling infrastructure and related signage, closed circuit television monitoring, lighting, vehicle detection, and other features as deemed necessary for the safe operation and enforcement of such facilities.

Toll Collection

Tolls collected on the express lanes will be done by electronic toll collection. In the future, license-plate recognition systems (known as "open road tolling") may be incorporated for enforcement efficiency. No tolls will be physically collected in the lanes.

- The express lane toll zones will include an automated vehicle identification (AVI) reader, antenna, and a transaction status indicator beacon. Sufficient lighting will be present to support license plate recognition and image capture, as well as safety for structural illumination.

Two forms of express lane toll collection will be possible:

- Electronic toll collection (ETC) from registered motorists who carry in-vehicle-mounted FasTrak® transponders. This is the primary means of toll collection as envisioned for the Express Lane System.
- In the future, MTC may collect tolls through license plate recognition (LPR) systems (often called "pay-by-plate"), which are linked to the state license plate database. This system for toll collection is only beginning to be used on priced express lane and toll systems throughout the U.S., although it is already being used on Bay Area bridges. It is permitted under California Vehicle Code Section 23302.

Collection of tolls will entail tracking vehicles through the Express Lane System, recording locations where vehicles pass under the toll zone's antenna and reader, and assembling trip information in processing the aggregated toll as a single trip transaction. The toll rate applied to the customer is expected to fluctuate from segment to segment based on the time of the trip when the customer initiated use of the segment and the prevailing operating conditions within the express lane. Collection for the aggregated journey will appear as a single trip transaction on the customer's statement.

Each toll user will have a debit account established, with business rules applied in a manner similar to current Bay Bridge transponder users. Account set-up will require debiting an initial amount from a user's credit card or bank account (currently $20 minimum for BATA bridges and I-680 Express Lane). Tolls will be paid from this debit balance until a minimum balance threshold (which is dependent upon toll use in the previous 30 days) is reached, at which time an additional $25 draft for payment will be automatically charged or drawn from the users credit card or bank account. BATA also provides a mechanism for FasTrak® transponders to be acquired with a cash-only account ($30 initial deposit), thereby serving unbanked travelers and others unwilling to provide a credit / debit account for toll transactions.

Collection of tolls on a defined portion of the express lanes may be suspended for a variety of reasons related to malfunctioning equipment, major incidents, special events or declared emergencies. In each instance, such events will be automatically coded on the payment record for each customer's account, if a toll is collected for portions of the aggregated trip, with a credit issued if appropriate.

Each customer will be sent a regular monthly billing statement, viewable by U.S. mail, email and via the *bayareafastrak.org* website, showing all toll transactions for the prior period.

Mainline Express Lane toll zones will be equipped with all necessary infrastructure to identify vehicles, process toll transactions, and inform enforcement personnel as to account status through strategically placed beacons. Additionally, at some time in the future, the toll zones may identify and photograph license plates of potential violators. The subsystems that accomplish this process are identified below.

Variable Toll Rate Signs (VTRS)

Signs with dynamic toll rate panels affixed will be installed in advance of and within access areas where they are longer than one mile and at least 2,000 feet before they end. To reduce costs and maintenance requirements, signs will include static sections (banners, guidance, and destinations) with variable display components for price information. The variable section will display the applicable toll rate.

Automatic Vehicle Identification (AVI) System

The AVI system to be installed in toll zone locations will be designed to read legacy as well as self-declaration transponders (as will be deployed for the Los Angeles County I-10 and I-110 Express Lanes and may be a potential future deployment in the Bay Area), differentiating not only the occupancy status but also the use of the express lanes or general purpose lanes. The AVI readers will read all legacy Title 21 FasTrak® transponders as being in a default setting of "SOV" for toll purposes. By default, the system will consist of antennas and readers mounted on cantilevered, median-mount gantry structures.

Zone Controllers

The zone controller processes all data obtained from the other subsystems, creates data records / packages for each vehicle entering the zone, transmits the data to the central processing system, verifies receipt of data, and provides system health communications. In addition, the zone controller has informational control over other subsystems: toll price messages on signs with dynamic toll rate panels, time-of-entry for toll-price correspondence and AVI concurrence of customers, and signal to the transaction indicator system for beacon status.

Central Processing System (CPS)

The CPS is the collection of computer hardware and software applications that comprise the primary logical unit for the calculation of tolls, evaluation of traffic, and assignment of toll transactions. All toll assets also report to the system, often referred to as the back office. Furthermore, this system pushes the latest information to all toll zones, signs, and provides data to system operators.

Enforcement

In order to maintain high person throughput, quality level of service, and long-term return on investment, the Bay Area Express Lane System must endeavor to minimize violations and improve enforcement of the facility's restrictions and requirements. Enforcement will rely on manual and automated strategies. The California Highway Patrol (CHP) will be contracted to perform monitoring and enforcement of the express lanes occupancy and safety policies. For some corridors, it may be determined that targeted part-time patrols during peak periods are sufficient to ensure acceptable rates of compliance. Contracts with CHP will cover the incremental costs necessary to provide for the increased levels of enforcement determined to be appropriate.

In the future, automated enforcement strategies may complement manual activities by limiting CHP enforcement responsibilities to occupancy verification and other traffic violations (i.e., illegal buffer crossings). If deployed, LPR-based cameras will capture license plate images of vehicles that either do not display a recognizable FasTrak® transponder or for which the transaction was not completed properly. The license plate images of these vehicles can then be used to determine whether the vehicle is registered to an account, in which case the toll will be automatically deducted. If the vehicle license plate is not associated with an active account, then the license plate number will be processed through the Department of Motor Vehicles ("DMV") database to locate an address to either send a violation notice to collect payment or issue a pay-by-plate invoice for toll payment, depending upon the business rules at the time of deployment. In this way, LPR removes the responsibility of toll violation enforcement from in-field CHP officers.

A high threshold of operational reliability is a primary goal of the express lane toll operation system. Maintaining this level of reliability is highly dependent upon the ability to respond to and control sources of revenue leakage through adequate enforcement. Although the automated and manual enforcement strategies described above will be employed to preserve the financial integrity of the express lanes, there are still likely to be several contributing sources to revenue leakage. These sources of leakage may include:

- Toll violators who intentionally travel on express lanes without obtaining and displaying a registered toll transponder. In the future, toll violations may be enforced using LPR cameras deployed at toll zones.
- Occupancy violators (in the application of switchable transponders, these are users without the requisite number of vehicle occupants traveling with a toll transponder placed in an HOV setting). Occupancy violations will be enforced using a combination of automated and manual enforcement strategies.
- Malfunctioning toll transponders or toll zone equipment. In the case of malfunctioning toll transponders, LPR cameras will capture license plate images that can be reconciled to a registered account at no charge to the customer.

Due to the unique attributes of each corridor, specific enforcement needs may vary throughout the Express Lane System. The level and magnitude of enforcement needed will vary based on the design and operational characteristics of each individual corridor. As a result, it is anticipated that enforcement needs will be determined at a corridor level (or within respective PSRs for a given corridor). The locations and frequency of designated enforcement areas will be decided based on discussions with local CHP personnel who are most familiar with the unique characteristics and enforcement needs of each corridor.

To assist on-site enforcement monitoring near toll zones, transaction status indicators will be installed on gantry posts / bridge columns (depending upon location of toll zone). The indicators, to be installed approximately 7 – 8 feet vertically from the pavement surface, will be visible by CHP personnel from an observation area located 100 to 150 feet downstream from the toll gantry. The beacons will signal the status of the transponder reading / transaction for the passing vehicle and allow enforcement personnel to target vehicles for visual enforcement of occupancy.

Management of the System

Traffic Management

The efficacy and efficiency of the Bay Area Express Lane System will be dependent upon maintaining a high level of reliability for free-flow travel times while not adversely impacting adjacent general purpose lanes. The ability to manage express lanes traffic and operations rests not only with the toll algorithms that help regulate demand, but also depends on the ability to monitor system performance and quickly detect and respond to changing traffic conditions throughout the Express Lane System.

The equipment used to monitor operating conditions of the express lanes and general purpose lanes must include sufficient systems to collect and process the necessary data for evaluation of performance. At a minimum, roadway detection devices must be capable of frequently and reliably collecting speed, volume, and video images throughout the Express Lane System. Speed and volume characteristics will be used to evaluate whether operating conditions are within desirable ranges, inform operators whether toll or other operating policies need to be modified to ensure optimal performance and determine the impact that toll rates are having on traffic operations and to assess whether toll changes are necessary to improve operations. For dynamically priced systems, speed and volume data are used

as direct inputs for the toll-setting algorithm implemented in real-time. This data is also used to evaluate the performance of fixed pricing strategies by informing operators of operational trends over a daily, weekly or monthly basis.

This equipment may consist of remote radar-based vehicle sensors, induction loop detectors mounted in the pavement, and other detection devices mounted on median posts, exterior roadside posts, or gantries. The purpose of this equipment will be to monitor traffic speeds, density, and lane occupancy (not vehicle occupancy) within both the express lanes and the general purpose lanes. This data is required to determine the impact that toll rates are having on traffic operations and to assess whether toll changes are necessary to improve operations.

In addition to the tolling and enforcement systems, the express lane corridors will feature virtually continuous installation of Intelligent Transportation Systems (ITS) technologies, including sensor loops, independent Closed-Circuit Television (CCTV) systems for traffic / incident monitoring and may be connected to ramp metering and other traffic control systems. Although these systems may be concurrently used by the region's Traffic Management Center (TMC), neither MTC nor BATA will have a role in their maintenance, as those that are associated expressly with the express lanes are already addressed.

Real-time peer-to-peer exchange of incident and traffic sensor data between the TMC, incident management responsible party, and tolling integrator will be maintained by MTC. Otherwise, the Department will continue to maintain all non-tolling related ITS installations along the Express Lane System.

Incident Management

Effective and responsive incident management protocols are critical for providing reliable, time-saving travel for users. To do so, not only must the express lanes maintain enhanced operating conditions during recurring congested periods, but they must also be managed effectively during non-recurring events or incidents to ensure that users are not adversely affected. The Federal Highway Administration (FHWA) *Guide for HOT Lane Development* provides general guidance for incident management within express lane facilities and strongly recommends that express lanes be equipped with incident surveillance and detection equipment, monitored by observant (and preferably dedicated) staff at least during periods of peak demand. Staff will be fully trained and experienced in express lanes incident response with drills and exercises to improve responsiveness and safety. The FHWA Final Rule and Federal Transit Administration (FTA) Final Policy on ITS Architecture states that projects that include ITS elements, such as the Bay Area express lanes, will be developed using a systems engineering process. As part of this process, participating agency roles and responsibilities should be defined. In terms of incident management, agency roles and responsibilities are documented, reviewed and agreed upon prior to the development of the express lanes.

Maintenance

While many aspects of express lane maintenance are no different than other aspects of general freeway or HOV lane maintenance, there are some components (notably tolling, ITS, and communications

infrastructure) that are not found on freeway or HOV lanes. These components are important to preserving service lane reliability and travel speed benefits.

The tolling and related toll enforcement systems maintenance require specialized attention, which may be specific in nature to the technology deployed by the tolling integrator. This technology, though, may also be present outside the express lane right-of-way. For example, tolling algorithms require a significant amount of detector data across multiple lanes of traffic (express lanes and general purpose lanes) in order to operate effectively. Given the inability to provide maintenance during active operations, a glitch in the tolling detection infrastructure could result in a failure to collect tolls or give customers advance toll information, resulting in a loss of revenue degradation of express lane operations. As such, these tightly integrated systems require a high level of reliability and preventative maintenance.

The express lanes may constitute an increase in the maintenance needs of ITS elements deployed throughout the region. Maintenance will require the express lane resources and equipment needs be identified and accounted for in capital and O&M estimates. Available funding streams and levels should be reviewed to determine if they can support the additional maintenance costs associated with express lanes. This includes the additional capital costs needed to purchase equipment inventories that can be used to quickly perform preventative or responsive maintenance as well as the labor costs associated with hiring additional maintenance personnel to handle the additional maintenance activities.

Institutional Roles and Responsibilities

There is currently no primary reference document that defines the various partner agencies and working structures for the Express Lane System. Therefore, the roles and responsibilities spelled out below are based on experiences and agreements formulated for construction projects in development, and are intended to serve as a framework for future agreements. In general, the agencies indentified below have a role in the development, implementation, operation, maintenance, and enforcement of the Bay Area express lanes.

Agency roles and responsibilities for traffic management will be documented, reviewed and agreed upon prior to system implementation. This provides clear understanding before systems become operational, leading to a seamless transition from the perspective of the user.

California Transportation Commission (CTC)

CTC will make a finding on the feasibility of toll implementation plans for freeway-based express lanes. The CTC will also be responsible for approving any public-private partnership agreement involving any aspect of the Express Lane System, as stipulated in Senate Bill Second Extraordinary Session 4 Chapter 2, Statutes of 2009 (SBX2-4, often referred to simply as SB 4).

Metropolitan Transportation Commission (MTC)

As the designated Metropolitan Planning Organization for the nine-county Bay Area, MTC is responsible for preparation and approval of the Regional Transportation Plan (RTP) which includes express lane

programming and phasing as part of the region's Transportation Improvement Program. MTC's responsibilities also include air quality planning and conformity analysis, for which express lanes may be identified as transportation control measures (TCMs) that seek to reduce transportation-related emissions. Federal and state matching funds that are involved in HOV or express lane operation are programmed through the MTC. As the primary author of the Project Study Report (PSR), MTC is charged with providing an estimate of funds available for the development, construction, maintenance and operation of the Express Lane Network.

Bay Area Toll Authority (BATA)

BATA will provide customer service and toll operations services. BATA's roles include supporting program development and implementation of the Express Lane System and providing operation and maintenance of all affected systems. Additionally, BATA is responsible for creating an express lane operational development plan.

Bay Area Infrastructure Financing Authority (BAIFA)

The Bay Area Infrastructure Financing Authority (BAIFA) is a joint exercise of powers agency formed by MTC and BATA. MTC may, through agreements or other arrangements with BAIFA, delegate to BAIFA some of its responsibilities for development, implementation, financing, and operation of the Express Lane Network.

California Highway Patrol (CHP)

CHP serves as the primary policing agency for state highways in rural and urban areas including Bay Area freeways. CHP has historically provided enforcement of express lanes on other projects in the state augmented under contract to local and private agencies operating these facilities. CHP also serves as the lead agency responsible for incident management on Bay Area freeways. As such, CHP will be responsible for coordinating and implementing response functions in relation to traffic incidents or other disruptions on the Express Lane System. This is likely to include sharing information with the Department and MTC staff to coordinate response efforts and information dissemination. CHP may also be involved in maintenance activities requiring lane closures on the freeway system or Express Lane System.

California Department of Transportation

The Department, as the owner of roadways on which express lanes are located, will be involved with the design (or design oversight), operations and maintenance of the freeway upon which express lanes are located and for compliance with any statewide standards and policies affecting the implementation and operation of express lanes. Responsibilities may also include operations and maintenance of express lanes, and reimbursable according to the terms of agreement between MTC and the Departmentin accordance with California Streets and Highways Code, Section 149.5 (e)(1). During planning and implementation, the Department is responsible for review and approval of all design and operation plans, including maintenance of traffic for implementation and maintenance activities that require lane closures.

District 4 of the Department currently operates the Bay Area Transportation Management Center ("TMC") housed in Oakland. Data received from traffic monitoring equipment installed throughout the freeway network is monitored by dedicated Department staff at the TMC at all times. The TMC also serves as a dispatch center for Department maintenance personnel to incidents or events where debris removal or cleanup assistance is needed. MTC's 511 Traveler Information Center is also co-located with the TMC to provide up to date traffic information to the public.

Freeway Service Patrol

The Freeway Service Patrol (FSP) is a joint program provided by MTC, CHP and the Department to maximize the effectiveness of the freeway system by expeditiously removing stalled vehicles and other obstructions from the roadway. The FSP fleet of service trucks patrols the freeway network during the most congested periods and is dispatched by CHP. With the addition of express lanes, FSP vehicles will still be relied upon to provide obstruction removal services. At a minimum, FSP events must be able to be initiated by non-CHP contractors, and FSP should have authority to clear incidents from the express lanes. These expanded functions could be funded through express lane revenue. Alternately, a dedicated patrol fleet to the express lanes could be provided apart from FSP if this functional role cannot be easily modified. A separate dedicated patrol could perform their function on a roving basis under a third party operation or maintenance contract.

Customer Service Center (CSC)

Functions related to the administration and management of toll accounts will be handled by the regional Customer Service Center (CSC). Customer service responsibilities for all toll accounts will be consolidated and housed within BATA. CSC responsibilities include:

- Establishing new customer accounts,
- Posting toll payments to customer accounts and replenishing accounts when minimum balances are reached,
- Distributing account statements,
- Responding to customer questions and concerns regarding toll transactions, and
- Administering refunds as necessary in the event of traffic incidents or other disruptions on the express lanes.

The number of registered toll accounts will increase as new express lane segments come online. Therefore, CSC capabilities may need to be expanded as network phasing progresses, which may necessitate the need for additional staff and equipment.

Congestion Management Agencies (CMA)

Each of the Bay Area's nine counties has a designated congestion management agency (CMA) that oversees development of a congestion management program (CMP) to be incorporated as part of a region's transportation improvement program. Each CMA consists of a governing body representative of local councils and agencies. Some CMAs also allocate locally approved transportation funds in addition to CMP funds allocated by the state. CMAs play a role in the planning and implementation

processes to ensure that express lanes within each agency's jurisdiction are consistent with other improvements as part of each countywide CMP. CMA roles could potentially be expanded beyond planning and implementation depending on specific agreements made with other agencies.

Federal Highway Administration (FHWA)

FHWA has an interest in the design and operation of express lanes, since these facilities are located on right-of-way owned by the state with improvements that include federal funding. FHWA is responsible for reviewing and approving any improvement and lane operation on a federal aid highway route. In order to implement a priced express lane on an interstate facility, the Department and FHWA must execute a tolling agreement that specifies the policy and operational parameters of the express lanes, how tolls will be collected, and the agreed upon distribution of revenues, in accordance with state and federal law concerning transportation revenue. In addition to the California Division of FHWA, who has oversight over design review, the Value Pricing Program housed within the FHWA Office of Operations will review and approve the tolling agreement.

Constituent Agencies (AAA, 511 Rideshare, etc.)

A number of affiliated agencies (public-sector, private-sector, and non-profit organizations) have supporting roles in promoting express lane operations, encouraging use of the express lanes by different modal users, and in helping constituent relations. They may serve to further the understanding of express lane operations, broker the acquisition of self-declaration transponders, and market the program.

Others

There are other agencies who will have selected roles associated with the implementation of express lanes. The Federal Transit Administration (FTA) may disburse funding for bus or other mass transit improvements attached to or connecting to express lanes, including determination of the express lanes as fixed guideway transit facilities. Various resource agencies at the local, state and federal levels will be involved in the review of environmental impacts associated with express lane implementation. These agencies are numerous and have defined roles in the project development and environmental review process.

Outreach and Marketing

The implementation of Bay Area express lanes rules and regulations constitute a significant learning curve for existing HOV lane users and potential new customers to express lanes. Almost two generations of Bay Area residents have grown up accustomed to the role of HOV lanes and how they operate. An even longer generational legacy exists regarding tolling on Bay Area bridges dating from the 1930s. Yet based on local construction projects currently being implemented, the purpose for implementing express lanes and the role they serve has not been widely articulated and not well understood. Express lane business rules require several new messages be communicated to the public through a concerted regional effort.

In order to build public understanding of these facets of the express lanes and address the needs of short-term and long-term audiences and customers, a detailed marketing plan will be developed and implemented. This plan can build on CMA efforts associated with the region's first construction projects. The implementation of a network of express lanes needs a consistent message and rationale. The customer definition includes those who currently use HOV lanes, those wishing to pay a toll to use them (as future customers) and those who may never use them but feel they are impacted by the presence of express lanes on the freeway system. The outreach effort comprises listening, communicating, education, awareness, marketing and promotion. Each of these efforts will be a critical component to the success of the program.

Attachment 7

Pro Forma Cash Flows

Base Case – Net Cash Flow ($000s)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Network - Total Cap Costs (esc) (neg)	(9,272)	(9,569)	(67,222)	(116,106)	(64,304)	(98,627)	(394,368)	(536,134)	(433,874)	(42,527)	(43,888)	(260,433)	(302,154)	(222,137)	(18,825)	(19,427)
Network - Total Revenues (esc)	-	-	-	-	27,286	32,629	38,554	40,994	43,603	152,849	164,657	177,229	186,152	195,569	217,301	230,371
Network - Total Var O&M Costs (esc) (neg)	-	-	-	-	(2,245)	(2,613)	(3,006)	(3,111)	(3,222)	(10,667)	(11,274)	(11,908)	(12,270)	(12,646)	(13,793)	(14,490)
Network - Total Fxd O&M Costs (esc) (neg)	-	-	-	-	(11,042)	(12,176)	(12,460)	(12,751)	(13,048)	(26,428)	(27,028)	(27,642)	(28,269)	(28,911)	(33,789)	(34,557)
Network - Total Rehab Costs (esc) (neg)	-	-	-	-	-	-	-	-	-	-	-	(8,844)	(9,071)	(9,304)	(9,543)	(9,789)
Network - Total Local Funding (esc)	826	1,226	10,676	12,478	2,402	4,617	17,058	26,291	20,342	-	-	-	-	-	-	-
Network - Total Grant Funding (esc)	16,839	-	-	367,022	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total debt proceeds	79,337	-	-	653,992	-	-	-	198,705	715,945	-	-	-	145,627	280,022	-	-
Network - Construction Cash Interest Income	-	-	323	59	21,246	23,454	24,079	11,072	(0)	10,126	10,015	10,749	3,680	(0)	4,587	4,738
Network - Upfront and annual fees (neg)	(1,190)	(48)	(49)	(6,399)	(101)	(104)	(106)	(108)	(3,711)	(170)	(173)	(177)	(181)	(1,984)	(252)	(258)
Network - Total debt interest pymts (neg)	-	(4,364)	(4,364)	(4,364)	(43,039)	(43,039)	(43,035)	(42,991)	(42,949)	(69,033)	(68,756)	(68,235)	(67,652)	(66,897)	(114,991)	(113,896)
Network - Total debt principal pymts (neg)	-	-	-	-	-	(83)	(789)	(766)	(766)	(5,038)	(8,719)	(9,561)	(12,191)	(14,769)	(17,406)	(21,772)
Network - DSRA funding, amortization and interest inc	-9269.038783	0	46	(60,772)	1,754	2,105	2,456	2,456	(29,168)	4,797	4,752	4,165	4,337	(11,005)	5,130	4,502
Network - Cash flow (to)/from escrow	(77,272)	12,753	60,589	(845,911)	68,043	93,837	371,617	316,344	(253,151)	(13,909)	(19,585)	194,656	91,993	(107,938)	(18,421)	(25,423)
Network - Net CF (esc)	(0)	-	-	-	-	-	-	-	-	-	-	-	-	-	(2)	-

	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Network - Total Cap Costs (esc) (neg)	(115,282)	(133,750)	(92,274)	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total Revenues (esc)	244,389	257,530	271,433	288,818	304,892	321,914.5	339,611	358,352	378,229	398,782	420,236	442,582	465,870	490,160	516,985	545,019
Network - Total Var O&M Costs (esc) (neg)	(15,231)	(15,902)	(16,603)	(17,513)	(18,317)	(19,160.3)	(20,024)	(20,930)	(21,882)	(22,851)	(23,853)	(24,882)	(25,943)	(27,037)	(28,248)	(29,499)
Network - Total Fxd O&M Costs (esc) (neg)	(35,344)	(36,148)	(36,971)	(41,566)	(42,510)	(43,475.3)	(44,463)	(45,473)	(46,507)	(45,583)	(46,586)	(47,613)	(48,662)	(49,734)	(50,991)	(52,273)
Network - Total Rehab Costs (esc) (neg)	(19,112)	(19,660)	(20,223)	(20,804)	(21,401)	(13,726.9)	(14,079)	(14,440)	(14,811)	(15,192)	(12,049)	(12,337)	(12,633)	(12,936)	(13,277)	(15,263)
Network - Total Local Funding (esc)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total Grant Funding (esc)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total debt proceeds	-	-	26,716	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Construction Cash Interest Income	5,312	3,157	174	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Upfront and annual fees (neg)	(263)	(269)	(275)	(281)	(287)	(294)	(300)	(307)	(314)	(320)	(328)	(335)	(342)	(350)	(291)	(229)
Network - Total debt interest pymts (neg)	(112,520)	(111,015)	(109,231)	(125,970)	(123,569)	(120,719)	(117,068)	(113,018)	(110,741)	(105,882)	(100,474)	(94,516)	(88,173)	(81,461)	(74,381)	(67,010)
Network - Total debt principal pymts (neg)	(23,743)	(27,970)	(31,835)	(37,949)	(45,617)	(58,696)	(65,163)	(71,217)	(78,555)	(88,035)	(97,342)	(103,743)	(109,860)	(115,893)	(120,472)	(87,595)
Network - DSRA funding, amortization and interest inc	4,210	4,470	4,448	4,429	4,056	4,122	4,109	4,098	4,073	3,984	4,348	4,496	4,929	8,662	63,247	2,800
Network - Cash flow (to)/from escrow	67,582	79,556	4,643	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Net CF (esc)	-	0	-	49,164	57,246	69,966	82,623	97,064	109,493	124,902	143,953	163,652	185,186	211,412	292,572	295,950

Base Case – Net Cash Flow Cont. ($000s)

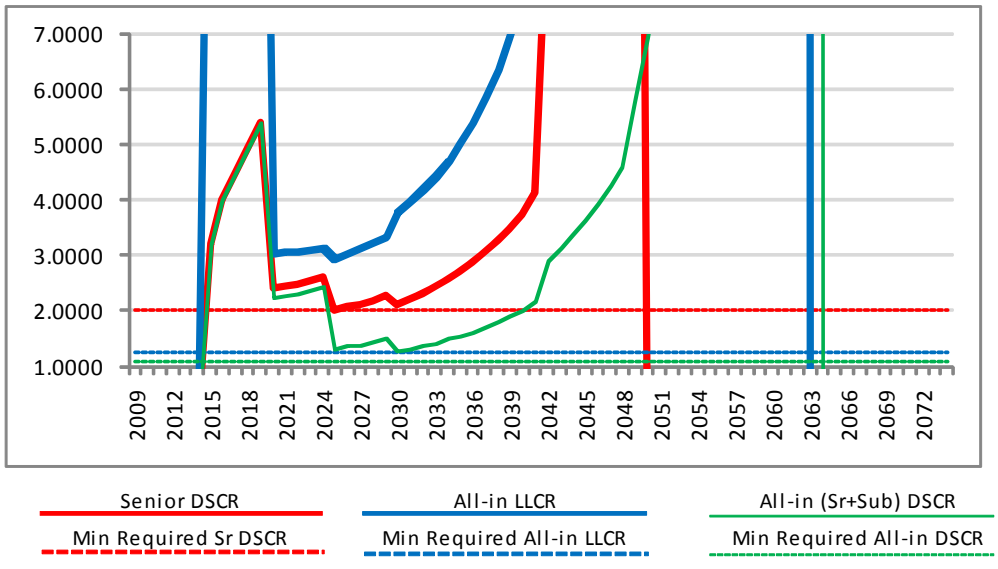
	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058
Network - Total Cap Costs (esc) (neg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total Revenues (esc)	574,326	605,038	637,597	672,128	708,759	747,641	788,917	832,762	879,344	928,861	981,506	#########	1,097,084	1,160,508	1,228,047	1,299,989
Network - Total Var O&M Costs (esc) (neg)	(30,792)	(32,135)	(33,545)	(35,028)	(36,587)	(38,228)	(39,954)	(41,773)	(43,690)	(45,711)	(47,842)	(50,091.0)	(52,466)	(54,974)	(57,627)	(60,432)
Network - Total Fxd O&M Costs (esc) (neg)	(53,587)	(54,934)	(56,315)	(57,732)	(59,184)	(60,672)	(62,199)	(63,764)	(65,369)	(67,014)	(68,702)	(70,432.1)	(72,206)	(74,026)	(75,892)	(77,805)
Network - Total Rehab Costs (esc) (neg)	(15,675)	(16,098)	(16,533)	(16,980)	(16,773)	(17,224)	(17,687)	(18,162)	(18,650)	(29,469)	(30,314)	(31,183.6)	(32,079)	(33,000)	(25,156)	(25,851)
Network - Total Local Funding (esc)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total Grant Funding (esc)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total debt proceeds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Construction Cash Interest Income	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Upfront and annual fees (neg)	(235)	(241)	(247)	(253)	(259)	(266)	(272)	(167)	(85)	(87)	(89)	(92)	(63)	(64)	(66)	(67)
Network - Total debt interest pymts (neg)	(61,996)	(56,861)	(51,599)	(46,203)	(40,666)	(34,958)	(29,091)	(24,387)	(20,252)	(16,768)	(13,264)	(9,682)	(6,020)	(4,736)	(3,428)	(2,079)
Network - Total debt principal pymts (neg)	(89,597)	(91,671)	(93,885)	(96,239)	(99,118)	(101,761)	(85,956)	(77,500)	(69,349)	(69,741)	(71,321)	(72,896)	(25,332)	(25,809)	(26,620)	(27,213)
Network - DSRA funding, amortization and interest inc	2,833	2,835	2,832	2,691	2,831	22,881	9,002	10,970	-	-	-	-	-	-	-	-
Network - Cash flow (to)/from escrow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Net CF (esc)	325,277	355,933	388,305	422,385	459,002	517,414	562,760	617,979	661,949	700,071	749,974	803,123	908,918	967,898	1,039,258	1,106,541

	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074
Network - Total Cap Costs (esc) (neg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total Revenues (esc)	1,376,654	1,458,382	1,545,538	1,638,525	1,737,758	1,843,703	1,956,851	2,077,748	2,206,961	2,345,120	2,492,894	2,651,017	2,820,263	3,001,486	3,195,605	3,403,620
Network - Total Var O&M Costs (esc) (neg)	(63,401)	(66,545)	(69,876)	(73,408)	(77,154)	(81,131)	(85,356)	(89,846)	(94,621)	(99,703)	(105,116)	(110,885)	(117,037)	(123,602)	(130,613)	(138,105)
Network - Total Fxd O&M Costs (esc) (neg)	(79,767)	(81,779)	(83,842)	(85,958)	(88,128)	(90,354)	(92,637)	(94,977)	(97,378)	(99,840)	(102,366)	(104,956)	(107,612)	(110,337)	(113,131)	(115,997)
Network - Total Rehab Costs (esc) (neg)	(26,565)	(27,299)	(28,054)	(22,583)	(23,181)	(23,794)	(24,424)	(25,071)	(21,779)	(22,334)	(22,904)	(23,489)	(24,088)	(7,100)	(7,294)	(7,494)
Network - Total Local Funding (esc)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total Grant Funding (esc)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total debt proceeds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Construction Cash Interest Income	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Upfront and annual fees (neg)	(69)	(35)	(36)	(37)	(38)	(39)	-	-	-	-	-	-	-	-	-	-
Network - Total debt interest pymts (neg)	(700)	(546)	(432)	(316)	(198)	(78)	-	-	-	-	-	-	-	-	-	-
Network - Total debt principal pymts (neg)	(2,716)	(1,898)	(1,926)	(1,968)	(2,005)	(1,300)	-	-	-	-	-	-	-	-	-	-
Network - DSRA funding, amortization and interest inc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Cash flow (to)/from escrow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Net CF (esc)	1,203,436	1,280,280	1,361,371	1,454,254	1,547,053	1,647,006	1,754,435	1,867,853	1,993,182	2,123,242	2,262,508	2,411,687	2,571,526	2,760,447	2,944,566	3,142,024

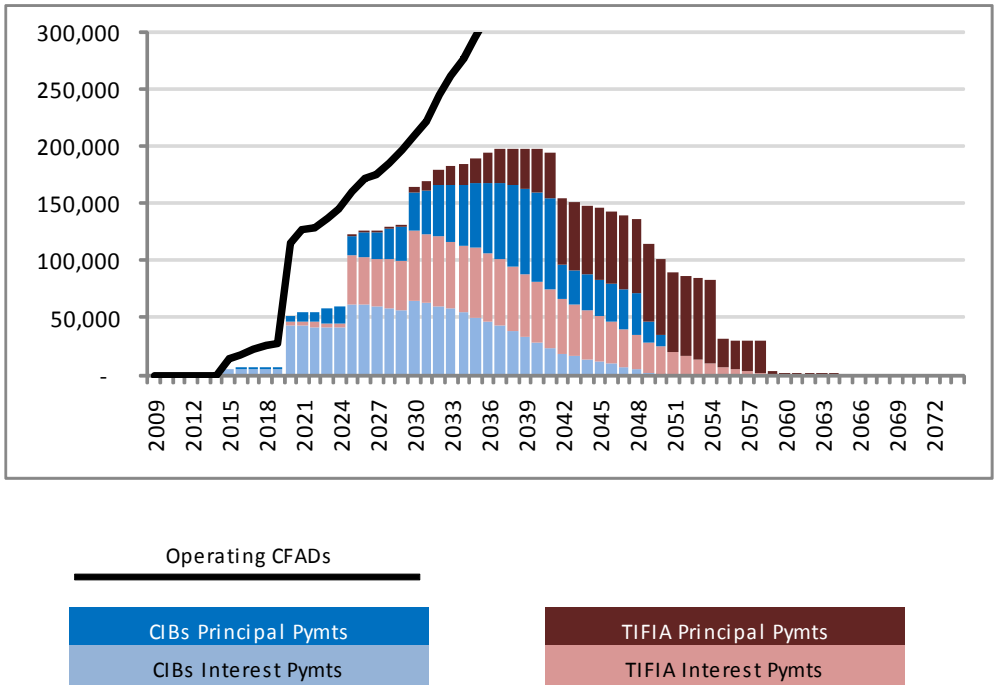
Base Case –Debt Service Coverage

SYSTEM CREDIT STATS	Required	Actual
Sr DSCR Min	2.00x	2.01x
Sr DSCR Avg	2.00x	5.77x
All-in DSCR Min	1.10x	1.27x
All-in DSCR Avg	1.10x	62.68x
All-in LLCR Min	1.25x	2.95x

Debt Service Coverage Ratios



Annual Debt Service and Cash Flow Available for Debt Service (CFADs)



Conservative Case – Net Cash Flow ($000s)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Network - Total Cap Costs (esc) (neg)	(8,130)	(8,390)	(59,057)	(67,351)	(8,812)	(23,673)	(69,009)	(166,862)	(181,687)	(42,523)	(66,151)	(245,086)	(284,054)	(227,958)	(42,901)	(44,274)
Network - Total Revenues (esc)	-	-	-	-	24,053	28,786	34,043	36,226	38,563	82,444	89,508	97,067	102,266	107,776	116,730	123,385
Network - Total Var O&M Costs (esc) (neg)	-	-	-	-	(1,961)	(2,283)	(2,627)	(2,720)	(2,819)	(5,507)	(5,843)	(6,196)	(6,394)	(6,601)	(7,110)	(7,450)
Network - Total Fxd O&M Costs (esc) (neg)	-	-	-	-	(9,760)	(10,830)	(11,085)	(11,345)	(11,612)	(19,085)	(19,522)	(19,969)	(20,427)	(20,895)	(27,015)	(27,630)
Network - Total Rehab Costs (esc) (neg)	-	-	-	-	-	-	-	-	-	-	-	(7,597)	(7,791)	(7,990)	(8,195)	(8,405)
Network - Total Local Funding (esc)	825	1,225	10,675	10,675	-	1,376	1,376	8,626	10,428	2,402	3,242	15,683	17,666	11,717	-	-
Network - Total Grant Funding (esc)	16,839	-	-	194,733	-	-	-	-	87,544	-	-	-	-	387,251	-	-
Network - Total debt proceeds	63,455	-	-	114,422	-	-	-	-	355,517	-	-	-	127,152	302,040	-	-
Network - Construction Cash Interest Income	-	-	274	43	6,078	7,342	8,310	6,641	1,937	12,254	11,423	10,705	3,955	0	20,950	18,654
Network - Upfront and annual fees (neg)	(1,031)	(48)	(49)	(1,083)	(101)	(104)	(106)	(108)	(3,341)	(170)	(173)	(177)	(181)	(2,176)	(252)	(258)
Network - Total debt interest pymts (neg)	-	(3,807)	(3,807)	(3,807)	(8,240)	(8,240)	(8,234)	(8,185)	(8,135)	(31,115)	(30,968)	(30,827)	(30,715)	(30,583)	(47,730)	(47,563)
Network - Total debt principal pymts (neg)	-	-	-	-	-	(98)	(818)	(845)	(875)	(2,456)	(2,347)	(1,866)	(2,135)	(2,376)	(2,670)	(3,952)
Network - DSRA funding, amortization and interest inc	-6105.170817	0	31	(7,396)	340	408	476	476	(30,813)	2,015	1,676	1,676	1,788	(17,270)	2,710	2,391
Network - Cash flow (to)/from escrow	(65,853)	11,020	51,933	(240,237)	(1,596)	7,316	47,676	138,097	(254,709)	1,741	19,155	186,587	98,869	(492,933)	(4,517)	(4,900)
Network - Net CF (esc)	-	-	-	-	-	-	-	-	0	-	(0)	-	-	-	-	-

	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Network - Total Cap Costs (esc) (neg)	(262,721)	(304,809)	(254,496)	(60,830)	(62,777)	(372,518.4)	(432,195)	(298,172)	-	-	-	-	-	-	-	-
Network - Total Revenues (esc)	130,445	137,488	144,933	158,221	167,691	177,771.4	187,715	198,244	318,556	338,328	359,266	378,562	398,694	419,718	442,947	467,247
Network - Total Var O&M Costs (esc) (neg)	(7,807)	(8,142)	(8,491)	(9,236)	(9,692)	(10,172.0)	(10,625)	(11,098)	(18,407)	(19,350)	(20,338)	(21,220)	(22,128)	(23,066)	(24,104)	(25,177)
Network - Total Fxd O&M Costs (esc) (neg)	(28,260)	(28,904)	(29,562)	(35,558)	(36,366)	(37,190.1)	(38,034)	(38,896)	(46,507)	(45,583)	(46,586)	(47,613)	(48,662)	(49,734)	(50,991)	(52,273)
Network - Total Rehab Costs (esc) (neg)	(15,125)	(15,574)	(16,037)	(16,514)	(17,005)	(13,876.3)	(14,231)	(14,594)	(14,967)	(15,351)	(9,312)	(9,543)	(9,780)	(10,023)	(10,294)	(17,488)
Network - Total Local Funding (esc)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total Grant Funding (esc)	-	-	110,000	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total debt proceeds	-	-	857,339	-	-	-	268,947	287,998	-	-	-	-	-	-	-	-
Network - Construction Cash Interest Income	17,582	10,773	1,044	23,725	20,107	18,091	5,467	(0)	-	-	-	-	-	-	-	-
Network - Upfront and annual fees (neg)	(263)	(269)	(7,850)	(352)	(359)	(367)	(375)	(384)	(392)	(401)	(409)	(418)	(428)	(437)	(448)	(390)
Network - Total debt interest pymts (neg)	(47,314)	(47,078)	(46,741)	(117,713)	(117,222)	(116,631)	(115,778)	(114,834)	(125,188)	(122,799)	(119,366)	(114,683)	(109,080)	(159,090)	(151,598)	(142,970)
Network - Total debt principal pymts (neg)	(3,845)	(5,316)	(6,518)	(7,610)	(9,169)	(12,949)	(14,273)	(15,437)	(35,775)	(50,829)	(68,610)	(81,391)	(94,012)	(107,411)	(123,269)	(133,593)
Network - DSRA funding, amortization and interest inc	2,231	2,391	(138,775)	7,685	7,172	7,172	7,172	7,172	8,231	7,618	8,706	8,696	9,132	9,192	13,499	8,573
Network - Cash flow (to)/from escrow	215,077	259,440	(604,846)	58,182	57,619	360,669	156,210	0	-	-	-	-	-	-	-	-
Network - Net CF (esc)	-	-	-	(0)	0	-	-	-	85,550	91,635	103,350	112,391	123,737	79,149	95,742	103,929

Conservative Case – Net Cash Flow Cont. ($000s)

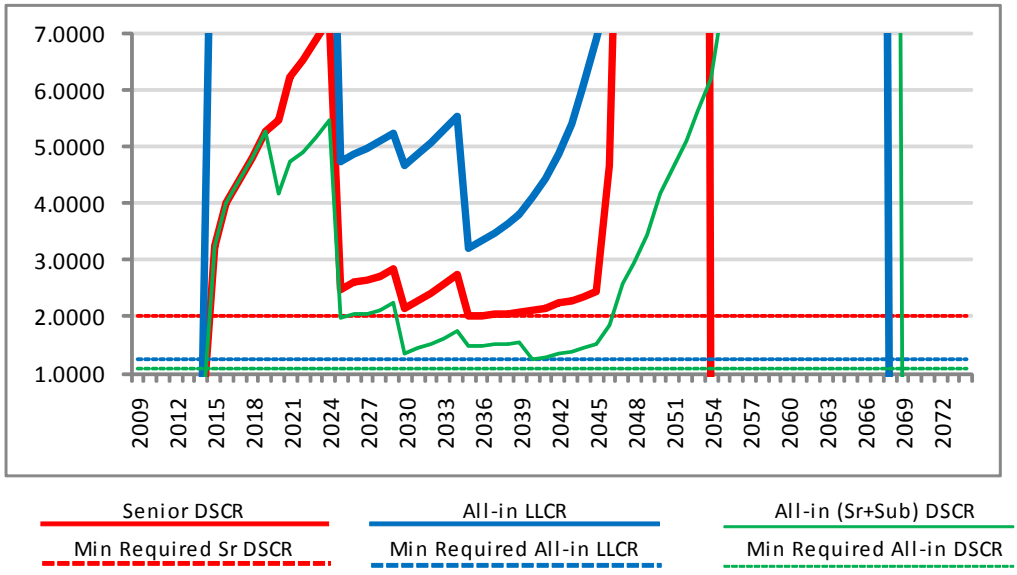
	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058
Network - Total Cap Costs (esc) (neg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total Revenues (esc)	492,683	519,369	547,680	577,724	609,618	643,495	679,482	717,734	758,400	801,656	847,674	896,650.5	948,800	1,004,344	1,063,527	1,126,606
Network - Total Var O&M Costs (esc) (neg)	(26,288)	(27,442)	(28,654)	(29,929)	(31,270)	(32,682)	(34,169)	(35,735)	(37,387)	(39,129)	(40,966)	(42,906.6)	(44,956)	(47,122)	(49,412)	(51,836)
Network - Total Fxd O&M Costs (esc) (neg)	(53,587)	(54,934)	(56,315)	(57,732)	(59,184)	(60,672)	(62,199)	(63,764)	(65,369)	(67,014)	(68,702)	(70,432.1)	(72,206)	(74,026)	(75,892)	(77,805)
Network - Total Rehab Costs (esc) (neg)	(17,948)	(18,420)	(18,904)	(19,401)	(15,132)	(15,556)	(15,993)	(16,443)	(16,905)	(28,008)	(28,776)	(29,565.1)	(30,377)	(31,211)	(22,372)	(23,012)
Network - Total Local Funding (esc)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total Grant Funding (esc)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total debt proceeds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Construction Cash Interest Income	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Upfront and annual fees (neg)	(400)	(410)	(346)	(354)	(285)	(292)	(299)	(195)	(200)	(205)	(210)	(215)	(94)	(96)	(99)	(101)
Network - Total debt interest pymts (neg)	(133,548)	(122,975)	(111,230)	(98,203)	(87,436)	(80,277)	(73,637)	(67,785)	(62,917)	(58,173)	(53,578)	(49,006)	(44,453)	(40,754)	(37,047)	(33,277)
Network - Total debt principal pymts (neg)	(149,373)	(165,386)	(182,951)	(155,843)	(108,737)	(101,547)	(90,671)	(76,405)	(74,757)	(72,626)	(72,427)	(72,335)	(60,250)	(60,507)	(61,662)	(62,350)
Network - DSRA funding, amortization and interest inc	9,716	12,841	87,064	66,973	2,722	11,922	14,303	973	1,080	912	1,180	9,940	-	-	-	-
Network - Cash flow (to)/from escrow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Net CF (esc)	121,256	142,643	236,344	283,237	310,297	364,390	416,817	458,379	501,944	537,413	584,196	642,130	696,464	750,629	817,043	878,224

	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074
Network - Total Cap Costs (esc) (neg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total Revenues (esc)	1,193,865	1,265,606	1,342,154	1,423,867	1,511,116	1,604,313	1,703,897	1,810,351	1,924,181	2,045,947	2,176,243	2,315,722	2,465,073	2,625,053	2,796,480	2,980,243
Network - Total Var O&M Costs (esc) (neg)	(54,402)	(57,121)	(60,002)	(63,058)	(66,300)	(69,743)	(73,402)	(77,292)	(81,430)	(85,834)	(90,528)	(95,531)	(100,867)	(106,562)	(112,646)	(119,148)
Network - Total Fxd O&M Costs (esc) (neg)	(79,767)	(81,779)	(83,842)	(85,958)	(88,128)	(90,354)	(92,637)	(94,977)	(97,378)	(99,840)	(102,366)	(104,956)	(107,612)	(110,337)	(113,131)	(115,997)
Network - Total Rehab Costs (esc) (neg)	(23,670)	(24,348)	(25,045)	(32,531)	(33,408)	(34,308)	(35,234)	(36,185)	(18,669)	(19,169)	(19,683)	(20,210)	(20,752)	(15,810)	(16,218)	(16,636)
Network - Total Local Funding (esc)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total Grant Funding (esc)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Total debt proceeds	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Construction Cash Interest Income	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Upfront and annual fees (neg)	(104)	(71)	(73)	(74)	(76)	(78)	(40)	(41)	(42)	(43)	(44)	-	-	-	-	-
Network - Total debt interest pymts (neg)	(29,472)	(26,067)	(23,284)	(20,470)	(17,631)	(14,744)	(11,943)	(9,673)	(7,356)	(4,961)	(2,508)	-	-	-	-	-
Network - Total debt principal pymts (neg)	(54,128)	(41,345)	(41,824)	(42,230)	(42,953)	(41,402)	(32,435)	(33,098)	(34,215)	(35,041)	(35,832)	-	-	-	-	-
Network - DSRA funding, amortization and interest inc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Cash flow (to)/from escrow	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Network - Net CF (esc)	952,321	1,034,876	1,108,084	1,179,546	1,262,620	1,353,684	1,458,206	1,559,085	1,685,091	1,801,058	1,925,282	2,095,025	2,235,842	2,392,344	2,554,485	2,728,462

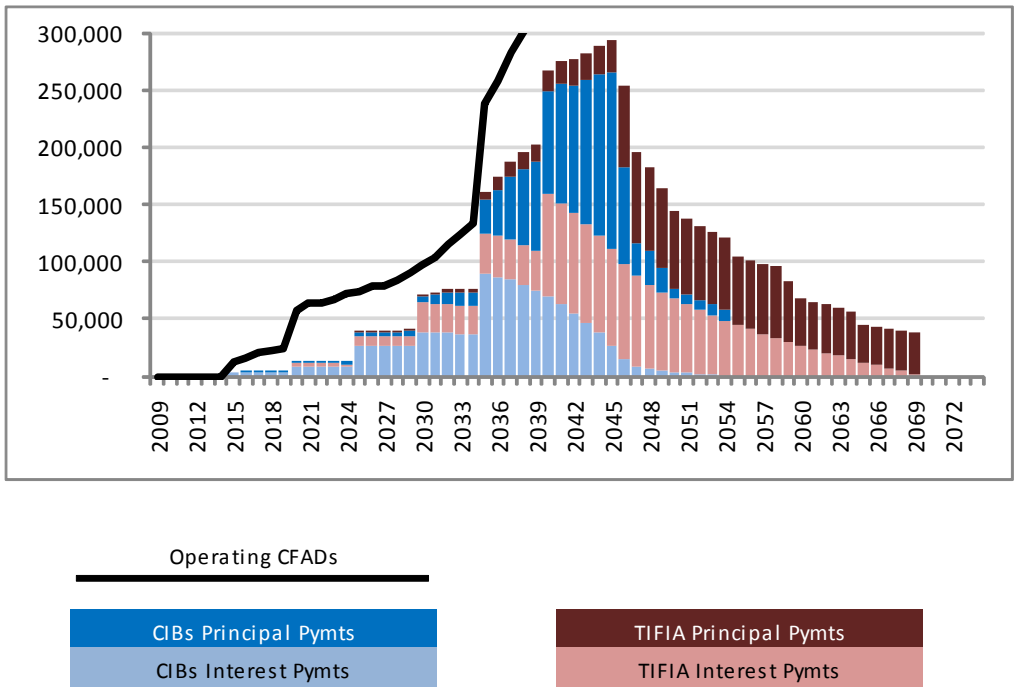
Conservative Case –Debt Service Coverage

SYSTEM CREDIT STATS	Required	Actual
Sr DSCR Min	2.00x	2.02x
Sr DSCR Avg	2.00x	10.10x
All-in DSCR Min	1.10x	1.26x
All-in DSCR Avg	1.10x	7.86x
All-in LLCR Min	1.25x	3.22x

Debt Service Coverage Ratios



Annual Debt Service and Cash Flow Available for Debt Service (CFADs)



Attachment 8

Detailed Financial Plan Assumptions

Operations, Maintenance and Rehabilitation Costs (Base and Conservative Cases)

- Operations and maintenance costs (fixed and variable) escalated following general inflation (2.2% per year through 2040, 2.5% onwards)
- Toll rehabilitation costs (fixed and variable) escalated following general inflation (2.2% per year through 2040, 2.5% onwards)
- Pavement rehabilitation costs escalated at 3.2% annually
- Variable operations and maintenance costs of $0.22 per transaction unit, gradually decreasing to $0.18 in 2011$ by 2074
- When calculating variable operations and maintenance costs, an adjustment factor equal to the average toll segment length (6.5 miles) divided by the average trip length (12 miles) is applied to the total number of transactions estimated for each construction project. This assumes that the average vehicle travels over multiple segments and transaction costs are incurred for an aggregated trip.
- Variable operations and maintenance costs subject to the revenue reduction associated with the reduced hours of tolling (10% /25% for the Base/Conservative Cases, except for construction projects 7B, 32 and 33)
- Additional banking fee calculated as 2.2% of revenues
- Cooperative agreements for funding contributions for rehabilitation costs will be developed as the projects are implemented. Neither Caltrans or CTC has the authority to approve any contribution to pavement rehabilitation, which is subject to legislative action.20% of the express lane pavement rehabilitation costs is assumed to be borne by the Network.A financial sensitivity analysis of the Base Case has demonstrated that delaying the Network's implementation (up to the Conservative Case phasing) would, in and of itself, fully mitigate 100% of the rehabilitation cost responsibility in the event that became necessary.
- Rehabilitation costs are spread out evenly over 5-year periods around the baseline year shown below

Detailed inputs for the fixed operations and maintenance costs, rehabilitation costs and numbers of transactions are detailed in the following tables.

	Fixed O&M ($000's in 2011$)	Pavement Rehabilitation Costs ($000's in 2011$), T=completion year									Toll Rehabilitation Costs ($000's in 2011$), T=completion year								
	Each year	T+10	T+15	T+20	T+25	T+30	T+35	T+40	T+45	T+50	T+10	T+15	T+20	T+25	T+30	T+35	T+40	T+45	T+50
Project 1	2,411	-	-	-	3,228	-	14,831	-	2,631	3,134	4,919	-	4,919	-	4,919	-	4,919	-	4,919
Project 2	1,354	781	-	-	5,733	314	14,253	781	-	-	2,662	-	2,662	-	2,662	-	2,662	-	2,662
Project 3	1,149	9,519	-	-	-	3,829	-	9,519	-	-	2,662	-	2,662	-	2,662	-	2,662	-	2,662
Project 4	848	4,933	-	-	2,910	1,984	7,236	4,933	-	-	1,578	-	1,578	-	1,578	-	1,578	-	1,578
Project 5	745	1,354	-	-	2,379	545	5,914	1,354	-	-	1,619	-	1,619	-	1,619	-	1,619	-	1,619
Project 6	543	2,244	26,551	-	-	225	-	560	-	-	1,090	-	1,090	-	1,090	-	1,090	-	1,090
Project 7A	2,126	20,217	1,358	-	-	8,097	-	20,131	-	-	4,467	-	4,467	-	4,467	-	4,467	-	4,467
Project 7B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project 8	413	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project 9	1,486	3,205	-	-	5,665	1,289	14,085	3,205	211	251	3,783	-	3,783	-	3,783	-	3,783	-	3,783
Project 10	156	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project 11	653	6,063	4,767	-	516	2,317	1,283	5,761	61	72	1,557	-	1,557	-	1,557	-	1,557	-	1,557
Project 13	980	7,709	13,939	-	933	2,745	2,320	6,825	35	42	2,133	-	2,133	-	2,133	-	2,133	-	2,133
Project 14	1,658	6,132	96,698	-	-	-	-	-	204	243	3,331	-	3,331	-	3,331	-	3,331	-	3,331
Project 15	1,480	321	5,061	-	1,432	-	3,559	-	2,649	3,155	2,802	-	2,802	-	2,802	-	2,802	-	2,802
Project 16	1,013	1,168	11,300	-	2,251	182	5,598	451	989	1,177	2,164	-	2,164	-	2,164	-	2,164	-	2,164
Project 17	1,013	2,788	27,393	-	2,011	422	4,999	1,050	375	446	2,164	-	2,164	-	2,164	-	2,164	-	2,164
Project 18	229	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project 19	1,239	4,236	14,124	-	182	1,344	451	3,340	2,390	2,847	2,709	-	2,709	-	2,709	-	2,709	-	2,709
Project 20	781	1,979	-	-	1,165	796	2,896	1,979	1,657	1,974	3,156	-	3,156	-	3,156	-	3,156	-	3,156
Project 21A	973	1,127	11,899	-	2,406	150	5,981	372	580	690	2,125	-	2,125	-	2,125	-	2,125	-	2,125
Project 21B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project 22a	1,934	13,302	-	-	-	5,350	-	13,302	-	-	3,215	-	3,215	-	3,215	-	3,215	-	3,215
Project 22b	-	2,539	-	-	335	1,021	833	2,539	-	-	1,012	-	1,012	-	1,012	-	1,012	-	1,012
Project 23A	1,956	16,674	-	-	-	6,707	-	16,674	-	-	3,822	-	3,822	-	3,822	-	3,822	-	3,822
Project 23B	643	7,377	-	-	1,592	2,967	3,959	7,377	-	-	1,635	-	1,635	-	1,635	-	1,635	-	1,635
Project 24	1,276	6,106	-	-	3,584	2,456	8,909	6,106	-	-	2,693	-	2,693	-	2,693	-	2,693	-	2,693
Project 25	627	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project 26	407	2,214	-	-	679	890	1,688	2,214	-	-	1,012	-	1,012	-	1,012	-	1,012	-	1,012
Project 27	394	1,309	-	-	1,524	527	3,789	1,309	-	-	1,043	-	1,043	-	1,043	-	1,043	-	1,043
Project 28	3,540	10,281	56,158	-	510	2,703	1,267	6,719	5,046	6,009	2,263	-	2,263	-	2,263	-	2,263	-	2,263
Project 29	295	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project 30	5,176	14,195	94,004	-	6,600	3,312	16,409	8,234	3,771	4,491	9,510	-	9,510	-	9,510	-	9,510	-	9,510
Project 31	977	6,080	28,724	-	-	1,713	-	4,258	-	-	2,133	-	2,133	-	2,133	-	2,133	-	2,133
Project 32	207	1,758	-	-	192	707	477	1,758	-	-	537	-	537	-	537	-	537	-	537
Project 33	233	2,431	-	-	-	978	-	2,431	-	-	522	-	522	-	522	-	522	-	522

	Thousands of Transactions Units - Base Case																			
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Project 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,066	1,084	1,102	1,120	1,138
Project 2	-	-	-	-	-	973	978	983	988	993	998	1,003	1,008	1,013	1,018	1,023	1,028	1,033	1,038	1,043
Project 3	785	786	787	788	789	1,976	1,990	2,004	2,018	2,032	2,046	2,060	2,075	2,090	2,105	2,120	2,135	2,150	2,165	2,181
Project 4	-	-	-	-	-	576	578	580	582	584	586	588	590	592	594	596	598	600	602	605
Project 5	-	-	-	-	-	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787
Project 6	-	-	-	-	-	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927
Project 7A	-	-	-	-	-	6,699	6,777	6,856	6,936	7,017	7,100	7,185	7,271	7,358	7,446	7,536	7,628	7,721	7,816	7,912
Project 7B	7,043	7,110	7,178	7,246	7,316	7,386	7,457	7,528	7,601	7,674	7,748	7,822	7,898	7,974	8,051	8,128	8,207	8,286	8,366	8,447
Project 8	-	-	-	-	-	183	184	185	186	188	189	190	192	193	194	196	197	198	200	201
Project 9	-	-	-	-	-	890	890	890	890	890	890	890	890	890	890	890	890	890	890	890
Project 10	-	-	-	-	-	220	220	220	220	220	220	220	220	220	220	230	230	230	230	230
Project 11	-	-	-	-	-	486	486	486	486	486	486	486	486	486	486	486	486	486	486	486
Project 13	-	-	-	-	-	1,025	1,033	1,041	1,049	1,057	1,065	1,074	1,083	1,092	1,101	1,110	1,119	1,128	1,137	1,146
Project 14	2,405	2,450	2,496	2,543	2,591	9,508	9,615	9,724	9,834	9,945	10,057	10,170	10,285	10,401	10,518	10,637	10,757	10,878	11,001	11,125
Project 15	-	-	-	-	-	-	-	-	-	-	2,246	2,313	2,382	2,453	2,526	2,601	2,679	2,759	2,841	2,926
Project 16	-	-	-	-	-	2,091	2,139	2,188	2,239	2,291	2,344	2,398	2,453	2,510	2,568	2,627	2,688	2,750	2,814	2,879
Project 17	525	543	561	580	600	2,155	2,201	2,248	2,296	2,345	2,395	2,446	2,498	2,551	2,605	2,660	2,716	2,773	2,832	2,892
Project 18	-	-	-	-	-	-	-	-	-	-	346	377	411	448	488	532	580	632	689	751
Project 19	-	-	-	-	-	-	-	-	-	-	2,646	2,760	2,878	3,001	3,129	3,263	3,402	3,548	3,699	3,857
Project 20	301	313	326	340	354	369	384	400	417	434	452	471	490	510	531	553	576	600	625	651
Project 21A	202	210	218	226	235	946	986	1,028	1,072	1,118	1,166	1,216	1,268	1,322	1,378	1,437	1,498	1,562	1,628	1,697
Project 22a	2,641	2,700	2,761	2,823	2,886	11,328	11,530	11,736	11,945	12,158	12,375	12,596	12,821	13,050	13,283	13,520	13,761	14,007	14,257	14,511
Project 22b	-	-	-	-	-	1,520	1,551	1,583	1,615	1,648	1,682	1,716	1,751	1,787	1,823	1,860	1,898	1,937	1,976	2,016
Project 23A	4,027	4,115	4,205	4,297	4,391	15,315	15,569	15,827	16,090	16,357	16,628	16,904	17,184	17,469	17,759	18,054	18,354	18,658	18,968	19,283
Project 32	140	140	150	150	150	150	150	160	160	160	160	160	170	170	170	170	180	180	180	180
Project 33	200	200	200	200	210	210	210	210	210	220	220	220	220	230	230	230	230	230	240	240

	Thousands of Transactions Units - Base Case																			
	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
Project 1	1,157	1,174	1,190	1,205	1,219	1,232	1,244	1,254	1,263	1,271	1,279	1,287	1,295	1,303	1,311	1,319	1,327	1,335	1,343	1,351
Project 2	1,048	1,053	1,058	1,063	1,068	1,073	1,078	1,083	1,088	1,093	1,098	1,103	1,108	1,113	1,118	1,123	1,128	1,133	1,138	1,143
Project 3	2,196	2,208	2,219	2,228	2,237	2,246	2,255	2,264	2,273	2,282	2,291	2,300	2,309	2,318	2,327	2,336	2,345	2,354	2,363	2,372
Project 4	613	616	619	622	625	628	631	634	637	640	643	646	649	652	655	658	661	664	667	670
Project 5	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787
Project 6	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927
Project 7A	8,011	8,099	8,185	8,269	8,350	8,429	8,506	8,580	8,651	8,719	8,787	8,856	8,925	8,995	9,065	9,136	9,207	9,279	9,351	9,424
Project 7B	8,526	8,608	8,690	8,773	8,856	8,939	9,022	9,105	9,188	9,272	9,356	9,441	9,527	9,614	9,701	9,789	9,878	9,968	10,059	10,150
Project 8	203	204	205	207	208	210	211	213	214	216	218	220	222	224	226	228	230	232	234	236
Project 9	890	890	890	890	890	890	890	890	890	890	894	898	902	906	910	914	918	922	926	930
Project 10	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
Project 11	486	488	490	492	494	496	498	500	503	506	508	510	512	514	516	518	520	522	524	526
Project 13	1,155	1,162	1,168	1,174	1,180	1,186	1,192	1,198	1,204	1,210	1,216	1,222	1,228	1,234	1,240	1,246	1,252	1,258	1,264	1,270
Project 14	11,251	11,355	11,449	11,532	11,604	11,665	11,723	11,782	11,841	11,900	11,959	12,018	12,078	12,138	12,198	12,258	12,319	12,380	12,441	12,503
Project 15	3,014	3,098	3,181	3,263	3,344	3,424	3,502	3,578	3,653	3,725	3,798	3,873	3,949	4,027	4,106	4,187	4,270	4,354	4,440	4,528
Project 16	2,946	3,008	3,069	3,128	3,185	3,240	3,292	3,342	3,389	3,433	3,478	3,523	3,569	3,615	3,662	3,710	3,758	3,807	3,856	3,906
Project 17	2,949	3,005	3,059	3,111	3,161	3,209	3,254	3,297	3,337	3,374	3,411	3,448	3,486	3,524	3,563	3,602	3,642	3,682	3,722	3,763
Project 18	818	892	972	1,059	1,155	1,258	1,371	1,495	1,629	1,776	1,936	2,110	2,300	2,507	2,733	2,979	3,247	3,540	3,859	4,207
Project 19	4,020	4,184	4,351	4,520	4,690	4,862	5,036	5,211	5,387	5,564	5,746	5,934	6,128	6,328	6,535	6,749	6,970	7,198	7,433	7,676
Project 20	678	705	732	759	787	815	843	871	899	927	955	984	1,014	1,045	1,077	1,110	1,144	1,179	1,215	1,252
Project 21A	1,766	1,838	1,911	1,985	2,059	2,134	2,210	2,286	2,363	2,440	2,519	2,601	2,685	2,772	2,862	2,955	3,051	3,150	3,252	3,357
Project 22a	14,771	15,022	15,262	15,491	15,708	15,912	16,103	16,280	16,443	16,607	16,772	16,939	17,107	17,277	17,449	17,623	17,798	17,975	18,154	18,335
Project 22b	2,057	2,096	2,134	2,170	2,205	2,238	2,269	2,298	2,326	2,352	2,378	2,404	2,430	2,457	2,484	2,511	2,539	2,567	2,595	2,624
Project 23A	19,602	19,888	20,158	20,412	20,649	20,868	21,068	21,249	21,410	21,551	21,692	21,834	21,977	22,121	22,266	22,412	22,559	22,707	22,856	23,006
Project 32	190	190	190	190	190	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Project 33	240	240	250	250	250	250	260	260	260	260	260	260	260	260	260	260	260	260	260	260

	Thousands of Transactions Units - Base Case																			
	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074
Project 1	1,359	1,367	1,375	1,383	1,391	1,399	1,407	1,415	1,423	1,432	1,441	1,450	1,459	1,468	1,477	1,486	1,495	1,504	1,513	1,522
Project 2	1,148	1,153	1,158	1,163	1,168	1,173	1,178	1,183	1,188	1,193	1,198	1,203	1,208	1,213	1,218	1,223	1,228	1,233	1,238	1,243
Project 3	2,381	2,390	2,399	2,408	2,417	2,426	2,435	2,444	2,453	2,462	2,471	2,480	2,489	2,498	2,507	2,516	2,525	2,534	2,544	2,554
Project 4	673	676	679	682	685	688	691	694	697	700	703	706	709	712	715	718	721	724	727	730
Project 5	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787
Project 6	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927
Project 7A	9,498	9,572	9,647	9,722	9,798	9,875	9,952	10,030	10,108	10,187	10,267	10,347	10,428	10,509	10,591	10,674	10,757	10,841	10,926	11,011
Project 7B	10,242	10,335	10,429	10,524	10,620	10,717	10,814	10,912	11,011	11,111	11,212	11,314	11,417	11,521	11,626	11,732	11,839	11,947	12,056	12,166
Project 8	238	240	242	244	246	248	250	252	254	256	258	260	262	264	266	268	270	272	274	276
Project 9	934	938	942	946	950	954	958	962	966	970	974	978	982	986	990	994	998	1,002	1,007	1,012
Project 10	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
Project 11	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566
Project 13	1,276	1,282	1,288	1,294	1,300	1,306	1,312	1,318	1,324	1,330	1,336	1,342	1,348	1,354	1,360	1,366	1,372	1,378	1,384	1,390
Project 14	12,565	12,627	12,690	12,753	12,816	12,880	12,944	13,008	13,073	13,138	13,203	13,269	13,335	13,401	13,468	13,535	13,602	13,670	13,738	13,806
Project 15	4,617	4,708	4,801	4,896	4,993	5,092	5,193	5,296	5,401	5,508	5,617	5,728	5,841	5,956	6,074	6,194	6,316	6,441	6,568	6,698
Project 16	3,957	4,008	4,060	4,113	4,166	4,220	4,275	4,331	4,387	4,444	4,502	4,561	4,620	4,680	4,741	4,803	4,866	4,929	4,993	5,058
Project 17	3,804	3,846	3,888	3,931	3,974	4,018	4,062	4,107	4,152	4,198	4,244	4,291	4,338	4,386	4,434	4,483	4,532	4,582	4,633	4,684
Project 18	4,586	4,999	5,450	5,941	6,477	7,061	7,698	8,392	9,149	9,974	10,874	11,855	12,924	14,090	15,361	16,747	18,258	19,905	21,701	23,659
Project 19	7,927	8,186	8,454	8,731	9,017	9,312	9,617	9,932	10,258	10,594	10,941	11,300	11,670	12,052	12,447	12,855	13,277	13,712	14,162	14,626
Project 20	1,290	1,330	1,371	1,413	1,457	1,502	1,548	1,596	1,645	1,696	1,748	1,802	1,858	1,915	1,974	2,035	2,098	2,163	2,230	2,299
Project 21A	3,466	3,578	3,694	3,814	3,938	4,066	4,198	4,334	4,475	4,620	4,770	4,925	5,085	5,250	5,421	5,597	5,779	5,967	6,161	6,361
Project 22a	18,517	18,701	18,887	19,075	19,265	19,457	19,651	19,846	20,043	20,242	20,443	20,646	20,851	21,058	21,268	21,480	21,694	21,910	22,128	22,348
Project 22b	2,653	2,682	2,711	2,741	2,771	2,801	2,832	2,863	2,895	2,927	2,959	2,992	3,025	3,058	3,092	3,126	3,160	3,195	3,230	3,266
Project 23A	23,157	23,309	23,462	23,616	23,771	23,927	24,084	24,242	24,401	24,561	24,722	24,884	25,047	25,211	25,377	25,544	25,712	25,881	26,051	26,222
Project 32	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Project 33	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260

	Thousands of Transactions Units - Conservative Case																			
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Project 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project 2	-	-	-	-	-	-	-	-	-	-	379	380	381	382	383	384	385	386	387	388
Project 3	-	-	-	-	-	465	465	465	466	466	467	467	467	468	468	468	468	469	470	470
Project 4	-	-	-	-	-	-	-	-	-	-	226	226	226	226	226	226	226	226	226	226
Project 5	-	-	-	-	-	283	283	283	283	283	283	283	283	283	283	283	283	283	283	283
Project 6	-	-	-	-	-	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927
Project 7A	-	-	-	-	-	6,699	6,777	6,856	6,936	7,017	7,100	7,185	7,271	7,358	7,446	7,536	7,628	7,721	7,816	7,912
Project 7B	7,043	7,110	7,178	7,246	7,316	7,386	7,457	7,528	7,601	7,674	7,748	7,822	7,898	7,974	8,051	8,128	8,207	8,286	8,366	8,447
Project 8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	74	75	75	75	76
Project 9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	262	262	262	262	262
Project 10	-	-	-	-	-	-	-	-	-	-	220	220	220	220	220	230	230	230	230	230
Project 11	-	-	-	-	-	-	-	-	-	-	486	486	486	486	486	486	486	486	486	486
Project 13	-	-	-	-	-	-	-	-	-	-	1,065	1,074	1,083	1,092	1,101	1,110	1,119	1,128	1,137	1,146
Project 14	2,405	2,450	2,496	2,543	2,591	9,508	9,615	9,724	9,834	9,945	10,057	10,170	10,285	10,401	10,518	10,637	10,757	10,878	11,001	11,125
Project 15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,601	2,679	2,759	2,841	2,926
Project 16	-	-	-	-	-	2,091	2,139	2,188	2,239	2,291	2,344	2,398	2,453	2,510	2,568	2,627	2,688	2,750	2,814	2,879
Project 17	525	543	561	580	600	2,155	2,201	2,248	2,296	2,345	2,395	2,446	2,498	2,551	2,605	2,660	2,716	2,773	2,832	2,892
Project 18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project 19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project 20	301	313	326	340	354	369	384	400	417	434	452	471	490	510	531	553	576	600	625	651
Project 21A	202	210	218	226	235	244	253	263	273	284	295	306	318	330	343	356	370	384	399	414
Project 22a	2,641	2,700	2,761	2,823	2,886	2,951	3,017	3,085	3,154	3,225	3,297	3,371	3,447	3,524	3,603	3,684	3,767	3,852	3,939	4,027
Project 22b	-	-	-	-	-	-	-	-	-	-	471	479	487	495	503	511	519	527	536	545
Project 23A	4,027	4,115	4,205	4,297	4,391	4,487	4,585	4,685	4,788	4,893	5,000	5,110	5,222	5,336	5,453	5,572	5,694	5,819	5,946	6,076
Project 32	140	140	150	150	150	150	150	160	160	160	160	160	170	170	170	170	180	180	180	180
Project 33	200	200	200	200	210	210	210	210	210	220	220	220	220	230	230	230	230	230	240	240

	Thousands of Transactions Units - Conservative Case																			
	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
Project 1	1,157	1,174	1,190	1,205	1,219	1,232	1,244	1,254	1,263	1,271	1,279	1,287	1,295	1,303	1,311	1,319	1,327	1,335	1,343	1,351
Project 2	1,048	1,053	1,058	1,063	1,068	1,073	1,078	1,083	1,088	1,093	1,098	1,103	1,108	1,113	1,118	1,123	1,128	1,133	1,138	1,143
Project 3	2,196	2,208	2,219	2,228	2,237	2,246	2,255	2,264	2,273	2,282	2,291	2,300	2,309	2,318	2,327	2,336	2,345	2,354	2,363	2,372
Project 4	613	616	619	622	625	628	631	634	637	640	643	646	649	652	655	658	661	664	667	670
Project 5	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787
Project 6	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927
Project 7A	8,011	8,099	8,185	8,269	8,350	8,429	8,506	8,580	8,651	8,719	8,787	8,856	8,925	8,995	9,065	9,136	9,207	9,279	9,351	9,424
Project 7B	8,526	8,608	8,690	8,773	8,856	8,939	9,022	9,105	9,188	9,272	9,356	9,441	9,527	9,614	9,701	9,789	9,878	9,968	10,059	10,150
Project 8	203	204	205	207	208	210	211	213	214	216	218	220	222	224	226	228	230	232	234	236
Project 9	890	890	890	890	890	890	890	890	890	890	894	898	902	906	910	914	918	922	926	930
Project 10	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
Project 11	486	488	490	492	494	496	498	500	503	506	508	510	512	514	516	518	520	522	524	526
Project 13	1,155	1,162	1,168	1,174	1,180	1,186	1,192	1,198	1,204	1,210	1,216	1,222	1,228	1,234	1,240	1,246	1,252	1,258	1,264	1,270
Project 14	11,251	11,355	11,449	11,532	11,604	11,665	11,723	11,782	11,841	11,900	11,959	12,018	12,078	12,138	12,198	12,258	12,319	12,380	12,441	12,503
Project 15	3,014	3,098	3,181	3,263	3,344	3,424	3,502	3,578	3,653	3,725	3,798	3,873	3,949	4,027	4,106	4,187	4,270	4,354	4,440	4,528
Project 16	2,946	3,008	3,069	3,128	3,185	3,240	3,292	3,342	3,389	3,433	3,478	3,523	3,569	3,615	3,662	3,710	3,758	3,807	3,856	3,906
Project 17	2,949	3,005	3,059	3,111	3,161	3,209	3,254	3,297	3,337	3,374	3,411	3,448	3,486	3,524	3,563	3,602	3,642	3,682	3,722	3,763
Project 18	818	892	972	1,059	1,155	1,258	1,371	1,495	1,629	1,776	1,936	2,110	2,300	2,507	2,733	2,979	3,247	3,540	3,859	4,207
Project 19	4,020	4,184	4,351	4,520	4,690	4,862	5,036	5,211	5,387	5,564	5,746	5,934	6,128	6,328	6,535	6,749	6,970	7,198	7,433	7,676
Project 20	678	705	732	759	787	815	843	871	899	927	955	984	1,014	1,045	1,077	1,110	1,144	1,179	1,215	1,252
Project 21A	1,766	1,838	1,911	1,985	2,059	2,134	2,210	2,286	2,363	2,440	2,519	2,601	2,685	2,772	2,862	2,955	3,051	3,150	3,252	3,357
Project 22a	14,771	15,022	15,262	15,491	15,708	15,912	16,103	16,280	16,443	16,607	16,772	16,939	17,107	17,277	17,449	17,623	17,798	17,975	18,154	18,335
Project 22b	2,057	2,096	2,134	2,170	2,205	2,238	2,269	2,298	2,326	2,352	2,378	2,404	2,430	2,457	2,484	2,511	2,539	2,567	2,595	2,624
Project 23A	19,602	19,888	20,158	20,412	20,649	20,868	21,068	21,249	21,410	21,551	21,692	21,834	21,977	22,121	22,266	22,412	22,559	22,707	22,856	23,006
Project 32	190	190	190	190	190	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Project 33	240	240	250	250	250	250	260	260	260	260	260	260	260	260	260	260	260	260	260	260

	Thousands of Transactions Units - Conservative Case																			
	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074
Project 1	1,359	1,367	1,375	1,383	1,391	1,399	1,407	1,415	1,423	1,432	1,441	1,450	1,459	1,468	1,477	1,486	1,495	1,504	1,513	1,522
Project 2	1,148	1,153	1,158	1,163	1,168	1,173	1,178	1,183	1,188	1,193	1,198	1,203	1,208	1,213	1,218	1,223	1,228	1,233	1,238	1,243
Project 3	2,381	2,390	2,399	2,408	2,417	2,426	2,435	2,444	2,453	2,462	2,471	2,480	2,489	2,498	2,507	2,516	2,525	2,534	2,544	2,554
Project 4	673	676	679	682	685	688	691	694	697	700	703	706	709	712	715	718	721	724	727	730
Project 5	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787	787
Project 6	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927	927
Project 7A	9,498	9,572	9,647	9,722	9,798	9,875	9,952	10,030	10,108	10,187	10,267	10,347	10,428	10,509	10,591	10,674	10,757	10,841	10,926	11,011
Project 7B	10,242	10,335	10,429	10,524	10,620	10,717	10,814	10,912	11,011	11,111	11,212	11,314	11,417	11,521	11,626	11,732	11,839	11,947	12,056	12,166
Project 8	238	240	242	244	246	248	250	252	254	256	258	260	262	264	266	268	270	272	274	276
Project 9	934	938	942	946	950	954	958	962	966	970	974	978	982	986	990	994	998	1,002	1,007	1,012
Project 10	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
Project 11	528	530	532	534	536	538	540	542	544	546	548	550	552	554	556	558	560	562	564	566
Project 13	1,276	1,282	1,288	1,294	1,300	1,306	1,312	1,318	1,324	1,330	1,336	1,342	1,348	1,354	1,360	1,366	1,372	1,378	1,384	1,390
Project 14	12,565	12,627	12,690	12,753	12,816	12,880	12,944	13,008	13,073	13,138	13,203	13,269	13,335	13,401	13,468	13,535	13,602	13,670	13,738	13,806
Project 15	4,617	4,708	4,801	4,896	4,993	5,092	5,193	5,296	5,401	5,508	5,617	5,728	5,841	5,956	6,074	6,194	6,316	6,441	6,568	6,698
Project 16	3,957	4,008	4,060	4,113	4,166	4,220	4,275	4,331	4,387	4,444	4,502	4,561	4,620	4,680	4,741	4,803	4,866	4,929	4,993	5,058
Project 17	3,804	3,846	3,888	3,931	3,974	4,018	4,062	4,107	4,152	4,198	4,244	4,291	4,338	4,386	4,434	4,483	4,532	4,582	4,633	4,684
Project 18	4,586	4,999	5,450	5,941	6,477	7,061	7,698	8,392	9,149	9,974	10,874	11,855	12,924	14,090	15,361	16,747	18,258	19,905	21,701	23,659
Project 19	7,927	8,186	8,454	8,731	9,017	9,312	9,617	9,932	10,258	10,594	10,941	11,300	11,670	12,052	12,447	12,855	13,277	13,712	14,162	14,626
Project 20	1,290	1,330	1,371	1,413	1,457	1,502	1,548	1,596	1,645	1,696	1,748	1,802	1,858	1,915	1,974	2,035	2,098	2,163	2,230	2,299
Project 21A	3,466	3,578	3,694	3,814	3,938	4,066	4,198	4,334	4,475	4,620	4,770	4,925	5,085	5,250	5,421	5,597	5,779	5,967	6,161	6,361
Project 22a	18,517	18,701	18,887	19,075	19,265	19,457	19,651	19,846	20,043	20,242	20,443	20,646	20,851	21,058	21,268	21,480	21,694	21,910	22,128	22,348
Project 22b	2,653	2,682	2,711	2,741	2,771	2,801	2,832	2,863	2,895	2,927	2,959	2,992	3,025	3,058	3,092	3,126	3,160	3,195	3,230	3,266
Project 23A	23,157	23,309	23,462	23,616	23,771	23,927	24,084	24,242	24,401	24,561	24,722	24,884	25,047	25,211	25,377	25,544	25,712	25,881	26,051	26,222
Project 32	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Project 33	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260

Capital Costs Assumptions (Base and Conservative Cases)

Conversion construction projects are assumed to be delivered in 4 years, while major expansion construction projects assume 6 years.

The construction projects that will convert existing HOV lanes incorporate the following assumptions:

- The environmental documentation would likely be a Categorical Exemption/Exclusion as has been the case for the I-680 express lane over Sunol Grade and for the SR237/I-880 express lane in Santa Clara County. In some cases, a focused Initial Study/Environmental Assessment may be required to assess specific issues of concern unique to the corridor involved. A year is assumed to be sufficient to accomplish this work. Refer to Parts C.9 and C.10 for additional details.
- The engineering design work for these construction projects is straight-forward once the traffic analysis is concluded. Six months of work would be sufficient once the environmental approval, including the traffic analysis, is secured.
- The Systems Engineering needed to properly define and then implement the electronic tolling system is the most critical design work. It will occur concurrently with the environmental studies, producing a Concept of Operations, a Systems Engineering Management Plan and a Request for Proposals for System Integration.
- Allowing start-up time for the consultant contracts and an additional 2 to 3 months to successfully complete the traffic operational analysis, 2 years has been assumed to be sufficient time to complete the environmental and design work on these construction projects.
- The advertising and award period for the construction contract is estimated to take approximately 6 months.
- The construction work required to convert existing HOV lanes to express lanes also has two parts: 1) the typical civil highway construction work and 2) the installation, testing and warranty period of the electronic toll system. In most cases the highway construction work will take no more than 1 year to complete, since no major roadway widening is expected. The installation of the electronic toll system takes approximately 4 months, followed by 1 to 2 months of testing. Together, 18 months would be sufficient to construct and implement these conversion construction projects.

The construction projects that will construct new lanes in order to establish express lanes incorporate the following assumptions:

- The environmental documentation would be at a minimum, a full Initial Study/Environmental Assessment or possibly even a complete Environmental Impact Statement/Environment Impact Report. The range of time needed to complete such a document would be from 2 to 4 years, depending upon the complexity of the construction project. For the purposes of this analysis, 2 ½ years are assumed necessary for successful completion of the environmental document based upon the fact that the design assumptions focused on widening within the existing State Right of Way. By avoiding the need to secure additional Right of Way, the greatest schedule risk to successful delivery is mitigated. Refer to Parts C.9 and C.10 for additional details.
- The engineering design work for these construction projects will include the work necessary to widen the roadway to accommodate an additional lane. A year is likely to be required for this effort, although much of the work can be accomplished as part of the environmental study phase(except for those construction projects involving federal funds).

- The Systems Engineering needed to properly define and then implement the electronic tolling system is similar to that required in the conversion construction projects. It will occur concurrently with the environmental studies, producing a Concept of Operations, a Systems Engineering Management Plan and a Request for Proposals for System Integration. The 3 and ½ year period needed for the environmental studies and the design is more than sufficient to accomplish this work.
- The start-up time for the consultant contracts and for the traffic operational analysis, is assumed to be part of the 2 ½ years for the environmental studies.
- The advertising and award period for the highway construction contract is estimated to take approximately 6 months.
- The construction work required for constructing new lanes as express lanes also has two parts: 1) the typical highway construction work to widen the roadway and modify associated existing facilities, install drainage facilities, construct sound walls, install new signs, install poles for tolling equipment, make barrier modifications and complete other civil work, and 2) the installation, testing and warranty period of the electronic toll system. The time needed to complete the highway construction work is assumed to be from 18 months to 2 years. The installation of the electronic toll system would take approximately 4 months, overlapping with the construction. Together, 2 years would be sufficient to construct and implement most of these added lane construction projects.

- Please refer to Part D.1 for the phasing for each construction project under the Base and Conservative Cases
- Capital cost escalation is assumed at 3.2% per year
- Detailed capital costs inputs are shown below. These are based on Design Variation 1 in the PSR (see Attachment 4.)

				Capital Costs ($000's, expressed in 2010$)		
				ROW	Support	Construction
Project 1	I-80	Yolo Co. Line to I-505	EB/WB	-	58,682	167,664
Project 2	I-80	I-505 to Airbase Pkwy	EB/WB	-	26,117	74,619
Project 3	I-80	Airbase Pkwy to Red Top Rd	EB/WB	-	4,426	12,645
Project 4	I-80	Red Top Rd to SR-37	EB/WB	2,780	30,139	83,331
Project 5	I-80	SR-37 to Carquinez Toll Plaza	EB/WB	-	37,640	107,542
Project 6	I-80	Carquinez Toll Plaza to SR-4	EB/WB	-	1,820	5,199
Project 7A	I-80	SR-4 to Bay Bridge	EB/WB	-	10,524	30,068
Project 7B	I-80	Bay Bridge Toll Plaza Bypass	WB	-	-	-
Project 8	I-80/I-680	Direct Connectors		-	24,079	68,798
Project 9	I-680	I-80 to I-780	NB/SB	-	57,784	165,096
Project 10	I-680	Benicia-Martinez Bridge (with HOT bypass)	NB	-	-	-
Project 11	I-680	Marina Vista to N. Main St.	NB	715	17,583	49,522
Project 13	I-680	Marina Vista to Livorna	SB	-	41,892	119,692
Project 14	I-680	Livorna to Alcosta	NB/SB	-	5,588	15,967
Project 15	I-680	Alcosta to SR-84	NB/SB	-	51,871	148,204
Project 16	I-680	SR-84 to SR-237	NB	-	31,505	90,013
Project 17	I-680	SR-84 to SR-237	SB	-	-	-
Project 18	I-580/I-680	Direct Connectors		-	45,706	130,587
Project 19	I-580	San Joaquin Co. Line to Greenville	EB/WB	-	57,605	164,586
Project 20	I-580	Greenville to Hacienda (dual lanes Vasco to Tassajara)	EB	-	6,997	21,662
Project 21A	I-580	Greenville to San Ramon/Foothill Rd. (single lane)	WB	-	3,531	10,089
Project 22a	I-880	Lewelling to SR-237	NB	-	7,225	20,642
Project 22b	I-880	Hegenberger to Lewelling	NB	12,253	39,437	86,173
Project 23A	I-880	Hegenberger to SR-237	SB	-	6,385	18,242
Project 32	SR-84	I-880 to Dumbarton Bridge Toll Plaza	WB	-	910	2,600
Project 33	SR-92	Hesperian to San Mateo Bridge Toll Plaza	WB	-	877	2,505

Revenue Assumptions (Base and Conservative Cases)

- Revenue Based on latest economic projections (ABAG Projections 2009 Update) and do not assume induced demand.
- Limited access, restricting on and off movements
- Effect of peak-hour spreading not considered (may increase revenues 5%)
- Toll rates generally consistent with I-680 Sunol Grade (14 miles)
    - Current rate: maximum $7.50; average peak $3.00
    - 2020: maximum $7.90; average peak $6.00
    - Compare with $1.00/mile for SR 91 in 2011
- Tolls set to maximize travel time savings, not revenue
- Different profile for each construction project, depending on how fast HOV2/3 demand grows
- Revenue bump-up upon conversion to HOV3+
- Straight-line revenue growth rate between 2020 and 2035. Growth rates after 2035 were reduced:
    - Current HOV policy baseline revenue curve: 3.2% over 2020-2035, then 2.9% through 2074
    - HOV3+ baseline revenue curve: 2.9% over 2020-2035, then 2.7% through 2074
- Baseline revenues are dependent upon the HOV policy assumed are different under the Base and Conservative Cases, and are modified with a number of adjustments listed below
    - Revenues are escalated according to general inflation assumptions: 2.2% per year through 2040, 2.5% onwards
    - Revenues are assumed to start for a given construction project in accordance with its planned phasing – which may differ under the Base and Conservative Cases
    - A ramp-up adjustment (revenue reduction) is assumed for each construction project and calculated in accordance with its phasing - 20% is applied for the first year of operations, and 10% for the second year
    - A reduction for toll violations is applied to baseline revenues – 5% through 2020 and 2% afterwards
    - A revenue decrease reflecting reduced hours of tolling operations is applied to baseline revenues (which were generated based on a 24/7 traffic model):
        - 10% in the Base Case
        - 25% in the Conservative Case
        - Note the revenue reduction is not applied to the following construction projects for which the applicable hours of tolling operations hours were factored into the baseline revenues: 7B (San Francisco/Oakland Bay Bridge Toll Plaza bypass; I-80 WB), 32 (I-880 to Dumbarton Bridge Toll Plaza; SR84-WB), 33 (Hesperian to San Mateo Bridge Toll Plaza; SR-92 WB)
- Detailed year-by-year baseline revenue assumptions are shown below for both the Base and Conservative Cases (these do not factor in the escalation or various reductions cited above)

	Baseline Revenues in thousands of 2011$ (before reductions cited above) - Base Case																			
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Project 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,485	2,534	2,584	2,635	2,687
Project 2	-	-	-	-	-	1,406	1,428	1,450	1,473	1,496	1,519	1,543	1,567	1,592	1,617	1,642	1,668	1,694	1,721	1,748
Project 3	209	209	209	209	209	1,164	1,177	1,190	1,204	1,218	1,232	1,246	1,260	1,275	1,290	1,305	1,320	1,335	1,351	1,367
Project 4	-	-	-	-	-	590	592	594	596	598	600	603	606	609	612	615	618	621	624	627
Project 5	-	-	-	-	-	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365
Project 6	-	-	-	-	-	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831
Project 7A	-	-	-	-	-	17,427	17,643	17,862	18,086	18,313	18,544	18,779	19,019	19,262	19,510	19,762	20,019	20,280	20,547	20,818
Project 7B	10,115	10,643	11,200	11,786	12,402	13,052	13,735	14,454	15,211	16,007	16,846	17,729	18,659	19,637	20,667	21,751	22,893	24,094	25,360	26,691
Project 8	-	-	-	-	-	25	25	25	25	26	26	26	26	26	27	27	27	27	27	27
Project 9	-	-	-	-	-	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,827
Project 10	-	-	-	-	-	220	220	220	220	220	220	220	220	220	220	230	230	230	230	230
Project 11	-	-	-	-	-	826	826	826	826	826	826	826	826	826	826	826	826	826	826	826
Project 13	-	-	-	-	-	1,483	1,490	1,497	1,504	1,512	1,520	1,528	1,536	1,544	1,552	1,560	1,568	1,576	1,584	1,592
Project 14	5,875	6,031	6,192	6,357	6,526	22,629	23,066	23,511	23,965	24,427	24,898	25,378	25,868	26,367	26,876	27,395	27,924	28,463	29,012	29,572
Project 15	-	-	-	-	-	-	-	-	-	-	4,299	4,523	4,759	5,007	5,268	5,542	5,831	6,135	6,455	6,791
Project 16	-	-	-	-	-	9,678	10,043	10,421	10,814	11,221	11,644	12,083	12,538	13,010	13,500	14,009	14,537	15,085	15,653	16,243
Project 17	2,382	2,497	2,618	2,745	2,878	9,321	9,633	9,956	10,290	10,635	10,992	11,360	11,741	12,135	12,542	12,962	13,397	13,846	14,310	14,790
Project 18	-	-	-	-	-	-	-	-	-	-	56	62	69	77	86	96	106	119	132	147
Project 19	-	-	-	-	-	-	-	-	-	-	7,990	8,521	9,087	9,691	10,335	11,022	11,755	12,536	13,370	14,259
Project 20	495	531	569	610	654	701	752	806	864	926	993	1,065	1,142	1,224	1,312	1,407	1,509	1,618	1,735	1,860
Project 21A	503	538	576	617	660	2,665	2,851	3,050	3,263	3,491	3,735	3,996	4,275	4,573	4,892	5,233	5,598	5,989	6,407	6,854
Project 22a	6,101	6,326	6,559	6,800	7,050	26,810	27,564	28,339	29,136	29,955	30,797	31,663	32,553	33,468	34,409	35,376	36,371	37,394	38,445	39,526
Project 22b	-	-	-	-	-	2,044	2,107	2,172	2,239	2,308	2,379	2,452	2,527	2,604	2,684	2,766	2,851	2,938	3,028	3,121
Project 23A	9,385	9,696	10,017	10,349	10,692	34,904	35,815	36,750	37,710	38,695	39,705	40,742	41,806	42,898	44,018	45,167	46,346	47,556	48,798	50,072
Project 32	140	140	150	150	150	150	150	160	160	160	160	160	170	170	170	170	180	180	180	180
Project 33	200	200	200	200	210	210	210	210	210	220	220	220	220	230	230	230	230	230	240	240

	Baseline Revenues in thousands of 2011$ (before reductions cited above) - Base Case																			
	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
Project 1	2,741	2,793	2,843	2,891	2,937	2,981	3,022	3,061	3,097	3,131	3,165	3,199	3,234	3,269	3,304	3,340	3,376	3,413	3,450	3,487
Project 2	1,775	1,801	1,826	1,849	1,871	1,891	1,909	1,926	1,941	1,954	1,967	1,980	1,993	2,006	2,019	2,032	2,045	2,058	2,071	2,084
Project 3	1,383	1,398	1,412	1,425	1,437	1,448	1,458	1,467	1,475	1,482	1,489	1,496	1,503	1,510	1,517	1,524	1,531	1,538	1,545	1,552
Project 4	628	631	634	637	640	643	646	649	652	655	658	661	664	667	670	673	676	679	682	685
Project 5	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365
Project 6	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831
Project 7A	21,095	21,356	21,600	21,826	22,035	22,232	22,429	22,625	22,821	23,015	23,210	23,407	23,605	23,805	24,007	24,211	24,416	24,623	24,832	25,043
Project 7B	28,093	29,556	31,094	32,710	34,409	36,196	38,073	40,046	42,123	44,308	46,606	49,023	51,565	54,239	57,052	60,011	63,123	66,397	69,841	73,463
Project 8	28	28	28	28	28	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
Project 9	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,836	1,845	1,854	1,863	1,872	1,881	1,890	1,899	1,908	1,917
Project 10	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
Project 11	826	830	834	838	842	846	850	854	858	862	866	870	874	878	882	886	890	894	898	902
Project 13	1,598	1,606	1,614	1,622	1,630	1,638	1,646	1,654	1,662	1,670	1,678	1,686	1,694	1,702	1,710	1,718	1,726	1,734	1,742	1,750
Project 14	30,141	30,662	31,162	31,639	32,091	32,518	32,918	33,290	33,633	33,946	34,261	34,579	34,900	35,224	35,551	35,881	36,214	36,550	36,889	37,231
Project 15	7,142	7,500	7,868	8,246	8,634	9,032	9,439	9,855	10,280	10,713	11,163	11,632	12,121	12,631	13,162	13,715	14,292	14,893	15,519	16,172
Project 16	16,854	17,455	18,060	18,668	19,278	19,889	20,499	21,107	21,712	22,313	22,930	23,564	24,216	24,886	25,574	26,281	27,008	27,755	28,523	29,312
Project 17	15,285	15,767	16,248	16,728	17,205	17,679	18,148	18,611	19,067	19,516	19,975	20,444	20,924	21,416	21,919	22,434	22,961	23,501	24,053	24,618
Project 18	164	183	204	227	253	281	313	349	389	433	481	535	595	662	736	819	911	1,014	1,128	1,255
Project 19	15,207	16,203	17,247	18,342	19,488	20,686	21,937	23,242	24,602	26,016	27,511	29,092	30,763	32,530	34,398	36,374	38,464	40,674	43,011	45,482
Project 20	1,993	2,135	2,285	2,443	2,609	2,784	2,968	3,161	3,364	3,576	3,801	4,040	4,294	4,564	4,851	5,156	5,480	5,825	6,192	6,582
Project 21A	7,332	7,836	8,367	8,926	9,513	10,129	10,775	11,452	12,160	12,899	13,682	14,513	15,394	16,329	17,321	18,373	19,489	20,673	21,929	23,261
Project 22a	40,637	41,734	42,819	43,889	44,942	45,976	46,987	47,974	48,933	49,912	50,910	51,928	52,966	54,025	55,105	56,207	57,331	58,478	59,647	60,840
Project 22b	3,215	3,311	3,407	3,502	3,597	3,691	3,783	3,874	3,963	4,050	4,138	4,228	4,320	4,414	4,510	4,609	4,710	4,813	4,918	5,025
Project 23A	51,380	52,619	53,835	55,025	56,187	57,317	58,412	59,470	60,488	61,463	62,453	63,459	64,481	65,520	66,576	67,649	68,739	69,846	70,971	72,114
Project 32	190	190	190	190	190	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Project 33	240	240	250	250	250	250	260	260	260	260	260	260	260	260	260	260	260	260	260	260

	Baseline Revenues in thousands of 2011$ (before reductions cited above) - Base Case																			
	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074
Project 1	3,525	3,563	3,602	3,641	3,680	3,720	3,760	3,801	3,842	3,884	3,926	3,969	4,012	4,056	4,100	4,145	4,190	4,235	4,281	4,327
Project 2	2,097	2,111	2,125	2,139	2,153	2,167	2,181	2,195	2,209	2,223	2,237	2,251	2,266	2,281	2,296	2,311	2,326	2,341	2,356	2,371
Project 3	1,559	1,566	1,573	1,580	1,587	1,594	1,601	1,608	1,615	1,622	1,629	1,636	1,643	1,650	1,657	1,664	1,671	1,678	1,685	1,692
Project 4	688	691	694	697	700	703	706	709	712	715	718	721	724	727	730	733	736	739	742	745
Project 5	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365
Project 6	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831
Project 7A	25,255	25,469	25,685	25,903	26,123	26,345	26,568	26,793	27,020	27,249	27,480	27,713	27,948	28,185	28,424	28,665	28,908	29,153	29,400	29,649
Project 7B	77,273	81,281	85,497	89,931	94,595	99,501	104,662	110,091	115,801	121,807	128,125	134,771	141,761	149,114	156,848	164,984	173,542	182,543	192,011	201,970
Project 8	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
Project 9	1,926	1,935	1,944	1,953	1,962	1,971	1,980	1,989	1,998	2,007	2,017	2,027	2,037	2,047	2,057	2,067	2,077	2,087	2,097	2,107
Project 10	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
Project 11	906	910	914	918	922	926	930	934	938	942	946	950	954	958	962	966	970	974	978	982
Project 13	1,758	1,766	1,774	1,782	1,790	1,798	1,806	1,815	1,824	1,833	1,842	1,851	1,860	1,869	1,878	1,887	1,896	1,905	1,914	1,923
Project 14	37,577	37,926	38,278	38,633	38,992	39,354	39,719	40,088	40,460	40,836	41,215	41,598	41,984	42,374	42,767	43,164	43,565	43,969	44,377	44,789
Project 15	16,852	17,561	18,299	19,068	19,870	20,706	21,577	22,484	23,430	24,415	25,442	26,512	27,627	28,789	30,000	31,262	32,577	33,947	35,375	36,863
Project 16	30,123	30,956	31,812	32,692	33,596	34,525	35,480	36,461	37,470	38,506	39,571	40,666	41,791	42,947	44,135	45,356	46,611	47,900	49,225	50,587
Project 17	25,197	25,789	26,395	27,015	27,650	28,300	28,965	29,646	30,343	31,056	31,786	32,533	33,298	34,081	34,882	35,702	36,541	37,400	38,279	39,179
Project 18	1,396	1,553	1,728	1,923	2,140	2,382	2,651	2,950	3,283	3,654	4,067	4,527	5,039	5,608	6,242	6,948	7,733	8,607	9,580	10,663
Project 19	48,095	50,858	53,780	56,870	60,137	63,592	67,246	71,110	75,196	79,517	84,086	88,918	94,027	99,430	105,144	111,186	117,576	124,333	131,478	139,033
Project 20	6,996	7,436	7,904	8,402	8,931	9,493	10,091	10,726	11,401	12,119	12,882	13,693	14,555	15,472	16,447	17,483	18,584	19,755	20,999	22,322
Project 21A	24,674	26,173	27,763	29,450	31,239	33,137	35,150	37,286	39,551	41,954	44,503	47,207	50,075	53,118	56,346	59,770	63,402	67,255	71,342	75,677
Project 22a	62,057	63,298	64,564	65,855	67,172	68,515	69,885	71,283	72,709	74,163	75,646	77,159	78,702	80,276	81,882	83,520	85,190	86,894	88,632	90,405
Project 22b	5,135	5,247	5,362	5,479	5,599	5,721	5,846	5,974	6,105	6,239	6,375	6,514	6,657	6,803	6,952	7,104	7,259	7,418	7,580	7,746
Project 23A	73,276	74,457	75,657	76,876	78,115	79,374	80,653	81,953	83,273	84,615	85,978	87,363	88,771	90,201	91,654	93,131	94,632	96,157	97,706	99,280
Project 32	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Project 33	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260

	Baseline Revenues in thousands of 2011$ (before reductions cited above) - Conservative Case																			
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Project 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project 2	-	-	-	-	-	-	-	-	-	-	469	470	471	472	473	474	475	476	477	478
Project 3	-	-	-	-	-	209	209	209	209	209	210	210	210	210	210	211	211	211	211	211
Project 4	-	-	-	-	-	-	-	-	-	-	231	231	231	231	231	231	231	231	231	231
Project 5	-	-	-	-	-	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131
Project 6	-	-	-	-	-	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831
Project 7A	-	-	-	-	-	17,427	17,643	17,862	18,086	18,313	18,544	18,779	19,019	19,262	19,510	19,762	20,019	20,280	20,547	20,818
Project 7B	10,115	10,643	11,200	11,786	12,402	13,052	13,735	14,454	15,211	16,007	16,846	17,729	18,659	19,637	20,667	21,751	22,893	24,094	25,360	26,691
Project 8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	10	10	10	10
Project 9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	512	511	510	509	508
Project 10	-	-	-	-	-	-	-	-	-	-	220	220	220	220	220	230	230	230	230	230
Project 11	-	-	-	-	-	-	-	-	-	-	826	826	826	826	826	826	826	826	826	826
Project 13	-	-	-	-	-	-	-	-	-	-	1,520	1,528	1,536	1,544	1,552	1,560	1,568	1,576	1,584	1,592
Project 14	5,875	6,031	6,192	6,357	6,526	22,629	23,066	23,511	23,965	24,427	24,898	25,378	25,868	26,367	26,876	27,395	27,924	28,463	29,012	29,572
Project 15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,542	5,831	6,135	6,455	6,791
Project 16	-	-	-	-	-	9,678	10,043	10,421	10,814	11,221	11,644	12,083	12,538	13,010	13,500	14,009	14,537	15,085	15,653	16,243
Project 17	2,382	2,497	2,618	2,745	2,878	9,321	9,633	9,956	10,290	10,635	10,992	11,360	11,741	12,135	12,542	12,962	13,397	13,846	14,310	14,790
Project 18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project 19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project 20	495	531	569	610	654	701	752	806	864	926	993	1,065	1,142	1,224	1,312	1,407	1,509	1,618	1,735	1,860
Project 21A	503	538	576	617	660	707	757	810	867	928	993	1,063	1,138	1,218	1,304	1,396	1,494	1,599	1,712	1,833
Project 22a	6,101	6,326	6,559	6,800	7,050	7,310	7,579	7,858	8,147	8,447	8,758	9,080	9,414	9,761	10,120	10,493	10,879	11,279	11,694	12,124
Project 22b	-	-	-	-	-	-	-	-	-	-	663	681	700	719	739	759	780	802	824	847
Project 23A	9,385	9,696	10,017	10,349	10,692	11,046	11,412	11,790	12,181	12,585	13,002	13,433	13,878	14,338	14,813	15,304	15,811	16,335	16,876	17,435
Project 32	140	140	150	150	150	150	150	160	160	160	160	160	170	170	170	170	180	180	180	180
Project 33	200	200	200	200	210	210	210	210	210	220	220	220	220	230	230	230	230	230	240	240

	Baseline Revenues in thousands of 2011$ (before reductions cited above) - Conservative Case																			
	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054
Project 1	2,741	2,793	2,843	2,891	2,937	2,981	3,022	3,061	3,097	3,131	3,165	3,199	3,234	3,269	3,304	3,340	3,376	3,413	3,450	3,487
Project 2	1,775	1,801	1,826	1,849	1,871	1,891	1,909	1,926	1,941	1,954	1,967	1,980	1,993	2,006	2,019	2,032	2,045	2,058	2,071	2,084
Project 3	1,383	1,398	1,412	1,425	1,437	1,448	1,458	1,467	1,475	1,482	1,489	1,496	1,503	1,510	1,517	1,524	1,531	1,538	1,545	1,552
Project 4	628	631	634	637	640	643	646	649	652	655	658	661	664	667	670	673	676	679	682	685
Project 5	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365
Project 6	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831
Project 7A	21,095	21,356	21,600	21,826	22,035	22,232	22,429	22,625	22,821	23,015	23,210	23,407	23,605	23,805	24,007	24,211	24,416	24,623	24,832	25,043
Project 7B	28,093	29,556	31,094	32,710	34,409	36,196	38,073	40,046	42,123	44,308	46,606	49,023	51,565	54,239	57,052	60,011	63,123	66,397	69,841	73,463
Project 8	28	28	28	28	28	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
Project 9	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,827	1,836	1,845	1,854	1,863	1,872	1,881	1,890	1,899	1,908	1,917
Project 10	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
Project 11	826	830	834	838	842	846	850	854	858	862	866	870	874	878	882	886	890	894	898	902
Project 13	1,598	1,606	1,614	1,622	1,630	1,638	1,646	1,654	1,662	1,670	1,678	1,686	1,694	1,702	1,710	1,718	1,726	1,734	1,742	1,750
Project 14	30,141	30,662	31,162	31,639	32,091	32,518	32,918	33,290	33,633	33,946	34,261	34,579	34,900	35,224	35,551	35,881	36,214	36,550	36,889	37,231
Project 15	7,142	7,500	7,868	8,246	8,634	9,032	9,439	9,855	10,280	10,713	11,163	11,632	12,121	12,631	13,162	13,715	14,292	14,893	15,519	16,172
Project 16	16,854	17,455	18,060	18,668	19,278	19,889	20,499	21,107	21,712	22,313	22,930	23,564	24,216	24,886	25,574	26,281	27,008	27,755	28,523	29,312
Project 17	15,285	15,767	16,248	16,728	17,205	17,679	18,148	18,611	19,067	19,516	19,975	20,444	20,924	21,416	21,919	22,434	22,961	23,501	24,053	24,618
Project 18	164	183	204	227	253	281	313	349	389	433	481	535	595	662	736	819	911	1,014	1,128	1,255
Project 19	15,207	16,203	17,247	18,342	19,488	20,686	21,937	23,242	24,602	26,016	27,511	29,092	30,763	32,530	34,398	36,374	38,464	40,674	43,011	45,482
Project 20	1,993	2,135	2,285	2,443	2,609	2,784	2,968	3,161	3,364	3,576	3,801	4,040	4,294	4,564	4,851	5,156	5,480	5,825	6,192	6,582
Project 21A	7,332	7,836	8,367	8,926	9,513	10,129	10,775	11,452	12,160	12,899	13,682	14,513	15,394	16,329	17,321	18,373	19,489	20,673	21,929	23,261
Project 22a	40,637	41,734	42,819	43,889	44,942	45,976	46,987	47,974	48,933	49,912	50,910	51,928	52,966	54,025	55,105	56,207	57,331	58,478	59,647	60,840
Project 22b	3,215	3,311	3,407	3,502	3,597	3,691	3,783	3,874	3,963	4,050	4,138	4,228	4,320	4,414	4,510	4,609	4,710	4,813	4,918	5,025
Project 23A	51,380	52,619	53,835	55,025	56,187	57,317	58,412	59,470	60,488	61,463	62,453	63,459	64,481	65,520	66,576	67,649	68,739	69,846	70,971	72,114
Project 32	190	190	190	190	190	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Project 33	240	240	250	250	250	250	260	260	260	260	260	260	260	260	260	260	260	260	260	260

	Baseline Revenues in thousands of 2011$ (before reductions cited above) - Conservative Case																			
	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074
Project 1	3,525	3,563	3,602	3,641	3,680	3,720	3,760	3,801	3,842	3,884	3,926	3,969	4,012	4,056	4,100	4,145	4,190	4,235	4,281	4,327
Project 2	2,097	2,111	2,125	2,139	2,153	2,167	2,181	2,195	2,209	2,223	2,237	2,251	2,266	2,281	2,296	2,311	2,326	2,341	2,356	2,371
Project 3	1,559	1,566	1,573	1,580	1,587	1,594	1,601	1,608	1,615	1,622	1,629	1,636	1,643	1,650	1,657	1,664	1,671	1,678	1,685	1,692
Project 4	688	691	694	697	700	703	706	709	712	715	718	721	724	727	730	733	736	739	742	745
Project 5	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365
Project 6	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831	831
Project 7A	25,255	25,469	25,685	25,903	26,123	26,345	26,568	26,793	27,020	27,249	27,480	27,713	27,948	28,185	28,424	28,665	28,908	29,153	29,400	29,649
Project 7B	77,273	81,281	85,497	89,931	94,595	99,501	104,662	110,091	115,801	121,807	128,125	134,771	141,761	149,114	156,848	164,984	173,542	182,543	192,011	201,970
Project 8	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
Project 9	1,926	1,935	1,944	1,953	1,962	1,971	1,980	1,989	1,998	2,007	2,017	2,027	2,037	2,047	2,057	2,067	2,077	2,087	2,097	2,107
Project 10	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230	230
Project 11	906	910	914	918	922	926	930	934	938	942	946	950	954	958	962	966	970	974	978	982
Project 13	1,758	1,766	1,774	1,782	1,790	1,798	1,806	1,815	1,824	1,833	1,842	1,851	1,860	1,869	1,878	1,887	1,896	1,905	1,914	1,923
Project 14	37,577	37,926	38,278	38,633	38,992	39,354	39,719	40,088	40,460	40,836	41,215	41,598	41,984	42,374	42,767	43,164	43,565	43,969	44,377	44,789
Project 15	16,852	17,561	18,299	19,068	19,870	20,706	21,577	22,484	23,430	24,415	25,442	26,512	27,627	28,789	30,000	31,262	32,577	33,947	35,375	36,863
Project 16	30,123	30,956	31,812	32,692	33,596	34,525	35,480	36,461	37,470	38,506	39,571	40,666	41,791	42,947	44,135	45,356	46,611	47,900	49,225	50,587
Project 17	25,197	25,789	26,395	27,015	27,650	28,300	28,965	29,646	30,343	31,056	31,786	32,533	33,298	34,081	34,882	35,702	36,541	37,400	38,279	39,179
Project 18	1,396	1,553	1,728	1,923	2,140	2,382	2,651	2,950	3,283	3,654	4,067	4,527	5,039	5,608	6,242	6,948	7,733	8,607	9,580	10,663
Project 19	48,095	50,858	53,780	56,870	60,137	63,592	67,246	71,110	75,196	79,517	84,086	88,918	94,027	99,430	105,144	111,186	117,576	124,333	131,478	139,033
Project 20	6,996	7,436	7,904	8,402	8,931	9,493	10,091	10,726	11,401	12,119	12,882	13,693	14,555	15,472	16,447	17,483	18,584	19,755	20,999	22,322
Project 21A	24,674	26,173	27,763	29,450	31,239	33,137	35,150	37,286	39,551	41,954	44,503	47,207	50,075	53,118	56,346	59,770	63,402	67,255	71,342	75,677
Project 22a	62,057	63,298	64,564	65,855	67,172	68,515	69,885	71,283	72,709	74,163	75,646	77,159	78,702	80,276	81,882	83,520	85,190	86,894	88,632	90,405
Project 22b	5,135	5,247	5,362	5,479	5,599	5,721	5,846	5,974	6,105	6,239	6,375	6,514	6,657	6,803	6,952	7,104	7,259	7,418	7,580	7,746
Project 23A	73,276	74,457	75,657	76,876	78,115	79,374	80,653	81,953	83,273	84,615	85,978	87,363	88,771	90,201	91,654	93,131	94,632	96,157	97,706	99,280
Project 32	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200
Project 33	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260	260

Financing assumptions (Base Case and Conservative Case)

	Phase I	Phase II	Phase III	Phase IV	Phase V
Upfront Fees					
CIBs upfront fees (as % of issuance)	1.00%	1.00%	1.00%	1.00%	1.00%
TIFIA app & processing fees ($000)	350	350	350	350	350
Annual Fees					
CIBs annual fees ($000)	35	35	35	35	35
TIFIA annual fees ($000)	11.50	11.50	11.50	11.50	11.50
All-in Annual Interest Rates					
CIBs interest rate - Base Case	5.50%	6.50%	7.00%	7.50%	N/A
CIBs interest rate - Conservative Case	6.00%	7.00%	7.00%	8.00%	7.50%
TIFIA interest rate - Base Case	5.00%	5.00%	5.00%	6.00%	N/A
TIFIA interest rate - Conservative Case	5.00%	5.00%	5.00%	6.00%	7.00%
Debt tenors					
CIBs tenor (years) - Base Case	29	27	30	26	N/A
CIBs tenor (years) - Conservative Case	30	30	30	30	17
TIFIA tenor (years) - Base Case	35	35	35	35	N/A
TIFIA tenor (years) - Conservative Case	35	35	35	35	35
Interest Capitalization & Grace Periods					
CIBs interest capitalization yrs	-	-	-	-	-
CIBs loan princ pymt grace pd	1	1	1	1	1
TIFIA interest capitalization yrs	5	5	5	5	5
TIFIA loan princ pymt grace pd	10	10	10	10	10
Debt Service Reserve Account					
CIBs DSRA requirement (months of MADS)	12	12	12	12	12

Attachment 9

Benefit-Cost Analysis

Bay Area Express Lanes Benefit-Cost Analysis

This attachment describes the methodology and results of a benefit-cost analysis developed to support the application to the California Transportation Commission to implement a network of express lanes in the Bay Area.

The California Life-Cycle Benefit-Cost Analysis Model (Cal-B/C) was used to evaluate the economic viability of the Express Lane Network for the Base Case in the financial plan. Specifically, the Cal-B/C Corridor Model was used, which is a modification of the original Cal-B/C Model developed to better evaluate highway projects comprising multiple segments. The Cal-B/C Model is an Excel-based model that was developed for the Department to assist in prioritizing highway and intercity transit projects, and represents a standard in cost / benefit analysis performed for transportation projects in California.

Benefit-Cost Analysis Data Inputs

Required Cal-B/C cost inputs for each construction project in the Base Case were provided by the consultant team and MTC in cooperation with the Department and include the following:

- Project Support
- Right of Way
- Construction
- Operating and Maintenance
- Replacement and Rehabilitation

Additionally, traffic model outputs for each construction project were used to provide build and no-build scenario traffic inputs for Cal-B/C. These included:

- Average Vehicle Occupancy (AVO)
- Vehicle Miles Traveled (VMT)
- Vehicle Hours Traveled (VHT)
- Percentage truck traffic

The no-build scenario traffic inputs were developed assuming that the HOV lane system as it exists today continues to operate under current occupancy requirements. The Base Case build scenario assumes that express lane projects are implemented in phases according to the schedule shown in Table 1. The build scenario further assumes that the occupancy threshold for toll-free use of the express lanes is increased to three or more occupants (HOV3+) in the year 2020, or upon opening, if that occurs later than 2020. There is no assumed increase in occupancy requirements for those HOV lanes currently operating at HOV3+ (construction projects 6, 7a and 7b in Table 1).

Table 1: Express Lane Construction Projects included in Benefit-Cost Analysis

Corridor	Construction Project No.	Description	Existing HOV Occupancy	Opening Year
I-80	1	I-505 to Yolo Co. Line	No existing HOV lane	2030
I-80	2	Airbase Parkway to I-505	No existing HOV lane	2020
I-80	3	Red Top Rd to Airbase Parkway	HOV2+	2015
I-80	4	SR-37 to I-680	No existing HOV lane	2020
I-80	5	I-780 to SR-37	No existing HOV lane	2020
I-80	6	SR-4 to I-780	HOV3+	2020
I-80	7a	Bay Bridge to SR-4	HOV3+	2020
I-80WB	7b	San Francisco/Oakland Bay Bridge HOV bypass	HOV3+	2015
I-80/ I-680	8	I-80/I-680 Freeway-to-Freeway Express Connectors	No existing HOV lane	2020
I-680NB	9	I-780 to I-80	No existing HOV lane	2020
I-680NB	11	Marina Vista to N. Main St.	HOV2+	2020
I-680SB	13	Marina Vista to Livorna Rd	No existing HOV lane	2020
I-680	14	Livorna Rd to Alcosta Blvd	HOV2+	2015
I-680	15	SR-84 to I-580	No existing HOV lane	2025
I-680NB	16	SR-237 to SR-84	No existing HOV lane	2020
I-680/ I-580	18	I-680/I-580 Freeway-to-Freeway Direct Connectors	No existing HOV lane	2025
I-580	19	Greenville Rd to San Joaquin Co. Line	No existing HOV lane	2025
I-580WB	21a	I-680 to Greenville Rd	HOV2+	2015
I-880NB	22a	Lewelling to SR-237	HOV2+	2015
I-880NB	22b	Hegenberger to Lewelling	No existing HOV lane	2020
I-880NB	23a	Hegenberger to SR-237	HOV2+	2015

The construction project list shown in Table 1 represents the list of all construction projects considered as part of the benefit-cost analysis. Three construction projects included as part of the financial plan developed to support the CTC application were not included in the benefit-cost analysis. These construction projects include the toll plaza bypass lanes at the Benicia-Martinez, San Mateo and Dumbarton bridges (construction projects 10, 32, and 33, respectively). User benefits were not able to be quantified for these construction projects. Further, a modified methodology was used to analyze construction projects 7b, 8, and 18, as they represent non-traditional direct connector construction projects, as opposed to conventional freeway projects, and the data received for these construction projects did not conform to the Cal-B/C model inputs. This methodology for addressing them is described in detail later in this report.

Benefit-Cost Analysis

The Cal-B/C Corridor Model is designed to evaluate a wide range of planned transportation projects. It is designed to use data from the "before" or "without project" case along with projections for future travel demand and information about the proposed project to evaluate whether or not the improvement is an economically efficient use of resources, relative to the case without the improvement.

The model period considers the construction duration in years, followed by 20 years of operations in which benefits accrue. All construction and related capital investment costs, along with ongoing operations and maintenance costs, are compared to the estimated travel benefits, including travel time savings, vehicle operating cost savings, and emissions reductions including CO_2, over the evaluation period. All future benefits and costs are discounted back to their present values using the Cal-B/C Corridor Model's standard real discount rate of 4.00% to acknowledge the time value of resources, or preference for present versus future consumption.

Updates were made to the Cal-B/C Corridor Model to better reflect current economic conditions. These modifications included updating the statewide hourly wage rate to $24.39 per hour (according to the Occupational Employment Statistics published by the Bureau of Labor Statistics) for value of time calculations. The average auto fuel price was also updated to $3.78 per gallon (AAA Fuel Gauge Report July 2011) These modifications did not affect the function of the model, but rather align costs and benefits with current economic conditions. It is important to note that projected toll revenues are not included in this model, as these represent a monetary transfer as distinct from new benefits from a social perspective.

Total construction project capital costs and operations and maintenance costs were obtained in constant 2010 dollars. 2010 dollars are used in order to properly match the present value of benefits in constant dollars to constant 2010 construction costs. This provides a consistent basis of comparison with the construction project benefits and ongoing O&M costs, both of which are also estimated in constant 2010 dollars. This is appropriate since present value discounting performed by the Model uses a real (net of inflation) discount rate under the assumption that all monetary values are already expressed in constant dollars.

Because the construction projects vary in phasing (opening year), those with the same opening year were grouped to provide consistent assignment of costs or benefits. The Cal-B/C Corridor Model was run four times to accommodate each possible opening year reflected in current network planning assumptions. The results of each model run were then discounted back to a common 2010 base year. This standardizes each construction project's costs and benefits regardless of when costs are incurred or benefits received, providing for a more accurate comparison of all construction projects regardless of phasing. Following the four opening year runs of the Cal-B/C Corridor Model, a modified methodology was used to evaluate the direct connector (construction projects 7b, 8, and 18) costs and benefits. This methodology is described in more detailed below.

The main categories of benefits evaluated in the study are:

1. Travel Time Savings Estimation

The Cal-B/C Corridor Model calculates travel time savings based upon selected volume data that is applied to the entire facility. The methodology compares travel times on each segment with and without modification. Travel times are calculated using average speed estimations based actual volumes as they relate to the capacity and the level of congestion. Travel time savings are monetized by taking into account the value of time of highway users commensurate with the average wage rate of the region in question.

2. Accident Reduction Benefits

Accident reduction benefits were not factored into the benefit-cost evaluation. The research on the safety impacts of HOV/express lane facilities is inconclusive and it is difficult to forecast future accident impacts of HOV/express lanes as traffic grows. It was therefore determined to be conservative and omit any potential accident reduction benefits associated with HOV/express lane facilities.

3. Emission Reduction Benefits

Emission reduction benefits including CO_2 were considered as part of this evaluation, and reflect the difference in emissions expected as a result of the completion of the express lane construction projects. These benefits accrue as a result of vehicles traveling at more efficient speeds due to the network improvements. Though some construction projects improve speed above the range of optimal emissions output, the network as a whole reduces overall emissions in the region. In general, as speeds increase from idling, emissions fall to a minimum around 55 mph, and then begin to rise again into higher average speeds.

4. Vehicle Operating Cost Savings

Vehicle operating cost savings consists of fuel and non-fuel components. The model may understate true benefits of vehicle operating cost savings, because it assumes steady state conditions and tends to equate higher speeds with higher fuel costs without considering the impact that lower speed stop and go traffic may have on fuel costs.

Methodological Exception

Several construction projects were not well-suited for input into the Cal-B/C Corridor Model. These include construction projects 7b, 8 and 18 as shown in Table 1. Construction project 7b represents conversion of the HOV bypass lane at the San Francisco/Oakland Bay Bridge. This construction project is not a typical freeway corridor that conforms to the requirements of the model, and inputs such as VMT, VHT and speed are not applicable. Instead, the annual Vehicle Hours of Delay (VHD) saved as a result of converting the HOV bypass lane to an express lane were estimated. This was accomplished by performing a toll plaza queuing analysis using existing and projected delay data. Estimated VHD savings were multiplied by the assumed average value of time to get an estimate of the benefits to users. Since VHD is the only input for this construction project, impacts on emissions and vehicle operating costs were not considered.

Similar to construction project 7b, construction projects 8 and 18 are also not typical freeway corridors that conform to the requirements of the Cal-B/C model, because VMT, VHT and speed are not calculated. These construction projects represent freeway-to-freeway direct connector ramps and the required Cal-B/C inputs are not applicable. Instead, the amount of time savings associated with implementation of the direct connectors was estimated and multiplied by the assumed average value of time to estimate benefits to users. The methodology for estimating time savings associated with the direct connectors assumed that vehicles would save an average of 10 minutes as a result of implementation in 2025. Emissions impacts and vehicle operating costs were not considered for these construction projects.

Present Value Calculations and Real Discount Rate Assumption

The Cal-B/C Corridor Model assumes a real discount rate of 4.0% for present value calculations. For consistency purposes, this evaluation does not deviate from this assumption. Moreover, 4.0% is an appropriate approximation for the real interest rate or the real time value of a resource in the absence of inflation plus a small allowance as a risk premium for uncertainty. A real discount rate (rather than a nominal discount rate) is the correct measure to use for present value calculations as all dollar amounts have been expressed in constant year 2010 dollars to eliminate the need to consider inflationary effects.

Benefit Measures

The primary objective of a benefit-cost analysis is to determine the economic feasibility of a proposed investment. An investment is considered economically feasible if the sum of its quantifiable benefits, measured over a reasonable evaluation period and discounted to their present values, exceed the investment and ongoing costs similarly discounted over the evaluation period. 21 total construction projects were evaluated.

The economic feasibility measures evaluated for the construction projects are presented below. These represent standard investment evaluation criteria, and can be applied to compare the present costs of the construction projects with their expected benefits.

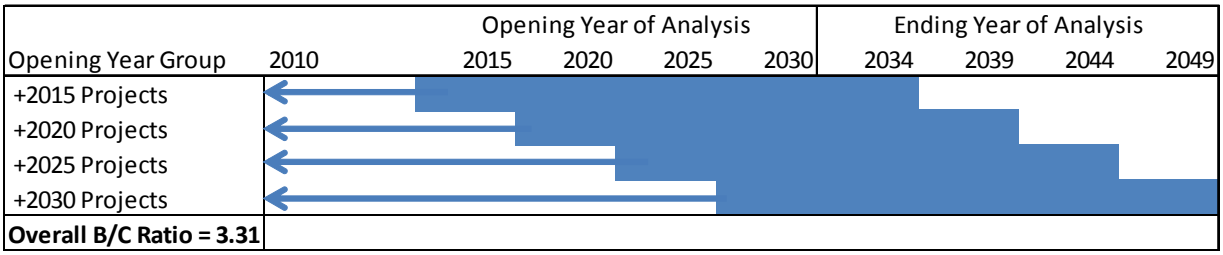
1. **Benefit-Cost Ratio (BCR)** - The BCR is defined as the present value of all benefits divided by the present value of all costs. It measures the factor by which benefits exceed (or are below) costs rather than focusing on what those values are. Values greater than 1.0 are considered economically feasible. The BCR is a useful measure for comparing the relative economic benefits produced by construction projects of different magnitude and timing.
2. **Net Present Value (NPV)** - In contrast to the BCR, the NPV is the present value of all benefits less the present value of all costs. Because the result is a dollar amount, both the ratio of the benefits and costs as well as the size of the construction project(s) considered affect the results. Values greater than $0.00 are considered economically beneficial. The NPV is a useful measure for comparing the overall dollar value of net benefits. It is possible for one investment to have a higher NPV but a lower BCR than another construction project, because the first construction project is of a larger overall scale in terms of investment cost.
3. **Internal Rate of Return (IRR)** - IRR gives the real discount rate for which a construction project's evaluation period present value benefits and costs break even (are equal), such that the BCR = 1.0 and the NPV = $0. This measure allows construction projects with different costs, different

benefit flows, and different evaluation time periods to be compared. It is also useful for considering whether or not construction projects that are not economically feasible could in fact be so under a less restrictive discount rate assumption. In other words, an IRR of less than 4.0% but greater than 0.0% indicates that undiscounted benefits exceed undiscounted costs, whereas a negative IRR indicates benefits that are altogether insufficient given the associated costs.

Overall Network Results

Table 2 shows the summary benefit-cost results of the Base Case for all construction projects over the 35 year period from 2015 to 2049. This is the timeframe which captures 20 years of operations for all construction projects, since some projects open in 2015, and others open as late as 2030. Overall results are discounted further from the preceding opening year summary tables to represent a constant 2010 overall cost benefit ratio. Figure 1 shows this discounting methodology visually.

Figure 1: Results Aggregation to 2010$



As seen in Table 2, the results of the aggregated construction projects are highly positive using any conventional measure of investment return. When including the direct freeway-to-freeway connectors and the San Francisco/Oakland Bay Bridge HOV bypass, the overall benefit-cost ratio is 2.94. When these construction projects are not included, the benefit-cost ratio is 3.31, meaning that the expected benefits of completing the network are 3.31 times the costs to build the network. The rate of return on investment for all construction projects is 23.9%, meaning that the discount rate used for future benefits could reach 24% before costs and benefits were equal. This is significantly greater than the real discount rate of 4% used in the analysis. The payback period of the Network as a whole, using a weighted average of all construction projects, is 12 years, meaning that all combined benefits in constant dollars will surpass combined costs in approximately 12 years. Approximately 85% of total benefits come from travel time savings, with the remaining benefits split between vehicle operating cost savings (12%) and emissions cost savings (4%).

Table 2: Overall Results of B/C Analysis (not including connectors)

INVESTMENT ANALYSIS

SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$1,617
Life-Cycle Benefits (mil. $)	$5,347
Net Present Value (mil. $)	$3,730
Benefit / Cost Ratio:	3.31
Rate of Return on Investment:	23.9%
Payback Period:	12 years

ITEMIZED BENEFITS (mil. $)	Average Annual	Total Over 35 Years
Travel Time Savings	$130	$4,555
Veh. Op. Cost Savings	$17	$611
Accident Cost Savings	-	-
Emission Cost Savings	$5	$182
TOTAL BENEFITS	$153	$5,347
Person-Hours of Time Saved	37,657,648	1,318,017,669
Additional CO_2 Emissions (tons)	(196,863)	(6,890,197)
Additional CO_2 Emissions (mil. $)	($2)	($81)

Note 1: Averages and totals computed over 35 year period to accommodate 20 years of operations for all construction projects
Note 2: Does not include direct connector construction projects or San Francisco/Oakland Bay Bridge HOV bypass

Key Findings

The following are the key findings associated with the benefit-cost analysis of the network of express lanes, as well as the direct connector construction projects:

- The overall network of express lanes, not including the direct connectors or San Francisco/Oakland Bay Bridge HOV bypass, is estimated to yield a benefit-cost ratio of 3.31, meaning that benefits related to all combined construction projects included in the analysis outweigh costs by 3.31x on a present value basis
- Adding the costs and benefits of the direct connectors decreases the benefit-cost ratio to 2.94. More detailed traffic data would be needed to fully evaluate the effects of the direct connectors on the network and benefit-cost analysis as a whole.
- The net present value of the benefits derived from the investment in the Network is approximately $3.7 billion.
- The great majority of benefits (approximately 85%) in the build case come from travel time savings associated with decreases in vehicle hours traveled. The remainder of the benefits is from reduced vehicle operating costs (12%) and reduced emissions (4%).

Construction projects could be prioritized in order of their benefit-cost ratios so that construction projects with higher ratios are prioritized. This process would allow the most beneficial construction projects to open first.

Results by Phases

The following section presents the benefit-cost evaluation results for each phased group of construction projects analyzed using the Cal-B/C Corridor Model. Each of the above economic feasibility measures are reported for each group based on opening year. The four groups evaluated are construction projects opening in 2015, 2020, 2025, and 2030.

The express lane construction projects assumed to open in 2015 include the following:

Table 3: 2015 Opening Year Construction Projects

Corridor	Construction Project No.	Description	Existing HOV Occupancy
I-80	7b*	San Francisco/Oakland Bay Bridge HOV bypass	HOV3+
I-680	14	Livorna Rd to Alcosta Blvd	HOV2+
I-580WB	21a	I-680 to Greenville Rd	HOV2+
I-880NB	22a	Lewelling to SR-237	HOV2+
I-880NB	23a	Hegenberger to SR-237	HOV2+

** Project 7b considered using different methodology*

Construction projects opening in 2015 show a benefit-cost ratio of 5.56, and an IRR of 34.7%, which greatly exceeds the real discount rate (or opportunity cost) of 4%. The NPV of these construction projects is also positive at approximately $1.4 billion. As seen in the table below, most of the benefits from the 2015 construction projects are derived from travel time savings, with vehicle operating and emissions savings providing the remainder of the benefits. See Table 4 for a summary of 2015 construction project results.

Table 4: 2015 Opening Construction Projects B/C Summary

INVESTMENT ANALYSIS

2015 OPENING YEAR SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$310
Life-Cycle Benefits (mil. $)	$1,722
Net Present Value (mil. $)	$1,412
Benefit / Cost Ratio:	5.56
Rate of Return on Investment:	34.7%
Payback Period:	5 years

ITEMIZED BENEFITS (mil. $)	Average Annual	Total Over 20 Years
Travel Time Savings	$64	$1,277
Veh. Op. Cost Savings	$17	$348
Accident Cost Savings	-	-
Emission Cost Savings	$5	$97
TOTAL BENEFITS	$86	$1,722
Person-Hours of Time Saved	9,135,079	182,701,575
Additional CO_2 Emissions (tons)	(93,381)	(1,867,614)
Additional CO_2 Emissions (mil. $)	($3)	($52)

The express lane construction projects assumed to open in 2020 include the following:

Table 5: 2020 Opening Year Construction Projects

Corridor	Construction Project No.	Description	Existing HOV Occupancy
I-80	2	Airbase Parkway to I-505	No existing HOV lane
I-80	4	SR-37 to I-680	No existing HOV lane
I-80	5	I-780 to SR-37	No existing HOV lane
I-80	6	SR-4 to I-780	HOV3+
I-80	7a	Bay Bridge to SR-4	HOV3+
I-80/I-680	8*	I-80/I-680 Freeway-to-Freeway Direct Connectors	No existing HOV lane
I-680	9	I-780 to I-80	No existing HOV lane
I-680NB	11	Marina Vista to N. Main St.	HOV2+
I-680SB	13	Marina Vista to Livorna Rd	No existing HOV lane
I-680NB	16	SR-237 to SR-84	No existing HOV lane
I-880NB	22b	Hegenberger to Lewelling	No existing HOV lane

**Project 8 considered using different methodology*

Construction projects opening in 2020 show a benefit-cost ratio of 3.54, and an IRR of 18.9%. The NPV of these construction projects is also positive at approximately $ 3.3 billion. Again, most of the benefits from the 2020 construction projects are derived from travel time savings, with vehicle operating and emissions savings providing the remainder of the benefits. See Table 6 for the 2020 opening year construction project benefit-cost summary.

Table 6: 2020 Opening Construction Projects B/C Summary

INVESTMENT ANALYSIS

2020 OPENING YEAR SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$1,285
Life-Cycle Benefits (mil. $)	$4,546
Net Present Value (mil. $)	$3,261
Benefit / Cost Ratio:	3.54
Rate of Return on Investment:	18.9%
Payback Period:	6 years

ITEMIZED BENEFITS (mil. $)	Average Annual	Total Over 20 Years
Travel Time Savings	$208	$4,152
Veh. Op. Cost Savings	$15	$291
Accident Cost Savings	-	-
Emission Cost Savings	$5	$103
TOTAL BENEFITS	$227	$4,546
Person-Hours of Time Saved	29,034,980	580,699,594
Additional CO_2 Emissions (tons)	(86,922)	(1,738,435)
Additional CO_2 Emissions (mil. $)	($2)	($46)

The express lane construction projects assumed to open in 2025 include the following:

Table 7: 2025 Opening Year Construction Projects

Corridor	Construction Project No.	Description	Existing HOV Occupancy
I-680	15	SR-84 to I-580	No existing HOV lane
I-680/I-580	18*	I-680/I-580 Freeway-to-Freeway Express Connectors	No existing HOV lane
I-580	19	Greenville Rd to San Joaquin Co. Line	No existing HOV lane

** Project 18 considered using separate methodology*

Construction projects opening in 2025 show a benefit-cost ratio of 10.5, and an IRR of 42.4%. The NPV of these construction projects is also positive at approximately $4.3 billion. The majority of the benefits from the 2025 construction projects are derived from travel time savings, with vehicle operating and emissions savings providing the remainder of the benefits. See Table 8 for a summary of benefits and costs for construction projects opening in 2025.

Table 8: 2025 Opening Construction Projects B/C Summary

INVESTMENT ANALYSIS

2025 OPENING YEAR SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$453
Life-Cycle Benefits (mil. $)	$4,754
Net Present Value (mil. $)	$4,302
Benefit / Cost Ratio:	10.50
Rate of Return on Investment:	42.4%
Payback Period:	3 years

ITEMIZED BENEFITS (mil. $)	Average Annual	Total Over 20 Years
Travel Time Savings	$194	$3,873
Veh. Op. Cost Savings	$34	$675
Accident Cost Savings	-	-
Emission Cost Savings	$10	$206
TOTAL BENEFITS	$238	$4,754
Person-Hours of Time Saved	27,152,445	543,048,892
Additional CO_2 Emissions (tons)	(179,614)	(3,592,287)
Additional CO_2 Emissions (mil. $)	($5)	($101)

Only Project 1 (I-80 from I-505 to Yolo Co.Line) is currently planned to open in 2030. This construction project shows a benefit-cost ratio of 0.02. The NPV of this construction project is calculated at $-249 million.

Table 9: 2030 Opening Year Construction Projects

Corridor	Construction Project No.	Description	Existing HOV Occupancy
I-80	1	I-505 to Yolo Co.Line	No existing HOV lane

Table 10: 2030 Opening Construction Projects B/C Summary

INVESTMENT ANALYSIS

2030 OPENING YEAR SUMMARY RESULTS

Life-Cycle Costs (mil. $)	$256
Life-Cycle Benefits (mil. $)	$6
Net Present Value (mil. $)	($249)
Benefit / Cost Ratio:	0.02
Rate of Return on Investment:	N/A
Payback Period:	20+ years

ITEMIZED BENEFITS (mil. $)	Average Annual	Total Over 20 Years
Travel Time Savings	$4	$84
Veh. Op. Cost Savings	($3)	($61)
Accident Cost Savings	-	-
Emission Cost Savings	($1)	($16)
TOTAL BENEFITS	$0	$6
Person-Hours of Time Saved	578,380	11,567,608
Additional CO_2 Emissions (tons)	15,407	308,139
Additional CO_2 Emissions (mil. $)	$0	$9

Direct Connectors Methodology and Results

A separate methodology was developed to estimate the benefits for the freeway-to-freeway direct connector ramps and the Bay Bridge HOV bypass (construction projects 7b, 8 and 18), as noted earlier, since these construction projects were unsuitable for input into the Cal-B/C Corridor Model. As only time savings could be estimated for these direct connectors, a simplified methodology was developed which only takes into account time savings for drivers in the region (in terms of hours of delay), leaving out any operating cost savings or emissions savings that could potentially accrue as a result of construction projects 7b, 8, and 18.

Using the mean hourly wage from the Bureau of Labor Statistics (BLS) May 2010 State Occupational Employment and Wage Estimates[2], the average hourly wage in California was determined to be $24.39 in 2010 dollars. This value was used as the base value of time for the analysis. To account for the fact that not all trips are work related, the automobile value of time was determined to be $12.20 using the methodology followed by the Cal-B/C model which assigns ½ of the average hourly wage as the

[2] *http://www.bls.gov/oes/current/oes_ca.htm#00-0000*

automobile value of time. Trucks were not included as part of the analysis as they are not permitted to use the HOT lanes. For consistency of methodology with the other express lanes projects, only automobile benefits were considered. It was also determined that the average vehicle occupancy (AVO) across all lanes (HOV and general purpose) would be 1.3 occupants. This AVO is the same parameter as the one used to calculate the benefits for the freeway projects in the Cal-B/C analysis.

The estimated operating and maintenance costs were subtracted from estimated time savings benefits in each year of the analysis for each construction project, and a net present value (NPV) of benefits was computed for each connector. This 2010 NPV was compared to each construction project's capital cost in 2010 dollars to arrive at a benefit-cost ratio for the connectors.

The below table shows a summary of the results for the direct connector economic analysis:

Table 11: Direct Connector Costs and Benefits

Corridor	Construction Project No.	Description	PV of Benefits (2010$ millions)	PV of Operating Costs (2010$ millions)	B/C Ratio	Opening Year
I-80	7b	San Francisco/Oakland Bay Bridge HOV bypass	$177.4	$9.4	N/A	2015
I-80/ I-680	8	I-680/I-580 Freeway-to-Freeway Express Connectors	$3.2	$4.2	(0.01)	2020
I-580/ I-680	18	Greenville Rd to San Joaquin Co. Line	$11.0	$2.4	0.05	2025

As seen in Table 11, while construction project 7b has an extremely high value of benefits related to its operating costs, construction projects 8 and 18 do not exhibit favorable rates of return on investment. This is generally because the costs of implementing and maintaining these construction projects far outweigh the projected future benefits. It should be noted that the methodology used to calculate benefits for these projects did not consider operating cost savings or emissions savings, so additional benefits might be captured. If these construction projects are included in the overall analysis, the cost benefit ratio falls to approximately 2.94. While this is an approximation, more detailed data on the full spectrum of traffic effects for these connectors in the context of the entire network would be needed to perform a comprehensive benefit-cost analysis.

Attachment 10

MTC Resolution No. 4030

Date: September 28, 2011
Referred by: Planning Committee

ABSTRACT

Resolution No. 4030

This resolution authorizes the Metropolitan Transportation Commission to submit an application to the California Transportation Commission (CTC) to develop and operate high-occupancy toll lanes (also called express lanes) in the Bay Area, consistent with California Streets and Highways Code Sections 143(a)(4)(A) and 149.7.

Discussion of this resolution is contained in the Deputy Executive Director's Memorandum to the Planning Committee dated August 29, 2011 and the Deputy Executive Director's Memorandum to the Commission dated September 23, 2011.

Date: September 28, 2011
Referred by: Planning Committee

Re: Authorization to Submit an Application to the California Transportation Commission to Develop and Operate High-Occupancy Toll Lanes

METROPOLITAN TRANSPORTATION COMMISSION
RESOLUTION NO. 4030

WHEREAS, Section 149.7 of the Streets and Highways Code (S&H Code) allows a regional transportation agency, in cooperation with the Department of Transportation (Caltrans), to apply to the California Transportation Commission (CTC) to develop and operate high-occupancy toll lanes, including the administration and operation of a value pricing program; and

WHEREAS, S&H Code Section 143(a)(4)(A) defines "regional transportation agency" to include a transportation planning agency as defined in Government Code Section 29532.1;

WHEREAS, the Metropolitan Transportation Commission (MTC) is the regional transportation planning agency for the San Francisco Bay Area pursuant to Government Code Sections 29532.1 and 66500 *et seq.*; and

WHEREAS, the current long-range transportation plan, *Transportation 2035* includes an integrated, seamless system of express lanes; and

WHEREAS, MTC is committed to planning, developing and operating a regional system of express lanes in coordination with Caltrans, the California Highway Patrol (CHP), and county congestion management agencies, among other regional partners; and

WHEREAS, MTC, acting as a regional transportation agency pursuant to S&H Code Section 143(a)(4)(a), wishes to apply to the CTC for authority to develop and operate high-occupancy toll lanes pursuant to S&H Code Section 149.7;

WHEREAS, MTC intends to establish policies and procedures to consult with Caltrans, the CHP, and the county congestion management agencies, among other region partners, prior to making major policy decisions regarding the development and operation of the Express Lane

Network, including: phasing and design; project development; operations, including toll policies, and other corridor improvements; now therefore, be it

RESOLVED, that MTC hereby authorizes the submission by MTC to the CTC of an application to develop and operate high-occupancy toll lanes, including the administration and operation of a value pricing program pursuant to S&H Code Section 149.7, as described in Attachment A; and be it further

RESOLVED, that MTC delegates to its Planning Committee the authority to approve any revisions to Attachment A necessitated by CTC or Caltrans, which revisions are incorporated herein by this reference; and be if further

RESOLVED, the Executive Director or his designated representative shall forward a copy of this resolution, and such other information as may be required, to the CTC and to such other agencies as may be appropriate.

METROPOLITAN TRANSPORTATION COMMISSION

Adrienne J. Tissier, Chair

The above resolution was approved by the
Metropolitan Transportation Commission
at a regular meeting of the Commission held
in Oakland, California, on September 28, 2011.

Date: September 28, 2011
W.I.: 1236
Referred by: Planning Committee

Attachment A
Resolution No. 4030
Page 1 of 1

Bay Area Express Lanes
Application to the California Transportation Commission (CTC)

Attachment A is MTC's application to the CTC to develop and operate high-occupancy toll lanes in the Bay Area, consistent with California Streets and Highways Code Sections 143(a)(4)(A) and 149.7. Copies of the application are available in the MTC-ABAG Library.

Attachment 11

Bay Area Infrastructure Authority (BAIFA) Joint Exercise of Powers (as amended on September 28, 2011 by MTC Resolution No. 3769 and BATA Resolution No. 70)

JOINT EXERCISE OF POWERS AGREEMENT

between

METROPOLITAN TRANSPORTATION COMMISSION

and

BAY AREA TOLL AUTHORITY

Dated as of August 1, 2006,

as amended September 28, 2011

Creating the

BAY AREA INFRASTRUCTURE FINANCING AUTHORITY

This JOINT EXERCISE OF POWERS AGREEMENT dated as of August 1, 2006, as amended September 28, 2011 (this "Agreement") between METROPOLITAN TRANSPORTATION COMMISSION ("MTC") and BAY AREA TOLL AUTHORITY ("BATA")

W I T N E S S E T H:

WHEREAS, MTC was created pursuant to the Metropolitan Transportation Commission Act (California Government Code section 66500 et seq. (the "MTC Act")) and has the power to accept grants, contributions, and appropriations from any public agency, private foundation, or individual under California Government Code section 66506 and to seek to assist in the development of adequate funding sources to develop, construct, and support transportation projects that it determines essential pursuant to California Government Code section 66530; and

WHEREAS, BATA was created pursuant to Chapter 4.3 of Division 17 of the California Streets and Highways Code (California Streets and Highways Code section 30950 et seq. (the "BATA Act")) and has the power under California Streets and Highways Code section 30951 to apply for, accept, receive, and disburse grants, loans, and other assistance from any agency of the United States or of the State of California, and to plan projects within its jurisdiction under California Streets and Highways Code section 30950.3; and

WHEREAS, pursuant to the California Joint Exercise of Powers Act, consisting of Sections 6500 through 6599.2 of the California Government Code, as amended from time to time (the "Joint Powers Act"), two or more public agencies may enter into an agreement to establish an agency to exercise any power common to the contracting parties; and

WHEREAS, each of MTC and BATA is a "public agency" as that term is defined in Section 6500 of the Joint Powers Act; and

WHEREAS, a public entity established by MTC and BATA pursuant to the Joint Powers Act is empowered, in exercising the authorized common powers of its members and the powers separately conferred by statute upon such entity, to undertake the activities specified in this Agreement, including without limitation, the issuance of Bonds (as used herein "Bonds" means bonds as defined in Section 6585(c) of the Joint Powers Act or issued in accordance with the California Transportation Financing Authority Act (Division 3 of Title 6.7 of the Government Code, the "CTFA Act") or other applicable provisions of law); and

WHEREAS, each of MTC, with the approval of MTC Resolution No. 3769 adopted on July 26, 2006 and amended September 28, 2011 and BATA, with the approval of BATA Resolution No. 70, adopted on July 26, 2006 and amended September 28, 2011, has determined that it is to the advantage of such public agency and in the public interest of the area and persons served by such public agency, to enter into this Agreement in order to establish an agency (the "Bay Area Infrastructure Financing Authority," "BAIFA" or the "Authority") that will undertake programs and projects, including the development, financing, and operation of high-occupancy toll lanes in MTC's jurisdiction, as herein provided by exercising the common powers of MTC and BATA relating to such programs and projects and such other powers as are granted to the Authority by or pursuant to the Joint Powers Act, the CTFA Act, Streets and Highways Code section 149.7 (the "Express Lanes Statute"), and other laws;

NOW, THEREFORE, MTC and BATA, for and in consideration of the mutual promises and agreements herein contained, do agree as follows:

SECTION 1. PURPOSE.

This Agreement is made pursuant to the Joint Powers Act to provide for the joint exercise of powers common to MTC and BATA and the powers separately conferred by or pursuant to law upon the Authority to plan projects and obtain funding in the form of grants, contributions, appropriations, loans and other assistance from the United States and from the State of California and apply money received to pay debt service on Bonds issued by the Authority to finance or refinance public capital improvements (as defined in the Joint Powers Act) and to develop and operate high-occupancy toll lane facilities pursuant to the Express Lanes Statute and to finance and refinance those facilities pursuant to the Joint Powers Act, the CTFA Act, and other laws. The purpose of this Agreement is to plan, develop, operate, and fund such projects and facilities and to exercise such powers jointly by pooling efforts and activities to achieve those ends. This purpose will be accomplished and said powers exercised in the manner set forth in this Agreement and in accordance with the Joint Powers Act, the CTFA Act, the Express Lanes Statute, and all other applicable laws of the State of California.

SECTION 2. TERM.

This Agreement shall become effective as of the date hereof and shall continue in full force and effect for a period of 50 years from such date unless extended or earlier terminated by a supplemental written agreement of MTC and BATA, provided that this Agreement shall not terminate or be terminated until the date on which: (i) all Bonds issued by the Authority shall have been paid or deemed paid in accordance with the resolution, indenture or other instrument or proceeding authorizing or securing such Bonds (each such resolution, indenture, instrument and proceeding being herein referred to as an "Indenture"); and (ii) all other indebtedness and liabilities incurred by the Authority shall have been paid or provided for. The Authority shall cause all records regarding its formation, existence, operations and proceedings pertaining to its termination to be retained for at least six years following termination of the Authority.

SECTION 3. AUTHORITY.

A. Creation of Authority.

There is hereby created under and pursuant to the Joint Powers Act an authority and public entity, separate and apart from MTC and BATA, to be known as the Bay Area Infrastructure Financing Authority ("BAIFA" or the "Authority"). The Authority's debts, liabilities and obligations shall not constitute debts, liabilities or obligations of MTC or BATA.

Within 30 days after the effective date of this Agreement, or any amendment hereto, the Authority will cause a notice of this Agreement or amendment to be prepared and filed with the office of the Secretary of State of the State of California in the manner set forth in Section 6503.5 of the Joint Powers Act.

B. Governing Board

The Authority shall be administered by a governing board (the "Board"), which shall consist of six members: the chair and the vice chair of MTC; the chair and the vice chair of

the BATA oversight committee; and the chair and the vice chair of the MTC programming and allocations committee. If either the BATA oversight committee or the MTC programming and allocations committee is reconstituted, the succeeding committee shall be responsible for the respective appointments to the Board. The members of the Board shall serve without compensation, but shall receive reimbursement for actual and necessary expenses incurred in connection with the performance of their duties. However, in lieu of this reimbursement for attendance at Authority or committee meetings, each member may receive a per diem of one hundred dollars ($100), but not to exceed a combined total of five meetings in any one calendar month, plus the necessary traveling expenses as may be authorized by the Authority.

C. Meetings of Board

(1) Regular Meetings and Special Meetings. The Board shall hold at least one regular meeting each year, and, by resolution, may provide for the holding of regular meetings at more frequent intervals. The date, hour and place of each such regular meeting shall be fixed by resolution of the Board but may be changed by the chair or vice chair of the Authority upon not less than 48 hours prior notice in order to coordinate the date, hour and place of the meeting with the date, hour and place of an MTC meeting or a BATA meeting. Special meetings of the Board may be called by the chair or the vice chair of the Authority or by a majority of the members of the Board on the date and at the hour and place fixed by notice to all of the members of the Board.

(2) Legal Notice. All regular and special meetings of the Board shall be called, noticed, held and conducted subject to the provisions of the Ralph M. Brown Act (codified at California Government Code sections 54950 and following).

(3) Minutes. The secretary of the Authority shall cause minutes of all meetings of the Board to be kept and shall, as soon as practicable after each meeting, cause a copy of the minutes to be forwarded to each member of the Board and to MTC and BATA.

(4) Quorum. A majority of the members of the Board shall constitute a quorum for the transaction of business.

D. Officers; Duties

(1) The chair of MTC shall be the chair of the Authority. The vice chair of MTC shall be the vice chair of the Authority. The Board shall by resolution appoint a secretary of the Authority.

(2) The Chief Financial Officer of MTC is hereby designated as Treasurer of the Authority. The Treasurer is designated as the depositary of the Authority to have custody of all the money of the Authority, from whatever source, and, as such, shall have the powers, duties and responsibilities specified in Section 6505.5 of the Joint Powers Act.

(3) The Chief Financial Officer of MTC is hereby designated as Auditor of the Authority, and, as such, shall have the powers, duties and responsibilities specified in Section 6505 and Section 6505.5 of the Joint Powers Act. The Auditor shall draw checks to pay demands against the Authority when the demands have been approved by the Authority.

(4) MTC shall determine the charges, if any, to be made against the Authority for the services of the Treasurer and Auditor. MTC may provide staff for the Authority and shall determine the charges to be paid by the Authority for such services.

(5) The Treasurer and Auditor of the Authority are designated as the public officers or persons who have charge of, handle, or have access to any property of the Authority, and such officers shall file an official bond as required by Section 6505.1 of the Joint Powers Act in the amount of $25,000.

(6) The Treasurer of the Authority is hereby authorized and directed to prepare or cause to be prepared a report in writing on the first day of July, October, January, and April of each year to the Board and the Authority, which report shall describe the amount of money held by the Treasurer and Auditor of the Authority for the Authority, the amount of receipts since the last such report, and the amount paid out since the first such report.

(7) The Executive Director of MTC is hereby designated as Executive Director of the Authority.

(8) The General Counsel for MTC shall be and act as General Counsel to the Authority.

(9) The Board shall have the power to appoint such other officers and employees as it may deem necessary.

E. Conflict of Interest Code.

MTC's conflict of interest code shall apply to the Authority.

F. Rules And Regulations.

The Authority may adopt, from time to time, by resolution of the Board, such rules and regulations for the conduct of its meetings and affairs as the Board determines are necessary or convenient.

SECTION 4. POWERS.

The Authority shall have any and all powers that are common powers of MTC and BATA, and the powers separately conferred by law upon the Authority, with respect to obtaining funding in the form of grants, contributions, appropriations, loans and other assistance from the United States and from the State of California and applying money received to pay debt service on Bonds issued by the Authority to finance or refinance public capital improvements (as defined in the Joint Powers Act), to issuing such Bonds, to developing and operating high-occupancy toll lane facilities pursuant to the Joint Powers Act and the Express Lanes Statute and other laws and to finance and refinance those facilities pursuant to the Joint Powers Act, the CTFA Act and other laws. All such powers, whether common to the Parties or separately conferred by or pursuant to law upon the Authority, are specified as powers of the Authority except any such powers which are specifically prohibited to the Authority by applicable law.

The Authority is hereby authorized, in its own name, to do all acts necessary or convenient for the exercise of its powers, including, but not limited to, any or all of the

following: to sue and be sued; to make and enter into contracts; to employ agents, consultants, attorneys, accountants, and employees; to acquire, hold or dispose of property, whether real or personal, tangible or intangible, wherever located; to issue Bonds or otherwise incur debts, liabilities or obligations to the extent authorized under the CTFA Act or by the Joint Powers Act, including Article 2 and Article 4 thereof, or any other applicable provision of law and to pledge any grants, contributions, appropriations, loans or other assistance or toll lane facilities or other property or toll revenues or other revenues or the rights thereto as security for such Bonds and other indebtedness; and to receive grants, contributions, appropriations, loans and other assistance from the United States and from the State of California and any other persons, firms, corporations or governmental entities. The Authority shall have all additional powers conferred under the Joint Powers Act or the CTFA Act or implied therefrom.

The Authority shall continue to exercise the powers herein conferred upon it until the end of the term of this Agreement as provided in Section 2.

SECTION 5. MANNER OF EXERCISING POWERS.

To the extent required by the Joint Powers Act, the manner in which the Authority shall exercise its powers and perform its duties is and shall be subject to the restrictions upon the manner in which BATA could exercise such powers and perform such duties pursuant to Section 6509 of the Joint Powers Act. The manner in which the Authority shall exercise its powers and perform its duties shall not be subject to any restrictions applicable to the manner in which any other public agency could exercise such powers or perform such duties, whether such agency is a party to this Agreement or not.

SECTION 6. FISCAL YEAR.

For the purposes of this Agreement, the term "Fiscal Year" shall mean the fiscal year of the Authority being, until changed by resolution of the Board, the period from July 1 to and including the following June 30 except for the first Fiscal Year which shall be the period from the date of this Agreement to and including June 30, 2007.

SECTION 7. CONTRIBUTIONS AND ADVANCES.

Contributions or advances of funds and property may be made to the Authority by MTC and BATA for any of the purposes of this Agreement and shall be deposited by the Authority in a fund hereby authorized to be established and operated by the Authority as the BAIFA Operating Fund. Any such advance may, but need not, be made subject to repayment, and if made subject to repayment shall be repaid in the manner agreed upon by the contributor and the Authority at the time of making such advance. It is mutually understood and agreed that neither MTC nor BATA has any obligation to make advances or contributions to the Authority. MTC and BATA may allow the use of personnel, equipment or property in lieu of other contributions or advances to the Authority. After termination of this Agreement pursuant to Section 2, any surplus money in possession of the Authority shall be returned to MTC and BATA in proportion to the unreimbursed advances each has made or as otherwise agreed to by MTC and BATA.

SECTION 8. DISPOSITION OF ASSETS.

Upon the termination of this Agreement as set forth in Section 2, after payment of all expenses and liabilities of the Authority, all property of the Authority both real and personal shall be distributed to MTC, subject to the provisions of Section 7.

SECTION 9. BONDS.

A. Authority To Issue Bonds.

When authorized by or pursuant to the CTFA Act or the Joint Powers Act or other applicable provisions of law and by resolution of the Board, the Authority may issue Bonds for the purpose of raising funds for the exercise of any of its powers or to otherwise carry out its purposes under this Agreement. Said Bonds shall have such terms and conditions as are authorized by the Board.

B. Bonds Limited Obligations.

The Bonds, including the principal and any purchase price thereof, and the interest and premium, if any, thereon, shall be special obligations of the Authority payable solely from, and secured solely by, the revenues, funds and other assets pledged therefor under the applicable Indenture(s) and shall not constitute a charge against the general credit of the Authority. The Bonds shall not be secured by a legal or equitable pledge of, or lien or charge upon or security interest in, any property of the Authority or any of its income or receipts except the property, income and receipts pledged therefor under the applicable Indenture(s). The Bonds shall not constitute a debt, liability or obligation of the State or any public agency thereof, including MTC and BATA, other than the special obligation of the Authority as described above. Neither the faith and credit nor the taxing power of the State of California or any public agency thereof, including MTC and BATA, shall be pledged to the payment of the principal or purchase price of, or the premium, if any, or interest on the Bonds nor shall the State of California or any public agency or instrumentality thereof, including MTC and BATA, in any manner be obligated to make any appropriation for such payment. The Authority shall have no taxing power.

No covenant or agreement contained in any Bond or Indenture shall be deemed to be a covenant or agreement of any director, officer, agent or employee of the Authority, in his or her individual capacity and no director or officer of the Authority executing a Bond shall be liable personally on such Bond or be subject to any personal liability or accountability by reason of the issuance of such Bond.

SECTION 10. SWAPS AND OTHER FINANCIAL PRODUCTS.

In the exercise of a common power of MTC and BATA or when the Authority is separately authorized by the Joint Powers Act or other applicable provisions of law, the Authority, when authorized by resolution of the Board, may enter into hedging or other arrangements authorized by California Government Code sections 5920-5923 on terms and conditions authorized by the Board.

SECTION 11. ACCOUNTS AND REPORTS.

A. Books And Records.

All funds of the Authority shall be strictly accounted for in books of account and financial records maintained by the Authority, including a report of all receipts and disbursements. The Authority shall establish and maintain such funds and accounts as may be required by generally accepted accounting principles and by each Indenture for outstanding Bonds (to the extent such duties are not assigned to a trustee for owners of Bonds). The books and records of the Authority shall be open to inspection at all reasonable times by MTC and BATA.

The Authority shall require that each Indenture provide that the trustee appointed thereunder shall establish suitable funds, furnish financial reports and provide suitable accounting procedures to carry out the provisions of such Indenture. Said trustee may be given such duties in said Indenture as may be desirable to carry out the requirements of this Section.

B. Audits.

The Auditor of the Authority shall cause an independent audit to be made of the books of accounts and financial records of the Authority in compliance with the requirements of the Joint Powers Act. Any costs of the audit, including contracts with, or employment of, certified public accountants or public accountants in making an audit pursuant to this Section, shall be borne by the Authority and shall be a charge against any unencumbered funds of the Authority available for that purpose.

C. Audit Reports.

The Treasurer of the Authority, as soon as practicable after the close of each Fiscal Year but in any event within the time necessary to comply with the requirements of the Joint Powers Act shall file a report of the audit performed pursuant to Subsection B of this Section 11 as required by the Joint Powers Act and shall send a copy of such report to public entities and persons in accordance with the requirements of the Joint Powers Act.

SECTION 12. FUNDS.

Subject to the provisions of each Indenture for outstanding Bonds providing for a trustee to receive, have custody of and disburse funds which constitute Authority funds, the Treasurer of the Authority shall receive, have the custody of and disburse Authority funds pursuant to accounting procedures approved by the Board and shall make the disbursements required by this Agreement or otherwise necessary to carry out the provisions and purposes of this Agreement.

SECTION 13. NOTICES.

Notices and other communications hereunder to the parties shall be sufficient if delivered to the clerk or secretary of the governing body of each party.

SECTION 14. WITHDRAWAL

Neither MTC nor BATA may withdraw from this Agreement prior to the end of the term of this Agreement determined in accordance with Section 2.

SECTION 15. INDEMNIFICATION.

To the full extent permitted by law, the Board may authorize indemnification by the Authority of any person who is or was a director, officer, employee or other agent of the Authority, and who was or is a party or is threatened to be made a party to a proceeding by reason of the fact that such person is or was such a director, officer, employee or other agent of the Authority, against expenses, judgments, fines, settlements and other amounts actually and reasonably incurred in connection with such proceeding, if such person acted in good faith and in a manner such person reasonably believed to be in the best interests of the Authority and, in the case of a criminal proceeding, had no reasonable cause to believe the conduct of such person was unlawful and, in the case of any action by or in the right of the Authority, acted with such care, including reasonable inquiry, as an ordinarily prudent person in a like position would use under similar circumstances.

SECTION 16. IMMUNITIES.

All of the privileges and immunities from liabilities, exemptions from laws, ordinances and rules, all pension, relief, disability, workers' compensation, and other benefits which apply to the activity of officers, agents, employees or other representatives of MTC or BATA when performing their respective functions within the territorial limits of their public agency, shall apply to them to the same degree and extent while engaged as a director, officer, agent, employee or other representative of the Authority or while engaged in the performance of any of their functions or duties under the provisions of this Agreement whether within or outside of the boundaries of MTC or BATA.

SECTION 17. COUNSEL, CONSULTANTS AND ADVISORS.

The Authority may employ the services of independent counsel, including bond and other special counsel, financing, engineering, construction, utility and other consultants and advisors, and accountants and auditors in connection with the programs undertaken pursuant to this Agreement, including the issuance of Bonds and the entry into financial products authorized by Section 10 hereof. The fees and expenses of such counsel, consultants, advisors, accountants and auditors, and the expenses of the Authority in connection with such programs and projects, shall be paid from the proceeds of Bonds or any other unencumbered funds of the Authority available for such purpose.

SECTION 18. AMENDMENTS.

This Agreement shall not be amended, modified, or altered except by a written instrument duly executed by MTC and BATA.

SECTION 19. EFFECTIVENESS.

This Agreement shall become effective and be in full force and effect and a legal, valid and binding obligation of MTC and BATA at 9:00 a.m., California time, on the first date as of which each of MTC and BATA has delivered to the other party an executed counterpart of

this Agreement, together with a certified copy of a resolution of the governing body of such party approving this Agreement and the execution and delivery hereof.

SECTION 20. PARTIAL INVALIDITY.

If any one or more of the terms, provisions, promises, covenants or conditions of this Agreement shall to any extent be adjudged invalid, unenforceable, void or voidable for any reason whatsoever by a court of competent jurisdiction, each and all of the remaining terms, provisions, promises, covenants and conditions of this Agreement shall not be affected thereby, and shall be valid and enforceable to the fullest extent permitted by law.

SECTION 21. SUCCESSORS.

This Agreement shall be binding upon and shall inure to the benefit of the successors of MTC and BATA. Except to the extent expressly provided herein, neither party may assign any right or obligation hereunder without the consent of the other.

SECTION 22. MISCELLANEOUS.

This Agreement may be executed in several counterparts, each of which shall be an original and all of which shall constitute but one and the same instrument.

Where reference is made to duties to be performed for the Authority by a public official or employee, such duties may be performed by that person's duly authorized deputy or assistant. Where reference is made to actions to be taken by MTC or BATA, such action may be exercised through the officers, staff or employees of MTC or BATA, as the case may be, in the manner provided by law.

The section and subsection headings herein are for convenience only and are not to be construed as modifying or governing the language in the section or subsection referred to.

This Agreement is made in the State of California, under the Constitution and laws of the state and is to be construed as a contract made and to be performed in the State of California.

This Agreement is the complete and exclusive statement of the agreement among the parties with respect to the subject matter hereof, which supersedes and merges all prior proposals, understandings, and other agreements, whether oral, written, or implied in conduct, between the parties relating to the subject matter of this Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement, as amended, to be executed by their proper officers thereunto duly authorized on September 28, 2011.

METROPOLITAN TRANSPORTATION COMMISSION

By_____
Name: Steve Heminger
Title: Executive Director

By_____
Name: Brian Mayhew
Title: Chief Financial Officer
Attest:

By_____
Name: Rosy Leyva
Title: Secretary

BAY AREA TOLL AUTHORITY

By_____
Name: Steve Heminger
Title: Executive Director

By_____
Name: Brian Mayhew
Title: Chief Financial Officer
Attest:

By_____
Name: Rosy Leyva
Title: Secretary