Interstate 205 and Interstate 5 HOT Lane Feasibility Review

Prepared for:
San Joaquin Council of Governments

Submitted by:
HNTB
in Association with
Fehr & Peers

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1 Executive Summary

San Joaquin County is facing increasing levels of congestion as the population, employment, and mobility needs of the County increases over time. Yet insufficient revenues from "traditional sources" to finance the necessary improvements to meet these growing mobility needs within the county exist. In light of this, the San Joaquin Council of Governments (SJCOG) considered the feasibility of high occupancy toll lanes (HOT Lanes or Managed Lanes) as a potential resource for new funding and/or improved mobility. In particular, the SJCOG's primary goal is to determine whether toll revenues from toll facilities could help finance the capital costs of the larger Interstate 5 (I-5) North freeway widening project.

The SJCOG assessed potential applications of HOT Lanes on I-5 in the Stockton area and on Interstate 205 (I-205) between Stockton and the Interstate 580 (I-580) connection to the Alameda County line. Based on the sketch-level financial analysis, the I-205 HOT lane concept appears to be feasible to be implement over the next 20 to 25 years, while the I-5 HOT lane concept appears to be feasible to implement over a longer timeframe. However, traffic operations analysis indicated the HOT lane concept will be an effective congestion management strategy earlier than the financial analysis indicated. Based on the traffic operations analysis, I-205 may need widening sometime between 2020 and 2025 and present a great opportunity for installation of HOV/HOT lanes. The widening of I-205 needs to be closely coordinated with widening of I-580 in Alameda County. The traffic operations analysis indicates that the I-5 corridor may benefit from a HOT lane as early as 2015 in the northbound direction. In general, HOT lanes function effectively when an extended period of congestion (approximately 2+ hours) exists. By monitoring intensity and duration of traffic congestions, the SJCOG can take next steps at an appropriate timing.

These conclusions are drawn from the sketch-level feasibility analysis. Prior to implementation, more-detailed traffic, revenue, environmental and engineering/design analyses will be required to refine the forecasts and assumptions supporting these conclusions and actually implementing the HOT lanes. Policy questions focused principally on the purpose of tolling in San Joaquin County and the timing of shifting from requiring two or more passengers (an HOV 2+ threshold) to requiring three or more passengers (an HOV 3+ threshold) will also need to be addressed. Operational and implementation issues including, but not limited to, institutional operating scenarios, the level of reconstruction on I-205 that is required and attributed to the HOT lanes (specifically the bridge structures) and the desire/feasibility/benefits of funding strategies such as public-private-partnerships (P3) will also need to be completed. These assessments and policy question outcomes may or may not ultimately support the conclusions drawn herein. However, based on this initial assessment, the SJCOG should further the discussion with its transportation partners and move forward with more-detailed analyses as funding becomes available.

Purpose of this Project and Report

The purpose of the *HOT Lane Feasibility Review for Interstate 205 and Interstate 5* is to provide an initial assessment of the feasibility of implementing HOT lanes in two corridors in San Joaquin County. As defined in this report, "feasibility" is a decision to be made by the SJCOG and is a function of future traffic forecasted for the corridors, the "willingness to pay" of potential HOT lane users, the costs associated with implementing and maintaining HOT lanes, and the resulting cash flow from these revenues and costs. This report documents the technical work conducted and provides the reader with an understanding of the HOT lanes and their potential.

This report is divided into six sections:

- Section 1 — Executive Summary provides a summary overview of the study process and results.
- Section 2 — Introduction and Background provides an overview of the methodologies and assumptions employed, as well as an overview of HOT lanes and the purposes for tolling that exist.
- Section 3 — HOT Lanes in California and Elsewhere provides a summary of the HOT lane projects operating in the United States and presents a matrix of these of projects.
- Section 4 — I-205 HOT Lanes Feasibility focuses on I-205 and discusses the rationale for HOT lanes, the traffic and revenue forecasts, the estimates of costs for implementing HOT lanes and the net revenues that could potentially be generated. A number of scenarios have been evaluated and the results and "next steps" are discussed.
- Section 5 — I-5 HOT Lanes Feasibility focuses on similar aspects as I-205 but on a segment of the I-5 in Stockton.
- Section 6 — HOT Lane Implementation Issues and Strategies focuses on the overall strategies for the SJCOG in moving forward with this concept.
- Section 7 – Next Steps provides specific actions for each of the corridors in developing.

I-205 and I-5 Corridors

Two distinct corridors, illustrated in Figure 1, were evaluated in this feasibility study. The I-205 corridor is an approximate 13-mile corridor extending from the I-205/I-5 interchange on the east to the I-205/I-580 interchange on the west. This corridor serves as both an intra-regional corridor serving trips within the general Tracy area, as well as between Tracy and Stockton. I-205 is also an inter-regional corridor serving both commute trips to and from the San Francisco Bay Area, as well as trade, recreation and other trips destined throughout California.

Figure 1: I-205 and I-5 Corridor Evaluated for HOT Lanes

Map Source: Google, 2010.

I-5 serves a similar market comprised of north-south trade, recreation and other trips, as well as commute trips to and from the Sacramento and Stockton regions, and the Bay Area. By late 2013, a six-lane segment of I-5 between Hammer Lane and Country Club will be widened to add two HOV lanes. Four-lane segments of I-5 will be converted to six GP lanes and two HOV lanes, providing continuous HOV facilities in Stockton between Hammer Lane and north of Eight Mile Road. The HOT lane evaluation in this corridor consisted of an approximate 16-mile corridor from Eight-Mile Road in the north to Lathrop Road in the south. In both the I-205 and the I-5 evaluations, bi-directional analyses were conducted and the results reflect this bi-directionality.

Key Findings

There are a number of findings that have been derived from this assessment and they are detailed in this document. Table 1 presents the key findings for both the I-205 and the I-5 corridor.

Table 1: Key Findings for I-205 and I-5 HOT Lane Feasibility Review

Corridor	Key Findings
I-205	**Traffic** — Forecasted to switch to HOV 3+ at approximately 2030 with a 1,400 vph and at approximately 2040 with a 1,650 vph threshold tested. May need to widen I-205 in both directions sometime between 2020 and 2030 to accommodated forecasted traffic growth.
I-205	**Revenues** — Forecasted to be net positive revenues within approximately 15 years with 1,400 vph and within 50 years with 1,650 vph threshold assuming a 2030 opening year.
I-205	**Capital costs** — $195 to $246 million dollars (2009 dollars) for implementation. Predicated on the assumption that all bridges in the corridor are reconstructed as part of the HOT lane project implementation.
I-205	**Feasibility** — Preliminary analysis concludes that HOT lanes is financially (defined as covering O&M costs over time) feasible in 20 to 25 years. More-detailed assessments are required to confirm.
I-5	**Traffic** — Forecasted to switch to HOV 3+ at approximately 2045/2055 with a 1,400 vph and does not achieve the HOV 3+ threshold with 1,650 vph through 2065. A bottleneck is forecasted to form as early as 2015 in the northbound direction and 2030 in the southbound direction.
I-5	**Revenues** — With the 1,400 vph threshold for HOV 3+ switch, net revenues become positive 30 years after a 2035 opening year, but a 2015 opening will not produce positive net revenue through 2065. With the 1,650 vph threshold for HOV 3+ switch, the HOT lane has an *increasing negative* cash flow through 2065 irrespective of opening year.
I-5	**Costs** — The estimated cost for implementing an HOT lane in the I-5 corridor from Hammer to Downing is approximately $122 million in constant dollars.
I-5	**Feasibility** — The I-5 corridor HOT lane appears to become more feasible in the out years as the traffic congestion levels grow. Variables such as the “value of time” and the policy decision on when the HOV 2+ switch to HOV 3+ occurs (at 1,400 vph or at 1,650 vph) affect the timing of the feasibility of the HOT lanes on I-5.
Both Corridors	**Functional capacity** at LOS “C” has been evaluated assuming 1,650 vph and 1,400 vph for the HOT lane. Achieving either of these thresholds with HOV 2+ vehicles allows for the corridor to shift to HOV 3+ for exempted vehicles in the HOT lane. By doing so, additional capacity is provided for toll-paying users. In all scenarios, the lower capacity number (1,400 vph) translates into higher overall revenues and a sooner positive cash flow for net revenues.
Both Corridors	**Delaying the implementation of the HOT lanes** until a forecasted year, as compared to selecting 2015 as the implementation year, is estimated to improve the net revenue generation of the HOT lane. This is due to the fact that the HOT lanes operate for shorter periods of time in an operating deficit and more-quickly recover into a net positive operating position as the traffic and revenues increase over time.

Methodology and Assumptions

The assessment of the I-205 and I-5 HOT lanes followed a multi-step methodology as described below. Key to this assessment is the assumptions made and applied. Summarized below and described in Section 2 — Introduction and Background, as well as in Sections 3 and 4 of this document — are the assumptions applied in this analysis.

The methodology utilized in the I-205 and I-5 HOT lane assessments consisted of inter-connected components discussed below:

- **Traffic Forecasts** were prepared by Fehr & Peers Associates (FPA) for 5-year increments beginning in 2015 and extending through 2065 for I-5 and 2070 for I-205. Because the HOT lane forecasts are "demand-based," *unconstrained traffic volumes* (meaning they are not constrained by the freeway capacity per se) were used as the starting point for estimating the HOT lane usage.
- **Estimations of HOT Lane Usage** were made using the Policy Options Evaluation Tool for Managed Lanes (POET-ML). The Federal Highway Administration (FHWA) developed POET-ML to provide *planning-level* assessments of various managed lanes strategies such as the HOT lanes under consideration for I-205 and I-5. Key assumptions made in the application of the POET-ML model included the capacity of the HOT lanes as 2,200 vehicles per hour (vph) and the general-purpose (GP) lanes as 2,000 vph. The HOT lane has a higher overall capacity because of reduced points of entry and exit resulting in reduced weaving and because trucks are not allowed in the lane by federal law. The HOT lane traffic forecasts, per federal policy, cannot exceed 75% of the capacity. High occupancy vehicles with two or more individuals (HOV 2+) are allowed to use the HOT lane without a toll payment. If/when the HOT lane reaches the 75% of capacity threshold, a HOV 3+ scenario goes into effect.
- **Estimations of Revenue** are based on the application of the POET-ML tool and the "willingness to pay" of potential users. This "willingness to pay" is related to the "value of time" users have which is tied to income levels. A number of different "values of time" have been evaluated in this assessment as sensitivity tests to provide a range of forecasts.
- **Physical Limits of the HOT Lanes** evaluated in this document have been based on an initial determination of the optimum sizing of the facility considering the future forecasted traffic volumes and on-going efforts by others on adjacent corridors (e.g., if studies are underway). The I-205 HOT lane corridor extends from west of the I-5/I-205 interchange west to the California Aqueduct crossing of I-205 east of the I-205/I-580 interchange. This is a distance of approximately 13.4 miles. The I-5 HOT lane corridor extends from Hammer Road interchange south to the Downing Road interchange. This is a distance of approximately 8.6 miles.
- **Cost Estimates** for both operating and maintenance (O&M) of the HOT lanes and for capital construction of the HOT lanes itself have been estimated. All costs are in constant (non-inflated future) dollars. There are several components of the **O&M costs** associated with the HOT lanes. While it is premature for a specific operating scenario, it is assumed that a "FasTrak-like" system would be deployed for payment of tolls, however; depending on the timeline for the implementation of the project a more national electronic payment system may be available. This study assumed that the services of an existing agency will be used to serve customers and clear transactions. Components of the **capital costs for construction** of the HOT lanes were estimated with two sets of assumptions. For I-205, a detailed (but still preliminary level) estimate of the costs for

adding HOT lanes was prepared. Section 3 of this document and Appendix B provide the details of this estimate. For I-5, a planning-level estimate of the costs has been prepared using "engineering judgment" for the need for improvements in the I-5 corridor, a set of unit prices derived from similar projects in the greater region, and an estimation of the quantities required. Section 4 of this document and Appendix C provide the details of this estimate.

- **Assessments and Net Revenue Forecasts** were prepared with alternate "opening day" scenarios the effect on the cash flow and net revenues estimated. In general, the later the HOT lanes are "opened", the sooner they turn a net profit as the traffic volumes increase over time and the increased congestion enhances the incentive for highway users to pay a toll and bypass the congestion if a HOT lane is in operation.

Next Steps

While the initial POET-ML model analysis suggests that the implementation of HOT lanes on I-5 and I-205 may not be financially feasible in the near future, HNTB believes that the model may be underestimating the revenue potential of these prospective HOT facilities. Managed lane facilities in other parts of the country, with similar operating characteristics, are already generating considerably more revenue than is being forecasted by POET-ML for I-5 and I-205. Part of the issue may stem from the fact that POET-ML was designed to evaluate policy alternatives for existing HOV facilities, whereas—at present—there are no HOV facilities on either I-5 or I-205. Therefore, a next step for the SJCOG would be to apply a sketch-level tool that is more targeted toward evaluating the revenue potential of new facilities to better understand the feasibility of implementing HOT lanes on I-5 and I-205.

- Operations and maintenance costs as cost assumption appears to be higher than those experienced by other facilities across the nation. This is partly due to including 25% contingency, and it is appropriate for this level of study. Further refinement of these costs is recommended.
- Define the policy objectives and expectations for the HOT lane. Engagement of the stakeholders in policy discussions needs to occur. The policy discussion to include a conversion of a HOV lane to HOT lane, timing for changing HOV requirements, method of financing, and usage of revenues.
- Monitor traffic conditions on the I-205 and I-5 corridors for intensity and duration of congestions. HOT lanes work most effectively when an extended duration (2+ hours) of congestion exist.
- Conduct further analysis and development of HOT lane project(s). Then, obtain an agreement from the SJCOG Board to amend the SJCOG Regional Transportation Plan (RTP) as appropriate to feasibility determination.
- Follow the required State and Federal documentation and application processes necessary for the conversion or implementation of a HOT lane.

2 Introduction and Background

San Joaquin County is facing increasing levels of congestion as the population and the mobility needs of the county increase over time. Revenues from "traditional sources" are not sufficient to finance the necessary improvements to meet these growing mobility needs. In light of this, the SJCOG has considered the feasibility of high occupancy toll lanes (HOT or Managed Lanes) as a potential resource for new funding and improved mobility. This report documents the results of an initial review of this potential transportation opportunity for I-205 and I-5 corridors in the county.

HOT lanes are high occupancy lanes of traffic, typically on freeways, that provide an option for solo-occupancy vehicle (SOV) users to pay a toll to use the lanes – if there is sufficient capacity available. The price paid varies based on the congestion is the corridor. The incentive for the SOV user is to bypass mainline general-purpose (GP) lane congestion if a SOV user so desires and is willing to pay a toll.

HNTB team assessed HOT lanes on the I-5 corridor in the Stockton area between Eight-Mile Road on the north and Lathrop Road on the south; a distance of 16 miles. Then, the team assessed the most productive segment to implement HOT lanes, and it was determined to be an 8.6-mile segment between Hammer Lane and Downing Avenue in Stockton. A second assessment was conducted on I-205, from west of the I-5/I-205 interchange to east of the I-205/I-580 interchange as the corridor approaches the San Joaquin/Alameda County line; a distance of 13.4 miles.

Based on the sketch-level financial analysis, the I-205 HOT lane concept appears to be feasible to implement over the next 20 to 25 years. The I-5 HOT lane concept appears to be feasible to implement over a longer timeframe. However, traffic operations analysis indicated the HOT lane concept will be an effective congestion management strategy earlier than the financial analysis indicated. Based on the traffic operations analysis, I-205 may need HOT lanes sometime between 2020 and 2025 and I-5 as early as 2015 in the northbound direction. The potential widening of I-205 needs to be coordinated with the widening of I-580 in Alameda County. Currently, the I-580 widening is assumed to occur in 2030-2035. These conclusions are drawn from the planning-level analysis documented herein. Prior to implementation, a number of "next steps" including a more-detailed traffic, revenue, environmental and engineering/design analyses will be required to refine the forecasts and assumptions supporting these conclusions.

2.1 Purpose of this Project and Report

The purpose of the I-5 and I-205 HOT Lane Feasibility Review is providing an initial assessment of the feasibility of implementing HOT lanes in either or both of the two corridors in San Joaquin County that are noted above. From a technical perspective, HOT lanes can be implemented in these corridors and there is the governmental authority to implement such a system. Thus, as defined in this report, "feasibility" is a decision to be made by the SJCOG and is a function of future traffic forecasted for the corridors, the "willingness to pay" of potential HOT lane users for reliable and faster travel, the costs associated with implementing, maintaining, and operating HOT lanes, and the resulting cash flow from these revenues and costs. The purpose of this report is to document the assumptions, methods, and conclusions of this initial technical assessment and to provide the SJCOG and the reader with an understanding of the HOT lane concepts and their potential if implemented in San Joaquin County.

A Technical Working Group (TWG) comprised of agency stakeholders in San Joaquin County with interests in the two corridors was formed and participated in this study effort. The TWG met

a total of six times over the course of the study and participated by identifying issues, providing guidance and providing general oversight of the development and progress of this feasibility review. Appendix A lists the members of the TWG who have participated in this effort.

A discussion of the corridors and the assumptions and methodologies utilized in this analysis follows.

2.2 I-205 and I-5 Corridors

Two distinct corridors have been evaluated in this feasibility study. As illustrated in Figure 2, the I-205 corridor is a 13.4-mile corridor extending from west of the I-205/I-5 interchange on the east end to the California Aqueduct crossing just east of the I-205/I-580 interchange on the west. This corridor serves as both an intra-regional corridor serving trips within the general Tracy area, as well as between Tracy and Stockton. I-205 is also an inter-regional corridor serving both commute trips to and from the San Francisco Bay Area, as well trade, recreation and other trips destined throughout California and the nation. Daily traffic volumes on I-205 between Tracy Boulevard and Lammers were 118,000 in 2020 and are forecasted to increase by 30% by 2040 and by 57% by 2070.

Currently, I-205 consists of three GP lanes in each direction, and there are no HOV lanes in the corridor.

Figure 2: I-205 Corridor Evaluated for HOT Lanes

Map Source: Google, 2010.

I-5 serves a similar market and is comprised of north-south trade, recreation and other trips, as well as commute trips to and from the Sacramento and Stockton regions, as well as the Bay Area. The HOT lane evaluation in this corridor consisted of an approximate 16-mile corridor

from Eight-Mile Road on the north to Lathrop Road on the south. Daily traffic volumes on I-5 between Country Club Boulevard and State Route 4 (SR 4) were 155,000 in 2015 and are forecasted to increase by 44% by 2035 and by 55% by 2065. Figure 3 illustrates the evaluated corridor.

In both the I-205 and the I-5 evaluations, bi-directional analyses were conducted and the results reflect this bi-directionality.

Currently, the I-5 corridors consist of three or four GP lanes depending on location, and there are no existing HOV lanes. HOV lanes on I-5 between Hammer Lane and Country Club Boulevard will be implemented by late 2013. This project will provide continuous HOV lanes from Hammer Lane to Eight Street, which would encompass the 8.6-mile study segment between Hammer Lane and Downing Avenue. This project will allow the I-5 corridor to be a potential candidate for a pilot HOT lane in the region.

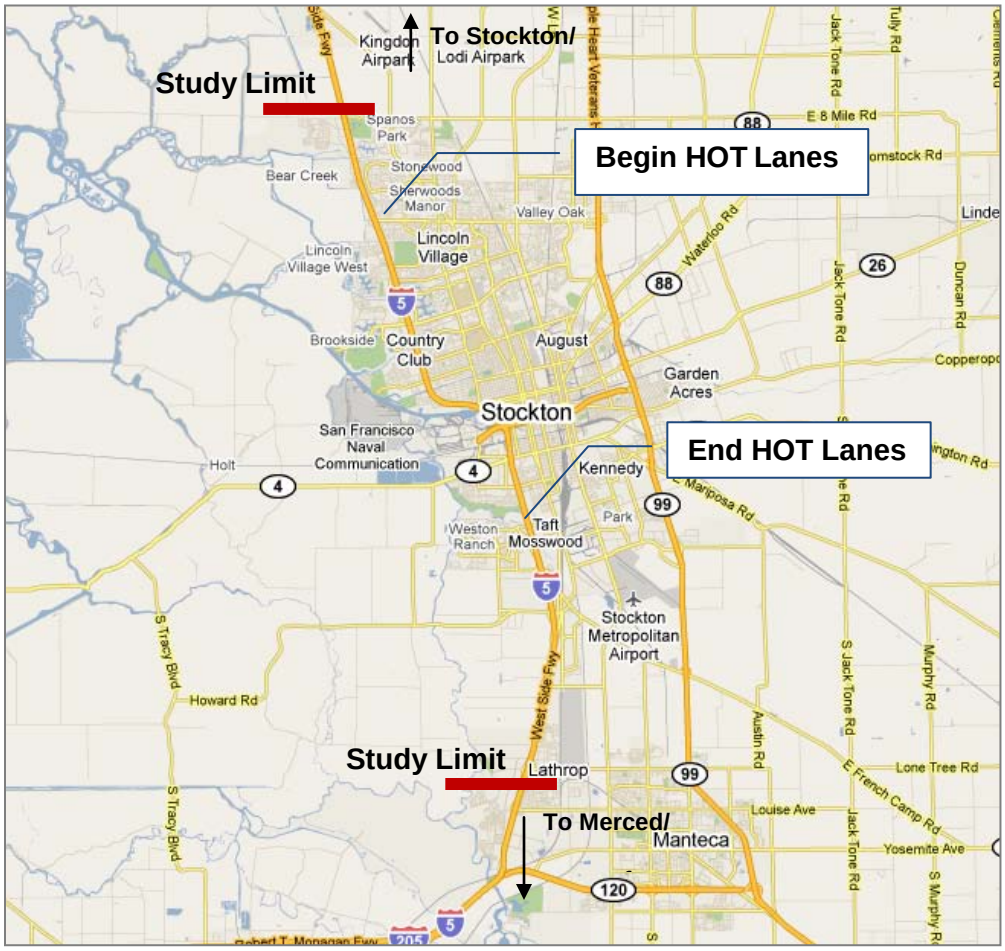

Figure 3: I-5 Corridor Evaluated for HOT Lanes

Map Source: Google, 2010.

2.3 Assumptions and Methodology

The assessment of the I-205 and I-5 HOT lanes followed a multi-step methodology as described beginning below and on the following pages. Keys to this assessment are the assumptions

made and applied. Described below, and in additional detail in Section 3 and 4 of this document, are the assumptions applied in this analysis. The methodology utilized in the I-205 and I-5 HOT lane assessments consisted of six inter-connected components as follows.

Traffic Forecasts were prepared by Fehr & Peers Associates (FPA) for 5-year increments beginning in 2020 and extending through 2070 for the I-205 corridor and beginning in 2015 and extending through 2065 for the I-5 corridor. A 50-year forecast was prepared per the SJCOG's direction in order to assess potential feasibility for financing future capital improvement projects. These forecasts are included in Appendices D and G of this document for the I-205 and I-5 corridors, respectively. The application of transportation forecasting models used for the SJCOG Regional Transportation Plan (RTP) update and the City of Stockton General Plan Update model serve as the basis for developing the traffic forecasts. Based on land use allocations, growth and travel parameters, these models developed 30-year forecasts (through 2040-45) for the region. FPA developed forecasts beyond the 2040-45 horizons using a straight-line continuation of growth at a reduced rate to achieve forecasts for 2065-2075 horizons. The level of uncertainty in future-year forecasts increases with the longer horizon. In order to account for high levels uncertainties associated with a long forecasting period, the study used conservative assumptions and methodologies.

Key assumptions made in conjunction with the traffic forecasts are:

- The San Joaquin County Regional Transportation Improvement Plan and City of Stockton forecasts for SOVs and HOVs are through the year 2035.
- The growth rates in travel beyond 2035 were assumed to be reduced by 50% reflecting future uncertainty, changing demographics and to provide conservative estimates.
- Because the HOT lane forecasts are "demand-based," *unconstrained traffic volumes* (meaning they are not constrained by the freeway capacity per se) were used as the starting point for estimating the HOT lane usage.
- Growth rates in traffic beyond the model-generated growth (post 2035) were assumed to be as follows:
- Mainline SOV growth: AM = 2.0%; PM = 2.0%
- Mainline HOV growth: AM = 4.5%; PM = 4.7%
- Mainline Ramp SOV growth: AM = 0.9%; PM = 2.8%
- Mainline Ramp HOV growth: AM = 1.7%; PM = 2.4%

Operations Analysis reviewed operational impacts of converting the potential HOV lanes as part of a congestion management strategy. The main reasons for converting HOV lanes to HOT lanes on this corridor include:

- Move more vehicles and people through mainline bottlenecks;
- Improve corridor speeds and reduce travel times; and
- Improve mobility for trucks.

Congestion management improves the effectiveness and efficiency of the transportation system through lower cost improvements and programs. Congestion management focuses on examining strategies for reducing single occupant vehicle use, promoting alternative modes, and better managing existing resources.

The team examined HOT lanes as a means to better manage traffic operations on I-205. The basic principle of HOT lanes as a congestion management strategy is to take advantage of reserve capacity on the HOV lane by allowing a pre-determined number of vehicles traveling in GP lanes to move over to the HOV lane for a price. The expected result of this strategy is that the traffic operations on the GP lanes should improve while the operations on the HOV lane should remain relatively the same. This condition would occur because the number of vehicles allowed in the HOV lane would be limited to maintain operations at the LOS C or better.

The following are the assumptions used in the analysis:

- GP lane capacity = 2,000 vehicles per hour
- HOV lane capacity = 1,650 vehicles per hour
- Pricing for HOT lane established at a level that would result in the HOV/HOT lane carrying about 1,400 vehicles per hour[1]
- All on-ramps along the corridor would be metered including the I-580/I-205 ramps

Estimations of HOT Lane Usage were made using the Policy Options Evaluation Tool for Managed Lanes (POET-ML). The Federal Highway Administration (FHWA) developed POET-ML to provide *planning-level* assessments of various managed lanes strategies such as the HOT lanes under consideration for I-205 and I-5. Key assumptions made in the application of the POET-ML model were:

- Traffic estimations were prepared for typically two- to five-mile segments within the I-205 and the I-5 corridors. Each corridor consisted of four or more segments. Within each segment, the *lowest* link traffic volume was used as the basis for estimating the potential HOT lane usage. By using the lowest link volume within the corridor, the estimates of HOT lane usage are conservative. The usage (and revenues) estimated for each segment was then added together to estimate the total corridor usage (and revenues) attributed to the HOT lanes in operation for each analysis year.
- The FHWA has an operational requirement that HOV and HOT lanes cannot operate at a level-of-service (LOS) lower than 75% of the capacity (denoted as LOS C) or an average operating speed lower than 55 miles per hour (mph) but higher than 47 mph. The capacity of the HOT lane was 2,200 vehicles per hour (vph). Thus, the initial assumption was that the HOT lane would have a maximum usable capacity of 1,650 vph.
- Further discussions with the TWG led to a determination that while the overall HOT lane could technically operate at a LOS C with 1,650 vph, individual segments within the corridor could experience higher volumes and a resulting lower LOS and operating (e.g. between certain interchanges where HOT lane ingress and egress points might be located). Thus, an analysis of “85% of the HOT lane functional capacity” was also tested. This resulted in a HOT lane capacity assumption of 1,400 vph.
- The FHWA also does not allow large semi-trailer trucks to utilize the HOV or HOT lanes. In addition, the GP lanes are affected by weaving movements and side-friction from ingress and egress lanes. HOV and HOT lanes do not have these capacity-reducing factors. Thus, the GP lanes are assumed to have a capacity of 2,000 vph per lane.

[1] The HOV lane capacity and LOS C/D range is consistent with assumptions that have been made for HOT lane studies in the San Francisco Bay Area. However, it should be noted that assuming no more than 1,400 vph in the HOV/HOT lane for analysis purposes is conservative; some studies in other regions have set the target at as much as 1,600 vph.

Estimations of Revenue have been developed using the POET-ML tool. These revenue estimations are based on the following assumptions:

- As previously noted, POET-ML is an FHWA-developed sketch-planning tool with application for evaluating mobility options such as implementation of HOT lanes. One "tool" within the POET-ML model is a revenue generation component that estimates future revenues for HOT lanes based certain assumptions (congestion and travel time savings and the value of that travel time savings).
- POET-ML assumes a "static pricing" concept based on the willingness to pay and the value of time (see below). Once the HOT lane fills to capacity with either HOVs or toll-paying SOVs, no additional SOVs are allowed into the HOT lane. As the HOT lane fills with non-paying users (HOVs), the revenues eventually decrease as there is less "space to sell" to non-HOVs. With static pricing, toll rates will likely to be increased overtime as congestion and time saving on traveling on HOT lanes increase. This "static price" tool is in contrast to a "dynamic pricing" concept that has been deployed on I-680 in Alameda County recently and has been deployed on I-15 in San Diego, California for a number of years. With "dynamic pricing," the toll rates fluctuate with the level of usage and as the HOT lane volume increases, the tolls increase to discourage further use and to maintain the functional capacity of the HOT lane. With increasing tolls, the revenues may also increase, stay flat or decrease to a lesser extent than with static tolling – as the number of vehicles fluctuates, the total revenues generated fluctuate as well.
- The HOT lane assessments assumed an initial allowance for high occupancy vehicles with two or more individuals per vehicle (HOV 2+) to utilize the HOT lane without paying. As the traffic forecasts increased, the numbers of HOV 2+ increase and this reduces the available capacity for toll-paying users.
- Vehicles exempt from paying a toll include low or zero emission vehicles with decals, motorcycles, taxis, emergency vehicles, and transit vehicles. Each category of exempt vehicles represented less than one percent of the vehicles in the total forecasts. While these vehicles were included in the capacity calculations, they were not included in the revenue forecasts as they are presently legally exempt from paying a toll.
- Once the HOT lane reaches its "functional capacity" (1,400 or 1,650 vph) by allowing HOV 2+ and tolled vehicles, the POET-ML tool provides the option to "switch" to an "HOV 3+" allowance. HOV 3+ are significantly smaller in number than HOV 2+ vehicles and this frees up capacity for new/additional toll-paying users of the HOT lane. This generates additional revenues from the HOT lane as the number of toll-paying vehicles increases.
- POET-ML utilizes the concept of travel-time savings of using the HOT lanes – as compared to the using the GP lanes. Along with a "willingness to pay" for that use, these become the premise for determining the usage and resulting revenues expected to be generated respectively. The "willingness to pay" for use of a HOT lane is a function of the "value of time" (VOT) for users in a region and is estimated as an hourly dollar amount. For the I-205 and I-5 analyses, a range of VOTs were used depending upon the corridor and scenario:
    - For the I-205 corridor, a "Low VOT" of $13.90 was used in the analysis. This amount reflects the average hourly income level for San Joaquin County and is based on information developed by the SJCOG. A "High VOT" of $19.58 was also used to develop a range of revenue estimates. This High VOT is equal to 75% of the average

San Francisco Bay Area regional hourly wage rate and was derived from information developed by the Metropolitan Transportation Commission (MTC) for the Bay Area.

- For the I-5 corridor, lower VOTs were assumed reflecting the lower overall income levels in San Joaquin and Sacramento County relative to the Bay Area. A "Low VOT of $11.20 per hour was applied based on the SJCOG TIGER applications and the US Department of Transportation guidance. This VOT is consistent with City of Stockton average incomes as developed by the University of the Pacific. A "High VOT" of $13.90 was used and is consistent with the I-205 corridor assumptions and an average countywide level as noted above. In addition, a "Blended Commuter" VOT of $16.83 was tested. This blended rate reflects an average of Bay Area and Sacramento County VOTs.

- Revenue estimations are based on the POET-ML assessment of the travel time savings that can be derived by using the HOT lane compared to the more-congested GP lanes and taking into account the willingness of the HOT lane user to pay a toll that is a function of the user's value of their time. With all (other) things being equal, as the VOT increases, users are more willing to pay tolls to bypass congestion. Likewise, as congestion increases in the GP lanes, users are more willing to pay a higher toll to achieve a travel time savings.

  The POET-ML calculates total daily revenues and gross annual revenue as follows:

  Total Daily Revenue =

  *(Total Peak Hour Tolling Vehicle Trips * HOT Peak Hour Travel Time Savings*
  *+ Total Daily Tolling Vehicle Trips * HOT Daily Travel Time Savings)*
  ** Minimum Value of Time / 60*

  Gross Annual Revenue =

  *Total Daily Revenue * Number of Working Days Per Year +*
  *Total Daily Revenue * (365 - Number of Working Days Per Year) **
  Ratio of Weekend Revenue and Weekday Revenue

  The purpose of a HOT lane can be several and vary by region, facility and potentially the time of the day. Purposes for tolling range from maximizing the throughput of the overall freeway system to maximizing the revenue generation of the HOT lane itself. How the HOT lane functions based on how the toll structure is set is a SJCOG policy decision and will determine which goals are achieved the most (at various times of the day/week/month/season). Some combination of maximizing the throughput of the system and overall mobility, balanced with revenue generation, may become the operating guidance for a HOT lane in San Joaquin County. (Presented later in this chapter is additional information on "The Purpose of Tolling.")

Physical Limits of the HOT Lanes evaluated in this document have been based on an initial determination of the optimum sizing of the facility given the considerations noted below.

- In general, the longer the length a HOT lane is, the greater the travel time savings and hence the greater the opportunity for revenue generation. However, if insufficient traffic congestion exists in a segment, the cost of the HOT lane is not recoverable from the revenues generated because there is little incentive to pay for minimal or no travel time savings.

- For I-205, the HOT lane concept presented herein extends from west of the I-205/I-5 interchange west to the California Aqueduct crossing of I-205. The rationale for this length is that the adjacent corridors both east and west of this corridor are the subject of

other planning efforts that may or may not conclude that HOV/HOT lanes would be beneficial. As these planning efforts advance, the SJCOG will provide the continuity and oversight to ensure that the results of this effort are integrated with either or both of those corridors so that a full system-wide cost effective approach is considered and implemented as appropriate to provide user a seamless travel between corridors..

- For I-5, the HOT lane study began by assessing the viability of a HOT lane extending from Eight-Mile Road on the north to Lathrop Road on the south; a distance of 16 miles. The *Potential I-5 North HOT Lane Travel and Revenue Estimates, Costing, and Net Revenue Estimates, April 2010* report identified the segment between Hammer Lane and Downing (a distance of 8.6 miles) as a "most financially viable segment" for the future horizon year(s) in terms of experiencing sufficient traffic congestion to warrant implementation of a HOT lane.

Cost Estimates for both operating and maintenance (O&M) of the HOT lane and for capital construction of the HOT lane itself have been estimated. All costs are in constant (non-inflated future) dollars. The following assumptions have been used in this analysis.

There are several components of the **O&M Costs** associated with the HOT lanes. While it is premature for a specific operating concept or vendor to be defined, it is assumed that a "FasTrak-like" system would be deployed for payment of tolls. The unit prices associated with such a system are noted below and are based on recent work completed by the MTC in their assessment of toll lanes in the Bay Area. These O&M assumptions are based on the toll facilities operating today.

- An existing back-office will be used to clear the transactions. A "user fee" of $0.21 per toll payer (SOV user) transaction covers the cost of administering the program (staffing, governance, license plate verification, etc.);
- A toll user violation fee of $0.04 per violation. The studies assumed approximately ten percent of SOV users violate tolls.
- A "financing fee" of 2.2% is assumed and is the cost of bank charges on credit card payments of the toll via a "FasTrak-like" system. As the only method of payment for FasTrak is credit cards, financing fee was applied to all transactions;
- The study assumed 10% of toll users failed to pay for various reasons. It also assumed 4 cents per violator for an additional transaction fee.
- Transponders, similar to what is currently used in the Bay Area, would cost $18 each and have a replacement life of six years. Sixty percent (60%) of the daily users would have new (or replaced) transponders and the remaining 40% of the daily users are assumed to be "returning direction" users;
- Tolling facility (electronic toll readers, variable message signs, etc.) maintenance costs would be $93,850 per lane mile per year;
- As agreed by TWG, pavement maintenance, barriers, striping and so forth for the HOT lane itself would be provided by other funding sources and not covered by the tolls themselves; and
- California Highway Patrol enforcement costs would be $11,500 per lane mile per year. This cost covers enforcement on HOT lanes beyond routine traffic enforcement costs.

Components of the **Capital Costs for Construction** of the HOT lanes have been estimated with two sets of assumptions.

- For I-205, the consulting firm of Rajappan & Meyer has prepared a detailed (but still preliminary level) estimate of the costs for adding a HOT lane on I-205. Section 3 of this document and Appendix B provide the details of this estimate.
- For I-5, a planning-level estimate of the costs has been prepared using "engineering judgment" for the need for improvements in the I-5 corridor, a set of unit prices derived from similar projects in the greater region, and an estimation of the quantities required. Section 4 of this document and Appendix C provide the details of this estimate.

Assessments and Net Revenue Forecasts were prepared based on the results of the analysis using the methods and the assumptions as noted. Alternate "opening day" scenarios were identified in the course of the study and the effect on the cash flow and net revenues estimated. In general, the later the HOT lanes are "opened", the sooner they turn a net profit as the traffic volumes increase over time and the increased congestion enhances the incentive for highway users to pay a toll and bypass the congestion if a HOT lane is in operation.

Given these assumptions, the traffic and revenue forecasts were prepared and the resulting "net revenue" and cash flow effects determined. Documentation of these results are in the later sections of this report.

2.4 HOT Lane Implementation Features and Concepts

There are ten HOT lane projects operating in the United States as of September 20, 2010. Of these HOT lane projects, no two have been designed, implemented, and/or operated in precisely the same way. Their consistency is in allowing high occupancy vehicles to use the lane for no charge and allowing other solo-driver vehicles to use the lane for a toll or fee. The incentive for these solo drivers is to bypass congestion and decrease their overall trip travel time. The key implementation elements are as follows.

Eligibility to Use a HOT Lane considers three types of users: a) HOVs, b) toll-paying users; and c) exempt users that are typically motorcycles, clean air vehicles, transit, etc. Vehicles prohibited from HOT lane use include trucks and semi-tractor-trailer trucks. These are described below in further detail.

- **High Occupancy Vehicles** – Because HOT lanes are converted HOV lanes in most cases, maintaining mobility of the lane for HOVs has been paramount. The key variable factor in this has been the occupancy requirement. Most HOV/HOT lanes require two or more occupants (HOV 2+) to be classified as a high occupancy vehicle. When/if the HOV lane becomes (or is likely to become) congested at an HOV 2+ level (which is forecasted to occur on the I-205 corridor evaluation in the future), the owner/operator of the HOV/HOT lane is faced with the need to take some action to keep the lane functioning (i.e., not becoming congested). Typical strategies include:
- Charge dynamic pricing
- Increase the occupancy requirement from HOV 2+ to HOV 3+ (three or more individuals per vehicle)
- HOV 2 may pay lower toll rates to use the HOT lane.
- Add a second HOV lane adjacent, but this requires sufficient right-of-way and potential modifications to structures and other facilities. Figure 3 illustrates an example of this "two-lane" HOT/HOV concept (as proposed for I-580 in Alameda County, California).
- **Toll-paying Vehicles** – Drivers who are willing to pay a toll are allowed to use a HOT lane. The keys to this include how the toll is to be paid and how toll-paying is enforced.

The general trend for HOT lanes is electronic toll collection using a transponder in the vehicle capable of sending a signal to a toll reading device enabling the user's account to be charged for the trip. Where a HOT lane is in a separate right-of-way, it is easier to determine whether the vehicles entering the lane have paid their toll. It is also easier to determine whether the HOV vehicles have the requisite number of occupants. It is important to understand that a HOT lane that has only painted lines as the edge boundaries will have more toll evasion and enforcement that is more challenging – as compared to a HOT lane that is physically separated by a barrier from the GP lanes.

- **Exempt Users** other than HOVs are potentially vehicles such as vanpools, clean-air vehicles, and motorcycles. These vehicles have been authorized in most states to use HOV lanes. This exemption may continue to be in use if an HOV lane is converted to a HOT lane. In California, the "sunset" date for allowing the currently exempted vehicles to use an HOV lane has been extended to July 1, 2011 with the passage of SB535 (Yee) with the signature of the Governor on August 30, 2010. SB535 also authorizes additional 40,000 vehicles that meet California's enhanced advanced technology partial zero-emission vehicles (enhanced AT PZEV), which includes plug-in hybrids and electric vehicles, to utilize HOV lanes without regard to the occupancy in the vehicle through January 1, 2015. AB1500 (Lieu) extends the current carpool lane exemptions for electric vehicles and CNG-powered vehicles to January 1, 2015. This legislation was signed into law by the Governor on July 6, 2010.
- In addition to the modified vehicle exemptions noted above in the recently-passed SB535 legislation, two subdivisions of Section 5205.5 of the Vehicle Code have been amended and are relevant to the future consideration of HOV and HOT lanes in California. Subdivision (d) states: "The Department of Transportation shall remove individual HOV lanes, or portions of those lanes, during periods of peak congestion from the access provisions provided in subdivision (a), following a finding by the Department of Transportation as follows: (1) The lane, or portion thereof, exceeds a level of service C…[and] (2) The operation or projected operation of the vehicles described in subdivision (a) [enhanced AT PZEV] in these lanes, or portions thereof, will significantly increase congestion."
- And, Subdivision (k) states: "Notwithstanding Section 21655.9, a vehicle described in paragraph (5) of subdivision (a) [enhanced AT PZEV] *shall not be exempt* (italics added) from toll charges imposed on single-occupant vehicles in lanes designated for tolls pursuant to the federally supported value-pricing and transit development demonstration program operated pursuant to Section 149.9 of the Streets and Highways Code."

SR 91 in Orange County, California

- There is a revenue generation implication with use by non-HOV, non-toll paying vehicles. This is a public policy issue that should be monitored over time to determine its effect on the application of HOV and HOT lanes in the SJCOG region.

HOT Lane Configuration or the layout of a HOT lane has significance for usage, enforcement, safety, effectiveness, maintainability, and revenue generation. HOT Lanes will be located left of GP lanes and will be buffer separated. Access to HOT lanes will be through transition lanes and

not direct access ramps are planned. The key considerations are: a) how the HOT lane is separated from the general purpose lanes; b) how wide the lane is and how much buffer is provided (both in the median and between the HOT lane and the general purpose lanes); c) how ingress to and egress from the HOT lane are configured and how many access points are provided; and d) how enforcement is provided for.

- **HOT Lane Separation** from the general purpose lanes can range from a painted buffer (as done on I-394 in Minneapolis and as shown in Figures 3 and 4 for the I-680 Express Lane in Alameda County and conceptual application in the San Francisco Bay Area) to separation by a physical barrier (as done on I-15 in San Diego). SR 91 uses a combination of paint and bendable pylons to separate the HOT lanes from other traffic. A painted separation is the least expensive to implement; but is also the least effective at keeping non-HOV, non-paying vehicles from using the HOT lane.
- **Lane Width and Buffer Space** for HOT lanes depend on whether they are physically separated from general traffic lanes and on how much buffer space is to be provided. Figure 5 illustrates a cross-section of one concept for this treatment. The MTC has generally held a principle that the ideal median shoulder should be 14 feet wide and the ideal buffer space should be four feet wide. However, this cannot be accomplished in all locations along a corridor being retrofitted for HOT lanes. One of the original reasons for the 14-foot median shoulder was to provide for enforcement space and breakdown space for vehicles. The California Highway Patrol (CHP) has concluded that it will not use median space for enforcement due to safety concerns and will move violating vehicles to the far right shoulder. This policy has the effect of reducing the need for a wide continuous median shoulder. Breakdown space remains an issue; however, with freeway service patrols, less so than in the past.

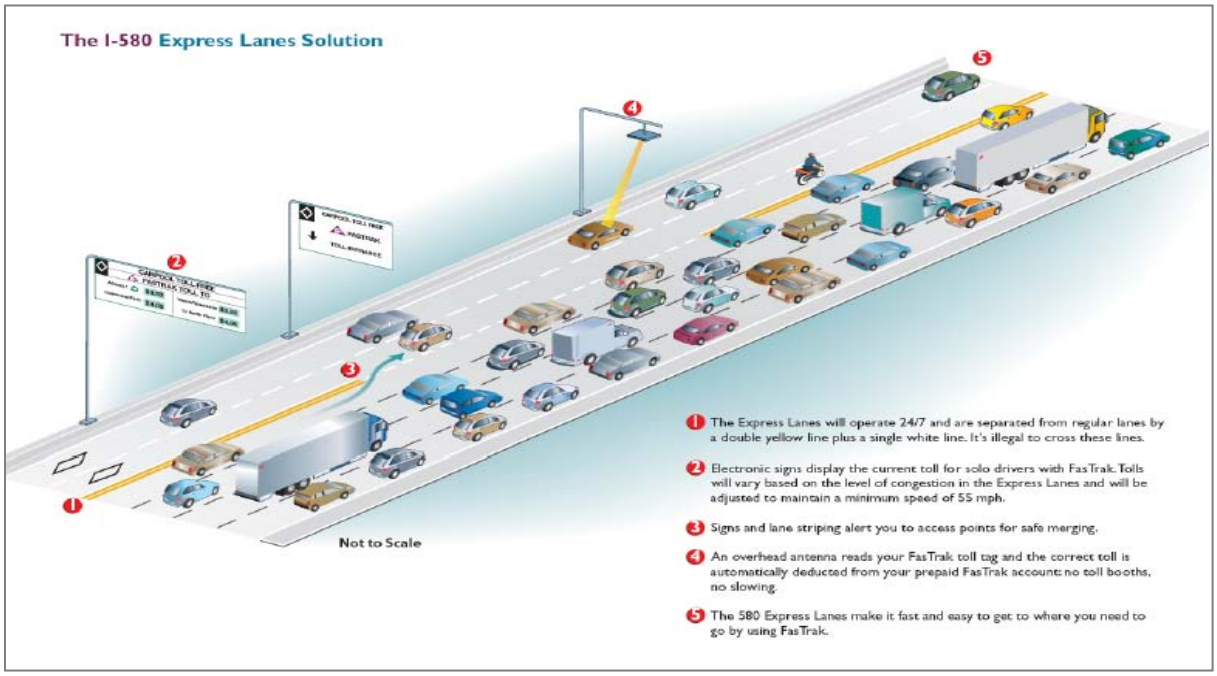

Figure 3: Example of Dual HOT/HOV Lanes

Source: Alameda County Congestion Management Agency; I-580 Corridor Improvements; 2010

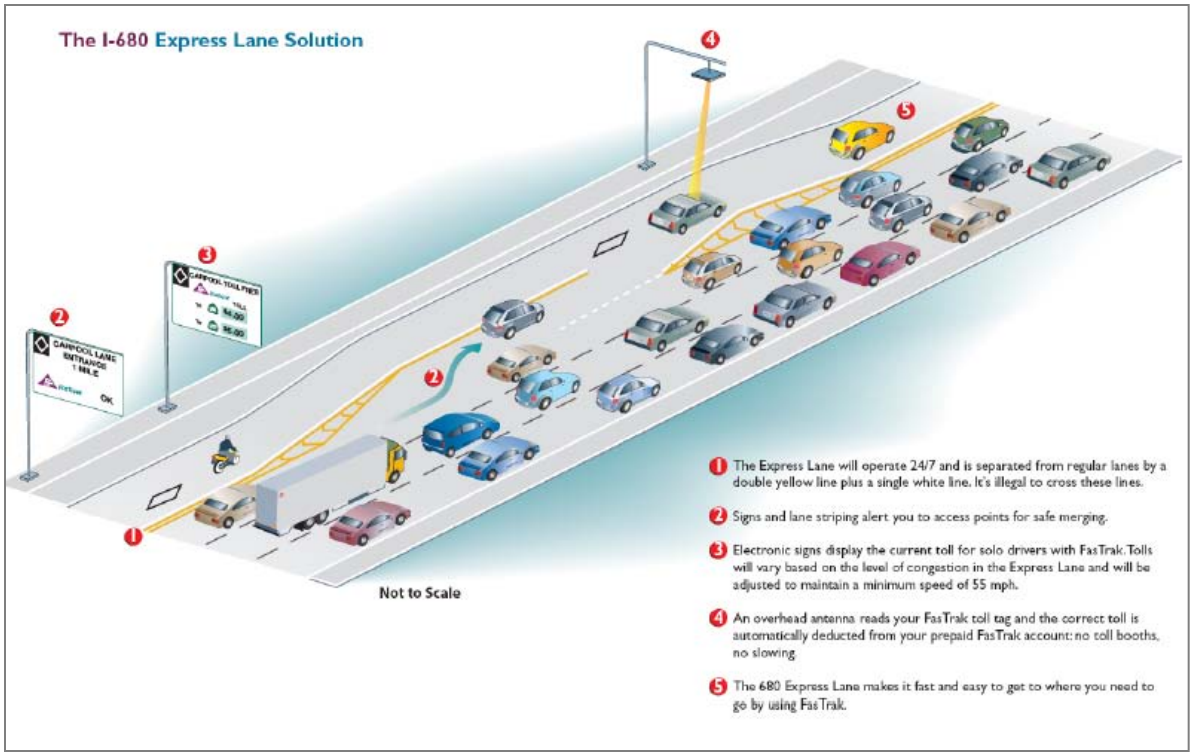

Figure 4: Example of HOT Lane Separation and Ingress Concept

Source: Sunol Smart Carpool Lane Joint Powers Authority; 2010

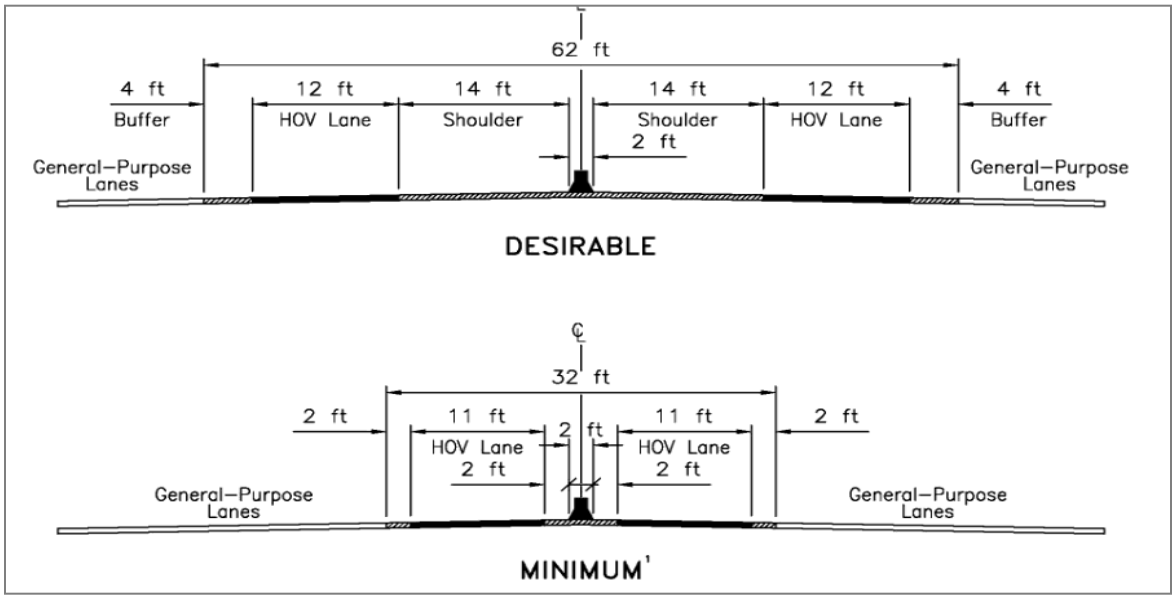

Figure 5: Conceptual Schematic Cross-Section of Limited Access HOT Lane

Source: MTC; 2008

Note: [1] Optional treatments should be incorporated if the minimum design cross sections are used.

- **Ingress and Egress** on HOT lanes has typically considered three approaches; 1) One entrance and only one exit for extended lengths (such as on I-15 in San Diego and SR 91 in Orange County); 2) Periodic ingress and egress locations with appropriate merging distances such as on various HOT lanes around the country and as depicted in Figures 3 and 4; and 3) Continuous ingress and egress which makes toll collection and enforcement difficult and would likely lead to an increased toll evasion rate among users. For the I-205 and I-5 corridors with multiple trip origins and destinations along the route, periodic ingress and egress is the most appropriate form of ingress and egress.
- **Enforcement** is directed towards violators of the HOV exemption policy or to determine whether toll-paying vehicles have actually paid their tolls. Violations of HOV policy have been provided by visual inspection (at toll booths or by roving CHP with electronic tolling) to determine whether the HOV vehicles have sufficient numbers of occupants. Photo enforcement can also help determine whether toll-paying vehicles have actually paid their tolls. If a vehicle does not have a transponder or if the transponder does not signal properly, a picture of the vehicle's license plate is taken and a bill is then sent to the vehicle owner. The CHP has concluded that its mission is public safety and is not be a toll collection enforcement organization. The CHP generally focuses on the vehicle code with particular attention to HOV compliance, speed, safety of merges, and vehicle equipment.
- **Pricing Principles** define what determines the price charged for a user trip. It can be based solely on the traffic conditions in the HOT Lanes or the traffic in the GP lanes can impact the HOT Lanes toll. Most facilities use traffic congestion although travel time saving is an option.
- **Tolling Principles** employed on the corridor will generate different HOT lane usage and different gross revenues. Among the tolling approaches that need to be considered are:
- Whether **tolling rates will be static or dynamic** – Static tolls do not change by time of day, level of congestion, or other factors. A standard toll is charged at all times of the day the HOT lane is operational. This tolling concept does not manage facility usage and the facility can theoretically fill to capacity. Alternatively, dynamic tolls can vary with the level of usage and, as the lane becomes more (or less) crowded, the tolls can increase (or decrease) thus discouraging (or encouraging) users. A dynamic tolling system allows the owner/operator to keep the lane from becoming congested and can maximize the effectiveness of the revenue generation. However, it is also a concept not commonly applied to public facilities. The experience with SR 91 in Orange County, California demonstrates that there can be public acceptance of dynamic tolling if the users and those affected by the lane believe the result (less congestion and more revenue) is acceptable and demonstrated. I-680 in Alameda County has just instituted dynamic pricing and the acceptance will be determined over time.

I-15 Managed Lanes in San Diego, CA

- Manual or electronic **collection of tolls** can be used – Electronic tolling costs less to operate when compared to staffed tollbooths, but requires investment in and

maintenance of toll readers, transponders, variable message signs and other features. Electronic tolling also requires enforcement, such as highway patrol and/or photo enforcement. As this study focuses in potential HOT lanes in 2015 or 2020, the study assumed use of electronic collection tolls.

- A third example used by the state of Utah on I-15 in the Salt Lake City area was to charge a **flat monthly fixed toll rate** for use of the HOT lanes in its initial phase. Toll-paying vehicles were provided a toll sticker that was affixed in a visible location on the vehicle. The Utah Highway Patrol needed to visually inspect vehicles traveling along the HOT lane for enforcement. Not unlike static tolling by electronic means, this concept has no effect on keeping the lane functioning without congestion. Moreover, the enforcement issue became problematic and the concept is being refined.
- Distance-based or per segment are two additional ways to charge a toll. In the distance-based concept, the toll paid is based on the total distance traveled and though it is a true way to charge a user it requires an accurate determination of the entry and exit of a user. I-15 in San Diego uses a distance-based tolling concept.I-15 in Utah uses the segment-based concept where a user is charged for each segment they pass through and the cumulative amount is deducted from their account.

Purpose of Tolling

In considering the potential for a HOT lane on I-205 and/or I-5, it is important to consider the intended purpose of the HOT lane. As a point of information, the terms “tolling” and “congestion pricing” are used variously in reviews of HOT lanes. For the purposes of this document and assessment, “tolling” refers generally to applying a price to use a travel lane, lanes or an entire facility -- without specifying a specific purpose for that pricing. “Congestion Pricing” refers to applying a toll with the intent of managing congestion. As congestion increases, the toll increases in response as the “value” of the lane (or facility) increases. The purpose of the tolling may be one or more of several as described below. Different purposes can lead to different approaches to the design, management, and operation of the HOT lane itself. Examples of potential purposes of tolling include the following:

- Managing congestion by optimally using all lanes (albeit in different ways). This could be described as maximizing the value of time saved for all travelers.
- Providing maximum advantage for HOVs and tolled vehicles in terms of travel time savings. This could be described as incentivizing the HOVs to encourage carpooling and providing some incentive for tolled vehicles over the general purpose lane vehicles.
- Providing very high reliability of travel time in the HOT lane. By keeping the HOT lane congestion-free, the trip reliability of the lane increases over the general purpose lanes and has value to certain groups of travelers and commuters.
- Maximizing revenue through pricing and optimizing the level of use and tolling. Revenues could be used for a variety of needs. Suggestions and/or actual uses have ranged from recovery of O&M costs, to recovery of capital costs, to offset transit operating deficits on services within (or parallel to) the corridor, to providing social equity payments for lower-income users of the facility, to all or some of the above.

The importance of addressing the purpose of tolling rests in the following areas:

- Different purposes will lead to different pricing and tolling principles (and, therefore, different traveler behavior). For example, if revenue maximization is selected as the purpose, the gross revenue could be 20% to 30% higher than using a different purpose

and peak period traffic in the general purpose lanes could be slower than might otherwise be the case.

- The tolling principles, freeway management techniques, and public information need to be coordinated based on the selected purpose(s).
- Elected officials, the media, and others will want to know why tolling is being considered. Having one common and agreed upon response will be important.
- With air quality, AB32, SB375, and related topics, it will be important to be clear and "on message" about how HOVs will be treated, the degree to which a HOT lane would affect capacity and usage, and how revenues would be used.
- Observations on the implications of different tolling purposes are reviewed in the table on the following pages.

Table 2 on the following page provides a concise overview of the various aspects related to tolling purpose(s).

Based on the discussions with the SJCOG and with the Technical Working Group, the *draft* "purpose of tolling" was identified to be as follows.

> *SJCOG considers the purpose of considering a HOT lane for I-5 and I-205 to include providing an additional tool for managing congestion and improving mobility while at the same time providing new revenue for capacity as well as operations and management.*

However, this is a policy decision resting with the SJCOG in consultation with its transportation partners. As such, it is anticipated that the purpose for tolling I-205 and/or I-5 may change over time as the analyses and discussions evolve.

Table 2: Tolling Principles and Implications

Possible Tolling Principle	Intended Impact	How Principle May Be Applied	Questions to Anticipate
Managing congestion by optimally using all lanes (i.e. with the intention of keeping the HOT lane "full" and pricing such that users of the general purpose lanes are encouraged to pay the toll)	• Improve travel time for all • Keep HOT lane flowing at all times • Provide priority for HOVs • As HOT lane fills with HOVs, take steps to keep it functioning for HOV purposes	• Dynamic pricing (varying in response to congestion and intended to optimize flow in general purpose and HOT lanes) • As HOV volumes rise, increase toll to discourage use of lane by solo drivers • Need to manage volume in HOT lane such that tolled vehicles don't displace HOVs • Increase HOV requirements from 2 or more passengers to 3 or more passengers • Reconsider eligible lane users	• How can everyone gain from putting a HOT lane in? • At some point, will the GP lanes become more congested than the HOT lane? • Would the HOV requirement be increased from 2+ to 3+ just to make room for more tolled vehicles? Why not make this a GP lane, so everyone can use it.
Providing maximum advantage for HOVs and tolled vehicles	• Increase number of HOV vehicles • Allow tolled vehicles up to the amount that will fill the space available after accounting for HOVs	• Let traffic in general purpose lanes become more congested • Improve operational effectiveness (and, therefore, capacity) of HOT lane by widening, improving ingress/egress, etc.	• How bad will you let the GP lanes get? • Why do the HOVs and tolled vehicles get such a relative benefit? • Will there be run away prices or will there be caps.
Providing very high reliability of travel time in the HOT lane	• Limit the numbers of tolled vehicles in the HOT lane (and, perhaps, the number of HOV vehicles) to assure that the lane does not slow or break down	• Increase HOV requirement from 2+ to 3+ early • Set toll levels higher than might be set otherwise to limit the number of tolled vehicles	• Will maximizing reliability limit both HOV usage and toll revenue? • How do you stop tolled vehicles from entering?
Maximizing revenue	• Provide for all HOVs that want to use the lane (set priority for HOV users) but switch to 3+ at earliest opportunity • Set toll rates to gain highest revenue in all time periods • Let general purpose lanes become congested	• User lower HOV threshold than would be used in other scenarios (e.g., switch to 3+ when HOV volumes exceed 1400 vphpl rather than 1650) • Use dynamic pricing based on detailed economic assessment of user behavior and response[2]	• If this project is all about generating revenue, is that equitable for all users? • What are the mobility and environmental effects?

[2] The sponsoring organization could consider creating a policy such that the system does not become revenue negative in any given year. This could lead to not using an HOV volume as the threshold for migrating from HOT2+ to HOT3+; the approach could be to take steps to keep (net) revenue positive

3 HOT Lanes in California and Elsewhere in the United States

While toll roads are not a new concept in the U.S. or elsewhere in the world, the concept of HOT lanes is relatively new. Toll roads in the U.S. were common in the 1700s and 1800s. The New York State Thruway, Pennsylvania Turnpike, New Jersey Turnpike, Illinois Tollway, and others came into existence in the 20th Century and now have long operational histories and are well-accepted facilities. Toll bridges are also commonly accepted with the San Francisco-Oakland Bay Bridge and the Golden Gate Bridge as northern California examples. Both of these bridges feature tolling approaches that vary by time of day and/or provide reduced fee travel for carpools with three or more occupants. This is similar in some degree to the HOT lane usage concept.

There are ten HOT lane projects operating in the United States as of November 2010. These are:

1. SR 91 in Orange County, California
2. I-15 in San Diego, County, California
3. I-680 in Alameda & Santa Clara Counties, California
4. I-95 in the Miami, Florida area
5. I-25 in the Denver, Colorado area
6. I-394 in the Minneapolis, Minnesota area
7. US 290 in the Houston, Texas area
8. I-10 Katy Freeway in the Houston, Texas area
9. I-15 in the Salt Lake City, Utah metropolitan area
10. SR 167 in the Seattle, Washington state, Puget Sound metropolitan area

Table 2 summarizes the lane characteristics and operational policies for the HOT lanes listed above.

The California Department of Transportation (Caltrans) developed an *HOV Express Lane Business Plan* intended to provide statewide guidance on planning, development, and operations of high occupancy vehicle lanes and high occupancy toll lanes. The effort has produced preliminary guidance and a plan for development of the physical, financial, and management approaches that Caltrans will apply statewide.[3]

The critical action schedule from the draft business plan features the following summary (quoted from page 29 of the draft):

> *California has already hit the ground running with several ongoing initiatives that are addressed within the list of identified critical actions to support the implementation of this Business Plan. Partners should continue to make progress and build upon these substantial efforts and consider the topics addressed in this Business Plan in doing so.*

3 The "California HOV/Express Lane Business Plan," March 31, 2009, can be found at http://www.dot.ca.gov/hq/traffops/systemops/hov/Express_Lane/files/Caltrans%20HOV-ExpressLaneBizPlan%202009.pdf

Table 3: Summary of Existing HOT Lanes

Facility		SR 91, Orange County, CA	I-15, San Diego County, CA	I-680, Alameda/Santa Clara Cos, CA	I-95 Miami, FL	I-25, Denver, CO
Operating Agency		**Orange County Transportation Authority (OCTA)**	**San Diego Association of Governments (SANDAG)**	**Sunol Smart Carpool Lane Joint Powers Authority (Opened 9/20/10)**	**Florida DOT (Districts 4 & 6)**	**CDOT, CO Tolling Enterprise**
Design Characteristics	**Number of Lanes**	4 (2 in each direction)	Current: Middle Segment 8 miles : 2+ 2 lanes + 1 reversible lane each, South Segment: 8 mile: 2 reversible lanes 2012: North Segment: 4 miles nonreversible buffer separated. Middle Segment: 8 mile 2+ 2 lanes + 1 reversible lane each barrier separated South Segment: 8 mile 2+ 2 lanes + 1 reversible lane each barrier separated	One (1) lane in southbound direction	4 (2 in each direction)	2 reversible lanes.
	Distance	10 miles	16 miles, will expand to 20 miles in 2012.	14 miles	10 miles	7 miles
	Access Control	No intermediate access points, Pylons separates the HOT and general purpose lanes	Access at ends and intermediate locations	Access at end and at intermediate locations	Separated by flexible plastic poles, access and egress at designate points (NB – 2 entries and 3 exits, SB – 3 entries and 2 exits)	Access at ends, SOV users enter HOT lane through separate path
	Tolling Technology	Open toll/fully automated, FasTrak	Open toll/fully automated , Gantries located en route, FasTrak	Open toll/fully automated , Gantries located en route, FasTrak	Open toll/fully automated, SunPass	Open toll/fully automated
	Payment Method	Transponder (pre paid) All vehicles have to have a transponder.	Transponder (pre paid). Only SOV needs to have a transponder.	Transponder (pre paid). Only SOV needs to have a transponder.	Transponder (pre paid). All vehicles have a transponder.	Transponder (pre paid). All vehicles have a transponder. Declaration Lane.
Operational Policies	**Hours of Operation**	24 hours, 7 days a week	The northern 8 miles - 24 hours, 7 days a week in both directions. Southern section varies by days of the week. (Mon – Thurs: SB: 5:30 AM – 12 PM, NB: 1 – 7PM/ Fridays: SB: 5:30AM – 12 PM, NB: 1 PM - Mon 4:30 AM / Holidays - NB direction only)	24 hours, 7 days a week (TBD)	24 hours, 7 days a week	Closed for maintenance between 3am to 5am and 10am to noon.
	Toll ($)	$1.30 to $9.80 (as of July 1, 2010)	Typical range - 50¢ to $4.00 (Max $8.00)	Dynamic pricing; will fluctuate with levels of congestion; TBD	25¢ to $3.50. It could go as high as $7.10 under extreme condition.	$0.50 to $3.50 (as of January 2009)
	Toll Adjustment	Varies by time, direction, days of the week and level of congestion, but not dynamically priced	Dynamic toll based on traffic density. Toll based on the distance traveled in the lanes and a rate per mile for their entry location.	Dynamic toll based on traffic density. Toll based on the distance traveled in the lanes and a rate per mile for their entry location	Dynamic tolling	Variable pricing based on time-of-day but not dynamic pricing
	Eligibility for free or discounted use	HOV 3+, low emission vehicles, motorcycles and disabled plates drive free most hours, Pay 50% of toll 4-6 PM in eastbound direction	HOV 2+, motorcycles and Clean Air vehicles with decals drive free	HOV 2+, motorcycles and Clean Air vehicles with decals drive free	Registered HOV 3+, motorcycles and registered low emission vehicles exempted.	HOV 2+ toll free
Enforcement		License plate camera record violators. $20 plus amount of the toll per toll violation First toll evasion $100, $150 for second toll evasion, $200 for each additional evasion within a year	CHP enforces the law in the Express Lanes for vehicle occupancy, toll evasion, and other motor vehicle requirements. Carpool violations carry a minimum fine of $341 for the first offense.	CHP enforces the law in the Express Lanes for vehicle occupancy, toll evasion, and other motor vehicle requirements. Carpool violations carry a minimum fine of $341 for the first offense.	Toll violators are photographed via automatic violation enforcement system. Enforcement beacons on the gantry structures will alert Highway Patrol troopers monitoring the lanes when a vehicle without a transponder passes.	License plate camera record violators $70 for toll violation
Other Requirements/ Considerations		No trucks are allowed.	Commercial trucks with more than 2 axles, trailers, and boats are not allowed. HOT lane use may be restricted to HOVs only.	Commercial trucks with more than 2 axles, trailers, and boats are not allowed. HOT lane use may be restricted to HOVs only.	Trucks with 3 or more axles are not allowed unless they are designated as emergency vehicles to specific incidents	NA
Annual Gross Revenue		$ 46,236,247 in operating revenue (FY 09)	NA	N/A (TBD)	NA	$2,155,869 in toll rev + $239,478 in fees and fines from violation (FY 09)
Source		91 Express Lanes 2009 Annual Report (http://www.91expresslanes.com/generalinfo/91annualreport.pdf)	I-15 FasTrak Progress Report (April-June 2009), I-15 Express Lane Website (http://fastrak.5111.sd.com)	I-680/Alameda County Express Lanes website (September 2010) (http://www.680expresslane.org/I-680.asp)	I-95 Express Lane Website (http://www.95express.com/home/tolling.shtm)	I-25 Express Lanes Monthly Progress Report http://www.coloradodot.info/travel/tolling/i-25-hov-express-lanes/Reports

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Table 2: Summary of Existing HOT Lanes (continued)

Facility		I-394, Minneapolis, MN	US 290 Quick Ride, Houston, TX	I-10 Katy Freeway, Houston, TX	I-15, Salt Lake City, UT Express Lanes	SR 167, King County, WA Pilot Project through 4/2012
Agency		**MN DOT**	**Houston Metro**	**Harris County Toll Road**	**UDOT**	**Washington DOT**
Design Characteristics	**Number of Lanes**	1 lane in each direction, eastern section provides 2 reversible lanes	2 reversible lanes	2 lanes in each direction	1 lane	2 lanes (1 in each direction)
	Distance	11 miles	15 miles	12 miles	44 miles	9 miles
	Access Control	Separated by pylons, access at ends and four intermediate locations	SOV users enter a HOT lane through a separate path.	SOV users enter a HOT lane through a separate path.	Access at ends and 19 intermediate locations, Striped buffer	Access at ends and 19 intermediate locations, Striped buffer
	Tolling Technology	Open toll/fully automated	Open toll/fully automated	Open toll/fully automated	n/a	Open toll/fully automated
	Toll Collection	Transponder (pre paid)	Transponder (pre paid)	Transponder (pre paid)	Transponder (pre paid)	Transponder (pre paid)
Operational Policies	**Hours of Operation**	Non-reversible lanes: 6 AM to 10 AM, 2 PM to 7 PM Open to general traffic the rest of each week day and on weekends Reversible lanes: 6 AM - 1 PM in EB direction, 2 PM - 5 AM in WB direction	6:45 AM – 8:00 AM	Mon – Fri, 5am to 11am and 2pm to 8p	n/a	5 AM – 7PM Open to general traffic between 7 PM and 5 AM
	Toll ($)	$1.00 to $4.00 (maximum of $8.00 in extreme conditions)	$2 (fixed toll)	$0.30 to $1.60	25 cents to $1 per zone The corridor is divided into 4 zones.	$0.50 to $9.00
	Toll Adjustment	Dynamic pricing (tolls vary based on time of day, days of week, and level of congestion)	None	Varies by time and direction, but not dynamically priced	Dynamic pricing to start on July 20, 2010	Dynamic pricing
	Eligibility for free or discounted use	HOV 2+, transit buses, and motorcyclists are exempted.	HOV 3+ toll free	HOV2+ and motorcyclists free during peak periods. Tolls for HOV and motorcyclists same as SOV during non-peak periods.	HOV 2+ and Hybrids toll free	HOV 2+ and motorcycles toll free
Enforcement		Enforcement by Highway Patrol (HP) carrying portable readers and conducting visual HOV enforcement	License plate camera record violators	License plate camera record violators 3+Axel pays $7 per toll plaza	Enforcement by Highway Patrol (HP) conducting visual HOV enforcement	Enforcement beacons on the gantry structures will alert Highway Patrol troopers monitoring the lanes when a vehicle without a transponder passes underneath.
Other Requirements /Considerations		NA	NA	NA	NA	NA
Annual Gross Revenue		$600,000 (1st year of operation in 2005-2006) Approx. $1 million (2007)	NA	NA	NA	$316,600 (5/3/2008 – 4/30/2009)
Reference		I-394 MnPass Toll Lanes High Occupancy Lanes, Planning & Operational Issues and Outcomes http://www.tollroadnews.com/node/3296, Minnesota to implement second toll express lanes after I-394 success www.mnpass.org	Website: http://www.ridemetro.org/services/HOV/QuickRide.aspx	Website: https://www.hctra.org.katymanagedlanes	Website: http://www.udot.utah.gov/expresslanes	SR 167 HOT Lanes Pilot Report 1st Annual Performance Summary, May 2008 – April 2009 http://www.wsdot.wa.gov/NR/rdonlyres/31FB3D24-79CC-4332-82F7-EBECEBE1CA71/0/HOTLanesAnnualReport2009.pdf

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The following are the critical actions from the list in **Section 5.2** that are already ongoing in California.

A4: Utilize better tools to collect, aggregate, and report corridor-wide data*. PeMS is already being evaluated for areas of improvement related to HOV and express lane reporting.*

A5: Assess active HOV lane management via pilot project(s) and ongoing monitoring. *There are currently projects that are attempting changes to minimum occupancy requirements, changes to HOV access from limited to continuous.*

B1: Develop an ongoing coordinating committee for HOV/express lanes and other tolling topics. *Currently many existing partnerships and committees collaborate on projects across the state. This action proposes to formalize and to continue these efforts.*

B4: Share lessons learned on financing options and operations and maintenance cost expectations. *Especially as it relates to express lanes, OCTA and SANDAG have been monumental in providing supportive data and input to partner agencies as they define their own express lane projects.*

C2: Support enabling legislation for more widespread tolling authority. *There are current activities that would provide for blanket tolling authority, reducing the overall effort in the state to gain tolling authority on a project-by-project basis.*

C5: Research automated enforcement technology and implement as available. *SANDAG is currently conducting an evaluation of technologies for this purpose and that may provide insights to this topic in the near future.*

D1: Educate the public on benefits of HOV and express lanes in a common way. *Many efforts are currently underway to communicate with the public for current and upcoming projects – these efforts will continue and should consider doing so in a coordinated manner.*

Recent Developments

Section 1, Exempt Users, of this document discusses the recent developments in California with regards to the eligibility of certain vehicles to utilize HOV lanes. AB 1500 (Lieu) was signed into law on July 6, 2010 and SB 535 (Yee) was signed into law on August 30, 2010. Combined, these two pieces of legislation extend the present clean-air vehicle exemptions with decals for HOV lanes (and carried over to certain HOT facilities in the state) through July 2011 (a 6-month extension). At that time hybrid vehicles will be dropped from eligibility; all-electric and CNG-powered vehicles will remain eligible through 2015. SB 535 also provides new eligibility for up to 40,000 next generation electric vehicles (Enhanced AT PZEV) beginning in 2012 through 2015.

In addition, SB 535 also clarifies that Caltrans can “remove individual HOV lanes, or portions of those lanes, during periods of peak congestion from the access provisions” if the HOV/HOT lane exceeds LOS C or “the operation or projected operation” of these low-emission vehicles will “significantly increase congestion” in that corridor.

SB 355 also notes that subdivision (k) of Section 5205.5 of the Vehicle Code has been amended to state that the Enhanced AT PZEV vehicles “shall *not be exempt* (emphasis added) from toll charges imposed on single-occupant vehicles in lanes designated for toll charges imposed on single-occupant vehicles lanes designated for tolls pursuant to the federally supported value-pricing and transit demonstration program…” This needs to be monitored over time.

The FHWA has also developed guidance on HOT lanes. Three such documents review the purposes, history, design guidance, operations, and maintenance practices, tolling principles, and implementation issues associated with HOT lanes.

"*Considerations for High Occupancy Vehicle (HOV) Lane to High Occupancy Toll (HOT) Lane Conversions Guidebook*"[4] — The Guidebook explores the planning, design, implementation, and ongoing operations and maintenance of HOT lane facilities converted from existing HOV lanes. The document provides technical guidance that will assist the state and local transportation planners in determining the conditions where conversion from HOV to HOT lanes is feasible and advisable. It also provides a comprehensive list of activities to be performed in the planning, implementation and operation of an HOT lane facility. Special attention is paid to institutional, system design and operational challenges that typically present themselves in the course of a conversion to a HOT lane.

"*Managed Lanes: A Cross-Cutting Study*"[5] — Published in 2004, this document provides case studies of selected HOT Lanes (SR 91 in Orange County, CA, I-15, in San Diego, I-10 and US 290 in Texas and the New Jersey Turnpike). From these case studies, several points are noted. Among them are: 1) Long-range planning and flexibility in implementation have been beneficial in getting projects going and obtaining stakeholder and general public buy-in. And 2) Emerging issues of public-private partnerships, technology enhancements for toll collection and enforcement, improved demand forecasting needs, driver education, and equity questions exist.

"*Managed Lanes: A Primer*"[6] — Published in 2008, this document provides an overview of the state-of-the art on HOT lanes and reinforces the previous concepts noted, as well as providing information updating the 2004 document (above).

Among the common topics from such national guidance is the importance of focusing early on the possible purpose of a HOT lane. While this may sound overly simple, it is critical in that different purposes will lead to different lane designs and, more importantly, different tolling principles. If the purpose were to maximize revenues, the allowed capacity and tolling rates would be very different from those that would be applied if the principal purpose were to be maximizing travel time savings for all travelers.

A key lesson learned (although not explicitly noted in the mentioned references) is that no two HOT lane experiences are the same. The purposes of the lanes, the lists of what costs are included in uses of gross and net revenues, and the governance structures are very different from project to project and region to region. It is important to provide sufficient time for decision-makers to learn from other areas and develop their own understandings of the key concepts.

[4] This FHWA guidebook can be found at http://ops.fhwa.dot.gov/publications/fhwahop08034/index.htm
[5] This FHWA guidance document can be found at http://ops.fhwa.dot.gov/freewaymgmt/publications/managed_lanes/crosscuttingstudy/final3_05.pdf
[6] The FHWA guidance document can be found at http://ops.fhwa.dot.gov/publications/managelanes_primer/

4 I-205 Corridor HOT Lane Feasibility

The study segment on I-205 is a 13.4-mile reach in San Joaquin County, extending from west of the I-5/I-205 interchange west to the California Aqueduct crossing of I-205 east of the I-205/I-580 interchange. It is a major corridor that serves traffic between the Central Valley and the Bay Area during both weekdays and weekends. I-205 at the Alameda and San Joaquin County Line carried approximately 115,000 vehicles on average weekday in 2009.[7] I-205 was recently widened to three lanes in each direction.

4.1 I-205 Traffic forecasts

4.1.1 Data Collection

FPA prepared traffic forecasts for the I-205 HOT lanes project. Peak period traffic volumes in the westbound direction during the morning peak period (4AM to 8AM) and eastbound direction in the evening peak period (3PM to 7PM) at Hansen Road overcrossing and Paradise Road overcrossings were collected in April 2010. The traffic counts included SOVs, HOVs, and trucks. This study used ramp volumes along the I-205 during peak periods from the *I-5/I-205 Corridor System Management Plan* (May 2010).

4.1.2 Methodology

The traffic forecasts were developed based on the most recent version of the SJCOG Travel Demand Model. The horizon year for the model is Year 2035. In order to improve reliability of the base year model (i.e., model volumes to better match field counts), the following two tasks were performed – 1) refining roadway network details, such as number of lanes, capacity and speed and 2) adjusting the peak hour-to-daily ratio.

Annual growth rates for SOVs and HOVs for the I-205 mainline and ramps were developed using the model. It is anticipated that the growth rate between years 2035 and 2070 would be lower than the rate between years 2010 and 2035 due to diminishing capacity on I-205 over the long-term. It was assumed that the growth rates between years 2035 and 2070 would be half of the rates estimated for the period between 2010 and 2035. Details of the rate calculation, comparison with the MTC model and forecasted traffic volumes are provided in the memorandum dated August 10, 2010, included in Appendix D.

Traffic forecasts were developed from Year 2010 through 2070 with five-year increments. For the revenue estimates, only the ten-year increments between 2020 and 2070 were calculated using POET-ML.

As shown in Table 4, the 13.4-mile corridor was divided into four segments for the purpose of estimating traffic volumes. Traffic volumes were constrained at the I-5/I-205 and I-205/I-580 junctions as they are bottlenecks for entering the I-205 corridor. By constraining the forecasts to the actual capacity of the roadway system at the gateways, a better estimate of the actual traffic demand within the study area could be achieved. As the HOT Lane forecasts are “demand-based,” vehicles entering and existing within the study corridor were not constrained. For this study, the model assumed capacity of 2,000 vph on a GP lane and 1,650 vph on a HOV lane. As ramp volumes were not constrained, the projected traffic volumes within the study area were well above the capacities described above. This is indicative of that fact that even after constraining the traffic volumes at the entry points, there would still be bottlenecks that develop within the study area.

[7] 2009 Annual Average Daily Traffic, Caltrans. http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/index.htm

The model improvements assumed are Lammers/11th Street interchange reconstruction (planned to be completed by 2016) and Paradise Road interchange (planned to be completed by 2020). I-580 over the Altamont Pass in Alameda County was assumed to be widened to eight lanes by 2035.

As this is a planning-level study, we have provided a conservative approach to estimate gross revenue. In addition to the methodology discussed previously, the following traffic-specific assumptions for the I-205 corridor were made in producing this revenue forecast:

- Three lanes GP lanes and one HOV lane in each direction were assumed. The study assumed the HOV/HOT lane to be implemented in 2020. The study also conducted a sensitivity analysis for opening in a later date.
- Percentage of HOV is based on the traffic counts conducted in April 2010. Percentage of SOVs is 89% of total peak hour traffic, HOV with two passengers (HOV 2) accounted for 9%, and HOV with three or more passengers (HOV 3+) accounted for 2%.
- Peak hour factor[8] of 9% was used.
- It was assumed that the HOT lanes would operate as static tolling based on segments, opposed to dynamic tolling.
- The study approximated total revenues by adding estimated revenues from the four segments, listed in Table 4.
- The study used modified unconstrained volumes. As it is constrained at the gateways, it reflects realistic traffic volumes entering the study corridor. As on and off-ramp volumes were not constrained, volumes reflect desired demand for users to use the I-205 corridor. The study assumed that 100 percent of the volume that could use the HOT lane would come from the GP lanes and no cars from parallel facilities because traffic volumes within the study segment were unconstrained.

Table 4: I-205 Corridor Study Segments

Segment	From	To	Distance (Miles)	Assumed Year of HOV/HOT Implementation
1	I-580	Mountain House	2.2	2020
2	Mountain House	Lammers	2.6	2020
3	Lammers	Tracy Blvd	3.0	2020
4	Tracy Blvd	I-5	5.6	2020
Total			13.4	2020

Source: Fehr and Peers Associates, 2010.

4.1.3 Traffic Volume Forecasts

Tables 4 and 5 summarize peak hour GP and HOV traffic volumes in peak directions. A higher percentage of traffic volume increase is assumed for years 2010 through 2035. The traffic volumes increase at half this rate for years 2036 through 2070. Both GP and HOV volumes

[8] A peak hour factor is calculated as peak hour volume divided by daily traffic volume. POET-ML uses "Peak Hour to Daily Conversion Factor," which is calculated as daily traffic volume divided by peak hour traffic volume.

were forecasted to increase. Growth rates in traffic beyond the model-generated growth (post 2035) were assumed to be as follows:

- Mainline SOV growth: AM = 2.0%; PM = 2.0%
- Mainline HOV growth: AM = 4.5%; PM = 4.7%
- Mainline Ramp SOV growth: AM = 0.9%; PM = 2.8%
- Mainline Ramp HOV growth: AM = 1.7%; PM = 2.4%

Table 5: Summary of I-205 Traffic Volumes – Westbound, AM Peak Hour

Segment 1 (Mountain House to I-580) - Westbound AM						
Data Category	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Peak Hour HOV (2) Lane Volume	1,120	1,430	1,598	1,624	1,650	1,676
Peak Hour HOV (3+) Lane Volume	144	169	201	240	278	316
Peak Hour HOV Total	**1,264**	**1,599**	**1,799**	**1,864**	**1,928**	**1,992**
% HOV Volume Growth	**-**	*26.5%*	*12.5%*	*3.6%*	*3.4%*	*3.3%*
Peak Hour GP Lane Volume	**4,941**	**5,754**	**6,333**	**6,678**	**7,023**	**7,369**
% GP Volume Growth	**-**	*16.5%*	*10.1%*	*5.4%*	*5.2%*	*4.9%*
Segment 2 (Lammers to Mountain House) - Westbound AM						
Data Category	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Peak Hour HOV (2) Lane Volume	1,076	1,421	1,604	1,626	1,647	1,669
Peak Hour HOV (3+) Lane Volume	137	168	202	240	278	316
Peak Hour HOV Total	**1,213**	**1,589**	**1,806**	**1,866**	**1,925**	**1,985**
% HOV Volume Growth	**-**	*31.0%*	*13.7%*	*3.3%*	*3.2%*	*3.1%*
Peak Hour GP Lane Volume	**4,941**	**5,754**	**6,333**	**6,678**	**7,023**	**7,369**
% GP Volume Growth	**-**	*16.5%*	*10.1%*	*5.4%*	*5.2%*	*4.9%*
Segment 3 (Tracy to Lammers) - Westbound AM						
Data Category	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Peak Hour HOV (2) Lane Volume	986	1,321	1,494	1,505	1,516	1,527
Peak Hour HOV (3+) Lane Volume	126	156	172	173	174	175
Peak Hour HOV Total	**1,112**	**1,477**	**1,666**	**1,678**	**1,690**	**1,702**
% HOV Volume Growth	**-**	*32.8%*	*12.8%*	*0.7%*	*0.7%*	*0.7%*
Peak Hour GP Lane Volume	**4,088**	**4,860**	**5,506**	**5,849**	**6,018**	**6,187**
% GP Volume Growth	**-**	*18.9%*	*13.3%*	*6.2%*	*2.9%*	*2.8%*
Segment 4 (I-5 to Tracy) - Westbound AM						
Data Category	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Peak Hour HOV (2) Lane Volume	1,006	1,338	1,505	1,509	1,512	1,516
Peak Hour HOV (3+) Lane Volume	128	157	173	173	174	174
Peak Hour HOV Total	**1,134**	**1,495**	**1,678**	**1,682**	**1,686**	**1,690**
% HOV Volume Growth	**-**	*31.8%*	*12.2%*	*0.2%*	*0.2%*	*0.2%*
Peak Hour GP Lane Volume	**4,219**	**5,008**	**5,666**	**5,998**	**6,135**	**6,273**
% GP Volume Growth	**-**	*18.7%*	*13.1%*	*5.9%*	*2.3%*	*2.2%*

Source: Fehr & Peers Associates, 2010.

Table 6: Summary of I-205 Traffic Volumes – Eastbound, PM Peak Hour

Segment 1 (Mountain House to I-580) - Eastbound PM						
Data Category	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Peak Hour HOV (2) Lane Volume	903	1,086	1,122	1,135	1,147	1,159
Peak Hour HOV (3+) Lane Volum	154	202	216	218	220	223
Peak Hour HOV Total	**1,057**	**1,288**	**1,338**	**1,353**	**1,367**	**1,382**
% HOV Volume Growth	**-**	*21.9%*	*3.9%*	*1.1%*	*1.0%*	*1.1%*
Peak Hour GP Lane Volume	**5,506**	**5,651**	**5,724**	**5,724**	**5,724**	**5,724**
% GP Volume Growth	**-**	*2.6%*	*1.3%*	*0.0%*	*0.0%*	*0.0%*
Segment 2 (Lammers to Mountain House) - Eastbound PM						
Data Category	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Peak Hour HOV (2) Lane Volume	825	1,058	1,141	1,182	1,224	1,265
Peak Hour HOV (3+) Lane Volum	143	198	219	227	235	243
Peak Hour HOV Total	**968**	**1,256**	**1,360**	**1,409**	**1,459**	**1,508**
% HOV Growth	**-**	*29.8%*	*8.3%*	*3.6%*	*3.5%*	*3.4%*
Peak Hour GP Lane Volume	**4,894**	**5,257**	**5,546**	**5,760**	**5,975**	**6,189**
% GP Volume Growth	**-**	*7.4%*	*5.5%*	*3.9%*	*3.7%*	*3.6%*
Segment 3 (Tracy to Lammers) - Eastbound PM						
Data Category	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Peak Hour HOV (2) Lane Volume	771	1,144	1,380	1,438	1,495	1,553
Peak Hour HOV (3+) Lane Volum	136	215	265	276	287	298
Peak Hour HOV Total	**907**	**1,359**	**1,645**	**1,714**	**1,782**	**1,851**
% HOV Growth	**-**	*49.8%*	*21.0%*	*4.2%*	*4.0%*	*3.9%*
Peak Hour GP Lane Volume	**4,472**	**5,819**	**6,139**	**6,686**	**7,233**	**7,780**
% GP Volume Growth	**-**	*30.1%*	*5.5%*	*8.9%*	*8.2%*	*7.6%*
Segment 4 (I-5 to Tracy) - Eastbound PM						
Data Category	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**
Peak Hour HOV (2) Lane Volume	845	1,240	1,373	1,510	1,648	1,785
Peak Hour HOV (3+) Lane Volum	148	233	264	290	317	343
Peak Hour HOV Total	**993**	**1,473**	**1,637**	**1,800**	**1,965**	**2,128**
% HOV Growth	**-**	*48.3%*	*11.1%*	*10.0%*	*9.2%*	*8.3%*
Peak Hour GP Lane Volume	**5,064**	**6,352**	**7,244**	**7,996**	**8,748**	**9,500**
% GP Volume Growth	**-**	*25.4%*	*14.0%*	*10.4%*	*9.4%*	*8.6%*

Source: Fehr & Peers Associates, 2010.

Figure 4 illustrates forecasted GP and HOV lane volumes through 2070. The HOV volume trend line and the Tolled vehicle volume trend line cross between 2030 and 2040 because the HOV policy requires three or more people (HOV 3+) after 2030. The HOV volumes through 2030 represent an HOV 2+ policy and HOV volumes after 2030 represents the HOV 3+ policy. This policy switch significantly impacts gross revenues.

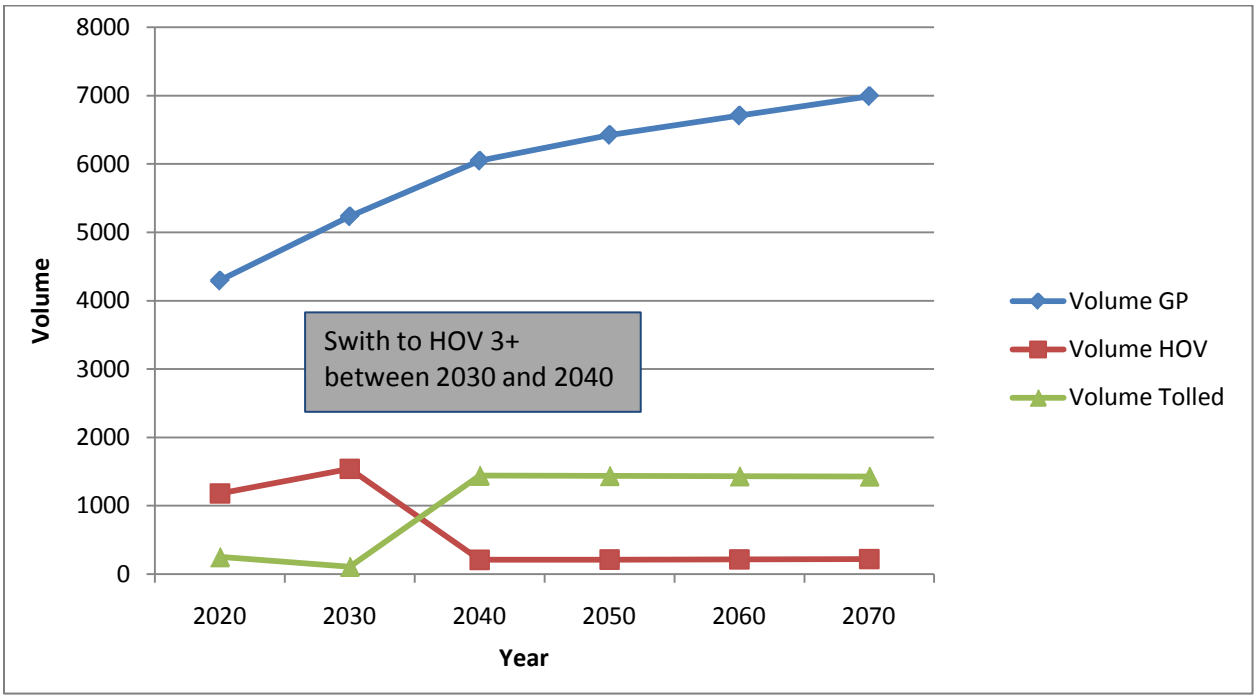


Figure 4: I-205 General Purpose and HOV Volumes – Westbound, AM Peak (HOV 3+ >1400 vph)

Source: Fehr & Peers and HNTB, 2010

4.2 I-205 Operations Analysis

This section summarizes the operations analysis results of converting the potential HOV lanes on I-205 between I-5 and I-580 to HOT lanes as part of a congestion management strategy. The team examined HOT lanes as a means to better manage traffic operations on I-205. The basic principle of HOT lanes as a congestion management strategy is to take advantage of reserve capacity on the HOV lane by allowing a pre-determined number of vehicles traveling in GP lanes to move over to the HOV lane for a price. The expected result of this strategy is that the traffic operations on the GP lanes should improve while the operations on the HOV lane should remain relatively the same. This condition would occur because the number of vehicles allowed in the HOV lane would be limited to maintain operations at the LOS C or better.

Based on the forecasted traffic volumes, I-205 needs be widened to an eight-lane facility with HOV lanes sometime between 2030 and 2035. It should be also noted that timing of the widening needs to be coordinated with I-580 widening over Altamont Pass in Alameda County.

Based on the projected traffic forecasts the HOV volumes on I-205 could exceed 1,400 vehicles per hour as early as year 2030. For this analysis, it was assumed that by year 2030, the HOV occupancy requirement would be changed from 2+ to 3+ persons to avoid substantial congestion on the HOV lane (i.e. LOS E/F).

In order to assess traffic operations on I-205 with and without HOT lanes, the following scenarios were evaluated for westbound AM peak period and eastbound PM peak period):

- Year 2030 with HOV lanes (3+ person requirement); and
- Year 2030 with HOT lanes (3+ persons in vehicle can use HOT lane for free).

Tables 7 and 8 present a comparison of the traffic operations for I-205 with an HOV lane and with a HOT lane. These results were developed through the use of the FREQ model[9] developed for the I-205 corridor. As shown in Tables 7 and 8, the conversion of an HOV lane to HOT lane would improve traffic operations on I-205. The largest benefit is demonstrated through the reduction of vehicle hours of delay.

Traffic operations were measured using the following measures of effectiveness:

- Vehicle and person throughput (number of trips);
- Average corridor travel time (minutes);
- Average corridor travel speed (mph); and
- Vehicle delay (hours).

Table 7: I-205 HOV vs. HOT Lane Comparison in Year 2030 Westbound, AM Peak

Measure of Effectiveness	HOV Lane Scenario*	HOT Lane Scenario*	% Difference (HOT scenario / HOV scenario)*
Vehicle Throughput in Bottleneck (peak hour)	5997 (74) [6071]	5683 (1472) [7155]	-5% (+1889%)[+18%]
Person Throughput in Bottleneck (peak hour)	7196 (222) [6219]	6820 (1900) [10099]	-5% (+756%) [+62%]
Average Corridor Travel Time (minutes)	19.3 (13.8) [19.3]	14.9 (14.1) [14.8]	-23% (+2%) [-23%]
Average Corridor Travel Speed (mph)	48 (65) [48]	62 (64) [63]	+29% (-2%) [+31%]
Corridor Vehicle Delay (vehicle hours)	1623 (0) [1623]	61 (4) [65]	-96% (n/a) [-96%]

Source: Fehr and Peers, September 2010.
Note: * Results presented as the following: Mixed Flow Lanes (HOV Lane) [Total or Weighted Average]

[9] A detailed calibration/validation of the FREQ model was not performed for this phase of the project. It is anticipated that a detailed traffic operations model would be developed in future phases of the project. The results presented in Tables 7 and 8 are intended to present the relative differences between the scenarios as opposed to absolute results.

Table 8: I-205 HOV vs. HOT Lane Comparison in Year 2030 Eastbound, PM Peak

Measure of Effectiveness	HOV Lane Scenario	HOT Lane Scenario	% Difference (HOT scenario / HOV scenario)
Vehicle Throughput in Bottleneck (peak hour)	5979 (177) [6156]	5748 (1488) [7236]	-4% (+741%) [+18%]
Person Throughput in Bottleneck (peak hour)	7175 (531) [6510]	6898 (2044) [10212]	-4% (+285%) [+57%]
Average Corridor Travel Time (minutes)	26.1 (13.3) [26.1]	15.2 (13.5) [15.2]	-42% (+2%) [-42%]
Average Corridor Travel Speed (mph)	34 (65) [34]	58 (64) [59]	+71% (-2%) [+74%]
Corridor Vehicle Delay (vehicle hours)	4141 (0) [4141]	654 (16) [670]	-84% (n/a) [-84%]

Source: Fehr and Peers, September 2010.
Note: * Results presented as the following: Mixed Flow Lanes (HOV Lane) [Total or Weighted Average]

The analysis indicates that there is an operational benefit from converting HOV lanes to HOT lanes if and when the occupancy requirement is changed from 2+ to 3+ persons. In particular, the HOT lanes appear to move more vehicles and persons through a mainline bottleneck. Furthermore, HOT lanes reduce travel times by improving average corridor travel speeds. Based on data collected there are a substantial number of trucks (westbound AM = 10% and eastbound PM = 5%). The reduction in travel times in the GP lanes should improve mobility for these trucks.

It is important to recognize that the operational benefits of the HOT lanes presented in Tables 7 and 8 will be substantially less during the period when the HOV occupancy requirement remains at 2+ persons because there would be little reserve capacity on the HOV lane to sell. The results presented in this section represent only a snapshot of what could occur from converting an HOV lane to a HOT lane. To gain a much larger understanding of the potential impacts there would need to be a greater understanding of the following:

- Existing single and high occupancy vehicle distribution throughout a 24-hour period;
- Future single and high occupancy forecasts for a 24-hour period;
- HOV 2+ versus HOV 3+ person policy decisions;
- HOV/HOT lane capacity and LOS C/D thresholds;
- Latent vehicle demand; and
- Potential mode shifts.

If and when a detailed operations study is prepared to fully evaluate the implications of converting the HOV lane to a HOT lane, the items listed above should be considered and addressed.

4.3 I-205 HOT Lane Gross Revenues

Annual gross revenues were developed using the POET-ML. Using the modified constrained volumes and the assumptions and methodologies noted above, the POET-ML generates estimates of the HOV 2+ or HOV 3+ usage, available capacity and revenue estimates.

As in the case of many existing HOT lane projects, gross annual revenue is forecasted to be lower than O&M costs. In opening year of 2020, the I-205 HOT lanes are estimated to generate approximately $0.1 million (2009 constant dollar). Annual gross revenue will significantly increase when HOV requirements are changed to HOV 3+ assuming HOV 2 will pay the same toll as SOVs. Revenues are forecasted to increase through 2070 as traffic volumes and congestion continues to increase.

4.4 I-205 HOT Lane Cost Estimates for Implementation

4.4.1 Capital Cost Estimates

Capital cost estimates of the I-205 HOT lanes was estimated for three alternatives as summarized in Table 9. The cost estimate assumed that HOT lanes will be physically separated from adjacent lanes through a two-foot wide painted buffer and operate 24 hours daily. HOT lanes will have designated ingress and egress zones to aid in tolling and enforcing the lanes. The design of the HOT lanes is assumed to be similar to the new southbound Express Lane over the Sunol Grade on I-680. A significant amount of this cost is related to the replacement of the existing bridges on I-205 that are to be replaced for multiple reasons. These costs account for 42 to 61 percent of the total construction cost. See Appendix B for details of the capital cost estimates.

The following assumptions have been made to develop the cost estimates:

- Assumed multiple entry and exit points in each direction.
- I-5/I-205 and I-580/I-205 freeway-to-freeway interchanges are not included.
- Environmental mitigation or right-of-way costs are not included.
- Further investigation of the replacement bridge structures is needed.

The capital cost of I-205 HOT Lane capital improvements have been estimated to be $268.5 million to $336.8 million in dollars escalated to the assumed year of construction in 2015; or $195 million to $246 million in non-escalated dollars. As previously stated, the estimated capital cost for this HOT lane is relatively high due to the assumed replacement of bridge structures in the corridor.

Table 9: Summary of I-205 HOT Lane Capital Improvement Alternative

Cost in $ millions	Minimum Bridge Replacement	Maximum Bridge Replacement
Construction	$194.9 M	$276.1 M
Construction Support	$19.5 M	$27.6 M
Design*	$27.3 M	$34.2 M
R/W Capital	$1.0 M	$1.1 M
R/W Support	$0.15 M	$0.2 M
Estimated Cost	**$268.5 M** ***($195M in constant $)***	**$336.8 M** ***($246M in constant $)***
Avg. Cost per Mile	**$20.0 M** ***($14.5M in constant $)***	**$25.1 M** ***($18.3M in constant $)***

Source: *(Draft)* Conceptual Cost Estimate Report, Rajappan & Meyer, August 2010
Notes:
"Design" includes PSR, PA/ED, and PS&E.
No escalation is assumed through 2013 and 2% escalation assumed for 2014 and beyond.

4.4.2 Operations and Maintenance Cost Estimates

A number of financial unit costs were used to estimate O&M costs, and assumptions are consistent with other HOT lane planning-level evaluations completed in the recent past and assumptions made by MTC's Regional Express Lane Study. See Section 2 for the assumptions made for the O&M costs.

O&M costs for the I-205 HOT lanes are estimated to be $3.1 million to $4.8 million annually (2009 constant dollar). These figures remain relatively constant throughout the planning horizon years.

4.5 I-205 HOT Lane Economic Benefit Analysis

Economic benefit analysis was undertaken for the period of 2020 through 2070 for the study corridor. Table 10 summarizes HOT lane costs and revenues for the most conservative scenario with low VOT of $13.90 and switching to HOV 3+ when HOV volumes exceed 1,650 vph. Details of the year-by-year cash flows, including ones for higher VOT, are included in Appendix F.

No estimation has been made at this time for the costs of borrowing associated with the capital and operations costs.

The estimates of the revenues, the number of users, and the expenses that are dependent upon the number of users, were developed for ten-year increments from 2020 through 2070. For the year-by-year cash flow analysis presented in Appendix F, each of these was straight lined for the "in-between" years to develop the annual cash flow results.

Operating expenses would be constant as the largest expenses (maintenance and enforcement) were calculated based on number of miles instead of users. Net revenue before financing turns positive approximately when HOV 3+ policy would be implemented. Sensitivity analysis examined a different threshold for switching to the HOV 3+ policy. In this conservative

scenario, Years beyond 2050 covers O&M costs, but it would not cover either the low or high range capital costs.

In the POET-ML analysis, revenue is function of travel time saving, number of toll payers and value of time. This study used the same VOT for all planning horizon years. The study found revenue to increase overtime as travel time saving increased in spite of slight decline in number of toll payers. While toll payers decrease slightly due to decrease of HOT lane capacity to sell, overtime number of vehicular trips (SOVs and HOVs) increase. This occurs as travel time saving increase was larger than decline in number of toll payers. With increased level of congestion in GP lanes, SOVs would be willing to pay higher toll rates in the future years for reliable and faster travel. As stated in Section 4.1.3, SOV volumes in mainline are expected to increase by two percent annually and HOV volumes in mainline by over four percent annually between 2035 to 2070. In these outer years, revenues are expected to grow two to five percent annually, which is in line with growth of traffic volumes during the same period.

Table 10: Summary of I-205 HOT Lane Costs and Revenues – HOV 3+>1650 vph, Low VOT

	2020	2021 to 2030	2031 to 2040	2041 to 2050	2051 to 2060	2061 to 2070
Gross Revenue	$0.1M	$1.3M	$9.8M	$39.2M	$69.3M	$91.8M
Operating Expenses	$3.5 M	$32.5M	$36.3M	$44.4M	$47.7M	$47.6M
Net Revenue Before Financing	($3.4M)	($31.2M)	($26.4M)	($5.2M)	$21.6M	$44.2M
Low Range Capital Cost	$195M (In constant, non-escalated $)					
High Range Capital Cost	$246M (In constant, non-escalated $)					

Source: Revenue and O&M Costs by HNTB, 2010. Capital cost estimates by Rajappan & Meyers, 2010.
Notes: Revenues and operating expenses are in 2009 constant dollar. Capital costs are in 2010 dollar. Low VOT of $13.90 is assumed.

4.5.1 Sensitivity Analysis

This study made a series of conservative assumptions, including VOT and HOV policy. However, in order to know potential range of revenues, the study tested two different VOTs and timing for changing to HOV 3+. In addition, different opening years were tested to see how it would impact cash flow.

HOV 3+ Policy Requirement Sensitivity Analysis

Figure 5 illustrates how HOV policy requirements impacts annual revenues. This is a policy question that needs to be decided prior to the HOT lane reaching the capacity of the lane. Switching to HOV 3+ before reaching to 1650 vph will generate higher revenues when HOT lane capacity is largely occupied. As HOV volumes approach the capacity of 1,650 vph, limited (and decreasing) capacity is available to accommodate SOVs willing to pay tolls. Thus, it limits potential revenues until the HOV policy is changed to 3+ or second HOT lane is added.

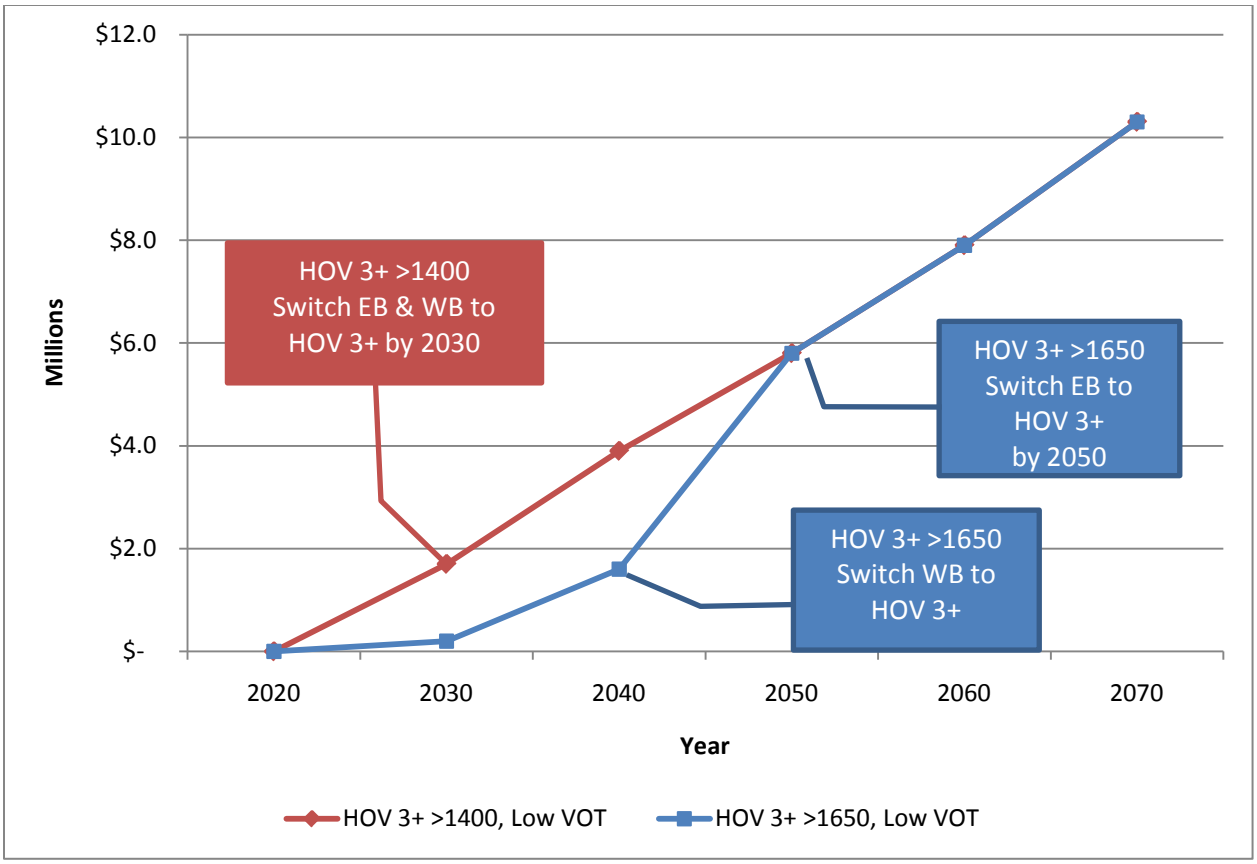


Figure 5: I-205 Gross Annual Revenue Estimate – HOV 3+>1650 vph vs. HOV 3+ >1400 vph

Source: HNTB, 2010
Notes: Low VOT is used.

VOT Sensitivity Analysis

The estimated gross annual revenue stated above provides a conservative estimate by using a conservative level of VOT. As discussed earlier, two different VOTs were applied to test a potential revenue range. The "Low VOT" represents an average San Joaquin County hourly wage. Based on a survey conducted by the University of Pacific, average per capita annual income in San Joaquin County in 2009 was $29,000 – or approximately $13.90 per hour based on 2080 work hours annually. This VOT is generally consistent with other urban areas nationally (outside of the high-labor rate areas such as Los Angeles and New York City, etc.).

However, I-205 commuters in the peak directions are largely composed of people who work in the Bay Area. Thus, the VOT for the I-205 users may be higher than the San Joaquin County average VOT. Thus, a VOT of $19.58, representing 75 percent of the Bay Area average hourly income, was used for the "High VOT" sensitivity test.

Figure 6 illustrates the annual gross revenues for the two VOT scenarios combined with HOV policy alternatives of 2+ and 3+ for I-205. By assuming a 41 percent higher VOT ($19.58), the estimated annual gross revenues also increase by 41 percent when compared to the VOT of $13.90 scenario.

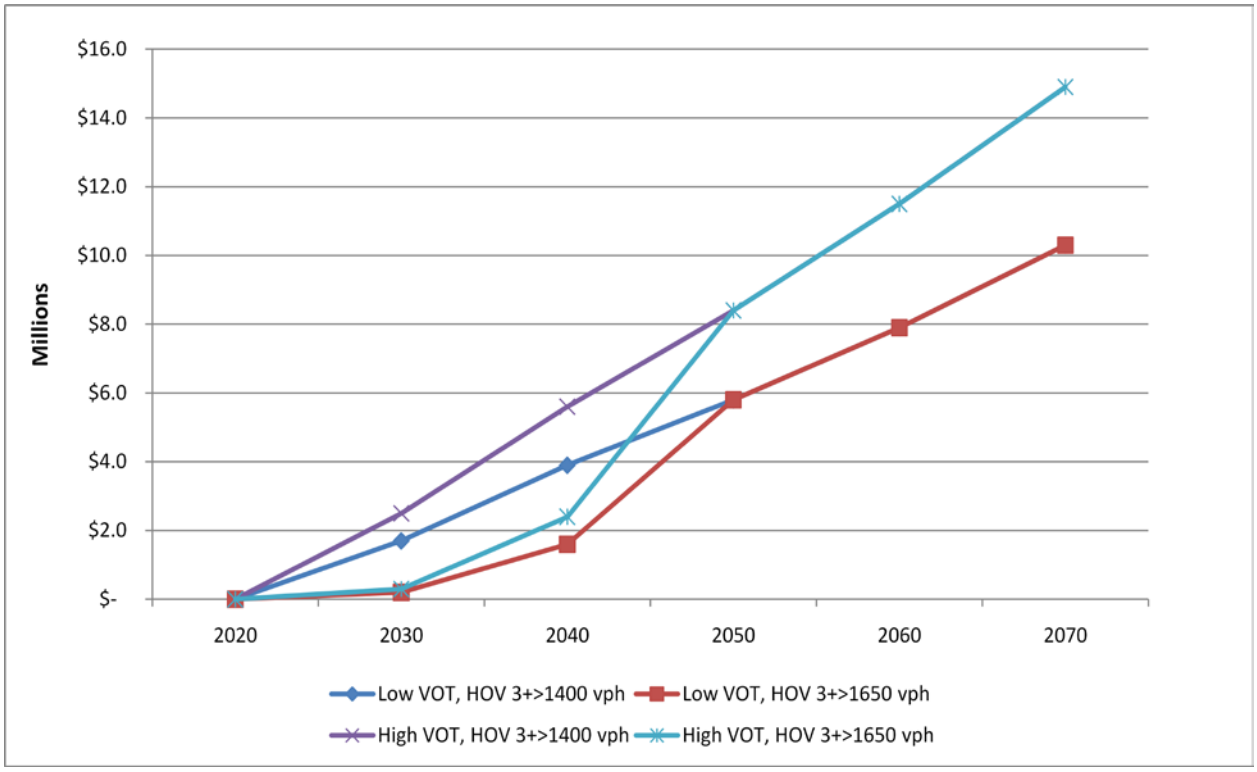


Figure 6: I-205 Gross Annual Revenue – Low VOT vs. High VOT

Source: HNTB, 2010
Notes: Low VOT = $13.90, High VOT = $19.58

Opening Year Sensitivity Analysis

Two different "opening years" for the HOT lane – Years 2020 and 2030– were evaluated as it relates to cash flow. Opening years have a significant implication on cash flow. By opening in 2030, the HOT lanes are expected to cover the on-going and accumulated O&M costs within a few years of its opening. If the HOT lanes are opened earlier, it would take a longer for revenue to recover the accumulated O&M costs plus the on-going O&M costs as the early opening does not generate enough revenue to cover the costs. Thus, opening in early is forecasted to result in an accumulating negative balance that takes longer to pay from the revenues once they exceed the on-going O&M costs.

Figure 7 illustrates the ending balances for the two opening year scenarios, assuming an HOV3+ policy will be in place when HOT lane volumes exceeds 1,650 vph. If the HOT lanes were opened in 2030, the on-going (including carry-over of previous year deficits) balance would become positive around 2060 (approximately 30 years). If the HOT lanes were opened ten years earlier in 2020, it would take approximately 50 years for the on-going (including carry-over of previous year deficits) balance to become positive – covering all O&M costs up to that point in time.

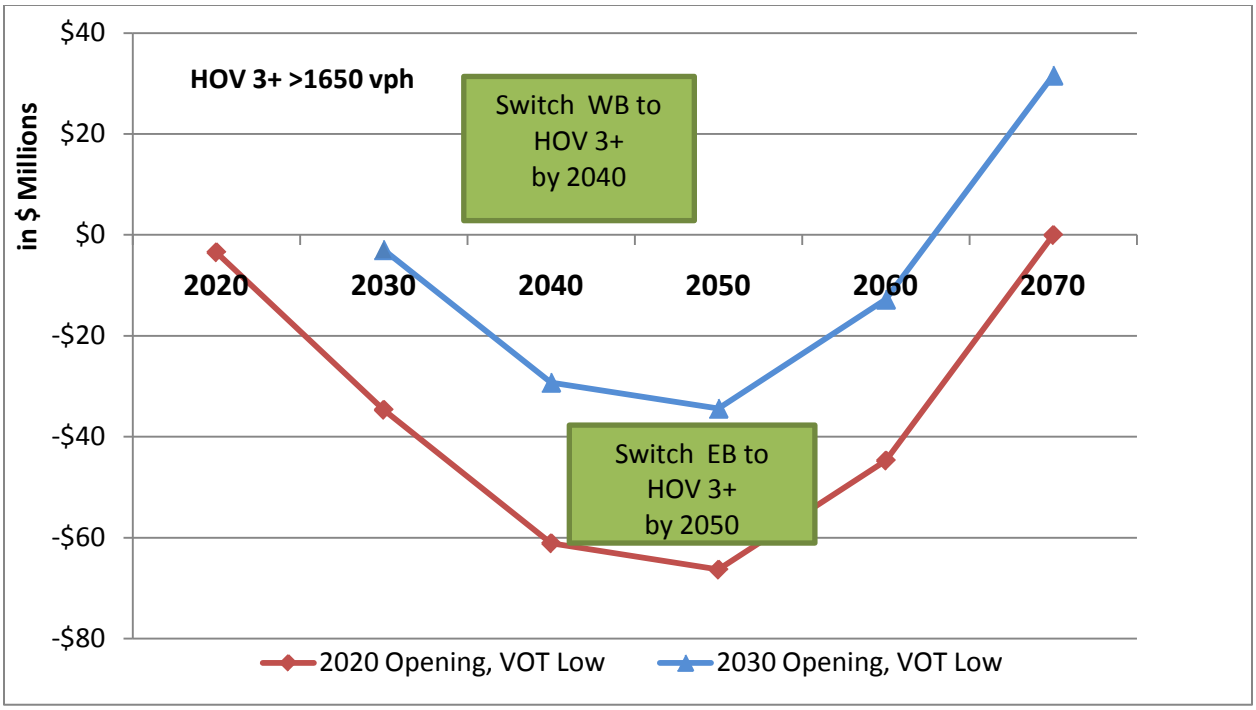


Figure 7: I-205 HOT Lane Cumulative Ending Balance – Opening in 2020 vs. 2030 (HOV 3+ >1650 vph)

Notes: Assumes low VOT and low volume range.
Source: HNTB, 2010

Figure 8 illustrates the ending balances for two opening-year scenarios, assuming HOV3+ policy will be in place when HOT lane volumes exceeds 1,400 vph (as compared to Figure 6 which assumes the 1,650 vph HOT lane capacity). If the HOT lanes were opened in 2030 assuming a lower VOT, the ending balance would become positive within approximately 30 years after opening. If the HOT lanes were opened in 2030 assuming a higher VOT, the ending balance would become positive within in approximately 15 years. If the HOT lanes were opened in 2020, it would take over 40 years to bring back to the ending balance of zero – covering all O&M costs up to that time.

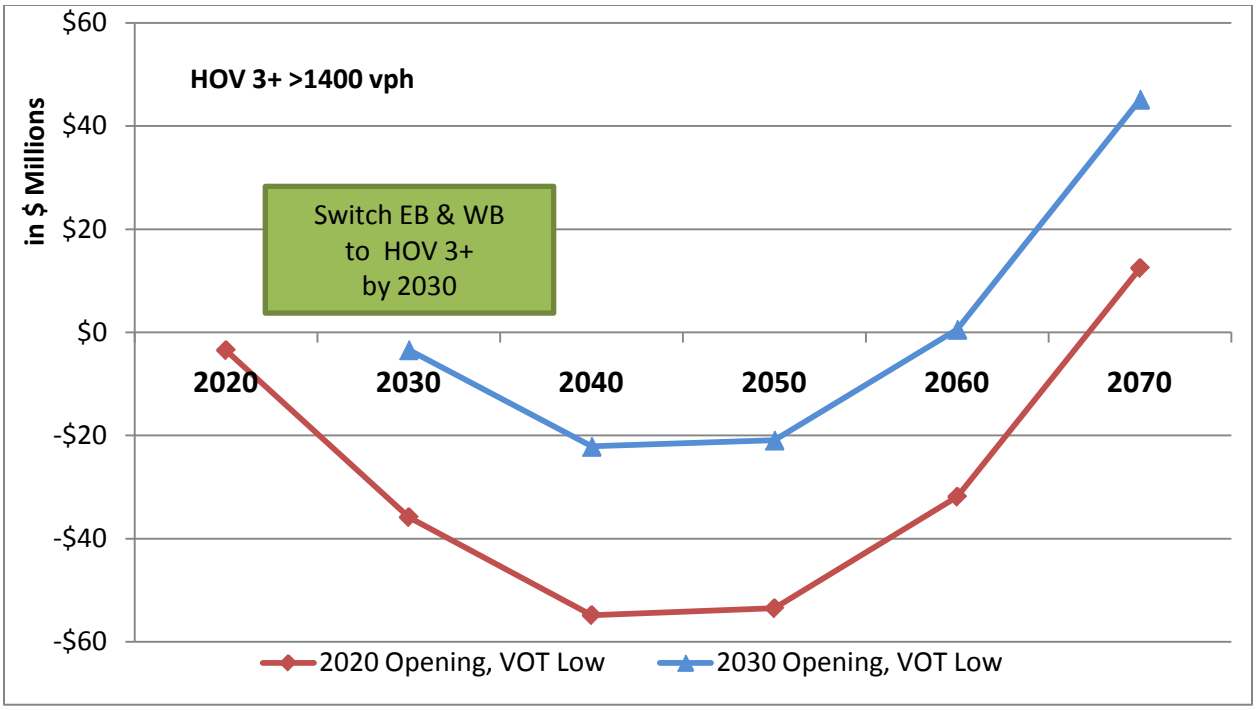


Figure 8: I-205 HOT Lane Cumulative Ending Balance – Opening in 2020 vs. 2030 (HOV3+ >1400 vph)

Note: Assumes Low VOT and low volume range
Source: HNTB, 2010

4.6 I-205 HOT Lane Feasibility Analysis Results

The sketch-level planning analysis revealed that I-205 corridor has a potential for HOT lanes although the analysis took a conservative approach. When HOV lanes would require shifting to HOV 3+, sometime around 2030, revenues are forecasted to have a dramatic increase and cover the annual O&M costs. Timings of opening HOT lanes and changing HOV requirements to 3+ have great implications on economic benefits. In addition, sensitivity analysis revealed that a 2030 opening is projected to have an improved cash flow position. This “opening year” question needs to be addressed and answered by the SJCOG.

Based on traffic operations analysis, the I-205 corridor would need to be widened sometime between 2020 and 2025. Potential widening would present an opportunity for installation of HOV/HOT lanes. Widening of I-205 has to be coordinated with widening of I-580 over Altamont Pass. Currently, Alameda CTC is coordinating the countywide transportation call for projects with MTC's regional transportation plan call for projects for inclusion of projects in the next regional RTP (*One Bay Area Plan*) to be adopted in 2013. This study assumed that widening of I-580 over Altamont Pass to happen in 2030-2035.

5 I-5 Corridor HOT Lane Feasibility

The study segment on I-5 is an 8.6-mile reach in northern San Joaquin County, extending from Hammer Lane to Downing Avenue. It serves as a major freeway corridor for commuters within the County as well as those traveling to Sacramento and the Bay Area, connecting to three major freeways, SR 4, SR 120, and I-205, in San Joaquin County. The study segment of I-5 carried approximately 100,000 to 150,000 vehicles on average weekday in 2009.[10] As discussed earlier, this report focuses on the segment between Hammer Lane and Downing Avenue (a distance of 8.6 miles) as it was identified as most financially viable in the report prepared for the SJCOG, *Potential I-5 North HOT Lane Travel and Revenue Estimates, Costing, and Net Revenue Estimates*, April 2010. With the programmed freeway widening and HOV lane project on I-5 in Stockton, a segment between Hammer Lane and Eight Mile Road will provide three GP lanes and one HOV lane in each direction by late 2013.

5.1 I-5 Traffic forecasts

5.1.1 Data Collection

FPA prepared traffic forecasts for the I-5 North HOT lanes project. The traffic data was collected from readily available sources including the *I-5 North Stockton Interchanges and Mainline Widening Traffic Report (I-5 Report)* and the City of Stockton Travel Demand Model.

5.1.2 Methodology

Traffic forecasts were developed from Year 2010 through Year 2065 in five-year increments for the freeway segments between Eight-Mile Road and Lathrop Road in San Joaquin County. Based on discussions with the SJCOG and Caltrans, it was agreed that the year 2035 traffic forecasts from the I-5 Report would be used for this project. The corridor south of Charter Way and all segments beyond Year 2035 were developed based on the City of Stockton Travel Demand Model. An annual growth rate of one percent was assumed for through trips on I-5 through Year 2065.

As shown in Table 11, the 8.6-mile corridor was divided into five segments for the purpose of estimating traffic volumes.

Table 11: I-5 Corridor Study Segments

Segment	From	To	Distance (Miles)	Assumed Year of HOV/HOT Implementation
1	Hammer Lane	March Lane	2.7	2015
2	March Lane	Country Club Blvd	1.5	2015
3	Country Club Blvd	SR 4	2.4	2015
4	SR 4	Charter Way	0.8	2015
5	Charter Way	Downing Ave	1.2	2015
Total			8.6	2015

Source: Fehr and Peers Associates, 2009.

[10] 2009 Annual Average Daily Traffic, Caltrans. http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/index.htm

As this is a planning-level study, we have provided a conservative approach to estimate economic benefits. In addition to the methodology discussed previously, the following traffic-specific assumptions for the I-5 corridor were made in estimating economic benefits:

- Percentage of HOV is based on the traffic counts conducted in the I-5 Report. Based on the I-5 Report, 18 percent of the passenger vehicles in the southbound AM peak direction had two or more people while 15 percent of the passenger vehicles in the northbound PM peak direction had two or more people. These ratios were assumed for all horizon years. The consultant team recognizes that the percentage of vehicles with two or more people are likely to change over the period through 2065, but no quantitative basis was available on which to base an estimate of that change. The team believes that assumption that the percentage to remain unchanged is a conservative assumption.
- Peak hour factor of 9.5 percent was used.
- The study used unconstrained volumes for the purpose of estimating economic benefits based on demand or desirability of the facility.
- Because the traffic volumes were unconstrained, the study assumed that 100 percent of the volume that could use the HOT lane would come from the GP lanes and no cars from parallel facilities.
- Eight lanes on I-5 (three GP lanes and one HOV lane in each direction) were assumed for Year 2015 and beyond.

5.1.3 Traffic Volume Forecasts

Based on traffic forecasts developed from Year 2010 through Year 2065, HNTB team estimated number of tolled vehicles. Figure 9 illustrates the forecasted GP and HOV lane and tolled vehicle volumes if the HOV 2+ policy remained until the HOV volumes reaches 1650 vph and then switches to an HOV 3+ assumption. The HOV volumes continue to climb gradually while the number of tolled vehicles decline gradually as there is reduced capacity available for toll-paying vehicles.

Tables 12 and 13 (following pages) summarize peak hour GP and HOV traffic volumes in peak directions. Both GP and HOV volumes were forecasted to increase and reach to their capacity.

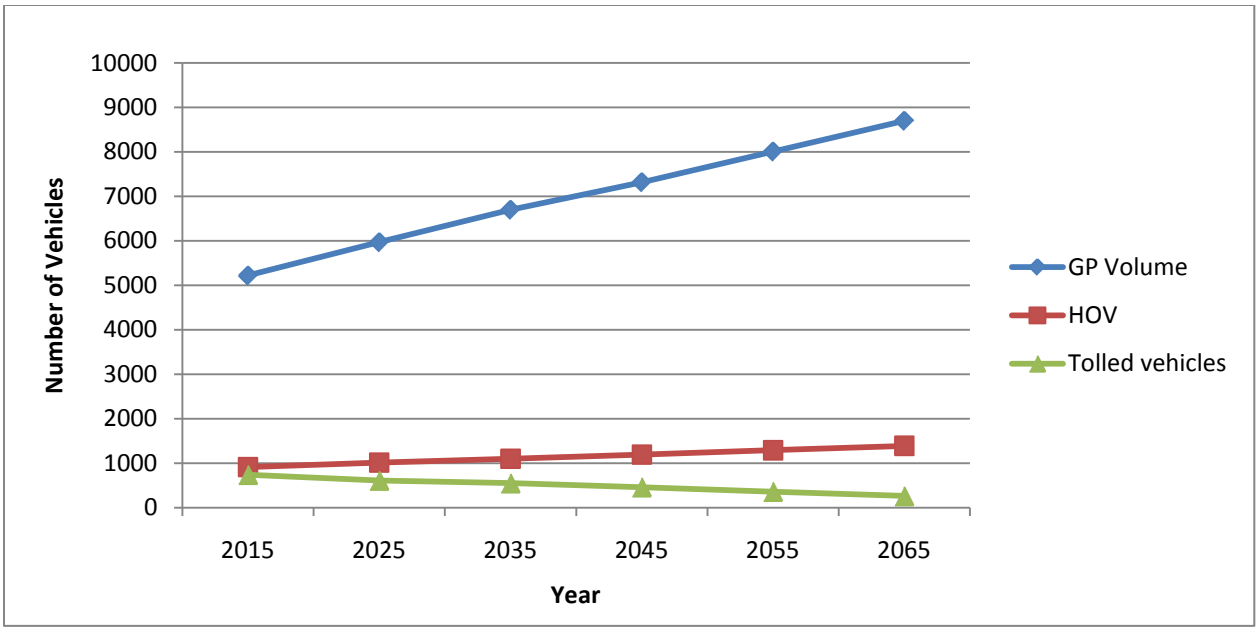


Figure 9: I-5 GP and HOV Volumes between SR 4 and Charter Way, Northbound PM with HOV 3+ >1650 vph

Source: Fehr and Peers Associates and HNTB, 2009.

Table 12: Summary of I-5 Traffic Volumes – Northbound, PM Peak Hour

Segment 2: Hammer Lane to March Lane, Northbound PM						
Year	**2015**	**2025**	**2035**	**2045**	**2055**	**2065**
HOV 2	783	933	1080	1214	1363	1512
HOV 3+	106	126	148	166	186	206
HOV Total	**889**	**1059**	**1228**	**1380**	**1549**	**1718**
% HOV increase	**-**	*19%*	*16%*	*12%*	*12%*	*11%*
GP Total	**5845**	**6958**	**8072**	**8348**	**8652**	**8958**
% GP increase	**-**	*19%*	*16%*	*3%*	*4%*	*4%*
Segment 3: March Lane to Country Club Blvd, Northbound PM						
Year	2015	2025	2035	2045	2055	2065
HOV 2	799	885	970	1048	1133	1220
HOV 3+	108	121	133	143	155	166
HOV Total	**907**	**1006**	**1103**	**1191**	**1288**	**1386**
% HOV increase	**-**	*11%*	*10%*	*8%*	*8%*	*8%*
GP Total	**5962**	**6607**	**7252**	**7784**	**8371**	**8961**
% GP increase	**-**	*11%*	*10%*	*7%*	*8%*	*7%*
Segment 4: Country Club Blvd to SR4, Northbound PM						
Year	2015	2025	2035	2045	2055	2065
HOV 2	895	991	1090	1179	1278	1377
HOV 3+	121	136	149	161	174	188
HOV Total	**1016**	**1127**	**1239**	**1340**	**1452**	**1565**
% HOV increase	**-**	*11%*	*10%*	*8%*	*8%*	*8%*
GP Total	**6671**	**7413**	**8154**	**8979**	**9892**	**10809**
% GP increase	**-**	*11%*	*10%*	*10%*	*10%*	*9%*
Segment 5: SR 4 to Charter Way, Northbound PM						
Year	2015	2025	2035	2045	2055	2065
HOV 2	960	1049	1141	1224	1316	1408
HOV 3+	129	144	156	167	180	192
HOV Total	**1089**	**1193**	**1297**	**1391**	**1496**	**1600**
% HOV increase	**-**	*10%*	*9%*	*7%*	*8%*	*7%*
GP Total	**7153**	**7847**	**8543**	**8869**	**9226**	**9589**
% GP increase	**-**	*10%*	*9%*	*4%*	*4%*	*4%*
Segment 6: Charter Way to Downing Ave, Northbound PM						
Year	2015	2025	2035	2045	2055	2065
HOV 2	910	1024	1141	1246	1363	1480
HOV 3+	123	140	156	170	186	202
HOV Total	**1033**	**1164**	**1297**	**1416**	**1549**	**1682**
% HOV increase	**-**	*13%*	*11%*	*9%*	*9%*	*9%*
GP Total	**6779**	**7661**	**8543**	**8909**	**9309**	**9716**
% GP increase	**-**	*13%*	*12%*	*4%*	*4%*	*4%*

Source: Fehr and Peers Associates, 2009.

Table 13: Summary of I-5 Traffic Volumes – Southbound, AM Peak Hour

Segment 2: Hammer Lane to March Lane, Southbound AM						
Year	**2015**	**2025**	**2035**	**2045**	**2055**	**2065**
HOV 2	887	1082	1276	1449	1642	1835
HOV 3+	99	120	141	161	183	204
HOV Total	**986**	**1202**	**1417**	**1610**	**1825**	**2039**
% HOV increase	**-**	*22%*	*18%*	*14%*	*13%*	*12%*
GP Total	**5313**	**6467**	**7623**	**7943**	**8294**	**8648**
% GP increase	**-**	*22%*	*18%*	*4%*	*4%*	*4%*
Segment 3: March Lane to Country Club Blvd, Southbound AM						
Year	2015	2025	2035	2045	2055	2065
HOV 2	903	1019	1134	1236	1352	1466
HOV 3+	101	113	126	138	150	163
HOV Total	**1004**	**1132**	**1260**	**1374**	**1502**	**1629**
% HOV increase	**-**	*13%*	*11%*	*9%*	*9%*	*8%*
GP Total	**5409**	**6093**	**6780**	**7354**	**7986**	**8623**
% GP increase	**-**	*13%*	*11%*	*8%*	*9%*	*8%*
Segment 4: Country Club Blvd to SR 4, Southbound AM						
Year	2015	2025	2035	2045	2055	2065
HOV 2	947	1072	1195	1195	1431	1554
HOV 3+	106	118	133	133	159	173
HOV Total	**1053**	**1190**	**1328**	**1328**	**1590**	**1727**
% HOV increase	**-**	*13%*	*12%*	*0%*	*20%*	*9%*
GP Total	**5677**	**6414**	**7152**	**7152**	**8116**	**10252**
% GP increase	**-**	*13%*	*12%*	*0%*	*13%*	*26%*
Segment 5: SR 4 to Charter Way, Southbound AM						
Year	2015	2025	2035	2045	2055	2065
HOV 2	738	890	1044	1182	1336	1489
HOV 3+	81	98	116	131	148	165
HOV Total	**819**	**988**	**1160**	**1313**	**1484**	**1654**
% HOV increase	**-**	*21%*	*17%*	*13%*	*13%*	*11%*
GP Total	**4415**	**5328**	**6240**	**7263**	**8392**	**9529**
% GP increase	**-**	*21%*	*17%*	*16%*	*16%*	*14%*
Segment 6: Charter Way to Downing Ave, Southbound AM						
Year	2015	2025	2035	2045	2055	2065
HOV 2	661	824	988	1135	1299	1462
HOV 3+	73	90	110	126	145	163
HOV Total	**734**	**914**	**1098**	**1261**	**1444**	**1625**
% HOV increase	**-**	*25%*	*20%*	*15%*	*15%*	*13%*
GP Total	**3958**	**4932**	**5902**	**6967**	**8140**	**9323**
% GP increase	**-**	*25%*	*20%*	*18%*	*17%*	*15%*

Source: Fehr and Peers Associates, 2009.

Figure 10 illustrates the GP and HOV volumes on I-5 between SR 4 and Charter Way. As shown in Figure 9, the HOV volume trend line and the Tolled vehicle trend line cross between 2045 and 2055 if the HOV3+ "switch" is assumed with a 1400 vph capacity. This effect of this alternate HOV lane capacity assumption is discussed further in the Sensitivity Analysis section.

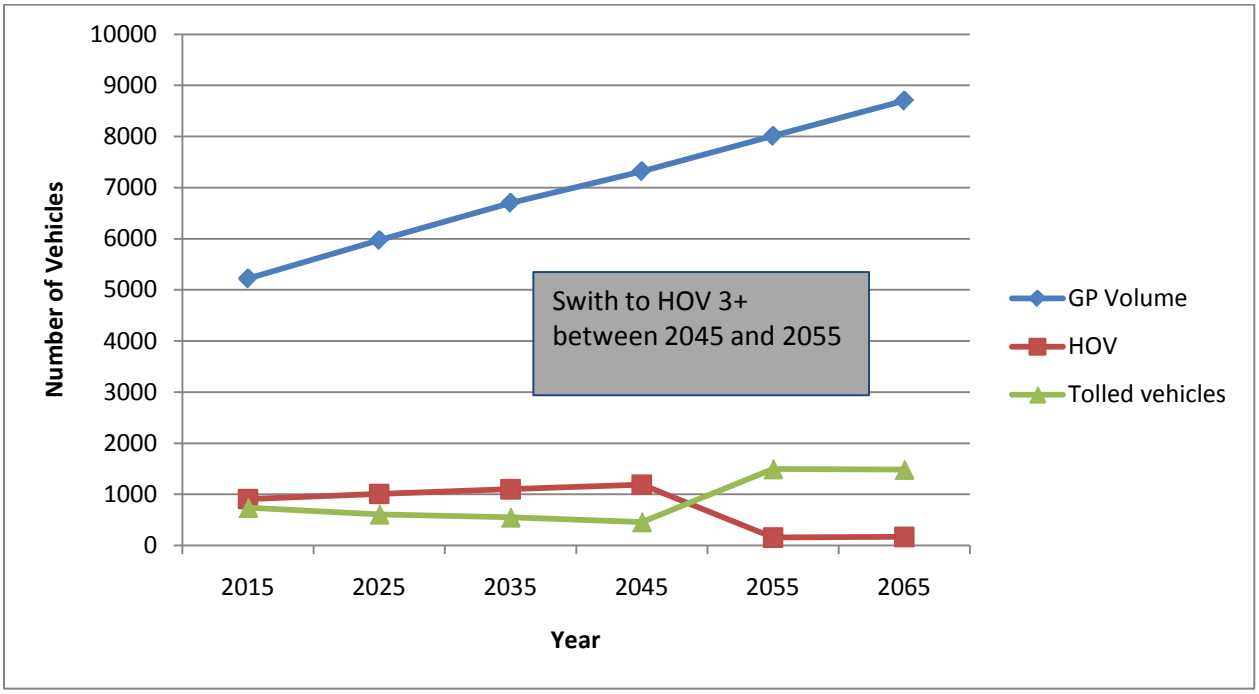


Figure 10: I-5 General Purpose and HOV Volumes between SR 4 and Charter Way, Northbound PM with HOV 3+ >1400 vph

Source: Fehr and Peers Associates and HNTB, 2009.

5.2 I-5 Operations Analysis

This section summarizes the operations analysis results of converting the proposed HOV lanes on I-5 between Charter Way and Eight Mile Road to HOT lanes as part of a congestion management strategy.

The effectiveness of a HOT lane as a congestion management strategy becomes realized when the mainline lanes begin to break down (i.e., bottlenecks begin to develop) and there is reserve capacity on the HOV lane. Based on both existing and projected year 2035 traffic volumes presented in the *Traffic Operations Report for the I-5 North Stockton Improvement Project* (I-5 Report, February 2008), it was determined that in the AM peak, the first mainline bottleneck would form in the southbound direction in about the year 2030. In the PM peak, the first mainline bottleneck would form in the northbound direction in the year 2015.

A review of the projected 2030 HOV volumes in the southbound AM peak direction revealed that there would be no reserve capacity in the HOV lane. Therefore, a HOT lane evaluation in the southbound AM peak period is unwarranted.[11] In the northbound PM peak direction there does

[11] This analysis assumes that the HOV lane has an occupancy requirement of 2+ persons. If the occupancy requirement were changed to 3+ persons, there would be reserve capacity.

appear to be reserve capacity in the HOV lane; therefore, this analysis focused on the year 2015 northbound PM peak period to help demonstrate the benefits of a HOT lane as a congestion management strategy.

Based on the analysis performed for the I-5 North Stockton Improvement Project, the HOV lane was assumed to have a capacity of 1,650 vehicles per hour (vph). For this analysis, it was assumed that the pricing for the HOT lane would be established at a level that would result in the HOV/HOT lane carrying about 1,400 vph (i.e. LOS C/D range).[12]

Table 14 presents a comparison of the traffic operations for I-5 with an HOV lane and with a HOT lane. These results were developed through the use of the FREQ model developed for the I-5 North Stockton Improvement Project and a simplified forecasting process involving linear interpolation between the existing and year 2035 traffic forecasts.

Table 14: I-5 HOV vs. HOT Lane Comparison in Year 2015, Northbound PM Peak Period

Measure of Effectiveness	HOV Lane Scenario	HOT Lane Scenario	% Difference (HOT scenario / HOV scenario)
Vehicle Throughput in Bottleneck (peak hour)	6,616 (1,115) [7,731]	6,616 (1,338) [7,954]	0% (+20%) [+3%]
Person Throughput in Bottleneck (peak hour)	6,616 (2,364) [8,980]	6,616 (2,587) [9,203]	0% (+9%) [+2%]
Average Corridor Travel Time (minutes)	22.6 (13.4) [20.8]	19.3 (13.9) [18.2]	-14% (+4%) [-13%]
Average Corridor Travel Speed (mph)	54 (70) [57]	64 (67) [65]	+17% (-4%) [+14%]
Corridor Vehicle Delay (vehicle hours)	1,872 (0) [1,872]	680 (48) [728]	-64% (n/a) [-61%]

Source: Fehr and Peers, September 2010.
Note: * Results presented as the following: Mixed Flow Lanes (HOV Lane) [Total or Weighted Average]

As shown in Table 14, the conversion of an HOV lane to HOT lane would improve traffic operations on I-5 in the northbound PM peak period. The largest benefit is demonstrated through the reduction of vehicle hours of delay (61% reduction).

Based on the analysis results there appears to be an operational benefit from converting HOV lanes to HOT lanes. In particular, the HOT lanes appear to move more vehicles and persons through a mainline bottleneck. Furthermore, HOT lanes reduce travel times by improving corridor speeds. There are a substantial number of trucks (12%) in the northbound PM peak

[12] The HOV lane capacity and LOS C/D range is consistent with assumptions that have been made for HOT lane studies in the San Francisco Bay Area. However, it should be noted that assuming no more than 1,400 vph in the HOV/HOT lane for analysis purposes is conservative; some studies in other regions have set the target at as much as 1,600 vph.

direction. The reduction in travel times in the mixed flow lanes should improve mobility for these trucks.

It should be noted that the benefits of the HOT lane presented in Table 14 would likely diminish over time, as traffic volumes on the HOV lane naturally increase thereby leaving less excess capacity to sell to single-occupancy users. To combat increasing volumes on the HOV lane and deterioration of the HOV lane to unacceptable service levels the common strategy to improve operations has been to increase the occupancy requirement to 3+ persons. When the occupancy requirement is increased, there is typically a surge in reserve capacity thereby making HOT lanes once again a viable option to manage congestion.

The results presented in this report represent only a snapshot of what could occur from converting an HOV lane to a HOT lane. To gain a much larger understanding of the potential impacts there would need to be a greater understanding of the following:

- Existing single and high occupancy vehicle distribution throughout a 24-hour period
- Future single and high occupancy forecasts for a 24-hour period;
- HOV 2+ versus HOV 3+ policy decisions;
- HOV/HOT lane capacity and LOS C/D thresholds;
- Latent vehicle demand; and
- Potential mode shifts.

If and when a detailed operations study is prepared to fully evaluate the implications of converting the HOV lane to a HOT lane, the items listed above should be considered and addressed.

5.3 I-5 HOT Lane Gross Revenues

Annual gross revenues were estimated using the POET-ML. Using the unconstrained volumes and the assumptions and methodologies noted above, the POET-ML generated estimates of the HOV 2+ or HOV 3+ usage, available capacity and revenue estimates. As this is a planning-level study, a conservative approach to estimating the gross revenue has been used.

- The study approximated total revenues by using the lowest segment volume to provide a conservative estimate.
- VOT used for the I-5 analysis is $11.20, representing the hourly average wage for the Stockton area, $13.90, representing the hourly average wage for San Joaquin County, and $16.83, representing the blended VOT for commuters to the Bay Area and Sacramento.

Based on the information developed and presented below, the I-5 HOT lanes do not generate as much revenues as the I-205 HOT lanes. When the most conservative estimates are used, the HOT lanes would not cover the O&M costs through 2065 even when an HOV 3+ threshold of 1400 vph is assumed.

Figure 11 summarizes the estimated annual gross revenues by direction. The northbound direction would generate more revenues than t the southbound as the southbound direction has higher HOV volumes. Thus, the southbound direction between 2045 and 2065 has extremely limited capacity to accommodate tolled vehicles and shows a decline in revenues over time.

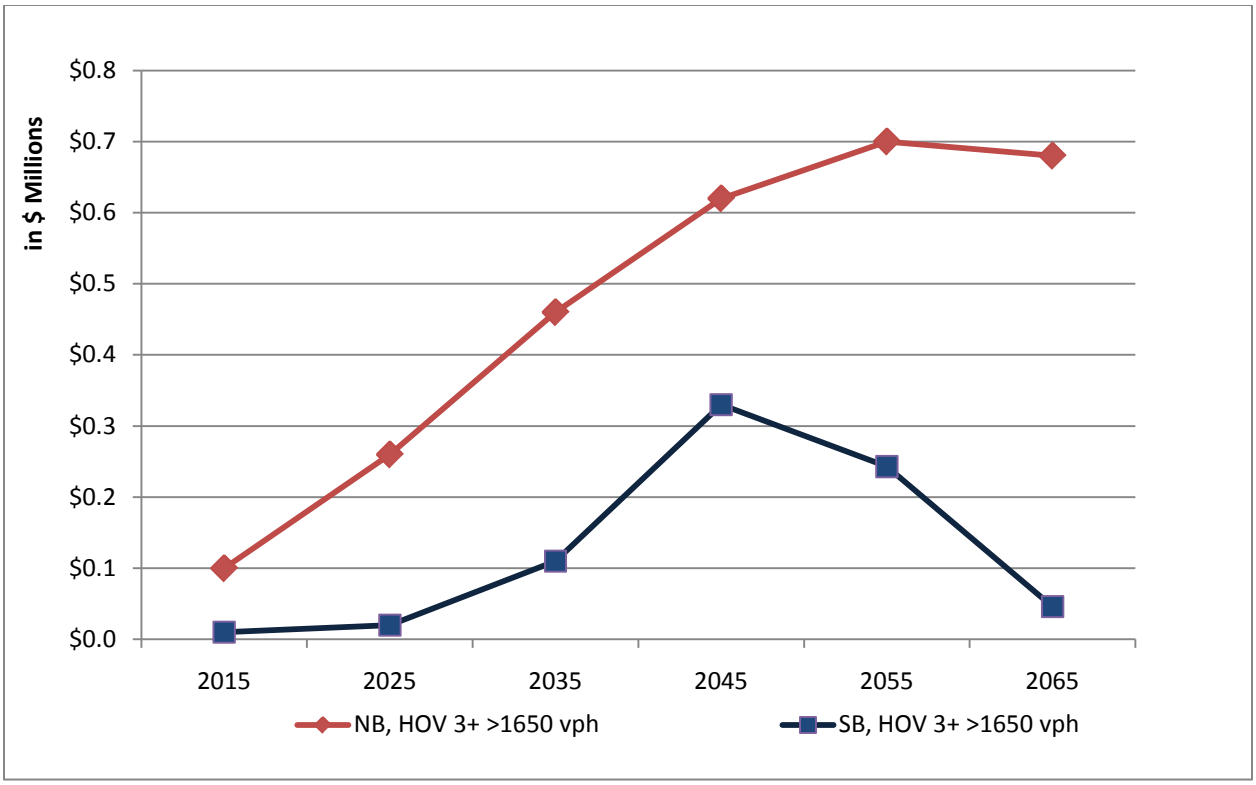


Figure 11: Annual Gross Revenues by Direction

Source: HNTB, 2010.
Notes: Assumed Low VOT, Low Volumes, and HOV 3>1650 vph

5.4 I-5 HOT Lane Cost Estimates for Implementation

5.4.1 Capital Cost Estimates

Capital cost estimates of the I-5 HOT lanes was estimated by HNTB based on information provided by Rajappan & Meyer Consulting Engineers. The cost estimate assumed that HOT lanes will be physically separated from adjacent lanes through a two-foot wide painted buffer and operate 24 hours daily. HOT lanes will have designated ingress and egress zones to aid in tolling and enforcing the lanes. The design of the HOT lanes will be similar to Express Lanes through Sunol on I-680, and it will require all toll payers to carry transponders. Table 15 summarizes capital improvement alternatives. See Appendix C for details of the capital cost estimates.

The following assumptions are made to develop cost estimates:

- Assumed multiple (over three) entry and exit points in each direction.
- Environmental mitigation or Right-of-Way cost is not included
- Further investigation of bridge structures is needed.

Table 15: Summary of I-5 HOT Lane Capital Improvement Alternative

	Estimated Cost (in $ millions)
Construction	$121.7 M
Construction Support	$13.5 M
Design*	$18.0 M
R/W Capital	n/a
R/W Support	n/a
Estimated Capital Cost	**$121.7 M** (In constant, non-escalated $)
Avg. Cost per Mile	**$14.2 M** (In constant, non-escalated $)

Source: HNTB summary of Rajappan & Meyer, 2009.
Notes:
"Design" includes PSR, PA/ED, and PS&E.
Right of Way capital and support excluded from the estimates.
Estimates are based on current dollar and does not account for inflation.

5.4.2 Operations and Maintenance Cost Estimates

Similar assumptions were made for the I-5 estimations of Operations and Maintenance (O&M) costs as were made for the I-205 study (see Section 3.3.2 for details). O&M costs for the I-5 HOT lanes are estimated to be $2.0 million to $2.6 million annually. These figures remain relatively constant throughout the planning horizon years.

5.5 I-5 HOT Lane Economic Benefit Analysis

Economic benefit analysis was undertaken for the period of 2015 through 2065 for the study corridor. Table 16 summarizes HOT lane costs and revenues for the most conservative scenario with low VOT of $11.20 and switching to HOV 3+ when HOV volumes exceed 1,650 vph. Details of the economic benefit analysis, including ones for high VOT, are included in Appendix I.

No estimation has been made at this time for the costs of borrowing associated with the capital and operations costs.

Operating expenses would be constant as the largest expenses, maintenance and enforcement, were calculated based on number of miles instead of users. Net revenue before financing turns positive approximately when HOV 3+ policy would be implemented. Sensitivity analysis examined a different threshold for switching to the HOV 3+ policy. In this conservative scenario, the estimated revenues would not cover O&M costs at any point through the analysis year of 2065.

Table 16: Summary of I-5 HOT Lane Costs and Revenues – HOV 3+>1650 vph, Low VOT

	2015	2016 to 2024	2026 to 2035	2036 to 2045	2046 to 2055	2056 to 2065
Gross Revenue	$0.1M	$2.1M	$4.4M	$7.8M	$9.4M	$8.2M
Operating Expenses	$2.6 M	$25.1M	$24.9M	$23.7M	$22.2M	$20.6M
Net Revenue Before Financing	($2.5M)	($23.0M)	($20.5M)	($15.9M)	($12.8M)	($12.4M)
Capital Cost	$121.7M					

Source: Revenue and O&M Costs by HNTB, 2010. Capital cost estimates by Rajappan & Meyers, 2009.
Notes:
Capital cost, revenues, and operating expenses are in 2009 constant dollar.
Assumed Low VOT of $11.20, Low volume range and HOV 3+>1650 vph assumed.

5.5.1 Sensitivity Analysis

The I-5 corridor HOT lane assessment tested three different VOTs, alternate timing for changing to HOV 3+, two sets of traffic forecast volumes, as well as impacts of alternate "opening days" of the HOT lanes on the projection of annual gross revenues and cash flows overall. Each of these sensitivity tests are discussed below and on the following pages.

HOV Policy Sensitivity Analysis

Figure 12 illustrates how HOV policy requirements affect annual revenues. This is a policy question that needs to be decided prior to opening the HOT lane as there is no policy on timing of switching to HOV3+. When HOV volumes approach the capacity of 1,650 vph, limited residual capacity in the HOT lane is available to accommodate SOVs willing to pay tolls; thus the revenues decrease over time as illustrated in the lower, blue curve.

Switching to HOV 3+ before reaching 1,650 vph would generate higher revenues then when the HOT lane capacity is fully used by HOV 2+ vehicles. As a comparison, if the HOV 3+ switch is required when the HOV volumes reach 1,400 vph, the HOT lanes generate significantly more revenue as compared to the 1,650 threshold. The red line on Figure 11 illustrates this conclusion. Even with the HOV 2+ to HOV 3+ switch occurring with the 1,400 vph threshold, the economic benefit assessment demonstrates that the I-5 corridor would not cover the O&M costs through 2065 with a 2015 opening date (see Appendix I for details).

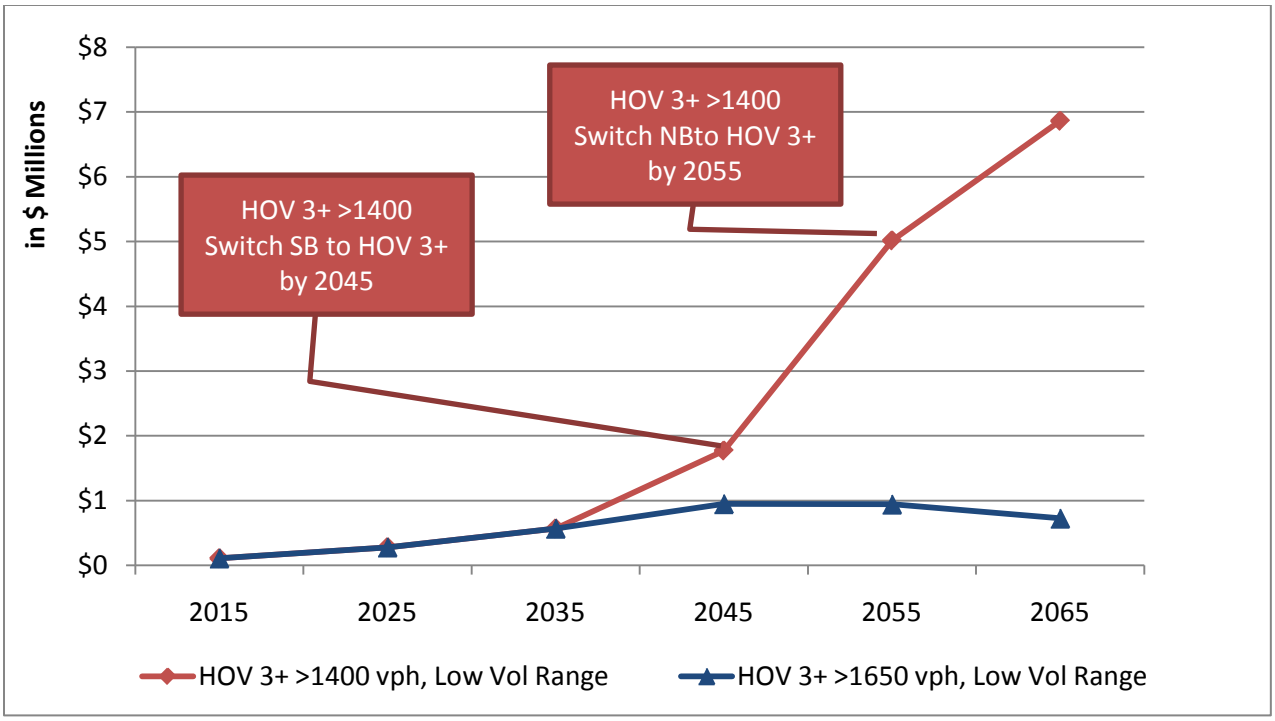


Figure 12: I-5 HOT Lane Gross Annual Revenue Estimate – HOV 3+ >1650 vph vs. HOV 3+ >1400 vph

Source: HNTB, 2010
Notes: Low VOT and Low Volumes are used.

High vs. Low Volume Sensitivity Analysis

As this is a planning-level and initial study of the potential of HOT lanes in the I-5 corridor, the revenue forecasts are based on conservative estimates and assumptions. Among these conservative assumptions was the use of the "low" traffic volume in the corridor. In order to provide some ranges to potential gross revenues, high traffic volumes were also used as a test to estimate the gross revenues. Figure 13 illustrates the range of annual gross revenues over time with the assumption of the "low" and the "high" traffic volumes.

Also shown in Figure 13 is the assumption of the 1,650 and 1,400 vph threshold for switching from an HOV 2+ to an HOV 3+ operating scenario.

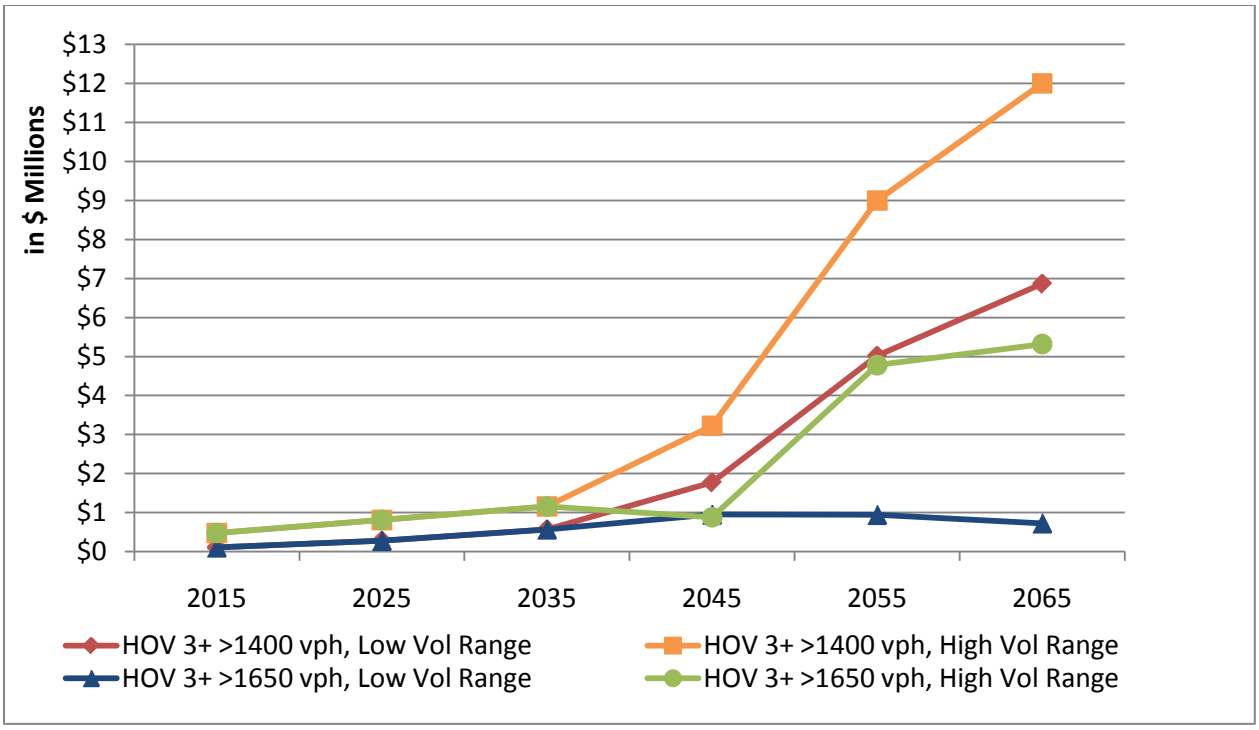


Figure 13: I-5 HOT Lane Gross Annual Revenue Estimate – Low vs. High Volume Range

Source: HNTB, 2010
Notes: Low VOT is used; Low Volumes and High Volumes are compared.

Several conclusions can be drawn from Figure 13.

- The "High Volume" scenarios generate significantly more revenue than the "Low Volume" scenarios.
- As previously noted, the "Low Volume" and 1,650 vph HOV 3+ threshold shows a decreasing level of revenue generation over time as the HOT lanes fills with exempt HOV 2+ vehicles leaving little room for toll-paying SOVs.
- With the "High Volume" scenarios, switching to HOV 3+ with the 1,400 vph threshold begins to generate significantly more revenue starting in 2035, than compared to the 1,650 vph threshold. While the two curves "meet" in approximately 2055, the additional revenue generated with the 1,400 vph assumption between 2035 and 2055 benefits the overall cash flow of the project.

VOT Sensitivity Analysis

The estimated gross annual revenues shown in Figure 14 are conservative estimates based on the use of a conservative (the lowest) level of the value-of-time (VOT). As discussed earlier, three different VOTs were tested to provide a sensitivity assessment of the potential revenue range associated with VOT differences. Figure 14 illustrates annual gross revenues for the three VOT scenarios combined for the HOV 3+ for over 1400 vph. The VOT tested were $11.20 (Stockton/San Joaquin County Low), $13.90 (San Joaquin County High), and $16.58 ("Blended" based on commuters to the Bay Area and Sacramento Area). As illustrated below, the higher VOT results in higher revenues being generated in the corridor.

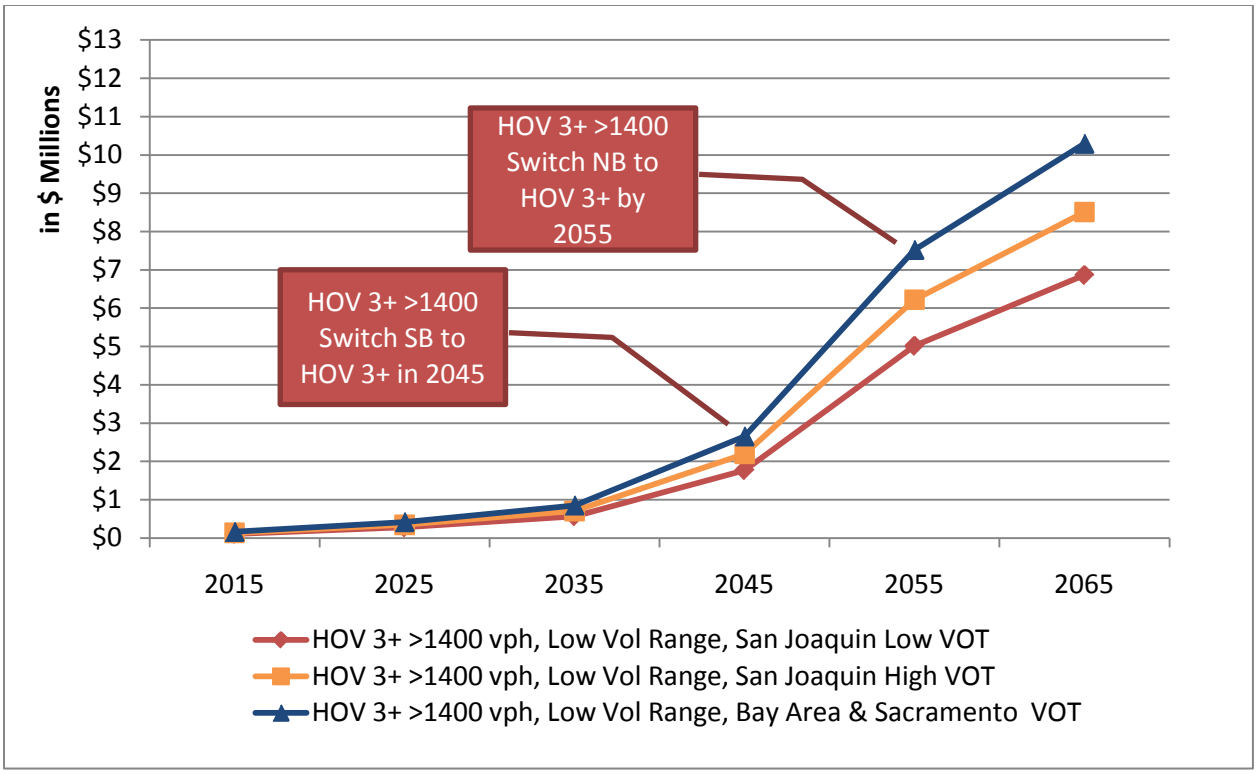


Figure 14: I-5 HOT Lane Gross Annual Revenue – Low VOT vs. High VOT

Source: HNTB, 2010
Notes: Low volume range is assumed.

Opening Year Sensitivity Analysis

Two different opening years – Years 2015 and 2035– were evaluated as it relates to cash flow. Opening years have a great implication on cash flow. Figure 15 illustrates the ending balances for the two opening year scenarios, assuming an HOV3+ policy will be in place when HOT lane volumes exceeds 1,650 vph. Alternatively, Figure 16 illustrates the ending balances for two opening year scenarios, assuming HOV3+ policy will be in place when HOT lane volumes exceeds 1,400 vph.

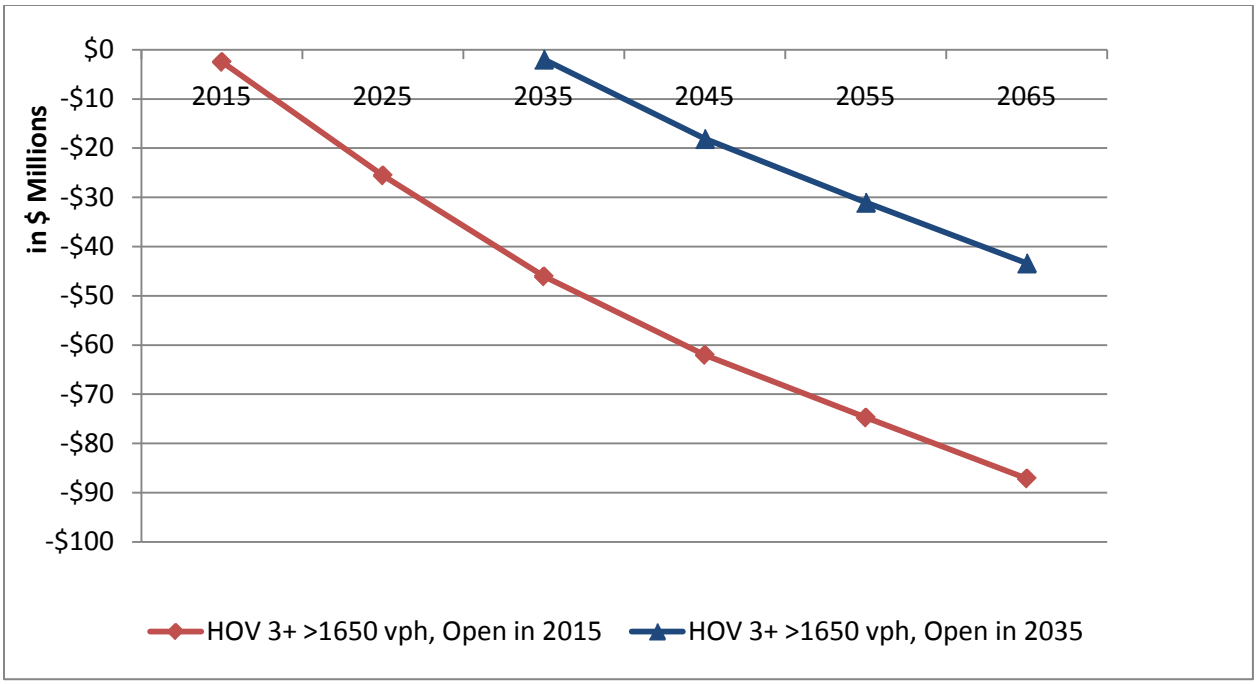


Figure 15: Summary of I-5 HOT Lane Cumulative Ending Balances – Opening in 2015 vs. 2035 (with HOV 3+ >1650 vph)

Source: HNTB, 2010

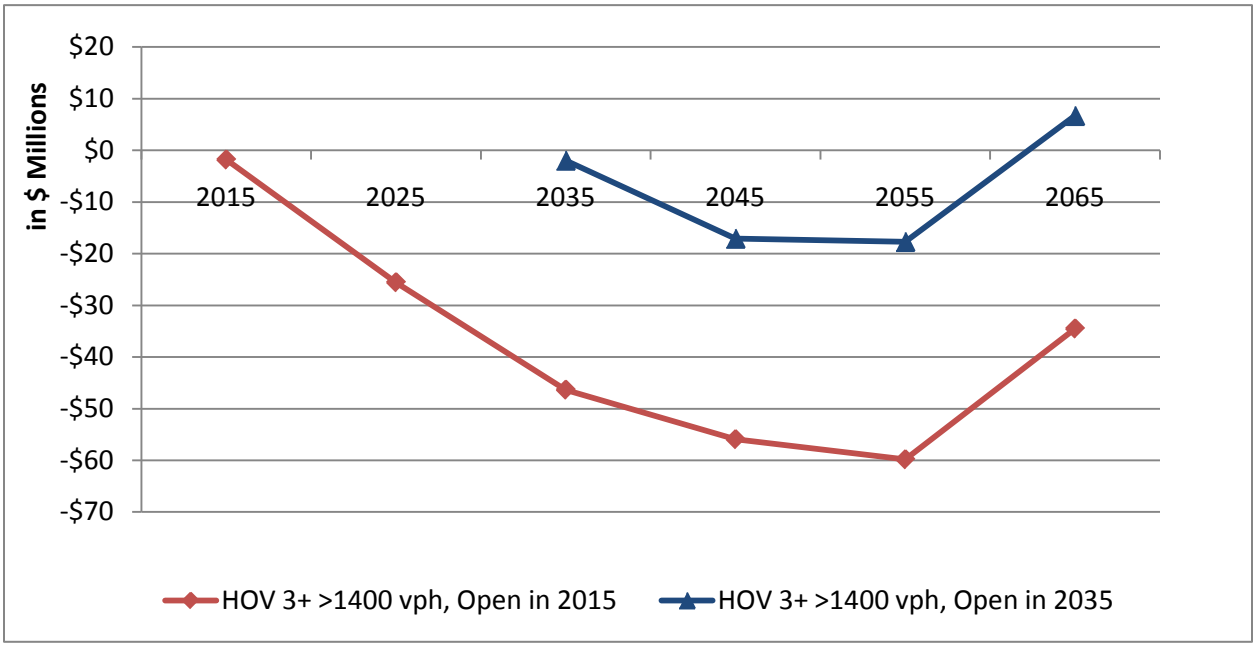


Figure 16: I-5 HOT Lane Cumulative Ending Balances – Opening in 2015 vs. 2035 (with HOV 3+ >1400 vph)

Source: HNTB, 2010

Conclusions drawn from Figures 15 and 16 are as follows.

- As illustrated in Figure 15 and with the 1,650 vph threshold for switching to HOV 3+, the I-5 corridor does not achieve a positive cash flow taking into account the revenues estimated to be generated and the O&M costs of the HOT lane. This conclusion is a function of the HOT lane filling with HOV 2+ vehicles and leaving limited capacity for toll-paying vehicles.
- As illustrated in Figure 15, opening the HOT lane in 2015 results in over $40 million additional operating deficit – as compared to opening the HOT lane in 2035. In either case, the O&M costs continue to exceed revenues. Thus, the annual ending cash-flow balances continue to decline over time reaching estimated cumulative deficit of over $43 million and over $87 million with opening-day horizons of 2035 and 2015 respectively.
- As illustrated in Figure 16, applying the 1,400 vph threshold assumption for shifting from HOV 2+ to HOV 3+, the HOT lanes are forecasted to show a positive cash-flow by the end of the assessment time frame (2065).
- As illustrated in Figure 16, opening the HOT lane in 2035 results in a positive cash flow estimated to occur by approximately 2065. This is compared to opening the HOT lanes in 2015 and a positive cash flow is not achieved through 2065.
- The ending cash balance with the 1,400 vph threshold is positive with either the 2015 or the 2035 opening-year scenario. However, with the 2035 opening-year scenario, the ending balance is estimated to be $7 million in 2065 – as compared to $35 million deficit in 2065 with the opening year of 2015. Again, the differences is the result of the earlier opening year and the *estimated* insufficient travel demand in the I-5 corridor to achieve sufficient toll revenues to cover operating costs. In turn, this results in accumulating negative cash flow balances over time that results in less net revenues in 2065 at the end of the study horizon – when compared to the later opening-year scenario.

5.6 I-5 HOT Lane Feasibility Analysis Results

The sketch-level planning analysis revealed that the I-5 corridor has less potential for HOT lanes with the analysis taking a conservative approach. Sensitivity tests reveal that implementing HOT lanes on I-5 later (as compared to as early as 2015), assessing the “shift” for exempt HOV 2+ vehicles to HOV 3+ vehicles when the capacity reaches 1,400 vph (as compared to 1,650 vph) and assessing further the VOT if potential users will have beneficial effects on the gross revenue generation and cash flow over time of the HOT lanes.

Based on operations analysis of the I-5 corridor, the first mainline bottleneck would form in the northbound direction in the year 2015 during the PM peak period and in the southbound direction in about the year 2030 in the AM peak. The northbound direction would benefit from a further analysis for HOT lanes.

6 HOT Lane Implementation Issues and Strategies

Key topics the region will need to be examined if further consideration is to be given to HOT lanes in the I-205 and/or the I-5 corridors include the following:

Uses of Gross Revenues – As described in earlier sections, no two regions in the United States have adopted the same principles for use of gross revenues from HOT lanes. Some have focused on covering only operations and maintenance costs. Some, particularly SR 91, have focused on covering all associated costs and having net revenues usable for other investments. The region will need to determine the priority uses of HOT lane revenues. One possible approach would be to prioritize the uses as follows:

- Operations and maintenance plus centralized services;
- Capital costs;
- Financing costs (a private financing organization will expect the HOT lane owner/operator to make a firm commitment to paying bond principal and interest which would make payment of financing costs a very high priority); and
- Other investments such as corridor improvements on transit and parallel facilities.

Tolling Objectives – As stated above, no two HOT lane projects have precisely the same tolling objectives. These objectives could be:

- Maximizing the value of time saved for all travelers can be accomplished by setting the capacity in the HOT lanes to carry as much traffic as possible without causing a traffic breakdown condition. Toll rates are the main mechanism for causing the balance of traffic in the HOT and GP lanes to be as balanced as possible.
- Maximizing revenues can be accomplished by restricting the volume in the HOT lane by increasing the toll and causing it to run free flow with a high speed and, thereby, causing more traffic to stay in the general purpose lanes.
- Minimizing travel time for HOVs and tolled vehicles can also be accomplished by restricting the volume of traffic in the HOT lane either through toll rates, metering, or, perhaps, other means.

Tolling Coordination with Neighboring Regions' Tolling Programs — The MTC and congestion management agencies in the San Francisco Bay Area are developing a regional HOT lane network. The Sacramento Area Council of Governments (SACOG) is considering the feasibility of HOT lanes. The San Joaquin region should become conversant with and take into account the plans of neighboring regions in further consideration of HOT lanes for topics including:

- Principles;
- HOT lane configuration;
- Tolling administration;
- Toll collection methods;
- Enforcement; and
- Governance.

Toll Administration — At least two options for tolling administration should be considered if the HOT lane concept is considered further:

- Coordination with and use of the existing HOT lane system and toll collection process — Bay Area Toll Authority (BATA) is willing to review extending its toll administration beyond the Bay Area as long as regions adopt the tolling system and conventions BATA uses (e.g., electronic toll collection, payment processing means, finance charges, customer registration system, etc.); or,
- Development of a local toll administration organization and system.

Enforcement — Toll violations can be provided by visual inspection (at toll booths or by roving CHP with electronic tolling) or photo enforcement. This study assumed use of photo enforcement which will help determine whether toll-paying vehicles have actually paid their tolls. If a vehicle does not have a transponder or if the transponder does not signal properly, a picture of the vehicle's license plate is taken and a bill is then sent to the vehicle owner. Photo enforcement and collection related costs are covered by toll violation and violation processing fee.

The CHP generally focuses on the vehicle code with particular attention to HOV compliance, speed, safety of merges, and vehicle equipment. The cost of vehicle code enforcement by CHP are covered by toll revenues. The CHP considers its role to be traffic enforcement and not toll monitoring or collection. The CHP also has certain design and operational requirements/practices, including no enforcement stops in the median (i.e., the CHP pulls vehicles over to the far right-side shoulder crossing multiple general purpose traffic lanes).

Bonding — If the SJCOG and its partners are interested in bonding against future HOT lane revenues, two approaches should be considered. These are "go it alone" and/or some form of an alliance with the Alameda County Transportation Commission and/or MTC. An I-205 set of gross revenues along with project risks associated with only one HOT lane corridor may cause a bond rating that would be lower than that which would be associated with a larger network (e.g., the Bay Area network of HOT lanes). The SJCOG and its partners need to consider the pros and cons of going it alone or allying with neighboring organizations.

A second set of key topics for the region concerns what would make a HOT lane or a network of HOT lanes successful. The points to consider in determining the success of a HOT Lane concept are the following:

- The purpose of instituting a HOT lane must be clear to the elected officials, public, stakeholders, and interested parties. If one party sees the purpose to be revenue generation and another sees the purpose as congestion relief, there may not be agreement about how to carry out the program or use revenues.
- The HOV/HOT lane needs to be actively managed so that it operates reliably without breakdown to a stop and go condition. Incident management should be clearly defined. If a lane is not reliable, travelers will not see the value of using the lane and, therefore, will not be as willing to pay a toll. Specifically, it needs to ensure that downstream congestion in the GP lanes would not flow into the HOT lanes and impact its condition. This will require careful planning when designing the exit lanes/areas.
- The timing for instituting a HOT lane needs to occur when there is likely to be increasing revenue and not just before the HOV eligibility requirement may need to change from 2+ to 3+. Otherwise, the purpose of instituting the lane may be assumed to be reduction of HOV usage along with the opportunity for revenue generation. In addition, as the HOV lane becomes crowded at 2+, there would likely be relatively little gross revenue until such time as the requirement increases to 3+.

- The SJCOG and Caltrans will need to determine how a HOT lane should be designed. This review considered lane configurations ranging from a minimalist approach (i.e., fit a HOT lane into the available space) to a much more extensive widening and structure replacement approach (assuring that a wide median, a wide lane, and a wide buffer are incorporated). Most HOT lanes are configured with "design exceptions" to standard federal and state freeway lane designs but that topic will need much further review. The capital cost implications of this choice for this topic are significant.
- If a network of HOT lanes is to be considered (e.g., I-5 along with I-205 and possibly other corridors), the means of transitioning from a HOT lane on one freeway to a HOT lane on another freeway will need to be examined in some detail. Freeway-to-freeway connectors providing a unique lane for tolled vehicles and HOVs can be very expensive ($50 million or more) and the costs of those can have a significant effect on use of gross tolling revenues.
- Prior to any HOT Lane implementation decision, refinements to the travel and revenue forecasts will be needed. The preliminary estimates used in this review are appropriate for the early review of whether a HOT lane may be appropriate. However, a more precise (meaning narrower range of estimates) will be needed before an investment decision should be made.
- A question faced by all regions considering HOT lanes is whether, and how to make use of the private sector's capabilities. Some turn to the private sector to design, operate, and maintain HOT lanes. Some provide for a franchise in which a private entity commits to develop and operate a HOT lane in exchange for long term revenue stream. In other cases, public entities provide almost all of those roles.
- Among the evaluation topics that should be considered as the region examines the HOT lane concept further are:
    1. Equity — How are different types of trips, different user groups, and different communities affected by HOT lanes?
    2. Should a take-a-lane approach be considered (i.e., converting a general purpose lane to an HOV and/or HOT lane)?
    3. What stakeholders have the principal responsibilities for making decisions about use of gross revenues?
    4. What principles should apply in considering how net revenues (funds remaining after covering necessary HOT lane-related costs) should be used?

State and Federal Application Process - The following discussion provides an overview of the State and Federal documentation and application processes necessary for the conversion or implementation of a HOT lane. The State of California AB 1467 application process will expire in January 1, 2012, and the SJCOG is unlikely to submit an application prior to the expiration date. This study assumed that a similar to the current state application system continues to exist. The state application process is discussed first, followed by the federal application process.

<u>State of California Application Process</u>

In 2009, AB 798 created the California Transportation Financing Authority (CTFA) to issue, or approve the issuance of, revenue bonds to finance transportation projects. The CTFA will review proposed projects to ensure they are financially sound. The CTFA also has the ability to approve tolls as part of the financing plans to repay revenue bonds. The CTFA will issue bonds backed by various revenue streams, such as Measure K funding in San Joaquin County.

With AB 798, a project applicant can apply for project approval by the California Transportation Commission (CTC) and financing approval by the CFTA in simultaneously.

An application process and guidelines listed in the AB 1467 is assumed to be similar beyond January 1, 2012. The AB 1467 application process, with modification by AB 798 removing requirements of the Legislative review and approval, is described below for reference. A number of policy and technical documentation steps must be completed prior to the submittal of the AB 1467 Application to the CTC for approval. A high-level discussion of the AB 1467 Application process is outlined below. The detailed guidelines for an AB 1467 report for the "Determination of Eligible Public Transportation Partnership Projects: High Occupancy Toll Lanes" are included on the CTC web site.[13]

1. Begin discussions with Caltrans and FHWA to agree on project purpose and need, as well as technical approach; including operational impacts, technology considerations, and right-of-way constraints for development of a HOT lane or Express Lane and identification of impacts to the general purpose lanes.
2. Develop an Outreach Plan for Key Stakeholders, as well as a Public Involvement/Information Plan
3. Develop project in greater detail (micro-simulation traffic modeling, conceptual design, operations, financial modeling) – following AB 1467 process. AB 1467 Documentation included for the Application includes the following Elements:

   Primary Evaluation and Eligibility Criteria

   a. Eligibility Criteria
   b. Technical Feasibility
   c. Financial Feasibility
   d. Regional Transportation Plan & Community Support
   e. Performance Measures

   Secondary Evaluation and Eligibility Criteria for Team (if Project Team is known)

   a. Qualifications and Experience
   b. Public Involvement Strategy

4. Prepare AB 1467 Application with Caltrans as a co-applicant
5. Obtain CTC approvals. Once the above noted analyses have been completed and documented within the AB 1467 Application, the submitting agency and Caltrans jointly submit the application to the CTC for review, analysis, and approval. A high-level summary of the CTC Application Approval process is provided below.

   Phase One: CTC Review of Application
   Phase Two: CTC Evaluation of Project Eligibility
   Phase Three: Public Hearings and Approval/Rejection

Federal Application Process

Although there were grant funds for HOV to HOT Lane conversions and development of HOT Lanes and Express Lanes, it is unlikely that new grant funds will become available until the

[13] http://www.catc.ca.gov/programs/HOTLanes/HOT_Lane_Guidelines.pdf

federal surface transportation act, SAFETEA-LU, is reauthorized. Meanwhile, the SJCOG would have to coordinate with the FHWA Tolling and Pricing Team, in coordination with Caltrans, to change the operation of the planned HOV lane to a HOT lane, once a decision had been made to move forward with the HOT Lane project(s). Some of the steps involved include:

1) Submit an Expression of Interest to the federal Tolling and Pricing Team, in coordination with Caltrans
2) The Tolling and Pricing Team will review the Expression of Interest to determine which program or programs are eligible for the proposed project.
3) Work with the selected federal program office to receive feedback and guidance for submittal of a formal application.
4) Submit formal application for tolling and pricing authority to the FHWA program office.
5) Development of a formal tolling agreement is prepared for signature once the project is approved.

7 Next Steps

While the initial POET-ML model analysis suggests that the implementation of HOT lanes on I-5 and I-205 may not be financially feasible in the near future, HNTB believes that the model may be underestimating the revenue potential of these prospective HOT facilities. Managed lane facilities in other parts of the country, with similar operating characteristics, are already generating considerably more revenue than is being forecasted by POET-ML for I-5 and I-205.

Part of the issue may stem from the fact that POET-ML was designed to evaluate policy alternatives for existing HOV facilities, whereas—at present—there are no HOV facilities on either I-5 or I-205. Therefore, a next step for the SJCOG would be to apply a preliminary feasibility analysis that is more targeted toward evaluating the revenue potential of new facilities to better understand the feasibility of implementing HOT lanes on I-5 and I-205.

In addition, it may be appropriate to re-visit some of the costs that underlie the feasibility assessment, for example:

- Transaction costs account for approximately 15% of the anticipated operations and maintenance (O&M) costs. The forecasted transaction costs are based on an assumed cost of 21 cents per transaction. It is suggested that the SJCOG to conduct a subsequent study and review the best toll administration structure for San Joaquin County.
- The assumed toll facility maintenance costs account for approximately 75% of the anticipated O&M costs. The per-mile cost assumption appears to be higher than those experienced by other facilities across the nation. This is partly due to inclusion of 25% contingency. Inclusion of such contingency is appropriate for this level of study. Further refinement of these costs is recommended.

After the above noted additional analysis and research have been completed, the SJCOG must define the policy objectives and expectations for the HOT lane and then obtain agreement from the SJCOG Board to amend the SJCOG Regional Transportation Plan (RTP) and approve further analysis and development of HOT lane project(s). The following steps are suggested as part of the initial policy definition activities.

The subsequent study needs to define the project from a SJCOG policy standpoint. For example, some policy considerations could be:

- SJCOG agreement that the conversion of a programmed or proposed HOV to a HOT lane is desired.
- Agreement on HOT lane approach – revenue generation or congestion management.
- Agreement on HOT lane operational performance measures and the treatment of HOVs.
- Amendment to the SJCOG RTP to include policies and proposed HOT lane project(s)

7.1 HOT Lane Project Development Process

Feasibility of HOT lanes can be determined in a three-step process (see Figure 17). As stated earlier, this study was a sketch-level feasibility analysis, which utilized readily available data supplemented with limited data collection. This type of study helps determine whether an agency should spend more efforts in analyzing the feasibility of HOT lanes. The following are the key steps as shown in Figure 17:

Sketch–level Feasibility Analysis

This phase has been completed as part of this study, and is a high-level assessment using available data. The results of this study are important for policy discussions regarding the development of HOT lanes on the I-205 and I-5 corridors. It is also important for policy development on HOT lanes in general for the SJCOG RTP.

Preliminary Feasibility Analysis

This phase involves a refinement of the travel forecast model with tolling options and preliminary engineering. It also further refines the projects so that the SJCOG can begin the federal and state applications process for the approval of HOT lanes on the I-205 and/or the I-5 corridors.

Investment-grade Analysis

An investment-grade traffic and toll revenue analysis is done to determine the amount of bonds or public or private financing that can be secured against the projected toll revenue. This toll revenue analysis is typically done 12 months before the project goes to construction. In addition, this phase finalizes the design of the projects and includes the necessary engineering work.

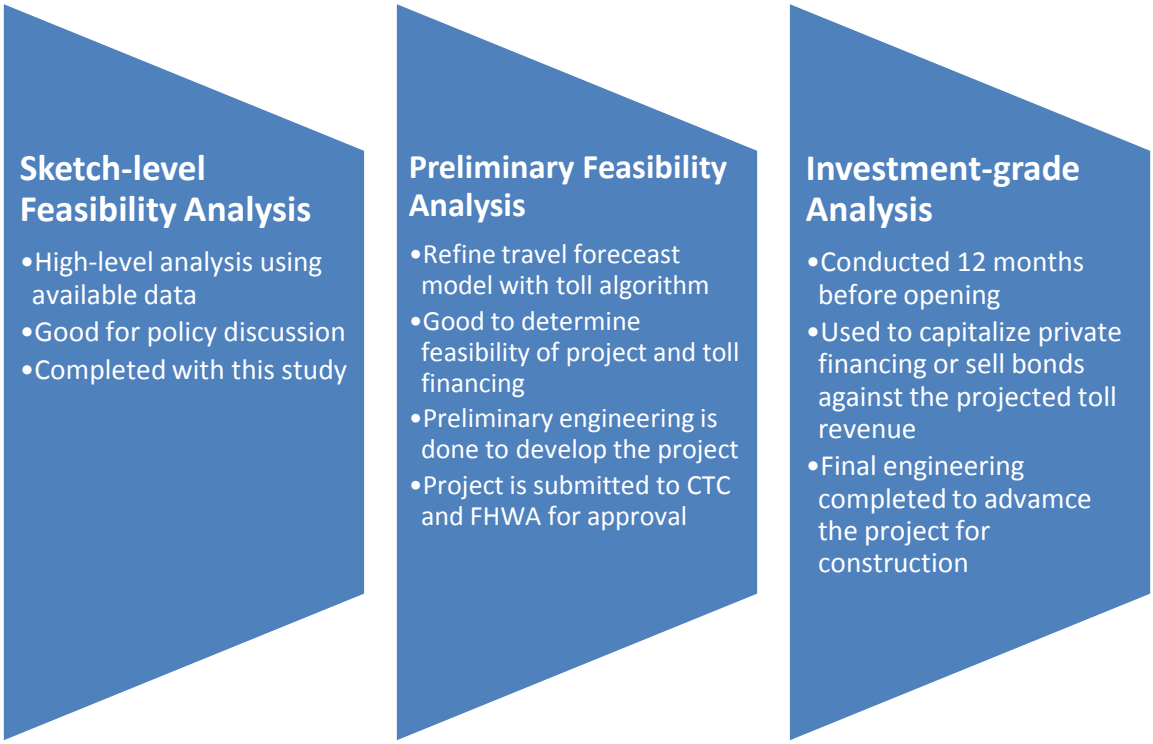


Figure 17: HOT Lane Development Process

7.2 Next Steps for the I-205 Corridor

The high-level analysis conducted for the I-205 corridor conducted as part of the HOT Lane Feasibility Review provided insights into potential policy options and impacts.

Next steps for the I-205 corridor are the following:

1. Refine conceptual planning and plan for a delivery of a HOT lane project. As shown below, a rapid delivery of HOT lanes is expected to take approximately ten years. Based

on the operations analysis, widening of I-205 would be needed sometime between 2030 and 2035.

Table 17: Rapid Delivery of HOT Lanes

Activities	Timing
Conceptual planning	Year 1
PSR	Year 1 — 2
Submission of federal and state applications for HOT lane approval	Year 2
PA/ED	Year 3 — 4
PS&E	Year 4 — 6
Construction	Year 6 — 9
Operation and testing	Year 9 — 10
Open to traffic	Year 10

2. Conduct a Preliminary Feasibility Analysis so that the SJCOG can begin and complete the state and federal approval process. As there are no identified funding sources for HOV or HOT lanes on I-205, this maybe a candidate for a P3 and financing with toll revenue.
3. Include the I-205 HOT lanes in the San Joaquin RTP as appropriate to feasibility determination.

The SJCOG needs to closely monitor traffic conditions to determine appropriate timing for planning the next step. GP lanes operating at LOS F for a longer period would create an ideal condition for a HOT lane application. The SJCOG needs monitor congestions during a 4-hour peak period in the morning and afternoon and determine length and intensity of traffic congestion periodically. In addition, the SJCOG needs to check actual traffic numbers against traffic forecasts and estimate time for an appropriate time for HOT lane application.

7.3 Next Steps for the I-5 Corridor

HOV lanes on I-5 between Hammer Lane and Country Club Boulevard will be implemented by late 2013. This project will provide continuous HOV lanes from Hammer Lane to Eighth Street, which would encompass the 8.6-mile study segment between Hammer Lane and Downing Avenue. This project will allow the I-5 corridor to be a potential candidate for a pilot HOT lane in the region.

Based on the operations analysis of the I-5 corridor, the first mainline bottleneck is expected to form in the northbound direction in about the year 2015 during the PM peak period and in the southbound direction in about the year 2030 in the AM peak period. Based on the forecasted volumes, planning for a potential conversion of a HOV lane to HOT lane, especially in the northbound direction, is critical. The SJCOG needs to closely monitor traffic conditions to

determine appropriate timing for planning the next step. GP lanes operating at LOS F for a longer period (2 hours or more) would create an ideal condition for a HOT lane application. The SJCOG should monitor congestions on GP lanes during a 4-hour peak period in the morning and afternoon and determine whether actual traffic numbers are in line with the forecasted volumes.

Next steps for the I-5 corridor are 1) to conduct a preliminary feasibility analysis, so that the SJCOG can begin and complete the state and federal approval process and 2) to include I-5 HOT Lanes in the San Joaquin County RTP as appropriate to feasibility determination. An investment-grade study would be required if public or private financing with toll revenues is desired in addition to public funding. If the project is funded with public funding and grants, not bonds, then final design is required, but investment-grade study is not.

Appendix A: Technical Working Group

Appendix A
I-5 and I-205 HOT Lanes Feasibility Study
Technical Advisory Committee Members

The Technical Advisory Committee members who provided guidance and review for the I-5 and I-205 HOT lane(s) feasibility study are:

San Joaquin Council of Governments
Wil Ridder
Dana Cowell
Steve Dial

Caltrans Districts and Headquarters (HQ)
Jose Mujica from District 10
Pat Robledo from District 10
PS Venkat from District 10
Homer Zarazuela from Caltrans District 10

Julie Campero from Caltrans District 4
Peter Lay Caltrans from District 4
Adrian Levy from Caltrans District 4
Cesar Pujol from Caltrans District 4
David Seriani from Caltrans District 4,

Joe Rouse from Caltrans HQ

California Highway Patrol
Doug Carraway
John Keller
Dana Sampson

Federal Highway Administration
Steve Pyburn

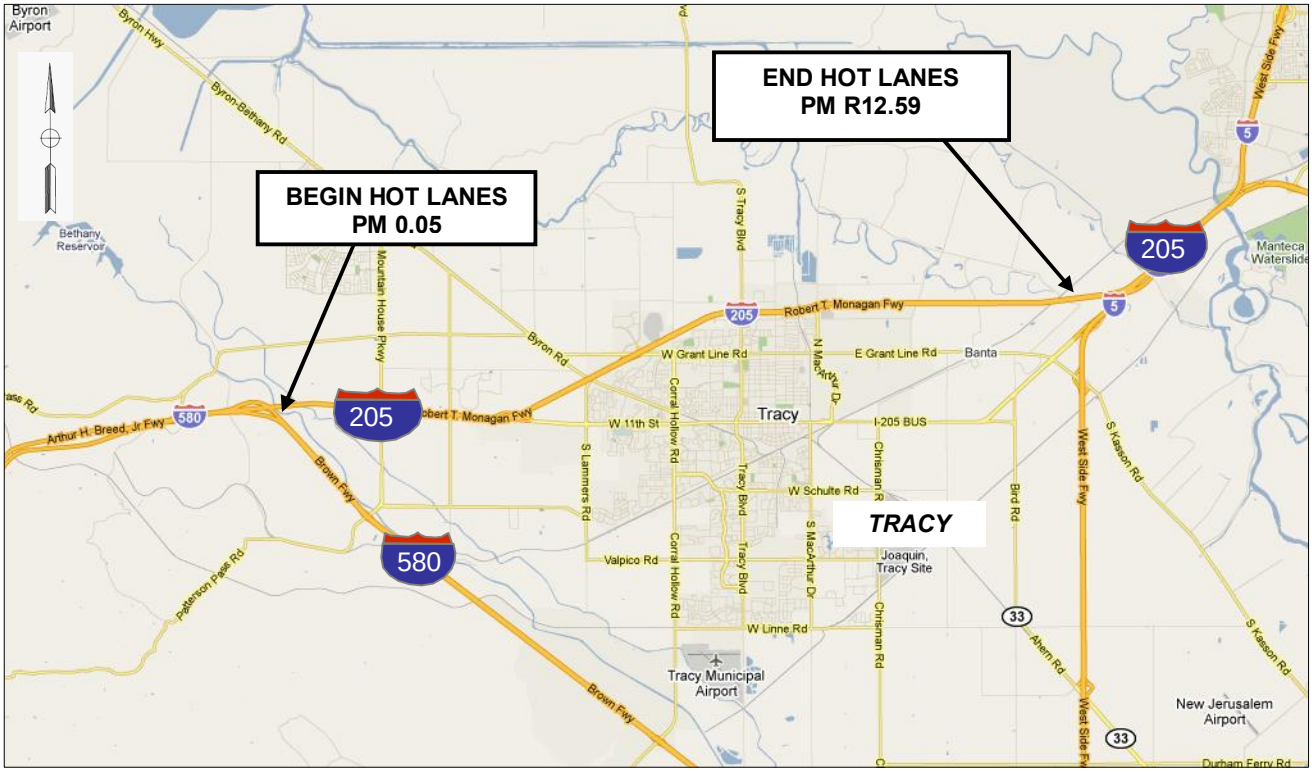
City of Stockton
Ray Deyto
Todd Greenwood
Alex Menor

City of Tracy
Zabih Zaca

Appendix B: I-205 HOT Lane Conceptual Capital Cost Estimates

Conceptual Cost Estimate Report

For Construction of Freeway Improvements Related to Implementation of I-205 HOT Lanes



In San Joaquin County
from the California Aqueduct UC to 0.1 mile west of Jct I-5

Prepared for:

SAN JOAQUIN COUNCIL OF GOVERNMENTS

Prepared by:

RAJAPPAN & MEYER CONSULTING ENGINEERS, INC.
1038 LEIGH AVE , SUITE 100
SAN JOSE, CA-95126
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August 9, 2010

- D R A F T -

INTRODUCTION

The San Joaquin Council of Governments (SJCOG) is underway with exploring the potential implementation of HOT (High Occupancy Toll) lanes (known as "Express Lanes" in the Bay Area) for the San Joaquin Valley transportation system. At the request of SJCOG, estimates were made for the cost of implementing HOT lane project on I-205.

This report describes the results and methodology used by Rajappan & Meyer Consulting Engineers, inc. for cost estimates to implement High Occupancy Toll Lanes on I-205.

I-205 BACKGROUND

The I-205 corridor serves as a major conduit for goods movement along the West Coast, which includes a high percentage of truck traffic. It is also a major recreational route for activities in the Central Valley, Bay Area, and the Sierra Nevada. It exhibits a heavy directional commute pattern from the Central Valley communities such as Stockton, Modesto and Tracy to the Bay Area employment centers of San Francisco, Oakland and the San Jose area (Silicon Valley). Over the last five years traffic growth in the corridor has averaged six to seven percent per year. The 20-year forecast for this route is 176,000 vehicles per day.

I-205 is a six (6) lane divided freeway separated by a concrete barrier or wide median, depending on location. In the project vicinity, the surrounding terrain is generally flat with a slight incline from east to west. The design speed of the existing facility is 80 MPH, posted at 70 MPH. The existing freeway has three (3) mixed-flow lanes in each direction from the I-205/I-580 junction to the I-5 junction. A project was completed in 2009 which added the 3rd through lane in each direction between Eleventh Street and I-5. Due to the evolution of design criteria from U.S. Customary Units to Metric and back again, the constructed through lane widths are either 3.6 m or 12 ft, depending on their age. The horizontal alignment of the existing facility is largely on tangent. Existing embankment slopes range between 2.5:1 to 4:1 and flatter. With respect to the land use, the proposed project is located in a suburban area, surrounded by agricultural fields, or bounded by commercial and residential uses.

In the proposed project vicinity there are two freeway to freeway interchanges, and five local interchanges:

- I-580/I-205 directional interchange
- Mountain House Parkway Interchange
- Eleventh Street Interchange
- Grant Line Road/Naglee Road Interchange
- Tracy Boulevard Interchange
- MacArthur Drive Interchange

- I-5/I-205 Directional Interchange

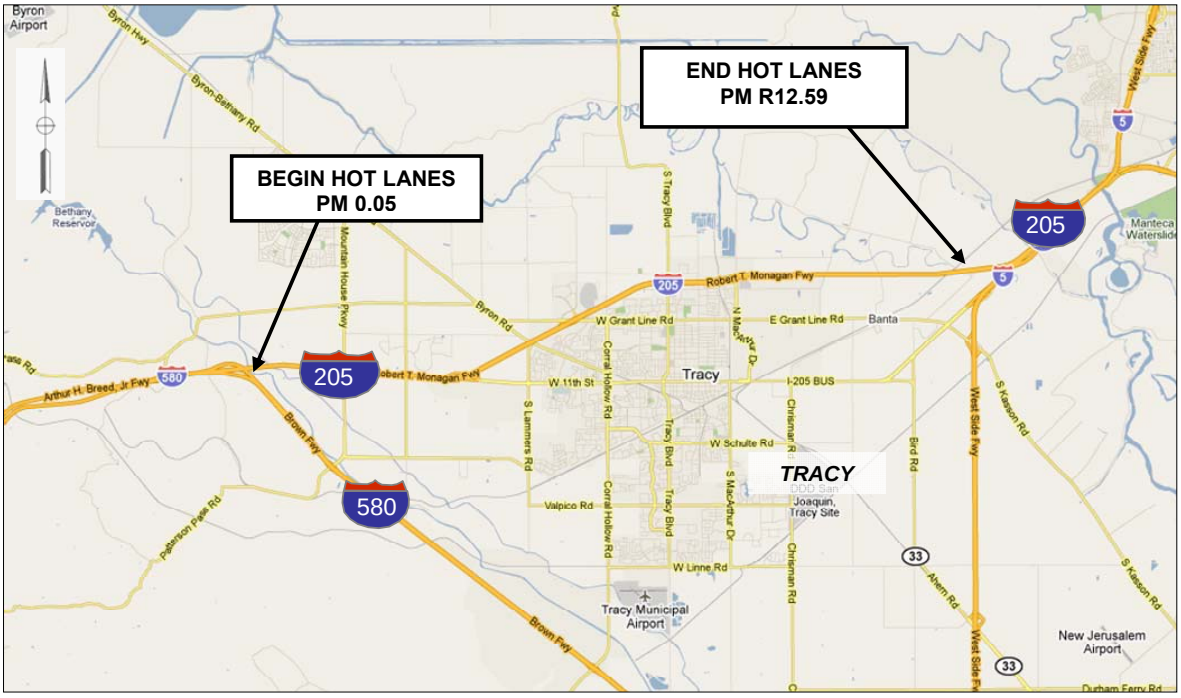
Future interchanges are planned at the following locations:

- I-205/Lammers/Eleventh Street interchange reconstruction (EA 10-0H9100). Sponsored by the City of Tracy. Currently in PA/ED phase. Funded in SJCOG RTP. Planned construction by 2016.
- I-205/Paradise Road Interchange. Sponsored by the Cities of Tracy and Lathrop. Currently in pre-PID phase. Construction timeframe estimated for 2020.

PROPOSED PROJECT

The proposed project is along Interstate 205 (I-205) in the City of Tracy, from PM 0.05 to PM R 12.69, for a distance of 12.64 miles, as shown in **Figure 1**. The proposed project consists of widening I-205 toward the median from the junction of I-5 to Eleventh Street, outside widening from Eleventh Street to Mountain House Parkway, and median widening again from Mountain House Parkway to the California Aqueduct.

FIGURE 1
PROJECT LIMITS



Typical widening for outside widening locations is shown in **Figure 2**. Typical widening for inside locations is shown in **Figure 3**. It is generally concluded that the widening for HOT lanes can all be done within the existing freeway right of way.

FIGURE 2
TYPICAL OUTSIDE WIDENING SECTION

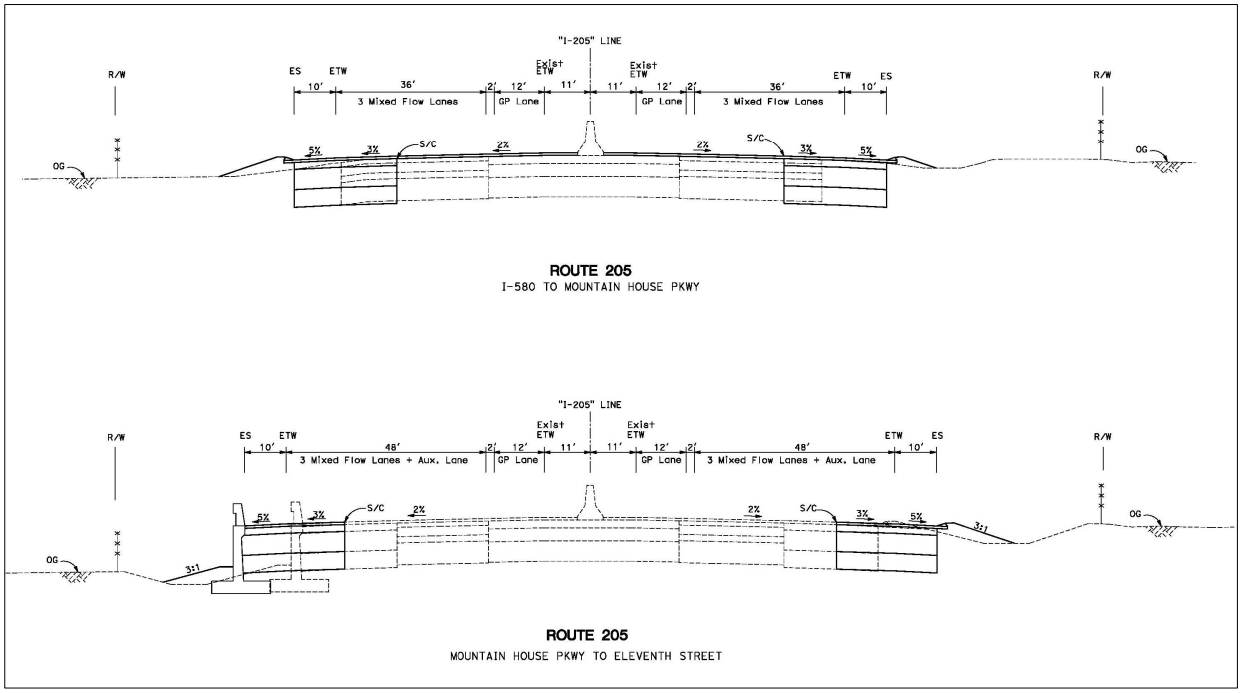
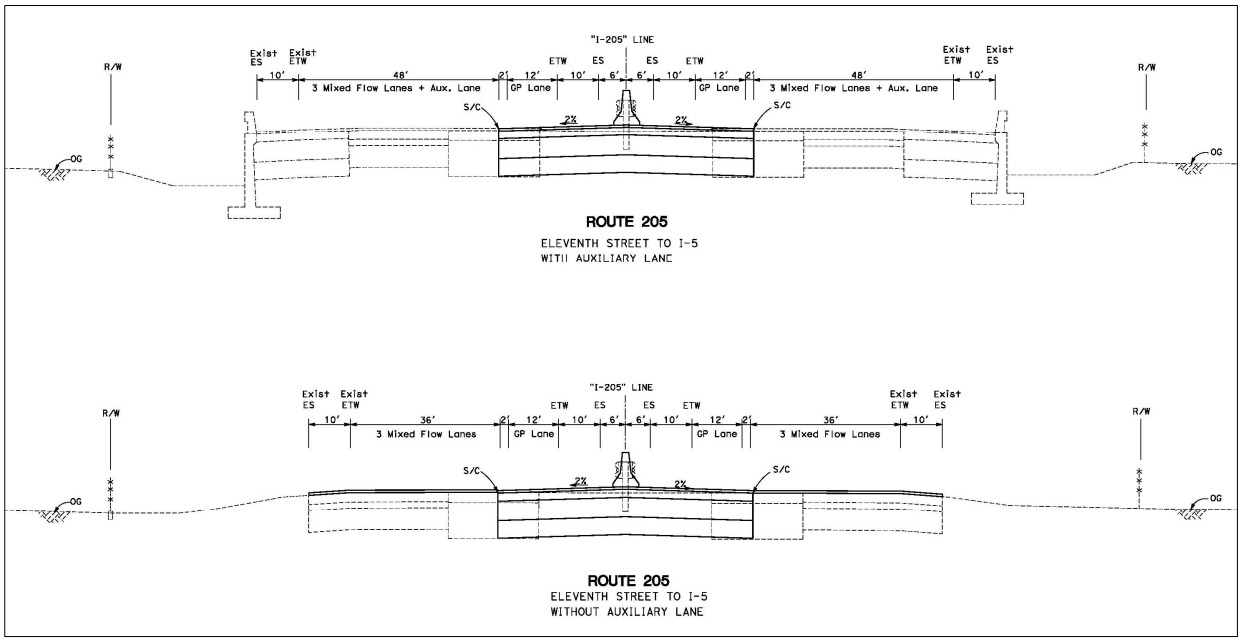


FIGURE 3
TYPICAL INSIDE WIDENING SECTION



The proposed design follows Caltrans District 4's preferred design components for contiguous single-lane Bay Area HOT facilities. This guidance was developed through meetings with Caltrans District 4 and the California Highway Patrol (CHP) and builds on prior work completed for the 1-680 Express Lane project as well as past lessons learned from the HOV system.

- HOT lanes will be physically separated from adjacent lanes through a painted buffer and operate 24 hours daily (no longer operating part-time as is the current HOV operating policy). The painted buffer would typically be 2 feet wide.
- HOT lanes will have separate designated ingress and egress zones to aid in tolling and enforcing the lanes.
- Transition lanes will be provided as part of each ingress or egress area to allow for the orderly diverging and merging of traffic to and from the HOT lane (See **Figures 4 and 5**).

FIGURE 4
EXAMPLE INGRESS ZONE FOR HOT LANE WITH TRANSITION LANE

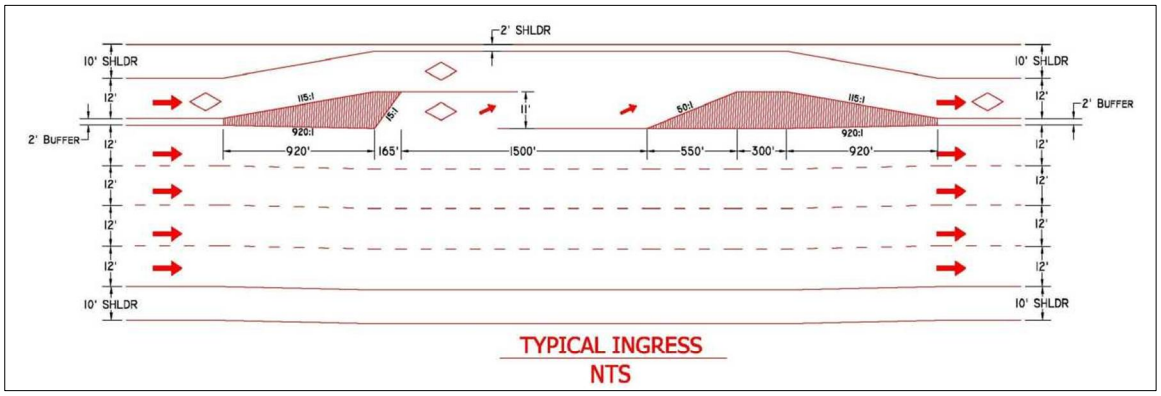
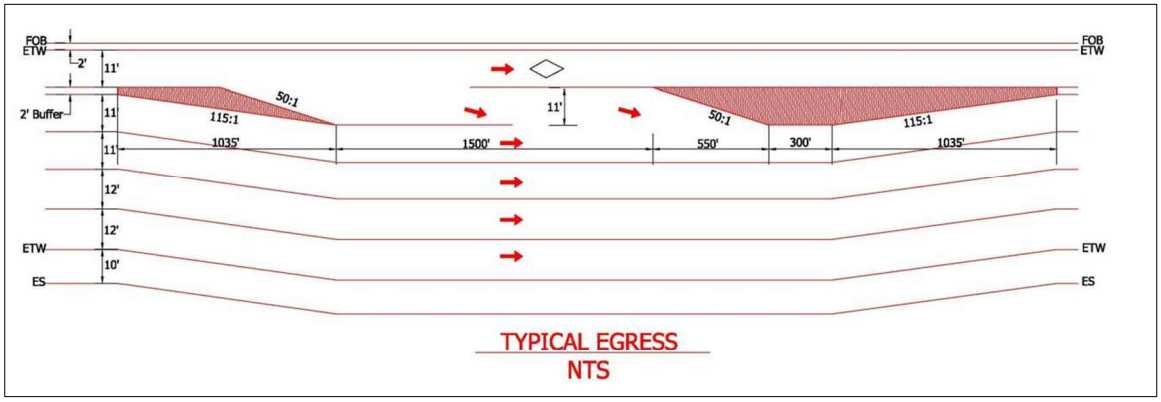


FIGURE 5
EXAMPLE EGRESS ZONE FOR HOT LANE WITH TRANSITION LANE



- No traffic channelizers, pylons or other raised "soft" barriers are considered within the designated buffer area. In past work with District 4, the CHP is interested in facilities that are self-enforcing, so some form of barrier to keep drivers from

weaving across the buffer would be desirable. Other strategies, including strategic placement of overhead readers and cameras to monitor driving behavior, should be considered to discourage buffer crossing.

- The outside shoulder is the preferred enforcement area in all forms of apprehension by CHP, including HOT lane violators.

ACCESS ASSUMPTIONS

Caltrans has two practice standards for access to HOV/HOT lanes. In Northern California, vehicles can enter and leave HOV lanes without restriction, while in Southern California, access is limited to certain places. Part of the reason for two standards is because in Northern California the lanes are reserved for HOVs only during peak hours and operate as general purpose lanes for the rest of the day. The access design standard used for I-205 is called a "transition lane", and is being used in the I-680 Sunol Express Lane Project, under construction by Caltrans. **Figure 6** shows the planned access points for the cost estimating exercise.

Initial access points are summarized as follows:

EASTBOUND I-205
Points of Entry – 3
Points of Exit – 6

WESTBOUND I-205
Points of Entry – 4
Points of Exit – 4

This access plan is the basis of costing for toll collection equipment.

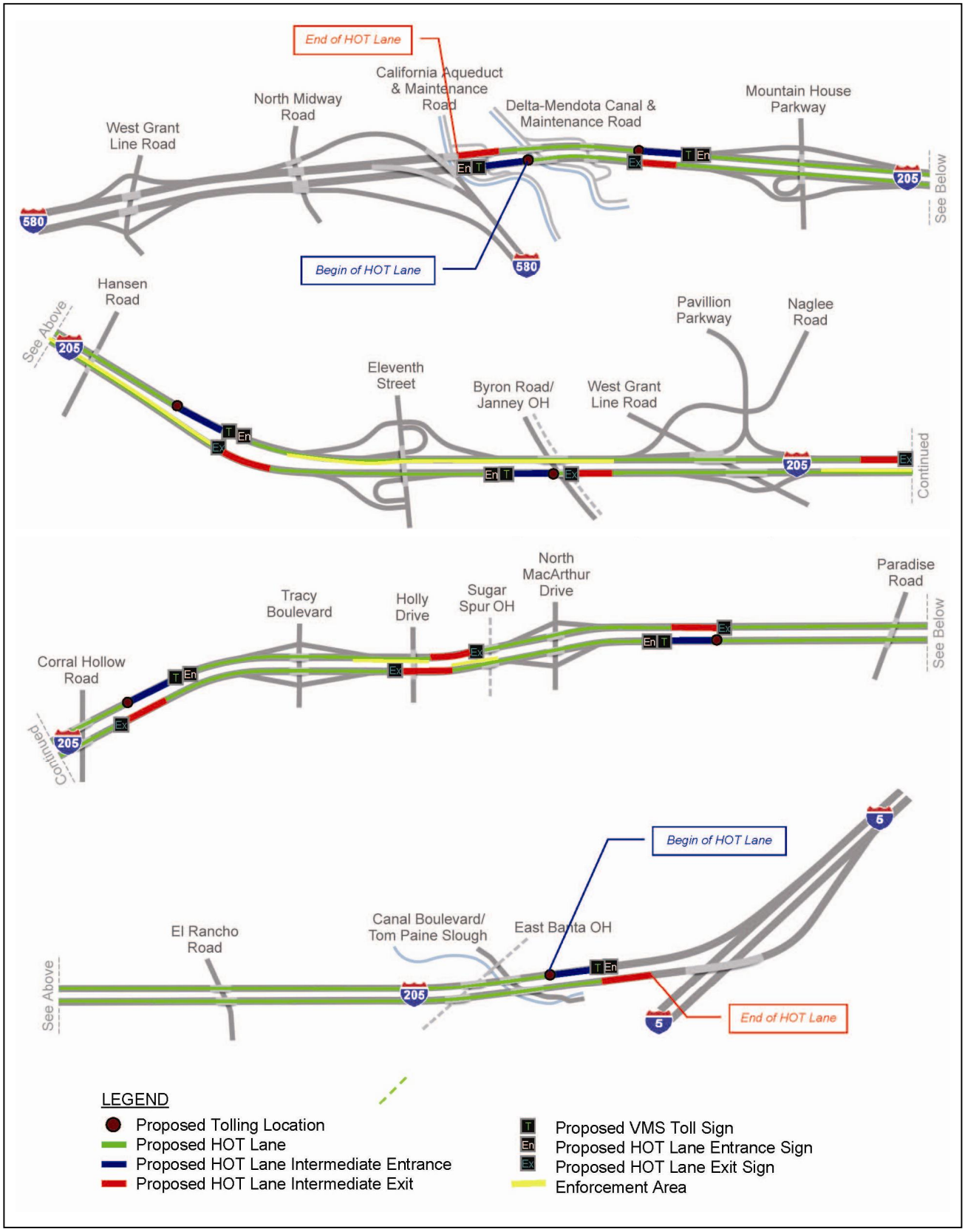
I-580 AND I-5 INTERCHANGES

For the purpose of this analysis, connections of the I-205 HOT lanes through the I-580 interchange on the west and the I-5 Interchange on the east are not included.

For the I-580 Interchange, complexities with the separate automobile/truck ramp configurations will require extensive reconstruction of the ramps in the westbound direction. This work would likely exceed $50 million and was determined to not be included as part of this analysis. This work would need to be contemplated if the HOT lanes were extended over the Altamont Pass.

For the I-5 Interchange, complexities with the "Mossdale Y" short distance connection to Route 120 would require complete reconstruction of the I-5/I-205/SR-120 complex, exceeding $100 million. This work would need to be contemplated if the HOT lanes were extended north on I-5.

FIGURE 6
HOT LANE ACCESS LOCATIONS



BRIDGE REPLACEMENT

A review of the bridges within the project limits was conducted by the design team with Caltrans Division of Engineering Services structures group. Recent construction of I-205 widening to six lanes has added additional polyester/concrete overlay to a number of the bridges, causing concern about the viability of the bridges for additional widening or overlay as part of the HOT lane project. **Figure 7** shows the current bridges and their load rating:

FIGURE 7
EXISTING BRIDGE INVENTORY

Post Mile	Bridge Number	Bridge Name	Structure Type	Spans		Length English	Width * English	Year Built	Permit Rating	I-205 HOT Widening Inside [ft]	I-205 HOT Widening Outside [ft]
_000.00		**ALAMEDA CO LIMIT**					**146 ft**				
LOOO.OI	290299	AQUEDUCT SERVICE ROAD UC	201	3	O	74.15	116.47	1966 1999	PPPPP		16
_000.15	290037	DELTA-MENDOTA CANAL CPM 007.67	204	3	O	155.84	116.14	1953 1998	PPPPG		16
		Maintenance Culvert	CBC								16
_001.36	290321	MOUNTAIN HOUSE PARKWAY	205	2	U	269.03	111.88	2007	PPPPP		
_002.38	290208	HANSEN ROAD	302	2	U	235.89	39.04	1970	PPGOO		
		Irrigation Canal (Owned by Irrig. Dist.)	RCP Pipe								16
R003.37	29 0203	OLD US 50 (11th Street)	302	2	U	408.14	34.12	1970	PPPPP		
R004.54	290074L	JANNEY OH	504 205	5	O	306.1	58.07	1970	PPPPP	20.3	
R004.54	290074R	JANNEY OH	504 205	5	O	306.1	58.07	1970	PPPPP	20.3	
R005.29	290186K	GRANT LINE ROAD UC	605	2	O	354.33	39.04	1997	PPPPP		12
R005.29	290186L	GRANT LINE ROAD UC	205	4	O	353.35	58.07	1970	PPPPP	20.3	
R005.29	290186R	GRANT LINE ROAD UC	205	4	O	353.35	58.07	1970	PPPPP	20.3	
R005.94	290132L	CORRAL HOLLOW ROAD UC	205	1	O	96.13	58.07	1970	PPPPP	20.3	
R005.94	290132R	CORRAL HOLLOW ROAD UC	205	1	O	96.13	58.07	1970	PPPPP	20.3	
R007.01	290178L	TRACY BLVD UC	205	3	O	155.84	58.07	1970	PPPPP	20.3	
R007.01	290178R	TRACY BLVD UC	205	3	O	155.84	58.07	1970	PPPPP	20.3	
R007.52	290182	HOLLY DRIVE OC	205	2	U	214.9	39.04	1970	PPPPP		
R007.85	290183L	SUGAR SPUR OH	205	4	O	193.9	47.24	1970	PPPPP	20.3	
R007.85	290183R	SUGAR SPUR OH	205	4	O	193.9	58.07	1970	PPPPP	20.3	
R008.12	290184L	MACARTHUR DRIVE UC	205	3	O	161.09	58.07	1970	PPPPP	20.3	
R008.12	290184R	MACARTHUR DRIVE UC	205	3	O	161.09	58.07	1970	PPPPP	20.3	
R009.61	290181	PARIDISE ROAD OC	205	2	U	230.97	34.12	1970	PPPPP		
R010.48	290214L	EL RANCHO ROAD UC	205	3	O	120.08	58.07	1970	PPPPP	20.3	
R010.48	290214R	EL RANCHO ROAD UC	205	3	O	120.08	58.07	1970	PPPPP	20.3	
R011.60	290179L	EAST BANTA OH	502 105	3	O	245.08	58.07	1970	PPPPP	20.3	
R011.60	290179R	EAST BANTA OH	502 105	3	O	245.08	58.07	1970	PPPPP	20.3	
R011.72	290180L	TOM PAINE SLOUGH	205	5	O	402.89	58.07	1970	PPPPP	20.3	
R011.72	290180R	TOM PAINE SLOUGH	205	5	O	402.89	58.07	1970	PPPPP	20.3	

** Presented bridge widths are based on a current CT Bridge Inventory. Therefore, they do not reflect currently completed I-205 Widening Project.*

Similar projects in District 10 have undergone evaluation of bridge capacity during final design. This is expected as will for the I-205 HOT lane project, so for the purpose of this cost evaluations, three cost alternatives are presented.

Alternative 1 – this alternative would retain all bridges as currently constructed and would provide allowable overlays for conform purposes, to be determined in the PID (PSR) phase, except for those as identified as critical structures by Caltrans. Bridges to be replaced in this alternative include: Janney OH; Sugar Spur OH; El Rancho Rd OH. New widening to the inside or outside would be done to current load and seismic standards.

Alternative 2 – this alternative would retain all bridges as currently constructed and would provide allowable overlays for conform purposes, to be determined in the PID (PSR) phase,

except for those as identified as critical or near critical structures by Caltrans. Bridges to be replaced in this alternative include: Janney OH; Sugar Spur OH; El Rancho Rd UC, Grant Line Rd UC; East Banta OH; Tom Paine Slough bridge. New widening to the inside or outside would be done to current load and seismic standards.

Alternative 3 – this would replace all bridges designated in Figure 5 with an "O", which are overcrossings. These would be reconstructed to current standards, along with the inside or outside widening as needed.

For all locations, the bridges designated as "U" (undercrossing), could be retained with I-205 widening using tie-back walls at slope paving locations under the existing bridges.

For the purpose of cost estimates, it is presumed that the I-205/Lammers/Eleventh Street interchange will be constructed by 2016. Therefore, replacement of the existing Eleventh Street bridge is not needed under this assumption.

COST ESTIMATING METHODOLOGY

The methodology used to develop the cost estimates is outlined as follows:

1) Existing As-builts were obtained for the I-205 Corridor from Caltrans.
2) Review of Bridge Load Ratings were made. A meeting was held with Caltrans DES to discuss minimum required replacements.
3) Estimates to widen the I-205 median were made.
4) Layouts of proposed operational configuration were made based on MTC operating criteria.
5) Based on engineering done in earlier projects, two basic types of modifications were defined. This included the addition of new lanes either towards the median or towards the outside of the freeway. Components required for each type of modification were identified. For example, adding lanes would require excavation of existing material, laying an aggregate base and pavement, striping, etc.
6) We then took unit prices for each component from Caltrans' 2009 Contract Cost Database, and recent District bid results.
7) A review was done of the corridor to determine the available right-of-way and identify any locations requiring special cost estimation. The scan was performed using aerial photographs supplemented by site visits for many of the corridors.
8) A preliminary 6-page cost estimate was prepared for two alternatives:
   - Alternative 1 – Freeway Widening with bridge widening and overlay only.
   - Alternative 2 – Freeway Widening with full bridge replacement.
8) Capital support costs such as the cost of engineering design and environmental clearance were then added on a percentage basis to produce the total cost of delivering HOT lanes in 2010 prices. Percentages used were 4% for PID/PAED phase, 10% for PS&E, 10% for construction management.

9) A cost escalation factor was developed for each of the components. Due to the economic downturn, construction prices have dropped to 10-year lows. Based on discussions with Caltrans, 2010 pricing is anticipated to hold at 0% increase until 2012, then 2.0% per year thereafter.
10) The escalation factors were then applied to the corridor cost estimates to produce a total estimated cost for implementing the network.

DELIVERY ASSUMPTION

The basic assumption used in the cost estimates was that the HOT lanes would be initially implemented using the "rapid delivery" design standards (also called "best fit"). The design approach assumes single lane, directional express lanes separated from the adjacent general purpose lanes with a two-foot painted buffer composed of double yellow lines, as shown in Figures 2 and 3.

The schedule for delivery is based on direction from SJCOG, as follows:

- PID Phase (PSR): 2011-2012
- PA/ED Phase (Env Doc/PR): 2012-2014
- Design (PS&E): 2014-2016
- Construction: 2016-2019
- Operation and Testing: 2019-2020
- Open to Traffic: 2020

CAPITAL OUTLAY COSTS

The estimated capital outlay cost format is equivalent to a Caltrans PSR 6-page estimate of major construction line-items, standard percentages for miscellaneous and traffic systems, plus 10% for mobilization (per guidance in the Caltrans Project Development Procedures Manual). Most of the capital outlay cost items are things that Caltrans has long experience with and so the unit costs, described in the next section, are well known. The exception to this is the ITS component, which were taken from recent MTC studies.

<u>Project Cost Estimate (including contingency)</u>
The next step was to produce a Conceptual Project Cost Estimate for each alternative. The estimate is similar to that used during the project development process, and includes all capital outlay costs, including right of way, structures and landscaping, but does not normally includes capital outlay support costs. Caltrans typically calls for 30%-50% contingency at the Feasibility Study Stage (appropriate for this stage of the HOT lane project), 25% for projects at the PSR stage, and 15% for projects at the PR stage. The PDPM says of early-stage cost estimates, "Since the Project Feasibility Cost Estimate is probably the initial cost estimate prepared for the project, there usually is limited information on which to base costs." Based on this guidance a 30% contingency factor was used.

Total Project Delivery Cost (including capital outlay support costs)
The final step in the development of the unescalated cost estimates was to add the cost of project development to the project cost estimate. Project development costs include such components as PSR, environmental clearance, preliminary engineering, PS&E, construction management, and administrative costs. We used a figure of 24% of the project cost estimate for the capital outlay support costs, based on the assumption that the project will be delivered through a combination of traditional design-bid-build.

SOURCES OF UNCERTAINTY

A certain degree of uncertainty is unavoidable in any planning study, which is why a large contingency factor was used. The key sources of uncertainty in the cost estimates are:

- Bridge Replacements – Further evaluation of needed bridge replacements would be conducted in the PID phase to determine the needed replacements.

- Addition of Unrelated Cost Items - The cost estimates focused on the cost of the express lanes themselves. Except for the contingency factor no allowance was made for unrelated items that may be added to the project as a matter of policy. For example, if Caltrans were to require that any on-ramps to freeways with express lanes be upgraded to include an HOV bypass lane then this could potentially add costs of several hundred thousand dollars per entrance location.

- Environmental Mitigation Costs - The cost estimates make the implicit assumption that the costs of environmental mitigation will be about average for Caltrans projects. In the event that unusually costly mitigation measures are required, such as noise barriers, then this could significantly increase capital costs.

- Price Uncertainty - As mentioned in an earlier section prices have been very unusually unstable in recent years.

- Right-of-Way - The cost estimates do not include costs to purchase right-of-way. Since, however, the rapid delivery design approach minimizes the need to purchase additional right-of-way, any associated costs should be minimized as well. Right-of-way may be needed in isolated locations.

CAPITAL COST CALCULATIONS (AUGUST 2010)

Estimated conceptual construction costs range from $195 million to $246 million in 2010 dollars for the three alternatives. Escalated total implementation costs range from $269 million to $337 million.

The following Figures 9, 10 and 11 present the results of the escalated conceptual cost estimates, including soft costs, for each alternative. Detailed 6-page estimates are provided in **Attachment A.**

FIGURE 9
ESCALATED CONCEPTUAL COST ESTIMATE
ALTERNATIVE 1 – MINIMUM BRIDGE REPLACEMENTS

COMPONENT	PCT	OF	CURRENT DOLLARS	START OF COST	ANNUAL PCT ESCALATION	ESCALATED COST
PSR	1.0%	CONST	$1,949,000	7/1/2011	0.0%	$1,900,000
PAED	3.0%	CONST	$5,847,000	7/1/2012	0.0%	$5,800,000
PS&E	10.0%	CONST	$19,490,000	7/1/2013	0.0%	$19,500,000
R/W Support	15%	R/W	$150,000	7/1/2015	2.0%	$200,000
R/W Capitol	100%	R/W	$1,000,000	7/1/2015	2.0%	$1,100,000
Constr. Support	10%	CONST	$19,490,000	7/1/2016	2.0%	$22,000,000
Construction	100%	CONST	$194,900,000	7/1/2016	2.0%	$219,900,000
TOTAL ESCALATED COST			**$240,877,000**			**$268,500,000**

FIGURE 10
ESCALATED CONCEPTUAL COST ESTIMATE
ALTERNATIVE 2 – ADDITIONAL BRIDGE REPLACEMENTS

COMPONENT	PCT	OF	CURRENT DOLLARS	START OF COST	ANNUAL PCT ESCALATION	ESCALATED COST
PSR	1.0%	CONST	$2,232,000	7/1/2011	0.0%	$2,200,000
PAED	3.0%	CONST	$6,696,000	7/1/2012	0.0%	$6,700,000
PS&E	10.0%	CONST	$22,320,000	7/1/2013	0.0%	$22,300,000
R/W Support	15%	R/W	$150,000	7/1/2015	2.0%	$200,000
R/W Capitol	100%	R/W	$1,000,000	7/1/2015	2.0%	$1,100,000
Constr. Support	10%	CONST	$22,320,000	7/1/2016	2.0%	$25,200,000
Construction	100%	CONST	$223,200,000	7/1/2016	2.0%	$251,800,000
TOTAL ESCALATED COST			**$275,686,000**			**$307,300,000**

FIGURE 11
ESCALATED CONCEPTUAL COST ESTIMATE
ALTERNATIVE 3 – FULL BRIDGE REPLACEMENTS

COMPONENT	PCT	OF	CURRENT DOLLARS	START OF COST	ANNUAL PCT ESCALATION	ESCALATED COST
PSR	1.0%	CONST	$2,447,000	7/1/2011	0.0%	$2,400,000
PAED	3.0%	CONST	$7,341,000	7/1/2012	0.0%	$7,300,000
PS&E	10.0%	CONST	$24,470,000	7/1/2013	0.0%	$24,500,000
R/W Support	15%	R/W	$150,000	7/1/2015	2.0%	$200,000
R/W Capitol	100%	R/W	$1,000,000	7/1/2015	2.0%	$1,100,000
Constr. Support	10%	CONST	$24,470,000	7/1/2016	2.0%	$27,600,000
Construction	100%	CONST	$244,700,000	7/1/2016	2.0%	$276,100,000
TOTAL ESCALATED COST			**$302,131,000**			**$336,800,000**

ATTACHMENT A

Conceptual Cost Estimate Detail

I-205 HOT LANES PROJECT
CONCEPTUAL PROJECT COST ESTIMATE SUMMARY
TOTAL ESCALATED IMPLEMENTATION COST

DIST - CO - RTE	10-SJ-205
Type of Estimate	Feasibility
PM:	0.05/12.59
Project ID:	TBD
PP No. :	
Date:	8/9/2010

Limits: **In San Joaquin County**
From 0.05 mile west of Jct I-580 to 0.1 mile west of Jct I-5
HOT LANE PROJECT

Proposed Improvement: (Scope) **1 - OVERLAY EXISTING UNDERCROSSING BRIDGES**
MINIMUM BRIDGE REPLACEMENTS

COMPONENT	PCT	OF	CURRENT DOLLARS	START OF COST	ANNUAL PCT ESCALATION	ESCALATED COST
PSR	1.0%	CONST	$1,949,000	7/1/2011	0.0%	$1,900,000
PAED	3.0%	CONST	$5,847,000	7/1/2012	0.0%	$5,800,000
PS&E	10.0%	CONST	$19,490,000	7/1/2013	0.0%	$19,500,000
R/W Support	15%	R/W	$150,000	7/1/2015	2.0%	$200,000
R/W Capitol	100%	R/W	$1,000,000	7/1/2015	2.0%	$1,100,000
Constr. Support	10%	CONST	$19,490,000	7/1/2016	2.0%	$22,000,000
Construction	100%	CONST	$194,900,000	7/1/2016	2.0%	$219,900,000
TOTAL ESCALATED COST			**$240,877,000**			**$268,500,000**
					CONST + CM	$241,900,000

I-205 HOT LANES PROJECT
PRELIMINARY PROJECT COST ESTIMATE SUMMARY

DIST - CO - RTE 10-SJ-205
PM: 0.05/R12.59
EA: -
Program Code:

Project Description:

Limits: **In San Joaquin County, In Tracy**

Proposed Improvement: **I-205 HOT Lanes**
(Scope) **From California Aqueduct to I-5**

Alternative: **1 - OVERLAY EXISTING UNDERCROSSING BRIDGES**
MINIMUM BRIDGE REPLACEMENTS

SUMMARY OF PROJECT COST ESTIMATE

TOTAL ROADWAY ITEMS	$136,600,000
TOTAL STRUCTURE ITEMS	$58,300,000
SUBTOTAL CONSTRUCTION COSTS	$194,900,000
TOTAL RIGHT OF WAY ITEMS	$1,000,000
TOTAL PROJECT CAPITAL OUTLAY COSTS	**$195,900,000**

Approved by
Project Manager K. Meyer - Rajappan & Meyer **Date** 8/9/2010
(Signature)

Phone No. 408-280-2772

Prepared by; RAJAPPAN & MEYER CONSULTING ENGINEERS

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

	DIST - CO - RTE
	10-SJ-205
PM:	0.05/R12.59
EA:	-

I. ROADWAY ITEMS

	Quantity	Unit	Unit Price	Item Cost	Section Cost
Section 1 - Earthwork					
Roadway Excavation	491,588	SY	$10.00	$4,915,875	
Existing Highway Facilities	Lump Sum	LS	$1,700,000.00	$1,700,000	
Clearing & Grubbing	Lump Sum	LS	$500,000.00	$500,000	
Develop Water Supply	Lump Sum	LS	$20,000.00	$20,000	
Project Schedule	Lump Sum	LS	$100,000.00	$100,000	
				Subtotal Earthwork	$7,235,875.00
Section 2 - Pavement Structural Section *					
PCC Pavement (___ Depth)					
PCC Pavement (___ Depth)					
Hot Mix Asphalt	491,600	SY	$25.00	$12,290,000	
Rubberized Hot Mix Asphalt	491,600	SY	$10.50	$5,161,800	
Cement-Treated Base					
Aggregate Base	491,600	SY	$17.00	$8,357,200	
Treated Permeable Base					
Aggregate Subbase	491,600	SY	$12.00	$5,899,200	
Pavement Reinforcing Fabric					
Edge Drains	Lump Sum	LS	$120,000.00	$120,000	
Jointed Plain Concrete Pavement		CY	$210.00	$0	
Minor Concrete		CY	$400.00	$0	
				Subtotal Pavement Structural Section	$31,828,200.00
Section 3 - Drainage					
Large Drainage Facilities					
Storm Drains	Lump Sum	LS	$3,000,000.00	$3,000,000	
Construction BMP's	Lump Sum	LS	$450,000.00	$450,000	
Construction Site Management	Lump Sum	LS	$240,000.00	$240,000	
Treatment BMP's	Lump Sum	LS	$0.00	$0	
Sampling and Analysis	Lump Sum	LS	$30,000.00	$30,000	
Pumping Plant	0	EA	$1,000,000.00	$1,000,000	
				Subtotal Drainage	$4,720,000.00

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

	DIST - CO - RTE
	10-SJ-205
PM:	0.05/R12.59
EA:	

	Quantity	Unit	Unit Price	Item Cost	Section Cost
Section 4 - Specialty Items					
Retaining Walls	22,800	LF	$397.00	$9,051,600	
Noise Barriers	2,600	LF	$400.00	$1,040,000	
Type 732S/A Barrier	25,400	LF	$53.00	$1,346,200	
Type 60 Barrier	109,100	LF	$55.00	$6,000,500	
Highway Planting	Lump Sum	LS	$250,000.00	$250,000	
Temporary Railing (Type K)	299,000	LF	$30.00	$8,970,000	
Irrigation Modification	Lump Sum	LS	$150,000.00	$150,000	
Relocate Private Irrigation Facilities					
Erosion Control	Lump Sum	LS	$815,000.00	$815,000	
Slope Protection					
Water Pollution Control	Lump Sum	LS	$450,000.00	$450,000	
Hazardous Waste Mitigation Work	Lump Sum	LS	$150,000.00	$150,000	
Environmental Mitigation	Lump Sum	LS	$500,000.00	$500,000	
Resident Engineer Office Space	Lump Sum	LS	$250,000.00	$250,000	
				Subtotal Specialty Items	$28,973,300.00
Section 5 - Traffic Items					
Lighting	Lump Sum	LS	$1,000,000.00	$1,000,000	
Traffic Delineation Items	850,000	FT	$0.60	$510,000	
Fiber Optic Backbone	Lump Sum	LS	$4,500,000.00	$4,500,000	
Traffic Signals	0	EA	$200,000.00	$0	
Overhead Sign Structures	30	EA	$150,000.00	$4,500,000	
Roadside Signs	Lump Sum	LS	$1,000,000.00	$1,000,000	
Traffic Control Systems	Lump Sum	LS	$2,050,000.00	$2,050,000	
Transportation Mgmt Plan	Lump Sum	LS	$500,000.00	$500,000	
ITS Improvements	Lump Sum	LS	$1,430,000.00	$1,430,000	
COZEEP Contract	Lump Sum	LS	$1,500,000.00	$1,500,000	
				Subtotal Traffic Items	$16,990,000.00
				TOTAL SECTIONS 1 - 5:	$89,747,375.00

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

DIST - CO - RTE	10-SJ-205
PM:	0.05/R12.59
EA:	-

					Item Cost	Section Cost
Section 6 - Minor Items						
Subtotal Sections 1 - 5		$89,747,375	X (5%)		$4,487,369	
				TOTAL MINOR ITEMS:		$4,487,369
Section 7 - Roadway Mobilization						
Subtotal Sections 1 - 5		$89,747,375				
Minor Items		$4,487,369				
	Sum	$94,234,744	X (10%)		$9,423,474	
				TOTAL ROADWAY MOBILIZATION		$9,423,470
Section 8 - Roadway Additions						
Supplemental						
Subtotal Sections 1 - 5		$89,747,375				
Minor Items		$4,487,369				
	Sum	$94,234,744	X (5%)		$4,711,737	
Contingencies						
Subtotal Sections 1 - 5		$89,747,375				
Minor Items		$4,487,369				
	Sum	$94,234,744	X 30%	*	$28,270,423	
				TOTAL ROADWAY ADDITIONS		$32,982,160
				TOTAL ROADWAY ITEMS (Subtotal of Sections 1 - 8)		$136,640,000

Estimate Prepared By:	Martha Dadala	(408) 280-2772	9-Aug-10
	(Print Name)	(Phone)	(Date)
Estimate Checked By:	Jiri Vitek	(408) 280-2772	9-Aug-10
	(Print Name)	(Phone)	(Date)

* Use 25% at the PSR stage or a higher or lower rate if justified.

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

DIST - CO - RTE	
	10-SJ-205
PM:	0.05/R12.59
EA:	-

II. STRUCTURES ITEMS

Bridge Name	New Bridges	Replace Bridge	Overlay Bridges
Structure Type			
Width (M) - out to out			
Span Lengths (M)			
Total Area (SQ M)			
Footing Type(pile/spread)			
Cost per Sq. M. Including: Mobilization: 10% Contingency: 25%			
Bridge Removal/Modification			
Total Cost For Structure	$43,800,000	$7,000,000	$7,000,000

SUBTOTAL STRUCTURES ITEMS (Sum of Total cost for Structures)	$57,800,000

Railroad Related Costs		$500,000.00	

SUBTOTAL RAILROAD ITEMS	$500,000
TOTAL STRUCTURES ITEMS: (Sum of Stuctures Items plus Railroad items)	$58,300,000

COMMENTS:

Estimate Prepared By:	Martha Dadala	(408)280-2772	9-Aug-10
	(Print Name)	(Phone)	(Date)

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

	DIST - CO - RTE
	10-SJ-205
PM:	0.05/R12.59
EA:	-

III. RIGHT OF WAY

		Escalated Value *
A.	Acquisition, including excess lands, damages to remainder(s) and Goodwill	$500,000
B.	Utility Relocation (State Share)	$500,000
C.	Relocation Assistance	$0
D.	Clearance / Demolition	$0
E.	Title and Escrow Fees	$0

TOTAL RIGHT OF WAY ITEMS (Escalated Value) $1,000,000

Anticipated Date of Right of Way Certification (Date to which Values are Escalated) _____

F. Construction Contract Work

Brief Description of Work: _____

Right of Way Branch Cost Estimate for Work* $0

*This dollar amount is to be included in the Roadway and/or Structures Item of Work, as appropriate. Do not include in the Right of Way Items

COMMENTS:

Estimate prepared by:	Martha Dadala	(408)-280-2772	9-Aug-10
	(Print Name)	(Phone)	(Date)

I-205 HOT LANES PROJECT
CONCEPTUAL PROJECT COST ESTIMATE SUMMARY
TOTAL ESCALATED IMPLEMENTATION COST

DIST - CO - RTE	10-SJ-205
Type of Estimate	Feasibility
PM:	0.05/12.59
Project ID:	TBD
PP No. :	
Date:	8/9/2010

Limits: **In San Joaquin County**
From 0.05 mile west of Jct I-580 to 0.1 mile west of Jct I-5
HOT LANE PROJECT

Proposed Improvement: (Scope) **2 - OVERLAY EXISTING UNDERCROSSING BRIDGES**
ADDITIONAL BRIDGE REPLACEMENTS

COMPONENT	PCT	OF	CURRENT DOLLARS	START OF COST	ANNUAL PCT ESCALATION	ESCALATED COST
PSR	1.0%	CONST	$2,232,000	7/1/2011	0.0%	$2,200,000
PAED	3.0%	CONST	$6,696,000	7/1/2012	0.0%	$6,700,000
PS&E	10.0%	CONST	$22,320,000	7/1/2013	0.0%	$22,300,000
R/W Support	15%	R/W	$150,000	7/1/2015	2.0%	$200,000
R/W Capitol	100%	R/W	$1,000,000	7/1/2015	2.0%	$1,100,000
Constr. Support	10%	CONST	$22,320,000	7/1/2016	2.0%	$25,200,000
Construction	100%	CONST	$223,200,000	7/1/2016	2.0%	$251,800,000
TOTAL ESCALATED COST			**$275,686,000**			**$307,300,000**
					CONST + CM	$277,000,000

I-205 HOT LANES PROJECT
PRELIMINARY PROJECT COST ESTIMATE SUMMARY

DIST - CO - RTE 10-SJ-205
PM: 0.05/R12.59
EA: -
Program Code:

Project Description:

Limits: **In San Joaquin County, In Tracy**

Proposed Improvement: **I-205 HOT Lanes**
(Scope) **From California Aqueduct to I-5**

Alternative: **2 - OVERLAY EXISTING UNDERCROSSING BRIDGES**
ADDITIONAL BRIDGE REPLACEMENTS

SUMMARY OF PROJECT COST ESTIMATE

TOTAL ROADWAY ITEMS	$138,100,000
TOTAL STRUCTURE ITEMS	$85,100,000
SUBTOTAL CONSTRUCTION COSTS	$223,200,000
TOTAL RIGHT OF WAY ITEMS	$1,000,000
TOTAL PROJECT CAPITAL OUTLAY COSTS	**$224,200,000**

Approved by
Project Manager K. Meyer - Rajappan & Meyer **Date** 8/9/2010
(Signature)

Phone No. 408-280-2772

Prepared by; RAJAPPAN & MEYER CONSULTING ENGINEERS

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

	DIST - CO - RTE
	10-SJ-205
PM:	0.05/R12.59
EA:	-

I. ROADWAY ITEMS

	Quantity	Unit	Unit Price	Item Cost	Section Cost
Section 1 - Earthwork					
Roadway Excavation	491,588	SY	$10.00	$4,915,875	
Existing Highway Facilities	Lump Sum	LS	$1,700,000.00	$1,700,000	
Clearing & Grubbing	Lump Sum	LS	$500,000.00	$500,000	
Develop Water Supply	Lump Sum	LS	$20,000.00	$20,000	
Project Schedule	Lump Sum	LS	$100,000.00	$100,000	
				Subtotal Earthwork	$7,235,875.00
Section 2 - Pavement Structural Section *					
PCC Pavement (___ Depth)					
PCC Pavement (___ Depth)					
Hot Mix Asphalt	491,600	SY	$25.00	$12,290,000	
Rubberized Hot Mix Asphalt	491,600	SY	$10.50	$5,161,800	
Cement-Treated Base					
Aggregate Base	491,600	SY	$17.00	$8,357,200	
Treated Permeable Base					
Aggregate Subbase	491,600	SY	$12.00	$5,899,200	
Pavement Reinforcing Fabric					
Edge Drains	Lump Sum	LS	$120,000.00	$120,000	
Jointed Plain Concrete Pavement		CY	$210.00	$0	
Minor Concrete		CY	$400.00	$0	
				Subtotal Pavement Structural Section	$31,828,200.00
Section 3 - Drainage					
Large Drainage Facilities					
Storm Drains	Lump Sum	LS	$3,000,000.00	$3,000,000	
Construction BMP's	Lump Sum	LS	$450,000.00	$450,000	
Construction Site Management	Lump Sum	LS	$240,000.00	$240,000	
Treatment BMP's	Lump Sum	LS	$0.00	$0	
Sampling and Analysis	Lump Sum	LS	$30,000.00	$30,000	
Pumping Plant	0	EA	$1,000,000.00	$1,000,000	
				Subtotal Drainage	$4,720,000.00

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

	DIST - CO - RTE
	10-SJ-205
PM:	0.05/R12.59
EA:	

	Quantity	Unit	Unit Price	Item Cost	Section Cost
Section 4 - Specialty Items					
Retaining Walls	22,800	LF	$397.00	$9,051,600	
Noise Barriers	2,600	LF	$400.00	$1,040,000	
Type 732S/A Barrier	25,400	LF	$53.00	$1,346,200	
Type 60 Barrier	109,100	LF	$55.00	$6,000,500	
Highway Planting	Lump Sum	LS	$250,000.00	$250,000	
Temporary Railing (Type K)	299,000	LF	$30.00	$8,970,000	
Irrigation Modification	Lump Sum	LS	$150,000.00	$150,000	
Relocate Private Irrigation Facilities					
Erosion Control	Lump Sum	LS	$815,000.00	$815,000	
Slope Protection					
Water Pollution Control	Lump Sum	LS	$450,000.00	$450,000	
Hazardous Waste Mitigation Work	Lump Sum	LS	$150,000.00	$150,000	
Environmental Mitigation	Lump Sum	LS	$500,000.00	$500,000	
Resident Engineer Office Space	Lump Sum	LS	$250,000.00	$250,000	
				Subtotal Specialty Items	$28,973,300.00
Section 5 - Traffic Items					
Lighting	Lump Sum	LS	$1,000,000.00	$1,000,000	
Traffic Delineation Items	850,000	FT	$0.60	$510,000	
Fiber Optic Backbone	Lump Sum	LS	$4,500,000.00	$4,500,000	
Traffic Signals	0	EA	$200,000.00	$0	
Overhead Sign Structures	30	EA	$150,000.00	$4,500,000	
Roadside Signs	Lump Sum	LS	$1,000,000.00	$1,000,000	
Traffic Control Systems	Lump Sum	LS	$3,000,000.00	$3,000,000	
Transportation Mgmt Plan	Lump Sum	LS	$500,000.00	$500,000	
ITS Improvements	Lump Sum	LS	$1,430,000.00	$1,430,000	
COZEEP Contract	Lump Sum	LS	$1,500,000.00	$1,500,000	
				Subtotal Traffic Items	$17,940,000.00
				TOTAL SECTIONS 1 - 5:	$90,697,375.00

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

	DIST - CO - RTE
	10-SJ-205
PM:	0.05/R12.59
EA:	-

					Item Cost	Section Cost
Section 6 - Minor Items						
Subtotal Sections 1 - 5		$90,697,375	X (5%)		$4,534,869	
				TOTAL MINOR ITEMS:		$4,534,869
Section 7 - Roadway Mobilization						
Subtotal Sections 1 - 5		$90,697,375				
Minor Items		$4,534,869				
	Sum	$95,232,244	X (10%)		$9,523,224	
				TOTAL ROADWAY MOBILIZATION		$9,523,220
Section 8 - Roadway Additions						
Supplemental						
Subtotal Sections 1 - 5		$90,697,375				
Minor Items		$4,534,869				
	Sum	$95,232,244	X (5%)		$4,761,612	
Contingencies						
Subtotal Sections 1 - 5		$90,697,375				
Minor Items		$4,534,869				
	Sum	$95,232,244	X 30%	*	$28,569,673	
				TOTAL ROADWAY ADDITIONS		$33,331,290
				TOTAL ROADWAY ITEMS (Subtotal of Sections 1 - 8)		$138,090,000

Estimate Prepared By:	Martha Dadala	(408) 280-2772	9-Aug-10
	(Print Name)	(Phone)	(Date)
Estimate Checked By:	Jiri Vitek	(408) 280-2772	9-Aug-10
	(Print Name)	(Phone)	(Date)

* Use 25% at the PSR stage or a higher or lower rate if justified.

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

DIST - CO - RTE	
	10-SJ-205
PM:	0.05/R12.59
EA:	-

II. STRUCTURES ITEMS

Bridge Name	New Bridges	Replace Bridge	Overlay Bridges
Structure Type			
Width (M) - out to out			
Span Lengths (M)			
Total Area (SQ M)			
Footing Type(pile/spread)			
Cost per Sq. M. Including: Mobilization: 10% Contingency: 25%			
Bridge Removal/Modification			
Total Cost For Structure	$43,800,000	$33,800,000	$7,000,000

SUBTOTAL STRUCTURES ITEMS (Sum of Total cost for Structures)	$84,600,000
Railroad Related Costs: $500,000.00	
SUBTOTAL RAILROAD ITEMS	$500,000
TOTAL STRUCTURES ITEMS: (Sum of Stuctures Items plus Railroad items)	$85,100,000

COMMENTS:

Estimate Prepared By:	Martha Dadala	(408)280-2772	9-Aug-10
	(Print Name)	(Phone)	(Date)

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

	DIST - CO - RTE
	10-SJ-205
PM:	0.05/R12.59
EA:	-

III. RIGHT OF WAY

		Escalated Value *
A.	Acquisition, including excess lands, damages to remainder(s) and Goodwill	$500,000
B.	Utility Relocation (State Share)	$500,000
C.	Relocation Assistance	$0
D.	Clearance / Demolition	$0
E.	Title and Escrow Fees	$0

TOTAL RIGHT OF WAY ITEMS (Escalated Value) $1,000,000

Anticipated Date of Right of Way Certification (Date to which Values are Escalated) _____

F. Construction Contract Work

Brief Description of Work: _____

Right of Way Branch Cost Estimate for Work* $0

*This dollar amount is to be included in the Roadway and/or Structures Item of Work, as appropriate. Do not include in the Right of Way Items

COMMENTS:

Estimate prepared by:	Martha Dadala	(408)-280-2772	9-Aug-10
	(Print Name)	(Phone)	(Date)

I-205 HOT LANES PROJECT
CONCEPTUAL PROJECT COST ESTIMATE SUMMARY
TOTAL ESCALATED IMPLEMENTATION COST

DIST - CO - RTE	10-SJ-205
Type of Estimate	Feasibility
PM:	0.05/12.59
Project ID:	TBD
PP No. :	
Date:	8/9/2010

Limits: **In San Joaquin County**
From 0.05 mile west of Jct I-580 to 0.1 mile west of Jct I-5
HOT LANE PROJECT

Proposed Improvement: (Scope) **3 - REPLACE ALL UNDERCROSSING BRIDGES**

COMPONENT	PCT	OF	CURRENT DOLLARS	START OF COST	ANNUAL PCT ESCALATION	ESCALATED COST
PSR	1.0%	CONST	$2,447,000	7/1/2011	0.0%	$2,400,000
PAED	3.0%	CONST	$7,341,000	7/1/2012	0.0%	$7,300,000
PS&E	10.0%	CONST	$24,470,000	7/1/2013	0.0%	$24,500,000
R/W Support	15%	R/W	$150,000	7/1/2015	2.0%	$200,000
R/W Capitol	100%	R/W	$1,000,000	7/1/2015	2.0%	$1,100,000
Constr. Support	10%	CONST	$24,470,000	7/1/2016	2.0%	$27,600,000
Construction	100%	CONST	$244,700,000	7/1/2016	2.0%	$276,100,000
TOTAL ESCALATED COST			**$302,131,000**			**$336,800,000**
					CONST + CM	$303,700,000

I-205 HOT LANES PROJECT
PRELIMINARY PROJECT COST ESTIMATE SUMMARY

DIST - CO - RTE 10-SJ-205
PM: 0.05/R12.59
EA: -
Program Code:

Project Description:

Limits: **In San Joaquin County, In Tracy**

Proposed Improvement: **I-205 HOT Lanes**
(Scope) **From California Aqueduct to I-5**

Alternative: **3 - REPLACE ALL UNDERCROSSING BRIDGES**

SUMMARY OF PROJECT COST ESTIMATE

TOTAL ROADWAY ITEMS	$141,100,000
TOTAL STRUCTURE ITEMS	$103,600,000
SUBTOTAL CONSTRUCTION COSTS	$244,700,000
TOTAL RIGHT OF WAY ITEMS	$1,000,000
TOTAL PROJECT CAPITAL OUTLAY COSTS	**$245,700,000**

Approved by
Project Manager K. Meyer - Rajappan & Meyer **Date** 8/9/2010
(Signature)

Phone No. 408-280-2772

Prepared by; RAJAPPAN & MEYER CONSULTING ENGINEERS

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

	DIST - CO - RTE
	10-SJ-205
PM:	0.05/R12.59
EA:	-

I. ROADWAY ITEMS

	Quantity	Unit	Unit Price	Item Cost	Section Cost
Section 1 - Earthwork					
Roadway Excavation	491,588	SY	$10.00	$4,915,875	
Existing Highway Facilities	Lump Sum	LS	$1,700,000.00	$1,700,000	
Clearing & Grubbing	Lump Sum	LS	$500,000.00	$500,000	
Develop Water Supply	Lump Sum	LS	$20,000.00	$20,000	
Project Schedule	Lump Sum	LS	$100,000.00	$100,000	
				Subtotal Earthwork	$7,235,875.00
Section 2 - Pavement Structural Section *					
PCC Pavement (___ Depth)					
PCC Pavement (___ Depth)					
Hot Mix Asphalt	491,600	SY	$25.00	$12,290,000	
Rubberized Hot Mix Asphalt	491,600	SY	$10.50	$5,161,800	
Cement-Treated Base					
Aggregate Base	491,600	SY	$17.00	$8,357,200	
Treated Permeable Base					
Aggregate Subbase	491,600	SY	$12.00	$5,899,200	
Pavement Reinforcing Fabric					
Edge Drains	Lump Sum	LS	$120,000.00	$120,000	
Jointed Plain Concrete Pavement		CY	$210.00	$0	
Minor Concrete		CY	$400.00	$0	
				Subtotal Pavement Structural Section	$31,828,200.00
Section 3 - Drainage					
Large Drainage Facilities					
Storm Drains	Lump Sum	LS	$3,000,000.00	$3,000,000	
Construction BMP's	Lump Sum	LS	$450,000.00	$450,000	
Construction Site Management	Lump Sum	LS	$240,000.00	$240,000	
Treatment BMP's	Lump Sum	LS	$0.00	$0	
Sampling and Analysis	Lump Sum	LS	$30,000.00	$30,000	
Pumping Plant	0	EA	$1,000,000.00	$1,000,000	
				Subtotal Drainage	$4,720,000.00

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

	DIST - CO - RTE
	10-SJ-205
PM:	0.05/R12.59
EA:	

	Quantity	Unit	Unit Price	Item Cost	Section Cost
Section 4 - Specialty Items					
Retaining Walls	22,800	LF	$397.00	$9,051,600	
Noise Barriers	2,600	LF	$400.00	$1,040,000	
Type 732S/A Barrier	25,400	LF	$53.00	$1,346,200	
Type 60 Barrier	109,100	LF	$55.00	$6,000,500	
Highway Planting	Lump Sum	LS	$250,000.00	$250,000	
Temporary Railing (Type K)	299,000	LF	$30.00	$8,970,000	
Irrigation Modification	Lump Sum	LS	$150,000.00	$150,000	
Relocate Private Irrigation Facilities					
Erosion Control	Lump Sum	LS	$815,000.00	$815,000	
Slope Protection					
Water Pollution Control	Lump Sum	LS	$450,000.00	$450,000	
Hazardous Waste Mitigation Work	Lump Sum	LS	$150,000.00	$150,000	
Environmental Mitigation	Lump Sum	LS	$500,000.00	$500,000	
Resident Engineer Office Space	Lump Sum	LS	$250,000.00	$250,000	
				Subtotal Specialty Items	$28,973,300.00
Section 5 - Traffic Items					
Lighting	Lump Sum	LS	$1,000,000.00	$1,000,000	
Traffic Delineation Items	850,000	FT	$0.60	$510,000	
Fiber Optic Backbone	Lump Sum	LS	$4,500,000.00	$4,500,000	
Traffic Signals	0	EA	$200,000.00	$0	
Overhead Sign Structures	30	EA	$150,000.00	$4,500,000	
Roadside Signs	Lump Sum	LS	$1,000,000.00	$1,000,000	
Traffic Control Systems	Lump Sum	LS	$5,000,000.00	$5,000,000	
Transportation Mgmt Plan	Lump Sum	LS	$500,000.00	$500,000	
ITS Improvements	Lump Sum	LS	$1,430,000.00	$1,430,000	
COZEEP Contract	Lump Sum	LS	$1,500,000.00	$1,500,000	
				Subtotal Traffic Items	$19,940,000.00
				TOTAL SECTIONS 1 - 5:	$92,697,375.00

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

DIST - CO - RTE	10-SJ-205
PM:	0.05/R12.59
EA:	-

					Item Cost		Section Cost
Section 6 - Minor Items							
Subtotal Sections 1 - 5		$92,697,375	X (5%)		$4,634,869		
					TOTAL MINOR ITEMS:		$4,634,869
Section 7 - Roadway Mobilization							
Subtotal Sections 1 - 5		$92,697,375					
Minor Items		$4,634,869					
	Sum	$97,332,244	X (10%)		$9,733,224		
					TOTAL ROADWAY MOBILIZATION		$9,733,220
Section 8 - Roadway Additions							
Supplemental							
Subtotal Sections 1 - 5		$92,697,375					
Minor Items		$4,634,869					
	Sum	$97,332,244	X (5%)		$4,866,612		
Contingencies							
Subtotal Sections 1 - 5		$92,697,375					
Minor Items		$4,634,869					
	Sum	$97,332,244	X	30%	*	$29,199,673	
					TOTAL ROADWAY ADDITIONS		$34,066,290
					TOTAL ROADWAY ITEMS (Subtotal of Sections 1 - 8)		$141,130,000

Estimate Prepared By:	Martha Dadala	(408) 280-2772	9-Aug-10
	(Print Name)	(Phone)	(Date)
Estimate Checked By:	Jiri Vitek	(408) 280-2772	9-Aug-10
	(Print Name)	(Phone)	(Date)

* Use 25% at the PSR stage or a higher or lower rate if justified.

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

DIST - CO - RTE	
	10-SJ-205
PM:	0.05/R12.59
EA:	-

II. STRUCTURES ITEMS

Bridge Name	New Bridges	Replace Bridge	Overlay Bridges
Structure Type			
Width (M) - out to out			
Span Lengths (M)			
Total Area (SQ M)			
Footing Type(pile/spread)			
Cost per Sq. M. Including: Mobilization: 10% Contingency: 25%			
Bridge Removal/Modification			
Total Cost For Structure	$103,100,000	$0	$0

SUBTOTAL STRUCTURES ITEMS (Sum of Total cost for Structures)	$103,100,000
Railroad Related Costs	$500,000.00
SUBTOTAL RAILROAD ITEMS	$500,000
TOTAL STRUCTURES ITEMS: (Sum of Stuctures Items plus Railroad items)	$103,600,000

COMMENTS:

Estimate Prepared By:	Martha Dadala	(408)280-2772	9-Aug-10
	(Print Name)	(Phone)	(Date)

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

	DIST - CO - RTE
	10-SJ-205
PM:	0.05/R12.59
EA:	-

III. RIGHT OF WAY

		Escalated Value *
A.	Acquisition, including excess lands, damages to remainder(s) and Goodwill	$500,000
B.	Utility Relocation (State Share)	$500,000
C.	Relocation Assistance	$0
D.	Clearance / Demolition	$0
E.	Title and Escrow Fees	$0

TOTAL RIGHT OF WAY ITEMS (Escalated Value) $1,000,000

Anticipated Date of Right of Way Certification (Date to which Values are Escalated) _____

F. Construction Contract Work

Brief Description of Work: _____

Right of Way Branch Cost Estimate for Work* $0

*This dollar amount is to be included in the Roadway and/or Structures Item of Work, as appropriate. Do not include in the Right of Way Items

COMMENTS:

Estimate prepared by:	Martha Dadala	(408)-280-2772	9-Aug-10
	(Print Name)	(Phone)	(Date)

Appendix C: I-5 HOT Lane Conceptual Capital Cost Estimates

Conversion of Proposed HOV Lanes to HOT Lanes - Cost Summary By Segment:
(Costs Shown Below Are in Thousands Dollar)

Capitol Outlay	Segment A Downing to Charter	Segment B Charter to Country Club	Segment C Country Club to Hammer	Project Total Downing to Hammer
Roadway Cost	$ 8,597	$ 16,182	$ 7,060	$ 31,839
Structure Cost	$ 16,000	$ 40,320	$ -	$ 56,320
Ingress and Egress (Incl. CMS/VMS and ITS)	$ 500	$ 500	$ 1,000	$ 2,000
Subtotal Construction Costs:	$ 25,097	$ 57,002	$ 8,060	$ 90,159
Right of Way	$ -	$ -	$ -	$ -
Total Capitol Outlay Costs	**$ 25,097**	**$ 57,002**	**$ 8,060**	**$ 90,159**
Average Cost Per Mile:	**$ 14,763**	**$ 17,813**	**$ 1,185**	

Support Costs	Segment A	Segment B	Segment C	Project Total
Preliminary Engineering and Environmental Document (PAED) - 10%	$ 2,510	$ 5,700	$ 806	$ 9,016
Final Design (PS&E) - 10%	$ 2,510	$ 5,700	$ 806	$ 9,016
Construction Administration and Support - 15%	$ 3,765	$ 8,550	$ 1,209	$ 13,524
Right of Way Support - 5%	$ -	$ -	$ -	$ -
Total Support Costs:	**$ 8,784**	**$ 19,951**	**$ 2,821**	**$ 31,556**
Average Cost Per Mile:	**$ 5,167**	**$ 6,235**	**$ 415**	

Total Costs	Segment A	Segment B	Segment C	Total Project
Total Construction Costs:	**$ 33,881**	**$ 76,953**	**$ 10,881**	**$ 121,715**
Average Construction Costs Per Mile	**$ 19,930**	**$ 12,412**	**$ 1,600**	

Segment	Descriptions	Length (Mile)
Segment A	Downing Avenue to Charter Way	1.2
Segment B	Charter Way to Country Club Blvd	3.2
Segment C	Country Club Blvd to Hammer Lane	4.2

Assumptions:
1) No Right of Way acqusitions is required.
2) Estimates are based on current dollar and does not account for inflation.
3) Operations and Maintenance Costs are not included.
4) Cost for CHP Enforcement Area is not included.
5) Assumes that HOV lanes are provided.

Appendix D: I-205 Traffic Forecast

I-205 HOT LANE PROJECT - TRAFFIC FORECAST

Analysis Input Data by Segment

Data Category	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Segment 1 (Mountain House to I-580) - Westbound AM													
Route Miles	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	810	965	1,120	1,275	1,430	1,585	1,598	1,611	1,624	1,637	1,650	1,663	1,676
Peak Period HOV (2) Lane Volume in Peak Direction	2,278	2,714	3,150	3,586	4,022	4,457	4,493	4,530	4,566	4,603	4,639	4,676	4,712
Peak Hour HOV (3+) Lane Volume in Peak Direction	118	131	144	156	169	182	201	220	240	259	278	297	316
Peak Period HOV (3+) Lane Volume in Peak Direction	357	396	435	473	512	551	609	667	725	783	841	899	957
Peak Hour GP Lane Volume in Peak Direction	4,129	4,535	4,941	5,348	5,754	6,160	6,333	6,505	6,678	6,851	7,023	7,196	7,369
Peak Period GP Lane Volume in Peak Direction	14,780	16,234	17,688	19,142	20,596	22,050	22,668	23,286	23,904	24,522	25,140	25,758	26,376
Daily GP Lane + HOV Volume	56,386	62,786	69,186	75,586	81,986	88,387	90,670	92,953	95,236	97,519	99,802	102,085	104,368
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Segment 1 (I-580 to Mountain House) - Eastbound PM													
Route Miles	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	595	749	903	1,056	1,086	1,116	1,122	1,129	1,135	1,141	1,147	1,153	1,159
Peak Period HOV (2) Lane Volume in Peak Direction	2,055	2,586	3,117	3,649	3,752	3,855	3,876	3,898	3,919	3,940	3,961	3,983	4,004
Peak Hour HOV (3+) Lane Volume in Peak Direction	83	119	154	190	202	214	216	217	218	219	220	222	223
Peak Period HOV (3+) Lane Volume in Peak Direction	274	392	509	627	668	708	712	716	720	723	727	731	735
Peak Hour GP Lane Volume in Peak Direction	4,653	5,080	5,506	5,579	5,651	5,724	5,724	5,724	5,724	5,724	5,724	5,724	5,724
Peak Period GP Lane Volume in Peak Direction	16,783	18,322	19,860	20,122	20,383	20,645	20,645	20,645	20,645	20,645	20,645	20,645	20,645
Daily GP Lane + HOV Volume	59,281	66,130	72,980	79,830	86,680	78,444	78,526	78,608	78,690	78,771	78,853	78,935	79,017
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

I-205 HOT LANE PROJECT - TRAFFIC FORECAST

Analysis Input Data by Segment

Data Category	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Segment 2 (Lammers to Mountain House) - Westbound AM													
Route Miles	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	732	904	1,076	1,248	1,421	1,593	1,604	1,615	1,626	1,636	1,647	1,658	1,669
Peak Period HOV (2) Lane Volume in Peak Direction	2,082	2,572	3,062	3,552	4,041	4,531	4,562	4,593	4,624	4,654	4,685	4,716	4,747
Peak Hour HOV (3+) Lane Volume in Peak Direction	107	122	137	152	168	183	202	221	240	259	278	297	316
Peak Period HOV (3+) Lane Volume in Peak Direction	327	373	420	466	513	559	617	675	733	792	850	908	966
Peak Hour GP Lane Volume in Peak Direction	3,728	4,231	4,733	5,236	5,739	6,241	6,408	6,574	6,741	6,907	7,074	7,240	7,407
Peak Period GP Lane Volume in Peak Direction	13,517	15,339	17,162	18,984	20,807	22,629	23,233	23,837	24,441	25,044	25,648	26,252	26,856
Daily GP Lane + HOV Volume	50,922	58,616	66,298	73,991	81,707	89,390	91,580	93,770	95,960	98,150	100,340	102,531	104,721
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Segment 2 (Mountain House to Lammers) - Eastbound PM													
Route Miles	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	486	656	825	995	1,058	1,120	1,141	1,161	1,182	1,203	1,224	1,244	1,265
Peak Period HOV (2) Lane Volume in Peak Direction	1,735	2,340	2,946	3,551	3,775	3,998	4,072	4,146	4,220	4,294	4,368	4,442	4,516
Peak Hour HOV (3+) Lane Volume in Peak Direction	68	106	143	181	198	215	219	223	227	231	235	239	243
Peak Period HOV (3+) Lane Volume in Peak Direction	232	360	488	617	676	734	748	761	775	788	802	815	829
Peak Hour GP Lane Volume in Peak Direction	3,804	4,349	4,894	5,076	5,257	5,439	5,546	5,653	5,760	5,868	5,975	6,082	6,189
Peak Period GP Lane Volume in Peak Direction	14,285	16,332	18,380	20,427	20,426	20,425	20,827	21,230	21,632	22,034	22,436	22,839	23,241
Daily GP Lane + HOV Volume	48,461	56,828	65,194	73,561	81,928	75,327	76,793	78,259	79,726	81,192	82,658	84,124	85,591
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

I-205 HOT LANE PROJECT - TRAFFIC FORECAST

Analysis Input Data by Segment

Data Category	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Segment 3 (Tracy to Lammers) - Westbound AM													
Route Miles	3	3	3	3	3	3	3	3	3	3	3	3	3
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	651	818	986	1,153	1,321	1,488	1,494	1,499	1,505	1,510	1,516	1,521	1,527
Peak Period HOV (2) Lane Volume in Peak Direction	1,830	2,654	3,479	4,303	5,128	5,952	5,974	5,997	6,019	6,041	6,063	6,086	6,108
Peak Hour HOV (3+) Lane Volume in Peak Direction	96	111	126	141	156	171	172	172	173	173	174	174	175
Peak Period HOV (3+) Lane Volume in Peak Direction	288	367	446	526	605	684	686	689	691	693	695	698	700
Peak Hour GP Lane Volume in Peak Direction	3,316	3,702	4,088	4,474	4,860	5,246	5,506	5,765	5,849	5,934	6,018	6,103	6,187
Peak Period GP Lane Volume in Peak Direction	11,863	13,244	14,625	16,006	17,387	18,768	19,697	20,626	20,928	21,229	21,531	21,832	22,134
Daily GP Lane + HOV Volume	45,302	51,636	57,980	64,313	70,658	76,991	78,558	80,125	81,693	83,260	84,828	86,395	87,962
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Segment 3 (Lammers to Tracy) - Eastbound PM													
Route Miles	3	3	3	3	3	3	3	3	3	3	3	3	3
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	399	585	771	958	1,144	1,181	1,380	1,409	1,438	1,467	1,495	1,524	1,553
Peak Period HOV (2) Lane Volume in Peak Direction	1,462	2,144	2,826	3,509	4,191	4,327	4,522	4,717	4,911	5,106	5,301	5,495	5,690
Peak Hour HOV (3+) Lane Volume in Peak Direction	56	96	136	175	215	227	265	271	276	282	287	293	298
Peak Period HOV (3+) Lane Volume in Peak Direction	196	335	475	614	754	795	830	866	901	937	972	1,008	1,043
Peak Hour GP Lane Volume in Peak Direction	3,125	3,799	4,472	5,146	5,819	5,866	6,139	6,413	6,686	6,960	7,233	7,507	7,780
Peak Period GP Lane Volume in Peak Direction	12,074	14,677	17,279	19,882	22,484	22,664	23,720	24,777	25,833	26,890	27,946	29,003	30,059
Daily GP Lane + HOV Volume	39,810	49,813	59,817	69,820	79,824	80,887	84,631	88,375	92,120	95,864	99,608	103,352	107,097
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

I-205 HOT LANE PROJECT - TRAFFIC FORECAST

Analysis Input Data by Segment

Data Category	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Segment 4 (I-5 to Tracy) - Westbound AM													
Route Miles	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	674	840	1,006	1,172	1,338	1,503	1,505	1,507	1,509	1,510	1,512	1,514	1,516
Peak Period HOV (2) Lane Volume in Peak Direction	1,943	2,758	3,572	4,387	5,201	6,012	6,019	6,027	6,034	6,042	6,049	6,057	6,064
Peak Hour HOV (3+) Lane Volume in Peak Direction	99	114	128	143	157	173	173	173	173	174	174	174	174
Peak Period HOV (3+) Lane Volume in Peak Direction	308	384	460	536	612	692	693	693	694	694	695	695	696
Peak Hour GP Lane Volume in Peak Direction	3,430	3,824	4,219	4,613	5,008	5,402	5,666	5,929	5,998	6,067	6,135	6,204	6,273
Peak Period GP Lane Volume in Peak Direction	12,606	14,056	15,505	16,955	18,404	19,854	20,823	21,791	22,044	22,297	22,549	22,802	23,055
Daily GP Lane + HOV Volume	46,863	53,275	59,686	66,097	72,508	78,920	80,329	81,739	83,149	84,558	85,968	87,378	88,787
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Segment 4 (Tracy to I-5) - Eastbound PM													
Route Miles	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	449	647	845	1,042	1,240	1,304	1,373	1,441	1,510	1,579	1,648	1,716	1,785
Peak Period HOV (2) Lane Volume in Peak Direction	1,642	2,365	3,089	3,812	4,536	4,767	5,019	5,270	5,522	5,773	6,025	6,276	6,528
Peak Hour HOV (3+) Lane Volume in Peak Direction	63	105	148	190	233	251	264	277	290	304	317	330	343
Peak Period HOV (3+) Lane Volume in Peak Direction	220	368	516	664	812	880	925	971	1,016	1,062	1,107	1,153	1,198
Peak Hour GP Lane Volume in Peak Direction	3,521	4,293	5,064	5,836	6,352	6,868	7,244	7,620	7,996	8,372	8,748	9,124	9,500
Peak Period GP Lane Volume in Peak Direction	13,661	16,832	20,003	23,174	25,323	27,472	28,976	30,480	31,984	33,488	34,992	36,496	38,000
Daily GP Lane + HOV Volume	44,847	56,098	67,349	78,601	89,852	93,664	98,755	103,847	108,938	114,029	119,121	124,212	129,303
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

Appendix E: Summary of I-205 Traffic Conditions and Tolls

Low VOT with HOV 3+>1650 vph

Low VOT with HOV 3+>1400 vph

Project:	**I-205HOT Lane**	***Distance***	***2.2***
Segment:	**Mountain House to I-580**	***No. Lanes***	***3 GP + 1 HOV***
Scenario:	**HOV 3+ > 1650vph, HOV 2+ < or =1650 vph**		

2020	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	5,506	1,057	4,922	1,057	584	6,424	3	3	0	$ 0.00	$ 0.00	$ 8,205
WB AM Pk	4,941	1,264	4,654	1,264	287	3,157	3	3	0	$ 0.00	$ 0.00	$ 3,387
						9,581				*Total Est. Annual Revenues*		*$ 10,000*

2030	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	5,651	1,288	5,289	1,288	362	3,982	3	3	1	$ 0.02	$ 0.01	$ 23,191
WB AM Pk	5,754	1,599	5,703	1,599	51	561	4	3	1	$ 0.04	$ 0.02	$ 6,706
						4,543				*Total Est. Annual Revenues*		*$ 30,000*

2040	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	5,724	1,338	5,412	1,338	312	3,113	3	3	1	$ 0.03	$ 0.01	$ 25,423
WB AM Pk	6,333	1,799	6,482	216	1,434	15,777	4	3	2	$ 0.08	$ 0.04	$ 407,849
						18,890				*Total Est. Annual Revenues*		*$ 430,000*

2050	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	5,724	1,353	5,427	1,353	297	3,267	3	3	1	$ 0.03	$ 0.01	$ 26,204
WB AM Pk	6,678	1,864	6,892	223	1,427	15,699	5	3	2	$ 0.11	$ 0.05	$ 548,573
						18,966				*Total Est. Annual Revenues*		*$ 570,000*

2060	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	5,724	1,367	5,441	1,367	283	3,113	3	3	1	$ 0.03	$ 0.01	$ 25,127
WB AM Pk	7,023	1,928	7,301	230	1,420	15,621	5	3	3	$ 0.14	$ 0.07	$ 701,487
						18,734				*Total Est. Annual Revenues*		*$ 730,000*

2070	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	5,724	1,382	5,456	1,382	268	2,948	3	3	1	$ 0.03	$ 0.01	$ 24,097
WB AM Pk	7,369	1,992	7,711	237	1,413	15,544	6	3	3	$ 0.18	$ 0.08	$ 867,151
						18,492				*Total Est. Annual Revenues*		*$ 890,000*

Notes:
VOT = $13.90\
Shift to HOV 3+ when HOV volumes exceed 1650 vph.
HOV 3+
Total annual revenue estimates are rounded to the nearest 1,000.

Project:	**I-205HOT Lane**	***Distance***	***2.2***
Segment:	**Mountain House to I-580**	***No. Lanes***	***3 GP + 1 HOV***
Scenario:	**Shift to HOV 3+ when HOV2+ > 1400vph**		

2030	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 3+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	6,733	206	5,289	206	1,444	15,884	3	3	1	$ 0.02	$ 0.01	$ 92,508
WB AM Pk	7,189	169	5,703	169	1,481	16,291	4	3	1	$ 0.04	$ 0.02	$ 194,749
						32,175				*Total Est. Annual Revenues*		*$ 290,000*

2040	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	6,848	214	5,412	205	1,436	15,774	3	3	1	$ 0.02	$ 0.01	$ 117,011
WB AM Pk	6,333	1,799	6,482	216	1,434	15,777	4	3	2	$ 0.08	$ 0.04	$ 407,849
						31,551				*Total Est. Annual Revenues*		*$ 520,000*

Notes:
VOT = $13.90\
Forced HOV 3+ if HOV volumes were grater than 1400 vph but less than 1650 vph.
Gray cells indicate that HOV3+ was not forced. Thus, numbers reported are same as HOV 3+ >1650 vph.
Total annual revenue estimates are rounded to the nearest 1,000.

Project:	**I-205HOT Lane**	***Distance***	***2.6***
Segment:	**Mountain House to Lammers**	***No. Lanes***	***3 GP + 1 HOV***
Scenario:	**HOV 3+ > 1650vph, HOV 2+ < or =1650 vph**		

2020	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	4,894	968	4,396	968	498	5,478	3	3	0	$ 0.00	$ 0.00	$ 5,877
WB AM Pk	4,941	1,213	4,615	1,213	326	3,586	3	3	0	$ 0.00	$ 0.00	$ 4,397
						9,064				*Total Est. Annual Revenues*		*$ 10,000*

2030	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	5,257	1,256	4,885	1,256	372	4,092	4	3	0	$ 0.01	$ 0.00	$ 8,362
WB AM Pk	5,754	1,589	5,693	1,589	61	671	4	3	1	$ 0.04	$ 0.02	$ 9,255
						4,763				*Total Est. Annual Revenues*		*$ 20,000*

2040	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	5,546	1,360	5,256	1,360	290	2,610	4	3	1	$ 0.02	$ 0.01	$ 19,556
WB AM Pk	6,333	1,806	6,489	216	1,434	12,902	5	3	2	$ 0.12	$ 0.05	$ 483,355
						15,512				*Total Est. Annual Revenues*		*$ 500,000*

2050	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	5,760	1,409	5,519	1,409	241	3,190	4	3	1	$ 0.03	$ 0.01	$ 28,305
WB AM Pk	6,678	1,866	6,894	223	1,427	15,769	6	3	2	$ 0.13	$ 0.05	$ 639,903
						18,959				*Total Est. Annual Revenues*		*$ 670,000*

2060	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	5,975	1,459	5,784	1,459	191	2,101	4	3	1	$ 0.04	$ 0.02	$ 28,229
WB AM Pk	7,023	1,925	7,298	230	1,420	15,625	6	3	3	$ 0.17	$ 0.07	$ 826,174
						17,726				*Total Est. Annual Revenues*		*$ 850,000*

2070	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	6,189	1,508	6,047	1,508	142	1,562	4	3	1	$ 0.06	$ 0.02	$ 28,089
WB AM Pk	7,369	1,985	7,704	236	1,414	15,552	7	3	4	$ 0.21	$ 0.08	$ 1,024,940
						17,114				*Total Est. Annual Revenues*		*$ 1,050,000*

Notes:
VOT = $13.90\
Shift to HOV 3+ when HOV volumes exceed 1650 vph.
HOV 3+
Total annual revenue estimates are rounded to the nearest 1,000.

Project:	**I-205HOT Lane**	***Distance***	***2.6***
Segment:	**Mountain House to Lammers**	***No. Lanes***	***3 GP + 1 HOV***
Scenario:	**Shift to HOV 3+ when HOV2+ > 1400vph**		

2030	**Unconstrained Traffic Volumes**		**POET Forecasted Volumes (Pk Hr and Daily)**				**Pk Hr Travel Times (TT)** *(Peak Direction in Minutes)*			**Average Weekday PEAK HOUR Toll**		**Estimated Annual Revenues**
	GP	**HOV**	**General Purpose**	**HOV (Free)**	**Tolled Vehicles Peak**	**Tolled Vehicles Daily**	**GP**	**HOT**	**Savings**	**Per Vehicle**	**Per Mile**	
EB PM Pk	6,325	188	4,885	188	1,440	15,840	4	3	0	$ 0.01	$ 0.00	$ 32,369
WB AM Pk	7,168	175	5,693	175	1,475	16,225	4	3	1	$ 0.05	$ 0.02	$ 223,801
						32,065				***Est. Annual Rev***	***Total Est. Annu***	***$ 260,000***

2040	**Unconstrained Traffic Volumes**		**POET Forecasted Volumes (Pk Hr and Daily)**				**Pk Hr Travel Times (TT)** *(Peak Direction in Minutes)*			**Average Weekday PEAK HOUR Toll**		**Estimated Annual Revenues**
	GP	**HOV**	**General Purpose**	**HOV (Free)**	**Tolled Vehicles Peak**	**Tolled Vehicles Daily**	**GP**	**HOT**	**Savings**	**Per Vehicle**	**Per Mile**	
EB PM Pk	6,702	204	5,256	204	1,446	15,906	4	3	1	$ 0.02	$ 0.01	$ 97,511
WB AM Pk	6,333	1,806	6,489	216	1,434	15,769	5	3	2	$ 0.12	$ 0.05	$ 483,355
						31,675				***Total Est. Annual Revenues***		***$ 580,000***

Notes:
VOT = $13.90\
Forced HOV 3+ if HOV volumes were grater than 1400 vph but less than 1650 vph.
Gray cells indicate that HOV3+ was not forced. Thus, numbers reported are same as HOV 3+ >1650 vph.
Total annual revenue estimates are rounded to the nearest 1,000.

Project:	**I-205HOT Lane**	***Distance***	***3.0***
Segment:	**Lammers to Tracy Blvd**	***No. Lanes***	***3 GP + 1 HOV***
Scenario:	**HOV 3+ > 1650vph, HOV 2+ < or =1650 vph**		

2020	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV 2+ (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	4,472	907	4,034	907	438	4,918	4	3	0	$ 0.00	$ 0.00	$ 7,384
WB AM Pk	4,088	1,112	3,900	1,112	188	2,068	4	3	0	$ 0.00	$ 0.00	$ 1,796
						6,986				*Est. Annual Revenues*		*$ 10,000*

2030	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV 2+	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	5,819	1,359	5,528	1,359	291	3,201	5	4	1	$ 0.04	$ 0.01	$ 39,901
WB AM Pk	4,860	1,477	4,753	1,477	107	1,177	4	4	0	$ 0.01	$ 0.00	$ 2,525
						4,378				*Est. Annual Revenues*		*$ 40,000*

2040	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV 2+	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	6,139	1,645	6,134	1,645	5	55	5	4	2	$ 0.08	$ 0.03	$ 1,441
WB AM Pk	5,506	1,666	5,522	201	1,449	15,938	5	4	1	$ 0.04	$ 0.01	$ 197,862
						15,993				*Est. Annual Revenues*		*$ 200,000*

2050	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV 2+	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	6,686	1,714	6,750	274	1,376	15,223	6	4	3	$ 0.14	$ 0.05	$ 652,581
WB AM Pk	5,849	1,678	5,877	202	1,448	15,909	5	4	1	$ 0.06	$ 0.02	$ 319,707
						31,132				*Est. Annual Revenues*		*$ 970,000*

2060	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV 2+	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	7,233	1,782	7,365	284	1,366	14,909	7	4	4	$ 0.20	$ 0.07	$ 948,591
WB AM Pk	6,018	1,690	6,058	204	1,446	13,017	5	4	2	$ 0.10	$ 0.03	$ 390,939
						27,926				*Est. Annual Revenues*		*$ 1,340,000*

2070	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV 2+	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	7,780	1,851	7,981	295	1,355	12,198	9	4	5	$ 0.34	$ 0.11	$ 1,304,711
WB AM Pk	6,187	1,702	6,239	205	1,445	13,005	6	4	2	$ 0.11	$ 0.04	$ 463,664
						25,203				*Est. Annual Revenues*		*$ 1,770,000*

Notes:
VOT = $13.90\
Shift to HOV 3+ when HOV volumes exceed 1650 vph.
HOV 3+
Total annual revenue estimates are rounded to the nearest 1,000.

Project:	**I-205HOT Lane**	***Distance***	***3.0***
Segment:	**Lammers to Tracy Blvd**	***No. Lanes***	***3 GP + 1 HOV***
Scenario:	**Shift to HOV 3+ when HOV2+ > 1400vph**		

2030	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) *(Peak Direction in Minutes)*			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	6,974	204	5,528	204	1,446	15,906	4	3	0	$ 0.01	$ 0.00	$ 198,273
WB AM Pk	7,168	175	5,693	175	1,475	16,225	4	3	1	$ 0.05	$ 0.02	$ 223,801
						32,131				***Est. Annual Revenues***		***$ 420,000***

2040	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) *(Peak Direction in Minutes)*			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	7,537	247	6,134	247	1,403	13,014	4	3	1	$ 0.02	$ 0.01	$ 404,465
WB AM Pk	6,333	1,806	6,489	216	1,434	15,938	5	3	2	$ 0.12	$ 0.05	$ 483,355
						28,952				***Est. Annual Revenues***		***$ 890,000***

Notes:
VOT = $13.90\
Forced HOV 3+ if HOV volumes were grater than 1400 vph but less than 1650 vph.
Gray cells indicate that HOV3+ was not forced. Thus, numbers reported are same as HOV 3+ >1650 vph.
Total annual revenue estimates are rounded to the nearest 1,000.

Project:	**I-205HOT Lane**	***Distance***	***5.6***
Segment:	**Tracy Blvd to I-5**	***No. Lanes***	***3 GP + 1 HOV***
Scenario:	**HOV 3+ > 1650vph, HOV 2+ < or =1650 vph**		

2020	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	5,064	993	4,543	993	521	5,731	7	7	1	$ 0.01	$ 0.00	$ 17,860
WB AM Pk	4,219	1,134	4,015	1,134	204	2,244	7	6	0	$ 0.01	$ 0.00	$ 5,159
						7,975				*Est. Annual Revenues*		*$ 20,000*

2030	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	6,352	1,473	6,175	1,473	177	1,947	10	7	3	$ 0.16	$ 0.03	$ 98,711
WB AM Pk	5,008	1,495	4,877	1,495	131	1,441	8	7	1	$ 0.01	$ 0.00	$ 5,374
						3,388				*Est. Annual Revenues*		*$ 100,000*

2040	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	7,244	1,637	7,231	1,633	17	143	13	7	6	$ 0.35	$ 0.06	$ 15,605
WB AM Pk	5,666	1,678	5,694	202	1,448	15,924	9	7	2	$ 0.10	$ 0.02	$ 477,527
						16,067				*Est. Annual Revenues*		*$ 490,000*

2050	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	7,996	1,800	8,146	287	1,363	14,993	17	7	10	$ 0.56	$ 0.10	$ 2,637,171
WB AM Pk	5,998	1,682	6,030	203	1,447	15,919	10	7	3	$ 0.14	$ 0.03	$ 698,588
						30,912				*Est. Annual Revenues*		*$ 3,340,000*

2060	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	8,748	1,965	9,063	312	1,338	14,721	21	7	14	$ 0.83	$ 0.15	$ 3,821,130
WB AM Pk	6,135	1,686	6,171	203	1,447	15,914	10	7	3	$ 0.16	$ 0.03	$ 806,506
						30,635				*Est. Annual Revenues*		*$ 4,630,000*

2070	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 2+	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	9,500	2,128	9,978	336	1,314	14,452	27	7	20	$ 1.16	$ 0.21	$ 5,227,924
WB AM Pk	6,273	1,690	6,313	204	1,446	15,909	11	7	4	$ 0.18	$ 0.03	$ 915,984
						30,361				*Est. Annual Revenues*		*$ 6,140,000*

Notes:
VOT = $13.90\
Shift to HOV 3+ when HOV volumes exceed 1650 vph.
HOV 3+
Total annual revenue estimates are rounded to the nearest 1,000.

Project:	**I-205HOT Lane**	***Distance***	***5.6***
Segment:	**Tracy Blvd to I-5**	***No. Lanes***	***3 GP + 1 HOV***
Scenario:	**Shift to HOV 3+ when HOV2+ > 1400vph**		

2030	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) *(Peak Direction in Minutes)*			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV	General Purpose	HOV 3+ (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	7,604	221	6,175	221	1,429	15,719	10	7	3	$ 0.02	$ 0.00	$ 797,420
WB AM Pk	6,339	164	4,877	164	1,462	16,082	8	7	1	$ 0.01	$ 0.00	$ 59,976
						31,801				***Est. Annual Revenues***		***$ 160,000***

2040	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) *(Peak Direction in Minutes)*			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV	General Purpose	HOV 3+ (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
EB PM Pk	8,635	246	7,231	246	1,404	15,444	13	7	6	$ 0.43	$ 0.08	$ 1,685,287
WB AM Pk	5,666	1,678	5,694	202	1,448	15,938	9	7	2	$ 0.12	$ 0.02	$ 477,527
						31,382				***Est. Annual Revenues***		***$ 2,160,000***

Notes:
VOT = $13.90\
Forced HOV 3+ if HOV volumes were grater than 1400 vph but less than 1650 vph.
Gray cells indicate that HOV3+ was not forced. Thus, numbers reported are same as HOV 3+ >1650 vph.
Total annual revenue estimates are rounded to the nearest 1,000.

Appendix F: I-205 HOT Lane Economic Benefit Analysis

Sensitivity Analysis including the following:

Low, High or Blended VOT

HOV 3+>1400 vph or HOV 3+ 1650 vph

Start in 2020 or start in 2030

SJCOG I-205 HOT Lane Study

Assumptions Factors	
1-Way: I-5 to I-580	13.4
2-Way (Total Miles)	26.8
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (VOT $13.90, HOV 3 when 1650 vph, Sum of Lin s, HOT Lane Opening in 2020)

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Revenue	$ 54,000	$ 68,000	$ 82,000	$ 96,000	$ 110,000	$ 124,000	$ 138,000	$ 152,000	$ 166,000	$ 180,000	$ 194,000	$ 337,500	$ 481,000	$ 624,500
Est. Daily Users (Veh)	9,600	9,100	8,600	8,100	7,600	7,100	6,600	6,100	5,600	5,100	4,800	6,200	7,600	9,000
Est. # Annual Users (Veh)	2,676,000	2,536,625	2,397,250	2,257,875	2,118,500	1,979,125	1,839,750	1,700,375	1,561,000	1,421,625	1,338,000	1,728,250	2,118,500	2,508,750
(# of New Transponders)	5,760	0	0	0	0	0	(300)	0	0	0	0	840	840	840
(# of Replacement Xsponders)	-	0	0	0	0	0	5,760	0	0	0	0	0	5,460	0
(Total # of New Transponders)	5,760	0	0	0	0	0	5,460	0	0	0	0	840	6,300	840
Beginning Balance	0	(3,458,000)	(6,768,000)	(10,033,000)	(13,254,000)	(16,430,000)	(19,562,000)	(22,747,000)	(25,790,000)	(28,788,000)	(31,742,000)	(34,664,000)	(37,543,000)	(40,461,000)
Annual Revenue	54,000	68,000	82,000	96,000	110,000	124,000	138,000	152,000	166,000	180,000	194,000	337,500	481,000	624,500
E penses														
User Fee (per X-Action)	572,700	542,800	513,000	483,200	453,400	423,500	393,700	363,900	334,100	304,200	286,300	369,800	453,400	536,900
Financing Fee (User Fee)	12,600	11,940	11,290	10,630	9,970	9,320	8,660	8,010	7,350	6,690	6,300	8,140	9,970	11,810
Transponder (Every 6 Yrs)	104,000	0	0	0	0	0	98,000	0	0	0	0	15,000	113,000	15,000
Tolling Facility Maint. (Mi)	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
Enforcement	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
Other (Capital)														
Total E penses	3,512,000	3,378,000	3,347,000	3,317,000	3,286,000	3,256,000	3,323,000	3,195,000	3,164,000	3,134,000	3,116,000	3,216,000	3,399,000	3,387,000
Ending Balance	(3,458,000)	(6,768,000)	(10,033,000)	(13,254,000)	(16,430,000)	(19,562,000)	(22,747,000)	(25,790,000)	(28,788,000)	(31,742,000)	(34,664,000)	(37,543,000)	(40,461,000)	(43,224,000)

Assumptions Factors	
1-Way: I-5 to I-580	13.4
2-Way (Total Miles)	26.8
User Fee (per X-Action)	$ 0.21
Can hide this row…	
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (VOT $13.90, HOV 3 when 1400 vph, Sum of Lin s, HOT Lane Opening in 2020)

Switch EB & WB to HOV 3+

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Revenue	$ 54,000	$ 223,200	$ 392,400	$ 561,600	$ 730,800	$ 900,000	$ 1,069,200	$ 1,238,400	$ 1,407,600	$ 1,576,800	$ 1,746,000	$ 1,958,500	$ 2,171,000	$ 2,383,500
Est. Daily Users (Veh)	9,600	11,900	14,200	16,500	18,800	21,100	23,400	25,700	28,000	30,300	32,200	32,100	32,000	31,900
Est. # Annual Users (Veh)	2,676,000	3,317,125	3,958,250	4,599,375	5,240,500	5,881,625	6,522,750	7,163,875	7,805,000	8,446,125	8,975,750	8,947,875	8,920,000	8,892,125
(# of New Transponders)	5,760	1380	1380	1380	1380	1380	1,380	1380	1380	1380	1140	0	(60)	0
(# of Replacement Xsponders)	-	0	0	0	0	0	5,760	1380	1380	1380	1380	1380	7,140	2760
(Total # of New Transponders)	5,760	1380	1380	1380	1380	1380	7,140	2760	2760	2760	2520	1380	7,080	2760
Beginning Balance	0	(3,458,000)	(6,809,000)	(10,131,000)	(13,423,000)	(16,686,000)	(19,920,000)	(23,230,000)	(26,432,000)	(29,604,000)	(32,747,000)	(35,832,000)	(38,679,000)	(41,409,000)
Annual Revenue	54,000	223,200	392,400	561,600	730,800	900,000	1,069,200	1,238,400	1,407,600	1,576,800	1,746,000	1,958,500	2,171,000	2,383,500
E penses														
User Fee (per X-Action)	572,700	709,900	847,100	984,300	1,121,500	1,258,700	1,395,900	1,533,100	1,670,300	1,807,500	1,920,800	1,914,800	1,908,900	1,902,900
Financing Fee (User Fee)	12,600	15,620	18,640	21,650	24,670	27,690	30,710	33,730	36,750	39,770	42,260	42,130	42,000	41,860
Transponder (Every 6 Yrs)	104,000	25,000	25,000	25,000	25,000	25,000	129,000	50,000	50,000	50,000	45,000	25,000	127,000	50,000
Tolling Facility Maint. (Mi)	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
Enforcement	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
Other (Capital)														
Total E penses	3,512,000	3,574,000	3,714,000	3,854,000	3,994,000	4,134,000	4,379,000	4,440,000	4,580,000	4,720,000	4,831,000	4,805,000	4,901,000	4,818,000
Ending Balance	(3,458,000)	(6,809,000)	(10,131,000)	(13,423,000)	(16,686,000)	(19,920,000)	(23,230,000)	(26,432,000)	(29,604,000)	(32,747,000)	(35,832,000)	(38,679,000)	(41,409,000)	(43,844,000)

Economic Benefit Analysis (VOT $13.90, HOV 3 when 1650 vph, Sum of Lin s, HOT Lane Opening in 202

Switch WB to HOV 3+

Switch EB to HOV 3+

2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
$ 768,000	$ 911,500	$ 1,055,000	$ 1,198,500	$ 1,342,000	$ 1,485,500	$ 1,629,000	$ 2,045,300	$ 2,461,600	$ 2,877,900	$ 3,294,200	$ 3,710,500	$ 4,126,800	$ 4,543,100	$ 4,959,400	$ 5,375,700	$ 5,792,000	$ 5,999,300	$ 6,206,600
10,400	11,800	13,200	14,600	16,000	17,400	18,900	20,100	21,300	22,500	23,700	24,900	26,100	27,300	28,500	29,700	31,100	31,100	31,100
2,899,000	**3,289,250**	**3,679,500**	**4,069,750**	**4,460,000**	**4,850,250**	**5,268,375**	**5,602,875**	**5,937,375**	**6,271,875**	**6,606,375**	**6,940,875**	**7,275,375**	**7,609,875**	**7,944,375**	**8,278,875**	**8,669,125**	**8,669,125**	**8,669,125**
840	840	840	840	840	840	900	720	720	720	720	720	720	720	720	720	840	0	0
0	0	0	840	6,300	840	840	840	840	1680	7,140	1680	1740	1560	1560	2400	7,860	2400	2460
840	840	840	1680	7,140	1680	1740	1560	1560	2400	7,860	2400	2460	2280	2280	3120	8,700	2400	2460
(43,224,000)	(45,928,000)	(48,574,000)	(51,162,000)	(53,707,000)	(56,292,000)	(58,721,000)	(61,098,000)	(63,129,000)	(64,817,000)	(66,177,000)	(67,292,000)	(67,966,000)	(68,297,000)	(68,282,000)	(67,925,000)	(67,239,000)	(66,323,000)	(65,086,000)
768,000	911,500	1,055,000	1,198,500	1,342,000	1,485,500	1,629,000	2,045,300	2,461,600	2,877,900	3,294,200	3,710,500	4,126,800	4,543,100	4,959,400	5,375,700	5,792,000	5,999,300	6,206,600
620,400	703,900	787,400	870,900	954,400	1,038,000	1,127,400	1,199,000	1,270,600	1,342,200	1,413,800	1,485,300	1,556,900	1,628,500	1,700,100	1,771,700	1,855,200	1,855,200	1,855,200
13,650	15,490	17,320	19,160	21,000	22,840	24,800	26,380	27,950	29,530	31,100	32,680	34,250	35,830	37,400	38,980	40,810	40,810	40,810
15,000	15,000	15,000	30,000	129,000	30,000	31,000	28,000	28,000	43,000	141,000	43,000	44,000	41,000	41,000	56,000	157,000	43,000	44,000
2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
3,472,000	3,557,000	3,643,000	3,743,000	3,927,000	3,914,000	4,006,000	4,076,000	4,150,000	4,238,000	4,409,000	4,384,000	4,458,000	4,528,000	4,602,000	4,690,000	4,876,000	4,762,000	4,763,000
(45,928,000)	(48,574,000)	(51,162,000)	(53,707,000)	(56,292,000)	(58,721,000)	(61,098,000)	(63,129,000)	(64,817,000)	(66,177,000)	(67,292,000)	(67,966,000)	(68,297,000)	(68,282,000)	(67,925,000)	(67,239,000)	(66,323,000)	(65,086,000)	(63,642,000)

Economic Benefit Analysis (VOT $13.90, HOV 3 when 1400 vph, Sum of Lin s, HOT Lane Opening in 2020)

2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
$ 2,596,000	$ 2,808,500	$ 3,021,000	$ 3,233,500	$ 3,446,000	$ 3,658,500	$ 3,871,000	$ 4,063,100	$ 4,255,200	$ 4,447,300	$ 4,639,400	$ 4,831,500	$ 5,023,600	$ 5,215,700	$ 5,407,800	$ 5,599,900	$ 5,792,000	$ 5,999,300	$ 6,206,600
31,800	31,700	31,600	31,500	31,400	31,300	31,400	31,400	31,400	31,400	31,400	31,400	31,400	31,400	31,400	31,400	31,100	31,100	31,100
8,864,250	**8,836,375**	**8,808,500**	**8,780,625**	**8,752,750**	**8,724,875**	**8,752,750**	**8,752,750**	**8,752,750**	**8,752,750**	**8,752,750**	**8,752,750**	**8,752,750**	**8,752,750**	**8,752,750**	**8,752,750**	**8,669,125**	**8,669,125**	**8,669,125**
0	0	0	0	(60)	0	60	0	0	0	-	0	0	0	0	0	(180)	0	0
2760	2760	2520	1380	7,080	2760	2760	2760	2520	1380	7,020	2760	2820	2760	2520	1380	7,020	2760	2820
2760	2760	2520	1380	7,020	2760	2820	2760	2520	1380	7,020	2760	2820	2760	2520	1380	6,840	2760	2820
(43,844,000)	(46,060,000)	(48,058,000)	(49,831,000)	(51,366,000)	(52,783,000)	(53,906,000)	(54,823,000)	(55,547,000)	(56,074,000)	(56,389,000)	(56,613,000)	(56,569,000)	(56,333,000)	(55,904,000)	(55,278,000)	(54,440,000)	(53,490,000)	(52,260,000)
2,596,000	2,808,500	3,021,000	3,233,500	3,446,000	3,658,500	3,871,000	4,063,100	4,255,200	4,447,300	4,639,400	4,831,500	5,023,600	5,215,700	5,407,800	5,599,900	5,792,000	5,999,300	6,206,600
1,896,900	1,891,000	1,885,000	1,879,100	1,873,100	1,867,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,855,200	1,855,200	1,855,200
41,730	41,600	41,470	41,340	41,210	41,080	41,210	41,210	41,210	41,210	41,210	41,210	41,210	41,210	41,210	41,210	40,810	40,810	40,810
50,000	50,000	45,000	25,000	126,000	50,000	51,000	50,000	45,000	25,000	126,000	50,000	51,000	50,000	45,000	25,000	123,000	50,000	51,000
2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
4,812,000	4,806,000	4,794,000	4,768,000	4,863,000	4,781,000	4,788,000	4,787,000	4,782,000	4,762,000	4,863,000	4,787,000	4,788,000	4,787,000	4,782,000	4,762,000	4,842,000	4,769,000	4,770,000
(46,060,000)	(48,058,000)	(49,831,000)	(51,366,000)	(52,783,000)	(53,906,000)	(54,823,000)	(55,547,000)	(56,074,000)	(56,389,000)	(56,613,000)	(56,569,000)	(56,333,000)	(55,904,000)	(55,278,000)	(54,440,000)	(53,490,000)	(52,260,000)	(50,823,000)

Economic Benefit Analysis (VOT $13.90, HOV 3 when 1650 vph, Sum of Lin s, HOT Lane Opening in 2020)

2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070
$ 6,413,900	$ 6,621,200	$ 6,828,500	$ 7,035,800	$ 7,243,100	$ 7,450,400	$ 7,657,700	$ 7,865,000	$ 8,104,200	$ 8,343,400	$ 8,582,600	$ 8,821,800	$ 9,061,000	$ 9,300,200	$ 9,539,400	$ 9,778,600	$ 10,017,800	$ 10,257,000
31,100	31,100	31,100	31,100	31,100	31,100	31,100	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,400
8,669,125	**8,669,125**	**8,669,125**	**8,669,125**	**8,669,125**	**8,669,125**	**8,669,125**	**8,529,750**	**8,529,750**	**8,529,750**	**8,529,750**	**8,529,750**	**8,529,750**	**8,529,750**	**8,529,750**	**8,529,750**	**8,529,750**	**8,474,000**
0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
2280	2280	3120	8,700	2400	2460	2280	2280	3120	8,700	2400	2460	2280	2280	3120	8,700	2400	2460
2280	2280	3120	8,700	2400	2460	2280	2280	3120	8,700	2400	2460	2280	2280	3120	8,700	2400	2460
(63,642,000)	(61,988,000)	(60,127,000)	(58,074,000)	(55,914,000)	(53,433,000)	(50,746,000)	(47,848,000)	(44,713,000)	(41,354,000)	(37,857,000)	(34,006,000)	(29,917,000)	(25,586,000)	(21,016,000)	(16,222,000)	(11,289,000)	(6,003,000)
6,413,900	6,621,200	6,828,500	7,035,800	7,243,100	7,450,400	7,657,700	7,865,000	8,104,200	8,343,400	8,582,600	8,821,800	9,061,000	9,300,200	9,539,400	9,778,600	10,017,800	10,257,000
1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,813,400
40,810	40,810	40,810	40,810	40,810	40,810	40,810	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	39,890
41,000	41,000	56,000	157,000	43,000	44,000	41,000	41,000	56,000	157,000	43,000	44,000	41,000	41,000	56,000	157,000	43,000	44,000
2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
4,760,000	4,760,000	4,775,000	4,876,000	4,762,000	4,763,000	4,760,000	4,730,000	4,745,000	4,846,000	4,732,000	4,733,000	4,730,000	4,730,000	4,745,000	4,846,000	4,732,000	4,720,000
(61,988,000)	(60,127,000)	(58,074,000)	(55,914,000)	(53,433,000)	(50,746,000)	(47,848,000)	(44,713,000)	(41,354,000)	(37,857,000)	(34,006,000)	(29,917,000)	(25,586,000)	(21,016,000)	(16,222,000)	(11,289,000)	(6,003,000)	(466,000)

Economic Benefit Analysis (VOT $13.90, HOV 3 when 1400 vph, Sum of Lin s, HOT Lane Opening in 2020)

2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070
$ 6,413,900	$ 6,621,200	$ 6,828,500	$ 7,035,800	$ 7,243,100	$ 7,450,400	$ 7,657,700	$ 7,865,000	$ 8,104,200	$ 8,343,400	$ 8,582,600	$ 8,821,800	$ 9,061,000	$ 9,300,200	$ 9,539,400	$ 9,778,600	$ 10,017,800	$ 10,257,000
31,100	31,100	31,100	31,100	31,100	31,100	31,100	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,400
8,669,125	**8,669,125**	**8,669,125**	**8,669,125**	**8,669,125**	**8,669,125**	**8,669,125**	**8,529,750**	**8,529,750**	**8,529,750**	**8,529,750**	**8,529,750**	**8,529,750**	**8,529,750**	**8,529,750**	**8,529,750**	**8,529,750**	**8,474,000**
0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
2760	2520	1380	6,840	2760	2820	2760	2520	1380	6,840	2760	2820	2760	2520	1380	6,840	2760	2820
2760	2520	1380	6,840	2760	2820	2760	2520	1380	6,840	2760	2820	2760	2520	1380	6,840	2760	2820
(50,823,000)	(49,178,000)	(47,321,000)	(45,237,000)	(43,043,000)	(40,569,000)	(37,889,000)	(35,000,000)	(31,869,000)	(28,479,000)	(24,948,000)	(21,104,000)	(17,022,000)	(12,700,000)	(8,134,000)	(3,309,000)	1,658,000	6,937,000
6,413,900	6,621,200	6,828,500	7,035,800	7,243,100	7,450,400	7,657,700	7,865,000	8,104,200	8,343,400	8,582,600	8,821,800	9,061,000	9,300,200	9,539,400	9,778,600	10,017,800	10,257,000
1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,813,400
40,810	40,810	40,810	40,810	40,810	40,810	40,810	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	39,890
50,000	45,000	25,000	123,000	50,000	51,000	50,000	45,000	25,000	123,000	50,000	51,000	50,000	45,000	25,000	123,000	50,000	51,000
2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
4,769,000	4,764,000	4,744,000	4,842,000	4,769,000	4,770,000	4,769,000	4,734,000	4,714,000	4,812,000	4,739,000	4,740,000	4,739,000	4,734,000	4,714,000	4,812,000	4,739,000	4,727,000
(49,178,000)	(47,321,000)	(45,237,000)	(43,043,000)	(40,569,000)	(37,889,000)	(35,000,000)	(31,869,000)	(28,479,000)	(24,948,000)	(21,104,000)	(17,022,000)	(12,700,000)	(8,134,000)	(3,309,000)	1,658,000	6,937,000	12,467,000

SJCOG I-205 HOT Lane Study

Economic Benefit Analysis (VOT $13.90, HOV 3 when 1650 vph, Sum of Lin s, HOT Lane Opening in 2030)

Switch WB to HOV 3+

Assumptions Factors	
1-Way: I-5 to I-580	13.4
2-Way (Total Miles)	26.8
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Revenue	$ 194,000	$ 338,000	$ 482,000	$ 626,000	$ 770,000	$ 914,000	$ 1,058,000	$ 1,202,000	$ 1,346,000	$ 1,490,000	$ 1,629,000	$ 2,045,000
Est. Daily Users (Veh)	4,800	6,200	7,600	9,000	10,400	11,800	13,200	14,600	16,000	17,400	18,900	20,100
Est. Annual Users (Veh)	1,338,000	1,728,250	2,118,500	2,508,750	2,899,000	3,289,250	3,679,500	4,069,750	4,460,000	4,850,250	5,268,375	5,602,875
(# of New Transponders)	2,880	840	840	840	840	840	840	840	840	840	900	720
(# of Replacement Xsponders)	-	0	0	0	0	0	2,880	840	840	840	840	840
(Total # of New Transponders)	2,880	840	840	840	840	840	3,720	1680	1680	1680	1740	1560
Beginning Balance	0	(2,974,000)	(5,852,000)	(8,671,000)	(11,432,000)	(14,134,000)	(16,777,000)	(19,414,000)	(21,955,000)	(24,437,000)	(26,861,000)	(29,238,000)
Annual Revenue	194,000	338,000	482,000	626,000	770,000	914,000	1,058,000	1,202,000	1,346,000	1,490,000	1,629,000	2,045,000
E penses												
User Fee (per X-Action)	286,300	369,800	453,400	536,900	620,400	703,900	787,400	870,900	954,400	1,038,000	1,127,400	1,199,000
Financing Fee (User Fee)	6,300	8,140	9,970	11,810	13,650	15,490	17,320	19,160	21,000	22,800	24,800	26,380
Transponder (Every 6 Yrs)	52,000	15,000	15,000	15,000	15,000	15,000	67,000	30,000	30,000	30,000	31,000	28,000
Tolling Facility Maint. (Mi)	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
Enforcement	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
Other (Capital)												
Total E penses	3,168,000	3,216,000	3,301,000	3,387,000	3,472,000	3,557,000	3,695,000	3,743,000	3,828,000	3,914,000	4,006,000	4,076,000
Ending Balance	(2,974,000)	(5,852,000)	(8,671,000)	(11,432,000)	(14,134,000)	(16,777,000)	(19,414,000)	(21,955,000)	(24,437,000)	(26,861,000)	(29,238,000)	(31,269,000)

Economic Benefit Analysis (VOT $13.90, HOV 3 when 1400 vph, Sum of Lin s, HOT Lane Opening in 2030)

Switch EB & WB to HOV 3+

Assumptions Factors	
1-Way: I-5 to I-580	13.4
2-Way (Total Miles)	26.8
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Revenue	$ 1,746,000	$ 1,959,000	$ 2,172,000	$ 2,385,000	$ 2,598,000	$ 2,811,000	$ 3,024,000	$ 3,237,000	$ 3,450,000	$ 3,663,000	$ 3,871,000	$ 4,063,000
Est. Daily Users (Veh)	32,200	32,100	32,000	31,900	31,800	31,700	31,600	31,500	31,400	31,300	31,400	31,400
Est. Annual Users (Veh)	8,975,750	8,947,875	8,920,000	8,892,125	8,864,250	8,836,375	8,808,500	8,780,625	8,752,750	8,724,875	8,752,750	8,752,750
(# of New Transponders)	19,320	0	0	0	0	0	(60)	0	0	0	60	0
(# of Replacement Xsponders)	-	0	0	0	0	0	19,320	0	0	0	0	0
(Total # of New Transponders)	19,320	0	0	0	0	0	19,260	0	0	0	60	0
Beginning Balance	0	(3,388,000)	(6,209,000)	(8,811,000)	(11,194,000)	(13,358,000)	(15,303,000)	(17,376,000)	(18,883,000)	(20,171,000)	(21,240,000)	(22,108,000)
Annual Revenue	1,746,000	1,959,000	2,172,000	2,385,000	2,598,000	2,811,000	3,024,000	3,237,000	3,450,000	3,663,000	3,871,000	4,063,000
E penses												
User Fee (per X-Action)	1,920,811	1,914,845	1,908,880	1,902,915	1,896,950	1,890,984	1,885,019	1,879,054	1,873,089	1,867,123	1,873,089	1,873,089
Financing Fee (User Fee)	42,258	42,127	41,995	41,864	41,733	41,602	41,470	41,339	41,208	41,077	41,208	41,208
Transponder (Every 6 Yrs)	347,760	0	0	0	0	0	346,680	0	0	0	1,080	0
Tolling Facility Maint. (Mi)	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180
Enforcement	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200
Other (Capital)												
Total E penses	5,134,000	4,780,000	4,774,000	4,768,000	4,762,000	4,756,000	5,097,000	4,744,000	4,738,000	4,732,000	4,739,000	4,738,000
Ending Balance	(3,388,000)	(6,209,000)	(8,811,000)	(11,194,000)	(13,358,000)	(15,303,000)	(17,376,000)	(18,883,000)	(20,171,000)	(21,240,000)	(22,108,000)	(22,783,000)

Economic Benefit Analysis (VOT $13.90, HOV 3 when 1650 vph, Sum of Lin s, HOT Lane Opening in 2030)

Switch EB to HOV 3+

2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058
$ 2,461,000	$ 2,877,000	$ 3,293,000	$ 3,709,000	$ 4,125,000	$ 4,541,000	$ 4,957,000	$ 5,373,000	$ 5,792,000	$ 5,999,000	$ 6,206,000	$ 6,413,000	$ 6,620,000	$ 6,827,000	$ 7,034,000	$ 7,241,000	$ 7,448,000
21,300	22,500	23,700	24,900	26,100	27,300	28,500	29,700	31,100	31,100	31,100	31,100	31,100	31,100	31,100	31,100	31,100
5,937,375	6,271,875	6,606,375	6,940,875	7,275,375	7,609,875	7,944,375	8,278,875	8,669,125	8,669,125	8,669,125	8,669,125	8,669,125	8,669,125	8,669,125	8,669,125	8,669,125
720	720	720	720	720	720	720	720	840	0	0	0	-	0	0	0	0
3,720	1680	1680	1680	1740	1560	4,440	2400	2400	2400	2460	2280	5,160	3120	3240	2400	2460
4,440	2400	2400	2400	2460	2280	5,160	3120	3240	2400	2460	2280	5,160	3120	3240	2400	2460
(31,269,000)	(33,010,000)	(34,371,000)	(35,389,000)	(36,064,000)	(36,397,000)	(36,384,000)	(36,081,000)	(35,398,000)	(34,383,000)	(33,146,000)	(31,703,000)	(30,050,000)	(28,242,000)	(26,190,000)	(23,933,000)	(21,454,000)
2,461,000	2,877,000	3,293,000	3,709,000	4,125,000	4,541,000	4,957,000	5,373,000	5,792,000	5,999,000	6,206,000	6,413,000	6,620,000	6,827,000	7,034,000	7,241,000	7,448,000
1,270,600	1,342,200	1,413,800	1,485,300	1,556,900	1,628,500	1,700,100	1,771,700	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200
27,950	29,530	31,100	32,680	34,250	35,830	37,400	38,980	40,810	40,810	40,810	40,810	40,810	40,810	40,810	40,810	40,810
80,000	43,000	43,000	43,000	44,000	41,000	93,000	56,000	58,000	43,000	44,000	41,000	93,000	56,000	58,000	43,000	44,000
2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
4,202,000	4,238,000	4,311,000	4,384,000	4,458,000	4,528,000	4,654,000	4,690,000	4,777,000	4,762,000	4,763,000	4,760,000	4,812,000	4,775,000	4,777,000	4,762,000	4,763,000
(33,010,000)	(34,371,000)	(35,389,000)	(36,064,000)	(36,397,000)	(36,384,000)	(36,081,000)	(35,398,000)	(34,383,000)	(33,146,000)	(31,703,000)	(30,050,000)	(28,242,000)	(26,190,000)	(23,933,000)	(21,454,000)	(18,769,000)

Economic Benefit Analysis (VOT $13.90, HOV 3 when 1400 vph, Sum of Lin s, HOT Lane Opening in 2030)

2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058
$ 4,255,000	$ 4,447,000	$ 4,639,000	$ 4,831,000	$ 5,023,000	$ 5,215,000	$ 5,407,000	$ 5,599,000	$ 5,792,000	$ 5,999,000	$ 6,206,000	$ 6,413,000	$ 6,620,000	$ 6,827,000	$ 7,034,000	$ 7,241,000	$ 7,448,000
31,400	31,400	31,400	31,400	31,400	31,400	31,400	31,400	31,100	31,100	31,100	31,100	31,100	31,100	31,100	31,100	31,100
8,752,750	8,752,750	8,752,750	8,752,750	8,752,750	8,752,750	8,752,750	8,752,750	8,669,125	8,669,125	8,669,125	8,669,125	8,669,125	8,669,125	8,669,125	8,669,125	8,669,125
-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0
19,260	0	0	0	60	0	19,260	0	0	0	60	0	19,260	0	0	0	60
19,260	0	0	0	60	0	19,260	0	0	0	60	0	19,260	0	0	0	60
(22,783,000)	(23,612,000)	(23,903,000)	(24,002,000)	(23,909,000)	(23,625,000)	(23,148,000)	(22,825,000)	(21,964,000)	(20,891,000)	(19,611,000)	(18,125,000)	(16,431,000)	(14,877,000)	(12,769,000)	(10,454,000)	(7,932,000)
4,255,000	4,447,000	4,639,000	4,831,000	5,023,000	5,215,000	5,407,000	5,599,000	5,792,000	5,999,000	6,206,000	6,413,000	6,620,000	6,827,000	7,034,000	7,241,000	7,448,000
1,873,089	1,873,089	1,873,089	1,873,089	1,873,089	1,873,089	1,873,089	1,873,089	1,855,193	1,855,193	1,855,193	1,855,193	1,855,193	1,855,193	1,855,193	1,855,193	1,855,193
41,208	41,208	41,208	41,208	41,208	41,208	41,208	41,208	40,814	40,814	40,814	40,814	40,814	40,814	40,814	40,814	40,814
346,680	0	0	0	1,080	0	346,680	0	0	0	1,080	0	346,680	0	0	0	1,080
2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180
308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200
5,084,000	4,738,000	4,738,000	4,738,000	4,739,000	4,738,000	5,084,000	4,738,000	4,719,000	4,719,000	4,720,000	4,719,000	5,066,000	4,719,000	4,719,000	4,719,000	4,720,000
(23,612,000)	(23,903,000)	(24,002,000)	(23,909,000)	(23,625,000)	(23,148,000)	(22,825,000)	(21,964,000)	(20,891,000)	(19,611,000)	(18,125,000)	(16,431,000)	(14,877,000)	(12,769,000)	(10,454,000)	(7,932,000)	(5,204,000)

Economic Benefit Analysis (VOT $13.90, HOV 3 when 1650 vph, Sum of Lin s, HOT Lane Opening in 2030)

2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070
$ 7,655,000	$ 7,865,000	$ 8,104,000	$ 8,343,000	$ 8,582,000	$ 8,821,000	$ 9,060,000	$ 9,299,000	$ 9,538,000	$ 9,777,000	$ 10,016,000	$ 10,257,000
31,100	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,400
8,669,125	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,474,000
0	(300)	0	0	0	0	0	-	0	0	0	0
2280	5,160	3120	3240	2400	2460	2280	4,860	3120	3240	2400	2460
2280	4,860	3120	3240	2400	2460	2280	4,860	3120	3240	2400	2460
(18,769,000)	(15,874,000)	(12,785,000)	(9,426,000)	(5,830,000)	(1,980,000)	2,108,000	6,438,000	10,961,000	15,754,000	20,784,000	26,068,000
7,655,000	7,865,000	8,104,000	8,343,000	8,582,000	8,821,000	9,060,000	9,299,000	9,538,000	9,777,000	10,016,000	10,257,000
1,855,200	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,813,400
40,810	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	39,890
41,000	87,000	56,000	58,000	43,000	44,000	41,000	87,000	56,000	58,000	43,000	44,000
2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
4,760,000	4,776,000	4,745,000	4,747,000	4,732,000	4,733,000	4,730,000	4,776,000	4,745,000	4,747,000	4,732,000	4,720,000
(15,874,000)	(12,785,000)	(9,426,000)	(5,830,000)	(1,980,000)	2,108,000	6,438,000	10,961,000	15,754,000	20,784,000	26,068,000	31,605,000

Economic Benefit Analysis (VOT $13.90, HOV 3 when 1400 vph, Sum of Lin s, HOT Lane Opening in 2030)

2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070
$ 7,655,000	$ 7,865,000	$ 8,104,200	$ 8,343,400	$ 8,582,600	$ 8,821,800	$ 9,061,000	$ 9,300,200	$ 9,539,400	$ 9,778,600	$ 10,017,800	$ 10,257,000
31,100	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,400
8,669,125	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,474,000
0	(300)	0	0	0	0	0	-	0	0	0	0
0	19,260	0	0	0	60	0	18,960	0	0	0	60
0	18,960	0	0	0	60	0	18,960	0	0	0	60
(5,204,000)	(2,268,000)	567,000	3,982,000	7,636,000	11,530,000	15,662,000	20,034,000	24,304,000	29,154,000	34,244,000	39,573,000
7,655,000	7,865,000	8,104,200	8,343,400	8,582,600	8,821,800	9,061,000	9,300,200	9,539,400	9,778,600	10,017,800	10,257,000
1,855,193	1,825,367	1,825,367	1,825,367	1,825,367	1,825,367	1,825,367	1,825,367	1,825,367	1,825,367	1,825,367	1,813,436
40,814	40,158	40,158	40,158	40,158	40,158	40,158	40,158	40,158	40,158	40,158	39,896
0	341,280	0	0	0	1,080	0	341,280	0	0	0	1,080
2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180	2,515,180
308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200	308,200
4,719,000	5,030,000	4,689,000	4,689,000	4,689,000	4,690,000	4,689,000	5,030,000	4,689,000	4,689,000	4,689,000	4,678,000
(2,268,000)	567,000	3,982,000	7,636,000	11,530,000	15,662,000	20,034,000	24,304,000	29,154,000	34,244,000	39,573,000	45,152,000

SJCOG I-205 HOT Lane Study

Economic Benefit Analysis (VOT $19.58, HOV 3 when 1650 vph, Sum of Lin s, HOT Lane Opening in 2030)

Switch WB to HOV 3+

Assumptions Factors	
1-Way: I-5 to I-580	13.4
2-Way (Total Miles)	26.8
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Revenue	$ 552,416	$ 734,000	$ 916,000	$ 1,098,000	$ 1,280,000	$ 1,462,000	$ 1,644,000	$ 1,826,000	$ 2,008,000	$ 2,190,000	$ 2,373,000	$ 2,980,000
Est. Daily Users (Veh)	4,800	6,200	7,600	9,000	10,400	11,800	13,200	14,600	16,000	17,400	18,900	20,100
Est Annual User (Veh)	1,338,000	1,728,300	2,118,500	2,508,800	2,899,000	3,289,300	3,679,500	4,069,800	4,460,000	4,850,300	5,268,400	5,602,900
Est. Toll Rate Veh Mile	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02
(# of New Transponders)	2,880	840	840	840	840	840	840	840	840	840	900	720
(# of Replacement Xsponders)	-	0	0	0	0	0	2,880	840	840	840	840	840
(Total # of New Transponders)	2,880	840	840	840	840	840	3,720	1680	1680	1680	1740	1560
Beginning Balance	0	(2,616,000)	(5,098,000)	(7,483,000)	(9,772,000)	(11,964,000)	(14,059,000)	(16,110,000)	(18,027,000)	(19,847,000)	(21,571,000)	(23,204,000)
Annual Revenue	552,416	734,000	916,000	1,098,000	1,280,000	1,462,000	1,644,000	1,826,000	2,008,000	2,190,000	2,373,000	2,980,000
E penses												
User Fee (per X-Action)	286,300	369,900	453,400	536,900	620,400	703,900	787,400	870,900	954,400	1,038,000	1,127,400	1,199,000
Financing Fee (User Fee)	6,300	8,140	9,970	11,810	13,650	15,490	17,320	19,160	21,000	22,800	24,800	26,380
Transponder (Every 6 Yrs)	52,000	15,000	15,000	15,000	15,000	15,000	67,000	30,000	30,000	30,000	31,000	28,000
Tolling Facility Maint. (Mi)	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
Enforcement	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
Other (Capital)												
Total E penses	3,168,000	3,216,000	3,301,000	3,387,000	3,472,000	3,557,000	3,695,000	3,743,000	3,828,000	3,914,000	4,006,000	4,076,000
Ending Balance	(2,616,000)	(5,098,000)	(7,483,000)	(9,772,000)	(11,964,000)	(14,059,000)	(16,110,000)	(18,027,000)	(19,847,000)	(21,571,000)	(23,204,000)	(24,300,000)

Economic Benefit Analysis (VOT $19.58, HOV 3 when 1400 vph, Sum of Lin s, HOT Lane Opening in 2030)

Switch EB & WB to HOV 3+

Assumptions Factors	
1-Way: I-5 to I-580	13.4
2-Way (Total Miles)	26.8
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Revenue	$ 2,544,000	$ 2,854,000	$ 3,164,000	$ 3,474,000	$ 3,784,000	$ 4,094,000	$ 4,404,000	$ 4,714,000	$ 5,024,000	$ 5,334,000	$ 5,639,000	$ 5,919,000
Est. Daily Users (Veh)	32,200	32,100	32,000	31,900	31,800	31,700	31,600	31,500	31,400	31,300	31,400	31,400
Est Annual User (Veh)	8,975,800	8,947,900	8,920,000	8,892,100	8,864,300	8,836,400	8,808,500	8,780,600	8,752,800	8,724,900	8,752,800	8,752,800
Est. Toll Rate Veh Mile	$ 0.01	$ 0.01	$ 0.01	$ 0.01	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.02	$ 0.03
(# of New Transponders)	19,320	0	0	0	0	0	(60)	0	0	0	60	0
(# of Replacement Xsponders)	-	0	0	0	0	0	19,320	0	0	0	0	0
(Total # of New Transponders)	19,320	0	0	0	0	0	19,260	0	0	0	60	0
Beginning Balance	0	(2,590,000)	(4,516,000)	(6,126,000)	(7,420,000)	(8,398,000)	(9,060,000)	(9,752,000)	(9,781,000)	(9,494,000)	(8,891,000)	(7,990,000)
Annual Revenue	2,544,000	2,854,000	3,164,000	3,474,000	3,784,000	4,094,000	4,404,000	4,714,000	5,024,000	5,334,000	5,639,000	5,919,000
E penses												
User Fee (per X-Action)	1,920,800	1,914,900	1,908,900	1,902,900	1,897,000	1,891,000	1,885,000	1,879,000	1,873,100	1,867,100	1,873,100	1,873,100
Financing Fee (User Fee)	42,260	42,130	42,000	41,860	41,730	41,600	41,470	41,340	41,210	41,100	41,210	41,210
Transponder (Every 6 Yrs)	348,000	0	0	0	0	0	347,000	0	0	0	1,000	0
Tolling Facility Maint. (Mi)	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
Enforcement	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
Other (Capital)												
Total E penses	5,134,000	4,780,000	4,774,000	4,768,000	4,762,000	4,756,000	5,096,000	4,743,000	4,737,000	4,731,000	4,738,000	4,737,000
Ending Balance	(2,590,000)	(4,516,000)	(6,126,000)	(7,420,000)	(8,398,000)	(9,060,000)	(9,752,000)	(9,781,000)	(9,494,000)	(8,891,000)	(7,990,000)	(6,808,000)

Economic Benefit Analysis (VOT $19.58, HOV 3 when 1650 vph, Sum of Lin s, HOT Lane Opening in 2030)

Switch EB to HOV 3+

2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058
$ 3,587,000	$ 4,194,000	$ 4,801,000	$ 5,408,000	$ 6,015,000	$ 6,622,000	$ 7,229,000	$ 7,836,000	$ 8,438,000	$ 8,740,000	$ 9,042,000	$ 9,344,000	$ 9,646,000	$ 9,948,000	$ 10,250,000	$ 10,552,000	$ 10,854,000
21,300	22,500	23,700	24,900	26,100	27,300	28,500	29,700	31,100	31,100	31,100	31,100	31,100	31,100	31,100	31,100	31,100
5,937,400	6,271,900	6,606,400	6,940,900	7,275,400	7,609,900	7,944,400	8,278,900	8,669,100	8,669,100	8,669,100	8,669,100	8,669,100	8,669,100	8,669,100	8,669,100	8,669,100
$ 0.02	$ 0.02	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.05	$ 0.05
720	720	720	720	720	720	720	720	840	0	0	0	-	0	0	0	0
3,720	1680	1680	1680	1740	1560	4,440	2400	2400	2400	2460	2280	5,160	3120	3240	2400	2460
4,440	2400	2400	2400	2460	2280	5,160	3120	3240	2400	2460	2280	5,160	3120	3240	2400	2460
(24,300,000)	(24,915,000)	(24,959,000)	(24,469,000)	(23,445,000)	(21,888,000)	(19,794,000)	(17,219,000)	(14,073,000)	(10,412,000)	(6,434,000)	(2,155,000)	2,429,000	7,263,000	12,436,000	17,909,000	23,699,000
3,587,000	4,194,000	4,801,000	5,408,000	6,015,000	6,622,000	7,229,000	7,836,000	8,438,000	8,740,000	9,042,000	9,344,000	9,646,000	9,948,000	10,250,000	10,552,000	10,854,000
1,270,600	1,342,200	1,413,800	1,485,400	1,556,900	1,628,500	1,700,100	1,771,700	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200
27,950	29,530	31,100	32,680	34,250	35,830	37,400	38,980	40,810	40,810	40,810	40,810	40,810	40,810	40,810	40,810	40,810
80,000	43,000	43,000	43,000	44,000	41,000	93,000	56,000	58,000	43,000	44,000	41,000	93,000	56,000	58,000	43,000	44,000
2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
4,202,000	4,238,000	4,311,000	4,384,000	4,458,000	4,528,000	4,654,000	4,690,000	4,777,000	4,762,000	4,763,000	4,760,000	4,812,000	4,775,000	4,777,000	4,762,000	4,763,000
(24,915,000)	(24,959,000)	(24,469,000)	(23,445,000)	(21,888,000)	(19,794,000)	(17,219,000)	(14,073,000)	(10,412,000)	(6,434,000)	(2,155,000)	2,429,000	7,263,000	12,436,000	17,909,000	23,699,000	29,790,000

Economic Benefit Analysis (VOT $19.58, HOV 3 when 1400 vph, Sum of Lin s, HOT Lane Opening in 2030)

2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058
$ 6,199,000	$ 6,479,000	$ 6,759,000	$ 7,039,000	$ 7,319,000	$ 7,599,000	$ 7,879,000	$ 8,159,000	$ 8,438,000	$ 8,740,000	$ 9,042,000	$ 9,344,000	$ 9,646,000	$ 9,948,000	$ 10,250,000	$ 10,552,000	$ 10,854,000
31,400	31,400	31,400	31,400	31,400	31,400	31,400	31,400	31,100	31,050	31,000	30,950	30,900	30,850	30,800	30,750	30,700
8,752,800	8,752,800	8,752,800	8,752,800	8,752,800	8,752,800	8,752,800	8,752,800	8,669,100	8,655,200	8,641,300	8,627,300	8,613,400	8,599,400	8,585,500	8,571,600	8,557,600
$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.03	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.04	$ 0.05	$ 0.05
-	0	0	0	0	0	-	0	0	0	0	0	(30)	0	0	0	0
19,260	0	0	0	60	0	19,260	0	0	0	60	0	19,260	0	0	0	60
19,260	0	0	0	60	0	19,260	0	0	0	60	0	19,230	0	0	0	60
(6,808,000)	(5,693,000)	(3,951,000)	(1,929,000)	373,000	2,954,000	5,816,000	8,611,000	12,033,000	15,752,000	19,776,000	24,104,000	28,738,000	33,331,000	38,575,000	44,124,000	49,978,000
6,199,000	6,479,000	6,759,000	7,039,000	7,319,000	7,599,000	7,879,000	8,159,000	8,438,000	8,740,000	9,042,000	9,344,000	9,646,000	9,948,000	10,250,000	10,552,000	10,854,000
1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,855,200	1,852,200	1,849,200	1,846,200	1,843,300	1,840,300	1,837,300	1,834,300	1,831,300
41,210	41,210	41,210	41,210	41,210	41,210	41,210	41,210	40,810	40,750	40,680	40,620	40,550	40,490	40,420	40,350	40,290
347,000	0	0	0	1,000	0	347,000	0	0	0	1,000	0	346,000	0	0	0	1,000
2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
5,084,000	4,737,000	4,737,000	4,737,000	4,738,000	4,737,000	5,084,000	4,737,000	4,719,000	4,716,000	4,714,000	4,710,000	5,053,000	4,704,000	4,701,000	4,698,000	4,696,000
(5,693,000)	(3,951,000)	(1,929,000)	373,000	2,954,000	5,816,000	8,611,000	12,033,000	15,752,000	19,776,000	24,104,000	28,738,000	33,331,000	38,575,000	44,124,000	49,978,000	56,136,000

Economic Benefit Analysis (VOT $19.58, HOV 3 when 1650 vph, Sum of Lin s, HOT Lane Opening in 2030)

2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070
$ 11,156,000	$ 11,458,000	$ 11,807,000	$ 12,156,000	$ 12,505,000	$ 12,854,000	$ 13,203,000	$ 13,552,000	$ 13,901,000	$ 14,250,000	$ 14,599,000	$ 14,943,000
31,100	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,400
8,669,100	8,529,800	8,529,800	8,529,800	8,529,800	8,529,800	8,529,800	8,529,800	8,529,800	8,529,800	8,529,800	8,474,000
$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.06	$ 0.06	$ 0.06	$ 0.06	$ 0.06	$ 0.06	$ 0.07
0	(300)	0	0	0	0	0	-	0	0	0	0
2280	5,160	3120	3240	2400	2460	2280	4,860	3120	3240	2400	2460
2280	4,860	3120	3240	2400	2460	2280	4,860	3120	3240	2400	2460
29,790,000	36,186,000	42,868,000	49,930,000	57,339,000	65,112,000	73,233,000	81,706,000	90,482,000	99,638,000	109,141,000	119,008,000
11,156,000	11,458,000	11,807,000	12,156,000	12,505,000	12,854,000	13,203,000	13,552,000	13,901,000	14,250,000	14,599,000	14,943,000
1,855,200	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,813,400
40,810	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	39,890
41,000	87,000	56,000	58,000	43,000	44,000	41,000	87,000	56,000	58,000	43,000	44,000
2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
4,760,000	4,776,000	4,745,000	4,747,000	4,732,000	4,733,000	4,730,000	4,776,000	4,745,000	4,747,000	4,732,000	4,720,000
36,186,000	42,868,000	49,930,000	57,339,000	65,112,000	73,233,000	81,706,000	90,482,000	99,638,000	109,141,000	119,008,000	129,231,000

Economic Benefit Analysis (VOT $19.58, HOV 3 when 1400 vph, Sum of Lin s, HOT Lane Opening in 2030)

2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070
$ 11,156,000	$ 11,458,000	$ 11,807,000	$ 12,156,000	$ 12,505,000	$ 12,854,000	$ 13,203,000	$ 13,552,000	$ 13,901,000	$ 14,250,000	$ 14,599,000	$ 14,943,000
30,650	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,400
8,543,700	8,529,800	8,529,800	8,529,800	8,529,800	8,529,800	8,529,800	8,529,800	8,529,800	8,529,800	8,529,800	8,474,000
$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.05	$ 0.06	$ 0.06	$ 0.06	$ 0.06	$ 0.06	$ 0.06	$ 0.07
0	(30)	0	0	0	0	0	-	0	0	0	0
0	19,230	0	0	0	60	0	19,200	0	0	0	60
0	19,200	0	0	0	60	0	19,200	0	0	0	60
56,136,000	62,600,000	69,023,000	76,141,000	83,608,000	91,424,000	99,588,000	108,102,000	116,619,000	125,831,000	135,392,000	145,302,000
11,156,000	11,458,000	11,807,000	12,156,000	12,505,000	12,854,000	13,203,000	13,552,000	13,901,000	14,250,000	14,599,000	14,943,000
1,828,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,813,400
40,220	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	39,890
0	346,000	0	0	0	1,000	0	346,000	0	0	0	1,000
2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
4,692,000	5,035,000	4,689,000	4,689,000	4,689,000	4,690,000	4,689,000	5,035,000	4,689,000	4,689,000	4,689,000	4,677,000
62,600,000	69,023,000	76,141,000	83,608,000	91,424,000	99,588,000	108,102,000	116,619,000	125,831,000	135,392,000	145,302,000	155,568,000

SJCOG I-205 HOT Lane Study

Assumptions Factors	
1-Way: I-5 to I-580	13.4
2-Way (Total Miles)	26.8
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (VOT $19.58, HOV 3 when 1650 vph, Sum of Lin s, HOT Lane Opening in 2020)

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Revenue	$ 79,000	$ 99,000	$ 119,000	$ 139,000	$ 159,000	$ 179,000	$ 199,000	$ 219,000	$ 239,000	$ 259,000	$ 283,000	$ 492,000	$ 701,000	$ 910,000
Est. Daily Users (Veh)	9,600	9,100	8,600	8,100	7,600	7,100	6,600	6,100	5,600	5,100	4,800	6,200	7,600	9,000
Est. Annual Users (Veh)	2,676,000	2,536,625	2,397,250	2,257,875	2,118,500	1,979,125	1,839,750	1,700,375	1,561,000	1,421,625	1,338,000	1,728,250	2,118,500	2,508,750
(# of New Transponders)	5,760	0	0	0	0	0	(300)	0	0	0	0	840	840	840
(# of Replacement Xsponders)	-	0	0	0	0	0	5,760	0	0	0	0	0	0	0
(Total # of New Transponders)	5,760	0	0	0	0	0	5,460	0	0	0	0	840	840	840
Beginning Balance	0	(3,433,000)	(6,712,000)	(9,940,000)	(13,118,000)	(16,245,000)	(19,322,000)	(22,446,000)	(25,422,000)	(28,347,000)	(31,222,000)	(34,055,000)	(36,779,000)	(39,379,000)
Annual Revenue	79,000	99,000	119,000	139,000	159,000	179,000	199,000	219,000	239,000	259,000	283,000	492,000	701,000	910,000
E penses														
User Fee (per X-Action)	572,700	542,800	513,000	483,200	453,400	423,500	393,700	363,900	334,100	304,200	286,300	369,800	453,400	536,900
Financing Fee (User Fee)	12,600	11,940	11,290	10,630	9,970	9,320	8,660	8,010	7,350	6,690	6,300	8,140	9,970	11,810
Transponder (Every 6 Yrs)	104,000	0	0	0	0	0	98,000	0	0	0	0	15,000	15,000	15,000
Tolling Facility Maint. (Mi)	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
Enforcement	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
Other (Capital)														
Total E penses	3,512,000	3,378,000	3,347,000	3,317,000	3,286,000	3,256,000	3,323,000	3,195,000	3,164,000	3,134,000	3,116,000	3,216,000	3,301,000	3,387,000
Ending Balance	(3,433,000)	(6,712,000)	(9,940,000)	(13,118,000)	(16,245,000)	(19,322,000)	(22,446,000)	(25,422,000)	(28,347,000)	(31,222,000)	(34,055,000)	(36,779,000)	(39,379,000)	(41,856,000)

Assumptions Factors	
1-Way: I-5 to I-580	13.4
2-Way (Total Miles)	26.8
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (VOT $19.58, HOV 3 when 1400 vph, Sum of Lin s, HOT Lane Opening in 2020)

Switch EB & WB to HOV 3+

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Revenue	$ 79,000	$ 326,000	$ 573,000	$ 820,000	$ 1,067,000	$ 1,314,000	$ 1,561,000	$ 1,808,000	$ 2,055,000	$ 2,302,000	$ 2,544,000	$ 2,854,000	$ 3,164,000	$ 3,474,000
Est. Daily Users (Veh)	9,600	11,900	14,200	16,500	18,800	21,100	23,400	25,700	28,000	30,300	32,200	32,100	32,000	31,900
Est. Annual Users (Veh)	2,676,000	3,317,125	3,958,250	4,599,375	5,240,500	5,881,625	6,522,750	7,163,875	7,805,000	8,446,125	8,975,750	8,947,875	8,920,000	8,892,125
(# of New Transponders)	5,760	1380	1380	1380	1380	1380	1,380	1380	1380	1380	1140	0	(60)	0
(# of Replacement Xsponders)	-	0	0	0	0	0	5,760	1380	1380	1380	1380	1380	7,140	2760
(Total # of New Transponders)	5,760	1380	1380	1380	1380	1380	7,140	2760	2760	2760	2520	1380	7,080	2760
Beginning Balance	0	(3,433,000)	(6,681,000)	(9,822,000)	(12,856,000)	(15,783,000)	(18,603,000)	(21,421,000)	(24,053,000)	(26,578,000)	(28,996,000)	(31,283,000)	(33,234,000)	(34,971,000)
Annual Revenue	79,000	326,000	573,000	820,000	1,067,000	1,314,000	1,561,000	1,808,000	2,055,000	2,302,000	2,544,000	2,854,000	3,164,000	3,474,000
E penses														
User Fee (per X-Action)	572,700	709,900	847,100	984,300	1,121,500	1,258,700	1,395,900	1,533,100	1,670,300	1,807,500	1,920,800	1,914,800	1,908,900	1,902,900
Financing Fee (User Fee)	12,600	15,620	18,640	21,650	24,670	27,690	30,710	33,730	36,750	39,770	42,260	42,130	42,000	41,860
Transponder (Every 6 Yrs)	104,000	25,000	25,000	25,000	25,000	25,000	129,000	50,000	50,000	50,000	45,000	25,000	127,000	50,000
Tolling Facility Maint. (Mi)	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
Enforcement	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
Other (Capital)														
Total E penses	3,512,000	3,574,000	3,714,000	3,854,000	3,994,000	4,134,000	4,379,000	4,440,000	4,580,000	4,720,000	4,831,000	4,805,000	4,901,000	4,818,000
Ending Balance	(3,433,000)	(6,681,000)	(9,822,000)	(12,856,000)	(15,783,000)	(18,603,000)	(21,421,000)	(24,053,000)	(26,578,000)	(28,996,000)	(31,283,000)	(33,234,000)	(34,971,000)	(36,315,000)

Economic Benefit Analysis (VOT $19.58, HOV 3 when 1650 vph, Sum of Lin s, HOT Lane Opening in 20

Switch WB to HOV 3+

Switch EB to HOV 3+

2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
$ 1,119,000	$ 1,328,000	$ 1,537,000	$ 1,746,000	$ 1,955,000	$ 2,164,000	$ 2,373,000	$ 2,980,000	$ 3,587,000	$ 4,194,000	$ 4,801,000	$ 5,408,000	$ 6,015,000	$ 6,622,000	$ 7,229,000	$ 7,836,000	$ 8,438,000	$ 8,740,000	$ 9,042,000
10,400	11,800	13,200	14,600	16,000	17,400	18,900	20,100	21,300	22,500	23,700	24,900	26,100	27,300	28,500	29,700	31,100	31,100	31,100
2,899,000	3,289,250	3,679,500	4,069,750	4,460,000	4,850,250	5,268,375	5,602,875	5,937,375	6,271,875	6,606,375	6,940,875	7,275,375	7,609,875	7,944,375	8,278,875	8,669,125	8,669,125	8,669,125
840	840	-	840	840	840	900	720	720	720	720	720	720	720	720	720	840	0	0
0	0	-	840	840	840	840	840	-	1680	1680	1680	1740	1560	720	2400	2400	2400	2460
840	840	-	1680	1680	1680	1740	1560	720	2400	2400	2400	2460	2280	1,440	3120	3240	2400	2460
(41,856,000)	(44,209,000)	(46,438,000)	(48,529,000)	(50,526,000)	(52,399,000)	(54,149,000)	(55,782,000)	(56,878,000)	(57,426,000)	(57,470,000)	(56,980,000)	(55,956,000)	(54,399,000)	(52,305,000)	(49,663,000)	(46,517,000)	(42,856,000)	(38,878,000)
1,119,000	1,328,000	1,537,000	1,746,000	1,955,000	2,164,000	2,373,000	2,980,000	3,587,000	4,194,000	4,801,000	5,408,000	6,015,000	6,622,000	7,229,000	7,836,000	8,438,000	8,740,000	9,042,000
620,400	703,900	787,400	870,900	954,400	1,038,000	1,127,400	1,199,000	1,270,600	1,342,200	1,413,800	1,485,300	1,556,900	1,628,500	1,700,100	1,771,700	1,855,200	1,855,200	1,855,200
13,650	15,490	17,320	19,160	21,000	22,840	24,800	26,380	27,950	29,530	31,100	32,680	34,250	35,830	37,400	38,980	40,810	40,810	40,810
15,000	15,000	0	30,000	30,000	30,000	31,000	28,000	13,000	43,000	43,000	43,000	44,000	41,000	26,000	56,000	58,000	43,000	44,000
2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
3,472,000	3,557,000	3,628,000	3,743,000	3,828,000	3,914,000	4,006,000	4,076,000	4,135,000	4,238,000	4,311,000	4,384,000	4,458,000	4,528,000	4,587,000	4,690,000	4,777,000	4,762,000	4,763,000
(44,209,000)	(46,438,000)	(48,529,000)	(50,526,000)	(52,399,000)	(54,149,000)	(55,782,000)	(56,878,000)	(57,426,000)	(57,470,000)	(56,980,000)	(55,956,000)	(54,399,000)	(52,305,000)	(49,663,000)	(46,517,000)	(42,856,000)	(38,878,000)	(34,599,000)

Economic Benefit Analysis (VOT $19.58, HOV 3 when 1400 vph, Sum of Lin s, HOT Lane Opening in 2020)

2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052
$ 3,784,000	$ 4,094,000	$ 4,404,000	$ 4,714,000	$ 5,024,000	$ 5,334,000	$ 5,639,000	$ 5,919,000	$ 6,199,000	$ 6,479,000	$ 6,759,000	$ 7,039,000	$ 7,319,000	$ 7,599,000	$ 7,879,000	$ 8,159,000	$ 8,438,000	$ 8,740,000	$ 9,042,000
31,800	31,700	31,600	31,500	31,400	31,300	31,400	31,400	31,400	31,400	31,400	31,400	31,400	31,400	31,400	31,400	31,100	31,100	31,100
8,864,250	8,836,375	8,808,500	8,780,625	8,752,750	8,724,875	8,752,750	8,752,750	8,752,750	8,752,750	8,752,750	8,752,750	8,752,750	8,752,750	8,752,750	8,752,750	8,669,125	8,669,125	8,669,125
0	0	0	0	(60)	0	60	0	0	0	-	0	0	0	0	0	(180)	0	0
2760	2760	2520	1380	7,080	2760	2760	2760	2520	1380	7,020	2760	2820	2760	2520	1380	7,020	2760	2820
2760	2760	2520	1380	7,020	2760	2820	2760	2520	1380	7,020	2760	2820	2760	2520	1380	6,840	2760	2820
(36,315,000)	(37,343,000)	(38,055,000)	(38,445,000)	(38,499,000)	(38,338,000)	(37,785,000)	(36,934,000)	(35,802,000)	(34,385,000)	(32,668,000)	(30,772,000)	(28,520,000)	(25,989,000)	(23,177,000)	(20,080,000)	(16,683,000)	(13,087,000)	(9,116,000)
3,784,000	4,094,000	4,404,000	4,714,000	5,024,000	5,334,000	5,639,000	5,919,000	6,199,000	6,479,000	6,759,000	7,039,000	7,319,000	7,599,000	7,879,000	8,159,000	8,438,000	8,740,000	9,042,000
1,896,900	1,891,000	1,885,000	1,879,100	1,873,100	1,867,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,873,100	1,855,200	1,855,200	1,855,200
41,730	41,600	41,470	41,340	41,210	41,080	41,210	41,210	41,210	41,210	41,210	41,210	41,210	41,210	41,210	41,210	40,810	40,810	40,810
50,000	50,000	45,000	25,000	126,000	50,000	51,000	50,000	45,000	25,000	126,000	50,000	51,000	50,000	45,000	25,000	123,000	50,000	51,000
2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
4,812,000	4,806,000	4,794,000	4,768,000	4,863,000	4,781,000	4,788,000	4,787,000	4,782,000	4,762,000	4,863,000	4,787,000	4,788,000	4,787,000	4,782,000	4,762,000	4,842,000	4,769,000	4,770,000
(37,343,000)	(38,055,000)	(38,445,000)	(38,499,000)	(38,338,000)	(37,785,000)	(36,934,000)	(35,802,000)	(34,385,000)	(32,668,000)	(30,772,000)	(28,520,000)	(25,989,000)	(23,177,000)	(20,080,000)	(16,683,000)	(13,087,000)	(9,116,000)	(4,844,000)

Economic Benefit Analysis (VOT $19.58, HOV 3 when 1650 vph, Sum of Lin s, HOT Lane Opening in 2020)

2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070
$ 9,344,000	$ 9,646,000	$ 9,948,000	$ 10,250,000	$ 10,552,000	$ 10,854,000	$ 11,156,000	$ 11,458,000	$ 11,807,000	$ 12,156,000	$ 12,505,000	$ 12,854,000	$ 13,203,000	$ 13,552,000	$ 13,901,000	$ 14,250,000	$ 14,599,000	$ 14,943,000
31,100	31,100	31,100	31,100	31,100	31,100	31,100	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,400
8,669,125	8,669,125	8,669,125	8,669,125	8,669,125	8,669,125	8,669,125	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,474,000
0	-	0	0	0	0	0	(300)	0	0	0	0	0	-	0	0	0	0
2280	1,440	3120	3240	2400	2460	2280	1,440	3120	3240	2400	2460	2280	1,140	3120	3240	2400	2460
2280	1,440	3120	3240	2400	2460	2280	1,140	3120	3240	2400	2460	2280	1,140	3120	3240	2400	2460
(34,599,000)	(30,015,000)	(25,114,000)	(19,941,000)	(14,468,000)	(8,678,000)	(2,587,000)	3,809,000	10,557,000	17,619,000	25,028,000	32,801,000	40,922,000	49,395,000	58,237,000	67,393,000	76,896,000	86,763,000
9,344,000	9,646,000	9,948,000	10,250,000	10,552,000	10,854,000	11,156,000	11,458,000	11,807,000	12,156,000	12,505,000	12,854,000	13,203,000	13,552,000	13,901,000	14,250,000	14,599,000	14,943,000
1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,813,400
40,810	40,810	40,810	40,810	40,810	40,810	40,810	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	39,890
41,000	26,000	56,000	58,000	43,000	44,000	41,000	21,000	56,000	58,000	43,000	44,000	41,000	21,000	56,000	58,000	43,000	44,000
2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
4,760,000	4,745,000	4,775,000	4,777,000	4,762,000	4,763,000	4,760,000	4,710,000	4,745,000	4,747,000	4,732,000	4,733,000	4,730,000	4,710,000	4,745,000	4,747,000	4,732,000	4,720,000
(30,015,000)	(25,114,000)	(19,941,000)	(14,468,000)	(8,678,000)	(2,587,000)	3,809,000	10,557,000	17,619,000	25,028,000	32,801,000	40,922,000	49,395,000	58,237,000	67,393,000	76,896,000	86,763,000	96,986,000

Economic Benefit Analysis (VOT $19.58, HOV 3 when 1400 vph, Sum of Lin s, HOT Lane Opening in 2020)

2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070
$ 9,344,000	$ 9,646,000	$ 9,948,000	$ 10,250,000	$ 10,552,000	$ 10,854,000	$ 11,156,000	$ 11,458,000	$ 11,807,000	$ 12,156,000	$ 12,505,000	$ 12,854,000	$ 13,203,000	$ 13,552,000	$ 13,901,000	$ 14,250,000	$ 14,599,000	$ 14,943,000
31,100	31,100	31,100	31,100	31,100	31,100	31,100	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,600	30,400
8,669,125	8,669,125	8,669,125	8,669,125	8,669,125	8,669,125	8,669,125	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,529,750	8,474,000
0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
2760	2520	1380	6,840	2760	2820	2760	2520	1380	6,840	2760	2820	2760	2520	1380	6,840	2760	2820
2760	2520	1380	6,840	2760	2820	2760	2520	1380	6,840	2760	2820	2760	2520	1380	6,840	2760	2820
(4,844,000)	(269,000)	4,613,000	9,817,000	15,225,000	21,008,000	27,092,000	33,479,000	40,203,000	47,296,000	54,640,000	62,406,000	70,520,000	78,984,000	87,802,000	96,989,000	106,427,000	116,287,000
9,344,000	9,646,000	9,948,000	10,250,000	10,552,000	10,854,000	11,156,000	11,458,000	11,807,000	12,156,000	12,505,000	12,854,000	13,203,000	13,552,000	13,901,000	14,250,000	14,599,000	14,943,000
1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,855,200	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,825,400	1,813,400
40,810	40,810	40,810	40,810	40,810	40,810	40,810	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	40,160	39,890
50,000	45,000	25,000	123,000	50,000	51,000	50,000	45,000	25,000	123,000	50,000	51,000	50,000	45,000	25,000	123,000	50,000	51,000
2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000	2,515,000
308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000	308,000
4,769,000	4,764,000	4,744,000	4,842,000	4,769,000	4,770,000	4,769,000	4,734,000	4,714,000	4,812,000	4,739,000	4,740,000	4,739,000	4,734,000	4,714,000	4,812,000	4,739,000	4,727,000
(269,000)	4,613,000	9,817,000	15,225,000	21,008,000	27,092,000	33,479,000	40,203,000	47,296,000	54,640,000	62,406,000	70,520,000	78,984,000	87,802,000	96,989,000	106,427,000	116,287,000	126,503,000

Appendix G: I-5 Traffic Forecasts

I-5 HOT LANES - TRANSPORTATION ANALYSIS DATA NEEDS

Analysis Input Data by Segment

Data Category	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Segment 1 (Hammer Lane to Eight Mile Road) - Northbound PM													
Route Miles	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	450	510	609	698	786	874	962	1032	1121	1210	1297	1386	1474
Peak Period HOV (2) Lane Volume in Peak Direction	1234	1400	1670	1912	2155	2397	2640	2832	3076	3320	3559	3803	4044
Peak Hour HOV (3+) Lane Volume in Peak Direction	61	70	83	95	107	119	131	141	153	165	177	189	201
Peak Period HOV (3+) Lane Volume in Peak Direction	168	191	228	261	294	327	360	387	420	453	486	519	552
Peak Hour GP Lane Volume in Peak Direction	3362	3817	4550	5210	5871	6531	7192	7235	7288	7342	7395	7449	7503
Peak Period GP Lane Volume in Peak Direction	9218	10465	12479	14291	16103	17915	19726	19844	19989	20137	20282	20430	20578
Daily GP Lane + HOV Volume	47000	52000	58250	64500	70750	77000	83250	83471	83748	84024	84300	84577	84853
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Segment 1 (Eight Mile Road to Hammer Lane) - Southbound AM													
Route Miles	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	450	534	659	776	893	1009	1127	1219	1336	1452	1569	1686	1802
Peak Period HOV (2) Lane Volume in Peak Direction	1173	1391	1717	2020	2323	2625	2928	3167	3471	3772	4076	4380	4681
Peak Hour HOV (3+) Lane Volume in Peak Direction	50	59	74	87	99	112	125	136	148	162	175	187	200
Peak Period HOV (3+) Lane Volume in Peak Direction	130	154	191	224	258	292	326	355	386	423	457	488	522
Peak Hour GP Lane Volume in Peak Direction	1891	3195	3948	4645	5341	6039	6733	6839	6970	7101	7232	7363	7495
Peak Period GP Lane Volume in Peak Direction	7821	8323	10277	12089	13898	15709	17519	17795	18136	18477	18818	19159	19502
Daily GP Lane + HOV Volume	47000	52000	58250	64500	70750	77000	83250	83471	83748	84024	84300	84577	84853
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

I-5 HOT LANES - TRANSPORTATION ANALYSIS DATA NEEDS

Analysis Input Data by Segment

Data Category	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Segment 2 (March Lane to Hammer Lane) - Northbound PM													
Route Miles	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	648	687	783	857	933	1006	1080	1139	1214	1288	1363	1437	1512
Peak Period HOV (2) Lane Volume in Peak Direction	1802	1909	2165	2368	2570	2772	2974	3136	3342	3546	3752	3956	4162
Peak Hour HOV (3+) Lane Volume in Peak Direction	89	94	106	116	126	137	148	156	166	176	186	196	206
Peak Period HOV (3+) Lane Volume in Peak Direction	247	261	296	323	350	378	405	427	454	481	508	535	562
Peak Hour GP Lane Volume in Peak Direction	4842	5141	5845	6402	6958	7515	8072	8195	8348	8500	8652	8805	8958
Peak Period GP Lane Volume in Peak Direction	13466	14268	16183	17692	19202	20709	22219	22558	22979	23397	23815	24236	24657
Daily GP Lane + HOV Volume	56500	61879	68604	75328	82052	88776	95500	96114	96880	97647	98413	99180	99946
Total Peak Hour (GP +HOV)	5579	5922	6734	7375	8017	8658	9300	9490	9728	9964	10201	10438	10676
Total Peak Period (GP+HOV)	15515	16438	18644	20383	22122	23859	25598	26121	26775	27424	28075	28727	29381
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Segment 2 (Hammer Lane to March Lane) - Southbound AM													
Route Miles	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	714	772	887	983	1082	1178	1276	1352	1449	1545	1642	1739	1835
Peak Period HOV (2) Lane Volume in Peak Direction	1866	2017	2314	2563	2811	3061	3310	3507	3759	4008	4260	4512	4761
Peak Hour HOV (3+) Lane Volume in Peak Direction	79	86	99	111	120	131	141	150	161	172	183	193	204
Peak Period HOV (3+) Lane Volume in Peak Direction	207	224	257	284	312	340	368	391	420	449	478	504	533
Peak Hour GP Lane Volume in Peak Direction	4274	4623	5313	5892	6467	7047	7623	7766	7943	8118	8294	8471	8648
Peak Period GP Lane Volume in Peak Direction	11162	12067	13842	15334	16824	18314	19803	20174	20634	21089	21546	22006	22466
Daily GP Lane + HOV Volume	56500	61879	68604	75328	82052	88776	95500	96114	96880	97647	98413	99180	99946
Total Peak Hour (GP +HOV)	5067	5481	6299	6986	7669	8356	9040	9268	9553	9835	10119	10403	10687
Total Peak Period (GP+HOV)	13235	14308	16413	18181	19947	21715	23481	24072	24813	25546	26284	27022	27760
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

I-5 HOT LANES - TRANSPORTATION ANALYSIS DATA NEEDS

Analysis Input Data by Segment

Data Category	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Segment 3 (Country Club to March Lane) - Northbound PM													
Route Miles	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	721	734	799	842	885	926	970	1005	1048	1091	1133	1177	1220
Peak Period HOV (2) Lane Volume in Peak Direction	2054	2092	2259	2375	2490	2604	2719	2817	2938	3059	3177	3300	3421
Peak Hour HOV (3+) Lane Volume in Peak Direction	98	100	108	114	121	127	133	137	143	149	155	161	166
Peak Period HOV (3+) Lane Volume in Peak Direction	282	286	309	324	340	355	369	380	397	414	431	448	462
Peak Hour GP Lane Volume in Peak Direction	5381	5493	5962	6285	6607	6931	7252	7489	7784	8078	8371	8667	8961
Peak Period GP Lane Volume in Peak Direction	15353	15630	16891	17746	18600	19453	20309	20973	21799	22622	23443	24272	25095
Daily GP Lane + HOV Volume	63000	67414	72931	78448	83966	89483	95000	95891	97005	98118	99232	100345	101459
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Segment 3 (March Lane to Country Club) - Southbound AM													
Route Miles	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	800	827	903	960	1019	1076	1134	1179	1236	1294	1352	1409	1466
Peak Period HOV (2) Lane Volume in Peak Direction	2144	2212	2408	2556	2702	2852	2999	3118	3269	3422	3575	3726	3877
Peak Hour HOV (3+) Lane Volume in Peak Direction	90	93	101	109	113	119	126	131	138	144	150	157	163
Peak Period HOV (3+) Lane Volume in Peak Direction	237	246	269	284	300	316	334	347	366	382	398	417	433
Peak Hour GP Lane Volume in Peak Direction	4791	4952	5409	5753	6093	6439	6780	7036	7354	7670	7986	8305	8623
Peak Period GP Lane Volume in Peak Direction	12823	13242	14408	15292	16175	17057	17936	18613	19454	20290	21126	21970	22811
Daily GP Lane + HOV Volume	63000	67414	72931	78448	83966	89483	95000	95891	97005	98118	99232	100345	101459
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

I-5 HOT LANES - TRANSPORTATION ANALYSIS DATA NEEDS

Analysis Input Data by Segment

Data Category	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Segment 4 (SR 4 to Country Club) - Northbound PM													
Route Miles	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	4	4	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	805	823	895	944	991	1041	1090	1130	1179	1229	1278	1327	1377
Peak Period HOV (2) Lane Volume in Peak Direction	2296	2348	2533	2665	2799	2930	3063	3175	3313	3454	3592	3730	3871
Peak Hour HOV (3+) Lane Volume in Peak Direction	109	112	121	127	136	142	149	154	161	167	174	181	188
Peak Period HOV (3+) Lane Volume in Peak Direction	315	321	346	364	381	399	415	429	449	466	486	506	526
Peak Hour GP Lane Volume in Peak Direction	6005	6155	6671	7043	7413	7784	8154	8522	8979	9436	9892	10351	10809
Peak Period GP Lane Volume in Peak Direction	17162	17544	18935	19920	20903	21886	22872	23904	25186	26468	27747	29034	30319
Daily GP Lane + HOV Volume	62167	68925	77373	85821	94269	102717	111165	112333	113793	115253	116713	118173	119633
Total Peak Hour (GP +HOV)	6919	7090	7687	8114	8540	8967	9393	9806	10319	10832	11344	11859	12374
Total Peak Period (GP+HOV)	19773	20213	21814	22949	24083	25215	26350	27508	28948	30388	31825	33270	34716
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Segment 4 (Country Club to SR 4) - Southbound AM													
Route Miles	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	0	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	4	4	3	3	3	3	3	4	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	836	868	947	1008	1072	1134	1195	1245	1307	1369	1431	1493	1554
Peak Period HOV (2) Lane Volume in Peak Direction	2250	2330	2539	2701	2860	3025	3187	3320	3485	3650	3815	3980	4143
Peak Hour HOV (3+) Lane Volume in Peak Direction	94	96	106	114	118	126	133	138	145	152	159	166	173
Peak Period HOV (3+) Lane Volume in Peak Direction	249	258	284	300	318	335	354	367	386	405	424	443	462
Peak Hour GP Lane Volume in Peak Direction	5014	5195	5677	6048	6414	6784	7152	7580	8116	8648	9181	9717	10252
Peak Period GP Lane Volume in Peak Direction	13459	13945	15195	16163	17131	18096	19060	20201	21629	23047	24467	25895	27321
Daily GP Lane + HOV Volume	62167	68925	77373	85821	94269	102717	111165	112333	113793	115253	116713	118173	119633
Total Peak Hour (GP +HOV)	5944	6159	6730	7170	7604	8044	8480	8963	9568	10169	10771	11376	11979
Total Peak Period (GP+HOV)	15958	16533	18018	19164	20309	21456	22601	23888	25500	27102	28706	30318	31926
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

I-5 HOT LANES - TRANSPORTATION ANALYSIS DATA NEEDS

Analysis Input Data by Segment

Data Category	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Segment 5 (Charter Way to SR 4) - Northbound PM													
Route Miles	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	4	4	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	876	892	960	1006	1049	1097	1141	1178	1224	1270	1316	1362	1408
Peak Period HOV (2) Lane Volume in Peak Direction	2543	2590	2770	2896	3027	3151	3280	3386	3518	3650	3782	3914	4046
Peak Hour HOV (3+) Lane Volume in Peak Direction	118	121	129	136	144	149	156	161	167	173	180	186	192
Peak Period HOV (3+) Lane Volume in Peak Direction	348	354	378	396	411	429	443	457	474	491	511	528	545
Peak Hour GP Lane Volume in Peak Direction	6528	6657	7153	7500	7847	8195	8543	8689	8869	9048	9226	9408	9589
Peak Period GP Lane Volume in Peak Direction	19003	19353	20704	21649	22592	23536	24482	24900	25416	25929	26439	26961	27480
Daily GP Lane + HOV Volume	70000	75579	82553	89527	96501	103475	110449	110611	110813	111015	111217	111419	111621
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Segment 5 (SR 4 to Charter Way) - Southbound AM													
Route Miles	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
No. of HOV Lanes Per Direction	0	0	1	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	4	4	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	598	644	738	812	890	967	1044	1105	1182	1258	1336	1412	1489
Peak Period HOV (2) Lane Volume in Peak Direction	1706	1824	2079	2287	2493	2705	2914	3084	3299	3511	3729	3941	4156
Peak Hour HOV (3+) Lane Volume in Peak Direction	68	71	81	92	98	107	116	123	131	140	148	157	165
Peak Period HOV (3+) Lane Volume in Peak Direction	189	201	233	255	278	299	324	344	366	391	413	438	460
Peak Hour GP Lane Volume in Peak Direction	3595	3845	4415	4875	5328	5786	6240	6694	7263	7828	8392	8961	9529
Peak Period GP Lane Volume in Peak Direction	10210	10919	12447	13691	14938	16182	17422	18690	20279	21857	23432	25021	26607
Daily GP Lane + HOV Volume	70000	75579	82553	89527	96501	103475	110449	110611	110813	111015	111217	111419	111621
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

I-5 HOT LANES - TRANSPORTATION ANALYSIS DATA NEEDS

Analysis Input Data by Segment

Data Category	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Segment 6 (Downing Ave to Charter Way) - Northbound PM													
Route Miles	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
No. of HOV Lanes Per Direction	0	0	0	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	804	830	910	968	1024	1084	1141	1188	1246	1305	1363	1421	1480
Peak Period HOV (2) Lane Volume in Peak Direction	2334	2410	2626	2787	2955	3114	3280	3415	3581	3751	3917	4084	4253
Peak Hour HOV (3+) Lane Volume in Peak Direction	108	112	123	131	140	147	156	162	170	178	186	194	202
Peak Period HOV (3+) Lane Volume in Peak Direction	319	328	360	381	400	423	443	460	483	505	528	551	573
Peak Hour GP Lane Volume in Peak Direction	5987	6191	6779	7220	7661	8102	8543	8707	8909	9110	9309	9514	9716
Peak Period GP Lane Volume in Peak Direction	17428	17998	19621	20841	22056	23269	24482	24952	25531	26107	26677	27265	27844
Daily GP Lane + HOV Volume	63000	69265	77097	84928	92760	100591	108423	108872	109433	109995	110556	111117	111678
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Segment 6 (Charter Way to Downing Ave) - Southbound AM													
Route Miles	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
No. of HOV Lanes Per Direction	0	0	0	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	512	563	661	742	824	906	988	1053	1135	1217	1299	1381	1462
Peak Period HOV (2) Lane Volume in Peak Direction	1461	1595	1862	2090	2308	2534	2758	2939	3168	3397	3626	3854	4081
Peak Hour HOV (3+) Lane Volume in Peak Direction	59	62	73	84	90	101	110	117	126	135	145	153	163
Peak Period HOV (3+) Lane Volume in Peak Direction	164	176	210	233	255	282	307	327	352	377	405	427	454
Peak Hour GP Lane Volume in Peak Direction	3084	3358	3958	4447	4932	5417	5902	6375	6967	7554	8140	8733	9323
Peak Period GP Lane Volume in Peak Direction	8759	9536	11159	12489	13828	15150	16478	17799	19453	21092	22728	24384	26032
Daily GP Lane + HOV Volume	63000	69265	77097	84928	92760	100591	108423	108872	109433	109995	110556	111117	111678
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

I-5 HOT LANES - TRANSPORTATION ANALYSIS DATA NEEDS

Analysis Input Data by Segment

Data Category	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Segment 7 (French Camp Rd to Downing Ave) - Northbound PM													
Route Miles	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
No. of HOV Lanes Per Direction	0	0	0	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	696	716	786	833	881	932	979	1019	1067	1117	1166	1214	1264
Peak Period HOV (2) Lane Volume in Peak Direction	2020	2079	2268	2398	2542	2677	2814	2929	3067	3210	3351	3489	3632
Peak Hour HOV (3+) Lane Volume in Peak Direction	94	96	106	113	120	126	134	139	146	152	159	166	172
Peak Period HOV (3+) Lane Volume in Peak Direction	277	281	311	329	343	363	381	395	414	431	451	471	488
Peak Hour GP Lane Volume in Peak Direction	5182	5330	5850	6223	6593	6965	7336	7485	7670	7852	8035	8221	8406
Peak Period GP Lane Volume in Peak Direction	15085	15495	16933	17963	18982	20003	21023	21450	21980	22502	23026	23559	24090
Daily GP Lane + HOV Volume	57000	61592	67331	73071	78811	84550	90290	90775	91381	91988	92594	93201	93807
Total Peak Hour (GP +HOV)	5972	6142	6742	7169	7594	8023	8449	8643	8883	9121	9360	9601	9842
Total Peak Period (GP+HOV)	17382	17855	19512	20690	21867	23043	24218	24774	25461	26143	26828	27519	28210
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Segment 7 (Downing Ave to French Camp Rd) - Southbound AM													
Route Miles	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
No. of HOV Lanes Per Direction	0	0	0	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	436	477	564	633	703	773	843	899	969	1040	1109	1179	1249
Peak Period HOV (2) Lane Volume in Peak Direction	1244	1351	1589	1783	1969	2162	2353	2509	2705	2903	3095	3291	3486
Peak Hour HOV (3+) Lane Volume in Peak Direction	50	52	62	71	77	86	94	100	108	115	123	131	139
Peak Period HOV (3+) Lane Volume in Peak Direction	139	147	178	197	218	240	263	280	302	321	343	365	388
Peak Hour GP Lane Volume in Peak Direction	2628	2847	3375	3795	4208	4625	5040	5494	6065	6630	7194	7765	8333
Peak Period GP Lane Volume in Peak Direction	7464	8085	9515	10658	11798	12935	14072	15340	16934	18512	20087	21682	23268
Daily GP Lane + HOV Volume	57000	61592	67331	73071	78811	84550	90290	90775	91381	91988	92594	93201	93807
Total Peak Hour (GP +HOV)	3114	3376	4001	4499	4988	5484	5977	6493	7142	7785	8426	9075	9721
Total Peak Period (GP+HOV)	8847	9583	11282	12638	13985	15337	16688	18129	19941	21736	23525	25338	27142
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

I-5 HOT LANES - TRANSPORTATION ANALYSIS DATA NEEDS

Analysis Input Data by Segment

Data Category	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Segment 8 (El Dorado St to French Camp Rd) - Northbound PM													
Route Miles	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
No. of HOV Lanes Per Direction	0	0	0	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	584	604	671	718	764	816	861	899	947	996	1044	1092	1139
Peak Period HOV (2) Lane Volume in Peak Direction	1695	1754	1936	2067	2205	2344	2475	2584	2722	2863	3000	3138	3273
Peak Hour HOV (3+) Lane Volume in Peak Direction	79	80	91	97	104	109	118	123	130	136	142	149	156
Peak Period HOV (3+) Lane Volume in Peak Direction	233	234	267	282	297	314	335	349	369	386	403	423	443
Peak Hour GP Lane Volume in Peak Direction	4339	4481	4994	5360	5723	6086	6449	6616	6823	7027	7232	7440	7646
Peak Period GP Lane Volume in Peak Direction	12631	13027	14455	15472	16477	17479	18481	18959	19553	20137	20725	21321	21912
Daily GP Lane + HOV Volume	55000	58004	61758	65513	69267	73022	76776	77587	78600	79614	80627	81641	82654
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Segment 8 (French Camp Rd to El Dorado St) - Southbound AM													
Route Miles	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
No. of HOV Lanes Per Direction	0	0	0	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	303	343	428	493	561	629	698	753	822	890	957	1025	1093
Peak Period HOV (2) Lane Volume in Peak Direction	864	971	1206	1389	1571	1760	1948	2102	2294	2484	2671	2861	3051
Peak Hour HOV (3+) Lane Volume in Peak Direction	36	37	47	56	62	71	79	84	91	99	106	114	122
Peak Period HOV (3+) Lane Volume in Peak Direction	100	105	135	155	176	198	221	235	254	276	296	318	340
Peak Hour GP Lane Volume in Peak Direction	1830	2039	2553	2963	3362	3767	4167	4629	5210	5783	6357	6938	7515
Peak Period GP Lane Volume in Peak Direction	5197	5790	7198	8321	9426	10535	11634	12924	14547	16147	17750	19372	20983
Daily GP Lane + HOV Volume	55000	58004	61758	65513	69267	73022	76776	77587	78600	79614	80627	81641	82654
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

I-5 HOT LANES - TRANSPORTATION ANALYSIS DATA NEEDS

Analysis Input Data by Segment

Data Category	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065
Segment 9 (Lathrop Rd to El Dorado St) - Northbound PM													
Route Miles	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
No. of HOV Lanes Per Direction	0	0	0	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	541	564	635	686	736	791	840	881	932	984	1036	1087	1139
Peak Period HOV (2) Lane Volume in Peak Direction	1571	1638	1832	1975	2124	2272	2415	2532	2679	2828	2977	3124	3273
Peak Hour HOV (3+) Lane Volume in Peak Direction	74	75	86	92	100	105	114	121	128	134	141	148	155
Peak Period HOV (3+) Lane Volume in Peak Direction	218	219	252	268	285	302	324	343	363	380	400	420	440
Peak Hour GP Lane Volume in Peak Direction	4020	4184	4724	5117	5506	5898	6288	6479	6717	6953	7189	7428	7666
Peak Period GP Lane Volume in Peak Direction	11702	12164	13673	14770	15852	16939	18020	18567	19249	19925	20602	21287	21969
Daily GP Lane + HOV Volume	51500	53915	56933	59951	62969	65987	69005	70014	71276	72537	73798	75060	76321
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Segment 8 (El Dorado St to Lathrop Rd) - Southbound AM													
Route Miles	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
No. of HOV Lanes Per Direction	0	0	0	1	1	1	1	1	1	1	1	1	1
No. of General Purpose (GP) Lanes per Direction	3	3	3	3	3	3	3	3	3	3	3	3	3
Peak Hour HOV (2) Lane Volume in Peak Direction	243	293	389	466	546	625	706	771	851	931	1010	1090	1169
Peak Period HOV (2) Lane Volume in Peak Direction	693	830	1096	1312	1529	1748	1971	2152	2375	2598	2819	3042	3263
Peak Hour HOV (3+) Lane Volume in Peak Direction	29	31	42	53	60	71	80	86	95	103	112	121	130
Peak Period HOV (3+) Lane Volume in Peak Direction	81	88	121	147	170	198	223	241	265	288	313	338	362
Peak Hour GP Lane Volume in Peak Direction	1472	1737	2321	2800	3269	3744	4214	4703	5317	5925	6533	7147	7759
Peak Period GP Lane Volume in Peak Direction	4181	4933	6543	7864	9165	10471	11765	13131	14846	16544	18241	19956	21665
Daily GP Lane + HOV Volume	51500	53915	56933	59951	62969	65987	69005	70014	71276	72537	73798	75060	76321
Peak Hour Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Period Public Transportation Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Daily Public Transportation Vehicles	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percentage of Motorcycles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Taxis in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%
Peak Hour Percent of Low Emission Vehicles in Peak Direction	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%	< 1%

Appendi H: Summary of I-5 Traffic Conditions and Tolls

Low VOT with HOV 3+>1650 vph

Low VOT with HOV 3+>1400 vph

Project: I5 SJCOG
Segment: Hammer to Downing
Scenario: Unconstrained 2

Low Range Traffic Volumes

2015	Unconstrained Traffic Volumes		POET Forecasted Volumes (P Hr and Daily)				P Hr Travel Times (TT) (Peak Direction in Minutes)			Average Wee day PEA HOUR Toll		Estimated Annual Revenues
	GP	HOV 2	General Purpose	HOV 2 (Free)	Tolled Vehicles Pea	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB PM P	5,960	910	5,220	910	740	7,030	11	9	2	$ 0.05	$ 0.01	$ 100,000
SB AM P	3,960	730	3,520	730	440	4,210	9	9	0	$ 0.01	$ 0.00	$ 10,000
										Est. Annual Revenues		$ 110,000

2025	Unconstrained Traffic Volumes		POET Forecasted Volumes (P Hr and Daily)				P Hr Travel Times (TT) (Peak Direction in Minutes)			Average Wee day PEA HOUR Toll		Estimated Annual Revenues
	GP	HOV 2	General Purpose	HOV 2	Tolled Vehicles Pea	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB PM P	6,610	1,010	5,970	1,010	640	6,080	13	9	4	$ 0.16	$ 0.02	$ 260,000
SB AM P	4,930	910	4,380	910	550	5,230	11	10	1	$ 0.01	$ 0.00	$ 20,000
										Est. Annual Revenues		$ 280,000

2035	Unconstrained Traffic Volumes		POET Forecasted Volumes (P Hr and Daily)				P Hr Travel Times (TT) (Peak Direction in Minutes)			Average Wee day PEA HOUR Toll		Estimated Annual Revenues
	GP	HOV 2	General Purpose	HOV 2	Tolled Vehicles Pea	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB PM P	7,250	1,100	6,700	1,100	550	5,230	18	11	7	$ 0.30	$ 0.03	$ 460,000
SB AM P	5,900	1,100	5,350	1,100	550	4,660	13	11	2	$ 0.07	$ 0.01	$ 110,000
										Est. Annual Revenues		$ 570,000

2045	Unconstrained Traffic Volumes		POET Forecasted Volumes (P Hr and Daily)				P Hr Travel Times (TT) (Peak Direction in Minutes)			Average Wee day PEA HOUR Toll		Estimated Annual Revenues
	GP	HOV 2	General Purpose	HOV 2	Tolled Vehicles Pea	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB PM P	7,780	1,190	7,320	1,190	460	4,370	21	11	10	$ 0.44	$ 0.05	$ 620,000
SB AM P	6,970	1,260	6,580	1,260	390	3,700	17	11	6	$ 0.28	$ 0.03	$ 330,000
										Est. Annual Revenues		$ 950,000

2055	Unconstrained Traffic Volumes		POET Forecasted Volumes (P Hr and Daily)				P Hr Travel Times (TT) (Peak Direction in Minutes)			Average Wee day PEA HOUR Toll		Estimated Annual Revenues
	GP	HOV 2	General Purpose	HOV 2	Tolled Vehicles Pea	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB PM P	8,370	1,290	8,010	1,290	360	3,420	25	11	14	$ 0.63	$ 0.07	$ 700,000
SB AM P	7,990	1,500	7,840	1,500	150	1,430	24	11	13	$ 0.58	$ 0.07	$ 270,000
										Est. Annual Revenues		$ 970,000

2065	Unconstrained Traffic Volumes		POET Forecasted Volumes (P Hr and Daily)				P Hr Travel Times (TT) (Peak Direction in Minutes)			Average Wee day PEA HOUR Toll		Estimated Annual Revenues
	GP	HOV 2	General Purpose	HOV 2	Tolled Vehicles Pea	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB PM P	8,960	1,390	8,700	1,390	260	2,470	30	11	19	$ 0.86	$ 0.10	$ 680,000
SB AM P	8,620	1,630	4,807	1,630	20	190	29	11	18	$ 0.83	$ 0.10	$ 50,000
										Est. Annual Revenues		$ 730,000

Notes:
The analysis used simple average of the four segments rather than weighted average.
VOT = $11.20
Total annual revenue estimates are rounded to the nearest 1,000.

Project: I5 SJCOG
Segment: Hammer to Downing
Scenario: Unconstrained 2

High Range Traffic Volumes

2015	Unconstrained Traffic Volumes		POET Forecasted Volumes (P Hr and Daily)				P Hr Travel Times (TT) (Peak Direction in Minutes)			Average Wee day PEA HOUR Toll		Estimated Annual Revenues
	GP	HOV 2	General Purpose	HOV 2 (Free)	Tolled Vehicles Pea	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB PM P	7,150	1,090	6,590	1,090	560	5,320	17	11	6	$ 0.31	$ 0.04	$ 430,000
SB AM P	5,680	1,050	5,080	1,050	600	5,700	12	11	1	$ 0.04	$ 0.00	$ 50,000
										Est. Annual Revenues		$ 480,000

2025	Unconstrained Traffic Volumes		POET Forecasted Volumes (P Hr and Daily)				P Hr Travel Times (TT) (Peak Direction in Minutes)			Average Wee day PEA HOUR Toll		Estimated Annual Revenues
	GP	HOV 2	General Purpose	HOV 2	Tolled Vehicles Pea	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB PM P	7,850	1,190	7,390	1,190	460	4,370	21	11	10	$ 0.51	$ 0.06	$ 590,000
SB AM P	6,470	1,200	6,020	1,200	450	4,280	15	11	4	$ 0.19	$ 0.02	$ 220,000
										Est. Annual Revenues		$ 810,000

2035	Unconstrained Traffic Volumes		POET Forecasted Volumes (P Hr and Daily)				P Hr Travel Times (TT) (Peak Direction in Minutes)			Average Wee day PEA HOUR Toll		Estimated Annual Revenues
	GP	HOV 2	General Purpose	HOV 2	Tolled Vehicles Pea	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB PM P	8,540	1,300	8,190	1,300	350	3,330	26	11	15	$ 0.83	$ 0.10	$ 810,000
SB AM P	7,620	1,420	7,390	1,420	230	2,190	21	11	10	$ 0.55	$ 0.06	$ 350,000
										Est. Annual Revenues		$ 1,160,000

2045	Unconstrained Traffic Volumes		POET Forecasted Volumes (P Hr and Daily)				P Hr Travel Times (TT) (Peak Direction in Minutes)			Average Wee day PEA HOUR Toll		Estimated Annual Revenues
	GP	HOV 2	General Purpose	HOV 2	Tolled Vehicles Pea	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB PM P	8,870	1,390	8,610	1,390	260	2,470	29	11	18	$ 0.99	$ 0.12	$ 790,000
SB AM P	7,940	1,610	7,900	1,610	40	380	24	11	13	$ 0.72	$ 0.08	$ 90,000
										Est. Annual Revenues		$ 880,000

2055	Unconstrained Traffic Volumes		POET Forecasted Volumes (P Hr and Daily)				P Hr Travel Times (TT) (Peak Direction in Minutes)			Average Wee day PEA HOUR Toll		Estimated Annual Revenues
	GP	HOV 2	General Purpose	HOV 2	Tolled Vehicles Pea	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB PM P	9,890	1,450	9,690	1,450	200	3,420	38	11	27	$ 1.49	$ 0.17	$ 910,000
SB AM P *	8,290	1,830	8,470	290	1,360	12,870	28	11	17	$ 0.93	$ 0.11	$ 3,870,000
										Est. Annual Revenues		$ 4,780,000

* Shift to HOV 3+

2065	Unconstrained Traffic Volumes		POET Forecasted Volumes (P Hr and Daily)				P Hr Travel Times (TT) (Peak Direction in Minutes)			Average Wee day PEA HOUR Toll		Estimated Annual Revenues
	GP	HOV 2	General Purpose	HOV 2	Tolled Vehicles Pea	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB PM P	10,810	1,570	10,730	1,570	80	760	49	11	38	$ 2.11	$ 0.25	$ 520,000
SB AM P *	8,650	2,040	9,040	320	1,330	12,630	32	11	21	$ 1.18	$ 0.14	$ 4,800,000
										Est. Annual Revenues		$ 5,320,000

Notes:
The analysis used simple average of the four segments rather than weighted average.
VOT = $11.20
Total annual revenue estimates are rounded to the nearest 1,000.

Project:	I-5 North	*Distance*	*8.6*
Segment:	Hammer to Downing	*No. Lanes*	*3 GP + 1 HOV*
Scenario:	Shift to HOV 3+ when HOV2+ > 1400vph, Low Volume Range		

LOW VOL RANGE

2045	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB AM Pk	7,780	1,190	7,320	1,190	460	4,370	21	11	10	$ 0.50	$ 0.06	$ 680,000
SB PM Pk	8,079	151	6,580	151	1,499	14,241	17	11	6	$ 0.26	$ 0.03	$ 1,152,000
						18,611				*Est. Annual Revenues*		*$ 1,830,000*

2055	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 3+	General Purpose	HOV 3+ (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB AM Pk	9,505	155	8,010	155	1,495	14,203	25	11	14	$ 0.59	$ 0.07	$ 2,633,000
SB PM Pk	9,310	180	7,840	180	1,470	13,965	24	11	13	$ 0.55	$ 0.06	$ 2,384,000
						28,168				*Est. Annual Revenues*		*$ 5,020,000*

2065	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 3+	General Purpose	HOV 3+ (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB AM Pk	10,183	167	8,700	167	1,483	14,089	30	11	19	$ 0.80	$ 0.09	$ 3,538,000
SB PM Pk	10,054	196	8,600	196	1,454	13,813	29	11	18	$ 0.77	$ 0.09	$ 3,326,000
						27,902				*Est. Annual Revenues*		*$ 6,860,000*

Notes:
The analysis used simple average of the four segments rather than weighted average.
Forced HOV 3+ if HOV volumes were grater than 1400 vph but less than 1650 vph.
VOT = $11.20
Gray cells indicate that HOV3+ was not forced. Thus, numbers reported are same as HOV 3+ >1650 vph.
Total annual revenue estimates are rounded to the nearest 1,000.

Project:	I-5 North	*Distance*	*8.6*
Segment:	Hammer to Downing	*No. Lanes*	*3 GP + 1 HOV*
Scenario:	Shift to HOV 3+ when HOV2+ > 1400vph, High Volume Range		

HIGH VOL RANGE

2045	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV	General Purpose	HOV (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB AM Pk	1,340	8,980	8,670	1,340	310	2,975			-	$ 0.79	$ 0.09	$ 731,000
SB PM Pk	9,357	193	7,900	193	1,457	13,842	24	11	13	$ 0.56	$ 0.07	$ 2,434,000
						16,817				*Est. Annual Revenues*		*$ 3,170,000*

2055	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 3+	General Purpose	HOV 3+ (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB AM Pk	11,166	174	9,690	174	1,476	14,022	38	11	27	$ 1.17	$ 0.14	$ 5,130,000
SB PM Pk	9,900	220	8,470	220	1,430	13,585	28	11	17	$ 0.73	$ 0.08	$ 3,095,000
						27,607				*Est. Annual Revenues*		*$ 8,230,000*

2065	Unconstrained Traffic Volumes		POET Forecasted Volumes (Pk Hr and Daily)				Pk Hr Travel Times (TT) (Peak Direction in Minutes)			Average Weekday PEAK HOUR Toll		Estimated Annual Revenues
	GP	HOV 3+	General Purpose	HOV 3+ (Free)	Tolled Vehicles Peak	Tolled Vehicles Daily	GP	HOT	Savings	Per Vehicle	Per Mile	
NB AM Pk	12,192	188	10,730	188	1,462	13,899	49	11	38	$ 1.65	$ 0.19	$ 7,150,000
SB PM Pk	10,982	198	9,530	198	1,452	13,794	37	11	26	$ 1.11	$ 0.13	$ 4,771,000
						27,693				*Est. Annual Revenues*		*$ 11,920,000*

Notes:
The analysis used simple average of the four segments rather than weighted average.
Forced HOV 3+ if HOV volumes were grater than 1400 vph but less than 1650 vph.
VOT = $11.20
Gray cells indicate that HOV3+ was not forced. Thus, numbers reported are same as HOV 3+ >1650 vph.
Total annual revenue estimates are rounded to the nearest 1,000.

Appendix I: I-5 HOT Lane Economic Benefit Analysis

Sensitivity Analysis including the following:

Low, High or Blended VOT

HOV 3+>1400 vph or HOV 3+ 1650 vph

Start in 2020 or start in 2030

San Joaquin COG I-5 North HOT Lane Study
Northbound, Low Traffic Volumes, Low VOT

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, Low Traffic Volumes, Low VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 100,000	$ 116,000	$ 132,000	$ 148,000	$ 164,000	$ 180,000	$ 196,000	$ 212,000	$ 228,000	$ 244,000	$ 260,000	$ 280,000	$ 300,000	$ 320,000
Est. Daily Users (Veh)	7,030	6,900	6,800	6,700	6,600	6,500	6,400	6,300	6,200	6,100	6,100	6,000	5,900	5,800
Est Annual User (Veh)	1,959,600	1,923,400	1,895,500	1,867,600	1,839,800	1,811,900	1,784,000	1,756,100	1,728,300	1,700,400	1,700,400	1,672,500	1,644,600	1,616,800
(# of New Transponders)	4,218	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0
(# of Replacement Xsponders)	-	0	0	0	0	0	4,218	0	0	0	0	0	4,158	0
(Total # of New Transponders)	4,218	0	0	0	0	0	4,158	0	0	0	0	0	4,098	0
Beginning Balance	0	(1,311,000)	(2,522,000)	(3,711,000)	(4,877,000)	(6,021,000)	(7,143,000)	(8,318,000)	(9,396,000)	(10,452,000)	(11,486,000)	(12,504,000)	(13,496,000)	(14,536,000)
Annual Revenue	100,000	116,000	132,000	148,000	164,000	180,000	196,000	212,000	228,000	244,000	260,000	280,000	300,000	320,000
E penses														
User Fee (per X-Action)	419,400	411,600	405,600	399,700	393,700	387,700	381,800	375,800	369,900	363,900	363,900	357,900	351,900	346,000
Financing Fee (User Fee)	9,230	9,060	8,920	8,790	8,660	8,530	8,400	8,270	8,140	8,010	8,010	7,870	7,740	7,610
Transponder (Every 6 Yrs)	76,000	0	0	0	0	0	75,000	0	0	0	0	0	74,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,411,000	1,327,000	1,321,000	1,314,000	1,308,000	1,302,000	1,371,000	1,290,000	1,284,000	1,278,000	1,278,000	1,272,000	1,340,000	1,260,000
Ending Balance	(1,311,000)	(2,522,000)	(3,711,000)	(4,877,000)	(6,021,000)	(7,143,000)	(8,318,000)	(9,396,000)	(10,452,000)	(11,486,000)	(12,504,000)	(13,496,000)	(14,536,000)	(15,476,000)

San Joaquin COG I-5 North HOT Lane Study

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, Low Traffic Volumes, Low VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 100,000	$ 116,000	$ 132,000	$ 148,000	$ 164,000	$ 180,000	$ 196,000	$ 212,000	$ 228,000	$ 244,000	$ 260,000	$ 280,000	$ 300,000	$ 320,000
Est. Daily Users (Veh)	7,030	6,900	6,800	6,700	6,600	6,500	6,400	6,300	6,200	6,100	6,100	6,000	5,900	5,800
Est Annual User (Veh)	1,959,600	1,923,400	1,895,500	1,867,600	1,839,800	1,811,900	1,784,000	1,756,100	1,728,300	1,700,400	1,700,400	1,672,500	1,644,600	1,616,800
(# of New Transponders)	4,218	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0
(# of Replacement Xsponders)	-	0	0	0	0	0	4,218	0	0	0	0	0	4,158	0
(Total # of New Transponders)	4,218	0	0	0	0	0	4,158	0	0	0	0	0	4,098	0
Beginning Balance	0	(1,311,000)	(2,522,000)	(3,711,000)	(4,877,000)	(6,021,000)	(7,143,000)	(8,318,000)	(9,396,000)	(10,452,000)	(11,486,000)	(12,504,000)	(13,496,000)	(14,536,000)
Annual Revenue	100,000	116,000	132,000	148,000	164,000	180,000	196,000	212,000	228,000	244,000	260,000	280,000	300,000	320,000
E penses														
User Fee (per X-Action)	419,400	411,600	405,600	399,700	393,700	387,700	381,800	375,800	369,900	363,900	363,900	357,900	351,900	346,000
Financing Fee (User Fee)	9,230	9,060	8,920	8,790	8,660	8,530	8,400	8,270	8,140	8,010	8,010	7,870	7,740	7,610
Transponder (Every 6 Yrs)	76,000	0	0	0	0	0	75,000	0	0	0	0	0	74,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,411,000	1,327,000	1,321,000	1,314,000	1,308,000	1,302,000	1,371,000	1,290,000	1,284,000	1,278,000	1,278,000	1,272,000	1,340,000	1,260,000
Ending Balance	(1,311,000)	(2,522,000)	(3,711,000)	(4,877,000)	(6,021,000)	(7,143,000)	(8,318,000)	(9,396,000)	(10,452,000)	(11,486,000)	(12,504,000)	(13,496,000)	(14,536,000)	(15,476,000)

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, Low Traffic Volumes, High VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 340,000	$ 360,000	$ 380,000	$ 400,000	$ 420,000	$ 440,000	$ 460,000	$ 476,000	$ 492,000	$ 508,000	$ 524,000	$ 540,000	$ 556,000	$ 572,000	$ 588,000	$ 604,000	$ 620,000	$ 628,000	$ 636,000
5,700	5,600	5,500	5,400	5,300	5,200	5,230	5,100	5,000	4,900	4,800	4,700	4,600	4,500	4,400	4,300	4,370	4,300	4,200
1,588,900	1,561,000	1,533,100	1,505,300	1,477,400	1,449,500	1,457,900	1,421,600	1,393,800	1,365,900	1,338,000	1,310,100	1,282,300	1,254,400	1,226,500	1,198,600	1,218,100	1,198,600	1,170,800
0	0	0	0	(60)	0	18	0	0	0	(60)	0	0	0	0	0	42	0	0
0	0	0	0	4,098	0	0	0	0	0	4,038	0	18	0	0	0	3,978	0	18
0	0	0	0	4,038	0	18	0	0	0	3,978	0	18	0	0	0	4,020	0	18
(15,476,000)	(16,389,000)	(17,276,000)	(18,137,000)	(18,972,000)	(19,854,000)	(20,637,000)	(21,402,000)	(22,143,000)	(22,862,000)	(23,559,000)	(24,306,000)	(24,959,000)	(25,589,000)	(26,197,000)	(26,783,000)	(27,347,000)	(27,971,000)	(28,511,000)
340,000	360,000	380,000	400,000	420,000	440,000	460,000	476,000	492,000	508,000	524,000	540,000	556,000	572,000	588,000	604,000	620,000	628,000	636,000
340,000	334,100	328,100	322,100	316,200	310,200	312,000	304,200	298,300	292,300	286,300	280,400	274,400	268,400	262,500	256,500	260,700	256,500	250,600
7,480	7,350	7,220	7,090	6,960	6,820	6,860	6,690	6,560	6,430	6,300	6,170	6,040	5,900	5,780	5,640	5,740	5,640	5,510
0	0	0	0	73,000	0	0	0	0	0	72,000	0	0	0	0	0	72,000	0	0
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,253,000	1,247,000	1,241,000	1,235,000	1,302,000	1,223,000	1,225,000	1,217,000	1,211,000	1,205,000	1,271,000	1,193,000	1,186,000	1,180,000	1,174,000	1,168,000	1,244,000	1,168,000	1,162,000
(16,389,000)	(17,276,000)	(18,137,000)	(18,972,000)	(19,854,000)	(20,637,000)	(21,402,000)	(22,143,000)	(22,862,000)	(23,559,000)	(24,306,000)	(24,959,000)	(25,589,000)	(26,197,000)	(26,783,000)	(27,347,000)	(27,971,000)	(28,511,000)	(29,037,000)

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, Low Traffic Volumes, High VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 340,000	$ 360,000	$ 380,000	$ 400,000	$ 420,000	$ 440,000	$ 460,000	$ 476,000	$ 492,000	$ 508,000	$ 524,000	$ 540,000	$ 556,000	$ 572,000	$ 588,000	$ 604,000	$ 620,000	$ 821,000	$ 1,022,000
5,700	5,600	5,500	5,400	5,300	5,200	5,230	5,100	5,000	4,900	4,800	4,700	4,600	4,500	4,400	4,300	4,370	5,400	6,400
1,588,900	1,561,000	1,533,100	1,505,300	1,477,400	1,449,500	1,457,900	1,421,600	1,393,800	1,365,900	1,338,000	1,310,100	1,282,300	1,254,400	1,226,500	1,198,600	1,218,100	1,505,300	1,784,000
0	0	0	0	(60)	0	18	0	0	0	(60)	0	0	0	0	0	42	618	600
0	0	0	0	4,098	0	0	0	0	0	4,038	0	18	0	0	0	3,978	0	18
0	0	0	0	4,038	0	18	0	0	0	3,978	0	18	0	0	0	4,020	618	618
(15,476,000)	(16,389,000)	(17,276,000)	(18,137,000)	(18,972,000)	(19,854,000)	(20,637,000)	(21,402,000)	(22,143,000)	(22,862,000)	(23,559,000)	(24,306,000)	(24,959,000)	(25,589,000)	(26,197,000)	(26,783,000)	(27,347,000)	(27,971,000)	(28,396,000)
340,000	360,000	380,000	400,000	420,000	440,000	460,000	476,000	492,000	508,000	524,000	540,000	556,000	572,000	588,000	604,000	620,000	821,000	1,022,000
340,000	334,100	328,100	322,100	316,200	310,200	312,000	304,200	298,300	292,300	286,300	280,400	274,400	268,400	262,500	256,500	260,700	322,100	381,800
7,480	7,350	7,220	7,090	6,960	6,820	6,860	6,690	6,560	6,430	6,300	6,170	6,040	5,900	5,780	5,640	5,740	7,090	8,400
0	0	0	0	73,000	0	0	0	0	0	72,000	0	0	0	0	0	72,000	11,000	11,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,253,000	1,247,000	1,241,000	1,235,000	1,302,000	1,223,000	1,225,000	1,217,000	1,211,000	1,205,000	1,271,000	1,193,000	1,186,000	1,180,000	1,174,000	1,168,000	1,244,000	1,246,000	1,307,000
(16,389,000)	(17,276,000)	(18,137,000)	(18,972,000)	(19,854,000)	(20,637,000)	(21,402,000)	(22,143,000)	(22,862,000)	(23,559,000)	(24,306,000)	(24,959,000)	(25,589,000)	(26,197,000)	(26,783,000)	(27,347,000)	(27,971,000)	(28,396,000)	(28,681,000)

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, Low Traffic Volumes, High VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 644,000	$ 652,000	$ 660,000	$ 668,000	$ 676,000	$ 684,000	$ 692,000	$ 700,000	$ 698,000	$ 696,000	$ 694,000	$ 692,000	$ 690,000	$ 688,000	$ 686,000	$ 684,000	$ 682,000	$ 680,000
4,100	4,000	3,900	3,800	3,700	3,600	3,500	3,420	3,300	3,200	3,100	3,000	2,900	2,800	2,700	2,600	2,500	2,470
1,142,900	1,115,000	1,087,100	1,059,300	1,031,400	1,003,500	975,600	953,300	919,900	892,000	864,100	836,300	808,400	780,500	752,600	724,800	696,900	688,500
0	0	0	(60)	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0	0
0	0	0	4,020	0	18	0	0	0	3,960	0	18	0	0	0	3,900	0	18
0	0	0	3,960	0	18	0	0	0	3,900	0	18	0	0	0	3,840	0	18
(29,037,000)	(29,549,000)	(30,047,000)	(30,531,000)	(31,072,000)	(31,528,000)	(31,969,000)	(32,396,000)	(32,810,000)	(33,219,000)	(33,694,000)	(34,095,000)	(34,492,000)	(34,885,000)	(35,274,000)	(35,659,000)	(36,109,000)	(36,485,000)
644,000	652,000	660,000	668,000	676,000	684,000	692,000	700,000	698,000	696,000	694,000	692,000	690,000	688,000	686,000	684,000	682,000	680,000
244,600	238,600	232,600	226,700	220,700	214,700	208,800	204,000	196,900	190,900	184,900	179,000	173,000	167,000	161,100	155,100	149,100	147,300
5,380	5,250	5,120	4,990	4,860	4,720	4,590	4,490	4,330	4,200	4,070	3,940	3,810	3,670	3,540	3,410	3,280	3,240
0	0	0	71,000	0	0	0	0	0	70,000	0	0	0	0	0	69,000	0	0
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,156,000	1,150,000	1,144,000	1,209,000	1,132,000	1,125,000	1,119,000	1,114,000	1,107,000	1,171,000	1,095,000	1,089,000	1,083,000	1,077,000	1,071,000	1,134,000	1,058,000	1,057,000
(29,549,000)	(30,047,000)	(30,531,000)	(31,072,000)	(31,528,000)	(31,969,000)	(32,396,000)	(32,810,000)	(33,219,000)	(33,694,000)	(34,095,000)	(34,492,000)	(34,885,000)	(35,274,000)	(35,659,000)	(36,109,000)	(36,485,000)	(36,862,000)

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, Low Traffic Volumes, High VOT)

Switch NB to HOV

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 1,223,000	$ 1,424,000	$ 1,625,000	$ 1,826,000	$ 2,027,000	$ 2,228,000	$ 2,429,000	$ 2,633,000	$ 2,724,000	$ 2,815,000	$ 2,906,000	$ 2,997,000	$ 3,088,000	$ 3,179,000	$ 3,270,000	$ 3,361,000	$ 3,452,000	$ 3,538,000
7,400	8,400	9,400	10,400	11,400	12,400	13,400	14,200	14,200	14,200	14,200	14,200	14,200	14,200	14,200	14,200	14,200	13,800
2,062,800	2,341,500	2,620,300	2,899,000	3,177,800	3,456,500	3,735,300	3,958,300	3,958,300	3,958,300	3,958,300	3,958,300	3,958,300	3,958,300	3,958,300	3,958,300	3,958,300	3,846,800
600	600	600	600	600	600	600	480	0	-	0	0	0	0	0	-	0	0
0	0	0	4,020	618	618	600	600	600	4,620	1218	1218	1200	1080	600	4,620	1218	1218
600	600	600	4,620	1218	1218	1200	1080	600	4,620	1218	1218	1200	1080	600	4,620	1218	1218
(28,681,000)	(28,826,000)	(28,831,000)	(28,696,000)	(28,493,000)	(28,089,000)	(27,545,000)	(26,861,000)	(26,019,000)	(25,078,000)	(24,118,000)	(23,006,000)	(21,803,000)	(20,509,000)	(19,121,000)	(17,634,000)	(16,128,000)	(14,470,000)
1,223,000	1,424,000	1,625,000	1,826,000	2,027,000	2,228,000	2,429,000	2,633,000	2,724,000	2,815,000	2,906,000	2,997,000	3,088,000	3,179,000	3,270,000	3,361,000	3,452,000	3,538,000
441,400	501,100	560,700	620,400	680,000	739,700	799,400	847,100	847,100	847,100	847,100	847,100	847,100	847,100	847,100	847,100	847,100	823,200
9,710	11,020	12,340	13,650	14,960	16,270	17,590	18,640	18,640	18,640	18,640	18,640	18,640	18,640	18,640	18,640	18,640	18,110
11,000	11,000	11,000	83,000	22,000	22,000	22,000	19,000	11,000	83,000	22,000	22,000	22,000	19,000	11,000	83,000	22,000	22,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,368,000	1,429,000	1,490,000	1,623,000	1,623,000	1,684,000	1,745,000	1,791,000	1,783,000	1,855,000	1,794,000	1,794,000	1,794,000	1,791,000	1,783,000	1,855,000	1,794,000	1,769,000
(28,826,000)	(28,831,000)	(28,696,000)	(28,493,000)	(28,089,000)	(27,545,000)	(26,861,000)	(26,019,000)	(25,078,000)	(24,118,000)	(23,006,000)	(21,803,000)	(20,509,000)	(19,121,000)	(17,634,000)	(16,128,000)	(14,470,000)	(12,701,000)

San Joaquin COG I-5 North HOT Lane Study
Northbound, Low Traffic Voulmues, SJ Co. High VOT

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, Low Traffic Volumes, High VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 124,000	$ 144,000	$ 164,000	$ 184,000	$ 204,000	$ 224,000	$ 244,000	$ 264,000	$ 284,000	$ 304,000	$ 322,000	$ 342,000	$ 362,000	$ 382,000
Est. Daily Users (Veh)	7,000	6,900	6,800	6,700	6,600	6,500	6,400	6,300	6,200	6,100	6,100	6,000	5,900	5,800
Est Annual User (Veh)	1,951,300	1,923,400	1,895,500	1,867,600	1,839,800	1,811,900	1,784,000	1,756,100	1,728,300	1,700,400	1,700,400	1,672,500	1,644,600	1,616,800
(# of New Transponders)	4,200	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0
(# of Replacement Xsponders)	-	0	0	0	0	0	4,200	0	0	0	0	0	4,140	0
(Total # of New Transponders)	4,200	0	0	0	0	0	4,140	0	0	0	0	0	4,080	0
Beginning Balance	0	(1,285,000)	(2,468,000)	(3,625,000)	(4,755,000)	(5,859,000)	(6,937,000)	(8,064,000)	(9,090,000)	(10,090,000)	(11,064,000)	(12,020,000)	(12,950,000)	(13,927,000)
Annual Revenue	124,000	144,000	164,000	184,000	204,000	224,000	244,000	264,000	284,000	304,000	322,000	342,000	362,000	382,000
E penses														
User Fee (per X-Action)	417,600	411,600	405,600	399,700	393,700	387,700	381,800	375,800	369,900	363,900	363,900	357,900	351,900	346,000
Financing Fee (User Fee)	9,190	9,060	8,920	8,790	8,660	8,530	8,400	8,270	8,140	8,010	8,010	7,870	7,740	7,610
Transponder (Every 6 Yrs)	76,000	0	0	0	0	0	75,000	0	0	0	0	0	73,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,409,000	1,327,000	1,321,000	1,314,000	1,308,000	1,302,000	1,371,000	1,290,000	1,284,000	1,278,000	1,278,000	1,272,000	1,339,000	1,260,000
Ending Balance	(1,285,000)	(2,468,000)	(3,625,000)	(4,755,000)	(5,859,000)	(6,937,000)	(8,064,000)	(9,090,000)	(10,090,000)	(11,064,000)	(12,020,000)	(12,950,000)	(13,927,000)	(14,805,000)

San Joaquin COG I-5 North HOT Lane Study

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, Low Traffic Volumes, High VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 124,000	$ 144,000	$ 164,000	$ 184,000	$ 204,000	$ 224,000	$ 244,000	$ 264,000	$ 284,000	$ 304,000	$ 322,000	$ 342,000	$ 362,000	$ 382,000
Est. Daily Users (Veh)	7,000	6,900	6,800	6,700	6,600	6,500	6,400	6,300	6,200	6,100	6,100	6,000	5,900	5,800
Est Annual User (Veh)	1,951,300	1,923,400	1,895,500	1,867,600	1,839,800	1,811,900	1,784,000	1,756,100	1,728,300	1,700,400	1,700,400	1,672,500	1,644,600	1,616,800
(# of New Transponders)	4,200	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0
(# of Replacement Xsponders)	-	0	0	0	0	0	4,200	0	0	0	0	0	4,140	0
(Total # of New Transponders)	4,200	0	0	0	0	0	4,140	0	0	0	0	0	4,080	0
Beginning Balance	0	(1,285,000)	(2,468,000)	(3,625,000)	(4,755,000)	(5,859,000)	(6,937,000)	(8,064,000)	(9,090,000)	(10,090,000)	(11,064,000)	(12,020,000)	(12,950,000)	(13,927,000)
Annual Revenue	124,000	144,000	164,000	184,000	204,000	224,000	244,000	264,000	284,000	304,000	322,000	342,000	362,000	382,000
E penses														
User Fee (per X-Action)	417,600	411,600	405,600	399,700	393,700	387,700	381,800	375,800	369,900	363,900	363,900	357,900	351,900	346,000
Financing Fee (User Fee)	9,190	9,060	8,920	8,790	8,660	8,530	8,400	8,270	8,140	8,010	8,010	7,870	7,740	7,610
Transponder (Every 6 Yrs)	76,000	0	0	0	0	0	75,000	0	0	0	0	0	73,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,409,000	1,327,000	1,321,000	1,314,000	1,308,000	1,302,000	1,371,000	1,290,000	1,284,000	1,278,000	1,278,000	1,272,000	1,339,000	1,260,000
Ending Balance	(1,285,000)	(2,468,000)	(3,625,000)	(4,755,000)	(5,859,000)	(6,937,000)	(8,064,000)	(9,090,000)	(10,090,000)	(11,064,000)	(12,020,000)	(12,950,000)	(13,927,000)	(14,805,000)

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, Low Traffic Volumes, High VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 402,000	$ 422,000	$ 442,000	$ 462,000	$ 482,000	$ 502,000	$ 570,000	$ 590,000	$ 610,000	$ 630,000	$ 650,000	$ 670,000	$ 690,000	$ 710,000	$ 730,000	$ 750,000	$ 769,000	$ 779,000	$ 789,000
5,700	5,600	5,500	5,400	5,300	5,200	5,200	5,100	5,000	4,900	4,800	4,700	4,600	4,500	4,400	4,300	4,400	4,300	4,200
1,588,900	1,561,000	1,533,100	1,505,300	1,477,400	1,449,500	1,449,500	1,421,600	1,393,800	1,365,900	1,338,000	1,310,100	1,282,300	1,254,400	1,226,500	1,198,600	1,226,500	1,198,600	1,170,800
0	0	0	0	(60)	0	0	0	0	0	(60)	0	0	0	0	0	60	0	0
0	0	0	0	4,080	0	0	0	0	0	4,020	0	0	0	0	0	3,960	0	0
0	0	0	0	4,020	0	0	0	0	0	3,960	0	0	0	0	0	4,020	0	0
(14,805,000)	(15,656,000)	(16,481,000)	(17,280,000)	(18,053,000)	(18,872,000)	(19,593,000)	(20,246,000)	(20,873,000)	(21,474,000)	(22,049,000)	(22,669,000)	(23,192,000)	(23,688,000)	(24,158,000)	(24,602,000)	(25,020,000)	(25,497,000)	(25,886,000)
402,000	422,000	442,000	462,000	482,000	502,000	570,000	590,000	610,000	630,000	650,000	670,000	690,000	710,000	730,000	750,000	769,000	779,000	789,000
340,000	334,100	328,100	322,100	316,200	310,200	310,200	304,200	298,300	292,300	286,300	280,400	274,400	268,400	262,500	256,500	262,500	256,500	250,600
7,480	7,350	7,220	7,090	6,960	6,820	6,820	6,690	6,560	6,430	6,300	6,170	6,040	5,900	5,780	5,640	5,780	5,640	5,510
0	0	0	0	72,000	0	0	0	0	0	71,000	0	0	0	0	0	72,000	0	0
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,253,000	1,247,000	1,241,000	1,235,000	1,301,000	1,223,000	1,223,000	1,217,000	1,211,000	1,205,000	1,270,000	1,193,000	1,186,000	1,180,000	1,174,000	1,168,000	1,246,000	1,168,000	1,162,000
(15,656,000)	(16,481,000)	(17,280,000)	(18,053,000)	(18,872,000)	(19,593,000)	(20,246,000)	(20,873,000)	(21,474,000)	(22,049,000)	(22,669,000)	(23,192,000)	(23,688,000)	(24,158,000)	(24,602,000)	(25,020,000)	(25,497,000)	(25,886,000)	(26,259,000)

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, Low Traffic Volumes, High VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 402,000	$ 422,000	$ 442,000	$ 462,000	$ 482,000	$ 502,000	$ 570,000	$ 590,000	$ 610,000	$ 630,000	$ 650,000	$ 670,000	$ 690,000	$ 710,000	$ 730,000	$ 750,000	$ 769,000	$ 1,019,000	$ 1,269,000
5,700	5,600	5,500	5,400	5,300	5,200	5,200	5,100	5,000	4,900	4,800	4,700	4,600	4,500	4,400	4,300	4,400	5,400	6,400
1,588,900	1,561,000	1,533,100	1,505,300	1,477,400	1,449,500	1,449,500	1,421,600	1,393,800	1,365,900	1,338,000	1,310,100	1,282,300	1,254,400	1,226,500	1,198,600	1,226,500	1,505,300	1,784,000
0	0	0	0	(60)	0	0	0	0	0	(60)	0	0	0	0	0	60	600	600
0	0	0	0	4,080	0	0	0	0	0	4,020	0	0	0	0	0	3,960	0	0
0	0	0	0	4,020	0	0	0	0	0	3,960	0	0	0	0	0	4,020	600	600
(14,805,000)	(15,656,000)	(16,481,000)	(17,280,000)	(18,053,000)	(18,872,000)	(19,593,000)	(20,246,000)	(20,873,000)	(21,474,000)	(22,049,000)	(22,669,000)	(23,192,000)	(23,688,000)	(24,158,000)	(24,602,000)	(25,020,000)	(25,497,000)	(25,724,000)
402,000	422,000	442,000	462,000	482,000	502,000	570,000	590,000	610,000	630,000	650,000	670,000	690,000	710,000	730,000	750,000	769,000	1,019,000	1,269,000
340,000	334,100	328,100	322,100	316,200	310,200	310,200	304,200	298,300	292,300	286,300	280,400	274,400	268,400	262,500	256,500	262,500	322,100	381,800
7,480	7,350	7,220	7,090	6,960	6,820	6,820	6,690	6,560	6,430	6,300	6,170	6,040	5,900	5,780	5,640	5,780	7,090	8,400
0	0	0	0	72,000	0	0	0	0	0	71,000	0	0	0	0	0	72,000	11,000	11,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,253,000	1,247,000	1,241,000	1,235,000	1,301,000	1,223,000	1,223,000	1,217,000	1,211,000	1,205,000	1,270,000	1,193,000	1,186,000	1,180,000	1,174,000	1,168,000	1,246,000	1,246,000	1,307,000
(15,656,000)	(16,481,000)	(17,280,000)	(18,053,000)	(18,872,000)	(19,593,000)	(20,246,000)	(20,873,000)	(21,474,000)	(22,049,000)	(22,669,000)	(23,192,000)	(23,688,000)	(24,158,000)	(24,602,000)	(25,020,000)	(25,497,000)	(25,724,000)	(25,762,000)

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, Low Traffic Volumes, High VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 799,000	$ 809,000	$ 819,000	$ 829,000	$ 839,000	$ 849,000	$ 859,000	$ 868,000	$ 865,500	$ 863,000	$ 860,500	$ 858,000	$ 855,500	$ 853,000	$ 850,500	$ 848,000	$ 845,500	$ 843,000
4,100	4,000	3,900	3,800	3,700	3,600	3,500	3,400	3,300	3,200	3,100	3,000	2,900	2,800	2,700	2,600	2,500	2,500
1,142,900	1,115,000	1,087,100	1,059,300	1,031,400	1,003,500	975,600	947,800	919,900	892,000	864,100	836,300	808,400	780,500	752,600	724,800	696,900	696,900
0	0	0	(60)	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0	0
0	0	0	4,020	0	0	0	0	0	3,960	0	0	0	0	0	3,900	0	0
0	0	0	3,960	0	0	0	0	0	3,900	0	0	0	0	0	3,840	0	0
(26,259,000)	(26,616,000)	(26,957,000)	(27,282,000)	(27,662,000)	(27,955,000)	(28,231,000)	(28,491,000)	(28,736,000)	(28,978,000)	(29,286,000)	(29,521,000)	(29,752,000)	(29,980,000)	(30,204,000)	(30,425,000)	(30,711,000)	(30,924,000)
799,000	809,000	819,000	829,000	839,000	849,000	859,000	868,000	865,500	863,000	860,500	858,000	855,500	853,000	850,500	848,000	845,500	843,000
244,600	238,600	232,600	226,700	220,700	214,700	208,800	202,800	196,900	190,900	184,900	179,000	173,000	167,000	161,100	155,100	149,100	149,100
5,380	5,250	5,120	4,990	4,860	4,720	4,590	4,460	4,330	4,200	4,070	3,940	3,810	3,670	3,540	3,410	3,280	3,280
0	0	0	71,000	0	0	0	0	0	70,000	0	0	0	0	0	69,000	0	0
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,156,000	1,150,000	1,144,000	1,209,000	1,132,000	1,125,000	1,119,000	1,113,000	1,107,000	1,171,000	1,095,000	1,089,000	1,083,000	1,077,000	1,071,000	1,134,000	1,058,000	1,058,000
(26,616,000)	(26,957,000)	(27,282,000)	(27,662,000)	(27,955,000)	(28,231,000)	(28,491,000)	(28,736,000)	(28,978,000)	(29,286,000)	(29,521,000)	(29,752,000)	(29,980,000)	(30,204,000)	(30,425,000)	(30,711,000)	(30,924,000)	(31,139,000)

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, Low Traffic Volumes, High VOT)

Switch NB to HOV 3+

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 1,519,000	$ 1,769,000	$ 2,019,000	$ 2,269,000	$ 2,519,000	$ 2,769,000	$ 3,019,000	$ 3,265,000	$ 3,377,200	$ 3,489,400	$ 3,601,600	$ 3,713,800	$ 3,826,000	$ 3,938,200	$ 4,050,400	$ 4,162,600	$ 4,274,800	$ 4,387,000
7,400	8,400	9,400	10,400	11,400	12,400	13,400	14,200	14,200	14,200	14,200	14,200	14,200	14,200	14,200	14,200	14,200	13,800
2,062,800	2,341,500	2,620,300	2,899,000	3,177,800	3,456,500	3,735,300	3,958,300	3,958,300	3,958,300	3,958,300	3,958,300	3,958,300	3,958,300	3,958,300	3,958,300	3,958,300	3,846,800
600	600	600	600	600	600	600	480	0	-	0	0	0	0	0	-	0	0
0	0	0	4,020	600	600	600	600	600	4,620	1200	1200	1200	1080	600	4,620	1200	1200
600	600	600	4,620	1200	1200	1200	1080	600	4,620	1200	1200	1200	1080	600	4,620	1200	1200
(25,762,000)	(25,611,000)	(25,271,000)	(24,742,000)	(24,096,000)	(23,200,000)	(22,115,000)	(20,841,000)	(19,367,000)	(17,773,000)	(16,139,000)	(14,331,000)	(12,411,000)	(10,379,000)	(8,232,000)	(5,965,000)	(3,657,000)	(1,176,000)
1,519,000	1,769,000	2,019,000	2,269,000	2,519,000	2,769,000	3,019,000	3,265,000	3,377,200	3,489,400	3,601,600	3,713,800	3,826,000	3,938,200	4,050,400	4,162,600	4,274,800	4,387,000
441,400	501,100	560,700	620,400	680,000	739,700	799,400	847,100	847,100	847,100	847,100	847,100	847,100	847,100	847,100	847,100	847,100	823,200
9,710	11,020	12,340	13,650	14,960	16,270	17,590	18,640	18,640	18,640	18,640	18,640	18,640	18,640	18,640	18,640	18,640	18,110
11,000	11,000	11,000	83,000	22,000	22,000	22,000	19,000	11,000	83,000	22,000	22,000	22,000	19,000	11,000	83,000	22,000	22,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,368,000	1,429,000	1,490,000	1,623,000	1,623,000	1,684,000	1,745,000	1,791,000	1,783,000	1,855,000	1,794,000	1,794,000	1,794,000	1,791,000	1,783,000	1,855,000	1,794,000	1,769,000
(25,611,000)	(25,271,000)	(24,742,000)	(24,096,000)	(23,200,000)	(22,115,000)	(20,841,000)	(19,367,000)	(17,773,000)	(16,139,000)	(14,331,000)	(12,411,000)	(10,379,000)	(8,232,000)	(5,965,000)	(3,657,000)	(1,176,000)	1,442,000

San Joaquin COG I-5 North HOT Lane Study
Northbound, Low Traffic Voulmues, Blended Bay Area and Sacto VOT

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, Low Traffic Volumes, Blended Bay Area and Sacto VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 150,000	$ 174,000	$ 198,000	$ 222,000	$ 246,000	$ 270,000	$ 294,000	$ 318,000	$ 342,000	$ 366,000	$ 390,000	$ 414,000	$ 438,000	$ 462,000
Est. Daily Users (Veh)	7,000	6,900	6,800	6,700	6,600	6,500	6,400	6,300	6,200	6,100	6,100	6,000	5,900	5,800
Est Annual User (Veh)	1,951,300	1,923,400	1,895,500	1,867,600	1,839,800	1,811,900	1,784,000	1,756,100	1,728,300	1,700,400	1,700,400	1,672,500	1,644,600	1,616,800
(# of New Transponders)	4,200	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0
(# of Replacement Xsponders)	-	0	0	0	0	0	4,200	0	0	0	0	0	4,140	0
(Total # of New Transponders)	4,200	0	0	0	0	0	4,140	0	0	0	0	0	4,080	0
Beginning Balance	0	(1,259,000)	(2,412,000)	(3,535,000)	(4,627,000)	(5,689,000)	(6,721,000)	(7,798,000)	(8,770,000)	(9,712,000)	(10,624,000)	(11,512,000)	(12,370,000)	(13,271,000)
Annual Revenue	150,000	174,000	198,000	222,000	246,000	270,000	294,000	318,000	342,000	366,000	390,000	414,000	438,000	462,000
E penses														
User Fee (per X-Action)	417,600	411,600	405,600	399,700	393,700	387,700	381,800	375,800	369,900	363,900	363,900	357,900	351,900	346,000
Financing Fee (User Fee)	9,190	9,060	8,920	8,790	8,660	8,530	8,400	8,270	8,140	8,010	8,010	7,870	7,740	7,610
Transponder (Every 6 Yrs)	76,000	0	0	0	0	0	75,000	0	0	0	0	0	73,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,409,000	1,327,000	1,321,000	1,314,000	1,308,000	1,302,000	1,371,000	1,290,000	1,284,000	1,278,000	1,278,000	1,272,000	1,339,000	1,260,000
Ending Balance	(1,259,000)	(2,412,000)	(3,535,000)	(4,627,000)	(5,689,000)	(6,721,000)	(7,798,000)	(8,770,000)	(9,712,000)	(10,624,000)	(11,512,000)	(12,370,000)	(13,271,000)	(14,069,000)

San Joaquin COG I-5 North HOT Lane Study

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, Low Traffic Volumes, Blended Bay Area and Sacto VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 150,000	$ 174,000	$ 198,000	$ 222,000	$ 246,000	$ 270,000	$ 294,000	$ 318,000	$ 342,000	$ 366,000	$ 390,000	$ 414,000	$ 438,000	$ 462,000
Est. Daily Users (Veh)	7,000	6,900	6,800	6,700	6,600	6,500	6,400	6,300	6,200	6,100	6,100	6,000	5,900	5,800
Est Annual User (Veh)	1,951,300	1,923,400	1,895,500	1,867,600	1,839,800	1,811,900	1,784,000	1,756,100	1,728,300	1,700,400	1,700,400	1,672,500	1,644,600	1,616,800
(# of New Transponders)	4,200	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0
(# of Replacement Xsponders)	-	0	0	0	0	0	4,200	0	0	0	0	0	4,140	0
(Total # of New Transponders)	4,200	0	0	0	0	0	4,140	0	0	0	0	0	4,080	0
Beginning Balance	0	(1,259,000)	(2,412,000)	(3,535,000)	(4,627,000)	(5,689,000)	(6,721,000)	(7,798,000)	(8,770,000)	(9,712,000)	(10,624,000)	(11,512,000)	(12,370,000)	(13,271,000)
Annual Revenue	150,000	174,000	198,000	222,000	246,000	270,000	294,000	318,000	342,000	366,000	390,000	414,000	438,000	462,000
E penses														
User Fee (per X-Action)	417,600	411,600	405,600	399,700	393,700	387,700	381,800	375,800	369,900	363,900	363,900	357,900	351,900	346,000
Financing Fee (User Fee)	9,190	9,060	8,920	8,790	8,660	8,530	8,400	8,270	8,140	8,010	8,010	7,870	7,740	7,610
Transponder (Every 6 Yrs)	76,000	0	0	0	0	0	75,000	0	0	0	0	0	73,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,409,000	1,327,000	1,321,000	1,314,000	1,308,000	1,302,000	1,371,000	1,290,000	1,284,000	1,278,000	1,278,000	1,272,000	1,339,000	1,260,000
Ending Balance	(1,259,000)	(2,412,000)	(3,535,000)	(4,627,000)	(5,689,000)	(6,721,000)	(7,798,000)	(8,770,000)	(9,712,000)	(10,624,000)	(11,512,000)	(12,370,000)	(13,271,000)	(14,069,000)

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, Low Traffic Volumes, Blended Bay Area and Sacto VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 486,000	$ 510,000	$ 534,000	$ 558,000	$ 582,000	$ 606,000	$ 690,000	$ 714,000	$ 738,000	$ 762,000	$ 786,000	$ 810,000	$ 834,000	$ 858,000	$ 882,000	$ 906,000	$ 930,000	$ 942,000	$ 954,000
5,700	5,600	5,500	5,400	5,300	5,200	5,200	5,100	5,000	4,900	4,800	4,700	4,600	4,500	4,400	4,300	4,400	4,300	4,200
1,588,900	1,561,000	1,533,100	1,505,300	1,477,400	1,449,500	1,449,500	1,421,600	1,393,800	1,365,900	1,338,000	1,310,100	1,282,300	1,254,400	1,226,500	1,198,600	1,226,500	1,198,600	1,170,800
0	0	0	0	(60)	0	0	0	0	0	(60)	0	0	0	0	0	60	0	0
0	0	0	0	4,080	0	0	0	0	0	4,020	0	0	0	0	0	3,960	0	0
0	0	0	0	4,020	0	0	0	0	0	3,960	0	0	0	0	0	4,020	0	0
(14,069,000)	(14,836,000)	(15,573,000)	(16,280,000)	(16,957,000)	(17,676,000)	(18,293,000)	(18,826,000)	(19,329,000)	(19,802,000)	(20,245,000)	(20,729,000)	(21,112,000)	(21,464,000)	(21,786,000)	(22,078,000)	(22,340,000)	(22,656,000)	(22,882,000)
486,000	510,000	534,000	558,000	582,000	606,000	690,000	714,000	738,000	762,000	786,000	810,000	834,000	858,000	882,000	906,000	930,000	942,000	954,000
340,000	334,100	328,100	322,100	316,200	310,200	310,200	304,200	298,300	292,300	286,300	280,400	274,400	268,400	262,500	256,500	262,500	256,500	250,600
7,480	7,350	7,220	7,090	6,960	6,820	6,820	6,690	6,560	6,430	6,300	6,170	6,040	5,900	5,780	5,640	5,780	5,640	5,510
0	0	0	0	72,000	0	0	0	0	0	71,000	0	0	0	0	0	72,000	0	0
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,253,000	1,247,000	1,241,000	1,235,000	1,301,000	1,223,000	1,223,000	1,217,000	1,211,000	1,205,000	1,270,000	1,193,000	1,186,000	1,180,000	1,174,000	1,168,000	1,246,000	1,168,000	1,162,000
(14,836,000)	(15,573,000)	(16,280,000)	(16,957,000)	(17,676,000)	(18,293,000)	(18,826,000)	(19,329,000)	(19,802,000)	(20,245,000)	(20,729,000)	(21,112,000)	(21,464,000)	(21,786,000)	(22,078,000)	(22,340,000)	(22,656,000)	(22,882,000)	(23,090,000)

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, Low Traffic Volumes, Blended Bay Area and Sacto VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 486,000	$ 510,000	$ 534,000	$ 558,000	$ 582,000	$ 606,000	$ 690,000	$ 714,000	$ 738,000	$ 762,000	$ 786,000	$ 810,000	$ 834,000	$ 858,000	$ 882,000	$ 906,000	$ 930,000	$ 1,232,000	$ 1,534,000
5,700	5,600	5,500	5,400	5,300	5,200	5,200	5,100	5,000	4,900	4,800	4,700	4,600	4,500	4,400	4,300	4,400	4,300	4,200
1,588,900	1,561,000	1,533,100	1,505,300	1,477,400	1,449,500	1,449,500	1,421,600	1,393,800	1,365,900	1,338,000	1,310,100	1,282,300	1,254,400	1,226,500	1,198,600	1,226,500	1,198,600	1,170,800
0	0	0	0	(60)	0	0	0	0	0	(60)	0	0	0	0	0	60	0	0
0	0	0	0	4,080	0	0	0	0	0	4,020	0	0	0	0	0	3,960	0	0
0	0	0	0	4,020	0	0	0	0	0	3,960	0	0	0	0	0	4,020	0	0
(14,069,000)	(14,836,000)	(15,573,000)	(16,280,000)	(16,957,000)	(17,676,000)	(18,293,000)	(18,826,000)	(19,329,000)	(19,802,000)	(20,245,000)	(20,729,000)	(21,112,000)	(21,464,000)	(21,786,000)	(22,078,000)	(22,340,000)	(21,750,000)	(20,780,000)
486,000	510,000	534,000	558,000	582,000	606,000	690,000	714,000	738,000	762,000	786,000	810,000	834,000	858,000	882,000	906,000	930,000	1,232,000	1,534,000
340,000	334,100	328,100	322,100	316,200	310,200	310,200	304,200	298,300	292,300	286,300	280,400	274,400	268,400	262,500	256,500	262,500	256,500	250,600
7,480	7,350	7,220	7,090	6,960	6,820	6,820	6,690	6,560	6,430	6,300	6,170	6,040	5,900	5,780	5,640	5,780	5,640	5,510
0	0	0	0	72,000	0	0	0	0	0	71,000	0	0	0	0	0	72,000	0	0
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000			
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000			
1,253,000	1,247,000	1,241,000	1,235,000	1,301,000	1,223,000	1,223,000	1,217,000	1,211,000	1,205,000	1,270,000	1,193,000	1,186,000	1,180,000	1,174,000	1,168,000	340,000	262,000	256,000
(14,836,000)	(15,573,000)	(16,280,000)	(16,957,000)	(17,676,000)	(18,293,000)	(18,826,000)	(19,329,000)	(19,802,000)	(20,245,000)	(20,729,000)	(21,112,000)	(21,464,000)	(21,786,000)	(22,078,000)	(22,340,000)	(21,750,000)	(20,780,000)	(19,502,000)

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, Low Traffic Volumes, Blended Bay Area and Sacto VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 966,000	$ 978,000	$ 990,000	$ 1,002,000	$ 1,014,000	$ 1,026,000	$ 1,038,000	$ 1,050,000	$ 1,047,000	$ 1,044,000	$ 1,041,000	$ 1,038,000	$ 1,035,000	$ 1,032,000	$ 1,029,000	$ 1,026,000	$ 1,023,000	$ 1,020,000
4,100	4,000	3,900	3,800	3,700	3,600	3,500	3,400	3,300	3,200	3,100	3,000	2,900	2,800	2,700	2,600	2,500	2,500
1,142,900	1,115,000	1,087,100	1,059,300	1,031,400	1,003,500	975,600	947,800	919,900	892,000	864,100	836,300	808,400	780,500	752,600	724,800	696,900	696,900
0	0	0	(60)	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0	0
0	0	0	4,020	0	0	0	0	0	3,960	0	0	0	0	0	3,900	0	0
0	0	0	3,960	0	0	0	0	0	3,900	0	0	0	0	0	3,840	0	0
(23,090,000)	(23,280,000)	(23,452,000)	(23,606,000)	(23,813,000)	(23,931,000)	(24,030,000)	(24,111,000)	(24,174,000)	(24,234,000)	(24,361,000)	(24,415,000)	(24,466,000)	(24,514,000)	(24,559,000)	(24,601,000)	(24,709,000)	(24,744,000)
966,000	978,000	990,000	1,002,000	1,014,000	1,026,000	1,038,000	1,050,000	1,047,000	1,044,000	1,041,000	1,038,000	1,035,000	1,032,000	1,029,000	1,026,000	1,023,000	1,020,000
244,600	238,600	232,600	226,700	220,700	214,700	208,800	202,800	196,900	190,900	184,900	179,000	173,000	167,000	161,100	155,100	149,100	149,100
5,380	5,250	5,120	4,990	4,860	4,720	4,590	4,460	4,330	4,200	4,070	3,940	3,810	3,670	3,540	3,410	3,280	3,280
0	0	0	71,000	0	0	0	0	0	70,000	0	0	0	0	0	69,000	0	0
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,156,000	1,150,000	1,144,000	1,209,000	1,132,000	1,125,000	1,119,000	1,113,000	1,107,000	1,171,000	1,095,000	1,089,000	1,083,000	1,077,000	1,071,000	1,134,000	1,058,000	1,058,000
(23,280,000)	(23,452,000)	(23,606,000)	(23,813,000)	(23,931,000)	(24,030,000)	(24,111,000)	(24,174,000)	(24,234,000)	(24,361,000)	(24,415,000)	(24,466,000)	(24,514,000)	(24,559,000)	(24,601,000)	(24,709,000)	(24,744,000)	(24,782,000)

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, Low Traffic Volumes, Blended Ba

Switch NB to HOV 3+

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 1,836,000	$ 2,138,000	$ 2,440,000	$ 2,742,000	$ 3,044,000	$ 3,346,000	$ 3,648,000	$ 3,950,000	$ 4,086,000	$ 4,222,000	$ 4,358,000	$ 4,494,000	$ 4,630,000	$ 4,766,000	$ 4,902,000	$ 5,038,000	$ 5,174,000	$ 5,307,000
4,100	4,000	3,900	3,800	3,700	3,600	3,500	14,200	14,100	14,000	13,900	13,800	13,700	13,600	13,500	13,400	13,300	13,100
1,142,900	1,115,000	1,087,100	1,059,300	1,031,400	1,003,500	975,600	3,958,300	3,930,400	3,902,500	3,874,600	3,846,800	3,818,900	3,791,000	3,763,100	3,735,300	3,707,400	3,651,600
0	0	0	-	0	0	0	6420	0	(60)	0	0	0	0	0	(60)	0	0
0	0	0	4,020	0	0	0	0	0	4,020	0	0	0	6420	0	3,960	0	0
0	0	0	4,020	0	0	0	6420	0	3,960	0	0	0	6420	0	3,900	0	0
(19,502,000)	(17,916,000)	(16,022,000)	(13,820,000)	(11,382,000)	(8,564,000)	(5,437,000)	(2,002,000)	60,000	2,380,000	4,772,000	7,377,000	10,124,000	13,013,000	15,928,000	19,101,000	22,346,000	25,803,000
1,836,000	2,138,000	2,440,000	2,742,000	3,044,000	3,346,000	3,648,000	3,950,000	4,086,000	4,222,000	4,358,000	4,494,000	4,630,000	4,766,000	4,902,000	5,038,000	5,174,000	5,307,000
244,600	238,600	232,600	226,700	220,700	214,700	208,800	847,100	841,100	835,100	829,200	823,200	817,200	811,300	805,300	799,400	793,400	781,400
5,380	5,250	5,120	4,990	4,860	4,720	4,590	18,640	18,500	18,370	18,240	18,110	17,980	17,850	17,720	17,590	17,450	17,190
0	0	0	72,000	0	0	0	116,000	0	71,000	0	0	0	116,000	0	70,000	0	0
							807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
							99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
250,000	244,000	238,000	304,000	226,000	219,000	213,000	1,888,000	1,766,000	1,830,000	1,753,000	1,747,000	1,741,000	1,851,000	1,729,000	1,793,000	1,717,000	1,705,000
(17,916,000)	(16,022,000)	(13,820,000)	(11,382,000)	(8,564,000)	(5,437,000)	(2,002,000)	60,000	2,380,000	4,772,000	7,377,000	10,124,000	13,013,000	15,928,000	19,101,000	22,346,000	25,803,000	29,405,000

San Joaquin COG I-5 North HOT Lane Study
Northbound, High Traffic Voulmues, Low VOT

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, High Traffic Volumes, Low VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 430,000	$ 446,000	$ 462,000	$ 478,000	$ 494,000	$ 510,000	$ 526,000	$ 542,000	$ 558,000	$ 574,000	$ 590,000	$ 612,000	$ 634,000	$ 656,000
Est. Daily Users (Veh)	5,300	5,200	5,100	5,000	4,900	4,800	4,700	4,600	4,500	4,400	4,400	4,300	4,200	4,100
Est Annual User (Veh)	1,477,400	1,449,500	1,421,625	1,393,800	1,365,900	1,338,000	1,310,100	1,282,300	1,254,400	1,226,500	1,226,500	1,198,600	1,170,800	1,142,900
(# of New Transponders)	3,180	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0
(# of Replacement Xsponders)	-	0	0	0	0	0	3,180	0	0	0	0	0	3,120	0
(Total # of New Transponders)	3,180	0	0	0	0	0	3,120	0	0	0	0	0	3,060	0
Beginning Balance	0	(856,000)	(1,633,000)	(2,388,000)	(3,121,000)	(3,832,000)	(4,521,000)	(5,244,000)	(5,888,000)	(6,510,000)	(7,110,000)	(7,694,000)	(8,250,000)	(8,833,000)
Annual Revenue	430,000	446,000	462,000	478,000	494,000	510,000	526,000	542,000	558,000	574,000	590,000	612,000	634,000	656,000
E penses														
User Fee (per X-Action)	316,200	310,200	304,200	298,300	292,300	286,300	280,400	274,400	268,400	262,500	262,500	256,500	250,600	244,600
Financing Fee (User Fee)	6,960	6,820	6,690	6,560	6,430	6,300	6,170	6,040	5,900	5,780	5,780	5,640	5,510	5,380
Transponder (Every 6 Yrs)	57,000	0	0	0	0	0	56,000	0	0	0	0	0	55,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,286,000	1,223,000	1,217,000	1,211,000	1,205,000	1,199,000	1,249,000	1,186,000	1,180,000	1,174,000	1,174,000	1,168,000	1,217,000	1,156,000
Ending Balance	(856,000)	(1,633,000)	(2,388,000)	(3,121,000)	(3,832,000)	(4,521,000)	(5,244,000)	(5,888,000)	(6,510,000)	(7,110,000)	(7,694,000)	(8,250,000)	(8,833,000)	(9,333,000)

San Joaquin COG I-5 North HOT Lane Study

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, High Traffic Volumes, Low VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 430,000	$ 446,000	$ 462,000	$ 478,000	$ 494,000	$ 510,000	$ 526,000	$ 542,000	$ 558,000	$ 574,000	$ 590,000	$ 612,000	$ 634,000	$ 656,000
Est. Daily Users (Veh)	5,300	5,200	5,100	5,000	4,900	4,800	4,700	4,600	4,500	4,400	4,400	4,300	4,200	4,100
Est Annual User (Veh)	1,477,400	1,449,500	1,421,625	1,393,800	1,365,900	1,338,000	1,310,100	1,282,300	1,254,400	1,226,500	1,226,500	1,198,600	1,170,800	1,142,900
(# of New Transponders)	3,180	0	0	0	0	0	(60)	0	0	0	0	0	-	0
(# of Replacement Xsponders)	-	0	0	0	0	0	3,180	0	0	0	0	0	3,120	0
(Total # of New Transponders)	3,180	0	0	0	0	0	3,120	0	0	0	0	0	3,120	0
Beginning Balance	0	(856,000)	(1,633,000)	(2,388,000)	(3,121,000)	(3,832,000)	(4,521,000)	(5,244,000)	(5,888,000)	(6,510,000)	(7,110,000)	(7,694,000)	(8,250,000)	(8,834,000)
Annual Revenue	430,000	446,000	462,000	478,000	494,000	510,000	526,000	542,000	558,000	574,000	590,000	612,000	634,000	656,000
E penses														
User Fee (per X-Action)	316,200	310,200	304,200	298,300	292,300	286,300	280,400	274,400	268,400	262,500	262,500	256,500	250,600	244,600
Financing Fee (User Fee)	6,960	6,820	6,690	6,560	6,430	6,300	6,170	6,040	5,900	5,780	5,780	5,640	5,510	5,380
Transponder (Every 6 Yrs)	57,000	0	0	0	0	0	56,000	0	0	0	0	0	56,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,286,000	1,223,000	1,217,000	1,211,000	1,205,000	1,199,000	1,249,000	1,186,000	1,180,000	1,174,000	1,174,000	1,168,000	1,218,000	1,156,000
Ending Balance	(856,000)	(1,633,000)	(2,388,000)	(3,121,000)	(3,832,000)	(4,521,000)	(5,244,000)	(5,888,000)	(6,510,000)	(7,110,000)	(7,694,000)	(8,250,000)	(8,834,000)	(9,334,000)

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, High Traffic Volumes, Low VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 678,000	$ 700,000	$ 722,000	$ 744,000	$ 766,000	$ 788,000	$ 810,000	$ 808,000	$ 806,000	$ 804,000	$ 802,000	$ 800,000	$ 798,000	$ 796,000	$ 794,000	$ 792,000	$ 790,000	$ 802,000	$ 814,000
4,000	3,900	3,800	3,700	3,600	3,500	3,300	3,200	3,100	3,000	2,900	2,800	2,700	2,600	2,500	2,400	2,500	2,400	2,300
1,115,000	1,087,100	1,059,300	1,031,400	1,003,500	975,600	919,900	892,000	864,100	836,300	808,400	780,500	752,600	724,800	696,900	669,000	696,900	669,000	641,100
0	0	0	0	(60)	0	0	0	0	0	(60)	0	0	0	0	0	60	0	0
0	0	0	0	3,060	0	0	0	0	0	3,000	0	0	0	0	0	2,940	0	0
0	0	0	0	3,000	0	0	0	0	0	2,940	0	0	0	0	0	3,000	0	0
(9,333,000)	(9,805,000)	(10,249,000)	(10,665,000)	(11,053,000)	(11,466,000)	(11,797,000)	(12,094,000)	(12,387,000)	(12,676,000)	(12,961,000)	(13,295,000)	(13,572,000)	(13,845,000)	(14,114,000)	(14,378,000)	(14,638,000)	(14,960,000)	(15,210,000)
678,000	700,000	722,000	744,000	766,000	788,000	810,000	808,000	806,000	804,000	802,000	800,000	798,000	796,000	794,000	792,000	790,000	802,000	814,000
238,600	232,600	226,700	220,700	214,700	208,800	196,900	190,900	184,900	179,000	173,000	167,000	161,100	155,100	149,100	143,200	149,100	143,200	137,200
5,250	5,120	4,990	4,860	4,720	4,590	4,330	4,200	4,070	3,940	3,810	3,670	3,540	3,410	3,280	3,150	3,280	3,150	3,020
0	0	0	0	54,000	0	0	0	0	0	53,000	0	0	0	0	0	54,000	0	0
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,150,000	1,144,000	1,138,000	1,132,000	1,179,000	1,119,000	1,107,000	1,101,000	1,095,000	1,089,000	1,136,000	1,077,000	1,071,000	1,065,000	1,058,000	1,052,000	1,112,000	1,052,000	1,046,000
(9,805,000)	(10,249,000)	(10,665,000)	(11,053,000)	(11,466,000)	(11,797,000)	(12,094,000)	(12,387,000)	(12,676,000)	(12,961,000)	(13,295,000)	(13,572,000)	(13,845,000)	(14,114,000)	(14,378,000)	(14,638,000)	(14,960,000)	(15,210,000)	(15,442,000)

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, High Traffic Volumes, Low VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 678,000	$ 700,000	$ 722,000	$ 744,000	$ 766,000	$ 788,000	$ 810,000	$ 808,000	$ 806,000	$ 804,000	$ 802,000	$ 800,000	$ 798,000	$ 796,000	$ 794,000	$ 792,000	$ 790,000	$ 1,224,000	$ 1,658,000
4,000	3,900	3,800	3,700	3,600	3,500	3,300	3,200	3,100	3,000	2,900	2,800	2,700	2,600	2,500	2,400	2,500	3,600	4,700
1,115,000	1,087,100	1,059,300	1,031,400	1,003,500	975,600	919,900	892,000	864,100	836,300	808,400	780,500	752,600	724,800	696,900	669,000	696,900	1,003,500	1,310,100
0	0	0	0	-	0	0	0	0	0	(60)	0	0	0	0	0	60	660	660
0	0	0	0	3,120	0	0	0	0	0	3,120	0	0	0	0	0	3,060	0	0
0	0	0	0	3,120	0	0	0	0	0	3,060	0	0	0	0	0	3,120	660	660
(9,334,000)	(9,806,000)	(10,250,000)	(10,666,000)	(11,054,000)	(11,469,000)	(11,800,000)	(12,097,000)	(12,390,000)	(12,679,000)	(12,964,000)	(13,300,000)	(13,577,000)	(13,850,000)	(14,119,000)	(14,383,000)	(14,643,000)	(14,967,000)	(14,880,000)
678,000	700,000	722,000	744,000	766,000	788,000	810,000	808,000	806,000	804,000	802,000	800,000	798,000	796,000	794,000	792,000	790,000	1,224,000	1,658,000
238,600	232,600	226,700	220,700	214,700	208,800	196,900	190,900	184,900	179,000	173,000	167,000	161,100	155,100	149,100	143,200	149,100	214,700	280,400
5,250	5,120	4,990	4,860	4,720	4,590	4,330	4,200	4,070	3,940	3,810	3,670	3,540	3,410	3,280	3,150	3,280	4,720	6,170
0	0	0	0	56,000	0	0	0	0	0	55,000	0	0	0	0	0	56,000	12,000	12,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,150,000	1,144,000	1,138,000	1,132,000	1,181,000	1,119,000	1,107,000	1,101,000	1,095,000	1,089,000	1,138,000	1,077,000	1,071,000	1,065,000	1,058,000	1,052,000	1,114,000	1,137,000	1,205,000
(9,806,000)	(10,250,000)	(10,666,000)	(11,054,000)	(11,469,000)	(11,800,000)	(12,097,000)	(12,390,000)	(12,679,000)	(12,964,000)	(13,300,000)	(13,577,000)	(13,850,000)	(14,119,000)	(14,383,000)	(14,643,000)	(14,967,000)	(14,880,000)	(14,427,000)

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, High Traffic Volumes, Low VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 826,000	$ 838,000	$ 850,000	$ 862,000	$ 874,000	$ 886,000	$ 898,000	$ 910,000	$ 871,000	$ 832,000	$ 793,000	$ 754,000	$ 715,000	$ 676,000	$ 637,000	$ 598,000	$ 559,000	$ 520,000
2,200	2,100	2,000	1,900	1,800	1,700	1,600	1,900	1,800	1,700	1,600	1,500	1,400	1,300	1,200	1,100	1,000	800
613,300	585,400	557,500	529,600	501,800	473,900	446,000	**529,600**	501,800	473,900	446,000	418,100	390,300	362,400	334,500	306,600	278,800	**223,000**
0	0	0	(60)	0	0	0	180	0	(60)	0	0	0	0	0	(60)	0	0
0	0	0	3,000	0	0	0	0	0	2,940	0	0	0	180	0	2,880	0	0
0	0	0	2,940	0	0	0	180	0	2,880	0	0	0	180	0	2,820	0	0
(15,442,000)	(15,656,000)	(15,852,000)	(16,030,000)	(16,243,000)	(16,385,000)	(16,509,000)	(16,615,000)	(16,730,000)	(16,875,000)	(17,105,000)	(17,316,000)	(17,559,000)	(17,835,000)	(18,147,000)	(18,489,000)	(18,915,000)	(19,323,000)
826,000	838,000	850,000	862,000	874,000	886,000	898,000	910,000	871,000	832,000	793,000	754,000	715,000	676,000	637,000	598,000	559,000	520,000
131,200	125,300	119,300	113,300	107,400	101,400	95,400	113,300	107,400	101,400	95,400	89,500	83,500	77,600	71,600	65,600	59,700	47,700
2,890	2,760	2,620	2,490	2,360	2,230	2,100	2,490	2,360	2,230	2,100	1,970	1,840	1,710	1,580	1,440	1,310	1,050
0	0	0	53,000	0	0	0	3,000	0	52,000	0	0	0	3,000	0	51,000	0	0
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,040,000	1,034,000	1,028,000	1,075,000	1,016,000	1,010,000	1,004,000	1,025,000	1,016,000	1,062,000	1,004,000	997,000	991,000	988,000	979,000	1,024,000	967,000	955,000
(15,656,000)	(15,852,000)	(16,030,000)	(16,243,000)	(16,385,000)	(16,509,000)	(16,615,000)	(16,730,000)	(16,875,000)	(17,105,000)	(17,316,000)	(17,559,000)	(17,835,000)	(18,147,000)	(18,489,000)	(18,915,000)	(19,323,000)	(19,758,000)

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, High Traffic Volumes, Low VOT)

Switch NB to HOV

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 2,092,000	$ 2,526,000	$ 2,960,000	$ 3,394,000	$ 3,828,000	$ 4,262,000	$ 4,696,000	$ 5,130,000	$ 5,337,000	$ 5,544,000	$ 5,751,000	$ 5,958,000	$ 6,165,000	$ 6,372,000	$ 6,579,000	$ 6,786,000	$ 6,993,000	$ 7,200,000
5,800	6,900	8,000	9,100	10,200	11,300	12,400	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,900
1,616,800	1,923,400	2,230,000	2,536,600	2,843,300	3,149,900	3,456,500	**3,791,000**	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	**3,874,600**
660	660	660	660	660	660	660	720	0	-	0	0	0	0	0	-	0	180
0	0	0	3,120	660	660	660	660	660	3,780	1320	1320	1320	1380	660	3,780	1320	1320
660	660	660	3,780	1320	1320	1320	1380	660	3,780	1320	1320	1320	1380	660	3,780	1320	1500
(14,427,000)	(13,607,000)	(12,420,000)	(10,866,000)	(9,001,000)	(6,725,000)	(4,082,000)	(1,072,000)	2,298,000	5,888,000	9,629,000	13,621,000	17,820,000	22,226,000	26,838,000	31,670,000	36,653,000	41,887,000
2,092,000	2,526,000	2,960,000	3,394,000	3,828,000	4,262,000	4,696,000	5,130,000	5,337,000	5,544,000	5,751,000	5,958,000	6,165,000	6,372,000	6,579,000	6,786,000	6,993,000	7,200,000
346,000	411,600	477,200	542,800	608,500	674,100	739,700	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	829,200
7,610	9,060	10,500	11,940	13,390	14,830	16,270	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	18,240
12,000	12,000	12,000	68,000	24,000	24,000	24,000	25,000	12,000	68,000	24,000	24,000	24,000	25,000	12,000	68,000	24,000	27,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,272,000	1,339,000	1,406,000	1,529,000	1,552,000	1,619,000	1,686,000	1,760,000	1,747,000	1,803,000	1,759,000	1,759,000	1,759,000	1,760,000	1,747,000	1,803,000	1,759,000	1,780,000
(13,607,000)	(12,420,000)	(10,866,000)	(9,001,000)	(6,725,000)	(4,082,000)	(1,072,000)	2,298,000	5,888,000	9,629,000	13,621,000	17,820,000	22,226,000	26,838,000	31,670,000	36,653,000	41,887,000	47,307,000

San Joaquin COG I-5 North HOT Lane Study
Northbound, High Traffic Voulmues, SJ Co. High VOT

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, High Traffic Volumes, High VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 533,000	$ 553,000	$ 573,000	$ 593,000	$ 613,000	$ 633,000	$ 653,000	$ 673,000	$ 693,000	$ 713,000	$ 732,000	$ 759,000	$ 786,000	$ 813,000
Est. Daily Users (Veh)	5,300	5,200	5,100	5,000	4,900	4,800	4,700	4,600	4,500	4,400	4,400	4,300	4,200	4,100
Est Annual User (Veh)	1,477,400	1,449,500	1,421,625	1,393,800	1,365,900	1,338,000	1,310,100	1,282,300	1,254,400	1,226,500	1,226,500	1,198,600	1,170,800	1,142,900
Est. Toll Rate Veh Mile	$ 0.04	$ 0.04	$ 0.05	$ 0.05	$ 0.05	$ 0.06	$ 0.06	$ 0.06	$ 0.06	$ 0.07	$ 0.07	$ 0.07	$ 0.08	$ 0.08
(# of New Transponders)	3,180	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0
(# of Replacement Xsponders)	-	0	0	0	0	0	3,180	0	0	0	0	0	3,120	0
(Total # of New Transponders)	3,180	0	0	0	0	0	3,120	0	0	0	0	0	3,060	0
Beginning Balance	0	(753,000)	(1,423,000)	(2,067,000)	(2,685,000)	(3,277,000)	(3,843,000)	(4,439,000)	(4,952,000)	(5,439,000)	(5,900,000)	(6,342,000)	(6,751,000)	(7,182,000)
Annual Revenue	533,000	553,000	573,000	593,000	613,000	633,000	653,000	673,000	693,000	713,000	732,000	759,000	786,000	813,000
E penses														
User Fee (per X-Action)	316,200	310,200	304,200	298,300	292,300	286,300	280,400	274,400	268,400	262,500	262,500	256,500	250,600	244,600
Financing Fee (User Fee)	6,960	6,820	6,690	6,560	6,430	6,300	6,170	6,040	5,900	5,780	5,780	5,640	5,510	5,380
Transponder (Every 6 Yrs)	57,000	0	0	0	0	0	56,000	0	0	0	0	0	55,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,286,000	1,223,000	1,217,000	1,211,000	1,205,000	1,199,000	1,249,000	1,186,000	1,180,000	1,174,000	1,174,000	1,168,000	1,217,000	1,156,000
Ending Balance	(753,000)	(1,423,000)	(2,067,000)	(2,685,000)	(3,277,000)	(3,843,000)	(4,439,000)	(4,952,000)	(5,439,000)	(5,900,000)	(6,342,000)	(6,751,000)	(7,182,000)	(7,525,000)

San Joaquin COG I-5 North HOT Lane Study

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, High Traffic Volumes, High VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 533,000	$ 553,000	$ 573,000	$ 593,000	$ 613,000	$ 633,000	$ 653,000	$ 673,000	$ 693,000	$ 713,000	$ 732,000	$ 759,000	$ 786,000	$ 813,000
Est. Daily Users (Veh)	5,300	5,200	5,100	5,000	4,900	4,800	4,700	4,600	4,500	4,400	4,400	4,300	4,200	4,100
Est Annual User (Veh)	1,477,400	1,449,500	1,421,625	1,393,800	1,365,900	1,338,000	1,310,100	1,282,300	1,254,400	1,226,500	1,226,500	1,198,600	1,170,800	1,142,900
Est. Toll Rate Veh Mile	$ 0.04	$ 0.04	$ 0.05	$ 0.05	$ 0.05	$ 0.06	$ 0.06	$ 0.06	$ 0.06	$ 0.07	$ 0.07	$ 0.07	$ 0.08	$ 0.08
(# of New Transponders)	3,180	0	0	0	0	0	(60)	0	0	0	0	0	0	0
(# of Replacement Xsponders)	-	0	0	0	0	0	3,180	0	0	0	0	0	3120	0
(Total # of New Transponders)	3,180	0	0	0	0	0	3,120	0	0	0	0	0	3120	0
Beginning Balance	0	(753,000)	(1,423,000)	(2,067,000)	(2,685,000)	(3,277,000)	(3,843,000)	(4,439,000)	(4,952,000)	(5,439,000)	(5,900,000)	(6,342,000)	(6,751,000)	(7,183,000)
Annual Revenue	533,000	553,000	573,000	593,000	613,000	633,000	653,000	673,000	693,000	713,000	732,000	759,000	786,000	813,000
E penses														
User Fee (per X-Action)	316,200	310,200	304,200	298,300	292,300	286,300	280,400	274,400	268,400	262,500	262,500	256,500	250,600	244,600
Financing Fee (User Fee)	6,960	6,820	6,690	6,560	6,430	6,300	6,170	6,040	5,900	5,780	5,780	5,640	5,510	5,380
Transponder (Every 6 Yrs)	57,000	0	0	0	0	0	56,000	0	0	0	0	0	56,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,286,000	1,223,000	1,217,000	1,211,000	1,205,000	1,199,000	1,249,000	1,186,000	1,180,000	1,174,000	1,174,000	1,168,000	1,218,000	1,156,000
Ending Balance	(753,000)	(1,423,000)	(2,067,000)	(2,685,000)	(3,277,000)	(3,843,000)	(4,439,000)	(4,952,000)	(5,439,000)	(5,900,000)	(6,342,000)	(6,751,000)	(7,183,000)	(7,526,000)

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, High Traffic Volumes, High VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 840,000	$ 867,000	$ 894,000	$ 921,000	$ 948,000	$ 975,000	$ 1,004,000	$ 1,002,000	$ 1,000,000	$ 998,000	$ 996,000	$ 994,000	$ 992,000	$ 990,000	$ 988,000	$ 986,000	$ 980,000	$ 995,000	$ 1,010,000
4,000	3,900	3,800	3,700	3,600	3,500	3,330	3,200	3,100	3,000	2,900	2,800	2,700	2,600	2,500	2,400	2,500	2,400	2,300
1,115,000	1,087,100	1,059,300	1,031,400	1,003,500	975,600	928,200	892,000	864,100	836,300	808,400	780,500	752,600	724,800	696,900	669,000	696,900	669,000	641,100
$ 0.09	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ 0.12	$ 0.13	$ 0.13	$ 0.13	$ 0.14	$ 0.14	$ 0.15	$ 0.15	$ 0.16	$ 0.16	$ 0.17	$ 0.16	$ 0.17	$ 0.18
0	0	0	0	(60)	0	0	0	0	0	(60)	0	0	0	0	0	60	0	0
0	0	0	0	3,060	0	0	0	0	0	3,000	0	0	0	0	0	2,940	0	0
0	0	0	0	3,000	0	0	0	0	0	2,940	0	0	0	0	0	3,000	0	0
(7,525,000)	(7,835,000)	(8,112,000)	(8,356,000)	(8,567,000)	(8,798,000)	(8,942,000)	(9,047,000)	(9,146,000)	(9,241,000)	(9,332,000)	(9,472,000)	(9,555,000)	(9,634,000)	(9,709,000)	(9,779,000)	(9,845,000)	(9,977,000)	(10,034,000)
840,000	867,000	894,000	921,000	948,000	975,000	1,004,000	1,002,000	1,000,000	998,000	996,000	994,000	992,000	990,000	988,000	986,000	980,000	995,000	1,010,000
238,600	232,600	226,700	220,700	214,700	208,800	198,600	190,900	184,900	179,000	173,000	167,000	161,100	155,100	149,100	143,200	149,100	143,200	137,200
5,250	5,120	4,990	4,860	4,720	4,590	4,370	4,200	4,070	3,940	3,810	3,670	3,540	3,410	3,280	3,150	3,280	3,150	3,020
0	0	0	0	54,000	0	0	0	0	0	53,000	0	0	0	0	0	54,000	0	0
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,150,000	1,144,000	1,138,000	1,132,000	1,179,000	1,119,000	1,109,000	1,101,000	1,095,000	1,089,000	1,136,000	1,077,000	1,071,000	1,065,000	1,058,000	1,052,000	1,112,000	1,052,000	1,046,000
(7,835,000)	(8,112,000)	(8,356,000)	(8,567,000)	(8,798,000)	(8,942,000)	(9,047,000)	(9,146,000)	(9,241,000)	(9,332,000)	(9,472,000)	(9,555,000)	(9,634,000)	(9,709,000)	(9,779,000)	(9,845,000)	(9,977,000)	(10,034,000)	(10,070,000)

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, High Traffic Volumes, High VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 840,000	$ 867,000	$ 894,000	$ 921,000	$ 948,000	$ 975,000	$ 1,004,000	$ 1,002,000	$ 1,000,000	$ 998,000	$ 996,000	$ 994,000	$ 992,000	$ 990,000	$ 988,000	$ 986,000	$ 980,000	$ 1,518,000	$ 2,056,000
4,000	3,900	3,800	3,700	3,600	3,500	3,330	3,200	3,100	3,000	2,900	2,800	2,700	2,600	2,500	2,400	2,500	3,600	4,700
1,115,000	1,087,100	1,059,300	1,031,400	1,003,500	975,600	928,200	892,000	864,100	836,300	808,400	780,500	752,600	724,800	696,900	669,000	696,900	1,003,500	1,310,100
$ 0.09	$ 0.09	$ 0.10	$ 0.10	$ 0.11	$ 0.12	$ 0.13	$ 0.13	$ 0.13	$ 0.14	$ 0.14	$ 0.15	$ 0.15	$ 0.16	$ 0.16	$ 0.17	$ 0.16	$ 0.18	$ 0.18
0	0	0	0	0	0	0	0	0	0	(60)	0	0	0	0	0	60	660	660
0	0	0	0	3120	0	0	0	0	0	3,120	0	0	0	0	0	3,060	0	0
0	0	0	0	3120	0	0	0	0	0	3,060	0	0	0	0	0	3,120	660	660
(7,526,000)	(7,836,000)	(8,113,000)	(8,357,000)	(8,568,000)	(8,801,000)	(8,945,000)	(9,050,000)	(9,149,000)	(9,244,000)	(9,335,000)	(9,477,000)	(9,560,000)	(9,639,000)	(9,714,000)	(9,784,000)	(9,850,000)	(9,984,000)	(9,603,000)
840,000	867,000	894,000	921,000	948,000	975,000	1,004,000	1,002,000	1,000,000	998,000	996,000	994,000	992,000	990,000	988,000	986,000	980,000	1,518,000	2,056,000
238,600	232,600	226,700	220,700	214,700	208,800	198,600	190,900	184,900	179,000	173,000	167,000	161,100	155,100	149,100	143,200	149,100	214,700	280,400
5,250	5,120	4,990	4,860	4,720	4,590	4,370	4,200	4,070	3,940	3,810	3,670	3,540	3,410	3,280	3,150	3,280	4,720	6,170
0	0	0	0	56,000	0	0	0	0	0	55,000	0	0	0	0	0	56,000	12,000	12,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,150,000	1,144,000	1,138,000	1,132,000	1,181,000	1,119,000	1,109,000	1,101,000	1,095,000	1,089,000	1,138,000	1,077,000	1,071,000	1,065,000	1,058,000	1,052,000	1,114,000	1,137,000	1,205,000
(7,836,000)	(8,113,000)	(8,357,000)	(8,568,000)	(8,801,000)	(8,945,000)	(9,050,000)	(9,149,000)	(9,244,000)	(9,335,000)	(9,477,000)	(9,560,000)	(9,639,000)	(9,714,000)	(9,784,000)	(9,850,000)	(9,984,000)	(9,603,000)	(8,752,000)

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, High Traffic Volumes, High VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 1,025,000	$ 1,040,000	$ 1,055,000	$ 1,070,000	$ 1,085,000	$ 1,100,000	$ 1,115,000	$ 1,128,000	$ 1,080,000	$ 1,032,000	$ 984,000	$ 936,000	$ 888,000	$ 840,000	$ 792,000	$ 744,000	$ 696,000	$ 645,000
2,200	2,100	2,000	1,900	1,800	1,700	1,600	1,900	1,800	1,700	1,600	1,500	1,400	1,300	1,200	1,100	1,000	800
613,300	585,400	557,500	529,600	501,800	473,900	446,000	529,600	501,800	473,900	446,000	418,100	390,300	362,400	334,500	306,600	278,800	223,000
$ 0.19	$ 0.21	$ 0.22	$ 0.23	$ 0.25	$ 0.27	$ 0.29	$ 0.25	$ 0.25	$ 0.25	$ 0.26	$ 0.26	$ 0.26	$ 0.27	$ 0.28	$ 0.28	$ 0.29	$ 0.34
0	0	0	(60)	0	0	0	180	0	(60)	0	0	0	0	0	(60)	0	0
0	0	0	3,000	0	0	0	0	0	2,940	0	0	0	180	0	2,880	0	0
0	0	0	2,940	0	0	0	180	0	2,880	0	0	0	180	0	2,820	0	0
(10,070,000)	(10,085,000)	(10,079,000)	(10,052,000)	(10,057,000)	(9,988,000)	(9,898,000)	(9,787,000)	(9,684,000)	(9,620,000)	(9,650,000)	(9,670,000)	(9,731,000)	(9,834,000)	(9,982,000)	(10,169,000)	(10,449,000)	(10,720,000)
1,025,000	1,040,000	1,055,000	1,070,000	1,085,000	1,100,000	1,115,000	1,128,000	1,080,000	1,032,000	984,000	936,000	888,000	840,000	792,000	744,000	696,000	645,000
131,200	125,300	119,300	113,300	107,400	101,400	95,400	113,300	107,400	101,400	95,400	89,500	83,500	77,600	71,600	65,600	59,700	47,700
2,890	2,760	2,620	2,490	2,360	2,230	2,100	2,490	2,360	2,230	2,100	1,970	1,840	1,710	1,580	1,440	1,310	1,050
0	0	0	53,000	0	0	0	3,000	0	52,000	0	0	0	3,000	0	51,000	0	0
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,040,000	1,034,000	1,028,000	1,075,000	1,016,000	1,010,000	1,004,000	1,025,000	1,016,000	1,062,000	1,004,000	997,000	991,000	988,000	979,000	1,024,000	967,000	955,000
(10,085,000)	(10,079,000)	(10,052,000)	(10,057,000)	(9,988,000)	(9,898,000)	(9,787,000)	(9,684,000)	(9,620,000)	(9,650,000)	(9,670,000)	(9,731,000)	(9,834,000)	(9,982,000)	(10,169,000)	(10,449,000)	(10,720,000)	(11,030,000)

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, High Traffic Volumes, Low VOT)

Switch NB to HOV

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 2,594,000	$ 3,132,000	$ 3,670,000	$ 4,208,000	$ 4,746,000	$ 5,284,000	$ 5,822,000	$ 6,361,000	$ 6,364,000	$ 6,367,000	$ 6,370,000	$ 6,373,000	$ 6,376,000	$ 6,379,000	$ 6,382,000	$ 6,385,000	$ 6,388,000	$ 8,928,000
5,800	6,900	8,000	9,100	10,200	11,300	12,400	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,900
1,616,800	1,923,400	2,230,000	2,536,600	2,843,300	3,149,900	3,456,500	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,874,600
$ 0.19	$ 0.19	$ 0.19	$ 0.19	$ 0.19	$ 0.20	$ 0.20	$ 0.20	$ 0.20	$ 0.20	$ 0.20	$ 0.20	$ 0.20	$ 0.20	$ 0.20	$ 0.20	$ 0.20	$ 0.27
660	660	660	660	660	660	660	720	0	-	0	0	0	0	0	-	0	180
0	0	0	3,120	660	660	660	660	660	3,780	1320	1320	1320	1380	660	3,780	1320	1320
660	660	660	3,780	1320	1320	1320	1380	660	3,780	1320	1320	1320	1380	660	3,780	1320	1500
(8,752,000)	(7,430,000)	(5,637,000)	(3,373,000)	(694,000)	2,500,000	6,165,000	10,301,000	14,902,000	19,519,000	24,083,000	28,694,000	33,308,000	37,925,000	42,544,000	47,179,000	51,761,000	56,390,000
2,594,000	3,132,000	3,670,000	4,208,000	4,746,000	5,284,000	5,822,000	6,361,000	6,364,000	6,367,000	6,370,000	6,373,000	6,376,000	6,379,000	6,382,000	6,385,000	6,388,000	8,928,000
346,000	411,600	477,200	542,800	608,500	674,100	739,700	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	829,200
7,610	9,060	10,500	11,940	13,390	14,830	16,270	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	18,240
12,000	12,000	12,000	68,000	24,000	24,000	24,000	25,000	12,000	68,000	24,000	24,000	24,000	25,000	12,000	68,000	24,000	27,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,272,000	1,339,000	1,406,000	1,529,000	1,552,000	1,619,000	1,686,000	1,760,000	1,747,000	1,803,000	1,759,000	1,759,000	1,759,000	1,760,000	1,747,000	1,803,000	1,759,000	1,780,000
(7,430,000)	(5,637,000)	(3,373,000)	(694,000)	2,500,000	6,165,000	10,301,000	14,902,000	19,519,000	24,083,000	28,694,000	33,308,000	37,925,000	42,544,000	47,179,000	51,761,000	56,390,000	63,538,000

San Joaquin COG I-5 North HOT Lane Study
Northbound, High Traffic Voulmues, Blended Bay Area & Sacto VOT

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, High Traffic Volumes, Blended Bay Area & Sacramento VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 645,000	$ 669,000	$ 693,000	$ 717,000	$ 741,000	$ 765,000	$ 789,000	$ 813,000	$ 837,000	$ 861,000	$ 885,000	$ 918,000	$ 951,000	$ 984,000
Est. Daily Users (Veh)	5,300	5,200	5,100	5,000	4,900	4,800	4,700	4,600	4,500	4,400	4,400	4,300	4,200	4,100
Est Annual User (Veh)	1,477,400	1,449,500	1,421,625	1,393,800	1,365,900	1,338,000	1,310,100	1,282,300	1,254,400	1,226,500	1,226,500	1,198,600	1,170,800	1,142,900
(# of New Transponders)	3,180	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0
(# of Replacement Xsponders)	-	0	0	0	0	0	3,180	0	0	0	0	0	3,120	0
(Total # of New Transponders)	3,180	0	0	0	0	0	3,120	0	0	0	0	0	3,060	0
Beginning Balance	0	(641,000)	(1,195,000)	(1,719,000)	(2,213,000)	(2,677,000)	(3,111,000)	(3,571,000)	(3,944,000)	(4,287,000)	(4,600,000)	(4,889,000)	(5,139,000)	(5,405,000)
Annual Revenue	645,000	669,000	693,000	717,000	741,000	765,000	789,000	813,000	837,000	861,000	885,000	918,000	951,000	984,000
E penses														
User Fee (per X-Action)	316,200	310,200	304,200	298,300	292,300	286,300	280,400	274,400	268,400	262,500	262,500	256,500	250,600	244,600
Financing Fee (User Fee)	6,960	6,820	6,690	6,560	6,430	6,300	6,170	6,040	5,900	5,780	5,780	5,640	5,510	5,380
Transponder (Every 6 Yrs)	57,000	0	0	0	0	0	56,000	0	0	0	0	0	55,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,286,000	1,223,000	1,217,000	1,211,000	1,205,000	1,199,000	1,249,000	1,186,000	1,180,000	1,174,000	1,174,000	1,168,000	1,217,000	1,156,000
Ending Balance	(641,000)	(1,195,000)	(1,719,000)	(2,213,000)	(2,677,000)	(3,111,000)	(3,571,000)	(3,944,000)	(4,287,000)	(4,600,000)	(4,889,000)	(5,139,000)	(5,405,000)	(5,577,000)

San Joaquin COG I-5 North HOT Lane Study

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, High Traffic Volumes, Blended Bay Area & Sacramento VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 645,000	$ 669,000	$ 693,000	$ 717,000	$ 741,000	$ 765,000	$ 789,000	$ 813,000	$ 837,000	$ 861,000	$ 885,000	$ 918,000	$ 951,000	$ 984,000
Est. Daily Users (Veh)	5,300	5,200	5,100	5,000	4,900	4,800	4,700	4,600	4,500	4,400	4,400	4,300	4,200	4,100
Est Annual User (Veh)	1,477,400	1,449,500	1,421,625	1,393,800	1,365,900	1,338,000	1,310,100	1,282,300	1,254,400	1,226,500	1,226,500	1,198,600	1,170,800	1,142,900
(# of New Transponders)	3,180	0	0	0	0	0	(60)	0	0	0	0	0	0	0
(# of Replacement Xsponders)	-	0	0	0	0	0	3,180	0	0	0	0	0	3120	0
(Total # of New Transponders)	3,180	0	0	0	0	0	3,120	0	0	0	0	0	3120	0
Beginning Balance	0	(641,000)	(1,195,000)	(1,719,000)	(2,213,000)	(2,677,000)	(3,111,000)	(3,571,000)	(3,944,000)	(4,287,000)	(4,600,000)	(4,889,000)	(5,139,000)	(5,406,000)
Annual Revenue	645,000	669,000	693,000	717,000	741,000	765,000	789,000	813,000	837,000	861,000	885,000	918,000	951,000	984,000
E penses														
User Fee (per X-Action)	316,200	310,200	304,200	298,300	292,300	286,300	280,400	274,400	268,400	262,500	262,500	256,500	250,600	244,600
Financing Fee (User Fee)	6,960	6,820	6,690	6,560	6,430	6,300	6,170	6,040	5,900	5,780	5,780	5,640	5,510	5,380
Transponder (Every 6 Yrs)	57,000	0	0	0	0	0	56,000	0	0	0	0	0	56,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,286,000	1,223,000	1,217,000	1,211,000	1,205,000	1,199,000	1,249,000	1,186,000	1,180,000	1,174,000	1,174,000	1,168,000	1,218,000	1,156,000
Ending Balance	(641,000)	(1,195,000)	(1,719,000)	(2,213,000)	(2,677,000)	(3,111,000)	(3,571,000)	(3,944,000)	(4,287,000)	(4,600,000)	(4,889,000)	(5,139,000)	(5,406,000)	(5,578,000)

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, High Traffic Volumes, Blended Bay Area & Sacramento VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 1,017,000	$ 1,050,000	$ 1,083,000	$ 1,116,000	$ 1,149,000	$ 1,182,000	$ 1,215,000	$ 1,212,000	$ 1,209,000	$ 1,206,000	$ 1,203,000	$ 1,200,000	$ 1,197,000	$ 1,194,000	$ 1,191,000	$ 1,188,000	$ 1,185,000	$ 1,179,000	$ 1,173,000
4,000	3,900	3,800	3,700	3,600	3,500	3,300	3,200	3,100	3,000	2,900	2,800	2,700	2,600	2,500	2,400	2,500	2,400	2,300
1,115,000	1,087,100	1,059,300	1,031,400	1,003,500	975,600	919,900	892,000	864,100	836,300	808,400	780,500	752,600	724,800	696,900	669,000	696,900	669,000	641,100
0	0	0	0	(60)	0	0	0	0	0	(60)	0	0	0	0	0	60	0	0
0	0	0	0	3,060	0	0	0	0	0	3,000	0	0	0	0	0	2,940	0	0
0	0	0	0	3,000	0	0	0	0	0	2,940	0	0	0	0	0	3,000	0	0
(5,577,000)	(5,710,000)	(5,804,000)	(5,859,000)	(5,875,000)	(5,905,000)	(5,842,000)	(5,734,000)	(5,623,000)	(5,509,000)	(5,392,000)	(5,325,000)	(5,202,000)	(5,076,000)	(4,947,000)	(4,814,000)	(4,678,000)	(4,605,000)	(4,478,000)
1,017,000	1,050,000	1,083,000	1,116,000	1,149,000	1,182,000	1,215,000	1,212,000	1,209,000	1,206,000	1,203,000	1,200,000	1,197,000	1,194,000	1,191,000	1,188,000	1,185,000	1,179,000	1,173,000
238,600	232,600	226,700	220,700	214,700	208,800	196,900	190,900	184,900	179,000	173,000	167,000	161,100	155,100	149,100	143,200	149,100	143,200	137,200
5,250	5,120	4,990	4,860	4,720	4,590	4,330	4,200	4,070	3,940	3,810	3,670	3,540	3,410	3,280	3,150	3,280	3,150	3,020
0	0	0	0	54,000	0	0	0	0	0	53,000	0	0	0	0	0	54,000	0	0
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,150,000	1,144,000	1,138,000	1,132,000	1,179,000	1,119,000	1,107,000	1,101,000	1,095,000	1,089,000	1,136,000	1,077,000	1,071,000	1,065,000	1,058,000	1,052,000	1,112,000	1,052,000	1,046,000
(5,710,000)	(5,804,000)	(5,859,000)	(5,875,000)	(5,905,000)	(5,842,000)	(5,734,000)	(5,623,000)	(5,509,000)	(5,392,000)	(5,325,000)	(5,202,000)	(5,076,000)	(4,947,000)	(4,814,000)	(4,678,000)	(4,605,000)	(4,478,000)	(4,351,000)

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, High Traffic Volumes, Blended Bay Area & Sacramento VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 1,017,000	$ 1,050,000	$ 1,083,000	$ 1,116,000	$ 1,149,000	$ 1,182,000	$ 1,215,000	$ 1,212,000	$ 1,209,000	$ 1,206,000	$ 1,203,000	$ 1,200,000	$ 1,197,000	$ 1,194,000	$ 1,191,000	$ 1,188,000	$ 1,185,000	$ 1,836,000	$ 2,487,000
4,000	3,900	3,800	3,700	3,600	3,500	3,300	3,200	3,100	3,000	2,900	2,800	2,700	2,600	2,500	2,400	2,500	3,600	4,700
1,115,000	1,087,100	1,059,300	1,031,400	1,003,500	975,600	919,900	892,000	864,100	836,300	808,400	780,500	752,600	724,800	696,900	669,000	696,900	1,003,500	1,310,100
0	0	0	0	0	0	0	0	0	0	(60)	0	0	0	0	0	60	660	660
0	0	0	0	3120	0	0	0	0	0	3,120	0	0	0	0	0	3,060	0	0
0	0	0	0	3120	0	0	0	0	0	3,060	0	0	0	0	0	3,120	660	660
(5,578,000)	(5,711,000)	(5,805,000)	(5,860,000)	(5,876,000)	(5,908,000)	(5,845,000)	(5,737,000)	(5,626,000)	(5,512,000)	(5,395,000)	(5,330,000)	(5,207,000)	(5,081,000)	(4,952,000)	(4,819,000)	(4,683,000)	(4,612,000)	(3,913,000)
1,017,000	1,050,000	1,083,000	1,116,000	1,149,000	1,182,000	1,215,000	1,212,000	1,209,000	1,206,000	1,203,000	1,200,000	1,197,000	1,194,000	1,191,000	1,188,000	1,185,000	1,836,000	2,487,000
238,600	232,600	226,700	220,700	214,700	208,800	196,900	190,900	184,900	179,000	173,000	167,000	161,100	155,100	149,100	143,200	149,100	214,700	280,400
5,250	5,120	4,990	4,860	4,720	4,590	4,330	4,200	4,070	3,940	3,810	3,670	3,540	3,410	3,280	3,150	3,280	4,720	6,170
0	0	0	0	56,000	0	0	0	0	0	55,000	0	0	0	0	0	56,000	12,000	12,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,150,000	1,144,000	1,138,000	1,132,000	1,181,000	1,119,000	1,107,000	1,101,000	1,095,000	1,089,000	1,138,000	1,077,000	1,071,000	1,065,000	1,058,000	1,052,000	1,114,000	1,137,000	1,205,000
(5,711,000)	(5,805,000)	(5,860,000)	(5,876,000)	(5,908,000)	(5,845,000)	(5,737,000)	(5,626,000)	(5,512,000)	(5,395,000)	(5,330,000)	(5,207,000)	(5,081,000)	(4,952,000)	(4,819,000)	(4,683,000)	(4,612,000)	(3,913,000)	(2,631,000)

Economic Benefit Analysis (Northbound, HOV 3 1650 vph, High Traffic Volumes, Blended Bay Area & Sacramento VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 1,167,000	$ 1,161,000	$ 1,155,000	$ 1,149,000	$ 1,143,000	$ 1,137,000	$ 1,131,000	$ 1,128,000	$ 1,080,000	$ 1,032,000	$ 984,000	$ 936,000	$ 888,000	$ 840,000	$ 792,000	$ 744,000	$ 696,000	$ 645,000
2,200	2,100	2,000	1,900	1,800	1,700	1,600	1,900	1,800	1,700	1,600	1,500	1,400	1,300	1,200	1,100	1,000	760
613,300	585,400	557,500	529,600	501,800	473,900	446,000	529,600	501,800	473,900	446,000	418,100	390,300	362,400	334,500	306,600	278,800	211,900
0	0	0	(60)	0	0	0	180	0	(60)	0	0	0	0	0	(60)	0	0
0	0	0	3,000	0	0	0	0	0	2,940	0	0	0	180	0	2,880	0	0
0	0	0	2,940	0	0	0	180	0	2,880	0	0	0	180	0	2,820	0	0
(4,351,000)	(4,224,000)	(4,097,000)	(3,970,000)	(3,896,000)	(3,769,000)	(3,642,000)	(3,515,000)	(3,412,000)	(3,348,000)	(3,378,000)	(3,398,000)	(3,459,000)	(3,562,000)	(3,710,000)	(3,897,000)	(4,177,000)	(4,448,000)
1,167,000	1,161,000	1,155,000	1,149,000	1,143,000	1,137,000	1,131,000	1,128,000	1,080,000	1,032,000	984,000	936,000	888,000	840,000	792,000	744,000	696,000	645,000
131,200	125,300	119,300	113,300	107,400	101,400	95,400	113,300	107,400	101,400	95,400	89,500	83,500	77,600	71,600	65,600	59,700	45,300
2,890	2,760	2,620	2,490	2,360	2,230	2,100	2,490	2,360	2,230	2,100	1,970	1,840	1,710	1,580	1,440	1,310	1,000
0	0	0	53,000	0	0	0	3,000	0	52,000	0	0	0	3,000	0	51,000	0	0
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,040,000	1,034,000	1,028,000	1,075,000	1,016,000	1,010,000	1,004,000	1,025,000	1,016,000	1,062,000	1,004,000	997,000	991,000	988,000	979,000	1,024,000	967,000	952,000
(4,224,000)	(4,097,000)	(3,970,000)	(3,896,000)	(3,769,000)	(3,642,000)	(3,515,000)	(3,412,000)	(3,348,000)	(3,378,000)	(3,398,000)	(3,459,000)	(3,562,000)	(3,710,000)	(3,897,000)	(4,177,000)	(4,448,000)	(4,755,000)

Economic Benefit Analysis (Northbound, HOV 3 1400 vph, High Traffic Volumes, Blended Bay Area & Sacramento VOT)

Switch NB to HOV

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 3,138,000	$ 3,789,000	$ 4,440,000	$ 5,091,000	$ 5,742,000	$ 6,393,000	$ 7,044,000	$ 7,695,000	$ 7,698,000	$ 7,701,000	$ 7,704,000	$ 7,707,000	$ 7,710,000	$ 7,713,000	$ 7,716,000	$ 7,719,000	$ 7,722,000	$ 10,800,000
5,800	6,900	8,000	9,100	10,200	11,300	12,400	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,900
1,616,800	1,923,400	2,230,000	2,536,600	2,843,300	3,149,900	3,456,500	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,874,600
660	660	660	660	660	660	660	720	0	-	0	0	0	0	0	-	0	180
0	0	0	3,120	660	660	660	660	660	3,780	1320	1320	1320	1380	660	3,780	1320	1320
660	660	660	3,780	1320	1320	1320	1380	660	3,780	1320	1320	1320	1380	660	3,780	1320	1500
(2,631,000)	(765,000)	1,685,000	4,719,000	8,281,000	12,471,000	17,245,000	22,603,000	28,538,000	34,489,000	40,387,000	46,332,000	52,280,000	58,231,000	64,184,000	70,153,000	76,069,000	82,032,000
3,138,000	3,789,000	4,440,000	5,091,000	5,742,000	6,393,000	7,044,000	7,695,000	7,698,000	7,701,000	7,704,000	7,707,000	7,710,000	7,713,000	7,716,000	7,719,000	7,722,000	10,800,000
346,000	411,600	477,200	542,800	608,500	674,100	739,700	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	829,200
7,610	9,060	10,500	11,940	13,390	14,830	16,270	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	18,240
12,000	12,000	12,000	68,000	24,000	24,000	24,000	25,000	12,000	68,000	24,000	24,000	24,000	25,000	12,000	68,000	24,000	27,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,272,000	1,339,000	1,406,000	1,529,000	1,552,000	1,619,000	1,686,000	1,760,000	1,747,000	1,803,000	1,759,000	1,759,000	1,759,000	1,760,000	1,747,000	1,803,000	1,759,000	1,780,000
(765,000)	1,685,000	4,719,000	8,281,000	12,471,000	17,245,000	22,603,000	28,538,000	34,489,000	40,387,000	46,332,000	52,280,000	58,231,000	64,184,000	70,153,000	76,069,000	82,032,000	91,052,000

San Joaquin COG I-5 North HOT Lane Study
Southbound, Low Traffic Voulmues, Low VOT

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, Low Traffic Volumes, Low VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 10,000	$ 11,000	$ 12,000	$ 13,000	$ 14,000	$ 15,000	$ 16,000	$ 17,000	$ 18,000	$ 19,000	$ 20,000	$ 29,000	$ 38,000	$ 47,000
Est. Daily Users (Veh)	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,200	5,200	5,200
Est Annual User (Veh)	1,170,800	1,198,600	1,226,500	1,254,400	1,282,300	1,310,100	1,338,000	1,365,900	1,393,800	1,421,600	1,449,500	1,449,500	1,449,500	1,449,500
(# of New Transponders)	2,520	60	60	60	100	60	60	60	60	60	60	0	-	0
(# of Replacement Xsponders)	-	0	0	0	0	0	2,520	60	60	60	100	60	2,580	120
(Total # of New Transponders)	2,520	60	60	60	100	60	2,580	120	120	120	160	60	2,580	120
Beginning Balance	0	(1,197,000)	(2,355,000)	(3,518,000)	(4,686,000)	(5,860,000)	(7,039,000)	(8,268,000)	(9,458,000)	(10,653,000)	(11,853,000)	(13,059,000)	(14,254,000)	(15,485,000)
Annual Revenue	10,000	11,000	12,000	13,000	14,000	15,000	16,000	17,000	18,000	19,000	20,000	29,000	38,000	47,000
E penses														
User Fee (per X-Action)	250,600	256,500	262,500	268,400	274,400	280,400	286,300	292,300	298,300	304,200	310,200	310,200	310,200	310,200
Financing Fee (User Fee)	5,510	5,640	5,780	5,900	6,040	6,170	6,300	6,430	6,560	6,690	6,820	6,820	6,820	6,820
Transponder (Every 6 Yrs)	45,000	1,000	1,000	1,000	2,000	1,000	46,000	2,000	2,000	2,000	3,000	1,000	46,000	2,000
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,207,000	1,169,000	1,175,000	1,181,000	1,188,000	1,194,000	1,245,000	1,207,000	1,213,000	1,219,000	1,226,000	1,224,000	1,269,000	1,225,000
Ending Balance	(1,197,000)	(2,355,000)	(3,518,000)	(4,686,000)	(5,860,000)	(7,039,000)	(8,268,000)	(9,458,000)	(10,653,000)	(11,853,000)	(13,059,000)	(14,254,000)	(15,485,000)	(16,663,000)

San Joaquin COG I-5 North HOT Lane Study

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, Low Traffic Volumes, Low VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 10,000	$ 11,000	$ 12,000	$ 13,000	$ 14,000	$ 15,000	$ 16,000	$ 17,000	$ 18,000	$ 19,000	$ 20,000	$ 29,000	$ 38,000	$ 47,000
Est. Daily Users (Veh)	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,300	5,400	5,500
Est Annual User (Veh)	1,170,800	1,198,600	1,226,500	1,254,400	1,282,300	1,310,100	1,338,000	1,365,900	1,393,800	1,421,600	1,449,500	1,477,400	1,505,300	1,533,100
(# of New Transponders)	2,520	60	60	60	60	60	60	60	60	60	60	60	60	60
(# of Replacement Xsponders)	-	0	0	0	0	0	2,520	60	60	60	60	60	2580	120
(Total # of New Transponders)	2,520	60	60	60	60	60	2,580	120	120	120	120	120	2640	180
Beginning Balance	0	(1,197,000)	(2,355,000)	(3,518,000)	(4,686,000)	(5,859,000)	(7,038,000)	(8,267,000)	(9,457,000)	(10,652,000)	(11,852,000)	(13,057,000)	(14,259,000)	(15,504,000)
Annual Revenue	10,000	11,000	12,000	13,000	14,000	15,000	16,000	17,000	18,000	19,000	20,000	29,000	38,000	47,000
E penses														
User Fee (per X-Action)	250,600	256,500	262,500	268,400	274,400	280,400	286,300	292,300	298,300	304,200	310,200	316,200	322,100	328,100
Financing Fee (User Fee)	5,510	5,640	5,780	5,900	6,040	6,170	6,300	6,430	6,560	6,690	6,820	6,960	7,090	7,220
Transponder (Every 6 Yrs)	45,000	1,000	1,000	1,000	1,000	1,000	46,000	2,000	2,000	2,000	2,000	2,000	48,000	3,000
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,207,000	1,169,000	1,175,000	1,181,000	1,187,000	1,194,000	1,245,000	1,207,000	1,213,000	1,219,000	1,225,000	1,231,000	1,283,000	1,244,000
Ending Balance	(1,197,000)	(2,355,000)	(3,518,000)	(4,686,000)	(5,859,000)	(7,038,000)	(8,267,000)	(9,457,000)	(10,652,000)	(11,852,000)	(13,057,000)	(14,259,000)	(15,504,000)	(16,701,000)

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, Low Traffic Volumes, Low VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 56,000	$ 65,000	$ 74,000	$ 83,000	$ 92,000	$ 101,000	$ 110,000	$ 132,000	$ 154,000	$ 176,000	$ 198,000	$ 220,000	$ 242,000	$ 264,000	$ 286,000	$ 308,000	$ 330,000	$ 321,000	$ 312,000
5,200	5,200	5,200	5,200	5,200	5,200	4,700	4,600	4,500	4,400	4,300	4,200	4,100	4,000	3,900	3,800	3,700	3,500	3,300
1,449,500	1,449,500	1,449,500	1,449,500	1,449,500	1,449,500	1,310,100	1,282,300	1,254,400	1,226,500	1,198,600	1,170,800	1,142,900	1,115,000	1,087,100	1,059,300	1,031,400	975,600	919,900
0	0	0	0	-	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0	0
120	120	160	60	2,580	120	120	120	160	60	2,580	120	120	120	160	60	2,520	120	120
120	120	160	60	2,580	120	120	120	160	60	2,520	120	120	120	160	60	2,460	120	120
(16,663,000)	(17,832,000)	(18,992,000)	(20,144,000)	(21,285,000)	(22,462,000)	(23,586,000)	(24,671,000)	(25,727,000)	(26,756,000)	(27,755,000)	(28,770,000)	(29,714,000)	(30,630,000)	(31,518,000)	(32,379,000)	(33,210,000)	(34,056,000)	(34,856,000)
56,000	65,000	74,000	83,000	92,000	101,000	110,000	132,000	154,000	176,000	198,000	220,000	242,000	264,000	286,000	308,000	330,000	321,000	312,000
310,200	310,200	310,200	310,200	310,200	310,200	280,400	274,400	268,400	262,500	256,500	250,600	244,600	238,600	232,600	226,700	220,700	208,800	196,900
6,820	6,820	6,820	6,820	6,820	6,820	6,170	6,040	5,900	5,780	5,640	5,510	5,380	5,250	5,120	4,990	4,860	4,590	4,330
2,000	2,000	3,000	1,000	46,000	2,000	2,000	2,000	3,000	1,000	45,000	2,000	2,000	2,000	3,000	1,000	44,000	2,000	2,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,225,000	1,225,000	1,226,000	1,224,000	1,269,000	1,225,000	1,195,000	1,188,000	1,183,000	1,175,000	1,213,000	1,164,000	1,158,000	1,152,000	1,147,000	1,139,000	1,176,000	1,121,000	1,109,000
(17,832,000)	(18,992,000)	(20,144,000)	(21,285,000)	(22,462,000)	(23,586,000)	(24,671,000)	(25,727,000)	(26,756,000)	(27,755,000)	(28,770,000)	(29,714,000)	(30,630,000)	(31,518,000)	(32,379,000)	(33,210,000)	(34,056,000)	(34,856,000)	(35,653,000)

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, High Traffic Volumes, Low VOT)

Switch SB to HOV 3+

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 56,000	$ 65,000	$ 74,000	$ 83,000	$ 92,000	$ 101,000	$ 110,000	$ 214,200	$ 318,400	$ 422,600	$ 526,800	$ 631,000	$ 735,200	$ 839,400	$ 943,600	$ 1,047,800	$ 1,152,000	$ 1,275,000	$ 1,398,000
5,600	5,700	5,800	5,900	6,000	6,100	4,700	6,000	7,000	8,000	9,000	10,000	11,000	12,000	13,000	14,000	14,200	14,100	14,000
1,561,000	1,588,900	1,616,800	1,644,600	1,672,500	1,700,400	1,310,100	1,672,500	1,951,300	2,230,000	2,508,800	2,787,500	3,066,300	3,345,000	3,623,800	3,902,500	3,958,300	3,930,400	3,902,500
60	60	60	60	60	60	0	780	600	600	600	600	600	600	600	600	120	0	0
120	120	120	120	2640	180	180	180	180	180	2,700	240	180	960	780	780	3,300	840	780
180	180	180	180	2700	240	180	960	780	780	3,300	840	780	1560	1380	1380	3,420	840	780
(16,701,000)	(17,895,000)	(19,086,000)	(20,275,000)	(21,461,000)	(22,690,000)	(23,871,000)	(24,957,000)	(26,032,000)	(27,061,000)	(28,046,000)	(29,033,000)	(29,933,000)	(30,789,000)	(31,616,000)	(32,396,000)	(33,132,000)	(33,814,000)	(34,320,000)
56,000	65,000	74,000	83,000	92,000	101,000	110,000	214,200	318,400	422,600	526,800	631,000	735,200	839,400	943,600	1,047,800	1,152,000	1,275,000	1,398,000
334,100	340,000	346,000	351,900	357,900	363,900	280,400	357,900	417,600	477,200	536,900	596,500	656,200	715,800	775,500	835,100	847,100	841,100	835,100
7,350	7,480	7,610	7,740	7,870	8,010	6,170	7,870	9,190	10,500	11,810	13,120	14,440	15,750	17,060	18,370	18,640	18,500	18,370
3,000	3,000	3,000	3,000	49,000	4,000	3,000	17,000	14,000	14,000	59,000	15,000	14,000	28,000	25,000	25,000	62,000	15,000	14,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,250,000	1,256,000	1,263,000	1,269,000	1,321,000	1,282,000	1,196,000	1,289,000	1,347,000	1,408,000	1,514,000	1,531,000	1,591,000	1,666,000	1,724,000	1,784,000	1,834,000	1,781,000	1,773,000
(17,895,000)	(19,086,000)	(20,275,000)	(21,461,000)	(22,690,000)	(23,871,000)	(24,957,000)	(26,032,000)	(27,061,000)	(28,046,000)	(29,033,000)	(29,933,000)	(30,789,000)	(31,616,000)	(32,396,000)	(33,132,000)	(33,814,000)	(34,320,000)	(34,695,000)

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, Low Traffic Volumes, Low VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 303,000	$ 294,000	$ 285,000	$ 276,000	$ 267,000	$ 258,000	$ 249,000	$ 243,000	$ 223,000	$ 203,000	$ 183,000	$ 163,000	$ 143,000	$ 123,000	$ 103,000	$ 83,000	$ 63,000	$ 46,000
3,100	2,900	2,700	2,500	2,300	2,100	1,900	1,400	1,300	1,200	1,100	1,000	900	800	700	600	500	200
864,100	808,400	752,600	696,900	641,100	585,400	529,600	390,300	362,400	334,500	306,600	278,800	250,900	223,000	195,100	167,300	139,400	55,800
0	0	0	(120)	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0	0
120	160	60	2,460	120	120	120	160	60	2,340	120	120	120	160	60	2,280	120	120
120	160	60	2,340	120	120	120	160	60	2,280	120	120	120	160	60	2,220	120	120
(35,653,000)	(36,447,000)	(37,239,000)	(38,026,000)	(38,850,000)	(39,631,000)	(40,409,000)	(41,184,000)	(41,935,000)	(42,698,000)	(43,515,000)	(44,307,000)	(45,113,000)	(45,933,000)	(46,768,000)	(47,615,000)	(48,515,000)	(49,390,000)
303,000	294,000	285,000	276,000	267,000	258,000	249,000	243,000	223,000	203,000	183,000	163,000	143,000	123,000	103,000	83,000	63,000	46,000
184,900	173,000	161,100	149,100	137,200	125,300	113,300	83,500	77,600	71,600	65,600	59,700	53,700	47,700	41,800	35,800	29,800	11,900
4,070	3,810	3,540	3,280	3,020	2,760	2,490	1,840	1,710	1,580	1,440	1,310	1,180	1,050	920	790	660	260
2,000	3,000	1,000	42,000	2,000	2,000	2,000	3,000	1,000	41,000	2,000	2,000	2,000	3,000	1,000	40,000	2,000	2,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,097,000	1,086,000	1,072,000	1,100,000	1,048,000	1,036,000	1,024,000	994,000	986,000	1,020,000	975,000	969,000	963,000	958,000	950,000	983,000	938,000	920,000
(36,447,000)	(37,239,000)	(38,026,000)	(38,850,000)	(39,631,000)	(40,409,000)	(41,184,000)	(41,935,000)	(42,698,000)	(43,515,000)	(44,307,000)	(45,113,000)	(45,933,000)	(46,768,000)	(47,615,000)	(48,515,000)	(49,390,000)	(50,264,000)

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, Low Traffic Volumes, Low VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 1,521,000	$ 1,644,000	$ 1,767,000	$ 1,890,000	$ 2,013,000	$ 2,136,000	$ 2,259,000	$ 2,384,000	$ 2,478,000	$ 2,572,000	$ 2,666,000	$ 2,760,000	$ 2,854,000	$ 2,948,000	$ 3,042,000	$ 3,136,000	$ 3,230,000	$ 3,326,000
13,900	13,800	13,700	13,600	13,500	13,400	13,300	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,800
3,874,600	3,846,800	3,818,900	3,791,000	3,763,100	3,735,300	3,707,400	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,846,800
0	0	0	(60)	0	0	0	180	0	-	0	0	0	0	0	-	0	120
1560	1380	1380	3,420	840	780	1560	1380	1380	3,360	840	780	1560	1560	1380	3,360	840	780
1560	1380	1380	3,360	840	780	1560	1560	1380	3,360	840	780	1560	1560	1380	3,360	840	900
(34,695,000)	(34,955,000)	(35,083,000)	(35,082,000)	(34,987,000)	(34,718,000)	(34,319,000)	(33,805,000)	(33,184,000)	(32,466,000)	(31,689,000)	(30,773,000)	(29,762,000)	(28,671,000)	(27,486,000)	(26,204,000)	(24,863,000)	(23,383,000)
1,521,000	1,644,000	1,767,000	1,890,000	2,013,000	2,136,000	2,259,000	2,384,000	2,478,000	2,572,000	2,666,000	2,760,000	2,854,000	2,948,000	3,042,000	3,136,000	3,230,000	3,326,000
829,200	823,200	817,200	811,300	805,300	799,400	793,400	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	823,200
18,240	18,110	17,980	17,850	17,720	17,590	17,450	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	18,110
28,000	25,000	25,000	60,000	15,000	14,000	28,000	28,000	25,000	60,000	15,000	14,000	28,000	28,000	25,000	60,000	15,000	16,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,781,000	1,772,000	1,766,000	1,795,000	1,744,000	1,737,000	1,745,000	1,763,000	1,760,000	1,795,000	1,750,000	1,749,000	1,763,000	1,763,000	1,760,000	1,795,000	1,750,000	1,763,000
(34,955,000)	(35,083,000)	(35,082,000)	(34,987,000)	(34,718,000)	(34,319,000)	(33,805,000)	(33,184,000)	(32,466,000)	(31,689,000)	(30,773,000)	(29,762,000)	(28,671,000)	(27,486,000)	(26,204,000)	(24,863,000)	(23,383,000)	(21,820,000)

San Joaquin COG I-5 North HOT Lane Study
Southbound, Low Traffic Voulmues, SJ Co. High VOT

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, Low Traffic Volumes, High VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 12,000	$ 13,000	$ 14,000	$ 15,000	$ 16,000	$ 17,000	$ 18,000	$ 19,000	$ 20,000	$ 21,000	$ 25,000	$ 36,000	$ 47,000	$ 58,000
Est. Daily Users (Veh)	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,200	5,200	5,200
Est Annual User (Veh)	1,170,800	1,198,600	1,226,500	1,254,400	1,282,300	1,310,100	1,338,000	1,365,900	1,393,800	1,421,600	1,449,500	1,449,500	1,449,500	1,449,500
(# of New Transponders)	2,520	60	60	60	100	60	60	60	60	60	60	0	-	0
(# of Replacement Xsponders)	-	0	0	0	0	0	2,520	60	60	60	100	60	2,580	120
(Total # of New Transponders)	2,520	60	60	60	100	60	2,580	120	120	120	160	60	2,580	120
Beginning Balance	0	(1,195,000)	(2,351,000)	(3,512,000)	(4,678,000)	(5,850,000)	(7,027,000)	(8,254,000)	(9,442,000)	(10,635,000)	(11,833,000)	(13,034,000)	(14,222,000)	(15,444,000)
Annual Revenue	12,000	13,000	14,000	15,000	16,000	17,000	18,000	19,000	20,000	21,000	25,000	36,000	47,000	58,000
E penses														
User Fee (per X-Action)	250,600	256,500	262,500	268,400	274,400	280,400	286,300	292,300	298,300	304,200	310,200	310,200	310,200	310,200
Financing Fee (User Fee)	5,510	5,640	5,780	5,900	6,040	6,170	6,300	6,430	6,560	6,690	6,820	6,820	6,820	6,820
Transponder (Every 6 Yrs)	45,000	1,000	1,000	1,000	2,000	1,000	46,000	2,000	2,000	2,000	3,000	1,000	46,000	2,000
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,207,000	1,169,000	1,175,000	1,181,000	1,188,000	1,194,000	1,245,000	1,207,000	1,213,000	1,219,000	1,226,000	1,224,000	1,269,000	1,225,000
Ending Balance	(1,195,000)	(2,351,000)	(3,512,000)	(4,678,000)	(5,850,000)	(7,027,000)	(8,254,000)	(9,442,000)	(10,635,000)	(11,833,000)	(13,034,000)	(14,222,000)	(15,444,000)	(16,611,000)

San Joaquin COG I-5 North HOT Lane Study

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, Low Traffic Volumes, High VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 12,000	$ 13,000	$ 14,000	$ 15,000	$ 16,000	$ 17,000	$ 18,000	$ 19,000	$ 20,000	$ 21,000	$ 25,000	$ 36,000	$ 47,000	$ 58,000
Est. Daily Users (Veh)	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,200	5,200	5,200
Est Annual User (Veh)	1,170,800	1,198,600	1,226,500	1,254,400	1,282,300	1,310,100	1,338,000	1,365,900	1,393,800	1,421,600	1,449,500	1,449,500	1,449,500	1,449,500
(# of New Transponders)	2,520	60	60	60	60	60	60	60	60	60	60	0	-	0
(# of Replacement Xsponders)	-	0	0	0	0	0	2,520	60	60	60	60	60	2,580	120
(Total # of New Transponders)	2,520	60	60	60	60	60	2,580	120	120	120	120	60	2,580	120
Beginning Balance	0	(1,195,000)	(2,351,000)	(3,512,000)	(4,678,000)	(5,849,000)	(7,026,000)	(8,253,000)	(9,441,000)	(10,634,000)	(11,832,000)	(13,032,000)	(14,220,000)	(15,442,000)
Annual Revenue	12,000	13,000	14,000	15,000	16,000	17,000	18,000	19,000	20,000	21,000	25,000	36,000	47,000	58,000
E penses														
User Fee (per X-Action)	250,600	256,500	262,500	268,400	274,400	280,400	286,300	292,300	298,300	304,200	310,200	310,200	310,200	310,200
Financing Fee (User Fee)	5,510	5,640	5,780	5,900	6,040	6,170	6,300	6,430	6,560	6,690	6,820	6,820	6,820	6,820
Transponder (Every 6 Yrs)	45,000	1,000	1,000	1,000	1,000	1,000	46,000	2,000	2,000	2,000	2,000	1,000	46,000	2,000
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,207,000	1,169,000	1,175,000	1,181,000	1,187,000	1,194,000	1,245,000	1,207,000	1,213,000	1,219,000	1,225,000	1,224,000	1,269,000	1,225,000
Ending Balance	(1,195,000)	(2,351,000)	(3,512,000)	(4,678,000)	(5,849,000)	(7,026,000)	(8,253,000)	(9,441,000)	(10,634,000)	(11,832,000)	(13,032,000)	(14,220,000)	(15,442,000)	(16,609,000)

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, Low Traffic Volumes, High VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 69,000	$ 80,000	$ 91,000	$ 102,000	$ 113,000	$ 124,000	$ 136,000	$ 160,000	$ 184,000	$ 208,000	$ 232,000	$ 256,000	$ 280,000	$ 304,000	$ 328,000	$ 352,000	$ 372,000	$ 365,000	$ 358,000
5,200	5,200	5,200	5,200	5,200	5,200	4,700	4,600	4,500	4,400	4,300	4,200	4,100	4,000	3,900	3,800	3,700	3,500	3,300
1,449,500	1,449,500	1,449,500	1,449,500	1,449,500	1,449,500	1,310,100	1,282,300	1,254,400	1,226,500	1,198,600	1,170,800	1,142,900	1,115,000	1,087,100	1,059,300	1,031,400	975,600	919,900
0	0	0	0	-	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0	0
120	120	160	60	2,580	120	120	120	160	60	2,580	120	120	120	160	60	2,520	120	120
120	120	160	60	2,580	120	120	120	160	60	2,520	120	120	120	160	60	2,460	120	120
(16,611,000)	(17,767,000)	(18,912,000)	(20,047,000)	(21,169,000)	(22,325,000)	(23,426,000)	(24,485,000)	(25,513,000)	(26,512,000)	(27,479,000)	(28,460,000)	(29,368,000)	(30,246,000)	(31,094,000)	(31,913,000)	(32,700,000)	(33,504,000)	(34,260,000)
69,000	80,000	91,000	102,000	113,000	124,000	136,000	160,000	184,000	208,000	232,000	256,000	280,000	304,000	328,000	352,000	372,000	365,000	358,000
310,200	310,200	310,200	310,200	310,200	310,200	280,400	274,400	268,400	262,500	256,500	250,600	244,600	238,600	232,600	226,700	220,700	208,800	196,900
6,820	6,820	6,820	6,820	6,820	6,820	6,170	6,040	5,900	5,780	5,640	5,510	5,380	5,250	5,120	4,990	4,860	4,590	4,330
2,000	2,000	3,000	1,000	46,000	2,000	2,000	2,000	3,000	1,000	45,000	2,000	2,000	2,000	3,000	1,000	44,000	2,000	2,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,225,000	1,225,000	1,226,000	1,224,000	1,269,000	1,225,000	1,195,000	1,188,000	1,183,000	1,175,000	1,213,000	1,164,000	1,158,000	1,152,000	1,147,000	1,139,000	1,176,000	1,121,000	1,109,000
(17,767,000)	(18,912,000)	(20,047,000)	(21,169,000)	(22,325,000)	(23,426,000)	(24,485,000)	(25,513,000)	(26,512,000)	(27,479,000)	(28,460,000)	(29,368,000)	(30,246,000)	(31,094,000)	(31,913,000)	(32,700,000)	(33,504,000)	(34,260,000)	(35,011,000)

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, Low Traffic Volumes, High VOT)

Switch SB to HOV 3+

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 69,000	$ 80,000	$ 91,000	$ 102,000	$ 113,000	$ 124,000	$ 136,000	$ 265,200	$ 394,400	$ 523,600	$ 652,800	$ 782,000	$ 911,200	$ 1,040,400	$ 1,169,600	$ 1,298,800	$ 1,428,000	$ 1,581,000	$ 1,734,000
5,200	5,200	5,200	5,200	5,200	5,200	4,700	6,000	7,000	8,000	9,000	10,000	11,000	12,000	13,000	14,000	14,200	14,100	14,000
1,449,500	1,449,500	1,449,500	1,449,500	1,449,500	1,449,500	1,310,100	1,672,500	1,951,300	2,230,000	2,508,800	2,787,500	3,066,300	3,345,000	3,623,800	3,902,500	3,958,300	3,930,400	3,902,500
0	0	0	0	-	0	0	780	600	600	600	600	600	600	600	600	120	0	0
120	120	120	60	2,580	120	120	120	120	60	2,580	120	120	900	720	660	3,180	720	720
120	120	120	60	2,580	120	120	900	720	660	3,180	720	720	1500	1320	1260	3,300	720	720
(16,609,000)	(17,765,000)	(18,910,000)	(20,044,000)	(21,166,000)	(22,322,000)	(23,423,000)	(24,482,000)	(25,505,000)	(26,457,000)	(27,339,000)	(28,198,000)	(28,945,000)	(29,624,000)	(30,249,000)	(30,802,000)	(31,285,000)	(31,688,000)	(31,886,000)
69,000	80,000	91,000	102,000	113,000	124,000	136,000	265,200	394,400	523,600	652,800	782,000	911,200	1,040,400	1,169,600	1,298,800	1,428,000	1,581,000	1,734,000
310,200	310,200	310,200	310,200	310,200	310,200	280,400	357,900	417,600	477,200	536,900	596,500	656,200	715,800	775,500	835,100	847,100	841,100	835,100
6,820	6,820	6,820	6,820	6,820	6,820	6,170	7,870	9,190	10,500	11,810	13,120	14,440	15,750	17,060	18,370	18,640	18,500	18,370
2,000	2,000	2,000	1,000	46,000	2,000	2,000	16,000	13,000	12,000	57,000	13,000	13,000	27,000	24,000	23,000	59,000	13,000	13,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,225,000	1,225,000	1,225,000	1,224,000	1,269,000	1,225,000	1,195,000	1,288,000	1,346,000	1,406,000	1,512,000	1,529,000	1,590,000	1,665,000	1,723,000	1,782,000	1,831,000	1,779,000	1,772,000
(17,765,000)	(18,910,000)	(20,044,000)	(21,166,000)	(22,322,000)	(23,423,000)	(24,482,000)	(25,505,000)	(26,457,000)	(27,339,000)	(28,198,000)	(28,945,000)	(29,624,000)	(30,249,000)	(30,802,000)	(31,285,000)	(31,688,000)	(31,886,000)	(31,924,000)

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, Low Traffic Volumes, High VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 351,000	$ 344,000	$ 337,000	$ 330,000	$ 323,000	$ 316,000	$ 309,000	$ 301,000	$ 277,000	$ 253,000	$ 229,000	$ 205,000	$ 181,000	$ 157,000	$ 133,000	$ 109,000	$ 85,000	$ 57,000
3,100	2,900	2,700	2,500	2,300	2,100	1,900	1,400	1,300	1,200	1,100	1,000	900	800	700	600	500	200
864,100	808,400	752,600	696,900	641,100	585,400	529,600	390,300	362,400	334,500	306,600	278,800	250,900	223,000	195,100	167,300	139,400	55,800
0	0	0	(120)	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0	0
120	160	60	2,460	120	120	120	160	60	2,340	120	120	120	160	60	2,280	120	120
120	160	60	2,340	120	120	120	160	60	2,280	120	120	120	160	60	2,220	120	120
(35,011,000)	(35,757,000)	(36,499,000)	(37,234,000)	(38,004,000)	(38,729,000)	(39,449,000)	(40,164,000)	(40,857,000)	(41,566,000)	(42,333,000)	(43,079,000)	(43,843,000)	(44,625,000)	(45,426,000)	(46,243,000)	(47,117,000)	(47,970,000)
351,000	344,000	337,000	330,000	323,000	316,000	309,000	301,000	277,000	253,000	229,000	205,000	181,000	157,000	133,000	109,000	85,000	57,000
184,900	173,000	161,100	149,100	137,200	125,300	113,300	83,500	77,600	71,600	65,600	59,700	53,700	47,700	41,800	35,800	29,800	11,900
4,070	3,810	3,540	3,280	3,020	2,760	2,490	1,840	1,710	1,580	1,440	1,310	1,180	1,050	920	790	660	260
2,000	3,000	1,000	42,000	2,000	2,000	2,000	3,000	1,000	41,000	2,000	2,000	2,000	3,000	1,000	40,000	2,000	2,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,097,000	1,086,000	1,072,000	1,100,000	1,048,000	1,036,000	1,024,000	994,000	986,000	1,020,000	975,000	969,000	963,000	958,000	950,000	983,000	938,000	920,000
(35,757,000)	(36,499,000)	(37,234,000)	(38,004,000)	(38,729,000)	(39,449,000)	(40,164,000)	(40,857,000)	(41,566,000)	(42,333,000)	(43,079,000)	(43,843,000)	(44,625,000)	(45,426,000)	(46,243,000)	(47,117,000)	(47,970,000)	(48,833,000)

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, Low Traffic Volumes, High VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 1,887,000	$ 2,040,000	$ 2,193,000	$ 2,346,000	$ 2,499,000	$ 2,652,000	$ 2,805,000	$ 2,956,000	$ 3,073,000	$ 3,190,000	$ 3,307,000	$ 3,424,000	$ 3,541,000	$ 3,658,000	$ 3,775,000	$ 3,892,000	$ 4,009,000	$ 4,124,000
13,900	13,800	13,700	13,600	13,500	13,400	13,300	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,800
3,874,600	3,846,800	3,818,900	3,791,000	3,763,100	3,735,300	3,707,400	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,846,800
0	0	0	(60)	0	0	0	180	0	-	0	0	0	0	0	-	0	120
1500	1320	1260	3,300	720	720	1500	1320	1260	3,240	720	720	1500	1500	1260	3,240	720	720
1500	1320	1260	3,240	720	720	1500	1500	1260	3,240	720	720	1500	1500	1260	3,240	720	840
(31,924,000)	(31,817,000)	(31,548,000)	(31,119,000)	(30,566,000)	(29,809,000)	(28,893,000)	(27,832,000)	(26,638,000)	(25,323,000)	(23,926,000)	(22,367,000)	(20,691,000)	(18,912,000)	(17,016,000)	(14,999,000)	(12,900,000)	(10,639,000)
1,887,000	2,040,000	2,193,000	2,346,000	2,499,000	2,652,000	2,805,000	2,956,000	3,073,000	3,190,000	3,307,000	3,424,000	3,541,000	3,658,000	3,775,000	3,892,000	4,009,000	4,124,000
829,200	823,200	817,200	811,300	805,300	799,400	793,400	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	823,200
18,240	18,110	17,980	17,850	17,720	17,590	17,450	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	18,110
27,000	24,000	23,000	58,000	13,000	13,000	27,000	27,000	23,000	58,000	13,000	13,000	27,000	27,000	23,000	58,000	13,000	15,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,780,000	1,771,000	1,764,000	1,793,000	1,742,000	1,736,000	1,744,000	1,762,000	1,758,000	1,793,000	1,748,000	1,748,000	1,762,000	1,762,000	1,758,000	1,793,000	1,748,000	1,762,000
(31,817,000)	(31,548,000)	(31,119,000)	(30,566,000)	(29,809,000)	(28,893,000)	(27,832,000)	(26,638,000)	(25,323,000)	(23,926,000)	(22,367,000)	(20,691,000)	(18,912,000)	(17,016,000)	(14,999,000)	(12,900,000)	(10,639,000)	(8,277,000)

San Joaquin COG I-5 North HOT Lane Study
Southbound, Low Traffic Voulmues, Blended Bay Area & Sacramento VOT

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, Low Traffic Volumes, Blended Bay Area & Sacramento VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 15,000	$ 17,000	$ 19,000	$ 21,000	$ 23,000	$ 25,000	$ 27,000	$ 29,000	$ 31,000	$ 33,000	$ 30,000	$ 44,000	$ 58,000	$ 72,000
Est. Daily Users (Veh)	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,200	5,200	5,200
Est Annual User (Veh)	1,170,800	1,198,600	1,226,500	1,254,400	1,282,300	1,310,100	1,338,000	1,365,900	1,393,800	1,421,600	1,449,500	1,449,500	1,449,500	1,449,500
(# of New Transponders)	2,520	60	60	60	100	60	60	60	60	60	60	0	-	0
(# of Replacement Xsponders)	-	0	0	0	0	0	2,520	60	60	60	100	60	2,580	120
(Total # of New Transponders)	2,520	60	60	60	100	60	2,580	120	120	120	160	60	2,580	120
Beginning Balance	0	(1,192,000)	(2,344,000)	(3,500,000)	(4,660,000)	(5,825,000)	(6,994,000)	(8,212,000)	(9,390,000)	(10,572,000)	(11,758,000)	(12,954,000)	(14,134,000)	(15,345,000)
Annual Revenue	15,000	17,000	19,000	21,000	23,000	25,000	27,000	29,000	31,000	33,000	30,000	44,000	58,000	72,000
E penses														
User Fee (per X-Action)	250,600	256,500	262,500	268,400	274,400	280,400	286,300	292,300	298,300	304,200	310,200	310,200	310,200	310,200
Financing Fee (User Fee)	5,510	5,640	5,780	5,900	6,040	6,170	6,300	6,430	6,560	6,690	6,820	6,820	6,820	6,820
Transponder (Every 6 Yrs)	45,000	1,000	1,000	1,000	2,000	1,000	46,000	2,000	2,000	2,000	3,000	1,000	46,000	2,000
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,207,000	1,169,000	1,175,000	1,181,000	1,188,000	1,194,000	1,245,000	1,207,000	1,213,000	1,219,000	1,226,000	1,224,000	1,269,000	1,225,000
Ending Balance	(1,192,000)	(2,344,000)	(3,500,000)	(4,660,000)	(5,825,000)	(6,994,000)	(8,212,000)	(9,390,000)	(10,572,000)	(11,758,000)	(12,954,000)	(14,134,000)	(15,345,000)	(16,498,000)

San Joaquin COG I-5 North HOT Lane Study

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, Low Traffic Volumes, Blended Bay Area & Sacramento VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 15,000	$ 17,000	$ 19,000	$ 21,000	$ 23,000	$ 25,000	$ 27,000	$ 29,000	$ 31,000	$ 33,000	$ 30,000	$ 44,000	$ 58,000	$ 72,000
Est. Daily Users (Veh)	4,200	4,300	4,400	4,500	4,600	4,700	4,800	4,900	5,000	5,100	5,200	5,200	5,200	5,200
Est Annual User (Veh)	1,170,800	1,198,600	1,226,500	1,254,400	1,282,300	1,310,100	1,338,000	1,365,900	1,393,800	1,421,600	1,449,500	1,449,500	1,449,500	1,449,500
(# of New Transponders)	2,520	60	60	60	60	60	60	60	60	60	60	0	-	0
(# of Replacement Xsponders)	-	0	0	0	0	0	2,520	60	60	60	60	60	2,580	120
(Total # of New Transponders)	2,520	60	60	60	60	60	2,580	120	120	120	120	60	2,580	120
Beginning Balance	0	(1,192,000)	(2,344,000)	(3,500,000)	(4,660,000)	(5,824,000)	(6,993,000)	(8,211,000)	(9,389,000)	(10,571,000)	(11,757,000)	(12,952,000)	(14,132,000)	(15,343,000)
Annual Revenue	15,000	17,000	19,000	21,000	23,000	25,000	27,000	29,000	31,000	33,000	30,000	44,000	58,000	72,000
E penses														
User Fee (per X-Action)	250,600	256,500	262,500	268,400	274,400	280,400	286,300	292,300	298,300	304,200	310,200	310,200	310,200	310,200
Financing Fee (User Fee)	5,510	5,640	5,780	5,900	6,040	6,170	6,300	6,430	6,560	6,690	6,820	6,820	6,820	6,820
Transponder (Every 6 Yrs)	45,000	1,000	1,000	1,000	1,000	1,000	46,000	2,000	2,000	2,000	2,000	1,000	46,000	2,000
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,207,000	1,169,000	1,175,000	1,181,000	1,187,000	1,194,000	1,245,000	1,207,000	1,213,000	1,219,000	1,225,000	1,224,000	1,269,000	1,225,000
Ending Balance	(1,192,000)	(2,344,000)	(3,500,000)	(4,660,000)	(5,824,000)	(6,993,000)	(8,211,000)	(9,389,000)	(10,571,000)	(11,757,000)	(12,952,000)	(14,132,000)	(15,343,000)	(16,496,000)

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, Low Traffic Volumes, Blended Bay Area & Sacramento VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 86,000	$ 100,000	$ 114,000	$ 128,000	$ 142,000	$ 156,000	$ 165,000	$ 157,000	$ 149,000	$ 141,000	$ 133,000	$ 125,000	$ 117,000	$ 109,000	$ 101,000	$ 93,000	$ 450,000	$ 442,000	$ 434,000
5,200	5,200	5,200	5,200	5,200	5,200	4,700	4,600	4,500	4,400	4,300	4,200	4,100	4,000	3,900	3,800	3,700	3,500	3,300
1,449,500	1,449,500	1,449,500	1,449,500	1,449,500	1,449,500	1,310,100	1,282,300	1,254,400	1,226,500	1,198,600	1,170,800	1,142,900	1,115,000	1,087,100	1,059,300	1,031,400	975,600	919,900
0	0	0	0	-	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0	0
120	120	160	60	2,580	120	120	120	160	60	2,580	120	120	120	160	60	2,520	120	120
120	120	160	60	2,580	120	120	120	160	60	2,520	120	120	120	160	60	2,460	120	120
(16,498,000)	(17,637,000)	(18,762,000)	(19,874,000)	(20,970,000)	(22,097,000)	(23,166,000)	(24,196,000)	(25,227,000)	(26,261,000)	(27,295,000)	(28,375,000)	(29,414,000)	(30,455,000)	(31,498,000)	(32,544,000)	(33,590,000)	(34,316,000)	(34,995,000)
86,000	100,000	114,000	128,000	142,000	156,000	165,000	157,000	149,000	141,000	133,000	125,000	117,000	109,000	101,000	93,000	450,000	442,000	434,000
310,200	310,200	310,200	310,200	310,200	310,200	280,400	274,400	268,400	262,500	256,500	250,600	244,600	238,600	232,600	226,700	220,700	208,800	196,900
6,820	6,820	6,820	6,820	6,820	6,820	6,170	6,040	5,900	5,780	5,640	5,510	5,380	5,250	5,120	4,990	4,860	4,590	4,330
2,000	2,000	3,000	1,000	46,000	2,000	2,000	2,000	3,000	1,000	45,000	2,000	2,000	2,000	3,000	1,000	44,000	2,000	2,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,225,000	1,225,000	1,226,000	1,224,000	1,269,000	1,225,000	1,195,000	1,188,000	1,183,000	1,175,000	1,213,000	1,164,000	1,158,000	1,152,000	1,147,000	1,139,000	1,176,000	1,121,000	1,109,000
(17,637,000)	(18,762,000)	(19,874,000)	(20,970,000)	(22,097,000)	(23,166,000)	(24,196,000)	(25,227,000)	(26,261,000)	(27,295,000)	(28,375,000)	(29,414,000)	(30,455,000)	(31,498,000)	(32,544,000)	(33,590,000)	(34,316,000)	(34,995,000)	(35,670,000)

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, Low Traffic Volumes, Blended Bay Area & Sacramento VOT)

Switch SB to HOV 3+

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 86,000	$ 100,000	$ 114,000	$ 128,000	$ 142,000	$ 156,000	$ 165,000	$ 350,000	$ 535,000	$ 720,000	$ 905,000	$ 1,090,000	$ 1,275,000	$ 1,460,000	$ 1,645,000	$ 1,830,000	$ 1,728,000	$ 1,913,000	$ 2,098,000
5,200	5,200	5,200	5,200	5,200	5,200	4,700	6,000	7,000	8,000	9,000	10,000	11,000	12,000	13,000	14,000	14,200	14,100	14,000
1,449,500	1,449,500	1,449,500	1,449,500	1,449,500	1,449,500	1,310,100	1,672,500	1,951,300	2,230,000	2,508,800	2,787,500	3,066,300	3,345,000	3,623,800	3,902,500	3,958,300	3,930,400	3,902,500
0	0	0	0	-	0	0	780	600	600	600	600	600	600	600	600	120	0	0
120	120	120	60	2,580	120	120	120	120	60	2,580	120	120	900	720	660	3,180	720	720
120	120	120	60	2,580	120	120	900	720	660	3,180	720	720	1500	1320	1260	3,300	720	720
(16,496,000)	(17,635,000)	(18,760,000)	(19,871,000)	(20,967,000)	(22,094,000)	(23,163,000)	(24,193,000)	(25,131,000)	(25,942,000)	(26,628,000)	(27,235,000)	(27,674,000)	(27,989,000)	(28,194,000)	(28,272,000)	(28,224,000)	(28,327,000)	(28,193,000)
86,000	100,000	114,000	128,000	142,000	156,000	165,000	350,000	535,000	720,000	905,000	1,090,000	1,275,000	1,460,000	1,645,000	1,830,000	1,728,000	1,913,000	2,098,000
310,200	310,200	310,200	310,200	310,200	310,200	280,400	357,900	417,600	477,200	536,900	596,500	656,200	715,800	775,500	835,100	847,100	841,100	835,100
6,820	6,820	6,820	6,820	6,820	6,820	6,170	7,870	9,190	10,500	11,810	13,120	14,440	15,750	17,060	18,370	18,640	18,500	18,370
2,000	2,000	2,000	1,000	46,000	2,000	2,000	16,000	13,000	12,000	57,000	13,000	13,000	27,000	24,000	23,000	59,000	13,000	13,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,225,000	1,225,000	1,225,000	1,224,000	1,269,000	1,225,000	1,195,000	1,288,000	1,346,000	1,406,000	1,512,000	1,529,000	1,590,000	1,665,000	1,723,000	1,782,000	1,831,000	1,779,000	1,772,000
(17,635,000)	(18,760,000)	(19,871,000)	(20,967,000)	(22,094,000)	(23,163,000)	(24,193,000)	(25,131,000)	(25,942,000)	(26,628,000)	(27,235,000)	(27,674,000)	(27,989,000)	(28,194,000)	(28,272,000)	(28,224,000)	(28,327,000)	(28,193,000)	(27,867,000)

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, Low Traffic Volumes, Blended Bay Area & Sacramento VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 426,000	$ 418,000	$ 410,000	$ 402,000	$ 394,000	$ 386,000	$ 378,000	$ 365,000	$ 335,000	$ 305,000	$ 275,000	$ 245,000	$ 215,000	$ 185,000	$ 155,000	$ 125,000	$ 95,000	$ 69,000
3,100	2,900	2,700	2,500	2,300	2,100	1,900	1,400	1,300	1,200	1,100	1,000	900	800	700	600	500	200
864,100	808,400	752,600	696,900	641,100	585,400	529,600	390,300	362,400	334,500	306,600	278,800	250,900	223,000	195,100	167,300	139,400	55,800
0	0	0	(120)	0	0	0	0	0	(60)	0	0	0	0	0	(60)	0	0
120	160	60	2,460	120	120	120	160	60	2,340	120	120	120	160	60	2,280	120	120
120	160	60	2,340	120	120	120	160	60	2,280	120	120	120	160	60	2,220	120	120
(35,670,000)	(36,341,000)	(37,009,000)	(37,671,000)	(38,369,000)	(39,023,000)	(39,673,000)	(40,319,000)	(40,948,000)	(41,599,000)	(42,314,000)	(43,014,000)	(43,738,000)	(44,486,000)	(45,259,000)	(46,054,000)	(46,912,000)	(47,755,000)
426,000	418,000	410,000	402,000	394,000	386,000	378,000	365,000	335,000	305,000	275,000	245,000	215,000	185,000	155,000	125,000	95,000	69,000
184,900	173,000	161,100	149,100	137,200	125,300	113,300	83,500	77,600	71,600	65,600	59,700	53,700	47,700	41,800	35,800	29,800	11,900
4,070	3,810	3,540	3,280	3,020	2,760	2,490	1,840	1,710	1,580	1,440	1,310	1,180	1,050	920	790	660	260
2,000	3,000	1,000	42,000	2,000	2,000	2,000	3,000	1,000	41,000	2,000	2,000	2,000	3,000	1,000	40,000	2,000	2,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,097,000	1,086,000	1,072,000	1,100,000	1,048,000	1,036,000	1,024,000	994,000	986,000	1,020,000	975,000	969,000	963,000	958,000	950,000	983,000	938,000	920,000
(36,341,000)	(37,009,000)	(37,671,000)	(38,369,000)	(39,023,000)	(39,673,000)	(40,319,000)	(40,948,000)	(41,599,000)	(42,314,000)	(43,014,000)	(43,738,000)	(44,486,000)	(45,259,000)	(46,054,000)	(46,912,000)	(47,755,000)	(48,606,000)

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, Low Traffic Volumes, Blended Bay Area & Sacramento VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 2,283,000	$ 2,468,000	$ 2,653,000	$ 2,838,000	$ 3,023,000	$ 3,208,000	$ 3,393,000	$ 3,576,000	$ 3,717,000	$ 3,858,000	$ 3,999,000	$ 4,140,000	$ 4,281,000	$ 4,422,000	$ 4,563,000	$ 4,704,000	$ 4,845,000	$ 4,989,000
13,900	13,800	13,700	13,600	13,500	13,400	13,300	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,800
3,874,600	3,846,800	3,818,900	3,791,000	3,763,100	3,735,300	3,707,400	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,791,000	3,846,800
0	0	0	(60)	0	0	0	180	0	-	0	0	0	0	0	-	0	120
1500	1320	1260	3,300	720	720	1500	1320	1260	3,240	720	720	1500	1500	1260	3,240	720	720
1500	1320	1260	3,240	720	720	1500	1500	1260	3,240	720	720	1500	1500	1260	3,240	720	840
(27,867,000)	(27,364,000)	(26,667,000)	(25,778,000)	(24,733,000)	(23,452,000)	(21,980,000)	(20,331,000)	(18,517,000)	(16,558,000)	(14,493,000)	(12,242,000)	(9,850,000)	(7,331,000)	(4,671,000)	(1,866,000)	1,045,000	4,142,000
2,283,000	2,468,000	2,653,000	2,838,000	3,023,000	3,208,000	3,393,000	3,576,000	3,717,000	3,858,000	3,999,000	4,140,000	4,281,000	4,422,000	4,563,000	4,704,000	4,845,000	4,989,000
829,200	823,200	817,200	811,300	805,300	799,400	793,400	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	811,300	823,200
18,240	18,110	17,980	17,850	17,720	17,590	17,450	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	17,850	18,110
27,000	24,000	23,000	58,000	13,000	13,000	27,000	27,000	23,000	58,000	13,000	13,000	27,000	27,000	23,000	58,000	13,000	15,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,780,000	1,771,000	1,764,000	1,793,000	1,742,000	1,736,000	1,744,000	1,762,000	1,758,000	1,793,000	1,748,000	1,748,000	1,762,000	1,762,000	1,758,000	1,793,000	1,748,000	1,762,000
(27,364,000)	(26,667,000)	(25,778,000)	(24,733,000)	(23,452,000)	(21,980,000)	(20,331,000)	(18,517,000)	(16,558,000)	(14,493,000)	(12,242,000)	(9,850,000)	(7,331,000)	(4,671,000)	(1,866,000)	1,045,000	4,142,000	7,369,000

San Joaquin COG I-5 North HOT Lane Study
Southbound, Low Traffic Voulmues, Low VOT

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, High Traffic Volumes, Low VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 50,000	$ 67,000	$ 84,000	$ 101,000	$ 118,000	$ 135,000	$ 152,000	$ 169,000	$ 186,000	$ 203,000	$ 220,000	$ 233,000	$ 246,000	$ 259,000
Est. Daily Users (Veh)	5,700	5,600	5,500	5,400	5,300	5,200	5,100	5,000	4,900	4,800	4,300	4,100	3,900	3,700
Est Annual User (Veh)	1,588,900	1,561,000	1,533,125	1,505,300	1,477,400	1,449,500	1,421,600	1,393,800	1,365,900	1,338,000	1,198,600	1,142,900	1,087,100	1,031,400
(# of New Transponders)	3,420	0	0	0	0	0	(60)	0	0	0	0	0	(120)	0
(# of Replacement Xsponders)	-	0	0	0	0	0	3,420	0	0	0	0	0	3,360	0
(Total # of New Transponders)	3,420	0	0	0	0	0	3,360	0	0	0	0	0	3,240	0
Beginning Balance	0	(1,265,000)	(2,445,000)	(3,602,000)	(4,736,000)	(5,847,000)	(6,935,000)	(8,060,000)	(9,102,000)	(10,121,000)	(11,117,000)	(12,065,000)	(12,988,000)	(13,944,000)
Annual Revenue	50,000	67,000	84,000	101,000	118,000	135,000	152,000	169,000	186,000	203,000	220,000	233,000	246,000	259,000
E penses														
User Fee (per X-Action)	340,000	334,100	328,100	322,100	316,200	310,200	304,200	298,300	292,300	286,300	256,500	244,600	232,600	220,700
Financing Fee (User Fee)	7,480	7,350	7,220	7,090	6,960	6,820	6,690	6,560	6,430	6,300	5,640	5,380	5,120	4,860
Transponder (Every 6 Yrs)	62,000	0	0	0	0	0	60,000	0	0	0	0	0	58,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,315,000	1,247,000	1,241,000	1,235,000	1,229,000	1,223,000	1,277,000	1,211,000	1,205,000	1,199,000	1,168,000	1,156,000	1,202,000	1,132,000
Ending Balance	(1,265,000)	(2,445,000)	(3,602,000)	(4,736,000)	(5,847,000)	(6,935,000)	(8,060,000)	(9,102,000)	(10,121,000)	(11,117,000)	(12,065,000)	(12,988,000)	(13,944,000)	(14,817,000)

San Joaquin COG I-5 North HOT Lane Study

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, High Traffic Volumes, Low VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 50,000	$ 67,000	$ 84,000	$ 101,000	$ 118,000	$ 135,000	$ 152,000	$ 169,000	$ 186,000	$ 203,000	$ 220,000	$ 233,000	$ 246,000	$ 259,000
Est. Daily Users (Veh)	5,700	5,600	5,500	5,400	5,300	5,200	5,100	5,000	4,900	4,800	4,300	4,100	3,900	3,700
Est Annual User (Veh)	1,588,900	1,561,000	1,533,125	1,505,300	1,477,400	1,449,500	1,421,600	1,393,800	1,365,900	1,338,000	1,198,600	1,142,900	1,087,100	1,031,400
(# of New Transponders)	3,420	0	0	0	0	0	(60)	0	0	0	0	0	0	0
(# of Replacement Xsponders)	-	0	0	0	0	0	3,420	0	0	0	0	0	3360	0
(Total # of New Transponders)	3,420	0	0	0	0	0	3,360	0	0	0	0	0	3360	0
Beginning Balance	0	(1,265,000)	(2,445,000)	(3,602,000)	(4,736,000)	(5,847,000)	(6,935,000)	(8,060,000)	(9,102,000)	(10,121,000)	(11,117,000)	(12,065,000)	(12,988,000)	(13,946,000)
Annual Revenue	50,000	67,000	84,000	101,000	118,000	135,000	152,000	169,000	186,000	203,000	220,000	233,000	246,000	259,000
E penses														
User Fee (per X-Action)	340,000	334,100	328,100	322,100	316,200	310,200	304,200	298,300	292,300	286,300	256,500	244,600	232,600	220,700
Financing Fee (User Fee)	7,480	7,350	7,220	7,090	6,960	6,820	6,690	6,560	6,430	6,300	5,640	5,380	5,120	4,860
Transponder (Every 6 Yrs)	62,000	0	0	0	0	0	60,000	0	0	0	0	0	60,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,315,000	1,247,000	1,241,000	1,235,000	1,229,000	1,223,000	1,277,000	1,211,000	1,205,000	1,199,000	1,168,000	1,156,000	1,204,000	1,132,000
Ending Balance	(1,265,000)	(2,445,000)	(3,602,000)	(4,736,000)	(5,847,000)	(6,935,000)	(8,060,000)	(9,102,000)	(10,121,000)	(11,117,000)	(12,065,000)	(12,988,000)	(13,946,000)	(14,819,000)

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, High Traffic Volumes, Low VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 272,000	$ 285,000	$ 298,000	$ 311,000	$ 324,000	$ 337,000	$ 350,000	$ 324,000	$ 298,000	$ 272,000	$ 246,000	$ 220,000	$ 194,000	$ 168,000	$ 142,000	$ 116,000	$ 90,000	$ 468,000	$ 846,000
3,500	3,300	3,100	2,900	2,700	2,500	2,200	2,000	1,800	1,600	1,400	1,200	1,000	800	600	400	400	1,700	3,000
975,600	919,900	864,100	808,400	752,600	696,900	613,300	557,500	501,800	446,000	390,300	334,500	278,800	223,000	167,300	111,500	111,500	473,900	836,300
0	0	0	0	(120)	0	0	0	0	0	(120)	0	0	0	0	0	-	780	780
0	0	0	0	3,240	0	0	0	0	0	3,120	0	0	0	0	0	3,000	0	0
0	0	0	0	3,120	0	0	0	0	0	3,000	0	0	0	0	0	3,000	780	780
(14,817,000)	(15,664,000)	(16,486,000)	(17,283,000)	(18,055,000)	(18,858,000)	(19,579,000)	(20,269,000)	(20,973,000)	(21,691,000)	(22,423,000)	(23,222,000)	(23,981,000)	(24,754,000)	(25,541,000)	(26,342,000)	(27,156,000)	(28,050,000)	(28,606,000)
272,000	285,000	298,000	311,000	324,000	337,000	350,000	324,000	298,000	272,000	246,000	220,000	194,000	168,000	142,000	116,000	90,000	468,000	846,000
208,800	196,900	184,900	173,000	161,100	149,100	131,200	119,300	107,400	95,400	83,500	71,600	59,700	47,700	35,800	23,900	23,900	101,400	179,000
4,590	4,330	4,070	3,810	3,540	3,280	2,890	2,620	2,360	2,100	1,840	1,580	1,310	1,050	790	530	530	2,230	3,940
0	0	0	0	56,000	0	0	0	0	0	54,000	0	0	0	0	0	54,000	14,000	14,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,119,000	1,107,000	1,095,000	1,083,000	1,127,000	1,058,000	1,040,000	1,028,000	1,016,000	1,004,000	1,045,000	979,000	967,000	955,000	943,000	930,000	984,000	1,024,000	1,103,000
(15,664,000)	(16,486,000)	(17,283,000)	(18,055,000)	(18,858,000)	(19,579,000)	(20,269,000)	(20,973,000)	(21,691,000)	(22,423,000)	(23,222,000)	(23,981,000)	(24,754,000)	(25,541,000)	(26,342,000)	(27,156,000)	(28,050,000)	(28,606,000)	(28,863,000)

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, High Traffic Volumes, Low VOT)

Switch SB to HOV 3+

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 272,000	$ 285,000	$ 298,000	$ 311,000	$ 324,000	$ 337,000	$ 350,000	$ 558,400	$ 766,800	$ 975,200	$ 1,183,600	$ 1,392,000	$ 1,600,400	$ 1,808,800	$ 2,017,200	$ 2,225,600	$ 2,434,000	$ 2,578,000	$ 2,722,000
3,500	3,300	3,100	2,900	2,700	2,500	2,200	3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000	11,000	13,800	13,700	13,600
975,600	919,900	864,100	808,400	752,600	696,900	613,300	836,300	1,115,000	1,393,800	1,672,500	1,951,300	2,230,000	2,508,800	2,787,500	3,066,300	3,846,800	3,818,900	3,791,000
0	0	0	0	0	0	0	480	600	600	600	600	600	600	600	600	1,680	0	0
0	0	0	0	3360	0	0	0	0	0	3,360	0	0	480	600	600	3,960	600	600
0	0	0	0	3360	0	0	480	600	600	3,960	600	600	1080	1200	1200	5,640	600	600
(14,819,000)	(15,666,000)	(16,488,000)	(17,285,000)	(18,057,000)	(18,864,000)	(19,585,000)	(20,275,000)	(20,815,000)	(21,209,000)	(21,456,000)	(21,615,000)	(21,567,000)	(21,372,000)	(21,037,000)	(20,558,000)	(19,931,000)	(19,346,000)	(18,520,000)
272,000	285,000	298,000	311,000	324,000	337,000	350,000	558,400	766,800	975,200	1,183,600	1,392,000	1,600,400	1,808,800	2,017,200	2,225,600	2,434,000	2,578,000	2,722,000
208,800	196,900	184,900	173,000	161,100	149,100	131,200	179,000	238,600	298,300	357,900	417,600	477,200	536,900	596,500	656,200	823,200	817,200	811,300
4,590	4,330	4,070	3,810	3,540	3,280	2,890	3,940	5,250	6,560	7,870	9,190	10,500	11,810	13,120	14,440	18,110	17,980	17,850
0	0	0	0	60,000	0	0	9,000	11,000	11,000	71,000	11,000	11,000	19,000	22,000	22,000	102,000	11,000	11,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,119,000	1,107,000	1,095,000	1,083,000	1,131,000	1,058,000	1,040,000	1,098,000	1,161,000	1,222,000	1,343,000	1,344,000	1,405,000	1,474,000	1,538,000	1,599,000	1,849,000	1,752,000	1,746,000
(15,666,000)	(16,488,000)	(17,285,000)	(18,057,000)	(18,864,000)	(19,585,000)	(20,275,000)	(20,815,000)	(21,209,000)	(21,456,000)	(21,615,000)	(21,567,000)	(21,372,000)	(21,037,000)	(20,558,000)	(19,931,000)	(19,346,000)	(18,520,000)	(17,544,000)

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, High Traffic Volumes, Low VOT)

Switch SB to HOV 3+

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 1,224,000	$ 1,602,000	$ 1,980,000	$ 2,358,000	$ 2,736,000	$ 3,114,000	$ 3,492,000	$ 3,870,000	$ 3,963,000	$ 4,056,000	$ 4,149,000	$ 4,242,000	$ 4,335,000	$ 4,428,000	$ 4,521,000	$ 4,614,000	$ 4,707,000	$ 4,800,000
4,300	5,600	6,900	8,200	9,500	10,800	12,100	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,600
1,198,600	1,561,000	1,923,400	2,285,800	2,648,100	3,010,500	3,372,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,512,300
780	780	780	780	780	780	780	480	0	-	0	0	0	0	0	-	0	0
0	0	0	3,000	780	780	780	780	780	3,780	1560	1560	1560	1260	780	3,780	1560	1560
780	780	780	3,780	1560	1560	1560	1260	780	3,780	1560	1560	1560	1260	780	3,780	1560	1560
(28,863,000)	(28,821,000)	(28,480,000)	(27,841,000)	(26,957,000)	(25,734,000)	(24,212,000)	(22,392,000)	(20,237,000)	(17,980,000)	(15,684,000)	(13,255,000)	(10,733,000)	(8,118,000)	(5,405,000)	(2,590,000)	264,000	3,251,000
1,224,000	1,602,000	1,980,000	2,358,000	2,736,000	3,114,000	3,492,000	3,870,000	3,963,000	4,056,000	4,149,000	4,242,000	4,335,000	4,428,000	4,521,000	4,614,000	4,707,000	4,800,000
256,500	334,100	411,600	489,200	566,700	644,200	721,800	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	751,600
5,640	7,350	9,060	10,760	12,470	14,170	15,880	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,540
14,000	14,000	14,000	68,000	28,000	28,000	28,000	23,000	14,000	68,000	28,000	28,000	28,000	23,000	14,000	68,000	28,000	28,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,182,000	1,261,000	1,341,000	1,474,000	1,513,000	1,592,000	1,672,000	1,715,000	1,706,000	1,760,000	1,720,000	1,720,000	1,720,000	1,715,000	1,706,000	1,760,000	1,720,000	1,702,000
(28,821,000)	(28,480,000)	(27,841,000)	(26,957,000)	(25,734,000)	(24,212,000)	(22,392,000)	(20,237,000)	(17,980,000)	(15,684,000)	(13,255,000)	(10,733,000)	(8,118,000)	(5,405,000)	(2,590,000)	264,000	3,251,000	6,349,000

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, High Traffic Volumes, Low VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 2,866,000	$ 3,010,000	$ 3,154,000	$ 3,298,000	$ 3,442,000	$ 3,586,000	$ 3,730,000	$ 3,870,000	$ 3,963,000	$ 4,056,000	$ 4,149,000	$ 4,242,000	$ 4,335,000	$ 4,428,000	$ 4,521,000	$ 4,614,000	$ 4,707,000	$ 4,800,000
13,500	13,400	13,300	13,200	13,100	13,000	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,600
3,763,100	3,735,300	3,707,400	3,679,500	3,651,600	3,623,800	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,512,300
0	0	0	(60)	0	0	0	0	0	-	0	0	0	0	0	-	0	0
1080	1200	1200	5,640	600	600	1080	1200	1200	5,580	600	600	1080	1200	1200	5,580	600	600
1080	1200	1200	5,580	600	600	1080	1200	1200	5,580	600	600	1080	1200	1200	5,580	600	600
(17,544,000)	(16,426,000)	(15,161,000)	(13,746,000)	(12,259,000)	(10,533,000)	(8,657,000)	(6,638,000)	(4,482,000)	(2,233,000)	31,000	2,477,000	5,016,000	7,640,000	10,354,000	13,161,000	15,983,000	18,987,000
2,866,000	3,010,000	3,154,000	3,298,000	3,442,000	3,586,000	3,730,000	3,870,000	3,963,000	4,056,000	4,149,000	4,242,000	4,335,000	4,428,000	4,521,000	4,614,000	4,707,000	4,800,000
805,300	799,400	793,400	787,400	781,400	775,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	751,600
17,720	17,590	17,450	17,320	17,190	17,060	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,540
19,000	22,000	22,000	100,000	11,000	11,000	19,000	22,000	22,000	100,000	11,000	11,000	19,000	22,000	22,000	100,000	11,000	11,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,748,000	1,745,000	1,739,000	1,811,000	1,716,000	1,710,000	1,711,000	1,714,000	1,714,000	1,792,000	1,703,000	1,703,000	1,711,000	1,714,000	1,714,000	1,792,000	1,703,000	1,685,000
(16,426,000)	(15,161,000)	(13,746,000)	(12,259,000)	(10,533,000)	(8,657,000)	(6,638,000)	(4,482,000)	(2,233,000)	31,000	2,477,000	5,016,000	7,640,000	10,354,000	13,161,000	15,983,000	18,987,000	22,102,000

San Joaquin COG I-5 North HOT Lane Study
Southbound, High Traffic Voulmues, High VOT

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, High Traffic Volumes, High VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 62,000	$ 83,000	$ 104,000	$ 125,000	$ 146,000	$ 167,000	$ 188,000	$ 209,000	$ 230,000	$ 251,000	$ 273,000	$ 289,000	$ 305,000	$ 321,000
Est. Daily Users (Veh)	5,700	5,600	5,500	5,400	5,300	5,200	5,100	5,000	4,900	4,800	4,300	4,100	3,900	3,700
Est Annual User (Veh)	1,588,900	1,561,000	1,533,125	1,505,300	1,477,400	1,449,500	1,421,600	1,393,800	1,365,900	1,338,000	1,198,600	1,142,900	1,087,100	1,031,400
(# of New Transponders)	3,420	0	0	0	0	0	(60)	0	0	0	0	0	(120)	0
(# of Replacement Xsponders)	-	0	0	0	0	0	3,420	0	0	0	0	0	3,360	0
(Total # of New Transponders)	3,420	0	0	0	0	0	3,360	0	0	0	0	0	3,240	0
Beginning Balance	0	(1,253,000)	(2,417,000)	(3,554,000)	(4,664,000)	(5,747,000)	(6,803,000)	(7,892,000)	(8,894,000)	(9,869,000)	(10,817,000)	(11,712,000)	(12,579,000)	(13,476,000)
Annual Revenue	62,000	83,000	104,000	125,000	146,000	167,000	188,000	209,000	230,000	251,000	273,000	289,000	305,000	321,000
E penses														
User Fee (per X-Action)	340,000	334,100	328,100	322,100	316,200	310,200	304,200	298,300	292,300	286,300	256,500	244,600	232,600	220,700
Financing Fee (User Fee)	7,480	7,350	7,220	7,090	6,960	6,820	6,690	6,560	6,430	6,300	5,640	5,380	5,120	4,860
Transponder (Every 6 Yrs)	62,000	0	0	0	0	0	60,000	0	0	0	0	0	58,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,315,000	1,247,000	1,241,000	1,235,000	1,229,000	1,223,000	1,277,000	1,211,000	1,205,000	1,199,000	1,168,000	1,156,000	1,202,000	1,132,000
Ending Balance	(1,253,000)	(2,417,000)	(3,554,000)	(4,664,000)	(5,747,000)	(6,803,000)	(7,892,000)	(8,894,000)	(9,869,000)	(10,817,000)	(11,712,000)	(12,579,000)	(13,476,000)	(14,287,000)

San Joaquin COG I-5 North HOT Lane Study

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, High Traffic Volumes, High VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 62,000	$ 83,000	$ 104,000	$ 125,000	$ 146,000	$ 167,000	$ 188,000	$ 209,000	$ 230,000	$ 251,000	$ 273,000	$ 289,000	$ 305,000	$ 321,000
Est. Daily Users (Veh)	5,700	5,600	5,500	5,400	5,300	5,200	5,100	5,000	4,900	4,800	4,300	4,100	3,900	3,700
Est Annual User (Veh)	1,588,900	1,561,000	1,533,125	1,505,300	1,477,400	1,449,500	1,421,600	1,393,800	1,365,900	1,338,000	1,198,600	1,142,900	1,087,100	1,031,400
(# of New Transponders)	3,420	0	0	0	0	0	(60)	0	0	0	0	0	0	0
(# of Replacement Xsponders)	-	0	0	0	0	0	3,420	0	0	0	0	0	3360	0
(Total # of New Transponders)	3,420	0	0	0	0	0	3,360	0	0	0	0	0	3360	0
Beginning Balance	0	(1,253,000)	(2,417,000)	(3,554,000)	(4,664,000)	(5,747,000)	(6,803,000)	(7,892,000)	(8,894,000)	(9,869,000)	(10,817,000)	(11,712,000)	(12,579,000)	(13,478,000)
Annual Revenue	62,000	83,000	104,000	125,000	146,000	167,000	188,000	209,000	230,000	251,000	273,000	289,000	305,000	321,000
E penses														
User Fee (per X-Action)	340,000	334,100	328,100	322,100	316,200	310,200	304,200	298,300	292,300	286,300	256,500	244,600	232,600	220,700
Financing Fee (User Fee)	7,480	7,350	7,220	7,090	6,960	6,820	6,690	6,560	6,430	6,300	5,640	5,380	5,120	4,860
Transponder (Every 6 Yrs)	62,000	0	0	0	0	0	60,000	0	0	0	0	0	60,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,315,000	1,247,000	1,241,000	1,235,000	1,229,000	1,223,000	1,277,000	1,211,000	1,205,000	1,199,000	1,168,000	1,156,000	1,204,000	1,132,000
Ending Balance	(1,253,000)	(2,417,000)	(3,554,000)	(4,664,000)	(5,747,000)	(6,803,000)	(7,892,000)	(8,894,000)	(9,869,000)	(10,817,000)	(11,712,000)	(12,579,000)	(13,478,000)	(14,289,000)

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, High Traffic Volumes, High VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 337,000	$ 353,000	$ 369,000	$ 385,000	$ 401,000	$ 417,000	$ 434,000	$ 402,000	$ 370,000	$ 338,000	$ 306,000	$ 274,000	$ 242,000	$ 210,000	$ 178,000	$ 146,000	$ 112,000	$ 581,000	$ 1,050,000
3,500	3,300	3,100	2,900	2,700	2,500	2,200	2,000	1,800	1,600	1,400	1,200	1,000	800	600	400	400	1,700	3,000
975,600	919,900	864,100	808,400	752,600	696,900	613,300	557,500	501,800	446,000	390,300	334,500	278,800	223,000	167,300	111,500	111,500	473,900	836,300
0	0	0	0	(120)	0	0	0	0	0	(120)	0	0	0	0	0	-	780	780
0	0	0	0	3,240	0	0	0	0	0	3,120	0	0	0	0	0	3,000	0	0
0	0	0	0	3,120	0	0	0	0	0	3,000	0	0	0	0	0	3,000	780	780
(14,287,000)	(15,069,000)	(15,823,000)	(16,549,000)	(17,247,000)	(17,973,000)	(18,614,000)	(19,220,000)	(19,846,000)	(20,492,000)	(21,158,000)	(21,897,000)	(22,602,000)	(23,327,000)	(24,072,000)	(24,837,000)	(25,621,000)	(26,493,000)	(26,936,000)
337,000	353,000	369,000	385,000	401,000	417,000	434,000	402,000	370,000	338,000	306,000	274,000	242,000	210,000	178,000	146,000	112,000	581,000	1,050,000
208,800	196,900	184,900	173,000	161,100	149,100	131,200	119,300	107,400	95,400	83,500	71,600	59,700	47,700	35,800	23,900	23,900	101,400	179,000
4,590	4,330	4,070	3,810	3,540	3,280	2,890	2,620	2,360	2,100	1,840	1,580	1,310	1,050	790	530	530	2,230	3,940
0	0	0	0	56,000	0	0	0	0	0	54,000	0	0	0	0	0	54,000	14,000	14,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,119,000	1,107,000	1,095,000	1,083,000	1,127,000	1,058,000	1,040,000	1,028,000	1,016,000	1,004,000	1,045,000	979,000	967,000	955,000	943,000	930,000	984,000	1,024,000	1,103,000
(15,069,000)	(15,823,000)	(16,549,000)	(17,247,000)	(17,973,000)	(18,614,000)	(19,220,000)	(19,846,000)	(20,492,000)	(21,158,000)	(21,897,000)	(22,602,000)	(23,327,000)	(24,072,000)	(24,837,000)	(25,621,000)	(26,493,000)	(26,936,000)	(26,989,000)

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, High Traffic Volumes, High VOT)

Switch SB to HOV 3+

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 337,000	$ 353,000	$ 369,000	$ 385,000	$ 401,000	$ 417,000	$ 434,000	$ 692,400	$ 950,800	$ 1,209,200	$ 1,467,600	$ 1,726,000	$ 1,984,400	$ 2,242,800	$ 2,501,200	$ 2,759,600	$ 3,018,000	$ 3,196,000	$ 3,374,000
3,500	3,300	3,100	2,900	2,700	2,500	2,200	3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000	11,000	13,800	13,700	13,600
975,600	919,900	864,100	808,400	752,600	696,900	613,300	836,300	1,115,000	1,393,800	1,672,500	1,951,300	2,230,000	2,508,800	2,787,500	3,066,300	3,846,800	3,818,900	3,791,000
0	0	0	0	0	0	0	480	600	600	600	600	600	600	600	600	1,680	0	0
0	0	0	0	3360	0	0	0	0	0	3,360	0	0	480	600	600	3,960	600	600
0	0	0	0	3360	0	0	480	600	600	3,960	600	600	1080	1200	1200	5,640	600	600
(14,289,000)	(15,071,000)	(15,825,000)	(16,551,000)	(17,249,000)	(17,979,000)	(18,620,000)	(19,226,000)	(19,632,000)	(19,842,000)	(19,855,000)	(19,730,000)	(19,348,000)	(18,769,000)	(18,000,000)	(17,037,000)	(15,876,000)	(14,707,000)	(13,263,000)
337,000	353,000	369,000	385,000	401,000	417,000	434,000	692,400	950,800	1,209,200	1,467,600	1,726,000	1,984,400	2,242,800	2,501,200	2,759,600	3,018,000	3,196,000	3,374,000
208,800	196,900	184,900	173,000	161,100	149,100	131,200	179,000	238,600	298,300	357,900	417,600	477,200	536,900	596,500	656,200	823,200	817,200	811,300
4,590	4,330	4,070	3,810	3,540	3,280	2,890	3,940	5,250	6,560	7,870	9,190	10,500	11,810	13,120	14,440	18,110	17,980	17,850
0	0	0	0	60,000	0	0	9,000	11,000	11,000	71,000	11,000	11,000	19,000	22,000	22,000	102,000	11,000	11,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,119,000	1,107,000	1,095,000	1,083,000	1,131,000	1,058,000	1,040,000	1,098,000	1,161,000	1,222,000	1,343,000	1,344,000	1,405,000	1,474,000	1,538,000	1,599,000	1,849,000	1,752,000	1,746,000
(15,071,000)	(15,825,000)	(16,551,000)	(17,249,000)	(17,979,000)	(18,620,000)	(19,226,000)	(19,632,000)	(19,842,000)	(19,855,000)	(19,730,000)	(19,348,000)	(18,769,000)	(18,000,000)	(17,037,000)	(15,876,000)	(14,707,000)	(13,263,000)	(11,635,000)

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, High Traffic Volumes, High VOT)

Switch SB to HOV 3+

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 1,519,000	$ 1,988,000	$ 2,457,000	$ 2,926,000	$ 3,395,000	$ 3,864,000	$ 4,333,000	$ 4,799,000	$ 4,914,000	$ 5,029,000	$ 5,144,000	$ 5,259,000	$ 5,374,000	$ 5,489,000	$ 5,604,000	$ 5,719,000	$ 5,834,000	$ 5,952,000
4,300	5,600	6,900	8,200	9,500	10,800	12,100	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,600
1,198,600	1,561,000	1,923,400	2,285,800	2,648,100	3,010,500	3,372,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,512,300
780	780	780	780	780	780	780	480	0	-	0	0	0	0	0	-	0	0
0	0	0	3,000	780	780	780	780	780	3,780	1560	1560	1560	1260	780	3,780	1560	1560
780	780	780	3,780	1560	1560	1560	1260	780	3,780	1560	1560	1560	1260	780	3,780	1560	1560
(26,989,000)	(26,652,000)	(25,925,000)	(24,809,000)	(23,357,000)	(21,475,000)	(19,203,000)	(16,542,000)	(13,458,000)	(10,250,000)	(6,981,000)	(3,557,000)	(18,000)	3,636,000	7,410,000	11,308,000	15,267,000	19,381,000
1,519,000	1,988,000	2,457,000	2,926,000	3,395,000	3,864,000	4,333,000	4,799,000	4,914,000	5,029,000	5,144,000	5,259,000	5,374,000	5,489,000	5,604,000	5,719,000	5,834,000	5,952,000
256,500	334,100	411,600	489,200	566,700	644,200	721,800	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	751,600
5,640	7,350	9,060	10,760	12,470	14,170	15,880	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,540
14,000	14,000	14,000	68,000	28,000	28,000	28,000	23,000	14,000	68,000	28,000	28,000	28,000	23,000	14,000	68,000	28,000	28,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,182,000	1,261,000	1,341,000	1,474,000	1,513,000	1,592,000	1,672,000	1,715,000	1,706,000	1,760,000	1,720,000	1,720,000	1,720,000	1,715,000	1,706,000	1,760,000	1,720,000	1,702,000
(26,652,000)	(25,925,000)	(24,809,000)	(23,357,000)	(21,475,000)	(19,203,000)	(16,542,000)	(13,458,000)	(10,250,000)	(6,981,000)	(3,557,000)	(18,000)	3,636,000	7,410,000	11,308,000	15,267,000	19,381,000	23,631,000

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, High Traffic Volumes, High VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 3,552,000	$ 3,730,000	$ 3,908,000	$ 4,086,000	$ 4,264,000	$ 4,442,000	$ 4,620,000	$ 4,799,000	$ 4,914,000	$ 5,029,000	$ 5,144,000	$ 5,259,000	$ 5,374,000	$ 5,489,000	$ 5,604,000	$ 5,719,000	$ 5,834,000	$ 5,952,000
13,500	13,400	13,300	13,200	13,100	13,000	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,600
3,763,100	3,735,300	3,707,400	3,679,500	3,651,600	3,623,800	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,512,300
0	0	0	(60)	0	0	0	0	0	-	0	0	0	0	0	-	0	0
1080	1200	1200	5,640	600	600	1080	1200	1200	5,580	600	600	1080	1200	1200	5,580	600	600
1080	1200	1200	5,580	600	600	1080	1200	1200	5,580	600	600	1080	1200	1200	5,580	600	600
(11,635,000)	(9,831,000)	(7,846,000)	(5,677,000)	(3,402,000)	(854,000)	1,878,000	4,787,000	7,872,000	11,072,000	14,309,000	17,750,000	21,306,000	24,969,000	28,744,000	32,634,000	36,561,000	40,692,000
3,552,000	3,730,000	3,908,000	4,086,000	4,264,000	4,442,000	4,620,000	4,799,000	4,914,000	5,029,000	5,144,000	5,259,000	5,374,000	5,489,000	5,604,000	5,719,000	5,834,000	5,952,000
805,300	799,400	793,400	787,400	781,400	775,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	751,600
17,720	17,590	17,450	17,320	17,190	17,060	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,540
19,000	22,000	22,000	100,000	11,000	11,000	19,000	22,000	22,000	100,000	11,000	11,000	19,000	22,000	22,000	100,000	11,000	11,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,748,000	1,745,000	1,739,000	1,811,000	1,716,000	1,710,000	1,711,000	1,714,000	1,714,000	1,792,000	1,703,000	1,703,000	1,711,000	1,714,000	1,714,000	1,792,000	1,703,000	1,685,000
(9,831,000)	(7,846,000)	(5,677,000)	(3,402,000)	(854,000)	1,878,000	4,787,000	7,872,000	11,072,000	14,309,000	17,750,000	21,306,000	24,969,000	28,744,000	32,634,000	36,561,000	40,692,000	44,959,000

San Joaquin COG I-5 North HOT Lane Study
Southbound, High Traffic Voulmues, Blended VOT

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, High Traffic Volumes, Blended Bay Area Sacramento VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 75,000	$ 101,000	$ 127,000	$ 153,000	$ 179,000	$ 205,000	$ 231,000	$ 257,000	$ 283,000	$ 309,000	$ 330,000	$ 350,000	$ 370,000	$ 390,000
Est. Daily Users (Veh)	5,700	5,600	5,500	5,400	5,300	5,200	5,100	5,000	4,900	4,800	4,300	4,100	3,900	3,700
Est Annual User (Veh)	1,588,900	1,561,000	1,533,125	1,505,300	1,477,400	1,449,500	1,421,600	1,393,800	1,365,900	1,338,000	1,198,600	1,142,900	1,087,100	1,031,400
(# of New Transponders)	3,420	0	0	0	0	0	(60)	0	0	0	0	0	(120)	0
(# of Replacement Xsponders)	-	0	0	0	0	0	3,420	0	0	0	0	0	3,360	0
(Total # of New Transponders)	3,420	0	0	0	0	0	3,360	0	0	0	0	0	3,240	0
Beginning Balance	0	(1,240,000)	(2,386,000)	(3,500,000)	(4,582,000)	(5,632,000)	(6,650,000)	(7,696,000)	(8,650,000)	(9,572,000)	(10,462,000)	(11,300,000)	(12,106,000)	(12,938,000)
Annual Revenue	75,000	101,000	127,000	153,000	179,000	205,000	231,000	257,000	283,000	309,000	330,000	350,000	370,000	390,000
E penses														
User Fee (per X-Action)	340,000	334,100	328,100	322,100	316,200	310,200	304,200	298,300	292,300	286,300	256,500	244,600	232,600	220,700
Financing Fee (User Fee)	7,480	7,350	7,220	7,090	6,960	6,820	6,690	6,560	6,430	6,300	5,640	5,380	5,120	4,860
Transponder (Every 6 Yrs)	62,000	0	0	0	0	0	60,000	0	0	0	0	0	58,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,315,000	1,247,000	1,241,000	1,235,000	1,229,000	1,223,000	1,277,000	1,211,000	1,205,000	1,199,000	1,168,000	1,156,000	1,202,000	1,132,000
Ending Balance	(1,240,000)	(2,386,000)	(3,500,000)	(4,582,000)	(5,632,000)	(6,650,000)	(7,696,000)	(8,650,000)	(9,572,000)	(10,462,000)	(11,300,000)	(12,106,000)	(12,938,000)	(13,680,000)

San Joaquin COG I-5 North HOT Lane Study

Assumptions Factors	
1-Way Hammer to Downing	8.6
User Fee (per X-Action)	$ 0.21
Violator Transaction Fee	$ 0.04
Financing Fee (User Fee)	2.20
Transponder (Every 6 Yrs)	$ 18.00
of Daily w Transponder	60
Tolling Facility Maint. (Mi)	$ 93,850
Enforcement (Mile)	$ 11,500
Other (Capital)	$ -

Note: Assume 60% of the Daily Users require a Transponder; the remaining 40% are "returning direction" users

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, High Traffic Volumes, Blended Bay Area Sacramento VOT)

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Revenue	$ 75,000	$ 101,000	$ 127,000	$ 153,000	$ 179,000	$ 205,000	$ 231,000	$ 257,000	$ 283,000	$ 309,000	$ 330,000	$ 350,000	$ 370,000	$ 390,000
Est. Daily Users (Veh)	5,700	5,600	5,500	5,400	5,300	5,200	5,100	5,000	4,900	4,800	4,300	4,100	3,900	3,700
Est Annual User (Veh)	1,588,900	1,561,000	1,533,125	1,505,300	1,477,400	1,449,500	1,421,600	1,393,800	1,365,900	1,338,000	1,198,600	1,142,900	1,087,100	1,031,400
(# of New Transponders)	3,420	0	0	0	0	0	(60)	0	0	0	0	0	0	0
(# of Replacement Xsponders)	-	0	0	0	0	0	3,420	0	0	0	0	0	3360	0
(Total # of New Transponders)	3,420	0	0	0	0	0	3,360	0	0	0	0	0	3360	0
Beginning Balance	0	(1,240,000)	(2,386,000)	(3,500,000)	(4,582,000)	(5,632,000)	(6,650,000)	(7,696,000)	(8,650,000)	(9,572,000)	(10,462,000)	(11,300,000)	(12,106,000)	(12,940,000)
Annual Revenue	75,000	101,000	127,000	153,000	179,000	205,000	231,000	257,000	283,000	309,000	330,000	350,000	370,000	390,000
E penses														
User Fee (per X-Action)	340,000	334,100	328,100	322,100	316,200	310,200	304,200	298,300	292,300	286,300	256,500	244,600	232,600	220,700
Financing Fee (User Fee)	7,480	7,350	7,220	7,090	6,960	6,820	6,690	6,560	6,430	6,300	5,640	5,380	5,120	4,860
Transponder (Every 6 Yrs)	62,000	0	0	0	0	0	60,000	0	0	0	0	0	60,000	0
Tolling Facility Maint. (Mi)	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
Enforcement	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
Other (Capital)														
Total E penses	1,315,000	1,247,000	1,241,000	1,235,000	1,229,000	1,223,000	1,277,000	1,211,000	1,205,000	1,199,000	1,168,000	1,156,000	1,204,000	1,132,000
Ending Balance	(1,240,000)	(2,386,000)	(3,500,000)	(4,582,000)	(5,632,000)	(6,650,000)	(7,696,000)	(8,650,000)	(9,572,000)	(10,462,000)	(11,300,000)	(12,106,000)	(12,940,000)	(13,682,000)

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, High Traffic Volumes, Blended Bay Area Sacramento VOT)

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 410,000	$ 430,000	$ 450,000	$ 470,000	$ 490,000	$ 510,000	$ 525,000	$ 486,000	$ 447,000	$ 408,000	$ 369,000	$ 330,000	$ 291,000	$ 252,000	$ 213,000	$ 174,000	$ 135,000	$ 702,000	$ 1,269,000
3,500	3,300	3,100	2,900	2,700	2,500	2,200	2,000	1,800	1,600	1,400	1,200	1,000	800	600	400	400	1,700	3,000
975,600	919,900	864,100	808,400	752,600	696,900	613,300	557,500	501,800	446,000	390,300	334,500	278,800	223,000	167,300	111,500	111,500	473,900	836,300
0	0	0	0	(120)	0	0	0	0	0	(120)	0	0	0	0	0	-	780	780
0	0	0	0	3,240	0	0	0	0	0	3,120	0	0	0	0	0	3,000	0	0
0	0	0	0	3,120	0	0	0	0	0	3,000	0	0	0	0	0	3,000	780	780
(13,680,000)	(14,389,000)	(15,066,000)	(15,711,000)	(16,324,000)	(16,961,000)	(17,509,000)	(18,024,000)	(18,566,000)	(19,135,000)	(19,731,000)	(20,407,000)	(21,056,000)	(21,732,000)	(22,435,000)	(23,165,000)	(23,921,000)	(24,770,000)	(25,092,000)
410,000	430,000	450,000	470,000	490,000	510,000	525,000	486,000	447,000	408,000	369,000	330,000	291,000	252,000	213,000	174,000	135,000	702,000	1,269,000
208,800	196,900	184,900	173,000	161,100	149,100	131,200	119,300	107,400	95,400	83,500	71,600	59,700	47,700	35,800	23,900	23,900	101,400	179,000
4,590	4,330	4,070	3,810	3,540	3,280	2,890	2,620	2,360	2,100	1,840	1,580	1,310	1,050	790	530	530	2,230	3,940
0	0	0	0	56,000	0	0	0	0	0	54,000	0	0	0	0	0	54,000	14,000	14,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,119,000	1,107,000	1,095,000	1,083,000	1,127,000	1,058,000	1,040,000	1,028,000	1,016,000	1,004,000	1,045,000	979,000	967,000	955,000	943,000	930,000	984,000	1,024,000	1,103,000
(14,389,000)	(15,066,000)	(15,711,000)	(16,324,000)	(16,961,000)	(17,509,000)	(18,024,000)	(18,566,000)	(19,135,000)	(19,731,000)	(20,407,000)	(21,056,000)	(21,732,000)	(22,435,000)	(23,165,000)	(23,921,000)	(24,770,000)	(25,092,000)	(24,926,000)

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, High Traffic Volumes, Blended Bay Area Sacramento VOT)

Switch SB to HOV 3+

2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
$ 410,000	$ 430,000	$ 450,000	$ 470,000	$ 490,000	$ 510,000	$ 525,000	$ 837,600	$ 1,150,200	$ 1,462,800	$ 1,775,400	$ 2,088,000	$ 2,400,600	$ 2,713,200	$ 3,025,800	$ 3,338,400	$ 3,651,000	$ 3,866,000	$ 4,081,000
3,500	3,300	3,100	2,900	2,700	2,500	2,200	3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000	11,000	13,800	13,700	13,600
975,600	919,900	864,100	808,400	752,600	696,900	613,300	836,300	1,115,000	1,393,800	1,672,500	1,951,300	2,230,000	2,508,800	2,787,500	3,066,300	3,846,800	3,818,900	3,791,000
0	0	0	0	0	0	0	480	600	600	600	600	600	600	600	600	1,680	0	0
0	0	0	0	3360	0	0	0	0	0	3,360	0	0	480	600	600	3,960	600	600
0	0	0	0	3360	0	0	480	600	600	3,960	600	600	1080	1200	1200	5,640	600	600
(13,682,000)	(14,391,000)	(15,068,000)	(15,713,000)	(16,326,000)	(16,967,000)	(17,515,000)	(18,030,000)	(18,290,000)	(18,301,000)	(18,060,000)	(17,628,000)	(16,884,000)	(15,888,000)	(14,649,000)	(13,161,000)	(11,422,000)	(9,620,000)	(7,506,000)
410,000	430,000	450,000	470,000	490,000	510,000	525,000	837,600	1,150,200	1,462,800	1,775,400	2,088,000	2,400,600	2,713,200	3,025,800	3,338,400	3,651,000	3,866,000	4,081,000
208,800	196,900	184,900	173,000	161,100	149,100	131,200	179,000	238,600	298,300	357,900	417,600	477,200	536,900	596,500	656,200	823,200	817,200	811,300
4,590	4,330	4,070	3,810	3,540	3,280	2,890	3,940	5,250	6,560	7,870	9,190	10,500	11,810	13,120	14,440	18,110	17,980	17,850
0	0	0	0	60,000	0	0	9,000	11,000	11,000	71,000	11,000	11,000	19,000	22,000	22,000	102,000	11,000	11,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,119,000	1,107,000	1,095,000	1,083,000	1,131,000	1,058,000	1,040,000	1,098,000	1,161,000	1,222,000	1,343,000	1,344,000	1,405,000	1,474,000	1,538,000	1,599,000	1,849,000	1,752,000	1,746,000
(14,391,000)	(15,068,000)	(15,713,000)	(16,326,000)	(16,967,000)	(17,515,000)	(18,030,000)	(18,290,000)	(18,301,000)	(18,060,000)	(17,628,000)	(16,884,000)	(15,888,000)	(14,649,000)	(13,161,000)	(11,422,000)	(9,620,000)	(7,506,000)	(5,171,000)

Economic Benefit Analysis (Southbound, HOV 3 1650 vph, High Traffic Volumes, Blended Bay Area Sacramento VOT)

Switch SB to HOV 3+

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 1,836,000	$ 2,403,000	$ 2,970,000	$ 3,537,000	$ 4,104,000	$ 4,671,000	$ 5,238,000	$ 5,805,000	$ 5,945,000	$ 6,085,000	$ 6,225,000	$ 6,365,000	$ 6,505,000	$ 6,645,000	$ 6,785,000	$ 6,925,000	$ 7,065,000	$ 7,200,000
4,300	5,600	6,900	8,200	9,500	10,800	12,100	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,600
1,198,600	1,561,000	1,923,400	2,285,800	2,648,100	3,010,500	3,372,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,512,300
780	780	780	780	780	780	780	480	0	-	0	0	0	0	0	-	0	0
0	0	0	3,000	780	780	780	780	780	3,780	1560	1560	1560	1260	780	3,780	1560	1560
780	780	780	3,780	1560	1560	1560	1260	780	3,780	1560	1560	1560	1260	780	3,780	1560	1560
(24,926,000)	(24,272,000)	(23,130,000)	(21,501,000)	(19,438,000)	(16,847,000)	(13,768,000)	(10,202,000)	(6,112,000)	(1,873,000)	2,452,000	6,957,000	11,602,000	16,387,000	21,317,000	26,396,000	31,561,000	36,906,000
1,836,000	2,403,000	2,970,000	3,537,000	4,104,000	4,671,000	5,238,000	5,805,000	5,945,000	6,085,000	6,225,000	6,365,000	6,505,000	6,645,000	6,785,000	6,925,000	7,065,000	7,200,000
256,500	334,100	411,600	489,200	566,700	644,200	721,800	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	751,600
5,640	7,350	9,060	10,760	12,470	14,170	15,880	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,540
14,000	14,000	14,000	68,000	28,000	28,000	28,000	23,000	14,000	68,000	28,000	28,000	28,000	23,000	14,000	68,000	28,000	28,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,182,000	1,261,000	1,341,000	1,474,000	1,513,000	1,592,000	1,672,000	1,715,000	1,706,000	1,760,000	1,720,000	1,720,000	1,720,000	1,715,000	1,706,000	1,760,000	1,720,000	1,702,000
(24,272,000)	(23,130,000)	(21,501,000)	(19,438,000)	(16,847,000)	(13,768,000)	(10,202,000)	(6,112,000)	(1,873,000)	2,452,000	6,957,000	11,602,000	16,387,000	21,317,000	26,396,000	31,561,000	36,906,000	42,404,000

Economic Benefit Analysis (Southbound, HOV 3 1400 vph, High Traffic Volumes, Blended Bay Area Sacramento VOT)

2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065
$ 4,296,000	$ 4,511,000	$ 4,726,000	$ 4,941,000	$ 5,156,000	$ 5,371,000	$ 5,586,000	$ 5,805,000	$ 5,945,000	$ 6,085,000	$ 6,225,000	$ 6,365,000	$ 6,505,000	$ 6,645,000	$ 6,785,000	$ 6,925,000	$ 7,065,000	$ 7,200,000
13,500	13,400	13,300	13,200	13,100	13,000	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,900	12,600
3,763,100	3,735,300	3,707,400	3,679,500	3,651,600	3,623,800	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,595,900	3,512,300
0	0	0	(60)	0	0	0	0	0	-	0	0	0	0	0	-	0	0
1080	1200	1200	5,640	600	600	1080	1200	1200	5,580	600	600	1080	1200	1200	5,580	600	600
1080	1200	1200	5,580	600	600	1080	1200	1200	5,580	600	600	1080	1200	1200	5,580	600	600
(5,171,000)	(2,623,000)	143,000	3,130,000	6,260,000	9,700,000	13,361,000	17,236,000	21,327,000	25,558,000	29,851,000	34,373,000	39,035,000	43,829,000	48,760,000	53,831,000	58,964,000	64,326,000
4,296,000	4,511,000	4,726,000	4,941,000	5,156,000	5,371,000	5,586,000	5,805,000	5,945,000	6,085,000	6,225,000	6,365,000	6,505,000	6,645,000	6,785,000	6,925,000	7,065,000	7,200,000
805,300	799,400	793,400	787,400	781,400	775,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	769,500	751,600
17,720	17,590	17,450	17,320	17,190	17,060	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,930	16,540
19,000	22,000	22,000	100,000	11,000	11,000	19,000	22,000	22,000	100,000	11,000	11,000	19,000	22,000	22,000	100,000	11,000	11,000
807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000	807,000
99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000	99,000
1,748,000	1,745,000	1,739,000	1,811,000	1,716,000	1,710,000	1,711,000	1,714,000	1,714,000	1,792,000	1,703,000	1,703,000	1,711,000	1,714,000	1,714,000	1,792,000	1,703,000	1,685,000
(2,623,000)	143,000	3,130,000	6,260,000	9,700,000	13,361,000	17,236,000	21,327,000	25,558,000	29,851,000	34,373,000	39,035,000	43,829,000	48,760,000	53,831,000	58,964,000	64,326,000	69,841,000