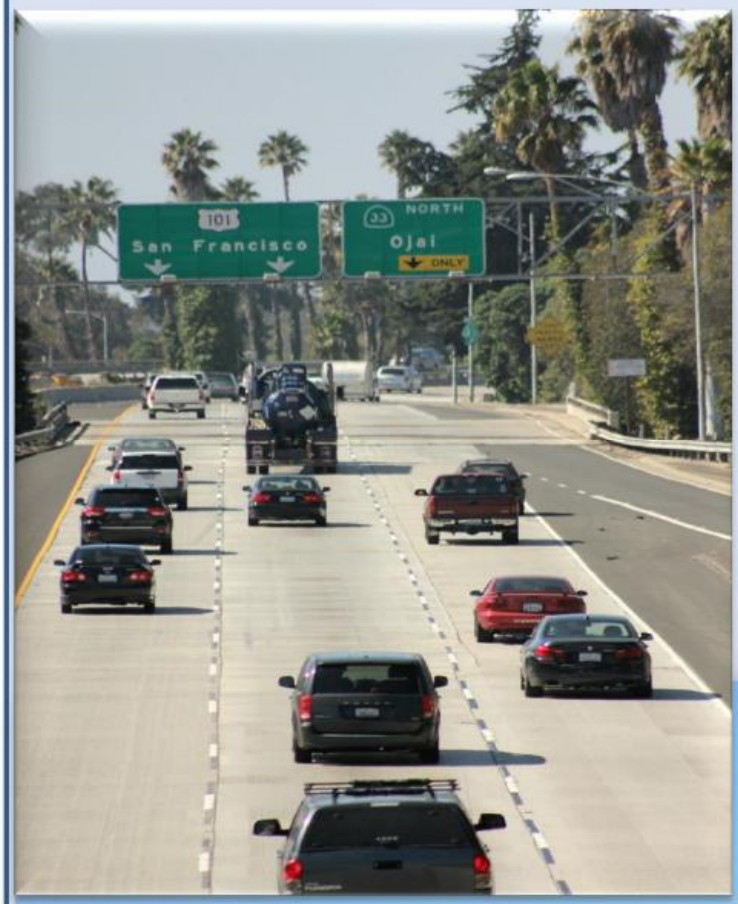
Ventura County Transportation Commission

HOT Lanes
Financial Feasibility Study
Summary Report



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1 Introduction

The Ventura County Transportation Commission (VCTC) completed its Comprehensive Transportation Plan (CTP) in August 2013. Through this planning process, the US-101 Freeway was identified as a priority for improvements due to its present and forecasted congestion as well as its key role in the economic development of the County. Based on the financial evaluation in the Comprehensive Transportation Plan, with current revenues it will likely take 30 years to complete the improvements on US-101. VCTC considered the possibility of implementation of high-occupancy/toll (HOT) lanes for its potential to provide an additional mobility option for auto drivers, maximize the utility of any additional capacity, and provide an additional funding source that could help expedite the freeway improvements. As proposed, the US-101 HOT lanes would consist of one added lane in each direction, from approximately SR-23 in Thousand Oaks to the junction of the SR-33 Freeway in Ventura.

This report summarizes the work completed under a sketch-level analysis to further develop the HOT lanes concept for the corridor and to evaluate the potential financial feasibility of the project.

1.1 Background and Objectives

Due to anticipated future growth in Ventura County, increase in required automobile-based travel demand to destination in Ventura County and beyond, and to remedy current congestion along the U.S. 101 freeway corridor, VCTC, Caltrans, and Corridor Cities have collectively worked on capacity and operational improvement along this major transportation corridor.

In 2013, Caltrans and VCTC adopted a Project Study Report – Project Development Support (PSR-PDS) that proposed one High-Occupancy Toll (HOT) lane in each direction on US-101 between Moorpark Road and SR-33. This consideration was to create a revenue stream that would assist in acceleration of implementation of the project and provide funds to pay for the costs of future maintenance and operation of the facility.

VCTC commissioned CDM Smith to perform a financial feasibility study for the proposed HOT lanes and identify the estimated revenues under all probable and practical scenarios/assumptions. The study was structured in two phases. Phase 1 included a sketch-level traffic and revenue analysis based on the available records from Caltrans District 7, the Southern California Association of Governments (SCAG) and other study partners and stakeholder agencies to conceptually identify potential HOT lanes alternatives, evaluate HOT lanes Concept of Operations, and develop a preliminary Concept of Operations document. Phase 2 included modeling and refinement of traffic and revenue forecast developed at sketch-level in phase 1, preliminary determination of HOT lanes concept cost and revenue, and preparation of a final report. Phase 2 was to be authorized after determination of viability of the proposed project by VCTC staff and the Board.

1.2 Study Area Description

The proposed HOT lanes would extend along US-101 in Ventura County between its interchanges with the SR- 23 and SR- 33 freeways (**Figure 1.1**), spanning a total distance of approximately 28 miles with 25 interchanges. Within the limits of the project, the freeway passes through the cities of Thousand Oaks, Camarillo, Oxnard, and Ventura. As a major regional east-west freeway corridor, US-101 is the primary link between these cities in Ventura County to neighboring Los Angeles County and Santa Barbara County. Between SR-23 and SR-33, US-101 is primarily a six-lane freeway, with auxiliary lanes between most interchanges in Thousand Oaks and selected interchanges in the other communities.

Figure 1.1 Project Location and Proposed HOT Lanes Limits

Traffic volumes are highest on the eastern end of the corridor, near Los Angeles County. Average daily traffic volumes in 2012 on US-101 are in the range of approximately 177,000 vehicles per day near SR-23; 125,000-150,000 vehicles per day through Camarillo and Oxnard; and 75,000-125,000 vehicles per day through Ventura. Heavy truck traffic accounts for 3 to 5 percent of the total traffic, indicating that this route is not a primary commercial traffic corridor but serves the communities along the freeway. **Figure 1.2** shows estimated weekday traffic volumes in different segments of the study corridor along with estimated a.m. and p.m. peak hour traffic volumes. [1]

[1] Sources include "2012 Traffic Volumes on the California State Highway System," State of California Department of Transportation, Division of Traffic Operations, "2012 Ramp Volumes on the California State Freeway System," and the Caltrans Performance Measurement System (PeMS) .

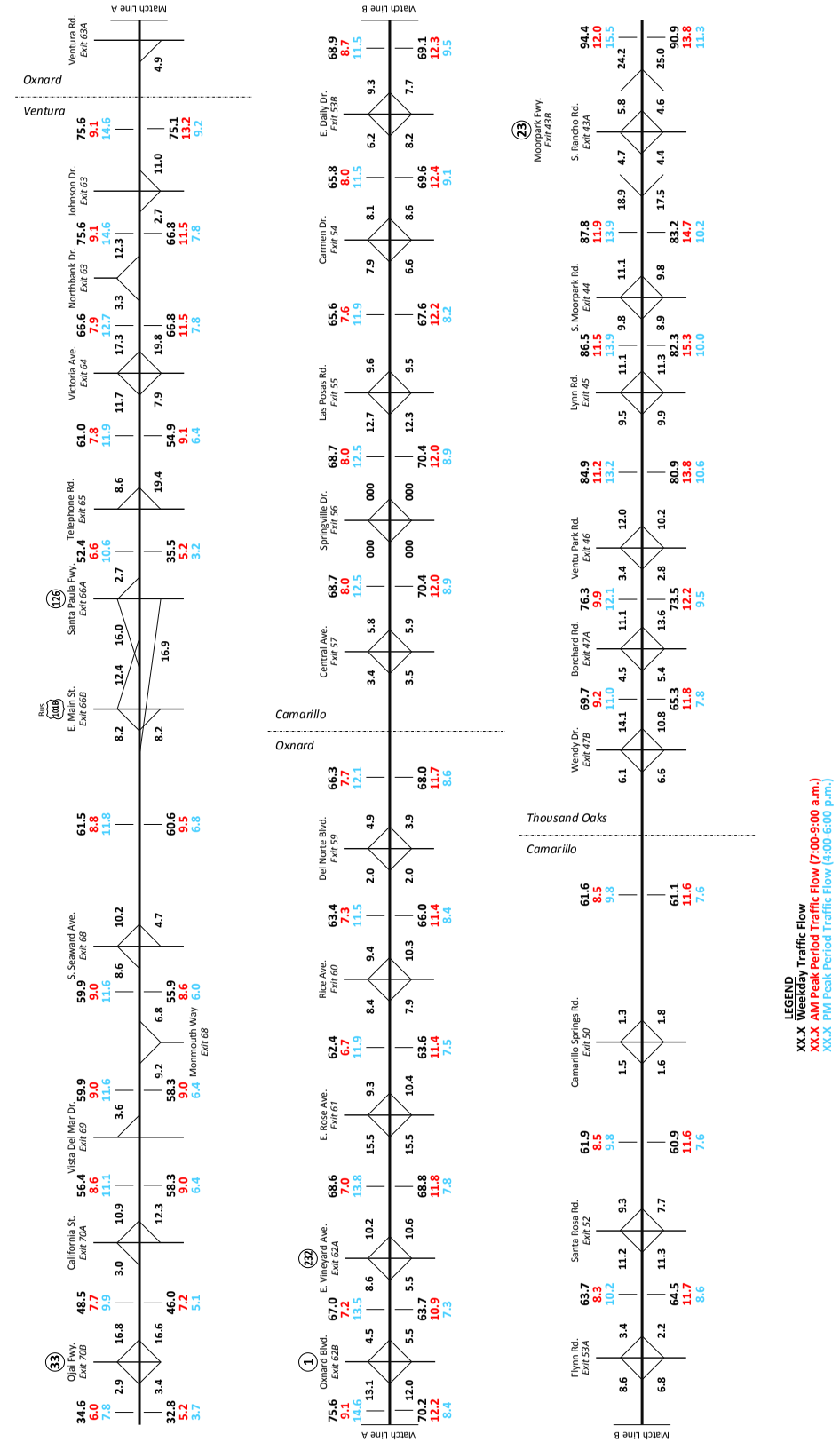


Figure 1.2 Estimated 2012 Weekday Traffic Levels

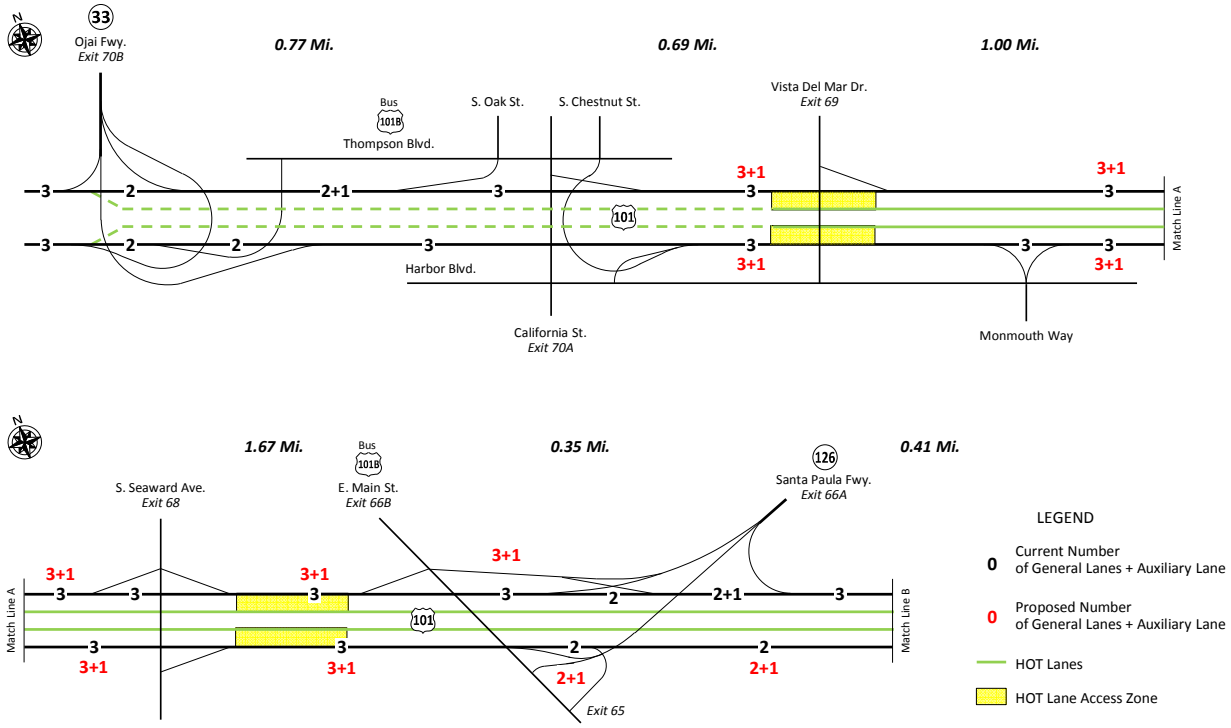
The main areas of traffic congestion on weekdays are primarily during the peak periods. In the morning peak period, the major direction of travel is eastbound, with congestion focused in Camarillo and Thousand Oaks. In the afternoon peak period, the major direction of travel is westbound, with congestion extending between Thousand Oaks and Oxnard. However, within Camarillo, both directions of travel experience delays during both a.m. and p.m. peak periods.[2]

2 Proposed US-101 HOT Lanes

2.1 Project Configuration

The US-101 HOT lanes would involve the construction of two high-occupancy/toll lanes (one per direction) in the median of US-101 between SR-23 and SR-33. The typical cross-section of the freeway in this study area is currently three general purpose lanes in each direction plus a fourth auxiliary lane in several locations (primarily in Thousand Oaks). As part of project study work performed for this corridor, Caltrans recommended auxiliary lane improvements between almost every interchange in Camarillo, Oxnard, and Ventura. The existing and proposed number of lanes on US-101 within the study area is shown in **Figure 2.1**.

Figure 2.1 Existing and Future Number of Lanes and Proposed Access Areas



[2] Based on observations using maps.google.com for typical weekday and specific weekdays during study period.

Figure 2.1 (continued) Existing and Future Number of Lanes and Proposed Access Areas

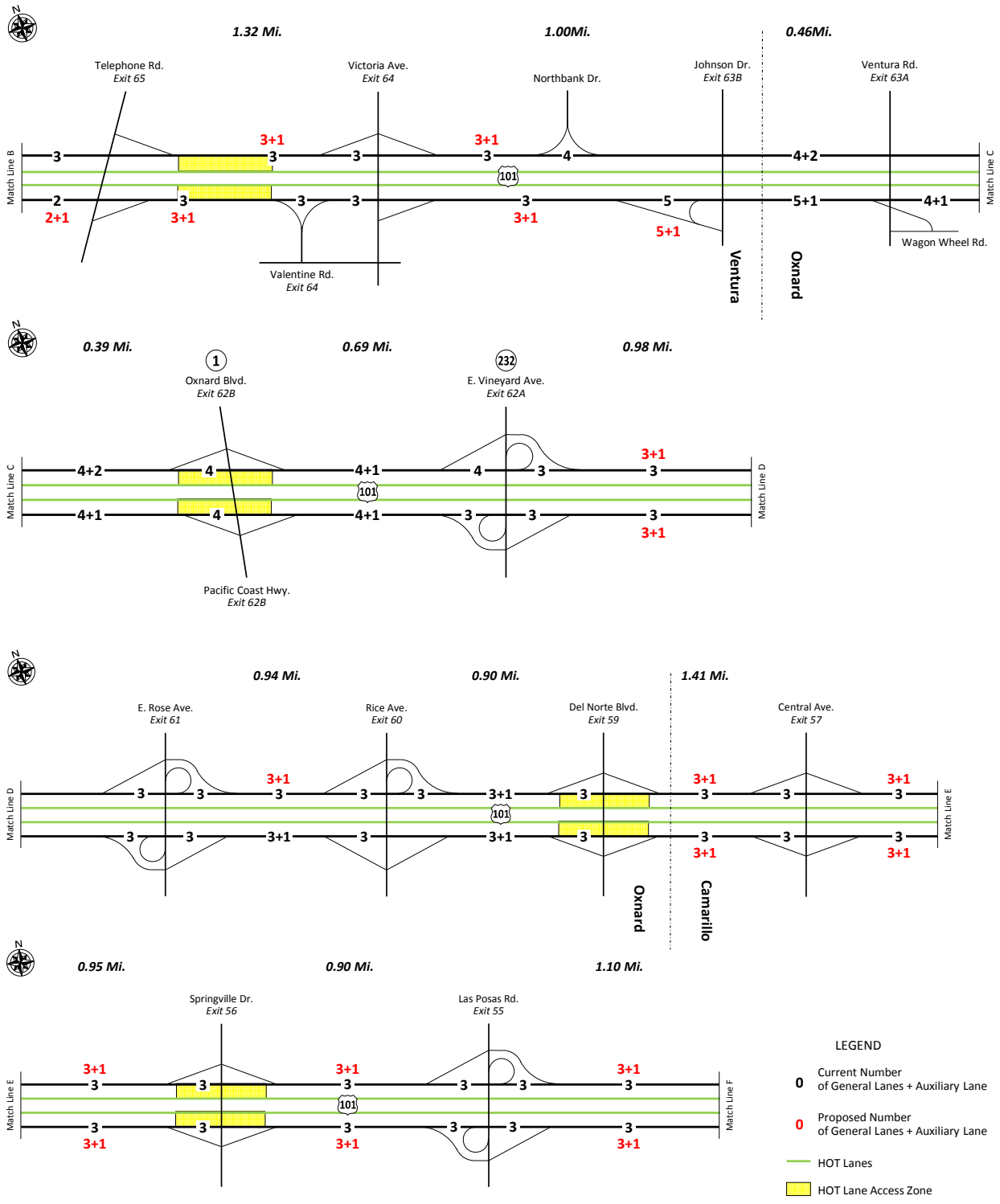
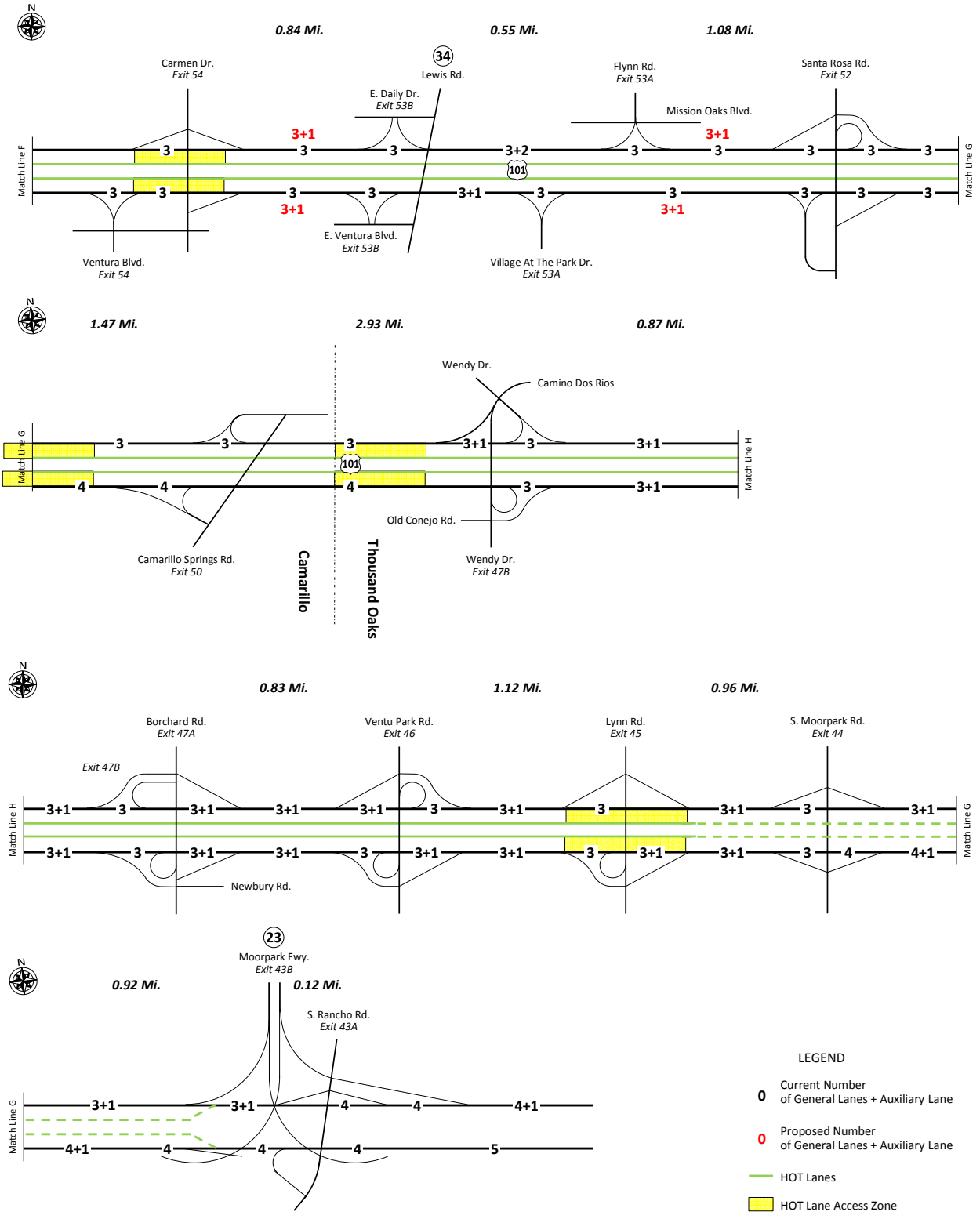


Figure 2.1 (continued) Existing and Future Number of Lanes and Proposed Access Areas



The overall length of the US-101 HOT lanes project would be 28 miles. The US-101 HOT lanes would be separated from the adjacent general purpose lanes using double solid-striped pavement markings. Access to and from the HOT lanes would be provided at fixed locations, designated by a change from solid to dashed striping. A detailed design of intermediate access points will be part of later studies should VCTC decide to proceed with planning for HOT lanes. A typical cross-section of the proposed facility is shown in **Figure 2.2**.

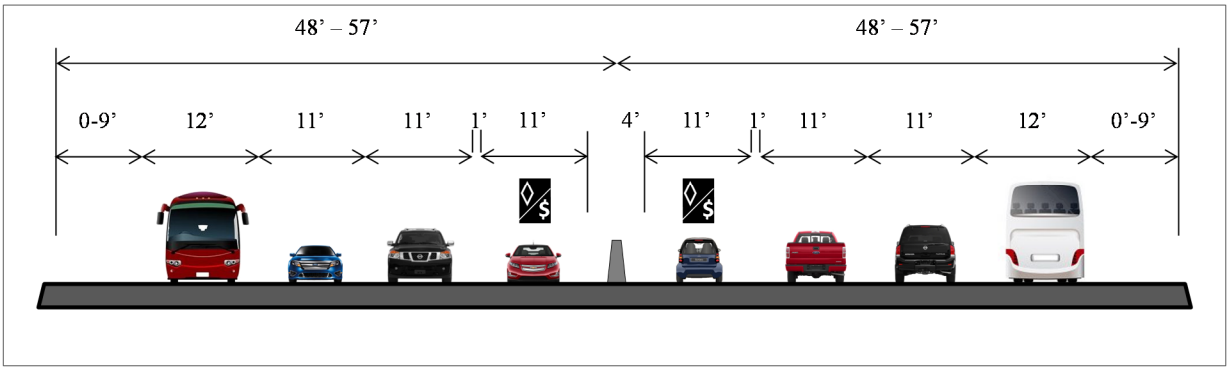


Figure 2.2 Typical Cross Section with HOT Lanes
(Source: Modified from Caltrans Freeway Project Studies for VCTC Presentation File, presented by Caltrans, October 4, 2013)

For the purposes of this study, initial locations of intermediate access points to the HOT lanes were developed based on the following criteria: provide access close to major interchanges, provide access to and from each community, provide access before or after areas of congestion, and locate access points a minimum of 0.5 miles before an exit ramp or after an entrance ramp to be served by the access point. As shown in Figure 1.3, the study assumed a total of 10 intermediate access points in addition to the termini in Thousand Oaks and Ventura.

2.2 General Operations Concept

In coordination with the Project Technical Advisory Committee, which consisted of Caltrans operations personnel; representatives from the cities of Camarillo, Ventura, Oxnard, and Thousand Oaks; and County of Ventura Public Works Agency, a general operations concept was developed for this project. The operations concept was designed to be consistent with state legislation regarding electronic toll collection equipment, operating policies on other existing projects (including the I-10 and I-110 Express Lanes projects in Los Angeles), and specific needs of this corridor. The HOT lanes feasibility analysis assumed the following operating parameters:

1. The HOT lanes would operate 24 hours per day, 7 days per week in both directions.

2. Vehicles that meet minimum eligibility requirements will be allowed toll-free use of the HOT lanes (two scenarios of minimum eligibility were tested: two occupants and three occupants).

3. Low-occupancy vehicles (LOV), which would include single-occupant vehicles (SOV) and other vehicles not meeting the minimum eligibility requirements (depending on the scenario), will be allowed to use the HOT lanes for a fee.

4. Demand for the HOT lanes will be managed by varying tolls at about 5-minute intervals. The tolling algorithm will be designed to increase tolls and restrict LOV access to the HOT lanes to maintain average travel speeds of 45 mph or higher (usually associated with traffic volumes of about 1,650 vehicles per hour.

5. Pricing signs will be placed in advance of each access point to inform drivers of the current price to use the HOT lanes. Signs will be placed sufficient distance away from the access point to allow drivers time and distance to make the necessary lane changes to enter the HOT lanes. The pricing signs will be variable message signs that will be updated at 5-minute intervals to show the current toll rate. The system will be designed to that the price the driver sees is the price that they will be charged, no matter how many times the prices change while the vehicle is in the HOT lanes. For goodwill purposes, should prices decrease while a vehicle is in the HOT lane, the toll system can be designed to charge the lower of the two rates.

6. A dynamic pricing sign typically shows two or three tolls, depending on the location of the entry point. The first toll shown will be the lowest toll that a trip will pay if they entered the system at that location, and the farthest destination the vehicle can travel before incurring an additional toll cost. The last toll shown is the highest toll a driver will be charged within the system, which is typically the farthest exit. The toll shown in the middle is the charge to a major intermediate destination.

7. To simplify the messaging on the sign, a segment-based toll scheme is recommended. Under this type of scheme, a vehicle will be charged based on their point of entry into a segment, which will cover their travel to the end of the segment. Trips that enter a segment midway will pay proportionally for the distance traveled to the end of that segment. If a trip enters a second segment, it will pay for the full length trip to the end of the second segment. Due to its length, the US-101 HOT lanes project was divided into three segments for the purposes of phasing, pricing and signing. **Figure 2.3** shows the three segments and the access points within each segment.

8. It is suggested that a minimum toll policy be set for this project. Minimum tolls are a minimum toll amount that will be charged to low-occupancy vehicles, regardless of time of day, operating condition, or distance traveled. Minimum tolls are recommended practice to ensure that operating costs and costs of collection are covered by the amount of toll collected, and help ensure maintain smooth traffic flow on the HOT lanes by discouraging very short trips on the project.

9. The tolling operation will be fully electronic, with tolls collected via electronic transponder.

10. All vehicles, regardless of free or toll status, will be required to have a transponder. Eligible high-occupancy vehicles will declare their occupancy status using switch on the transponder that indicates the number of occupants in the vehicle.

11. Enforcement will be performed manually by California Highway Patrol officers and electronically by video-capture of license plates. Although there is no technology that is currently available to accurately detect the number of people in a moving vehicle, research is being conducted in this area and other resources may be likely to be available by the time the US-101 HOT lanes are implemented.

More detailed description of proposed toll operations is provided in a separate technical memorandum, "Concept of Operations, US-101 HOT Lanes Sketch-Level Feasibility Study."

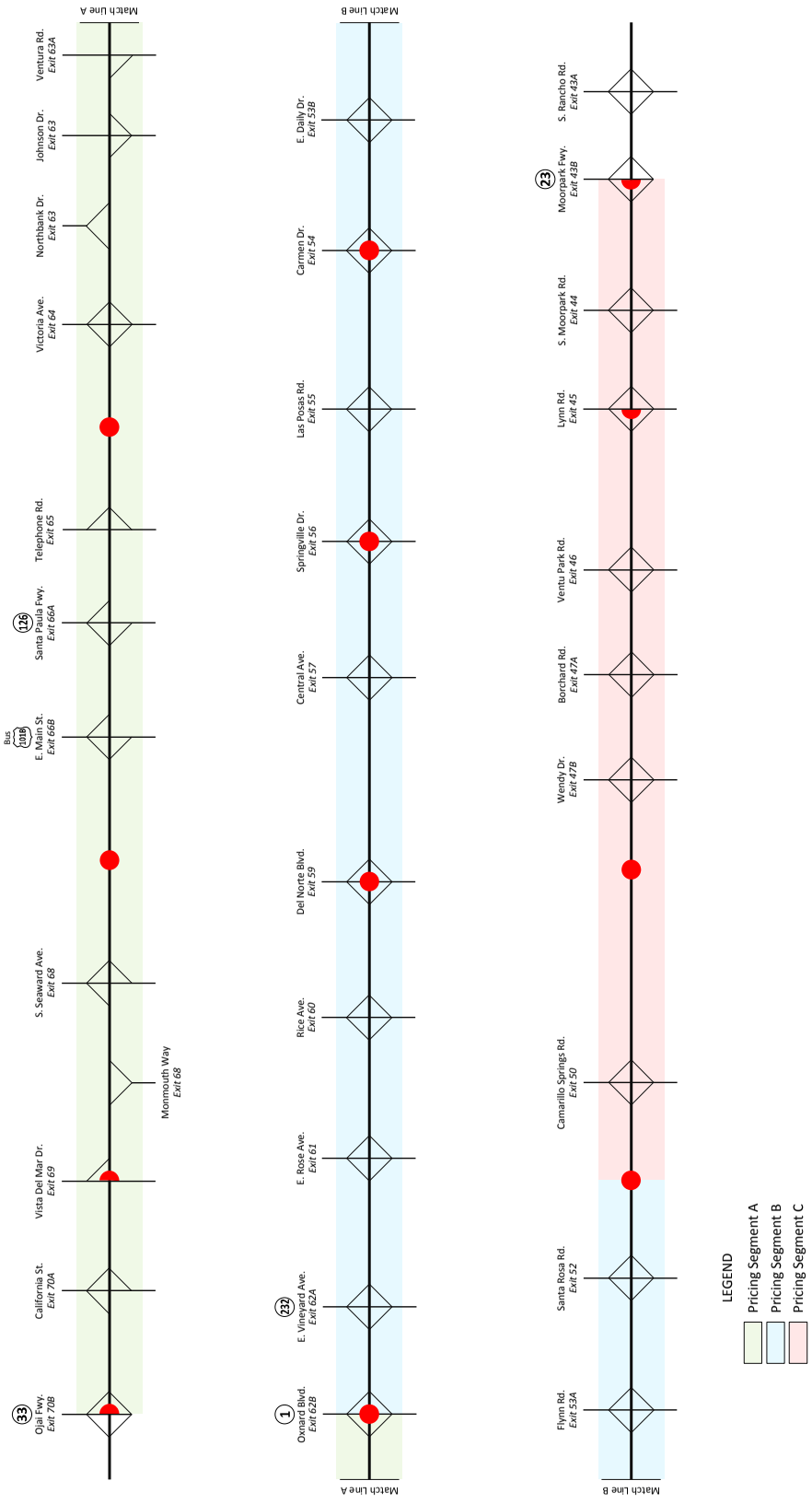


Figure 2.3 Proposed Pricing Segments

3 Sketch-Level Traffic and Toll Revenue Analysis

This study scope called for a sketch-level traffic and toll revenue forecast to be conducted for the US-101 HOT lanes project. Commensurate with its sketch-level nature, the analysis relied exclusively on previously collected data and reports; no new data collection was performed. Primary sources of information include reports and tables published by the California Department of Transportation, including traffic data from "Traffic Volumes on California Highways", "Ramp Volumes on the California State Freeway System", and the Performance Monitoring System (PeMS).

3.1 Analysis Approach

CDM Smith used the following approach to develop the inputs to the sketch-level model.

1. Obtain average daily traffic volumes for freeway mainline links from Caltrans report, "2012 Traffic Volumes on California Highways."

2. Obtain average daily traffic volumes for freeway ramps from Caltrans report, "2012 Ramp Volumes on the California State Freeway System."

3. Obtain truck percentage share for US-101 from Caltrans report, "2012 Annual Average Daily Truck Traffic on the California State Highway System." Assumed 5 percent for initial modeling based on data from this report.

4. Obtain assumptions on auxiliary lane improvements to US-101 based on Caltrans report, "Minor Operational Analysis Level of Service (LOS) Analysis Report, Northbound and Southbound Route 101 HOV Lanes and Auxiliary Lanes, March 17, 2014."

5. Obtain from Caltrans and review historical traffic count information for US-101. Assumed 18 percent of total traffic in the corridor is two-or-more-occupants (HOV-2+).

6. Collect and use data from the PeMS system to identify hourly peaking patterns in the freeway corridor. Only the interchange ramps in Thousand Oaks area were available on PeMS; one or two other mainline locations were available in Ventura. The hourly variation patterns were applied to other interchanges based on location, nearby land uses, and orientation to/from employment centers to develop estimates of hourly and peak period traffic volumes by segment.

7. Develop an estimate of 2012-level hourly traffic demand for each mainline and ramp on US-101 from SR 33 to SR 23 for using the data collected in the list above.

8. Collect travel speed information for an average weekday from the maps.google.com website and for selected locations from the PeMS website. This served to provide an indication of areas of congestion and potential bottleneck locations within the corridor.

9. Review aerials from Google Maps to identify the number of existing general purpose lanes on US-101. Assume all auxiliary lanes recommended in Caltrans Operational Analysis Report will be implemented by 2028.

10. Gather county-level and municipal-level income information from American Community Survey, and the Consumers Price Index from the Bureau of Labor Statistics.

11. Review growth forecasts from the Southern California Association of Governments (SCAG) regional travel demand model and from the Caltrans TCR and PSR for the corridor.

12. Forecast future traffic using 1.0 percent per year from 2012 to 2028, 1.0 percent from 2028 to 2038, and 0.5 percent per year from 2038 to 2048, resulting in a net annualized growth rate of 0.86 percent over 36 years, which was similar to the assumptions used in the Caltrans studies.

3.2 Forecast Methodology

Demand for HOT lanes is very sensitive to small changes in total traffic demand and travel time savings since HOT lanes tend to attract toll-paying traffic only when the adjacent free lanes are congested. When traffic shifts into the HOT lanes, travel time in the general purpose lanes may improve. As a result, the travel time savings offered by the HOT lanes is reduced and the number of users willing to pay a toll would be lower. At the same time, when time savings are lower, the toll that needs to be charged to manage demand for the HOT lanes would be lower. The sketch-level model was developed to attempt to recognize this equilibrium effect.

The data listed in the previous section were incorporated into the sketch-level spreadsheet model. The model includes hourly traffic volumes by direction for every mainline link on the freeway before and after every ramp. The model calculates the travel time in the general purpose and HOT lanes based on the ratio of traffic volume to mainline capacity (v/c) ratio on those links. For the distance between each pair of HOT lanes access points, the model compares the travel time in the general purpose lanes to the travel times in the HOT lanes to estimate the travel time savings offered by the HOT lanes.

In addition, the model recognizes that value of time (expressed in units of dollars per minute), while usually expressed in an average form, varies among drivers and differs depending on the urgency of a driver's situation and user perception. For example, all else being equal, drivers typically value time savings while on a commute to work trip more highly than while on a shopping trip. Drivers who are late for an appointment tend to have a higher value of time at that moment than others. **Figure 3.1** illustrates the concept of a distribution of value of time. In the chart, the X-axis represents a range of values of time. The Y-axis represents the percent share of drivers with that value of time. The model compares the amount of toll paid against the amount of time savings (dollars paid per minute saved) and estimates the share of drivers with a value of time equal to or higher than the "dollars per minutes saved". Drivers who have a value of time higher than the value of the toll cost per minute of times savings will tend to choose to pay a toll.

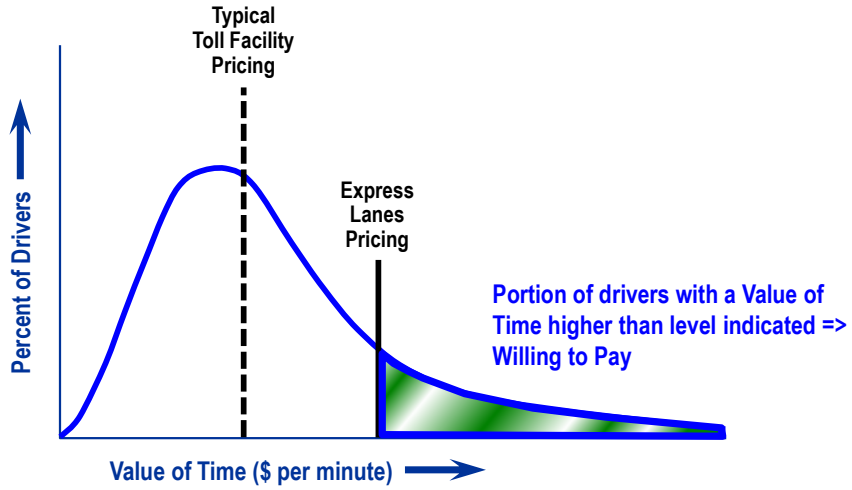


Figure 3.1 Illustration of Distribution of Value of Time and HOT Lanes Usage

Traditional toll facilities that price all drivers and have two, three, or more lanes per direction charge tolls to attract the largest number of users. HOT lanes typically include only one or two lanes per direction, and represent only 25 to 33 percent of the total capacity of the freeway. As such, the toll rates charged on HOT lanes are set to manage demand for the HOT lanes and tend to be higher than the median value of time. If they were set to the median value of drivers, the lanes would attract 50 percent of users, and would not meet its operational goals.

Based on the time savings, an assumed distribution of value of time, and the share of total traffic that is in the HOT lanes, the sketch-level model calculates the estimated toll value of the time savings. In periods where the general purpose lanes are free flow, very little traffic is expected to pay a toll to use the HOT lanes. A range of traffic and toll levels are tested to identify toll rates that would maximize traffic utilization of the lanes as well as toll rates that would optimize revenues by time of day and direction.

3.3 Revenue Estimation Assumptions

In addition to the operating parameters outlined in Section 2, and the traffic inputs outlined above, the toll revenue forecast assumed the following factors:

- The project is assumed to open to tolled traffic on January 1, 2028.
- The project will be in operations 24 hours per day, 365 days per year.
- An annualization factor of 262.5 effective weekdays was used to annualize the weekday revenue to annual revenue. This was developed assuming 240 normal/non-holiday weekdays, 115 holiday weekdays and weekend days, and 10 atypical Fridays. Holidays and weekends were assumed to generate daily revenues about 10 percent of a typical weekday and atypical Fridays were assumed to generate revenues 10 percent higher than a typical weekday.
- No deductions from the toll revenue have been taken for violations, leakage, or non-collectible revenue (assumes violations processing fees will offset losses in uncollectible tolls).
- Traffic and revenue for the period beyond 2048 was extrapolated to include inflation and real increases in toll rates needed to manage demand.

- While the sketch-level spreadsheet model is not designed to model the effects of minimum tolls, manual adjustments were applied to reflect the effects of minimum tolls. A minimum toll of the lower of $0.09 per mile or $0.30 per transaction (in 2014 dollars) was assumed to be charged in order to cover transaction costs.
- While the sketch-level spreadsheet model is not designed to model the effects of segment-based pricing based on point-of-entry as outlined in Section 2, the evaluation of tolls by segment presents an appropriate order-of-magnitude estimate of toll revenue potential for this project based on relative congestion levels and forecasted traffic growth.

3.4 Estimated Annual Gross Toll Revenue

A total of six scenarios were evaluated for the US-101 HOT lanes with parameters as outlined in Table 3-1. The scenarios used variations on the minimum occupancy requirements needed for toll free travel; whether the proposed auxiliary lanes in the corridor are constructed; and two types of toll policy, one to use the lowest tolls needed to maximize traffic usage of the HOT lanes while maintaining minimum speeds of 45 mph (or maximum of 1,650 vehicles per hour) or one using tolls that would optimize revenues in the HOT lanes based on congestion in the general purpose lanes.

Table 3-1 Scenarios Analyzed

Scenario	Mininum Occupancy for Free Travel	Planned Auxiliary Lanes	Toll Policy Set to:
1	HOV-2+	Yes	Maximize Traffic
2	HOV-3+	Yes	Maximize Traffic
3	HOV-2+	No	Maximize Traffic
4	HOV-3+	No	Maximize Traffic
5	HOV-2+	Yes	Optimize Revenue
6	HOV-3+	Yes	Optimize Revenue

Table 3-2 shows the traffic and toll revenue forecast at annualized levels for the forecast period for Scenarios 1 through 4 while Table 3-3 shows the annual revenues for Scenarios 5 and 6 as compared to Scenario 1. The scenarios assuming construction of the auxiliary lanes in the central (Segment B) and western (Segment A) portions of the US-101 corridor (Scenarios 1 and 2) yields lower gross toll revenue since the additional capacity will alleviate congestion and improve traffic weaving maneuvers in these section. The scenarios assuming a definition of HOV-3+ for free use of the HOT lanes (Scenarios 2, 4, and 6) are anticipated to yield higher revenues than the corresponding scenarios with HOV-2+ free, since a greater share of the traffic in the HOT lanes will be tolled; under the HOV-2+ free scenario, certain parts of the HOT lanes may be full with free traffic, resulting in the need to close the facility to toll-paying traffic during the peak hours.

The revenues are highest under Scenarios 5 and 6, which assume toll rates are raised to optimize revenues. These higher toll rates are in effect only during peak hours, when traffic congestion in the general purpose lanes would encourage use of the proposed HOT lanes.

The average tolls per trip (revenue divided by number of transactions) for Scenarios 1 through 4 are between $0.40 and $0.50 per trip ($2014) in the opening year, 2028. During most hours of the day,

the minimum toll of $0.30 per trip was charged; higher tolls were charged in the peak direction during the peak hours only. Average tolls for an entire day for Scenarios 1 through 4 increases to the range of $0.55 to $0.75 cents per trip ($2014) by 2038, and $0.70 to $0.95 ($2014) by 2048. Peak hour tolls in Scenarios 1 through 4 were about $0.45 in 2028, increasing to $0.80-$1.00 in 2038 and $1.20-$1.50 in 2048 (in 2014 dollars).

Average daily tolls for Scenarios 5 and 6 are higher ($0.55 and $0.77, respectively, in 2028) due to higher toll rates used in the peak hours. For Scenarios 5 and 6, peak hour tolls would be in the range of $0.60-$1.20 in 2028, $1.10-2.10 in 2038, and $1.50-$2.75 in 2048 (in 2014 dollars). The lower end of these ranges would apply to Scenario 5, where HOV-2+ traffic is allowed to use the HOT lanes for free and the higher end would apply to Scenario 6, where HOV-2 traffic is assumed to pay a toll.

On this facility, if HOV-2 traffic were assumed to be charged to use the HOT lanes, there would be more traffic congestion in the general purpose lanes, resulting in more time savings offered by the HOT lanes, resulting in higher toll rates and willingness to pay.

The forecasted toll rates are significantly lower than the tolls currently charged on existing facilities in Los Angeles and Orange Counties. This is due to the differences in congestion characteristics between US-101 and I-10, I-110, and SR-91. The peak period of congestion on US-101 is shorter than on the other corridors and the congestion is highly directional, meaning there is congestion in one direction of travel only, limiting the revenue-generating potential of the HOT lanes project to a few hours each weekday. The existing congestion that exists in Camarillo in both directions during peak hours will be mitigated by the construction of new auxiliary lanes. Congestion on US-101 is normally high on weekends and during holidays and summer. The social/recreational nature of weekend and summer traffic on US-101 results in a higher share of traffic with two-or-more occupants during these times, which would help increase utilization of the HOT lanes. If the toll policy is set to allow HOV-2+ traffic to use the lanes for free, there may be little excess capacity for tolled single occupant vehicles.

Table 3-2 Comparison of Estimated Annual Tolled Trips and Gross Toll Revenue, Toll Policy to Maximize Traffic

		Pricing Set to Maximize Traffic Usage of Toll Lanes													
		Scenario 1: HOV-2+ Traffic Free, With New Auxiliary Lanes		Scenario 2: HOV-3+ Traffic Free, With New Auxiliary Lanes		Percent Difference from Base		Scenario 3: HOV-2+ Traffic Free, No New Auxiliary Lanes		Percent Difference from Base		Scenario 4: HOV-3+ Traffic Free, No New Auxiliary Lanes		Percent Difference from Base	
Year		Annual Tolled Trips	Annual Gross Toll Revenue(1)	Annual Tolled Trips	Annual Gross Toll Revenue(1)	Tolled Trips	Annual Gross Toll Revenue	Annual Tolled Trips	Annual Gross Toll Revenue(1)	Tolled Trips	Annual Gross Toll Revenue	Annual Tolled Trips	Annual Gross Toll Revenue(1)	Tolled Trips	Annual Gross Toll Revenue
2028	(2)	1,418,000	$576,000	2,489,000	$971,000	76%	69%	1,976,000	$931,000	39%	62%	3,374,000	$1,472,000	138%	156%
2029	(2)	2,309,000	1,056,000	4,033,000	1,732,000	75%	64%	3,200,000	1,697,000	39%	61%	5,417,000	$2,629,000	135%	149%
2030	(2)	2,855,000	1,421,000	4,963,000	2,287,000	74%	61%	3,936,000	2,275,000	38%	60%	6,611,000	$3,477,000	132%	145%
2031		3,110,000	1,649,000	5,385,000	2,617,000	73%	59%	4,269,000	2,632,000	37%	60%	7,121,000	$3,982,000	129%	141%
2032		3,292,000	1,830,000	5,680,000	2,873,000	73%	57%	4,501,000	2,914,000	37%	59%	7,461,000	$4,374,000	127%	139%
2033		3,474,000	2,000,000	5,975,000	3,114,000	72%	56%	4,734,000	3,180,000	36%	59%	7,801,000	$4,743,000	125%	137%
2034		3,656,000	2,161,000	6,269,000	3,342,000	71%	55%	4,966,000	3,431,000	36%	59%	8,141,000	$5,091,000	123%	136%
2035		3,838,000	2,311,000	6,564,000	3,556,000	71%	54%	5,198,000	3,667,000	35%	59%	8,481,000	$5,419,000	121%	134%
2036		4,020,000	2,453,000	6,859,000	3,756,000	71%	53%	5,430,000	3,889,000	35%	59%	8,821,000	$5,726,000	119%	133%
2037		4,202,000	2,587,000	7,154,000	3,945,000	70%	52%	5,662,000	4,097,000	35%	58%	9,161,000	$6,015,000	118%	133%
2038		4,384,000	2,712,000	7,449,000	4,121,000	70%	52%	5,894,000	4,292,000	34%	58%	9,501,000	$6,285,000	117%	132%
2039		4,503,000	2,916,000	7,626,000	4,403,000	69%	51%	6,038,000	4,601,000	34%	58%	9,698,000	$6,739,000	115%	131%
2040		4,623,000	3,109,000	7,802,000	4,668,000	69%	50%	6,182,000	4,893,000	34%	57%	9,879,000	$7,166,000	114%	130%
2041		4,742,000	3,289,000	7,979,000	4,917,000	68%	49%	6,326,000	5,166,000	33%	57%	10,041,000	$7,566,000	112%	130%
2042		4,861,000	3,458,000	8,156,000	5,151,000	68%	49%	6,470,000	5,422,000	33%	57%	10,188,000	$7,942,000	110%	130%
2043		4,981,000	3,617,000	8,333,000	5,369,000	67%	48%	6,615,000	5,662,000	33%	57%	10,319,000	$8,295,000	107%	129%
2044		5,100,000	3,766,000	8,509,000	5,573,000	67%	48%	6,759,000	5,887,000	33%	56%	10,438,000	$8,624,000	105%	129%
2045		5,219,000	3,905,000	8,686,000	5,763,000	66%	48%	6,903,000	6,096,000	32%	56%	10,545,000	$8,931,000	102%	129%
2046		5,338,000	4,034,000	8,863,000	5,940,000	66%	47%	7,047,000	6,291,000	32%	56%	10,641,000	$9,217,000	99%	128%
2047		5,458,000	4,154,000	9,039,000	6,104,000	66%	47%	7,191,000	6,472,000	32%	56%	10,727,000	$9,482,000	97%	128%
2048		5,577,000	4,266,000	9,216,000	6,256,000	65%	47%	7,335,000	6,640,000	32%	56%	11,471,000	$9,729,000	106%	128%
2049		5,666,000	4,324,000	9,349,000	6,341,000	65%	47%	7,443,000	6,731,000	31%	56%	11,505,000	$9,862,000	103%	128%
2050		5,756,000	4,383,000	9,481,000	6,428,000	65%	47%	7,551,000	6,823,000	31%	56%	11,505,000	$9,996,000	100%	128%
2051		5,845,000	4,443,000	9,614,000	6,516,000	64%	47%	7,659,000	6,916,000	31%	56%	11,505,000	$10,132,000	97%	128%
2052		5,935,000	4,482,000	9,746,000	6,573,000	64%	47%	7,767,000	6,977,000	31%	56%	11,505,000	$10,221,000	94%	128%
2053		6,024,000	4,521,000	9,879,000	6,631,000	64%	47%	7,875,000	7,038,000	31%	56%	11,505,000	$10,311,000	91%	128%
2054		6,114,000	4,561,000	10,011,000	6,689,000	64%	47%	7,983,000	7,099,000	31%	56%	11,505,000	$10,402,000	88%	128%
2055		6,203,000	4,601,000	10,144,000	6,748,000	64%	47%	8,092,000	7,162,000	30%	56%	11,505,000	$10,493,000	85%	128%
2056		6,293,000	4,641,000	10,276,000	6,807,000	63%	47%	8,200,000	7,224,000	30%	56%	11,505,000	$10,585,000	83%	128%
2057		6,382,000	4,682,000	10,409,000	6,867,000	63%	47%	8,308,000	7,288,000	30%	56%	11,505,000	$10,678,000	80%	128%
2058		6,472,000	4,723,000	10,541,000	6,927,000	63%	47%	8,416,000	7,352,000	30%	56%	11,505,000	$10,771,000	78%	128%

Assumptions: US 101 has one toll lane in each direction from SR 33 to SR 23.
Toll lanes operation begins on January 1, 2028. Toll lanes in operation 24 hours per day.
New auxiliary lanes between interchanges are as recommended by Caltrans in the Operational Analysis/Level of Service Analysis Report dated March 17, 2014.

(1) Annual revenues expressed in 2014 dollars.

(2) Adjustment factors (.553,.841,.975) have been applied to modeled traffic and revenues for first three years of operation for recognize ramp-up in demand for new toll lanes.

Table 3-3 Comparison of Estimated Annual Tolled Trips and Gross Toll Revenue, Toll Policy to Optimize Revenue

		Pricing Set to Maximize Traffic Usage of Toll Lanes		Pricing Set to Optimize Revenues of Toll Lanes							
		Scenario 1: HOV-2+ Traffic Free, With New Auxiliary Lanes		Scenario 5: HOV-2+ Traffic Free, With New Auxiliary Lanes				Scenario 6: HOV-3+ Traffic Free, With New Auxiliary Lanes			
						Percent Difference from Base				Percent Difference from Base	
Year		Annual Tolled Trips	Annual Gross Toll Revenue(1)	Annual Tolled Trips	Annual Gross Toll Revenue(1)	Tolled Trips	Annual Gross Toll Revenue	Annual Tolled Trips	Annual Gross Toll Revenue(1)	Tolled Trips	Annual Gross Toll Revenue
2028	(2)	1,418,000	$576,000	1,222,000	$677,000	-14%	18%	1,837,000	$1,414,000	30%	145%
2029	(2)	2,309,000	1,056,000	1,990,000	1,235,000	-14%	17%	2,963,000	2,541,000	28%	141%
2030	(2)	2,855,000	1,421,000	2,460,000	1,656,000	-14%	17%	3,632,000	3,373,000	27%	137%
2031		3,110,000	1,649,000	2,681,000	1,916,000	-14%	16%	3,927,000	3,873,000	26%	135%
2032		3,292,000	1,830,000	2,838,000	2,121,000	-14%	16%	4,129,000	4,265,000	25%	133%
2033		3,474,000	2,000,000	2,995,000	2,314,000	-14%	16%	4,332,000	4,633,000	25%	132%
2034		3,656,000	2,161,000	3,152,000	2,497,000	-14%	16%	4,534,000	4,980,000	24%	130%
2035		3,838,000	2,311,000	3,309,000	2,669,000	-14%	15%	4,736,000	5,306,000	23%	130%
2036		4,020,000	2,453,000	3,467,000	2,830,000	-14%	15%	4,938,000	5,614,000	23%	129%
2037		4,202,000	2,587,000	3,624,000	2,982,000	-14%	15%	5,140,000	5,901,000	22%	128%
2038		4,384,000	2,712,000	3,781,000	3,124,000	-14%	15%	5,342,000	6,171,000	22%	128%
2039		4,503,000	2,916,000	3,886,000	3,325,000	-14%	14%	5,486,000	6,579,000	22%	126%
2040		4,623,000	3,109,000	3,991,000	3,514,000	-14%	13%	5,629,000	6,962,000	22%	124%
2041		4,742,000	3,289,000	4,097,000	3,692,000	-14%	12%	5,773,000	7,321,000	22%	123%
2042		4,861,000	3,458,000	4,202,000	3,858,000	-14%	12%	5,916,000	7,658,000	22%	121%
2043		4,981,000	3,617,000	4,307,000	4,014,000	-14%	11%	6,060,000	7,973,000	22%	120%
2044		5,100,000	3,766,000	4,412,000	4,159,000	-13%	10%	6,204,000	8,268,000	22%	120%
2045		5,219,000	3,905,000	4,517,000	4,294,000	-13%	10%	6,347,000	8,542,000	22%	119%
2046		5,338,000	4,034,000	4,623,000	4,420,000	-13%	10%	6,491,000	8,797,000	22%	118%
2047		5,458,000	4,154,000	4,728,000	4,536,000	-13%	9%	6,634,000	9,033,000	22%	117%
2048		5,577,000	4,266,000	4,833,000	4,644,000	-13%	9%	6,778,000	9,252,000	22%	117%
2049		5,666,000	4,324,000	4,912,000	4,708,000	-13%	9%	6,886,000	9,379,000	22%	117%
2050		5,756,000	4,383,000	4,991,000	4,772,000	-13%	9%	6,993,000	9,506,000	21%	117%
2051		5,845,000	4,443,000	5,070,000	4,837,000	-13%	9%	7,101,000	9,636,000	21%	117%
2052		5,935,000	4,482,000	5,149,000	4,879,000	-13%	9%	7,209,000	9,721,000	21%	117%
2053		6,024,000	4,521,000	5,228,000	4,922,000	-13%	9%	7,317,000	9,806,000	21%	117%
2054		6,114,000	4,561,000	5,306,000	4,965,000	-13%	9%	7,424,000	9,892,000	21%	117%
2055		6,203,000	4,601,000	5,385,000	5,009,000	-13%	9%	7,532,000	9,979,000	21%	117%
2056		6,293,000	4,641,000	5,464,000	5,053,000	-13%	9%	7,640,000	10,066,000	21%	117%
2057		6,382,000	4,682,000	5,543,000	5,097,000	-13%	9%	7,747,000	10,154,000	21%	117%
2058		6,472,000	4,723,000	5,622,000	5,142,000	-13%	9%	7,855,000	10,244,000	21%	117%

Assumptions: US 101 has one toll lane in each direction from SR 33 to SR 23.
Toll lanes operation begins on January 1, 2028. Toll lanes in operation 24 hours per day.
New auxiliary lanes between interchanges as recommended by Caltrans in the Operational Analysis/Level of Service Analysis Report dated March 17, 2014, are constructed.

(1) Annual revenues expressed in 2014 dollars.

(2) Adjustment factors (.553,.841,.975) have been applied to modeled traffic and revenues for first three years of operation for recognize ramp-up in demand for new toll lanes.

3.5 Annual Revenue by Segment for Composite Scenario

A final composite scenario was developed for use in the financial feasibility analysis. The composite scenario was based on the scenarios assuming a minimum of three occupants for free travel in the HOT lane, along with construction of the auxiliary lanes. Since the HOT lanes revenues would be used to help offset the cost of the lanes, the composite scenario used the average of the traffic maximizing and revenue optimizing toll rate policies. In effect, it was assumed that the toll algorithm would be set to try to achieve more revenue during the peak periods when the HOT lanes offer greater value, but remain at low levels during other times of the day. Table 3-4 and Figure 3.2 show the revenues by segment for the composite scenario.

Table 3-4 Estimated Annual Tolled Trips and Gross Toll Revenue by Segment, Composite Scenario

		HOV-3+ Traffic Free, With New Auxiliary Lanes				
Year		Annual Tolled Trips	Segment A: SR-33 to Oxnard Blvd.	Segment B: Oxnard Blvd. to West of Camarillo Springs Rd.	Segment C: West of Camarillo Springs Rd. to SR-23	Annual Gross Toll Revenue(1)
2028	(2)	2,163,000	$155,000	680,000	358,000	$1,193,000
2029	(2)	3,498,000	278,000	1,218,000	641,000	2,137,000
2030	(2)	4,297,500	368,000	1,613,000	849,000	2,830,000
2031		4,656,000	422,000	1,849,000	974,000	3,245,000
2032		4,904,500	464,000	2,034,000	1,071,000	3,569,000
2033		5,153,500	504,000	2,208,000	1,162,000	3,874,000
2034		5,401,500	541,000	2,372,000	1,248,000	4,161,000
2035		5,650,000	576,000	2,526,000	1,329,000	4,431,000
2036		5,898,500	609,000	2,670,000	1,406,000	4,685,000
2037		6,147,000	640,000	2,806,000	1,477,000	4,923,000
2038		6,395,500	669,000	2,933,000	1,544,000	5,146,000
2039		6,556,000	714,000	3,130,000	1,647,000	5,491,000
2040		6,715,500	756,000	3,314,000	1,745,000	5,815,000
2041		6,876,000	795,000	3,488,000	1,836,000	6,119,000
2042		7,036,000	833,000	3,650,000	1,922,000	6,405,000
2043		7,196,500	867,000	3,803,000	2,001,000	6,671,000
2044		7,356,500	900,000	3,945,000	2,076,000	6,921,000
2045		7,516,500	930,000	4,077,000	2,146,000	7,153,000
2046		7,677,000	958,000	4,200,000	2,211,000	7,369,000
2047		7,836,500	984,000	4,314,000	2,271,000	7,569,000
2048		7,997,000	1,008,000	4,420,000	2,326,000	7,754,000
2049		8,117,500	1,022,000	4,480,000	2,358,000	7,860,000
2050		8,237,000	1,036,000	4,541,000	2,390,000	7,967,000
2051		8,357,500	1,050,000	4,603,000	2,423,000	8,076,000
2052		8,477,500	1,059,000	4,644,000	2,444,000	8,147,000
2053		8,598,000	1,068,000	4,685,000	2,466,000	8,219,000
2054		8,717,500	1,078,000	4,726,000	2,487,000	8,291,000
2055		8,838,000	1,087,000	4,768,000	2,509,000	8,364,000
2056		8,958,000	1,097,000	4,809,000	2,531,000	8,437,000
2057		9,078,000	1,106,000	4,852,000	2,553,000	8,511,000
2058		9,198,000	1,116,000	4,894,000	2,576,000	8,586,000
2059		9,294,000	1,120,000	4,913,000	2,586,000	8,619,000
2060		9,390,000	1,125,000	4,932,000	2,596,000	8,653,000
2061		9,486,000	1,129,000	4,951,000	2,606,000	8,686,000
2062		9,582,500	1,134,000	4,970,000	2,616,000	8,720,000
2063		9,678,500	1,138,000	4,990,000	2,626,000	8,754,000
2064		9,774,500	1,142,000	5,010,000	2,636,000	8,788,000
2065		9,870,500	1,147,000	5,028,000	2,647,000	8,822,000
2066		9,966,500	1,151,000	5,049,000	2,657,000	8,857,000
2067		10,062,500	1,156,000	5,068,000	2,667,000	8,891,000
2068		10,159,000	1,160,000	5,088,000	2,678,000	8,926,000

Assumptions: US 101 has one toll lane in each direction from SR 33 to SR 23.
Toll lanes operation begins on January 1, 2028. Toll lanes in operation 24 hours per day.
New auxiliary lanes between interchanges as recommended by Caltrans in the Operational Analysis/Level of Service Analysis Report dated March 17, 2014, are constructed.

(1) Annual revenues expressed in 2014 dollars.

(2) Adjustment factors (.553,.841,.975) have been applied to modeled traffic and revenues for first three years of operation to recognize ramp-up in demand for new toll lanes.

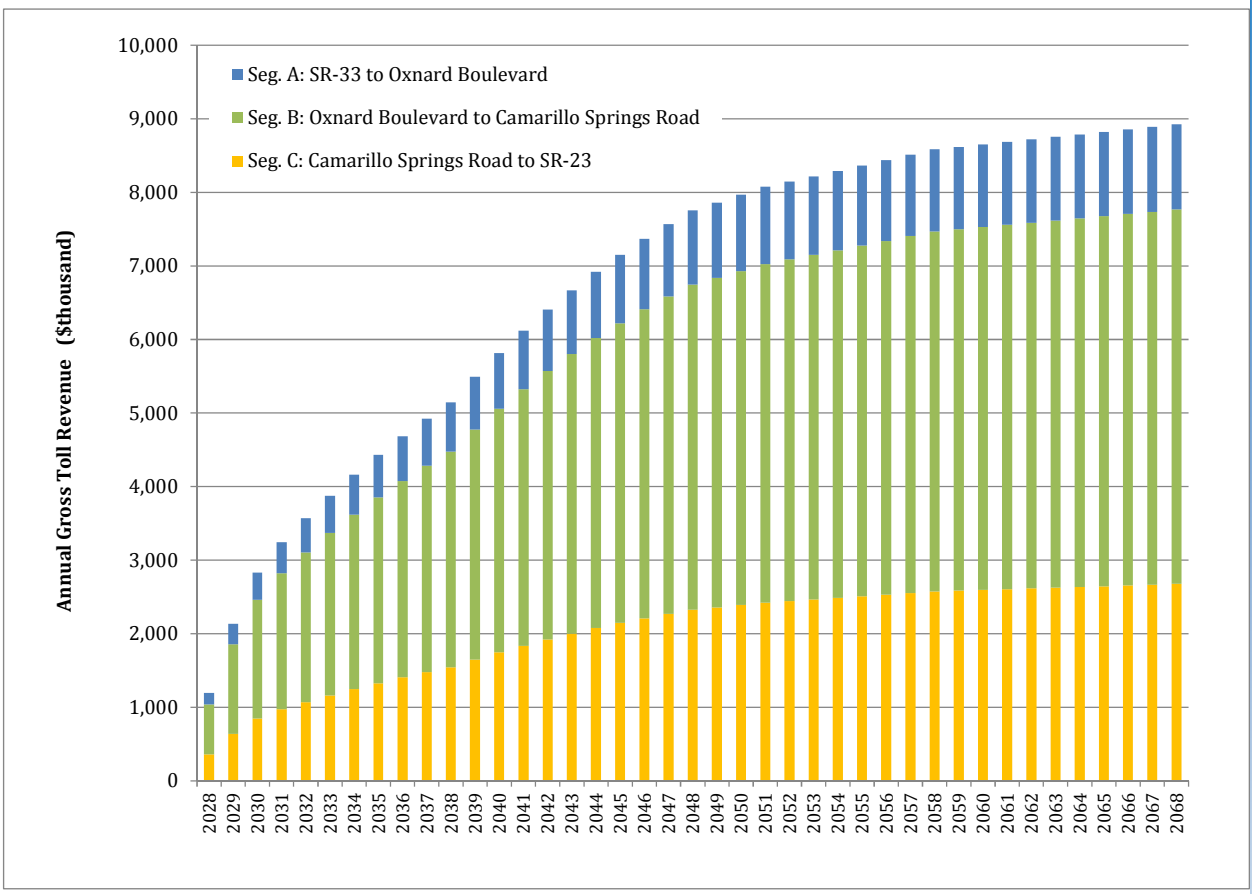


Figure 3.2 Estimated Annual Gross Toll Revenue by Segment, Composite Scenario

4 Preliminary Financial Feasibility Analysis

The PFM Group conducted a preliminary feasibility analysis of the US-101 HOT lanes to identify the preliminary bonding capacity of the project revenue stream, considering toll revenue bonds, TIFIA loans, and other sources of state and federal funding. PFM was also asked to evaluate phasing or segmenting strategies that may improve operations, reduce initial costs, and generate revenues to support implementation of subsequent segments.

4.1 Assumptions

The financial feasibility analysis is based on the following assumptions regarding revenues and costs:

1. Used the lower limit of capital cost of the most reasonable and probable alternative from the Project Study Report, Alternative 3, one standard HOV lane in each direction ($1.34 billion in $2013)[3]
2. Assume toll revenue (composite scenario) are used first to pay ordinary maintenance and major capital maintenance/replacement costs, then to service the toll revenue debt
3. Assume revenues from fines and fees add 10 percent to the toll revenues
4. Added inflation to the operating and capital costs, and tolls, based on the annual inflation rates used in the CTP, which ranged from 1.8% to 3.3%
5. Annualized the capital costs using a cost curve that spread the costs over a 13-year period, and estimated annual soft versus hard costs
6. Used debt interest rates equal to a 10-year historical average
7. A debt service reserve is funded incrementally from toll revenues for both toll revenue bonds and TIFIA loan, equal to maximum annual debt service over the next five years, and initially funded at 10% of the principal amount, or the first year's interest, from proceeds of the debt
8. Costs of issuance for debt is equal to 0.30% of the principal amount
9. Debt service and major capital maintenance reserves earn interest at 2.5%
10. Maintained average debt service coverage (i.e., net revenues divided by debt service) over the life of the debt of 1.75 times for a TIFIA loan and 2.00 times for toll revenue bonds
11. Allocated state and federal funding to the HOT lanes based on the maximum amounts available in the CTP, including the use of "advance construction" that allocates future year funding to reimburse prior year expenditures

[3] Caltrans "Project Study Report-Project Development Support (PSR-PDS) to Request Programming for Capital Support (Project Approval and Environmental Document Phase) in the 2014 STIP On Route US-101 Between Near S. Moorpark Road (PM 4.1) and Near State Route 33 (PM 30.9), November 2013."

12. Remainder of gross toll and other operating revenues after payment of operating and maintenance costs toll revenue bond debt service, TIFIA debt service, toll revenue bond and TIFIA debt service reserve fund deposits, and major capital maintenance deposits, are available to VCTC for eligible expenditures within the corridor

13. Estimated segment operating and major capital maintenance costs based on the proportional length of the segment

4.2 Findings

The financing plan sources and uses of funds for the 28-mile length US-101 HOT lanes is shown in Table 4-1, which shows the anticipated toll revenue bond proceeds, a federal TIFIA loan, and state STIP and federal STP funds, to total approximately $413 million. The total capital costs of the project, including inflation-adjusted construction and financing costs, are $1.9 billion, leaving an unfunded amount of almost $1.5 billion. The project toll and other revenues can fund approximately 22 percent of the overall project; the project is not considered to be financially feasible based on current funding sources.

Table 4-1 Financing Plan for Entire US-101 HOT Lanes Project

	Total (Inflated$)
Sources	
Toll Revenue Bonds	
CIBS Par Amount	$25,595,000
CABS Par Amount	16,042,435
CCABS Par Amount	
+Premium/-Discount	700,535
Bond Proceeds	$42,337,970
TIFIA Proceeds	49,964,922
STIP	178,506,044
STP	142,044,663
Total Sources	$412,853,599
Uses	
Capital Costs	$1,896,221,989
Financing Costs	9,764,750
Total Uses	$1,905,986,739
Unfunded Amount	$1,493,133,140

Following this initial conclusion, PFM was asked to develop a preliminary bonding capacity analysis assuming the project is separated into three segments (labelled A, B, and C) that would be constructed over time. Segment A includes SR-33 to Oxnard Boulevard and is 8 miles in length, Segment B includes Oxnard Boulevard to West of Camarillo Springs Road and is 12 miles, and Segment C includes West of Camarillo Springs Road to SR-23 and is 8 miles. The preliminary bonding capacity analyses for each segment of the project was performed by developing separate cash flow models and running alternative scenarios to determine the timing of constructing and financing each segment and allocating available state and federal funding to each segment to identify the optimum years for project phasing, and assuming a toll system financing, whereby the revenues of each segment are jointly pledged to the toll revenue debt of each segment.

Table 4-2 shows the sources and uses of funding and possible implementation year of each of the segments based on available revenues. The "funding capacity" is the maximum amount of construction costs that can be funded from the toll revenue debt and available state and federal funding. The cost to construct each segment has not been estimated.

Table 4-2 Alternatives Financing Plan (Prioritized by Potential Revenue)

	Segment B	Segment A	Segment C	Total (Inflated$)
Sources				
Toll Revenue Bonds				
CIBS Par Amount				
CABS Par Amount				
CCABS Par Amount				
+Premium/-Discount				
Bond Proceeds				
TIFIA Proceeds	$67,500,000	$45,500,000	$15,000,000	$128,000,000
STIP	154,313,551	133,848,112	89,628,128	377,789,791
STP	113,660,233	76,051,888	42,771,872	232,483,993
Total Sources	$335,473,784	$255,400,000	$147,400,000	$738,273,784
Uses				
Funding Capacity	$332,492,637	$253,390,486	$146,737,523	$732,620,646
TIFIA Reserve	2,778,647	1,873,014	617,477	5,269,138
Cost of Issuance	202,500	136,500	45,000	384,000
Total Uses	$335,473,784	$255,400,000	$147,400,000	$738,273,784
Year of Operation	**2028**	**2035**	**2042**	

Segment B is assumed constructed first, as this segment has the most congestion and highest amount of gross toll revenue, and can support the construction of $332 million of capital costs. Segment A is assumed constructed second, and can support $253 million of capital costs, and is completed seven years later in 2035. Segment C is constructed last in 2042, and supports $147 million of capital costs.

For each of the segments, only a TIFIA loan is assumed, as the maximum amount of toll revenue debt that can be supported by the toll revenue is less than the assumed maximum TIFIA loan amount (33% of eligible project costs), and the TIFIA loan has a lower assumed interest rate than toll revenue bonds.[4]

Table 4-2 shows that should VCTC consider pursuing this project, a phased implementation could help enhance funding capacity up to a total of $733 million. Segment B is the most logical first phase of the total, based on its length and level of congestion. The segmented, or phased, construction of the project increases the funding capacity in comparison to constructing the full 28-mile length, as additional state and federal funds can be allocated to the project, and greater debt capacity is achieved when a toll system financing is used, if the toll revenue projections are realized. If the toll revenues are accrued as projected, VCTC will receive residual revenues over time that can help fund future costs, and the future revenues help support the debt of subsequent segments during the initial ramp-up phase. The estimated amount of cumulative residual revenues at the time the debt is repaid in 2071 is $309 million.

Continued multi-agency collaboration and support for the overall project is key to the success of this project, which would improve mobility on the primary travel corridor in Ventura County.

[4] TIFIA regulations allow for loans up to 49% of eligible project costs; however, all TIFIA loans made to date have been limited to 33%.