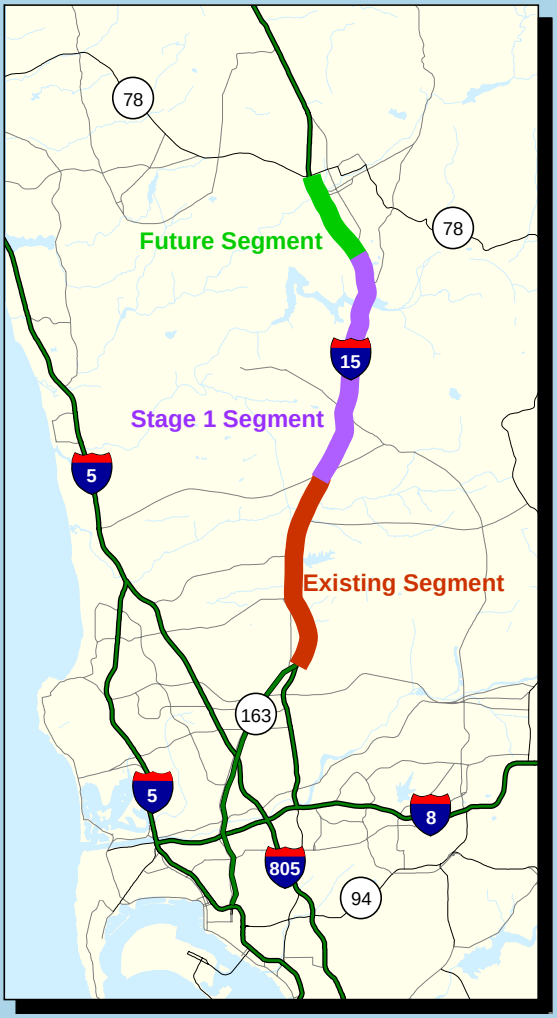
Concept Plan



Volume 1
Traffic, Revenue and Toll Operations

I-15 MANAGED LANES VALUE PRICING PROJECT PLANNING STUDY

ENGINEERS
PLANNERS
ECONOMISTS

Wilbur Smith Associates

In association with

- FPL and Associates
- Judith Norman Transportation Consultant
- Fairfax Research
- Frank Wilson Associates
- ESTC
- ALESC

San Diego
ASSOCIATION OF
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Concept Plan

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February 2002

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ASSOCIATION OF
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EXECUTIVE SUMMARY

The I-15 Express Lanes project in San Diego County has provided a landmark demonstration of not only the potential for High Occupancy Toll (HOT) lane operation but also the world's first example of fully dynamic variable pricing. The current value pricing program was applied to an eight-mile section of reversible HOV lane, extending along I-15 generally between S.R. 163 and Ted Williams Parkway.

Plans are now underway to substantially expand capacity in the I-15 corridor, with particular emphasis on additional capacity for HOV traffic. Based on the success of the I-15 value pricing demonstration project, it is currently planned to extend the project into what will ultimately be a 20-mile, two-directional "managed lane" project extending as far north as Escondido.

As part of this planning process for the new facility, a team headed by Wilbur Smith Associates (WSA) is studying the overall operational and financial feasibility of the expanded managed lanes project, including traffic operations, electronic toll collection requirements, traffic and revenue potential and a significant public outreach program. This report summarizes the results of the first two phases of that study, leading up to the development of a "Concept Plan" for the expanded managed lanes facility. The report is submitted in two volumes: this document is Volume 1 which covers traffic, revenue and toll operations issues. The extensive Outreach Program is summarized in Volume 2.

PROJECT DESCRIPTION

The existing I-15 Value Pricing Demonstration Project extends about eight miles from the S.R. 163 Freeway to Ted Williams Parkway, and is currently a two-lane reversible roadway operated southbound in the morning and northbound in the afternoon peak period. For several years, the demonstration program has permitted use of these lanes by single-occupant vehicles, in exchange for a toll charge. The project is unique in many ways, but the most innovative aspect of the current operation is the use of dynamic pricing, where the toll rate is varied up to every six minutes based on measured traffic in the Express Lanes.

The proposed extension and expansion of the managed lane project will be completed in phases. Ultimately, the project will be extended to a total length of about 20 miles, and will be expanded to a total cross-section of four lanes over most of its length. This includes ultimate expansion of the existing two-lane reversible section.

The lower 17 miles of the ultimate project will be designed with a moveable barrier to permit unbalanced lane utilization during peak periods. In the morning peak, three lanes will operate in the southbound direction while just one lane will operate northbound. The opposite arrangement will occur in the p.m. peak.

In addition to extending and expanding the facility, access to and from the managed lanes will be significantly increased. There will be direct access to four planned bus rapid transit centers, two other direct connections to local streets and several "transition areas" between the managed lanes and the main lanes. The expansion of the project, together with the increased number of access locations, will significantly change operations of the managed lanes.

METHODOLOGY OVERVIEW

The overall study is being conducted in three phases:

- Phase I: Traffic Operations Planning;
- Phase II: Concept Plan/Project Feasibility Analysis; and
- Phase III: System Requirements Plan.

The bulk of the information included in this report relates to the Phase II efforts. In this phase, the operational and financial feasibility of the extended/expanded managed lanes project has been examined, under a number of project alternatives. A series of potential alternative pricing strategies were identified. From these, the project management team selected five basic alternatives to be subjected to the traffic and revenue analysis. In addition to the five basic options, two additional "sensitivity" scenarios were identified.

The traffic and revenue analysis used the basic SANDAG Series 9 model inputs, but required the development of specialized analytical techniques to evaluate the unique nature of this managed lane project. Traffic analyses were performed at multiple toll rates for each of six analysis

periods on a typical weekday. In addition to a detailed evaluation of traffic utilization and operations, preliminary annual toll revenue estimates were prepared for the five base scenarios and two sensitivity tests.

Phase II also included development of a preliminary toll technology and toll operations system concept. The expanded facility, with multiple access points, will make the toll collection process somewhat more complex. A toll concept was developed which would work with all of the alternative pricing strategies studied, while still making use of FasTrak electronic toll collection transponders which are already in use.

As noted above, Phase II of the study work program also included an extensive public outreach component. The results of that analysis are documented in the Volume 2 report.

ALERNATIVE PRICING SCENARIOS

A number of potential pricing alternatives were identified for consideration by the project management team. These were subjected to preliminary analysis and screening, culminating in the selection of five preferred scenarios for more detailed analysis. These included:

- **Scenario A-1: Standard Flat Rate (All Entries)** - Under this scenario, all vehicles entering the managed lanes at a given point in time would be assessed the same flat toll, regardless of point of entry or point of exit;

- **Scenario A-2: Flat Rate With Maximum Toll Per Entry** – This scenario is similar to Scenario A-1, except that the flat rate displayed at any given time would be based on the maximum length trip in the managed lanes which would be possible from any given point of entry (i.e., the shorter the maximum length of trip, the lower the flat rate at any given point in time);

- **Scenario B-1: Standard Per-Mile Rate** – Under this scenario tolls would be based on distance traveled, with a per-mile rate that would be "standard" at any given time, regardless of point of entry. There would also be a minimum and maximum toll associated with this scenario. The minimum toll at each rate level was represented by a typical 5-mile trip, while maximum toll was based on a 15-mile trip;

- **Scenario B-2: Skewed Per-Mile Rate** – This scenario is the same as Scenario B-1, except that the per-mile rate at any given time may be different depending on point of entry, to aid in demand management around certain "bottleneck" locations; and

- **Scenario C-1: Standard Rate Per Segment** – In this case, the toll rate would be expressed as a certain standard charge "per segment" (i.e., the travel segments between successive opportunities for access or egress). For example, if the segment rate at a given time was $0.50, and the trip used three "segments," the total toll would be $1.50. Under Scenario C-1, at any given time the segment rate would be the same for any point of entry.

SENSITIVITY TEST SCENARIOS

In addition to the five base scenarios described above, two additional "sensitivity test" scenarios were run to test the impact of possible alternative project configurations or changes in the definition of HOVs. The two sensitivity tests were tested as variations to Base Scenario B-1, the standard per-mile rate with minimum and maximum tolls. The two alternatives tested as sensitivity tests included:

- **Sensitivity Scenario B-1-a: Scenario B-1 with Fixed Barrier** – In this case, the project was assumed to always have two managed lanes in each travel direction without a movable barrier; and

- **Sensitivity Scenario B-1-b: Scenario B-1 Assuming HOV 3+** - This scenario was intended to test impacts on traffic and revenue of a future condition where the regional definition of high-occupant vehicles would be changed from two or more persons to three or more persons. This may be necessary at some point in the future due to increasing traffic levels in HOV lanes throughout the region.

OVERVIEW OF TRAFFIC AND REVENUE FINDINGS

Each of the five base scenarios as well as the two sensitivity scenarios were subjected to a traffic and revenue analysis at 2005, 2010 and 2015 levels. Alternative toll rates were tested to determine optimum rates under each scenario, during each of six time intervals during the day.

OPTIMUM TOLL RATES

In identifying the optimum toll rates, two primary criteria were recognized:

- Rates which provided sufficient "demand management" to ensure targeted levels of service in the managed lanes were always maintained; and

- Rates which maximized toll revenue potential.

The "demand management" criteria was always given priority over revenue maximization; rates which maximize revenue were selected only when demand management criteria was also satisfied.

Study findings regarding toll rates included:

- For Scenario A-1, the uniform flat rate toll required in peak periods was found to be $2.00, with rates as low as $0.50 proving to be optimum in off-peak hours;

- Under Scenario A-2, where flat rate tolls would be graduated based on the maximum length of possible trip at each access point, peak period flat rate tolls would range from as high as $3.50 to as low as $0.70, depending on point of entry;

- Under Scenario B-1, the optimum peak period rate was found to be $0.20 per mile in the major travel direction, ranging down to as low as $0.05 during off-peak hours;

- In Scenario B-2, where per-mile rates can be skewed depending on point of entry, optimum peak period tolls were found to vary between $0.10 and $0.30 per mile, depending on point of entry;

- It was determined to be necessary under any of the per-mile rate options to include a minimum and maximum toll, to reduce the probability of "queue jump" maneuvers in and out of the managed lanes; and

- Under Scenario C-1, the optimum peak period toll per segment was found to be between $0.25 and $0.40 per segment, depending on travel direction. Lower rates would be used during off-peak hours.

TRAFFIC SHARE ANALYSIS

The various scenarios were compared in terms of the relative proportion of total non-HOV traffic on I-15 which will be expected to be accommodated in the managed lanes. At the south end of the corridor, the share of non-HOV traffic in the managed lanes was generally consistent among the five basic scenarios, with the managed lanes accommodating between 13.1 and 14.7 percent of total SOV demand in the a.m. peak southbound and between 9.1 and 13.2 percent in the p.m. peak northbound. There tended to be more variability in the share of SOV traffic toward the center of the project, where more SOV "capacity" tended to be available. In this case, the share of SOV traffic in the managed lanes ranged from 7.3 to 20.7 percent, depending on scenario and travel direction. This wider variation was attributable to the nature of the particular pricing strategy. For example, some strategies tended to favor longer-distance trips while other strategies favored short-distance trips.

Within the managed lanes themselves, with few exceptions, HOV traffic usually constituted more than half of the total vehicles in the managed lanes. At the south end of the project, the non-HOV share of managed lanes traffic ranged from about 42 to 45 percent depending on scenario. Again, toward the middle of the project there was more variability between the HOV and non-HOV shares.

Considering the sensitivity scenarios, the possible alternative of constructing the expanded managed lanes with a fixed barrier, thereby permitting two managed lanes in each travel direction at all times would substantially reduce the amount of peak period capacity available for non-HOV traffic, in the major travel direction. The non-HOV share under this sensitivity test would drop to between 3 and 13 percent of total traffic in the managed lanes, depending on location and travel direction.

By contrast, if the definition of HOV were changed to vehicles with three or more occupants, this would substantially shift the balance toward non-HOV traffic. Between 85 and 90 percent of traffic in the managed lanes would fall into the non-HOV category (including both one and two-occupant vehicles) even though HOV traffic would still be allowed to use the facility at no toll charge.

COMPARATIVE SUMMARY OF RESULTS

Table ES-1 provides a comparative summary of overall traffic and revenue study reports for the five base scenarios and two sensitivity scenarios. The table includes a comparison, at both 2005 and 2015 levels, of six items, including:

Table ES-1

Comparative Summary of Results

	Base Scenarios					Sensitivity Scenarios	
2005 Levels	A-1	A-2	B-1	B-2	C-1	B-1-a	B-1-b
Toll Trips (000')	20.6	22.2	21.3	19.8	31.0	11.2	52.4
Toll VMT (000's)	270.9	250.3	192.6	205.0	211.0	90.3	499.6
Average Toll Trip Length	13.2	11.3	9.0	10.4	6.8	8.1	9.5
Annual Revenue (000)	$7,654	$7,848	$7,784	$7,183	$7,688	$4,274	$16,259
Revenue Per Toll Vehicle	$1.23	$1.17	$1.21	$1.20	$0.82	$1.26	$1.03
Average Peak Period Toll [(1)]	$1.80	$1.59	$1.82	$1.62	$1.35	$2.18	$1.76
2015 Levels							
Toll Trips (000')	18.7	25.2	18.3	23.8	24.6	20.2	69.4
Toll VMT (000's)	254.5	293.6	161.6	236.4	156.8	177.1	668.8
Average Toll Trip Length	13.6	11.7	8.8	9.9	6.4	8.8	9.6
Annual Revenue (000)	$9,629	$10,904	$8,917	$9,111	$8,471	$7,255	$25,645
Revenue Per Toll Vehicle	$1.71	$1.43	$1.61	$1.27	$1.14	$1.19	$1.22
Average Peak Period Toll [(1)]	$3.28	$2.41	$3.33	$2.98	$2.20	$2.20	$1.86
Other Considerations							
Toll Equity	Low	Very Low	Med-High	Medium	High	Med-High	Med-High
Rate Simplicity (Dynamic)	Simple	Simple	Complex	Complex	Medium	Complex	Complex
Demand Management Focus	Low	Very Low	Low	High	Low	Low	Low

Note: All Tolls and Revenue are in 2001 Dollars

[(1)] Highest of AM and PM Period

- Number of Toll Trips – The total number of toll-paying vehicles (single SOV in all scenarios except B-1-b) regardless of trip length;

- Toll Traffic Vehicle Miles of Travel (VMT) – A good relative measure of the overall efficiency of utilization of the managed lanes by non-HOV traffic;

- Average Toll Trip Length – The average length of non-HOV traffic only, simply the total VMT divided by the number of daily trips in this category. In general, the higher the average trip length the better, since a low trip length would be indicative of frequent entry and exit maneuvers in and out of the managed lanes;

- Annual Toll Revenue – Including both weekday as well as a preliminary approximation of weekend revenue;

- Revenue per Vehicle – on a total average annual daily basis; and

- Average Peak Period Toll – Values shown represent the highest average toll in either the a.m. or p.m. peak period for each respective scenario.

The bottom of the table also provides a comparison of other measures, such as toll equity, relatively complexity and demand management.

Among the five base scenarios, the segment toll program would have the highest average weekday number of vehicles, but also, by a wide margin, the shortest average trip length. The longest trip length, as might be expected, would occur under Scenario A-1, which would feature a flat rate toll for use of the managed lanes, regardless of point of entry or exit or trip length.

In terms of revenue potential, each of the five base scenarios was found to be relatively close. At 2005 levels, estimated annual revenue ranged from about $7.2 to $7.8 million for each of the base scenarios. However, if the project were constructed with a fixed barrier, with two managed lanes in each direction, revenue potential would be reduced substantially, to $4.3 million. By contrast, if the definition of high-occupant vehicle were increased from two to three in the region, revenue potential would be increased to $16.3 million.

The bottom portion of table ES-1 also provides a comparison of other characteristics. With regard to toll equity, the flat rate option would be poor, while the per-mile and segment based rate structures would be much better. However, per-mile tolling would be somewhat more complex, both in terms of signing and patron understanding. The ability of each system to focus demand management in certain areas would be generally low, with the exception of Section B-2 where skewed toll rates could be used to more precisely manage demand in specific locations.

OVERALL RANKING OF SCENARIOS

Table ES-2 provides an overall ranking of the five base scenarios with respect to seven evaluation measures. For each evaluation measure, the scenarios were simply ranked from lowest (1) to highest (5). No attempt was made to weight the relative importance of the measures and the composite ranking total reflects simply summations of the individual rankings.

Since revenue is considered a secondary priority in determining the optimum program, based on discussions with SANDAG, Caltrans and the project management team, ranking totals are provided both with and without the toll revenue rankings included. Interestingly, the same two scenarios are ranked highest whether or not toll revenue is included in the calculation. These include:

- Scenario A-1: A uniform flat toll; and
- Scenario B-2: A skewed per-mile rate program, with minimum and maximum tolls.

TOLL COLLECTION SYSTEM AND OPERATIONS CONCEPT

The necessary characteristics of the toll collection and enforcement system were identified prior to beginning development of the concept and presented considerable challenge to the concept development process. The chief requirements are the following:

- The system must be capable of controlling traffic demand on the managed lanes. This is to be accomplished by dynamically varying tolls in response to measured traffic characteristics;

- The dynamically varying prices must be presented to the motorist just prior to the managed lane entrances and the price structure presented must remain in effect for the entire trip made by the motorist;

- Access to the managed lanes will be via transition areas with slip lanes that offer no opportunity to read tags in the vehicles entering and exiting;

- The tolling technology to be used on the project must be the Title 21 standard dedicated short-range communications (DSRC) system mandated by state law.

- The managed lanes will be used by both tolled and free HOV vehicles mixing in the lanes without restraint;

- The system will be deployed in stages;

- There will be direct access ramps to and from Bus Route Transit Centers (BRTC) and the toll system must be able to adjust the toll charged for vehicles that initiate or terminate their trips at the BRTC;

- The tolling system must be capable of supporting the pricing strategies being considered for this project; and

- There must be a viable enforcement capability.

The system concept developed in the study has the following characteristics:

- All tags are read at the price announcing signs so that toll rates are associated with the tag at the point when the motorist reads the rates;

- Toll readers are placed between all entrances to and exits from the managed lanes so all managed lane movements are measured;

- Readers are planned at the BRTCs to permit commuter tie-in pricing;

- Enforcement is system-assisted in that it provides overhead signals at the tolling zone to identify vehicles paying the toll; and

- A creative design approach mitigated the lack of a read write capability in Title 21 ETC design standard.

The design concept developed, though novel is quite within the state of the art, satisfies all the initial requirements, and will support all the alternate pricing strategies under consideration for the project.

CHAPTER 1

INTRODUCTION

The I-15 Express Lanes project in San Diego County has provided a landmark demonstration of not only the potential for High Occupancy Toll (HOT) lane operation but also the world's first example of fully dynamic variable pricing. The current value pricing program was applied to an eight-mile section of reversible HOV lane, extending along I-15 generally between S.R. 163 and Ted Williams Parkway.

Plans are now underway to substantially expand capacity in the I-15 corridor, with particular emphasis on additional capacity for HOV traffic. Based on the success of the I-15 value pricing demonstration project, it is currently planned to extend the project into what will ultimately be a 20-mile, two-directional "managed lane" project extending as far north as Escondido.

As part of this planning process for the new facility, a team headed by Wilbur Smith Associates (WSA) is studying the overall operational and financial feasibility of the expanded managed lanes project, including traffic operations, electronic toll collection requirements, traffic and revenue potential and a significant public outreach program. This report summarizes the results of the first two phases of that study, leading up to the development of a "Concept Plan" for the expanded managed lanes facility. The report is submitted in two volumes: this document is Volume 1, which covers traffic, revenue and toll operations issues. The extensive Outreach Program is summarized in Volume 2.

PROJECT DESCRIPTION

As shown in Figure 1-1, the existing I-15 Value Pricing Demonstration project extends from the junction with the S.R. 163 Freeway on the south to the interchange with S.R. 56, Ted Williams Parkway, on the north. This section of I-15 had a previously-constructed two-lane reversible HOV

I-15 Managed Lanes Concept Plan

ENGINEERS PLANNERS ECONOMISTS
Wilbur Smith Associates

LOCATION MAP

FIGURE 1-1

facility, with access only at the two endpoints. No intermediate access is permitted. The two-lane roadway is reversible; operated in the southbound direction in the morning peak period and the northbound direction in the afternoon peak. The lanes are closed during midday and evening hours. In addition to the two-lane reversible roadway, I-15 generally includes four-five general purpose lanes in each travel direction.

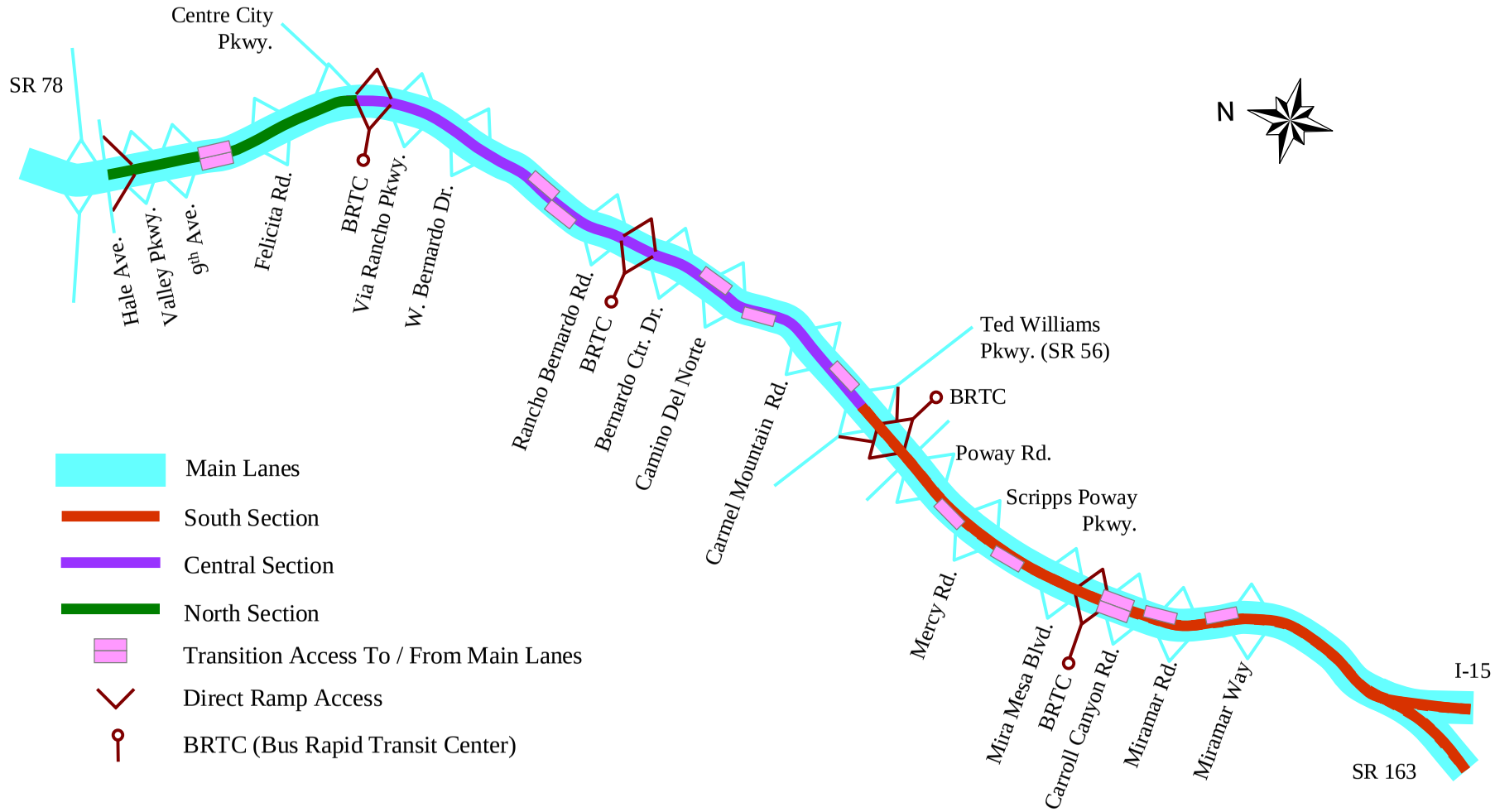
For the last several years, the value pricing demonstration program has permitted use of the HOV lanes by single-occupant vehicles, in exchange for a toll charge. The program was phased in; initially the demonstration began with a manual "subscription" monthly pass arrangement, and was ultimately converted to a fully-electronic per-transaction variable pricing system. The most innovative aspect of the current operation is the use of dynamic pricing; where traffic conditions in the Express Lanes are continually monitored and toll charges for single-occupant vehicles are varied up to every six minutes to regulate demand in the Express Lanes to ensure maintenance of free-flow conditions. Motorists are advised of the single-occupant vehicle toll rate on variable message signs immediately prior to each of the potential entry points. Vehicles with two or more occupants continue to be able to use the Express Lanes without toll charge, and without the requirement for electronic toll transponders.

The proposed extension of the I-15 Managed Lanes project is also shown in Figure 1-1. While this may be implemented in phases, the ultimate "full build" project would extend the managed lanes as far north as the S.R. 78 Freeway in Escondido as well as widening the existing two-lane reversible roadway to a full four-lane cross section. In addition to extending the facility, multiple access points will be added, both on the extended section and on the existing portion. When completed, the managed lanes will provide a 20-mile alternative for trips throughout this heavily developed residential corridor and to longer-distance commuters traveling from points in northern San Diego County and southern Riverside County.

A more detailed look at the proposed project configuration is shown in Figure 1-2. The existing reversible lane section is shown in red. As noted previously, as part of the ultimate expansion this will be converted to a full four-lane cross section.

The actual extension of the managed lanes to the north may be done in two phases. The central section would likely be the first phase extension, as shown in purple. The final phase would be the north section, generally within Escondido.

I-15 Managed Lanes Concept Plan



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I-15 MANAGED LANES EXPANSION CONFIGURATION

FIGURE 1-2

Most of the northern section (shown in green) would be constructed with a fixed median barrier and two managed lanes in each travel direction. However, the remaining 17 miles of the project, from just north of Center City Parkway through S.R. 163, would be constructed with a movable median barrier permitting unbalanced lane distributions during peak periods. For example, in the morning peak period three lanes would operate in the southbound direction and one lane in the northbound direction.

There will generally be three types of access to and from the managed lanes. The most common access arrangement will be transition areas, shown in pink in Figure 1-2. These areas will provide opportunities for transition between the main lanes (general purpose lanes) and the managed lanes. A number of transition areas will be provided in each travel direction, including several new access points on the existing portion of the managed lanes project.

There will also be direct access ramps to up to four bus rapid transit centers (BRTC). These centers would typically include large park-and-ride facilities and offer opportunities for direct modal transfer. In the ultimate development of final toll technology plans and pricing strategies, consideration will be given to integrated electronic pricing which may be designed to encourage modal transfer, such as reduced tolls for single-occupant vehicles who use managed lane for direct access to BRTC sites.

Finally, there will be a limited number of direct access ramps not associated with BRTC sites. Specifically, these will allow access to and from the north at Ted Williams Parkway and Hale Avenue. Overall, this configuration when built in its entirety would result in 11 possible travel segments in the northbound direction and 12 segments in the southbound direction. This, together with extending the length and two-directional operation, will significantly change the character of the I-15 Managed Lanes project.

For purposes of consistency in the evaluation between alternatives, all elements of the study discussed herein are based on the full project construction, i.e., between S.R. 78 and S.R. 163. There will likely be an interim operating condition, with a four-lane facility between Center City Parkway and Ted Williams Parkway and the continuation of a two-lane reversible facility south of Ted Williams Parkway. This will require special operating considerations, such as non-reversal of the managed lanes in the new section. However, since this is a temporary condition, the

full project configuration has been used in testing various project alternatives. Refinements for the "interim" operation will be made once the specific preferred pricing strategy and operating plan is selected from among the alternatives.

SCOPE OF STUDY

The overall study is being conducted in three phases:

- Phase 1: Traffic Operations Plan;
- Phase 2: Concept Plan/Project Feasibility Analysis; and
- Phase 3: System Requirements Plan.

The initial phase of the study focused on an extensive data collection effort and development of preliminary traffic operations concepts for the extended managed lanes. The results of that phase were documented separately in a technical memorandum. Portions of the Phase 1 work related to traffic data and forecasts are included in this document.

The bulk of the information included in Volumes 1 and 2 of this report relates to the Phase 2 effort. In this Phase, the operational and financial feasibility of the extended managed lanes project has been examined, under a number of project alternatives. A series of potential alternative pricing strategies were identified. From these, the project management team selected five basic alternatives to be subjected to the traffic and revenue analysis. In addition to the five basic options, two additional "sensitivity" scenarios were identified. The first tested the potential impacts on traffic and revenue associated with possible construction of the managed lanes with a fixed-barrier cross section with two managed lanes in each direction. A second sensitivity test was performed to see what impact a hypothetical change in the definition of high-occupant vehicles (HOV) from two or more persons to three or more, would have on operations, traffic and revenue.

The traffic and revenue analysis used basic SANDAG Series 9 model inputs, but required the development of specialized analytical techniques to evaluate the unique nature of a managed lanes project; whereby traffic needs to choose between immediately adjacent toll and toll-free lanes. Traffic assignments were performed at multiple toll rates, for each of six analysis periods for a typical weekday, to determine optimum toll rates and to ensure sufficient demand management in the managed lanes to permit continuing free-flow operations.

As a result of this, preliminary annual toll revenue estimates were developed for the five basic scenarios considered, plus the two additional sensitivity scenarios. A comparison of operating characteristics under each case was also provided.

Phase 2 also included development of a preliminary toll technology and toll operations system concept. The expanded facility, with multiple access points, would make the toll collection process somewhat more complex. This is particularly true if the current dynamic pricing arrangement was used, possibly in concert with "distance-based" tolling.

A toll collection system concept was developed which would work with all of the alternative pricing strategies studied, while still making use of FasTRAK electronic toll collection transponders which are already in use. Preliminary estimates of capital costs associated with the toll collection and traffic management system were prepared. In addition, toll collection operating costs were also developed for each of the various scenarios.

A significant effort in Phase 2 was devoted to a major community outreach program. This included focus groups, an intercept survey of existing carpoolers and transit users, an extensive telephone survey as well as meetings and discussions with opinion leaders and stakeholders. Environmental justice issues were also addressed.

The results of the Phase 2 analysis are summarized in this report. As noted above, the summary of the outreach process is included in Volume 2; all other elements are included in this Volume 1.

One final element originally envisioned for the Phase 2 work program related to the development of the project monitoring and evaluation plan for the expanded value pricing pilot program. While this work will be conducted, it has been decided to commence this following selection of a preferred pricing and project alternative. Hence it is not yet discussed in this document.

Phase 3 will, in essence, will involve the delineation of a more detailed system requirements plan, for the preferred project and pricing alternative. This will include:

- The electronic toll collection system;

- Traffic management systems and integration with other regional management systems;
- Telecommunications requirements;
- The interim operations requirements including interface with the existing lanes; and
- Preparation of the final, detailed system requirements plan.

ORDER OF PRESENTATION

Chapter 2 of this document presents a summary of the I-15 operating profile, including both the existing Express Lanes operating characteristics as well as an overall operations profile for the extended I-15 corridor between Escondido and San Diego. Alternative pricing strategies for the expanded managed lanes project are presented in Chapter 3. Chapter 4 presents the results of the traffic and revenue analysis, focusing on the five basic alternative strategies selected for analysis, plus two additional "sensitivity scenarios." Finally, the toll technology and operations concept is presented in Chapter 5.

Volume 2 of the report presents the results of the overall public outreach process. It includes a summary of the focus group process, telephone surveys, intercept surveys and the various stakeholder interviews. The Volume 2 document was prepared directly by the Project Outreach subconsultant team, which included Redman Consulting, Judith Norman-Transportation Consultant, Frank Wilson & Associates and Fairfax Research Group.

CHAPTER 2

I-15 OPERATING PROFILE

Traffic operating characteristics within the I-15 Managed Lanes study corridor were identified in terms of the existing traffic volumes, travel times, vehicle classifications, and vehicle occupancy profiles. Traffic data was obtained from SANDAG, Caltrans District 11 and field studies conducted by WSA.

HISTORICAL TRAFFIC TRENDS

Traffic trends at selected locations along the I-15 Managed Lanes study corridor are presented in terms of average weekday daily traffic. Sources of data include Caltrans District 11 and SANDAG.

Table 2-1 summarizes annual weekday traffic trends at four locations along the I-15 corridor area for the ten-year period between 1990 and 2000. Also shown is the percent change (APC) on an annual basis and the average annual percent change (AAPC) for the ten-year period 1990–2000. It should be noted that year 2000 traffic data was not available for the northern location immediately south of Via Rancho Parkway. It is also important to note that the traffic counts reported for the locations at Mira Mesa Boulevard and immediately north of the I-15/SR 163 junction include only mainline traffic. Express Lane traffic trends are discussed later in a separate section.

As shown, the I-15 study corridor has experienced an average annual growth rate in the range of 2.1 percent to 3.2 percent. The highest rate of traffic growth in the corridor has been experienced in the vicinity of Carmel Mountain Road. The lowest overall rate of growth has occurred at the south end of the corridor where the traffic volumes are the highest.

Table 2-1
Average Weekday Daily Traffic Trends
I-15 Managed Lanes Value Pricing

LOCATION	1990	APC	1991	APC	1992	APC	1993	APC	1994	APC	1995	APC	1996	APC	1997	APC	1998	APC	1999	APC	2000	AAPC 1990-2000
I-15 s/o Via Rancho Pkwy																						
Northbound	85,353	1.23%	86,400	2.00%	88,124	2.82%	90,613	2.24%	92,643	1.70%	94,220	0.22%	94,427	-2.44%	92,124	15.84%	106,716	-0.83%	105,828	N/A	N/A	2.42%
Southbound	84,315	1.72%	85,764	3.20%	88,505	2.68%	90,880	-1.10%	89,882	-2.47%	87,658	2.72%	90,043	3.26%	92,982	13.87%	105,878	-2.43%	103,300	N/A	N/A	2.28%
TOTAL	169,668	1.47%	172,164	2.59%	176,629	2.75%	181,493	0.57%	182,525	-0.35%	181,878	1.43%	184,470	0.34%	185,106	14.85%	212,594	-1.63%	209,128	N/A	N/A	2.35%
I-15 s/o Carmel Mountain Rd																						
Northbound	83,127	1.76%	84,588	2.04%	86,313	1.73%	87,806	4.52%	91,776	-1.44%	90,455	9.05%	98,639	2.33%	100,937	5.24%	106,227	3.99%	110,461	2.14%	112,824	3.10%
Southbound	84,313	0.83%	85,012	-0.11%	84,920	1.30%	86,021	6.61%	91,704	7.19%	98,293	3.27%	101,511	0.96%	102,490	6.02%	108,659	4.67%	113,734	2.20%	116,241	3.26%
TOTAL	167,440	1.29%	169,600	0.96%	171,233	1.51%	173,827	5.55%	183,480	2.87%	188,748	6.04%	200,150	1.64%	203,427	5.63%	214,886	4.33%	224,195	2.17%	229,065	3.18%
I-15 s/o Mira Mesa Blvd																						
Northbound	94,854	1.33%	96,115	1.84%	97,879	6.54%	104,281	4.89%	109,379	2.42%	112,031	3.11%	115,511	3.34%	119,373	3.48%	123,522	2.83%	127,019	0.40%	127,531	3.00%
Southbound	103,449	0.90%	104,381	0.46%	104,861	3.08%	108,093	4.89%	113,383	2.37%	116,066	3.07%	119,633	3.59%	123,926	3.09%	127,754	3.03%	131,622	0.80%	132,681	2.52%
TOTAL	198,303	1.11%	200,496	1.12%	202,740	4.75%	212,374	4.89%	222,762	2.39%	228,097	3.09%	235,144	3.47%	243,299	3.28%	251,276	2.93%	258,641	0.61%	260,212	2.75%
I-15 n/o SR-163/I-15 Junction																						
Northbound	117,003	1.08%	118,266	2.61%	121,351	1.77%	123,497	3.44%	127,745	1.84%	130,100	1.86%	132,524	-5.08%	125,791	4.12%	130,974	4.06%	136,289	0.43%	136,876	1.58%
Southbound	111,403	3.72%	115,549	6.26%	122,782	2.27%	125,572	3.77%	130,306	2.83%	133,991	3.03%	138,054	-3.47%	133,267	3.74%	138,254	4.28%	144,167	0.72%	145,210	2.69%
TOTAL	228,406	2.37%	233,815	4.41%	244,133	2.02%	249,069	3.61%	258,051	2.34%	264,091	2.46%	270,578	-4.26%	259,058	3.93%	269,228	4.17%	280,456	0.58%	282,086	2.13%

Notes: Traffic volumes at Mira Mesa Blvd and n/o SR 163/I-15 include only mainline traffic.
AAPC - Average Annual Percent Change
N/A - Not Available

AVERAGE WEEKDAY TRAFFIC

Year 2000 average weekday daily traffic volumes were obtained from SANDAG to establish baseline traffic conditions in the corridor. Average weekday traffic volumes are developed by SANDAG from Caltrans District 11 loop counters located along the I-15 corridor. WSA utilized traffic data from the four mainline count locations identified in Table 2-1 as well as from each of the interchange on and off ramps to create a profile of weekday traffic within the corridor. Figure 2-1 presents year 2000 average weekday traffic volumes that have been balanced (from one interchange ramp the next), by direction of travel, for the length of the study corridor.

Weekday traffic is shown to generally increase from north to south within the study corridor. At the north end of the corridor, north of SR 78 weekday traffic averages approximately 93,400 vehicles while at the south end weekday traffic volumes average 296,200 vehicles. In the middle segment, between Centre City Parkway and Mercy Road, the weekday traffic ranges from 199,000 to 247,000 vehicles.

As shown in the figure inset, year 2000 weekday traffic on the reversible Express Lanes averaged 17,100 vehicles with 7,100 vehicles using the Express Lanes during the morning southbound commute and 10,000 vehicles using the Express Lanes during northbound afternoon/evening commute.

A review of the directional characteristics of weekday traffic reveals that southbound traffic volumes are consistently higher than northbound volumes throughout the corridor. This suggests that some of the return commute trips are made on alternative routes. Imbalances in the inter-regional (through trip) travel flows may also contribute to this pattern.

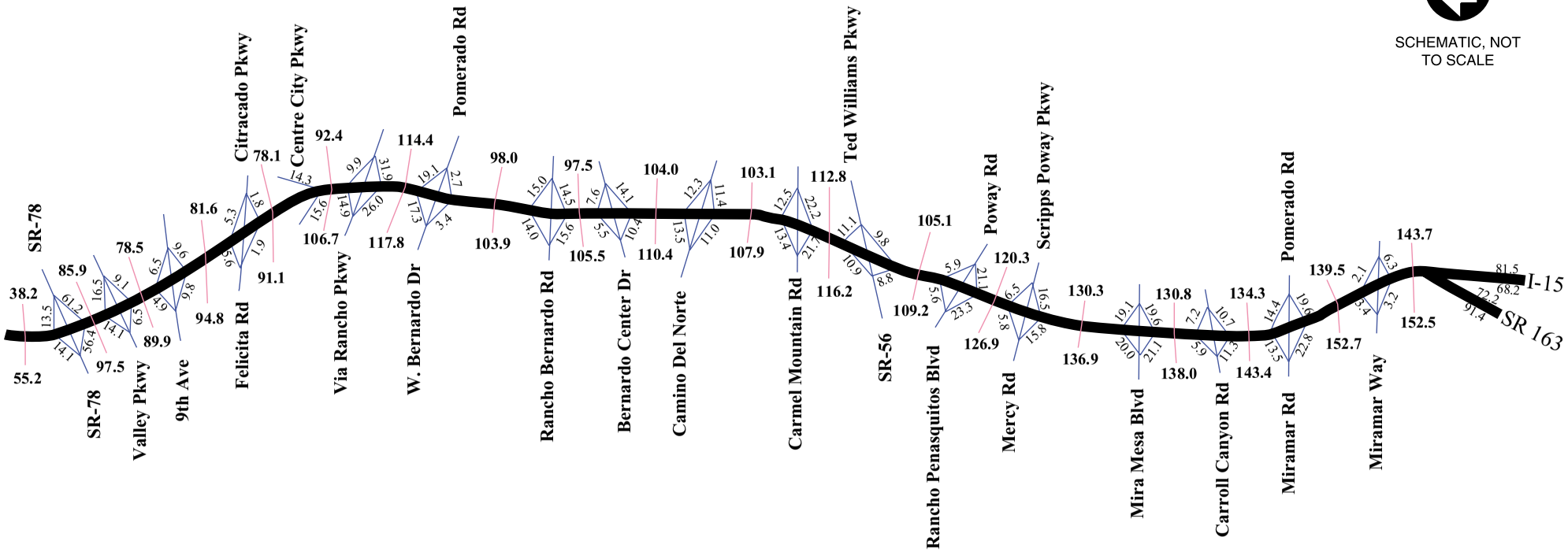
HOURLY TRAFFIC DISTRIBUTION

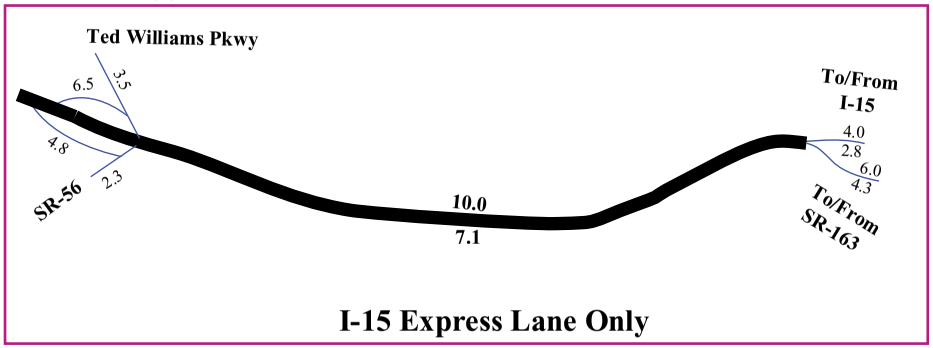
Morning and evening peak period traffic volumes are depicted in Figures 2-2 and 2-3 respectively. The morning peak period occurs from 6:00 a.m. to 9:00 a.m. and the afternoon/evening peak extends from 3:00 p.m. to 6:00 p.m. These periods are consistent with the peak traffic periods used in the SANDAG travel forecasting model.

The highest traffic hours for the I-15 study corridor generally occur between 7:00 and 8:00 in the morning and from 4:00 to 5:00 in the

I-15 Managed Lanes Concept Plan

SCHEMATIC, NOT TO SCALE





NOTE: Balanced Volumes in Thousands

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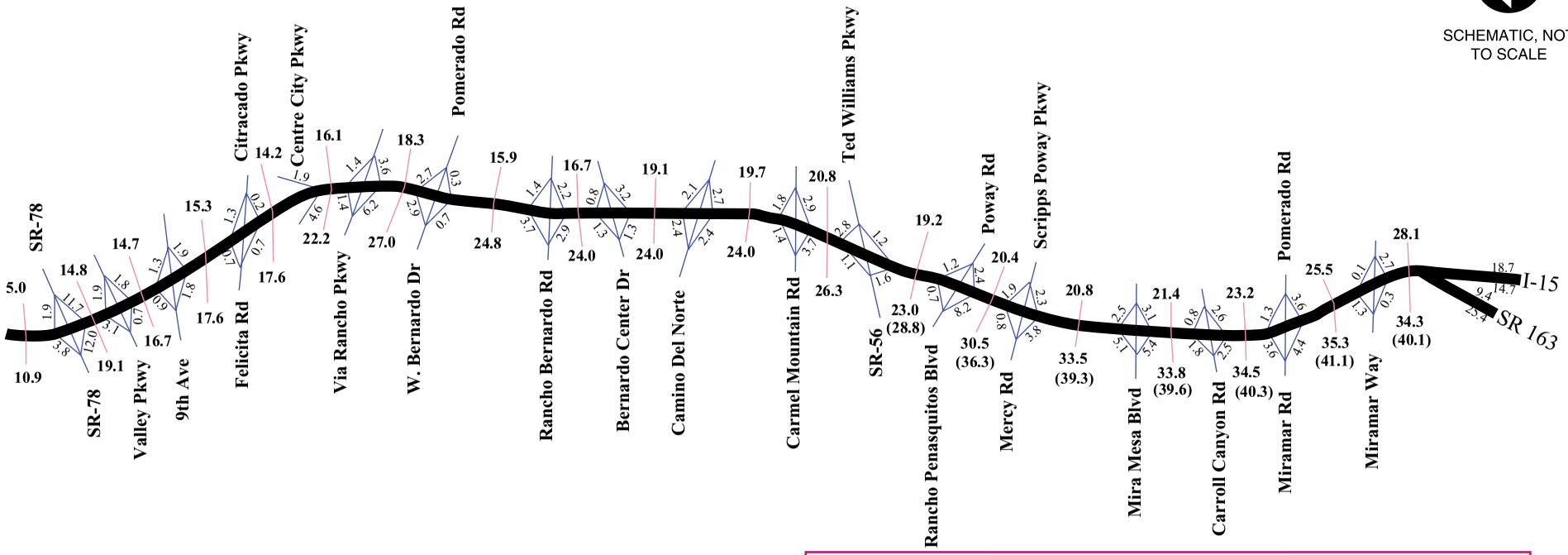
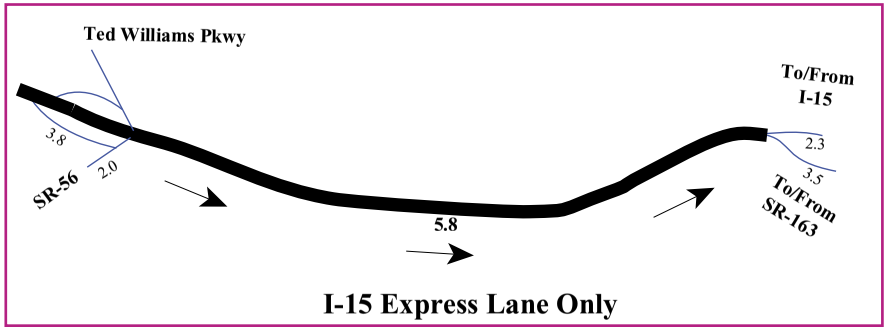
YEAR 2000 AWDT

FIGURE 2-1

I-15 Managed Lanes Concept Plan

SCHEMATIC, NOT TO SCALE





(00.0) - Southbound Volume Including Express Lanes

NOTE: Balanced Volumes in Thousands

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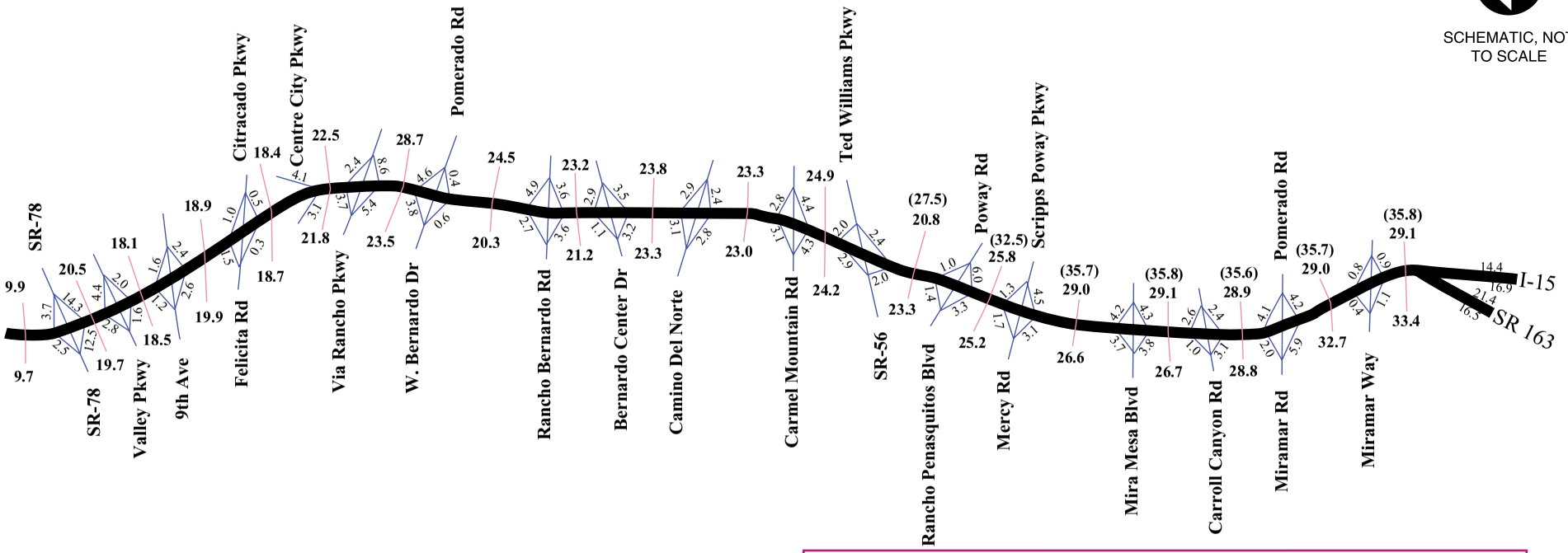
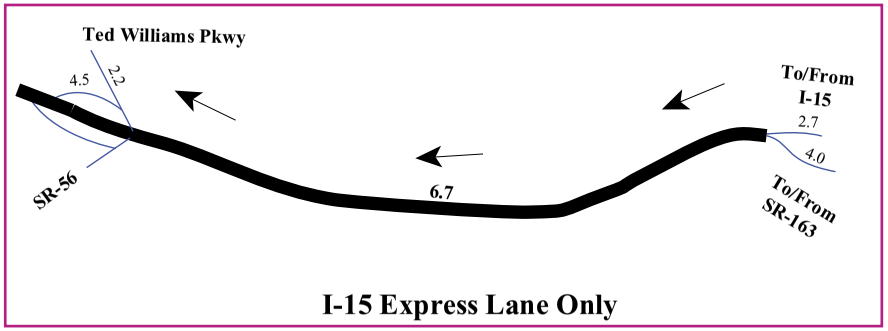
YEAR 2000 AM PEAK PERIOD

FIGURE 2-2

I-15 Managed Lanes Concept Plan

SCHEMATIC, NOT TO SCALE





(00.0) - Northbound Volume Including Express Lanes

NOTE: Balanced Volumes in Thousands

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YEAR 2000 PM PEAK PERIOD

FIGURE 2-3

afternoon/evening. Depending on the location and direction of travel, however, localized peak hours occur at different times that are generally within the three-hour periods defined above.

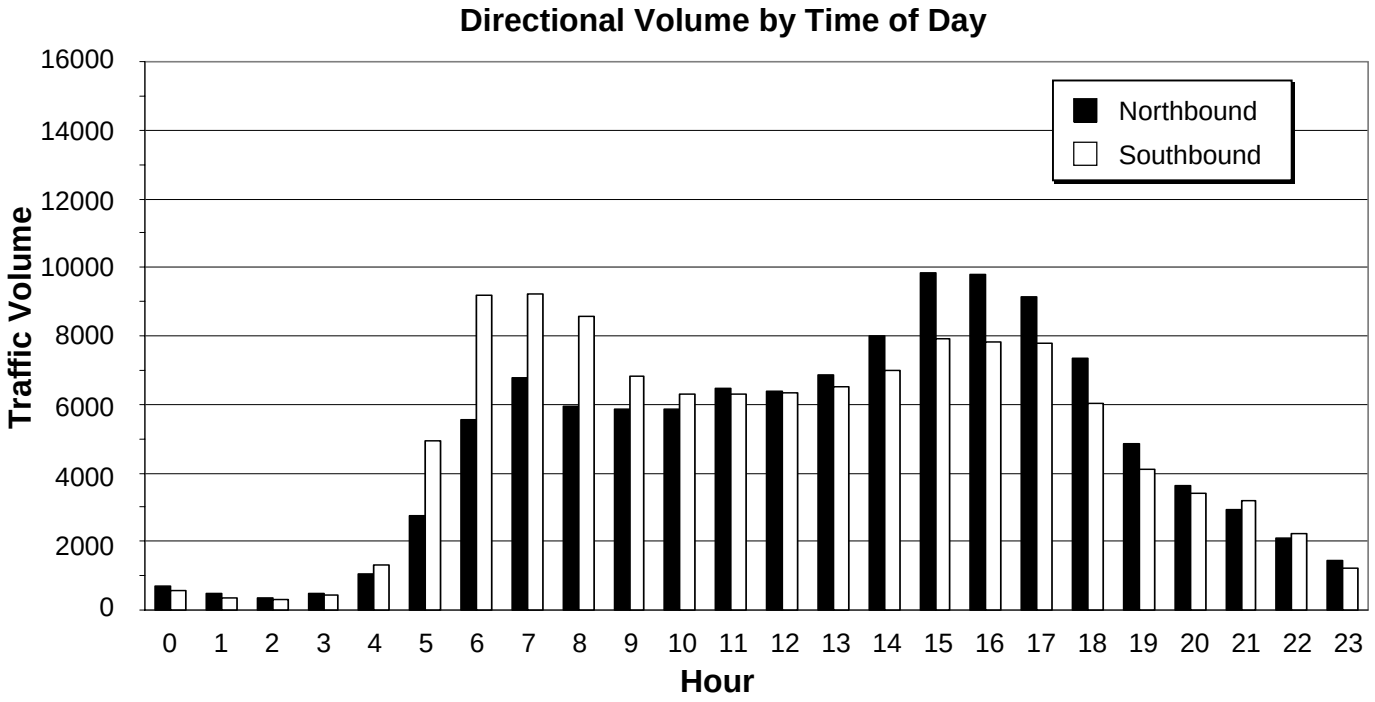
Hourly traffic distribution within the study corridor is graphically displayed in Figures 2-4 through 2-6 for three separate locations along the corridor. The northernmost location is situated south of Via Rancho Parkway. The central location is immediately north of SR 56/Ted Williams Parkway and the southernmost location is at Mira Mesa Boulevard. Each graphic displays both the directional traffic volume by time of day and the directional distribution, as a percent of the hourly traffic, by time of day.

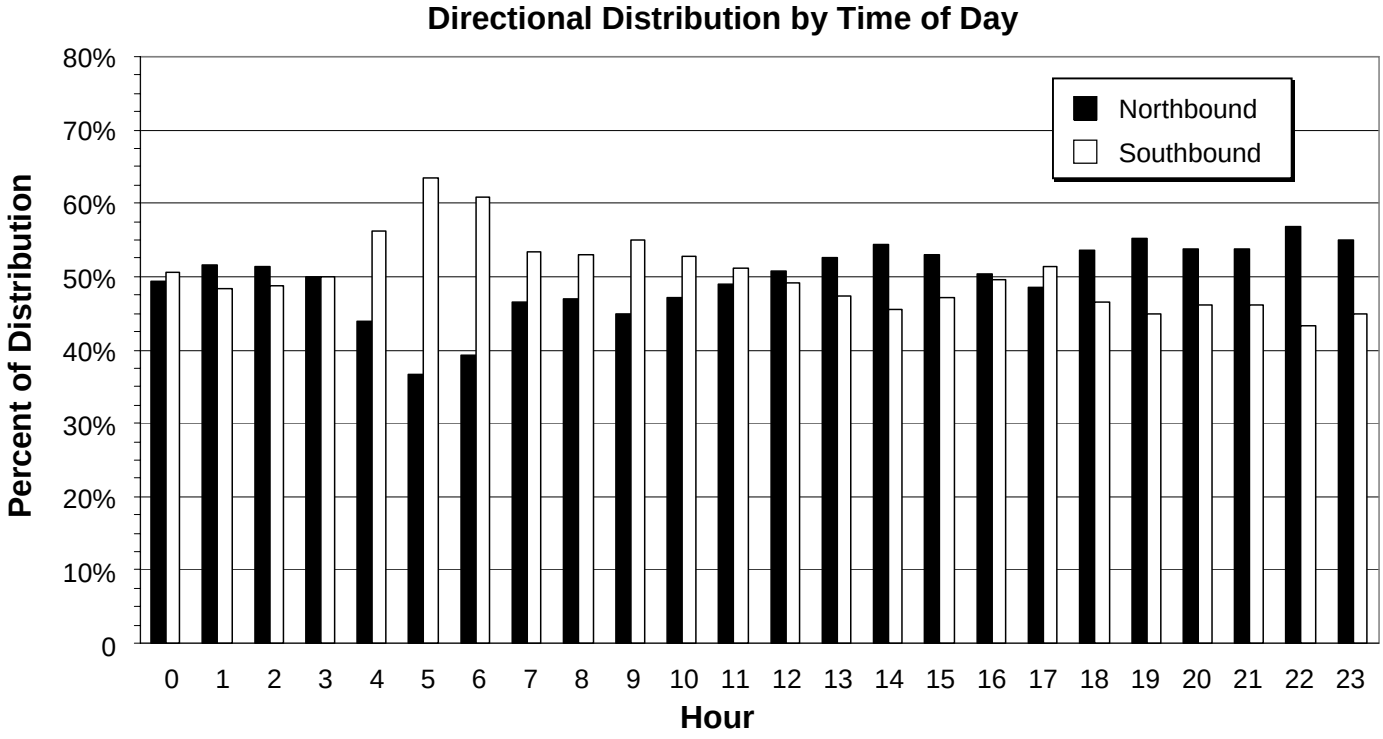
The hourly distribution of traffic in the I-15 study corridor displays the typical morning and evening periods of increased traffic that are influenced by the work commute. The directional distribution of travel in the corridor is heavier southbound in the morning and northbound in the evening. This is most pronounced in the traffic characteristics recorded for I-15 at Mira Mesa Boulevard. Here the directional split exceeds 70 percent/30 percent during the morning peak and 60 percent/40 percent during the evening peak. Traffic characteristics for the I-15 locations near SR 56 and Via Rancho Parkway reveal a directional split slightly in excess of 60 percent/40 percent during the morning peak and a lesser split of approximately 55 percent/45 percent during the evening peak.

VEHICLE OCCUPANCY DISTRIBUTION

Mainline I-15 vehicle occupancy counts were recorded at two locations of the study corridor, at Bernardo Center Drive in the northern half and Carroll Canyon Road in the southern half.

As shown in Table 2-2, At Bernardo Center Drive, occupancy counts for the morning peak period from 6:00 to 8:00 a.m. indicate that 88.5 percent of the northbound traffic was comprised of single-occupant vehicles (SOV's), while 85.5 percent of the southbound traffic was single-occupant vehicles. The remaining morning peak period traffic consisted of 2-person carpool vehicles (11.1 percent northbound and 14.1 percent southbound), and 3+ person carpool vehicles (0.4 percent northbound and 0.4 percent southbound). Average vehicle occupancy between 6:00 and 8:00 a.m. was approximately 1.12 persons per vehicle northbound and approximately 1.15 persons per vehicle southbound.





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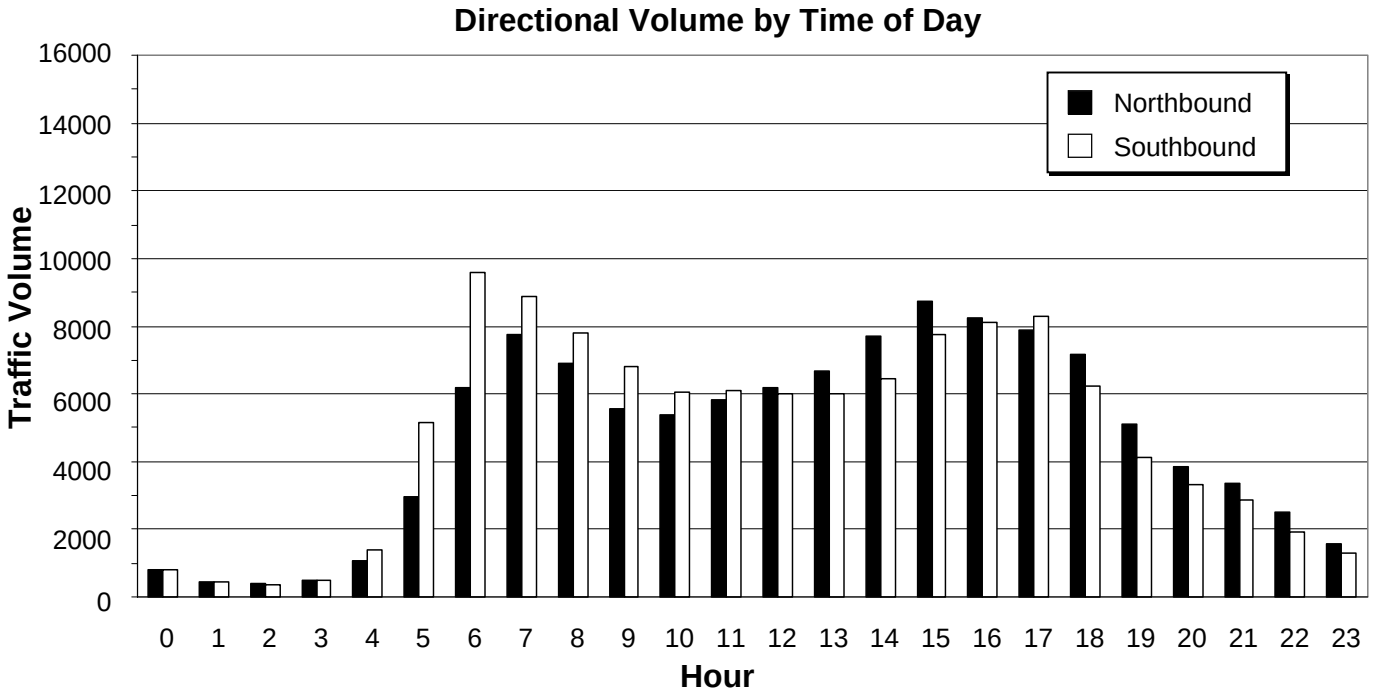
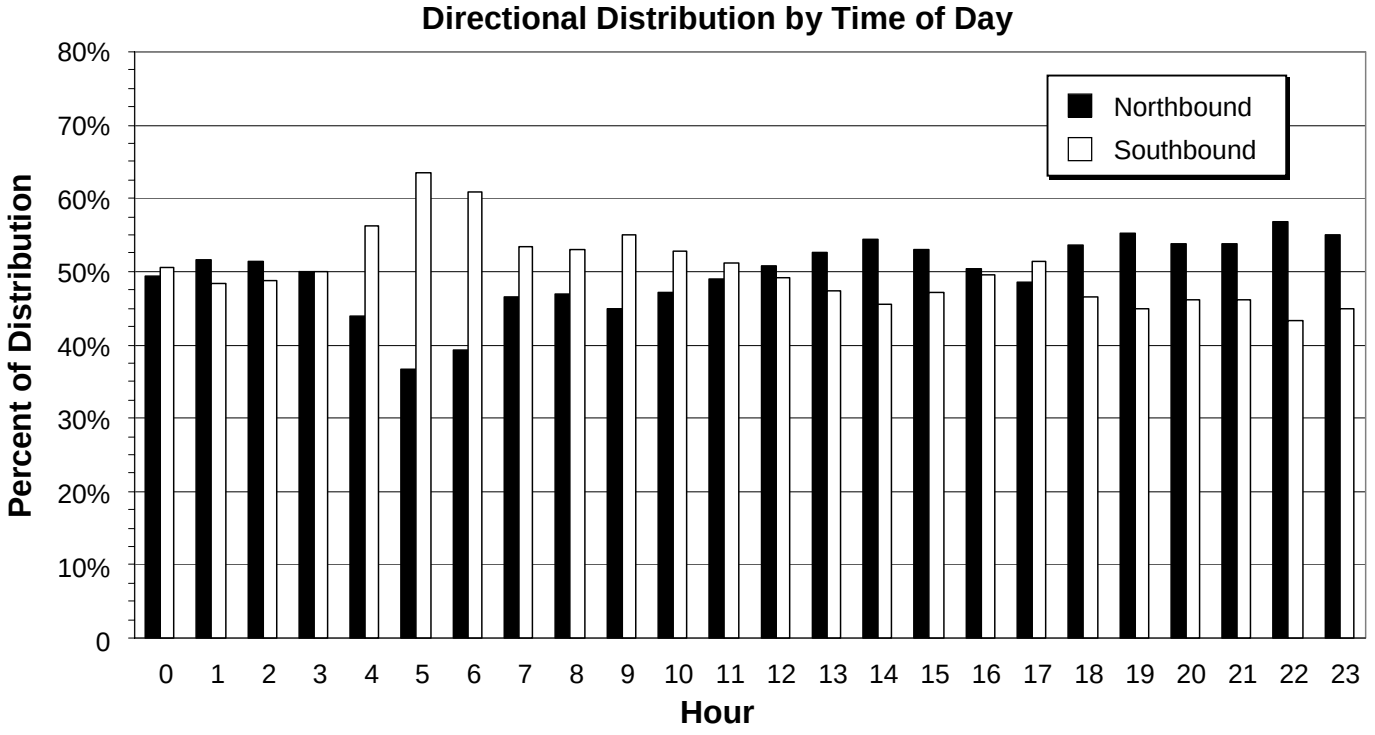
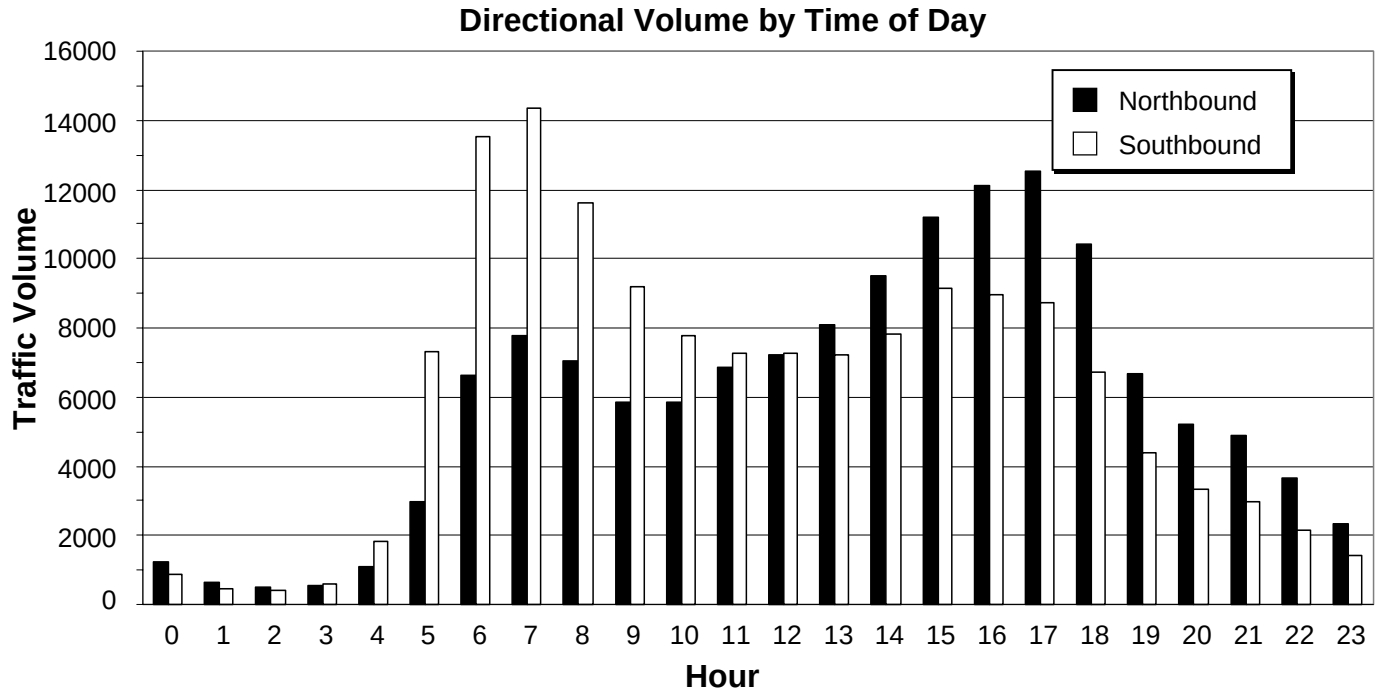
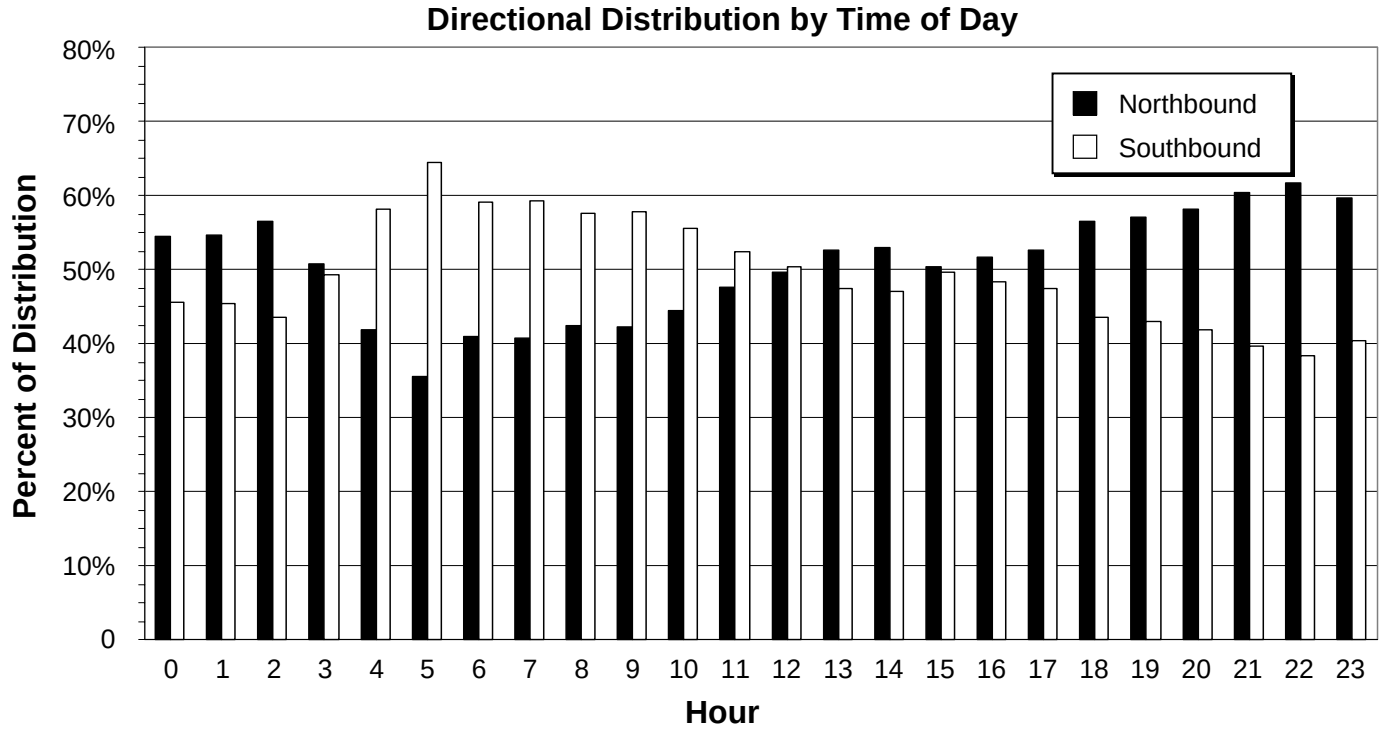
I-15 HOURLY TRAFFIC DISTRIBUTIONS
South of Via Rancho Parkway

FIGURE 2-4


Directional Volume by Time of Day
Traffic Volume
16000
14000
12000
10000
8000
6000
4000
2000
0
Northbound
Southbound
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Hour


Directional Distribution by Time of Day
Percent of Distribution
80%
70%
60%
50%
40%
30%
20%
10%
0
Northbound
Southbound
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Hour





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I-15 HOURLY TRAFFIC DISTRIBUTIONS
At Mira Mesa Boulevard

FIGURE 2-6

Table 2-2
Vehicle Occupancy Distribution
I-15 Managed Lanes Value Pricing

I-15 at Bernardo Center Dr Overpass
Wednesday (7/11/2001)

	Northbound				Southbound				Total			
	1	2	3+	Total	1	2	3+	Total	1	2	3+	Total
6-8AM	8954	1124	45	10123	14768	2441	67	17276	23722	3565	112	27399
PERCENT	88.5%	11.1%	0.4%	100.0%	85.5%	14.1%	0.4%	100.0%	86.6%	13.0%	0.4%	100.0%
8-9AM	4161	873	45	5079	7506	657	16	8179	11667	1530	61	13258
PERCENT	81.9%	17.2%	0.9%	100.0%	91.8%	8.0%	0.2%	100.0%	88.0%	11.5%	0.5%	100.0%
9AM-2PM	21487	4522	74	26083	24903	3403	99	28405	46390	7925	173	54488
PERCENT	82.4%	17.3%	0.3%	100.0%	87.7%	12.0%	0.3%	100.0%	85.1%	14.5%	0.3%	100.0%
2-3PM	6480	884	20	7384	5041	880	30	5951	11521	1764	50	13335
PERCENT	87.8%	12.0%	0.3%	100.0%	84.7%	14.8%	0.5%	100.0%	86.4%	13.2%	0.4%	100.0%
3-6PM	18682	4134	185	23001	14122	4208	91	18421	32804	8342	276	41422
PERCENT	81.2%	18.0%	0.8%	100.0%	76.7%	22.8%	0.5%	100.0%	79.2%	20.1%	0.7%	100.0%
6-7PM	6121	1601	97	7819	3157	1529	83	4769	9278	3130	180	12588
PERCENT	78.3%	20.5%	1.2%	100.0%	66.2%	32.1%	1.7%	100.0%	73.7%	24.9%	1.4%	100.0%
TOTAL	*65885*	*13138*	*466*	*79489*	*69497*	*13118*	*386*	*83001*	*135382*	*26256*	*852*	*162490*
PERCENT	*82.9%*	*16.5%*	*0.6%*	*100.0%*	*83.7%*	*15.8%*	*0.5%*	*100.0%*	*83.3%*	*16.2%*	*0.5%*	*100.0%*

I-15 at Carroll Canyon Overpass
Thursday (7/12/2001)

	Northbound				Southbound				Total			
	1	2	3+	Total	1	2	3+	Total	1	2	3+	Total
6-8AM	13734	2040	117	15891	20018	4025	137	24180	33752	6065	254	40071
PERCENT	86.4%	12.8%	0.7%	100.0%	82.8%	16.6%	0.6%	100.0%	84.2%	15.1%	0.6%	100.0%
8-9AM	6776	985	47	7808	9005	1754	151	10910	15781	2739	198	18718
PERCENT	86.8%	12.6%	0.6%	100.0%	82.5%	16.1%	1.4%	100.0%	84.3%	14.6%	1.1%	100.0%
9AM-2PM	27815	5497	168	33480	31178	8749	316	40243	58993	14246	484	73723
PERCENT	83.1%	16.4%	0.5%	100.0%	77.5%	21.7%	0.8%	100.0%	80.0%	19.3%	0.7%	100.0%
2-3PM	7444	1849	47	9340	5883	1865	59	7807	13327	3714	106	17147
PERCENT	79.7%	19.8%	0.5%	100.0%	75.4%	23.9%	0.8%	100.0%	77.7%	21.7%	0.6%	100.0%
3-6PM	24294	7243	459	31996	18601	7316	265	26182	42895	14559	724	58178
PERCENT	75.9%	22.6%	1.4%	100.0%	71.0%	27.9%	1.0%	100.0%	73.7%	25.0%	1.2%	100.0%
6-7PM	7355	1955	164	9474	4239	2217	100	6556	11594	4172	264	16030
PERCENT	77.6%	20.6%	1.7%	100.0%	64.7%	33.8%	1.5%	100.0%	72.3%	26.0%	1.6%	100.0%
TOTAL	*87418*	*19569*	*1002*	*107989*	*88924*	*25926*	*1028*	*115878*	*176342*	*45495*	*2030*	*223867*
PERCENT	*81.0%*	*18.1%*	*0.9%*	*100.0%*	*76.7%*	*22.4%*	*0.9%*	*100.0%*	*78.8%*	*20.3%*	*0.9%*	*100.0%*

The daily traffic totals at Bernardo Center Drive indicate that 82.9 percent of northbound daily traffic and 83.7 percent of southbound daily traffic was composed of SOV's, while 2-person HOV's comprised 16.5 percent of the northbound and 15.8 percent of the southbound traffic at this location. Carpools with three or more persons were 0.6 percent and 0.5 percent of the northbound and southbound daily traffic, respectively. Average vehicle occupancy at Bernardo Center Drive was approximately 1.18 persons per vehicle northbound and approximately 1.17 persons per vehicle southbound on a daily basis.

At Carroll Canyon Road, the morning peak period occupancy for northbound traffic indicated that 86.4 percent of the vehicles were SOV's, while 82.8 percent of the southbound traffic were SOV's. Two-person carpool vehicles comprised 12.8 percent of the northbound traffic and 16.6 percent of the southbound traffic, while 3+ person carpool vehicles were 0.7 percent of the northbound total and 0.6 percent of the southbound total. Average vehicle occupancy at Carroll Canyon between 6:00 and 8:00 a.m. was approximately 1.14 persons per vehicle northbound and approximately 1.18 persons per vehicle southbound.

Daily traffic volumes at Carroll Canyon indicate that 81.0 percent of northbound daily traffic and 76.7 percent of southbound daily traffic was composed of SOV's, while 2-person HOV's comprised 18.1 percent of the northbound and 22.4 percent of the southbound traffic at this location. Carpools with three or more persons were 0.9 percent of both the northbound and southbound daily traffic. Average vehicle occupancy at Carroll Canyon was approximately 1.20 persons per vehicle northbound and approximately 1.24 persons per vehicle southbound on a daily basis.

VEHICLE CLASSIFICATIONS DISTRIBUTION

Vehicle classification counts were conducted at Bernardo Center Drive in the northern half of the study corridor and at Carroll Canyon Road in the southern half. As shown in Table 2-3, autos at Bernardo Center Drive comprised 93.8 percent of vehicular traffic in the northbound direction and 92.5 percent in the southbound direction on a daily basis. In the morning peak period, 93.8 percent of northbound and 93.0 percent of southbound traffic at Bernardo Center Drive was composed of autos. At this same location, motorcycles, buses, light-duty trucks, and heavy-duty trucks comprised 0.4, 0.2, 1.9, and 3.6 percent of the northbound daily traffic, respectively, and 0.4 percent, 0.2 percent, 3.6 percent, and 3.2 percent of the southbound daily traffic, respectively. During the morning peak period, 0.3, 0.2, 1.8, and 3.9 percent of the northbound traffic and 0.7, 0.2,

Table 2-3
Vehicle Classification Distribution
I-15 Managed Lanes Value Pricing

I-15 at Bernardo Center Dr Overpass
Wednesday (7/11/2001)

	Northbound						Southbound						Total					
	Passenger Vehicle	Motocycle	Bus	2-3 Axle	4+ Axle	Total	Passenger Vehicle	Motocycle	Bus	2-3 Axle	4+ Axle	Total	Passenger Vehicle	Motocycle	Bus	2-3 Axle	4+ Axle	Total
6-8 AM	9,496	28	21	182	396	10,123	16,065	115	30	582	484	17,276	25,561	143	51	764	880	27,399
PERCENT	93.8%	0.3%	0.2%	1.8%	3.9%	100.0%	93.0%	0.7%	0.2%	3.4%	2.8%	100.0%	93.3%	0.5%	0.2%	2.8%	3.2%	100.0%
8-9AM	4,631	12	19	147	270	5,079	7,493	48	12	326	300	8,179	12,124	60	31	473	570	13,258
PERCENT	91.2%	0.2%	0.4%	2.9%	5.3%	100.0%	91.6%	0.6%	0.1%	4.0%	3.7%	100.0%	91.4%	0.5%	0.2%	3.6%	4.3%	100.0%
9-2PM	23,846	78	45	718	1,396	26,083	25,778	94	48	1,234	1,251	28,405	49,624	172	93	1,952	2,647	54,488
PERCENT	91.4%	0.3%	0.2%	2.8%	5.4%	100.0%	90.8%	0.3%	0.2%	4.3%	4.4%	100.0%	91.1%	0.3%	0.2%	3.6%	4.9%	100.0%
2-3PM	6,945	25	16	121	277	7,384	5,448	21	16	256	210	5,951	12,393	46	32	377	487	13,335
PERCENT	94.1%	0.3%	0.2%	1.6%	3.8%	100.0%	91.5%	0.4%	0.3%	4.3%	3.5%	100.0%	92.9%	0.3%	0.2%	2.8%	3.7%	100.0%
3-6PM	22,067	142	31	314	447	23,001	17,406	73	51	518	373	18,421	39,473	215	82	832	820	41,422
PERCENT	95.9%	0.6%	0.1%	1.4%	1.9%	100.0%	94.5%	0.4%	0.3%	2.8%	2.0%	100.0%	95.3%	0.5%	0.2%	2.0%	2.0%	100.0%
6-7PM	7,600	41	13	53	112	7,819	4,618	13	15	55	68	4,769	12,218	54	28	108	180	12,588
PERCENT	97.2%	0.5%	0.2%	0.7%	1.4%	100.0%	96.8%	0.3%	0.3%	1.2%	1.4%	100.0%	97.1%	0.4%	0.2%	0.9%	1.4%	100.0%
TOTAL	*74,585*	*326*	*145*	*1,535*	*2,898*	*79,489*	*76,808*	*364*	*172*	*2,971*	*2,686*	*83,001*	*151,393*	*690*	*317*	*4,506*	*5,584*	*162,490*
PERCENT	*93.8%*	*0.4%*	*0.2%*	*1.9%*	*3.6%*	*100.0%*	*92.5%*	*0.4%*	*0.2%*	*3.6%*	*3.2%*	*100.0%*	*93.2%*	*0.4%*	*0.2%*	*2.8%*	*3.4%*	*100.0%*

I-15 at Carroll Canyon Overpass
Thursday (7/12/2001)

	Northbound						Southbound						Total					
	Passenger Vehicle	Motocycle	Bus	2-3 Axle	4+ Axle	Total	Passenger Vehicle	Motocycle	Bus	2-3 Axle	4+ Axle	Total	Passenger Vehicle	Motocycle	Bus	2-3 Axle	4+ Axle	Total
6-8 AM	14,589	49	87	686	480	15,891	23,301	89	21	348	421	24,180	37,890	138	108	1,034	901	40,071
PERCENT	91.8%	0.3%	0.5%	4.3%	3.0%	100.0%	96.4%	0.4%	0.1%	1.4%	1.7%	100.0%	94.6%	0.3%	0.3%	2.6%	2.2%	100.0%
8-9AM	7,041	26	30	395	316	7,808	10,357	24	22	219	288	10,910	17,398	50	52	614	604	18,718
PERCENT	90.2%	0.3%	0.4%	5.1%	4.0%	100.0%	94.9%	0.2%	0.2%	2.0%	2.6%	100.0%	92.9%	0.3%	0.3%	3.3%	3.2%	100.0%
9-2PM	30,157	78	78	1,466	1,701	33,480	37,195	119	92	1,544	1,293	40,243	67,352	197	170	3,010	2,994	73,723
PERCENT	90.1%	0.2%	0.2%	4.4%	5.1%	100.0%	92.4%	0.3%	0.2%	3.8%	3.2%	100.0%	91.4%	0.3%	0.2%	4.1%	4.1%	100.0%
2-3PM	8,748	23	15	248	306	9,340	7,202	28	26	317	234	7,807	15,950	51	41	565	540	17,147
PERCENT	93.7%	0.2%	0.2%	2.7%	3.3%	100.0%	92.3%	0.4%	0.3%	4.1%	3.0%	100.0%	93.0%	0.3%	0.2%	3.3%	3.1%	100.0%
3-6PM	31,171	60	32	330	403	31,996	25,039	118	57	610	358	26,182	56,210	178	89	940	761	58,178
PERCENT	97.4%	0.2%	0.1%	1.0%	1.3%	100.0%	95.6%	0.5%	0.2%	2.3%	1.4%	100.0%	96.6%	0.3%	0.2%	1.6%	1.3%	100.0%
6-7PM	7,903	16	2	66	87	8,074	6,295	44	17	129	71	6,556	14,198	60	19	195	158	14,630
PERCENT	97.9%	0.2%	0.0%	0.8%	1.1%	100.0%	96.0%	0.7%	0.3%	2.0%	1.1%	100.0%	97.0%	0.4%	0.1%	1.3%	1.1%	100.0%
TOTAL	*99,609*	*252*	*244*	*3,191*	*3,293*	*106,589*	*109,389*	*422*	*235*	*3,167*	*2,665*	*115,878*	*208,998*	*674*	*479*	*6,358*	*5,958*	*222,467*
PERCENT	*93.5%*	*0.2%*	*0.2%*	*3.0%*	*3.1%*	*100.0%*	*94.4%*	*0.4%*	*0.2%*	*2.7%*	*2.3%*	*100.0%*	*93.9%*	*0.3%*	*0.2%*	*2.9%*	*2.7%*	*100.0%*

3.4, and 2.8 percent of the southbound traffic was comprised of motorcycles, buses, light-duty trucks, and heavy-duty trucks, respectively.

At Carroll Canyon Road, autos comprised 93.5 percent of vehicular traffic in the northbound direction and 94.4 percent in the southbound direction on a daily basis. In the morning peak period, 91.8 percent of northbound and 96.4 percent of southbound traffic at Carroll Canyon was composed of autos. The northbound daily traffic at Carroll Canyon also included 0.2 percent, 0.2 percent, 3.0 percent, and 3.1 percent motorcycles, buses, light-duty trucks, and heavy-duty trucks, respectively. In the southbound direction, 0.4, 0.2, 2.7, and 2.3 percent of the daily traffic, respectively, was comprised of motorcycles, buses, light-duty trucks, and heavy-duty trucks. The morning peak period included 0.3 percent, 0.5 percent, 4.3 percent, and 3.0 percent motorcycles, buses, light-duty trucks, and heavy-duty trucks, respectively, in the northbound direction, and 0.4, 0.1, 1.4, and 1.7 percent motorcycles, buses, light-duty trucks, and heavy-duty trucks, respectively, in the southbound direction.

CURRENT PEAK PERIOD MAINLINE OPERATING SPEEDS

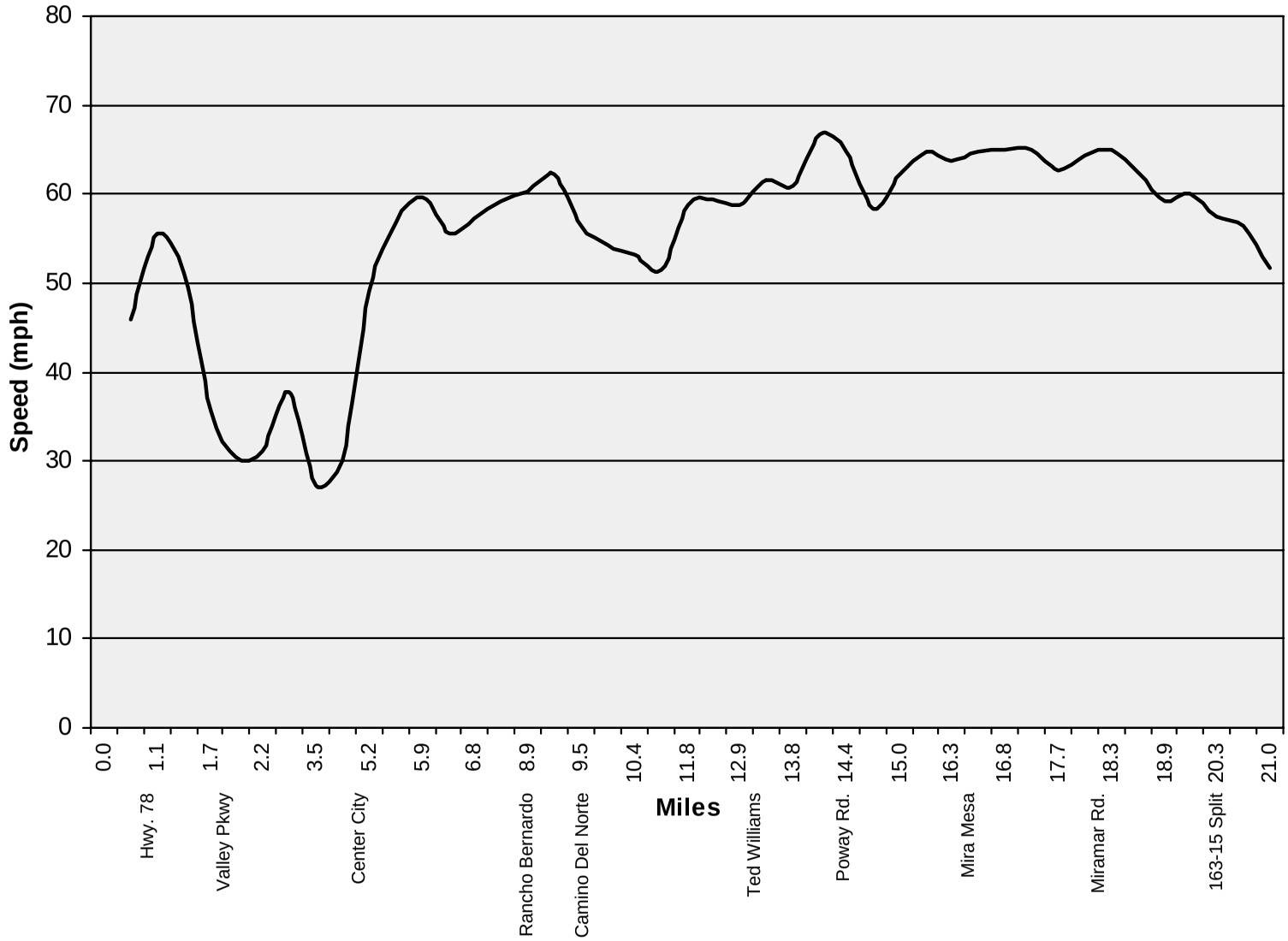
A series of travel time distance studies were conducted by WSA during July 2001. Travel speeds and travel delays were observed and recorded during the peak travel periods along the I-15 study corridor.

The process involved driving in the normal traffic stream during each trial run. Travel speeds were structured to keep pace with traffic flow in each lane. Travel time and observed mileage were recorded at critical checkpoints, such as interchanges, overpasses, and underpasses along the corridor.

The travel time-distance information collected during the studies was useful in refining the computer traffic model used in the estimation of traffic and toll revenue for the proposed I-15 Managed Lanes Value Pricing Project alternative pricing options. It also provides an overview of current traffic operating conditions.

A graphical summary of the travel time/distance study results is presented for the southbound morning peak period direction of travel in Figures 2-7 through 2-10. Results of the travel speeds for the northbound evening peak period direction of travel are presented in Figure 2-11 through 2-14.

As part of the 2001 survey, speeds on I-15 were recorded as follows. In the southbound direction, between SR 78 and Centre City Parkway,



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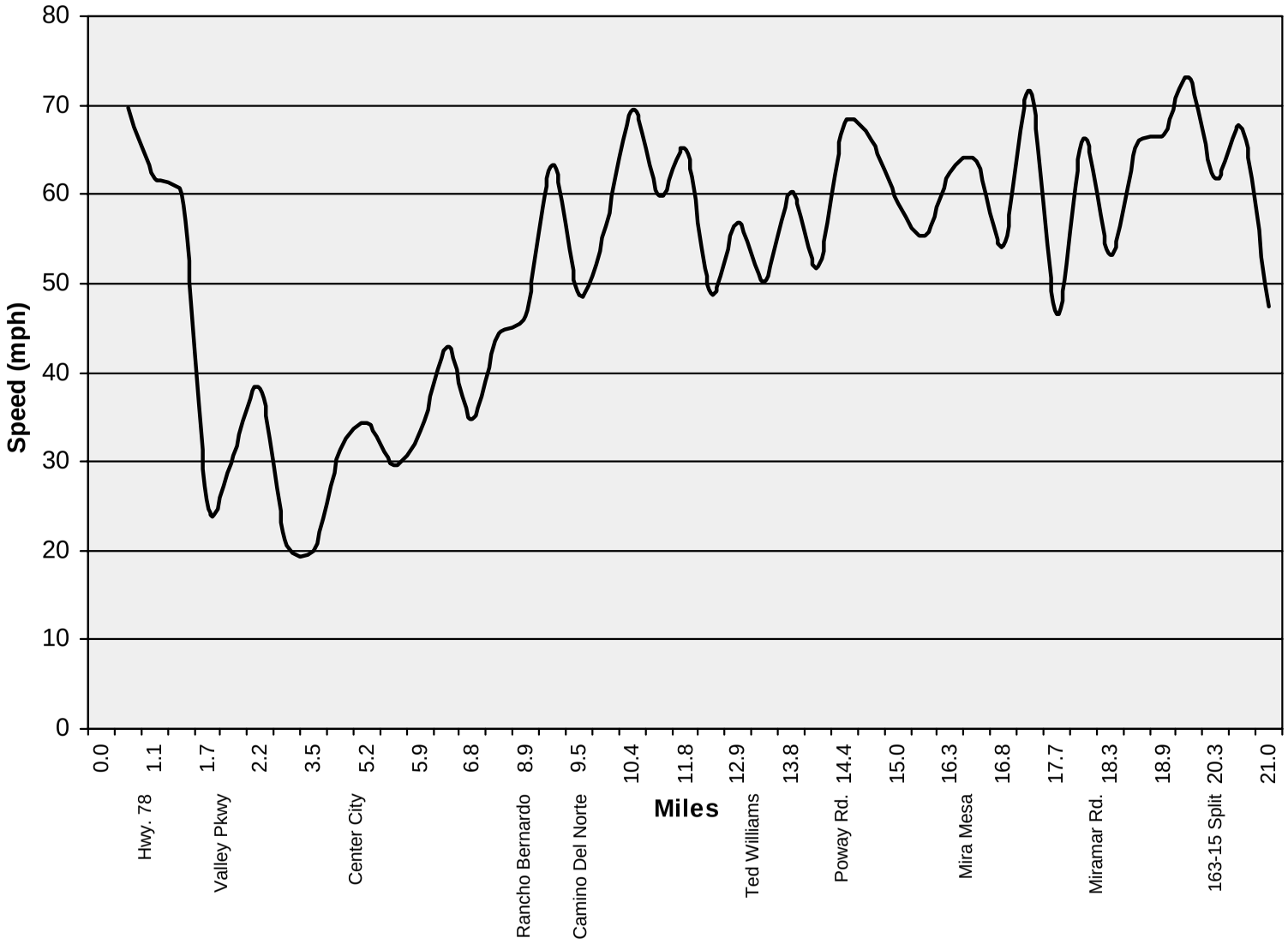
TRAVEL SPEED PROFILE - A.M. SOUTHBOUND
HIGHWAY 78 TO KEARNEY VILLA - Thursday 6:04 A.M.

FIGURE 2-7



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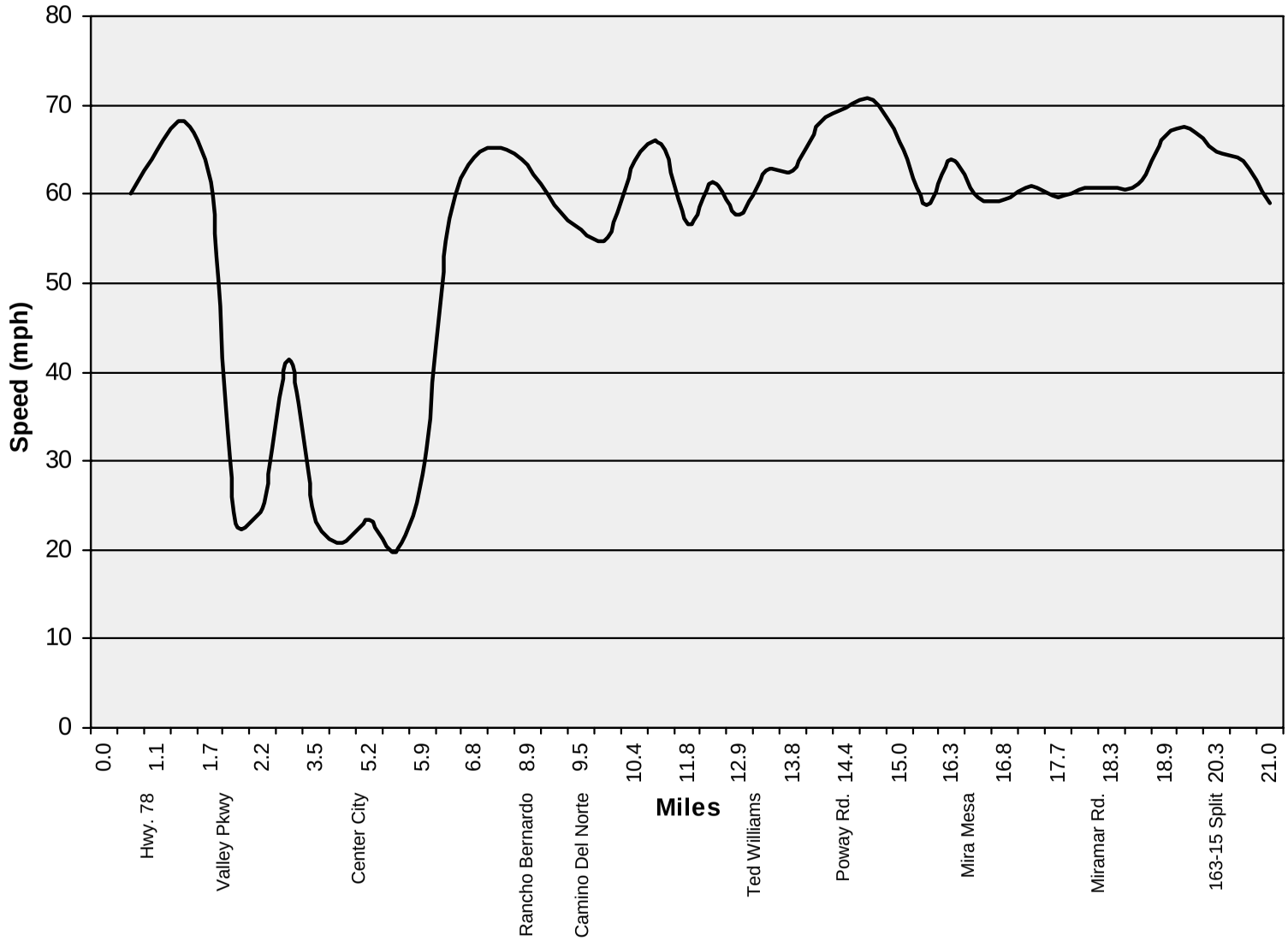
TRAVEL SPEED PROFILE - A.M. SOUTHBOUND
HIGHWAY 78 TO KEARNEY VILLA - Thursday, 7:08 A.M.

FIGURE 2-8



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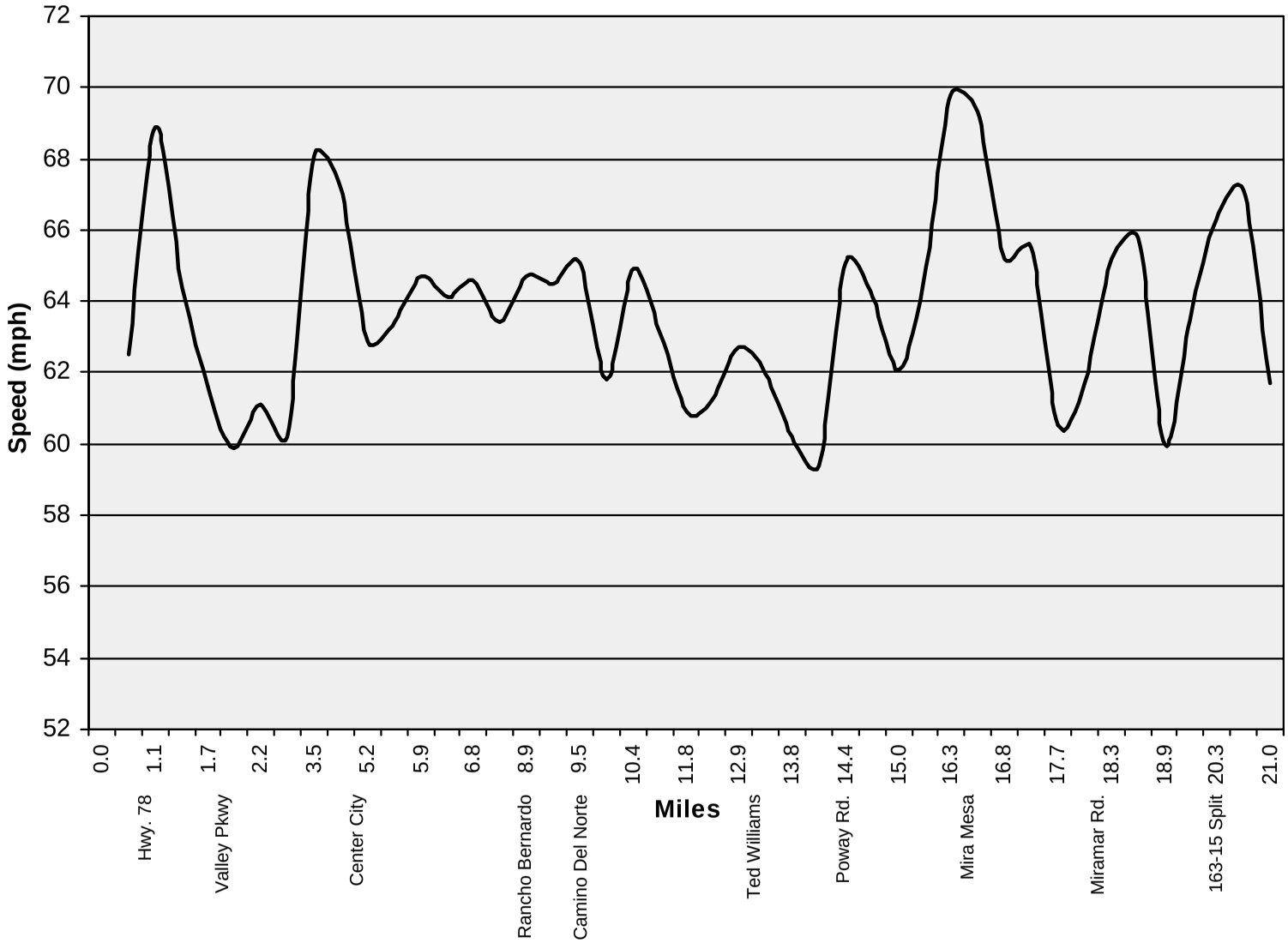
TRAVEL SPEED PROFILE - A.M. SOUTHBOUND

HIGHWAY 78 TO KEARNEY VILLA - Thursday, 8:14 A.M.

FIGURE 2-9



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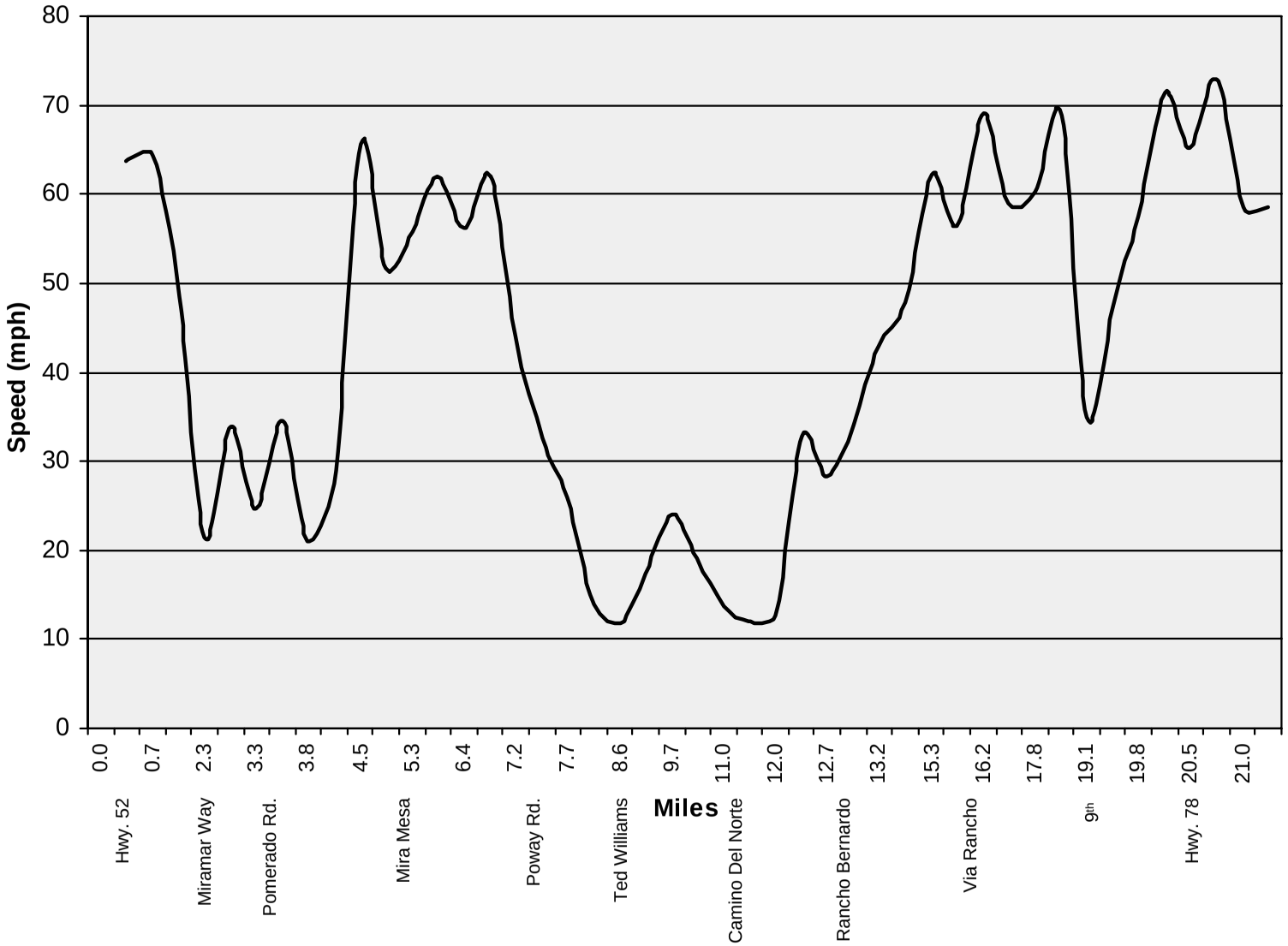
TRAVEL SPEED PROFILE - A.M. SOUTHBOUND
HIGHWAY 78 TO KEARNEY VILLA - Thursday, 9:06 A.M.

FIGURE 2-10



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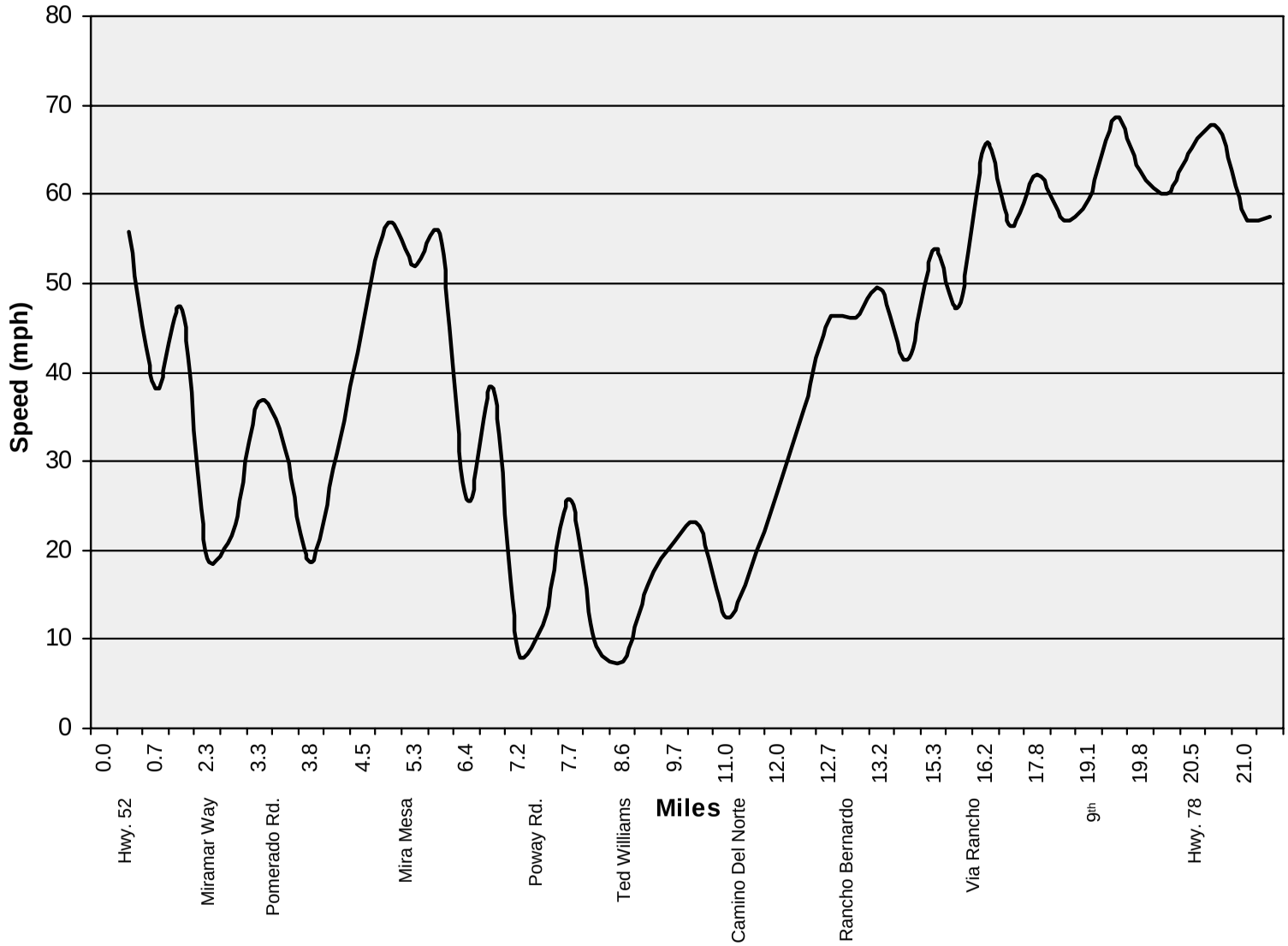
TRAVEL SPEED PROFILE - P.M. NORTHBOUND
HIGHWAY 52 TO EL NORTE - Thursday, 3:45 P.M.

FIGURE 2-11



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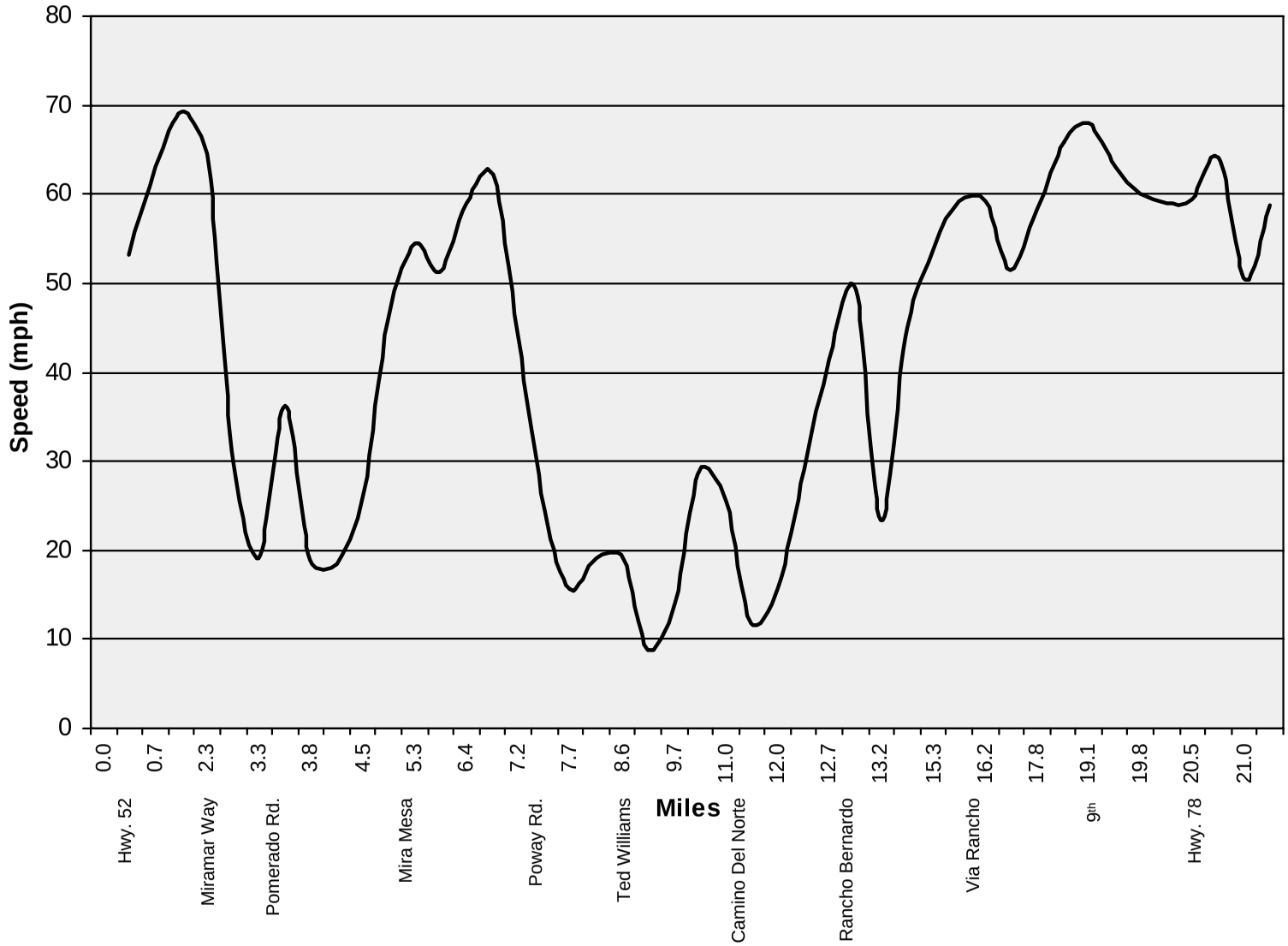
TRAVEL SPEED PROFILE - P.M. NORTHBOUND
HIGHWAY 52 TO EL NORTE - Thursday, 4:08 P.M.

FIGURE 2-12



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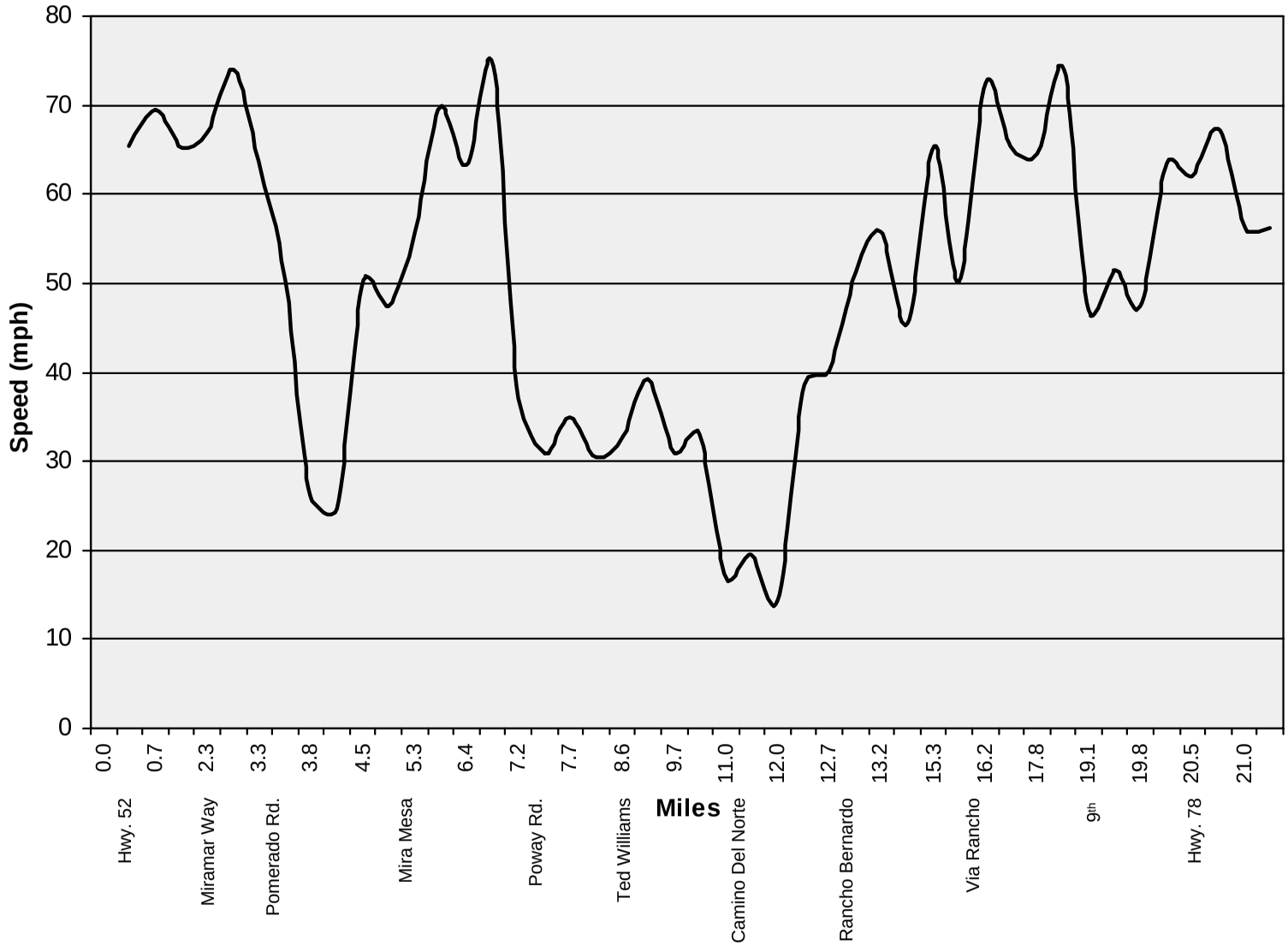
TRAVEL SPEED PROFILE - P.M. NORTHBOUND
HIGHWAY 52 TO EL NORTE - Thursday, 5:41 P.M.

FIGURE 2-13



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TRAVEL SPEED PROFILE - P.M. NORTHBOUND
HIGHWAY 52 TO EL NORTE - Thursday, 6:10 P.M.

FIGURE 2-14

morning peak period speeds generally averaged between 20 and 40 mph. South of Rancho Bernardo Road, the southbound morning peak speeds averaged between 55 and 60 mph. By 9:00 a.m., southbound speeds increased to at least 60 mph throughout the corridor.

During the afternoon/evening peak period, northbound travel speeds are between 20 and 35 mph in the vicinity of Miramar Way and Pomerado Road. From Mira Mesa Boulevard to Poway Road travel speeds increase to between 50 and 65 mph before slowing again at SR 56/Ted Williams Parkway. Between Ted Williams Parkway and Rancho Bernardo Road, travel speeds are generally in the range of 10 to 25 mph during the peak. North of Rancho Bernardo Road, peak period speeds increase generally to 45 mph and higher. Northbound travel speeds increase to approximately 40 mph or higher throughout the corridor by 7:00 p.m.

EXISTING EXPRESS LANES OPERATING CHARACTERISTICS

The existing Express Lanes provide two reversible lanes of travel in a barrier separated facility located between SR 56/Ted Williams Parkway and the I-15/SR 163 Junction. The Express Lanes serve primarily HOV traffic but allow SOV's that have FasTrak transponder accounts.

HOURS OF OPERATION AND TOLL CONCEPT

The current operating schedule and FasTrak toll schedule for the Express Lanes is presented in Figure 2-15. The Express Lanes are only open on weekdays and operate in the southbound direction from approximately 5:45 a.m. to 11:00 a.m. and in the northbound direction from approximately 12:00 noon to 7:00 p.m.

The tolling concept that is applied to SOV FasTrak customers using the Express Lanes is basically a variable rate structure that changes dynamically based on traffic volumes in the Express Lanes. As depicted in Figure 2-15, the toll structure imposes maximum tolls that are set for specific time periods within the morning and evening periods of operation. A separate and unique toll schedule is used for the Friday evening period of operation. In all cases, the toll schedule has been designed to manage SOV usage of the Express Lanes and to assure that traffic service levels of "C" or better are maintained within the HOV facility.

HISTORICAL TRENDS

SANDAG has been maintaining operating statistics of the Express Lanes and I-15 FasTrak program since the tolling system was implemented in March 1998 as part of the I-15 Value Pricing Project. Monthly statistics

Maximum Toll	Morning Period (Southbound)							
$4.00								
$3.00								
$2.50								
$2.00								
$1.50								
$1.00								
$.75								
$.50								
	5:45-6:00	6:00-6:30	6:30-7:00	7:00-7:30	7:30-8:00	8:00-8:30	8:30-9:00	9:00-11:00

Maximum Toll	Evening Period (Northbound)								
$4.00									
$3.00									
$2.50									
$2.00									
$1.50									
$1.00									
$.75									
$.50									
	12:00-1:00	1:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	6:00-6:30	6:30-7:00

Maximum Toll	Friday Evening Period (Northbound) Only								
$4.00									
$3.00									
$2.50									
$2.00									
$1.50									
$1.00									
$.75									
$.50									
	12:00-1:00	1:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	6:00-6:30	6:30-7:00

are maintained for a variety of operating characteristics such as I-15 FasTrak Customer accounts and transponders, HOV and SOV traffic usage of the Express Lanes, and FasTrak toll revenue.

Figure 2-16 presents a 13 month history of I-15 FasTrak Customer accounts, transponders and closed accounts. Since October 2000, I-15 FasTrak accounts have increased from 10,056 to 12,599 and the distribution of transponders have increased from 15,390 to 18,457. The average growth in I-15 FasTrak customer accounts for this period has been approximately 255 per month The typical rate of account closures averages between 45 and 50 closures per month. This produces a net increase of approximately 205 accounts per month. An average of 1.5 transponders has been distributed to each account holder.

Statistics on traffic usage of the Express Lanes is illustrated for the last 12 months in Figure 2-17. Since November 2000, HOV traffic has increased slightly from 12,954 vehicles per day to 13,078 vehicles per day during October 2001. During this period, HOV traffic was highest (14,213 vehicles per day) during the month of August 2001.

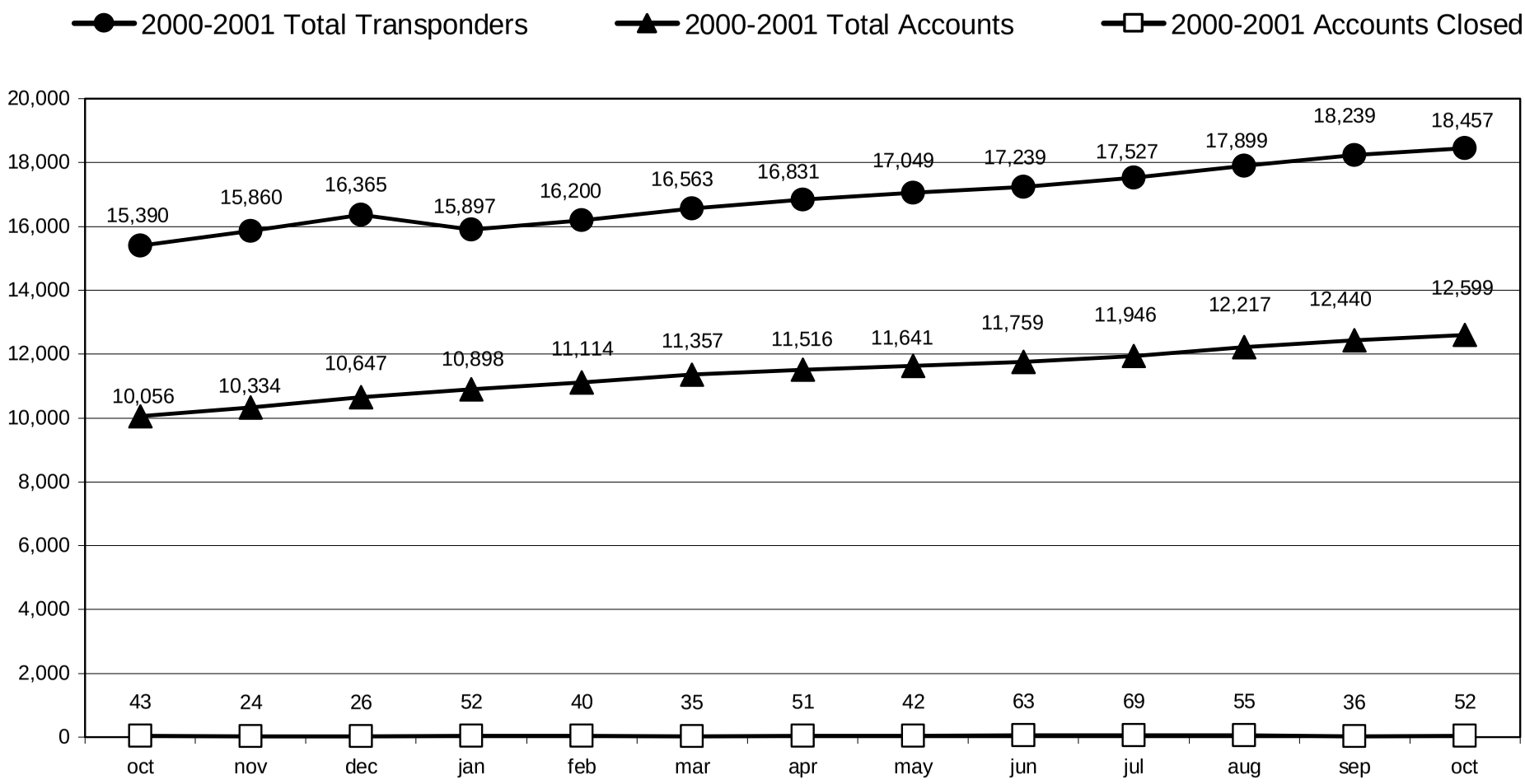
During this same period, FasTrak traffic has also increased from 4,431 vehicles per day to a high of 4,697 vehicles per day during October 2001. Total traffic, including invalid transponder reads, has increased from 17,485 vehicle per day to 17,884 vehicles per day.

A summary of I-15 FasTrak toll revenue since January 1999 is presented in Figure 2-18. In January 1999, daily average toll revenue was just above $5,000. In October 2001 the daily toll revenues averaged approximately $8,525. While daily average toll revenues fluctuate from one month to another, the historical data shows steadily increasing revenues for the individual months. The comparable daily revenue in October 1999 was approximately $6,400 and approximately $7,600 in October 2000.

WEEKDAY TRAFFIC VARIATIONS

The variation of traffic in the Express Lanes by day of week has been derived from traffic data collected during 2000 and 2001. Table 2-4 summarizes the average daily traffic volumes in the Express Lanes by day of week. The traffic volumes have been listed by category, including HOV, FasTrak, and Non-AVI (i.e. invalid transponder reads). Also shown is the average weekday traffic and weekday traffic index.

As shown in Table 2-4, traffic volumes in the Express Lanes are highest on Fridays when traffic is typically 10 percent higher than the average weekday. Most of the increase in traffic on Fridays is due to higher



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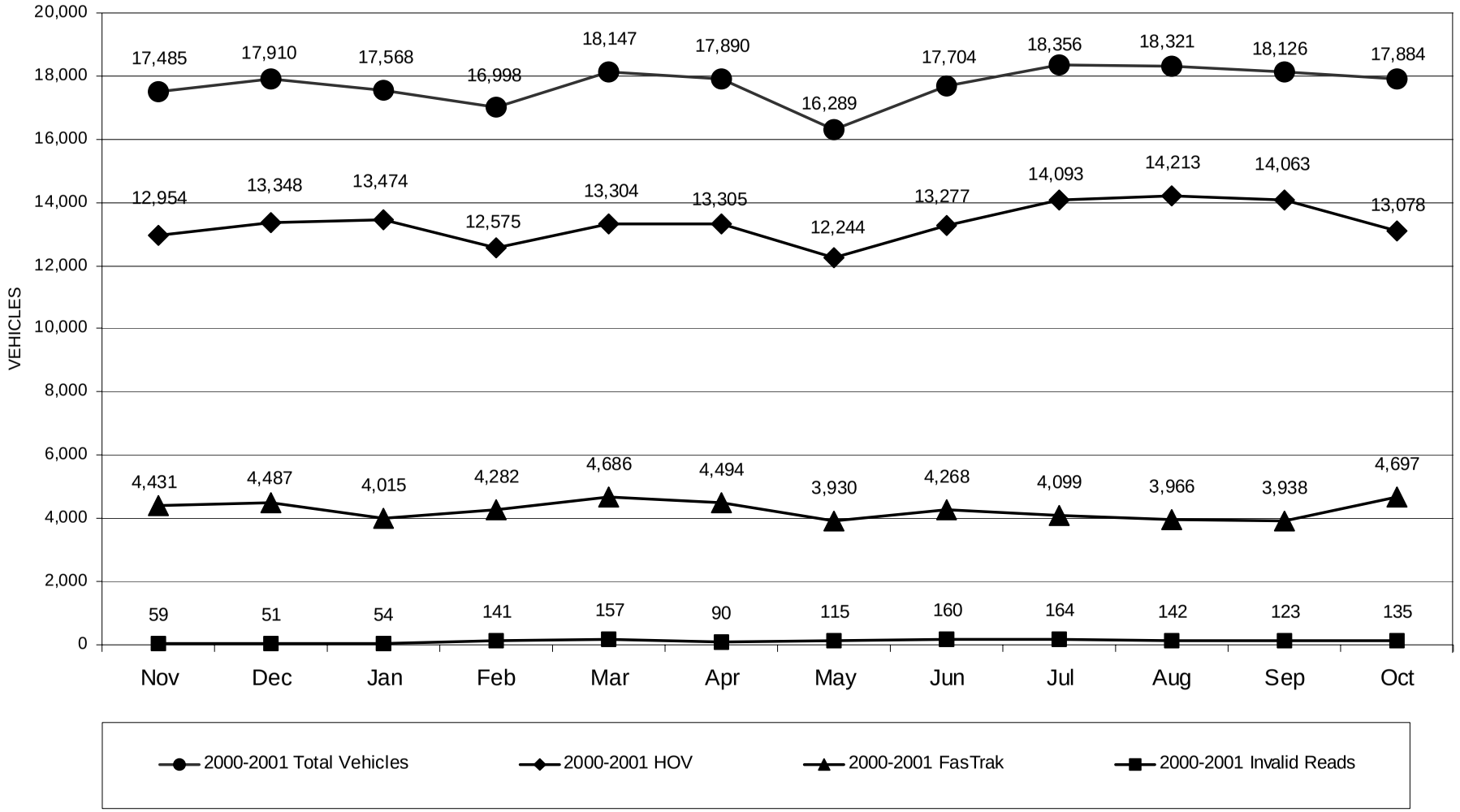
FASTRAK ACCOUNTS AND TRANSPONDERS

FIGURE 2-16

I-15 Managed Lanes Concept Plan



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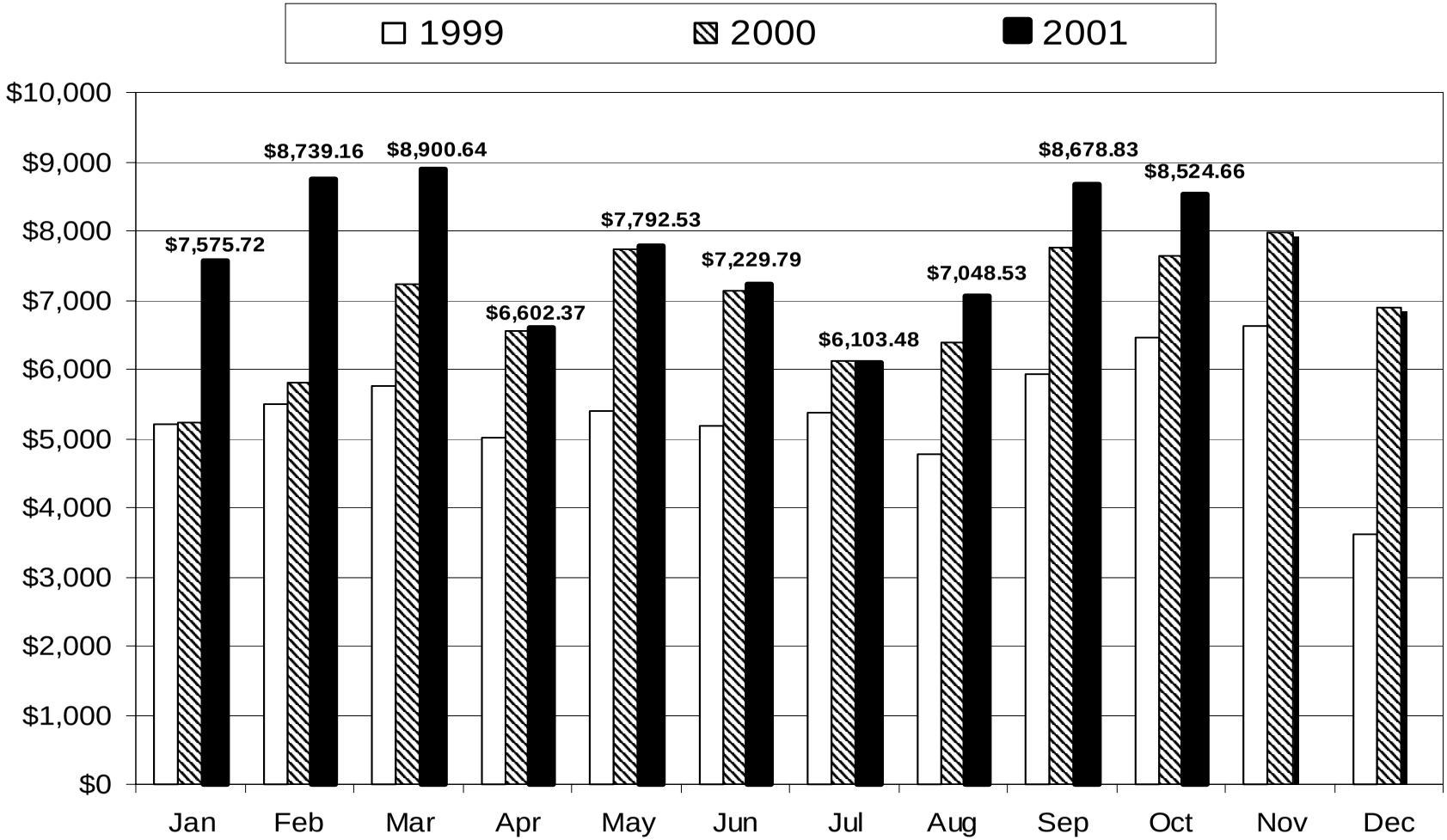
HOV AND SOV TRAFFIC

FIGURE 2-17



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AVERAGE DAILY TOLL REVENUE

FIGURE 2-18

Table 2-4

2000 - 2001 Average Daily Volumes by Day of Week

	HOV		FasTrak		Non-AVI		Total	
Day	Volume	Index	Volume	Index	Volume	Index	Volume	Index
Monday	12,675	0.95	4,096	0.96	124	1.01	16,884	0.95
Tuesday	12,534	0.94	4,171	0.98	112	0.91	16,826	0.95
Wednesday	12,850	0.96	4,222	0.99	129	1.05	17,201	0.97
Thursday	13,612	1.02	4,433	1.04	123	1.00	18,179	1.02
Friday	15,066	1.13	4,405	1.03	126	1.03	19,597	1.10
Average	13,347	1.00	4,265	1.00	123	1.00	17,737	1.00
Share	75.3%		24.0%		0.7%		100.0%	

volumes of HOV's. FasTrak traffic is only 3 percent higher on Friday than the average weekday. FasTrak traffic is typically highest on Thursdays when it is 4 percent higher than the average weekday. On the basis of total traffic, Mondays and Tuesdays have the lowest traffic with only 95 percent of the traffic in an average weekday.

CHAPTER 3

ALTERNATIVE PRICING STRATEGIES

The existing I-15 Managed Lanes project is recognized as one of the most innovative transportation experiments in the world. Among other unique characteristics, it is the only priced roadway to make use of fully "dynamic" variable tolls, where toll rates may be adjusted frequently based on actual measured traffic levels.

The proposed extension and expansion of the I-15 Managed Lanes project will result in significant new challenges and may require substantially different pricing strategies. A number of new factors are being introduced, including:

- A longer facility which might substantially increase maximum tolls and/or offer opportunities for distance-based pricing;
- Multiple access points in each travel direction – this will present new challenges in terms of pricing strategies, toll system complexity and communications interface with potential users;
- Two directions of travel, as compared with the single reversible roadway now in use, may necessitate differential tolls by travel direction depending on time of day;
- Possible 24-hour operation, as compared with the current lanes which operate only 12 hours; and
- New direct interface points between the managed lanes and park and ride/bus rapid transit facilities – creating new opportunities for integrated pricing strategies to further encourage increased carpooling and/or diversion to transit.

This chapter identifies a series of potential pricing arrangements which could be considered for the expanded I-15 Managed Lanes project.

Advantages and disadvantages of the various options are identified and an initial screening is conducted. The primary goal is to identify the most promising pricing strategies which could then be subject to more detailed evaluation in the traffic, revenue and toll technology analyses.

PRICING GOALS AND ISSUES

In identifying various pricing strategies, it is important to take into consideration the various goals of pricing which are trying to be achieved. In addition, the expanded facility will raise a number of new issues which also should be taken into consideration.

PRICING GOALS

The primary goals of pricing on the expanded Managed Lanes facility are first demand management and then revenue generation. In the initial project, demand management was the primary objective, in keeping with enabling legislation which required maintenance of a high level of service on the Managed Lane as a condition of allowing single occupant vehicles to "buy in". This is likely to continue to be a primary objective, even with the expanded facility. However, with multiple access points and an ultimate 20-mile facility, there will be many new challenges and priorities within the overall category of demand management.

For example, under the current project all traffic enters and exits at each end, with no intermediate access. Hence, while the toll rate is dynamically variable, only a single rate is displayed and charged at any given instant. Demand regulation involves only a single travel movement – end to end.

With multiple access points, there may ultimately prove to be multiple "bottle neck" locations within the Managed Lanes and/or the adjacent general purpose lanes. There may also be a need to "focus" demand management on certain segments of the Managed Lanes project while adequate capacity remains available on others. As will be discussed in more detail below, the use of multiple access points, particularly if a distance-based rate structure is used, may actually encourage frequent transfers in and out of the Managed Lanes, causing unnecessary weaving and increased safety and operational hazards. All of these issues must be recognized in establishing demand management goals and objectives.

Revenue from the current system is used primarily for transit subsidies. However, recognizing potential funding constraints on the expanded project, toll revenue may become a more important objective in the

expanded facility. A number of other issues should be considered as new pricing strategies are considered. Some of these include:

TOLL EQUITY/FAIRNESS

Under the current project all vehicles using the Express Lanes travel the same distance. As the project is expanded in length and intermediate access points are opened, one factor to be taken into consideration will be toll equity. In the future, the users of the facility will include short trips and long trips. To achieve maximum equity, toll rates should be adjusted to reflect distance traveled. However, in general, the more equitable the toll rates the less influence rate adjustments will have on demand management. In a perfectly equitable distance-based system, short trips would have very low tolls, which would provide relatively little disincentive to using the Managed Lanes. However a flat toll system, which would charge the same rate to all vehicles regardless of trip length, would have low levels of toll equity, but would discourage frequent shifts between the managed lanes and the general purpose lanes.

TARGETED TRIPS

As noted above, the expanded facility will cater to both a mix of short and long distance trips. To facilitate demand management and optimize usage, SANDAG and Caltrans may wish to "target" certain types of trips, i.e. longer-distance through trips versus short trips, etc. Different pricing strategies will, by their nature, encourage one type of trip versus the other.

USER AND SYSTEM COMPLEXITY

The expanded facility, and the frequent new access, will certainly increase the complexity of the tolling system and patron interface. However, pricing strategies may differ widely in their complexity. Complexity in customer interface, particularly as related to variable message signing, will be a very important consideration in selecting the optimum strategy.

CURRENT I-15 PRICING SYSTEM

The existing Express Lanes on I-15 extend about 8 miles with no intermediate access. There is a single "tolling zone" at which tolls are actually assessed to those vehicles equipped with transponders and traveling with a single occupant. It is not necessary for all users of the current express lanes to be equipped with transponders. In fact, motorists with two or more occupants use the lanes whether or not they have FasTrak.

At the tolling zone, vehicles with a single occupant must have a transponder. Using a delay factor in the tolling algorithm, the motorists FasTrak account is charged the toll rate which was displayed on the toll sign prior to entering the Express Lanes. For those vehicles with transponders, but which also have two or more occupants, a shielding pouch is provided to disable the transponder for that particular trip.

Enforcement is made through police observation. In essence, enforcement is primarily for compliance with vehicle occupancy regulations, with the police looking for "two heads" or "one head and a valid toll signal." Valid transponders are indicated through a signal light.

It is likely that the expanded facility will use a similar enforcement approach. For purposes of this analysis, it has been assumed that high occupant vehicles will not be required to have transponders. It is also assumed that channelization of HOV and non-HOV traffic at tolling zones will not be done, particularly given the plan for ultimate use of a reversible barrier. Hence, enforcement is likely to continue to be through observation.

The current system also uses dynamic pricing. Tolls are varied between very low rates such as $0.50 and high rates of as much as $4.00 or more to manage demand. Toll rates may be adjusted up to every six minutes based on continuing counts of total traffic in the managed lanes. The public has generally accepted the concept of dynamic pricing and it has proven to be successful in maintaining a high level of service in the managed lanes.

At any given time, the current toll in affect is displayed on a variable message sign (VMS) at each of the access points. Since there is only one movement possible, at any given time, there is only one rate in affect, which simplifies the motorist interface challenge under the current operation.

POTENTIAL PRICING CONCEPTS

In identifying a wide range of potential pricing options, WSA first considered the issue of time variability of pricing. In general, there are three basic options with respect to time variance, including:

- **Fixed Schedule** – essentially no variability by time of day – most traditional toll facilities follow this pattern;

- **Preset Variable Rates** – where toll rates are varied by time of day and/or travel direction, but on a preset fixed schedule, such as the approach now in use on the S.R. 91 Express Lanes in Orange County; and

- **Dynamic Variable Pricing** – in which prices vary based on actual levels of demand and not on a fixed schedule – this is the approach currently in use on the existing I-15 project.

After initial analysis, WSA believes that any pricing strategy for the I-15 Managed Lanes must employ some type of variable toll. Demand management will be a clear objective, and may well be required through legislation. A fixed toll schedule which does not vary by time of day or based on levels of demand, would make demand management very difficult and it would be almost impossible to ensure a high-level of service in the Managed Lanes. Further, given the nature of these facilities (with competing toll-free lanes immediately adjacent) a non-variable toll structure which would be optimal in peak periods would generate virtually no traffic or revenue in off-peak periods.

The operators of the S.R. 91 project were among the first to use the term "value pricing", which literally indicates that rates are adjusted in proportion to the "value" motorists receive in terms of time savings versus the toll-free lanes. As the toll-free lanes get more congested, the time savings value of the express lanes increases and the price is adjusted upward to reflect this. However, in off-peak hours as congestion levels are lower in the toll-free lanes, toll rates must be adjusted downward to attract any traffic into the express lanes.

Therefore, WSA believes that a fixed-rate schedule on the I-15 Managed Lanes project would likely neither satisfy demand management nor revenue generation objectives. Non-variable rate schedules do not appear to be viable and are not recommended.

The concepts of preset versus dynamic variable pricing should continue to be considered as we develop various pricing concepts. In fact, almost any of the pricing concepts discussed below could be "varied" either on a preset or dynamic basis. In general, the use of dynamic pricing will increase the ability to manage demand in the new lanes. However, it will add complexity to both the toll system and, perhaps, in terms of patron interface and communications. WSA suggests that neither of these options be ruled out initially. In terms of traffic and revenue analysis, these options are essentially equivalent since estimates are based on

"static" trip tables reflecting "global demand" in each period of the day. Ultimately, the decision between preset and dynamic pricing may be a function of technology and safety issues; although the success of the current dynamic pricing system suggests that dynamic pricing should be used, if at all possible.

Table 3-1 presents a broad overview of potential I-15 Managed Lanes pricing options. Three general concepts are suggested, together with a number of suboptions and other variations. These three suboptions include:

A. Flat Tolls – in which a single rate is charged from any given point of entry regardless of the point of exit from the managed lanes;

B. Per-Mile Tolls – in which the toll rate at any given time is based on the distance traveled in the managed lanes themselves; and

C. Segment Tolls – in which a nominal toll rate is charged per segment (i.e., the portion of the Managed Lanes between each pair of access points) – in general the more segments used the higher the toll.

These three concepts all deal with the mechanism of assessing pricing on the lanes. All of these are assumed to actually vary either with time or dynamically based on travel demand.

There is a very critical assumption which must be recognized in reviewing any of these pricing options. The rate which is displayed to the motorist at the time of entry into the managed lanes must be the rate which is actually charged, regardless of length of trip and even if nominal rates dynamically change during the course of the trip. WSA believes it would not be appropriate to change toll rates for a given vehicle during the course of the trip and potentially force that traffic to prematurely exit the managed lanes. Such a practice would increase safety risks and reduce the credibility of the pricing program thereby discouraging motorists from ever using the managed lanes. This is an important assumption and in some cases will require complex toll system design. However, in reviewing the pricing options below, it should be recognized that, whatever the system, the toll rate displayed to the motorists at the time he/she enters the Managed Lanes will be the rate which is paid for that particular trip.

Table 3-1
Overview Of Potential I-15 Managed Lanes
Pricing Options

Basic Concept	Description	Primary Suboptions	Other Variations
A. Flat Tolls	Single Rate charged from a given port of entry regardless of trips length.	1. Standard Rate at All Entry Points.	
		2. Rate based on max. length trips from each point of entry.	
B. Per-Mile Tolls	Toll rate based on distance traveled in Managed Lanes	1. Standard per-mile rates at all points of entry.	- Without minimum toll - With minimum toll - With minimum and maximum toll
		2. Skewed per-mile rates depending on entry point.	- Without minimum toll - With minimum toll - With minimum and maximum toll
C. Segment Tolls	Nominal toll charged per segment between access points - the more segments used - the higher the toll.	1. Standard rate per segment regardless of point of entry.	
		2. Skewed segment rate at different points of entry.	

A. FLAT TOLLS

As shown in Table 3-1, there would be two primary suboptions for flat tolls;

- A standard rate which would be displayed at all entry points regardless of location and regardless of trip length; and
- A flat toll rate based on the maximum length of trip in the managed lanes from each entry point.

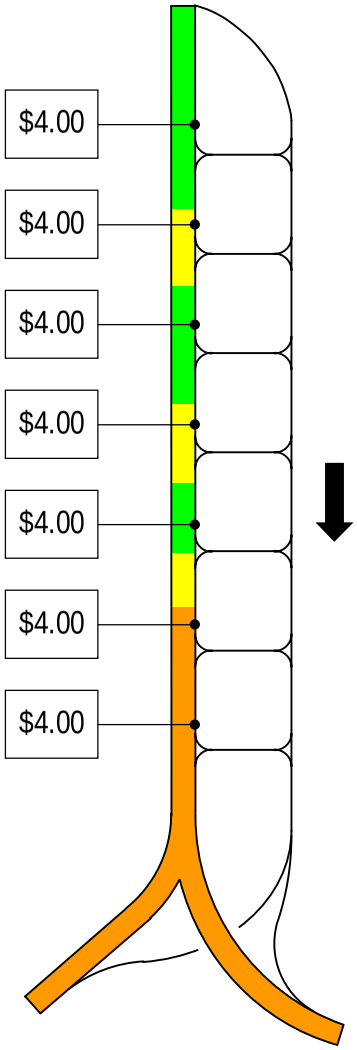
The difference between these options is illustrated graphically in Figure 3-1. The simple schematic diagrams are not to scale and generally reflect a southbound pattern of flow. The colored bands in the general purpose lane are intended to represent differing levels of hypothetical congestion in those lanes, with green being least congested and orange being most congested.

As shown in Figure 3-1, there would be a variable message sign in the general purpose lanes in the immediate vicinity of each access point. Under a flat toll system, the sign would simply display the current charge in affect at any given time that would be assessed a vehicle entering the lanes at that time. The same toll would apply to a vehicle entering a certain point at that time whether the vehicle used one segment or traveled the full 20 miles.

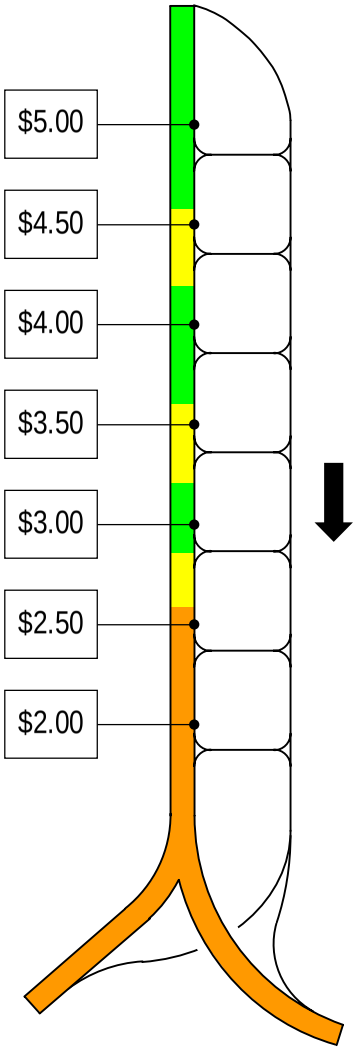
As shown on the left side of Figure 3-1, under the "standard rates" approach, at any given time, the variable message signs at all entry points would display the same toll. In this example, each sign would show $4.00 as the flat rate charge for entering the Managed Lanes. Under the alternative plan, the flat rate toll displayed at any given time varies based on the maximum length of trip which can be made in the Managed Lanes for each entry point. For example, if one were to enter the lanes at the northernmost point, the flat toll rate would be $5.00 at that moment; whether the motorist intended to travel just three miles or 20 miles. However, at the south end of the project, the sign would display $2.00 since the maximum length trip might be, say, three miles.

The straight flat rate for all movements would be among the least equitable pricing options. The maximum trip rates are intended to introduce some measure of toll equity. At the same time, at least in the southbound direction, the use of maximum trip rates might be counter-productive in terms of demand management, indicating that toll cost savings could be realized by staying in the general purpose lanes as long

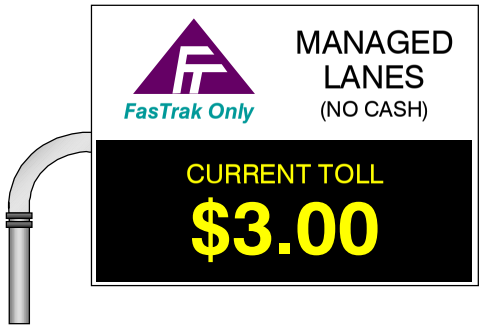
I-15 Managed Lanes Concept Plan



STANDARD RATES



MAXIMUM TRIP RATES



Typical Variable
Message Toll Sign

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ILLUSTRATIVE RATE LEVELS – FLAT RATE OPTIONS

FIGURE 3-1

as possible and charging the lowest toll for short trips in what might be the most congested locations.

B. PER-MILE TOLLS

Maximum toll equity would be achieved by using some form of distance-based toll, probably in conjunction with preset or dynamic variable pricing. However, per-mile rates will present considerable operational challenges (not insurmountable) and certain secondary issues regarding demand management and safety. As shown previously in Table 3-1, there are two primary suboptions which can be considered under per-mile tolls:

- 1. Standard per-mile rates at any given time regardless of the specific point of entry; or

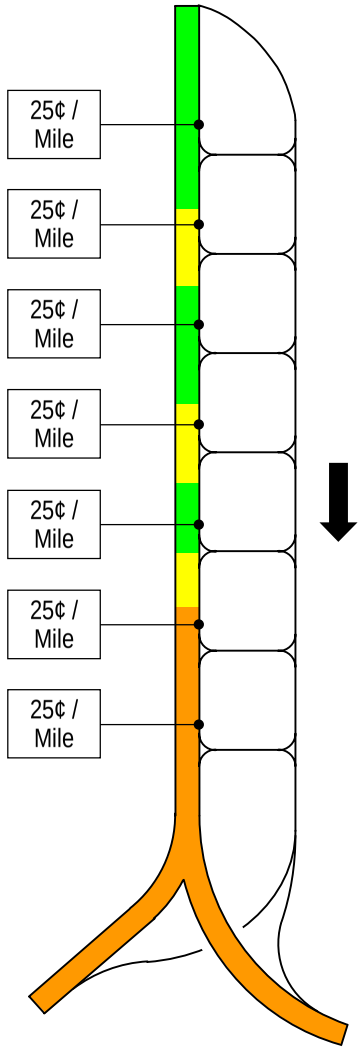
- 2. Potentially skewed per-mile rates where the per-mile rate itself may be different depending on the particular point of entry.

The latter option would be intended to "focus" the demand management capability of the pricing strategy, to encourage or discourage entry at certain locations along the managed lanes. For example, if traffic was particularly heavy at the south end of the managed lanes during the morning peak, but the capacity was available at the north end, consideration could be given to a differential per-mile rate for traffic entering at the north versus the south end.

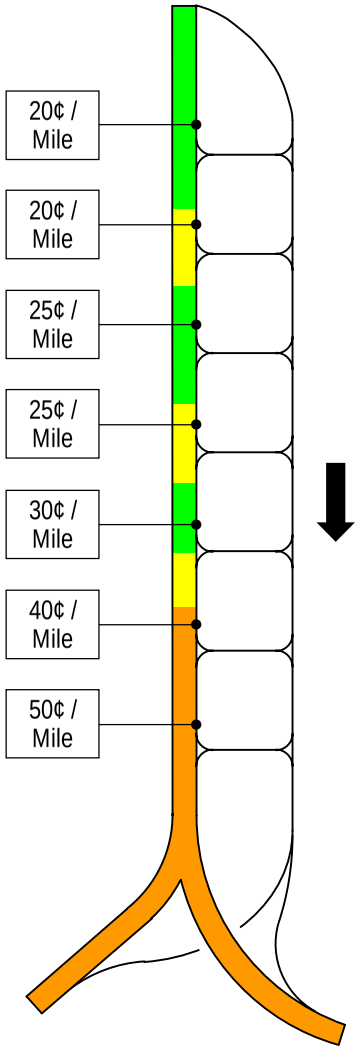
This concept is further displayed in Figure 3-2. Since the toll would be different depending on where the vehicles entered or exited the road, it would probably be necessary to display the rate on a "per-mile" basis on the variable message sign. As will be described in more detail below, it may also be necessary to display a "minimum" and/or "maximum" toll under the per-mile rate system.

In the example shown in Figure 3-2, the standard per-mile rate at this hypothetical point in time would be displayed as $0.25 per mile, regardless of point of entry. This type of arrangement would actually encourage shorter trips and, unless some type of minimum toll was assessed, might also encourage motorists to weave in and out of the managed lanes. Simply stated, there would be no difference in per-mile rate whether the vehicle entered at the northernmost end of the project or at the bottom of the project. In order to reduce their total toll charge, motorists would tend to enter the managed lanes at the last possible location.

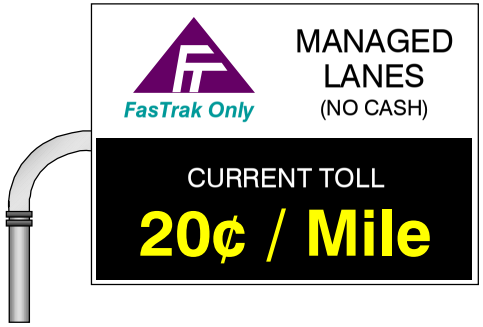
I-15 Managed Lanes Concept Plan



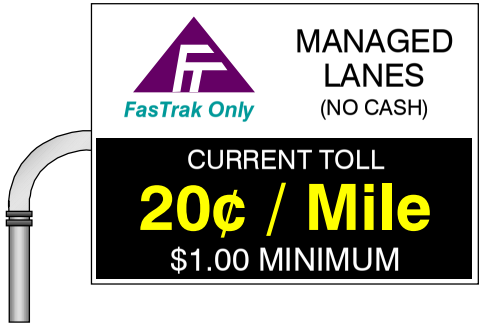
STANDARD RATES



SKEWED RATES



Typical Variable Message Sign
Without Minimum Toll



Typical Variable Message Sign
With Minimum Toll

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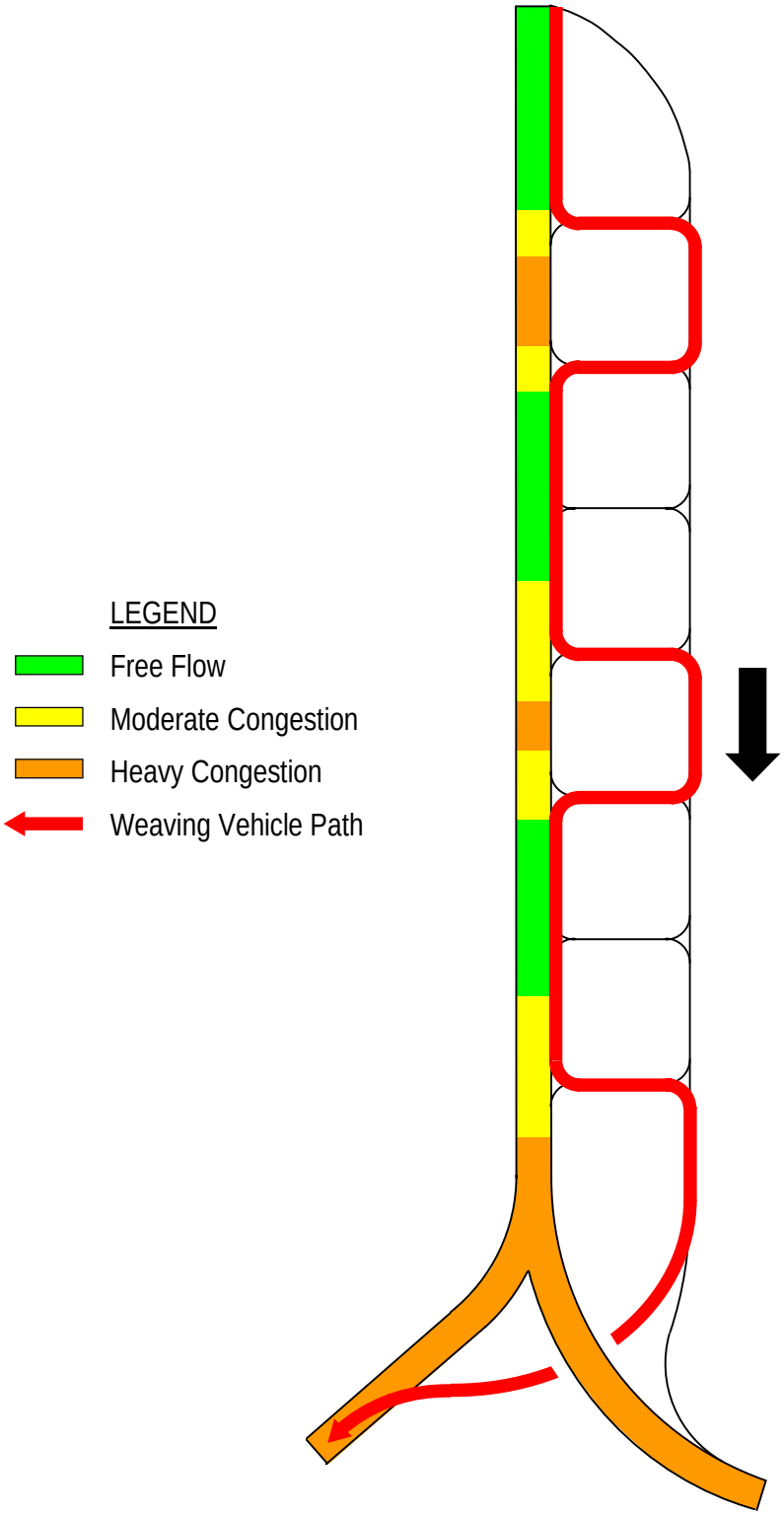
ILLUSTRATIVE RATE LEVELS – PER MILE RATE OPTIONS

FIGURE 3-2

Under the "skewed" rates approach, the actual per-mile rate would be varied to better manage demand on the system. In the example shown, higher tolls "per-mile" would be charged for motorists entering the facility in more congested locations. Both the standard and skewed per-mile rate program would require somewhat more complexity in terms of patron interface, since motorists would typically need to "mentally compute" anticipated tolls based on their own expected pattern of usage. However, the use of skewed rates would not necessarily increase the confusion, since only one rate would be shown on each individual sign (which might be, say, three miles apart) at any given time. In general, the skewed rate concept might be more effective with a "preset" variable rate structure such that motorists would anticipate that rates would be higher to enter the facility at certain locations. With dynamic pricing, motorists would not necessarily be encouraged to enter the facility earlier since they would not know, in advance, that rates were higher at other locations.

As shown previously in Table 3-1, a further suboption to any of the per-mile rate alternatives would be the use of minimum and/or maximum tolls. WSA believes this is an extremely important issue. Without any minimum or maximum tolls, a per-mile rate structure would almost certainly encourage increased weaving in and out of the managed lanes, increasing safety hazards and undesirable traffic interference. This potential "queue jump" weaving pattern is shown graphically in Figure 3-3. Varying hypothetical levels of congestion are shown at various points along the main lanes in Figure 3-3. Three different pockets of heavy traffic are shown along the 20-mile trip. Under this concept, and in the absence of minimum tolls, there would be no incentive for motorists to not simply weave in and out of the managed lanes for the shortest possible distance to simply bypass short queues of traffic. In the hypothetical example, a single trip would actually enter and exit the managed lanes three different times, with a total trip length of, say, 8 miles.

The use of a minimum toll, perhaps based on a minimum five-mile trip, would reduce the incentive for motorists to leave and re-enter the managed lanes. Once the decision was made to enter the lanes, there would be little incentive to leave and re-enter since a new "minimum toll" would be assessed each time that happened. WSA strongly suggests the use of minimum tolls, with a nominal minimum trip length of five miles seeming most appropriate. Obviously, motorists could use the managed lanes for less than five miles but they still would be assessed a five-mile minimum toll.



POTENTIAL "QUEUE JUMP" WEAVING PATTERN

FIGURE 3-3

The question of maximum tolls also needs to be considered, but for different reasons. Consider current operations on the existing eight-mile managed lanes. To effectively manage demand during certain hours, tolls sometimes need to be raised to $4.00 (or in isolated cases even more). This $4.00 toll is equivalent to about $0.50 per mile at certain times. If the same level of per-mile toll were needed to manage demand, at least on the southern section of the project, this would result in an equivalent through trip rate of $10.00 once the project is extended to 20 miles. We anticipate that there could be some pricing instability without the use of some type of maximum toll, since the per-mile rates which might be needed to manage demand on certain sections of the project would result in through trip tolls which are so high as to discourage virtually all through trips altogether.

A reasonable nominal distance for a "maximum toll" trip is about 15 miles. Table 3-2 shows minimum and maximum tolls at different hypo-

Table 3-2
Typical Per Mile Rates
With Maximum And Minimum Tolls

Per Mile Rate	Typical Minimum Toll(1)	Typical Maximum Toll(2)	Thru Trip Toll w/o Maximum(3)
$ 0.10	$ 0.50	$ 1.50	$ 2.00
0.20	1.00	3.00	4.00
0.30	1.50	4.50	6.00
0.40	2.00	6.00	8.00
0.50	2.50	7.50	10.00

(1) Minimum based on 5-mile trip.
(2) Maximum based on 15-mile trip.
(3) Through trip - ultimate project - 20-mile length.

thetical per-mile rates, ranging from $0.10 per mile to $0.50 per mile. The table also shows what the through trip toll would be for a maximum length (20 miles) trip if no maximum toll were used.

C. SEGMENT TOLLS

Segment tolls would, in essence, be a simplified variation of per-mile distance based tolling. Consider that there may be, say, 10-12 Managed Lane "mainline segments" in each travel direction between each point of access. The actual length of each segment may be different, but for pricing purposes each segment would be assumed to have an electronic tolling zone.

Segment tolls would be relatively simple to handle from a technology standpoint since the vehicle would be assessed a standard charge for each segment use. The more segments, the higher the toll.

Two suboptions would be available under segment tolls as well:

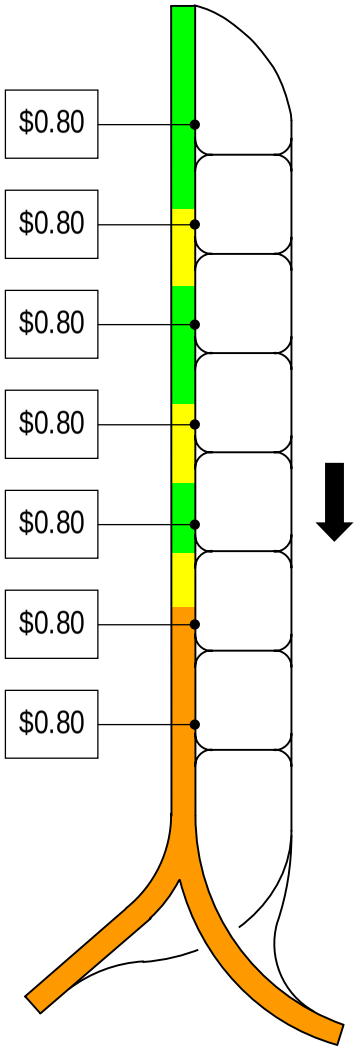
- A standard segment rate regardless of point of entry; or
- Skewed segment rates which would be adjusted to focus demand management in certain areas.

Illustrative examples of these are shown in Figure 3-4. One advantage of the segment toll would be the variable message display itself. In this case, a single toll rate would be shown "per segment." The motorist would still need to "mentally compute" the anticipated toll for their particular movement, but this might be easier to do than on a per-mile basis. One problem might be a misinterpretation by the patron – that the segment toll shown reflects the "total toll", not the rate per segment.

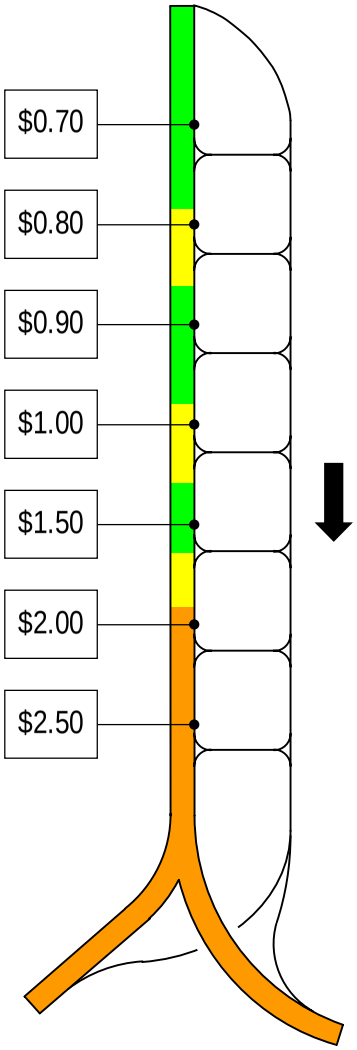
In the example shown, under a "standard" segment toll, the sign would display a current segment rate of $0.80 regardless of point of entry. However, under the skewed segment rates, at the same time different segment rates would be shown for different points of entry.

It is important to recognize, as described above, that motorists using the Managed Lanes would always be charged the rate which was displayed at the time of entry. Therefore, in the example shown, a motorist who entered the managed lane at the northernmost access point would pay a rate of $0.70 per segment, regardless of how many segments were used. Motorists entering, say, midway through the project would pay a segment rate of 1.00 per segment. Under this plan, two vehicles passing through the same segment could be assessed different tolls.

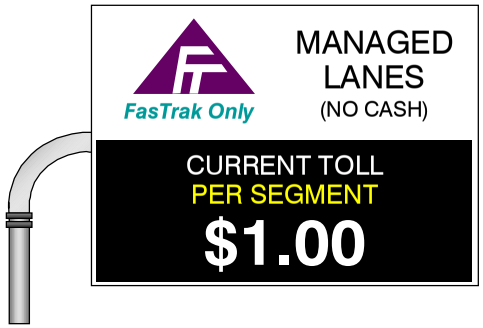
I-15 Managed Lanes Concept Plan



STANDARD RATES



SKEWED RATES



Typical Variable
Message Toll Sign

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ILLUSTRATIVE RATE LEVELS – SEGMENT TOLLS

FIGURE 3-4

In practice, this will be almost certainly be the case no matter what pricing option is used, since the prices will vary by time or dynamically anyway. The toll system will need to be rigorously planned and designed to accommodate this, but it should be transparent to the users during the course of each trip. Again, the toll rate displayed to the customer at the time they enter the lanes will be the rate that remains with that vehicle for the entire trip, regardless of what is displayed at other points of access and at other times.

Segment tolls would likely be more easy to understand by customers. However, they would have some of the same problems as per-mile rates in terms of encouraging frequent entry and exit from the managed lanes, unless some type of minimum toll were introduced. From a technology standpoint, the imposition of a minimum toll under a segment pricing system would be extremely difficult and may not be readily comprehensible and would be difficult to communicate to customers.

COMPARATIVE TOLL RATES

Each of these pricing options would ultimately favor certain types of trips over others and, in most cases, would result in different tolls for different types of trips. A simple comparison for hypothetical toll rates for many of these concepts are shown for different types of trips in Table 3-3. Four sample trips are covered, including two short trips (one assumed to be a three-mile trip in a less congested section and one assumed to be a four-mile trip in a more congested section), a mid-range 12-mile trip and a through trip under the ultimate project configuration. For purposes of this exercise, toll rates are calculated based on a nominal $0.30 per mile equivalent, and the minimum toll is based on five miles, the maximum toll (where relevant) is based on 15 miles. The "standard" flat toll rate was also computed based on a nominal 15-mile trip.

Under the standard flat toll, all four of these trips would be required to pay a full $4.50. Clearly this would discourage the short trips, particularly in less congested sections and would encourage use by longer-distance travelers. If the flat toll was varied based on the maximum length trip, the toll would range from $2.50 to $6.00, but would still be considerably inequitable for shorter trips. The straight per-mile calculated toll would be the most equitable, with toll rates ranging from $0.90 to $6.00 based directly on assumed trip length. However, it is important to note that the toll for the four-mile trip at the south end of the project, assumed to be more congested, would only be $1.20, which would provide minimal demand management capability. In essence, all of the per-mile rates provide maximum toll equity but generally less demand management

Table 3-3
Comparison of Toll Rates for Various Trip Types
(Based on nominal $0.30 per mile equivalents)

Toll Concept	3-Mile Trip North End	4-Mile Trip South End	12- Mile Trip	Through Trip (20 miles)
Flat Toll - Standard	$ 4.50	$ 4.50	$ 4.50	$ 4.50
Flat Toll - Max. Trip	4.50	2.50	3.50	6.00
Per Mile - No Minimum	0.90	1.20	3.60	6.00
Per Mile W/ Minimum	1.50	1.50	3.60	6.00
Per Mile w/ Min & Max.	1.50	1.50	3.60	4.50
Per Mile - Skewed	0.90	2.00	3.60	6.00
Per Mile - Skewed (with Minimum)	1.50	2.50	3.60	6.00
Per Mile - Skewed (with Min & Max.)	1.50	2.50	3.60	4.50
Segment Toll - Standard	0.90	1.80	3.60	5.60
Segment Toll - Skewed	0.90	3.00	3.60	5.60

Notes:
Minimum Toll based on 5 miles
Maximum Toll based on 15 miles.
Standard Flat Rate based on nominal 15 mile trip.
Average segment length is 3 miles.
For this example, south section assumed to be more congested than north section.

capability and certainly less ability to focus demand management on certain sections of the managed lanes.

This would be improved by introducing a minimum toll, (in this case $1.50) and perhaps a maximum toll (in this case $4.50). The effect of "skewing" the per-mile rate is also clearly shown, where tolls in the more congested section are assumed to have a higher per-mile rate than the non-congested section. This would increase the toll for a similar length trip from $0.90 to $2.00 – improving demand management capability but also eroding the very toll equity which is attempted to be achieved by distance-based tolls in the first place.

Finally, the segment toll rates are shown at the bottom of the table; these would range from $0.90 to $5.60, depending on the number of segments assumed to be used on each trips.

COMPARATIVE ATTRIBUTE SUMMARY

Table 3-4 presents a useful comparison of each of the major pricing strategies with respect to a number of attributes and evaluation criteria. In this case, each option is generally rated for preset versus dynamic pricing.

From the standpoint of toll equity, the per-mile rates would be most equitable while the flat toll would have the lowest equity. On the other hand, flat tolls would encourage longer trips while per-mile rates, at least without minimum tolls, would encourage short trips. The introduction of minimum and/or maximum tolls would tend to moderate this.

Demand management is one of the most important attributes of any pricing strategy for the managed lanes. Table 3-4 addresses the general overall effectiveness of each concept, as well as the ability to focus demand management in certain portions of the managed lanes and to discourage weaving in and out of the Managed Lanes.

The standard flat toll would generally have low-medium demand management effectiveness with preset variable pricing although this would be improved with dynamic pricing. There would be virtually no ability, however, to "focus" demand management strategies on particular sections of the managed lanes given the nature of flat tolls. On the other hand, flat tolls would totally discourage weaving in and out of the managed lanes; there would simply be no incentive to leave and re-enter and vehicles choosing to use the lanes would likely do so for the maximum possible trip.

Table 3-4
Comparative Attribute Matrix
Alternative Pricing Strategies

Toll Concept	Toll Variation Method	Toll Equity	Trips Favored	Demand Management Characteristics			Complexity Level	
				Overall Effectiveness	Focus Ability	Discourage Weaving	Driver Interface	Toll System
Flat Toll - Standard	Pre - Set	Low	Long	Low-Med	Low	High	Simple	Low
	Dynamic	Low	Long	Med-High	Low	High	Med	Med
Flat Toll - Max. Trip	Pre - Set	Med	Long	Low	Low	Med	Simple	Low
	Dynamic	Med	Long	Med	Low	Med	Med	Med
Per Mile - No Minimum	Pre - Set	High	Short	Low	Low	Low	Med-Comp	Med
	Dynamic	High	Short	Med	Low	Low	Complex	High
Per Mile W/ Minimum	Pre - Set	Med	Med	Med	Low	Med	Med-Comp.	Med
	Dynamic	Med	Med	High	Low	Med	Complex	High
Per Mile - Skewed	Pre - Set	Med	Short	Med	Med-High	Low	Med-Comp	Med
	Dynamic	Med	Short	High	High	Low	Complex	High
Per Mile - Skewed (with Minimum)	Pre - Set	Med	Med	High	High	Med	Complex	High
	Dynamic	Med	Med	Very High	Very High	Med	Complex	Very High
Segment Toll - Standard	Pre - Set	High	Short	Low	Low	Low	Simp-Med	Low
	Dynamic	High	Short	Med	Low	Low	Medium	Med
Segment Toll - Skewed	Pre - Set	Med	Med	Med	Med	Med	Medium	High
	Dynamic	Med	Med	High	High	Med	Med-Comp	High

Per-mile rates would also have low to moderate effectiveness in terms of demand management unless some type of minimum tolls were introduced. The use of dynamic pricing would improve the effectiveness; with the best demand management capability coming from some type of skewed per-mile rate system with minimum tolls and dynamic pricing. Per-mile tolls would not provide a good opportunity to focus demand management unless "skewed" rates were used. Most importantly, per-mile tolls, with no minimum, would provide no disincentive to weaving and actually might encourage frequent shifts between the general purpose and managed lanes.

Standard segment tolls would be generally poor in terms of demand management and would offer little opportunity to focus on certain areas or discourage weaving. Skewing the segment tolls would improve demand management characteristics, but might add some confusion.

Complexity level is also an important consideration, both in terms of the toll system requirements and driver interface, and in terms of communicating to the motorist, particularly if a preset variable rate structure were used. Adding dynamic pricing only slightly increases the complexity and would make the system essentially equivalent to that which is now in use on the existing I-15 project.

The use of per-mile rates would seem to increase the complexity and the "mental computations" necessary on the part of motorists deciding whether or not to use managed lanes. This would be made additionally complex if dynamic pricing were used, since a possibly different "computation" might be needed each day.

In this case, with per-mile rates, a preset variable rate structure would have the added advantage of permitting the printing and distribution of point-to-point rate schedules covering various times of the day. While it would still would not be possible to have the sign show the current toll to every possible exit point at every potential entry point, a pre-printed form would give motorists a sense of the different tolls which would be charged at any given time for entering and exiting the system at various combination of points. This would not be possible with dynamic, distance-based pricing where it really would be necessary for the motorist to make the "mental computation" at the time of each trip.

The biggest advantage of some type of segment toll system, which would be comparable in terms of toll equity to a per-mile system, would be that just a single segment toll rate would have to be displayed. Motorists

would tend to become quickly aware of how many "segments" they travel on a typical trip each day. Again, this would be slightly more complex if dynamic pricing was used. There could also be some confusion between segment rates and total toll rates.

As noted above, WSA believes that a fully-electronic toll system could be implemented to accomplish any of the pricing concepts discussed, with either preset or dynamic pricing. However, some systems will be considerably more complicated than others, as shown in Table 3-4. The least complex system would, of course, be the flat rate system while the most complicated systems would involve per-mile rate charges together with dynamic pricing variability.

HOV DEFINITION

The current I-15 Managed Lanes project allows vehicles with two or more occupants to use the lanes toll free. It is assumed that the "base case" analysis for the future expanded facility will continue this practice. However, it is important to recognize that analytical results, particularly as related to revenue potential, may be significantly different if the definition of an HOV were to be increased to vehicles with three or more occupants.

Vehicle occupancy counts conducted as part of this, and other studies, show that a substantial portion of HOV traffic currently has two occupants. Increasing the definition of HOV to three occupants would reduce the number of vehicles eligible for toll-free usage by two-thirds or more. This can have a "double impact" on traffic and revenue potential for managed lanes projects. On the one hand, it reduces the amount of managed lane capacity which is used by toll-free vehicles and frees up additional capacity for toll paying vehicles. Secondly, since less toll-free traffic is in the managed lanes, operating conditions in the toll-free lanes may be slightly worse, increasing the "value" to toll paying traffic of using the managed lanes.

INTEGRATED ELECTRONIC PRICING OPPORTUNITIES

The Managed Lanes are currently planned to have direct access to and from three Bus Rapid Transit Centers (BRTC), interface points along the corridor, plus indirect access to a fourth BRTC . Since any of the pricing programs would make use of fully electronic toll collection, this may

create opportunities for integrated electronic pricing strategies which would encourage shifts to carpools or transit.

For example, consideration could be given to a concept whereby toll rates for using the managed lanes were, say, reduced by 50 percent if the user exited into a "park-and-ride" lot. This would require extending the electronic toll system to the parking facility itself.

OPTIONS SELECTED FOR FURTHER ANALYSIS

Based on the screening analysis performed in this task, almost any of the pricing strategies could be considered. However, to arrive at a manageable number of scenarios for purposes of traffic and revenue analysis, the Project Management Team selected the following five base alternatives for traffic and revenue analyses:

- Scenario A-1 - standard flat rate;
- Scenario A-2 - flat rate with maximum length trip feature;
- Scenario B-1 - standard per-mile rates with minimum and maximum toll;
- Scenario B-2 - skewed per-mile rates with minimum and maximum toll; and
- Scenario C-1 - standard rate segment tolls.

CHAPTER 4

TRAFFIC AND REVENUE ANALYSIS

Once the alternative pricing strategies were selected, a traffic and revenue analysis was performed. This analysis was intended to estimate traffic, by direction and time period, which would be expected to use the managed lanes. This includes estimates of HOV and SOV traffic demand. Based on this, and using optimum toll rates which were required to effectively manage demand, estimates of annual toll revenue potential were developed for each strategy.

Chapter 4 presents an overview of the methodology used in developing these estimates. Traffic and revenue estimates are included for each of the five basic concepts, plus two additional "sensitivity scenarios." Each of the various alternatives are compared in terms of user characteristics, revenue potential and more.

BASE SCENARIOS EVALUATED

As discussed previously in Chapter 3, five base pricing strategies were identified for more detailed analysis. These base Scenarios include:

- **Scenario A-1: Standard Flat Rate (All Entries)** - Under this scenario, all vehicles entering the managed lanes at a given point in time would be assessed the same flat toll, regardless of point of entry or point of exit;

- **Scenario A-2: Flat Rate With Maximum Toll Per Entry** – This scenario is similar to Scenario A-1, except that the flat rate displayed at any given time would be based on the maximum length trip in the managed lanes which would be possible from any given point of entry (i.e., the shorter the maximum length of trip, the lower the flat rate at any given point in time);

- **Scenario B-1: Standard Per-Mile Rate** – Under this scenario tolls would be based on distance traveled, with a per-mile rate that would be "standard" at any given time, regardless of point of entry. There would also be a minimum and maximum toll associated with this scenario. The minimum toll at each rate level was represented by a typical 5-mile trip, while maximum toll was based on a 15-mile trip;

- **Scenario B-2: Skewed Per-Mile Rate** – This scenario is the same as Scenario B-1, except that the per-mile rate at any given time may be different depending on point of entry, to aid in demand management around certain "bottleneck" locations; and

- **Scenario C-1: Standard Rate Per Segment** – In this case, the toll rate would be expressed as a certain standard charge "per segment" (i.e., the travel segments between successive opportunities for access or egress). For example, if the segment rate at a given time was $0.50, and the trip used three "segments," the total toll would be $1.50. Under Scenario C-1, at any given time the segment rate would be the same for any point of entry.

SENSITIVITY TEST SCENARIOS

In addition to the five base scenarios described above, two additional "sensitivity test" scenarios were run to test the impact of possible alternative project configurations or changes in the definition of HOVs. The two sensitivity tests were tested as variations to Base Scenario B-1, the standard per-mile rate with minimum and maximum tolls. The two alternatives tested as sensitivity tests included:

- **Sensitivity Scenario B-1-a: Scenario B-1 with Fixed Barrier** – In this case, the project was assumed to always have two managed lanes in each travel direction without a movable barrier; and

- **Sensitivity Scenario B-1-b: Scenario B-1 Assuming HOV 3+** - This scenario was intended to test impacts on traffic and revenue of a future condition where the regional definition of high-occupant vehicles would be changed from two or more persons to three or more persons. This may be necessary at some point in the future due to increasing traffic levels in HOV lanes throughout the region.

It is important to recognize that these additional scenarios were run as sensitivity variations to the basic Scenario B-1. They were intended only

to provide information about the potential impacts on traffic and revenue of either a change in the possible design of the managed lane facility or a change in the regionwide HOV definition.

METHODOLOGY

All of the above scenarios, including the base and sensitivity scenarios, were evaluated using a modified version of the SANDAG Series 9 model. All were evaluated assuming the full managed lane expanded project facility, i.e., from S.R. 78 to S.R. 163, with widening south of Ted Williams Parkway. In addition, all were modeled by time period, assuming the use of variable tolls during different times of day, and by travel direction.

The latest Series 9 networks and trip tables were provided to WSA by SANDAG for use in the analysis. To simplify the assignment approach, the model was initially "windowed" to exclude portions of the model south of I-8. The managed lanes project, including all proposed access locations, was recoded into the network to permit the use of WSA toll diversion traffic assignments.

The traffic analysis itself was conducted at 2005, 2010 and 2015 levels. Trip tables for each of these years, plus 2000 (base year) were obtained at A.M. peak, P.M. peak and off-peak levels from SANDAG.

Initially, the trip tables were then further subdivided into the following specific analysis periods for purposes of this analysis:

- A.M. Peak (6 – 8 A.M.);
- A.M. Shoulder (8 – 9 A.M.);
- Midday (9 A.M. – 2 P.M.);
- P.M. Shoulder (2 periods: 2 P.M. – 3 P.M. and 6 P.M. – 7 P.M.); and
- P.M. Peak Period (3 – 6 P.M.)

Each of the adjusted "period" trip tables were then further segregated into the following vehicle categories:

- Single-occupant passenger cars (SOV);
- Two-occupant passenger cars (HOV-2);
- Passenger cars with three or more occupants (HOV-3+); and
- Commercial vehicles (CV).

This disaggregation was based both on inherent information in the SANDAG trip tables and the results of vehicle occupancy and classification counts conducted by WSA along the I-15 corridor, as described previously in Chapter 2. The occupancy distribution was particularly critical; WSA directly used the occupancy data by time period collected in the field data collection process to more precisely disaggregate the trip tables.

The base year (2000) disaggregated trip tables were then used in a series of "calibration" traffic assignments. Basically, assuming only the existing reversible HOV lanes, traffic was assigned to I-15 for each period, and each market segment (SOV, HOV-2, HOV-3, etc.) and compared with the detailed traffic profiles developed as part of the study and discussed previously in Chapter 2. Using a WSA trip table calibration process, the "segment level" trip tables were then adjusted to result in assignments which more closely reflected the traffic profiles developed as part of this study, for each vehicle category.

To develop future-year trip tables by time period and market segment, WSA identified the projected growth rate in each interchange-to-interchange movement estimated in the base Series 9 trip tables (i.e., 2005, 2010 and 2015). SANDAG projected increases in each trip interchange were then applied to the "calibrated" base year trip tables to establish the future-year trip tables by time period.

For each of the different scenarios, traffic assignments were made at each of the six time intervals described above. Five alternative toll rates were tested for each pricing strategy and each period of day. This was to determine optimum tolls both in terms of optimizing revenue potential and ensuring appropriate acceptable levels of management of SOV traffic to ensure free flowing conditions for HOV traffic.

A modified form of the TRANPLAN equilibrium assignment technique was used, which incorporates a WSA toll diversion market share algorithm. The various vehicle categories (e.g., SOV, HOV-2, HOV-3 and truck) were handled as separate "trip purposes" in the TRANPLAN assignment process to recognize differing restrictions on lane use, and toll charges. For example, truck traffic was not permitted to use the managed lanes. HOV traffic was permitted to use the managed lanes "toll free." With the exception of one sensitivity test, both the HOV-2 and HOV-3+ trip tables were assumed to have toll-free access.

The SOV traffic component was then subjected to the toll diversion analysis, which estimates the share of traffic for each travel movement which would be expected to use the tolled managed lanes versus the toll-free general purpose lanes. That market share was a function of estimated time savings between the two paths and the toll rate for each scenario.

Under this approach, only the SOV travel component was actually being "managed" by pricing adjustments, since the HOV traffic was assumed to have toll-free access. The exception to this was Sensitivity Scenario B-1-b, which assumed both SOV and HOV-2 vehicles would be required to pay a toll.

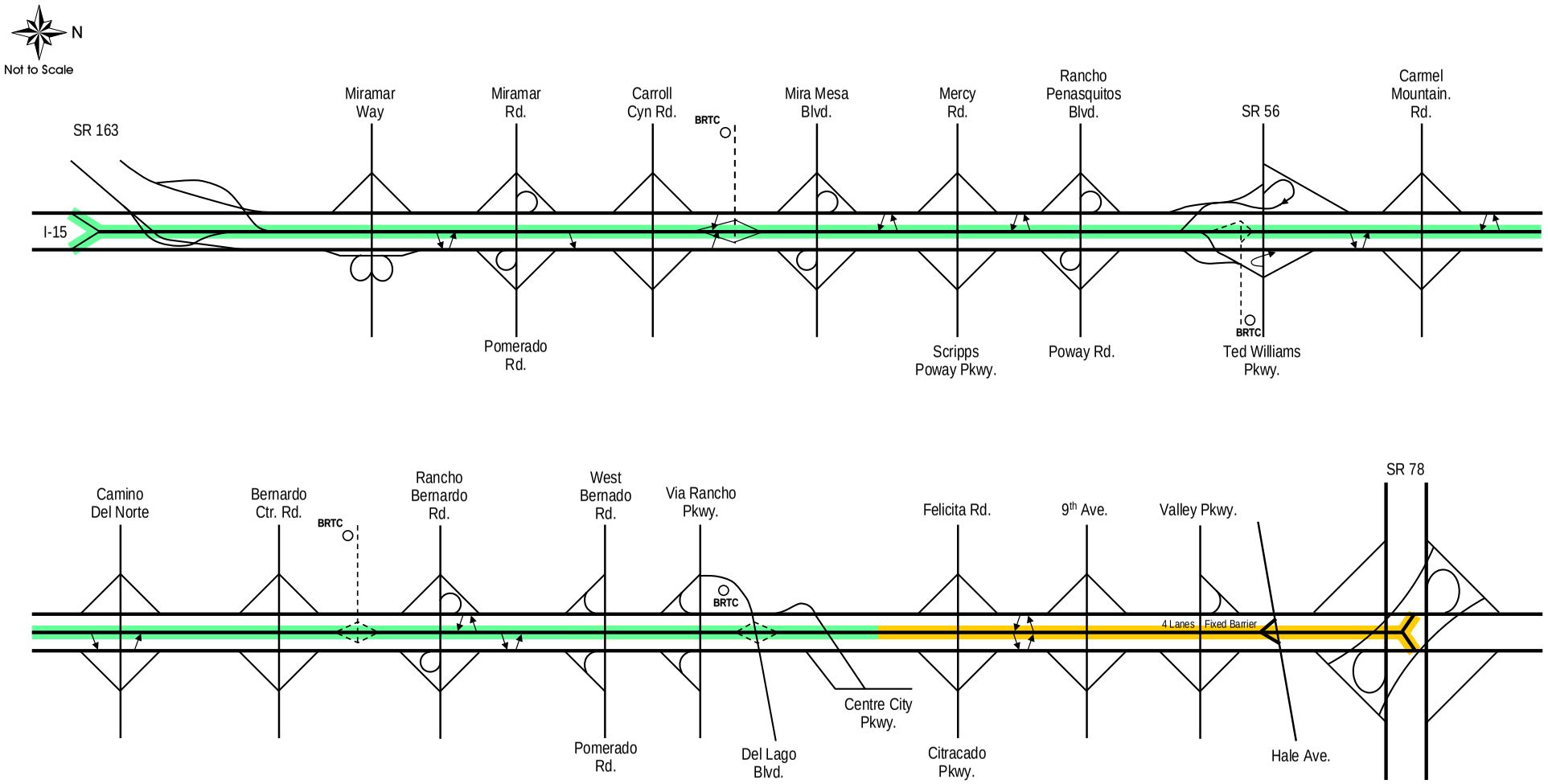
In making the traffic assignments, the model was also coded so as to reflect the appropriate lane reversals during the various peak periods. For the A.M. Peak and A.M. Shoulder analysis, the managed lanes were assumed to have three lanes southbound and one lane northbound. For the P.M. Peak and P.M. Shoulder conditions, three lanes northbound and one lane southbound were assumed. For the Midday period, balanced flow was assumed (e.g., two lanes each way).

In reviewing the traffic assignment results, optimum prices were selected which would result in traffic "per-lane" in the managed lanes of no more than 1,500 per hour. This was intended to ensure continuing free flow operation. In some cases, particularly in the A.M. Peak and P.M. Peak conditions, maximum toll revenue would be produced at rates which would allow traffic in excess of the 1,500 vehicles per lane per hour; hence, toll rates beyond the optimum level would be required to manage demand. In all cases, the demand management criteria was given priority over the revenue maximization criteria.

PROPOSED EXPANDED MANAGED LANES CONFIGURATION

Figure 4-1 shows the proposed full expanded managed lanes configuration. The ultimate project will extend from S.R. 163 on the south to S.R. 78 on the north, in Escondido. The existing project, generally south of Ted Williams Parkway will ultimately be widened to four lanes. The remaining sections of the managed lanes will also be constructed as a four-lane facility, probably in phases. As shown in green in Figure 4-1, the entire portion of the project from a point just north of Center City Parkway will be designed for reversible operation (three lanes in the major direction, one lane in the minor direction). This will be accommodated by moveable barrier over this entire section. The northern

I-15 Managed Lanes Concept Plan



LEGEND

- Moveable Barrier Section (3 x 1 Lanes)
- Fixed Barrier Section (2 x 2 Lanes)

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PROPOSED EXPANDED MANAGED LANES CONFIGURATION - FULL BUILD CONDITION

FIGURE 4-1

portion of the project, shown in orange, will have a fixed barrier wall in the center of the managed lanes and would feature two managed lanes in each direction. It is noted that one of these managed lanes would drop in each direction north of Hale Avenue; so the very northernmost segment would involve one lane in each direction.

In the reversible section, the managed lanes would be physically separated from the general purpose main lanes by a fixed barrier wall. Periodic openings in the fixed barriers will occur at transition areas between the main lanes and the managed lanes. In the northbound direction, seven such transition areas would be implemented, two of which will provide access only from or only to the managed lanes, while the others will provide access both to and from the managed lanes. In the southbound direction there would be six such transition areas, although in most cases they would be located at different points than the northbound access.

In the fixed barrier section, there would be no barrier wall between the main lanes and the managed lanes. Rather, this would be handled by double paint stripe, similar to the approach used on most HOV lanes in California. Transition areas that allow access between the general purpose lanes and the managed lanes are shown in Figure 4-1.

In addition to the transition areas, direct access ramps not associated with the BRTC sites would be provided to and from the north in the managed lanes at both Hale Avenue and Ted Williams Parkway (S.R. 56). In the case of S.R. 56, these access ramps already exist since this is the current end of the existing reversible roadway. As with the current system, direct access to the managed lanes would also be provided to and from both S.R. 163 and I-15 at the south end of the project.

Finally, direct access from the managed lanes would be provided to and from four bus rapid transit centers (BRTC), spread throughout the managed lane corridor. In one case, Del Lago Blvd., access to the BRTC would be indirect; while in the other three cases separate direct access ramps would be provided. It is understood that each of these BRTC locations would include large park and ride facilities, with bus rapid transit modal transfer options.

INTERIM PHASE

In the Interim Phase, the new four-lane extension of the managed lanes will extend only as far north as City Center Parkway, in southern Escondido. In essence, the four-lane, fixed-barrier section, shown in yellow in Figure 4-1, would be added later. In addition, the existing

portion, from S.R. 163 to Ted Williams Parkway, would remain a two-lane reversible roadway.

For purposes of comparison between alternatives, the Interim Phase configuration has not yet been modeled. This interim operation will be analyzed once the preferred overall pricing scenario is selected.

SCENARIO A-1: FLAT TOLLS

Under Scenario A-1, all SOV traffic electing to use the managed lanes would pay the same flat rate prevailing at any given time, regardless of point of entry or exit. The rate itself will vary by time of day or, more likely, based on traffic flow. However, trip length would not be a factor in determining the toll rates.

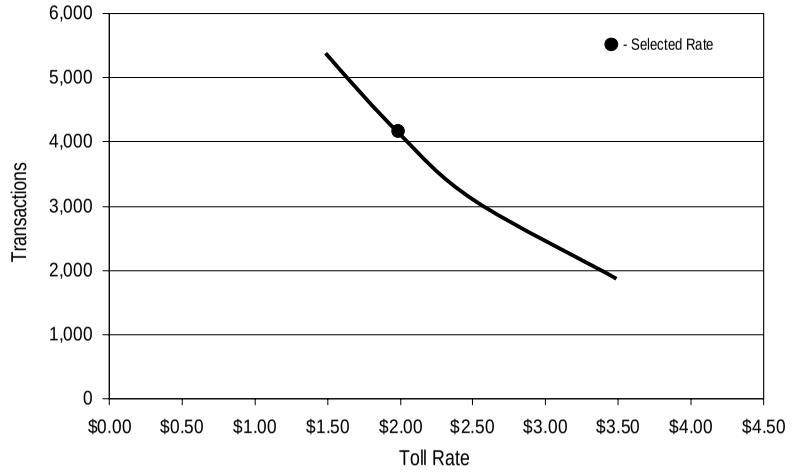
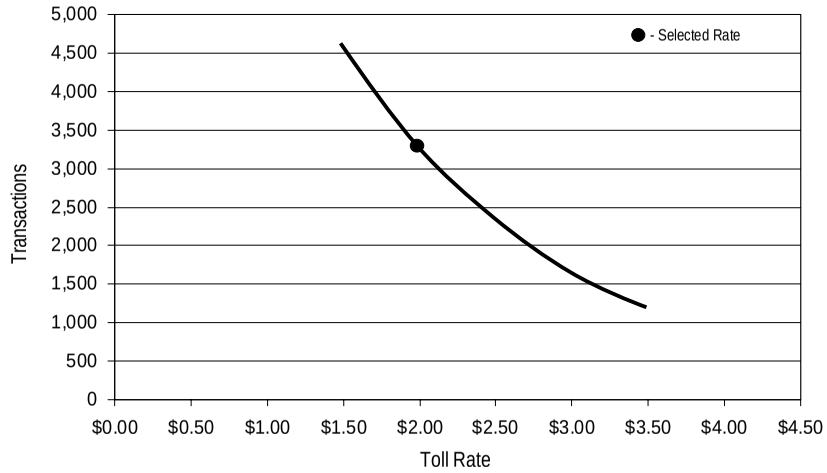
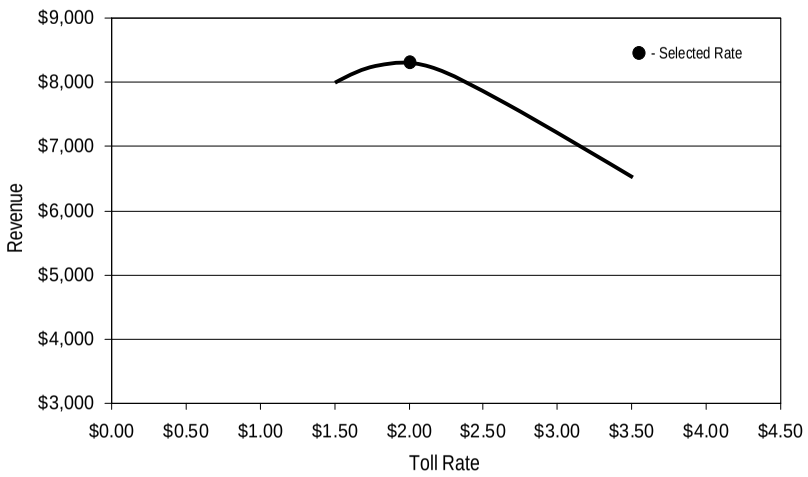
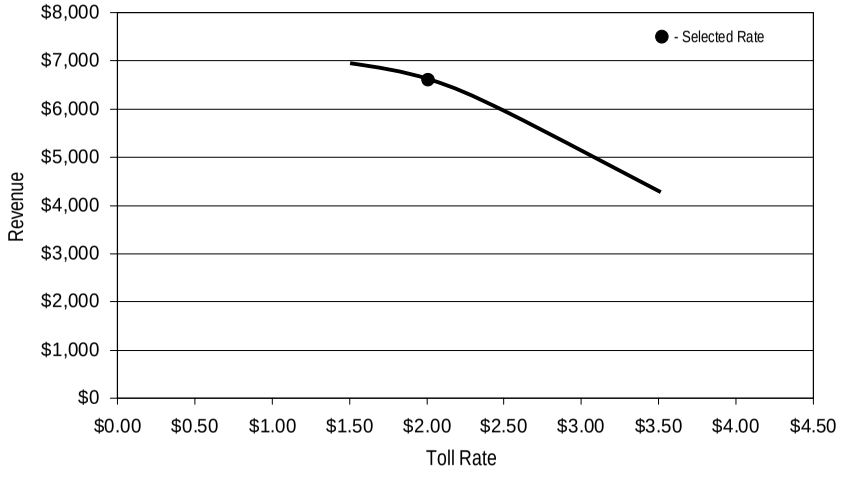
TOLL RATE SENSITIVITY ANALYSIS

This scenario was evaluated at several different toll rates. While different rates were tested at all periods of the day, the results of the peak period toll sensitivity analysis is graphically shown in Figure 4-2. Only the peak period, major travel direction is shown in the figure, with separate curves provided for both transactions and revenue. In this case, the toll rates shown along the bottom of each graph reflect the "flat rate" which would be applied to all SOV trips, regardless of point of entry and exit.

The relatively high sensitivity to toll rate changes is clearly shown in the sharply descending SOV transaction estimates as rates increase. For example, total A.M. period southbound transactions (two hour totals) would be estimated at more than 5,000 at a $1.50 toll, dropping to about 3,000 at a $2.50 flat rate toll and toll less than 2,000 at a $3.50 toll.

Maximum revenue is shown to be derived at a flat toll rate of $2.00. This is actually lower than the current maximum toll rates on the shorter reversible lane section, even though the curves in Figure 4-2 reflect 2005 conditions. There are two primary reasons for this:

- As part of the overall expansion program, it is also assumed that additional capacity will be added to the main lanes, typically one additional "toll-free" main lane in each travel direction – this would tend to make the managed lanes slightly less competitive with the general purpose lanes than is currently the case; and

	A.M. Peak - Southbound	P.M.. Peak - Northbound
Period Transactions		
Period Revenue		

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PEAK PERIOD TOLL SENSITIVITY CURVES - SCENARIO A-1
2005 LEVELS

FIGURE 4-2

- Because the curves in Figure 4-2 reflect the major travel direction only, with the assumption of a three/one reversible roadway, there is actually more capacity available in the managed lanes than there is today (in the major direction – hence, the demand management component of the price is not as severe.

However, in selecting the optimum rate for this and all scenarios studied, WSA always gave priority to the demand management requirements, with revenue being a secondary consideration. For example, in the A.M. peak period southbound, the selected rate of $2.00 would meet target maximum traffic levels in all sections and produce maximum toll revenue. However, in the P.M. peak northbound direction, the same $2.00 toll would be needed to manage demand, but would actually produce revenue slightly below the maximum.

The suggested toll rate levels for Scenario A-1, by period of the day and travel direction are shown in Table 4-1. All of these values reflect a "flat toll" which would be applied to all SOV traffic, regardless of point of entry or exit, in a given direction. The rates are shown by the various analysis intervals. This is a result of the modeling process, using fixed trip tables for each of these paragraphs. In practice, if dynamic pricing is used, the rate within a period may vary above or below the rates shown in Table 4-1.

As might be expected, the optimum flat toll rate in the midday and some of the shoulder periods is considerably lower than the peak periods. In addition, the major travel direction consistently has a higher optimum flat toll rate in peak periods than the minor direction. It is also interesting to note that the optimum toll rate increases over time. For example, the optimum southbound A.M. peak flat toll rate in 2005 is $2.00; this increases to $3.50 in 2015.

It is noted that all toll rates shown in Table 4-1 and throughout this Chapter should be considered to be in year 2001 dollars, i.e., not adjusted for inflation. In practice, the required flat toll in 2015, for example, would be need to be considerably higher to achieve the same level of traffic management, to account for inflation. For example, if inflation were to average, say, 2.5 percent per year between 2001 and 2015, the southbound A.M. peak flat toll rate would actually be closer to $5.00 (in year 2015 dollars).

Table 4-1
Toll Rate Levels - Scenario A-1

Year/Period	Flat Toll Rate	
	Southbound	Northbound
2005		
A.M. Peak	$2.00	$0.50
A.M. Shoulder	1.00	0.50
Mid-Day	0.50	0.50
P.M. Shoulder	0.50	1.00
P.M. Peak	1.00	2.00
P.M. Shoulder	0.75	1.00
2010		
A.M. Peak	$3.00	$1.00
A.M. Shoulder	1.50	0.75
Mid-Day	0.50	0.50
P.M. Shoulder	1.00	1.50
P.M. Peak	1.50	3.50
P.M. Shoulder	1.00	1.50
2015		
A.M. Peak	$3.50	$1.50
A.M. Shoulder	1.50	0.75
Mid-Day	0.50	0.50
P.M. Shoulder	1.00	1.50
P.M. Peak	1.50	4.00
P.M. Shoulder	1.00	2.00

ESTIMATED WEEKDAY TRAFFIC

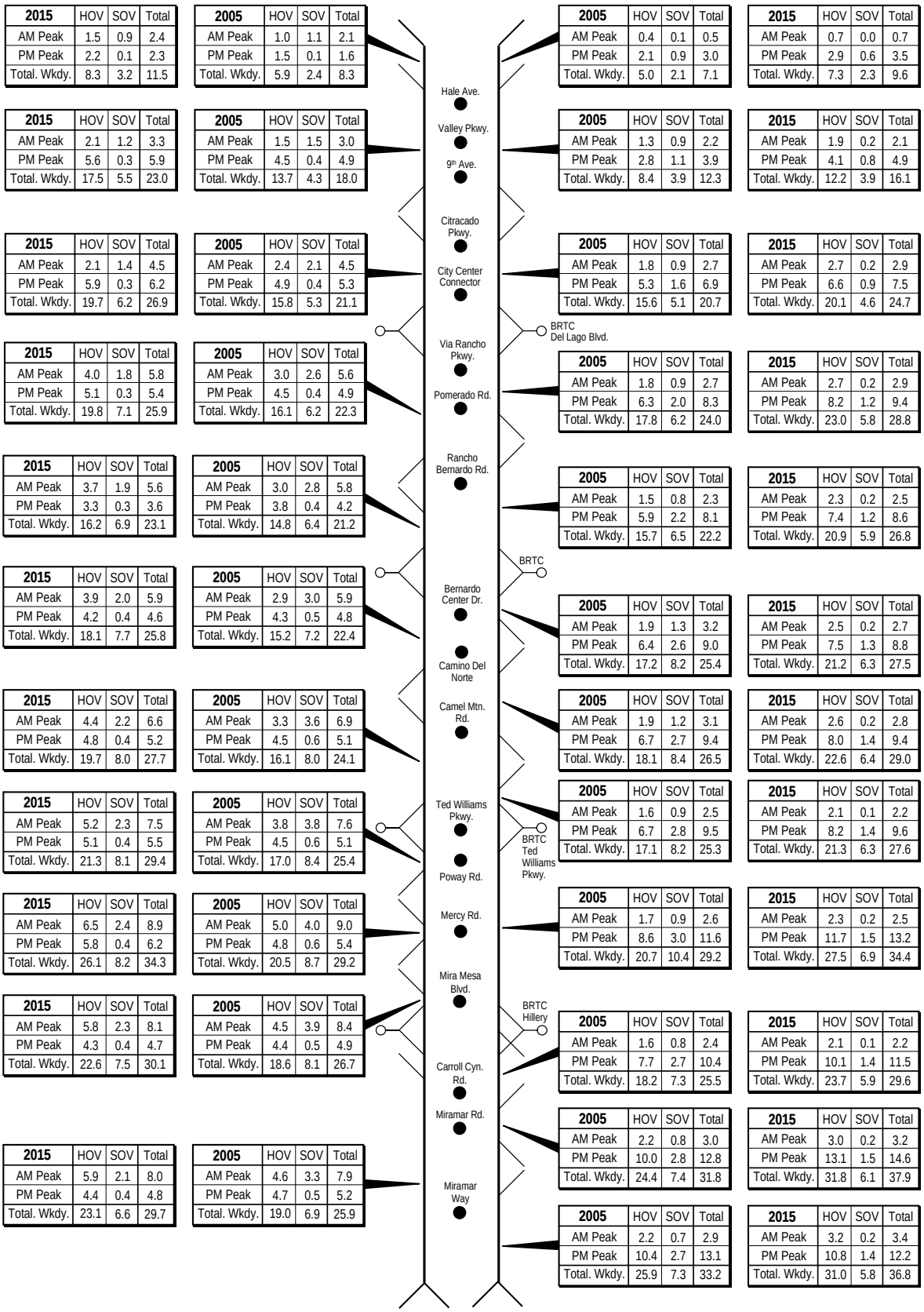
Figure 4-3 shows estimated A.M. peak, P.M. peak and total weekday traffic in the managed lanes under Scenario A-1. Traffic estimates are shown for each of the "mainline segments", that is travel segments between each of the respective access points in the managed lanes themselves. Traffic estimates are shown separately for 2005 and 2015, and are shown separately by HOV, SOV and total vehicle categories. All traffic figures shown in Figure 4-3 are in thousands. Also, as with all scenarios, evaluation in all analysis years was done assuming the full project configuration was in place. In practice this is not likely to be the case by the year 2005; however, comparable information is provided for all scenarios for purposes of comparison.

The A.M. peak and P.M. peak values represent total period volumes. That is, A.M. peak represents a two-hour period and P.M. peak represents a three-hour period. It also should be kept in mind that during peak periods, all segments generally south of the City Center Connector are assumed to operate in a three/one arrangement, meaning there is significantly more capacity available in the major direction than the minor direction in the managed lanes.

In reviewing the total traffic figures, and in selecting required optimum toll rates, WSA used a general target of approximately 1,500 vehicles per hour per lane as a desirable threshold. This level of traffic would ensure generally free flow conditions in the managed lanes. This would have the following equivalent "period" capacities per direction.

Lanes	A.M. Peak Period	P.M. Peak Period
1	3,000	4,500
2	6,000	9,000
3	9,000	13,500

With a few isolated exceptions, the total traffic on each segment during the respective A.M. peak and P.M. peak periods fall within these target thresholds. There are a few isolated instances where total demand (including HOV and SOV) slightly exceeds these target values, but would still be well below the true capacity limits of the managed lane roadway in all cases. In practice, dynamic pricing adjustments would be made to deal with short-term bottleneck conditions. However, overall the peak period toll rates selected for use in this analysis would effectively manage demand in the vast majority of segments, as shown in Figure 4-3.



2015	HOV	SOV	Total
AM Peak	1.5	0.9	2.4
PM Peak	2.2	0.1	2.3
Total. Wkdy.	8.3	3.2	11.5

2005	HOV	SOV	Total
AM Peak	1.0	1.1	2.1
PM Peak	1.5	0.1	1.6
Total. Wkdy.	5.9	2.4	8.3

2005	HOV	SOV	Total
AM Peak	0.4	0.1	0.5
PM Peak	2.1	0.9	3.0
Total. Wkdy.	5.0	2.1	7.1

2015	HOV	SOV	Total
AM Peak	0.7	0.0	0.7
PM Peak	2.9	0.6	3.5
Total. Wkdy.	7.3	2.3	9.6

2015	HOV	SOV	Total
AM Peak	2.1	1.2	3.3
PM Peak	5.6	0.3	5.9
Total. Wkdy.	17.5	5.5	23.0

2005	HOV	SOV	Total
AM Peak	1.5	1.5	3.0
PM Peak	4.5	0.4	4.9
Total. Wkdy.	13.7	4.3	18.0

2005	HOV	SOV	Total
AM Peak	1.3	0.9	2.2
PM Peak	2.8	1.1	3.9
Total. Wkdy.	8.4	3.9	12.3

2015	HOV	SOV	Total
AM Peak	1.9	0.2	2.1
PM Peak	4.1	0.8	4.9
Total. Wkdy.	12.2	3.9	16.1

2015	HOV	SOV	Total
AM Peak	2.1	1.4	4.5
PM Peak	5.9	0.3	6.2
Total. Wkdy.	19.7	6.2	26.9

2005	HOV	SOV	Total
AM Peak	2.4	2.1	4.5
PM Peak	4.9	0.4	5.3
Total. Wkdy.	15.8	5.3	21.1

2005	HOV	SOV	Total
AM Peak	1.8	0.9	2.7
PM Peak	5.3	1.6	6.9
Total. Wkdy.	15.6	5.1	20.7

2015	HOV	SOV	Total
AM Peak	2.7	0.2	2.9
PM Peak	6.6	0.9	7.5
Total. Wkdy.	20.1	4.6	24.7

2015	HOV	SOV	Total
AM Peak	4.0	1.8	5.8
PM Peak	5.1	0.3	5.4
Total. Wkdy.	19.8	7.1	25.9

2005	HOV	SOV	Total
AM Peak	3.0	2.6	5.6
PM Peak	4.5	0.4	4.9
Total. Wkdy.	16.1	6.2	22.3

2005	HOV	SOV	Total
AM Peak	1.8	0.9	2.7
PM Peak	6.3	2.0	8.3
Total. Wkdy.	17.8	6.2	24.0

2015	HOV	SOV	Total
AM Peak	2.7	0.2	2.9
PM Peak	8.2	1.2	9.4
Total. Wkdy.	23.0	5.8	28.8

2015	HOV	SOV	Total
AM Peak	3.7	1.9	5.6
PM Peak	3.3	0.3	3.6
Total. Wkdy.	16.2	6.9	23.1

2005	HOV	SOV	Total
AM Peak	3.0	2.8	5.8
PM Peak	3.8	0.4	4.2
Total. Wkdy.	14.8	6.4	21.2

2005	HOV	SOV	Total
AM Peak	1.5	0.8	2.3
PM Peak	5.9	2.2	8.1
Total. Wkdy.	15.7	6.5	22.2

2015	HOV	SOV	Total
AM Peak	2.3	0.2	2.5
PM Peak	7.4	1.2	8.6
Total. Wkdy.	20.9	5.9	26.8

2015	HOV	SOV	Total
AM Peak	3.9	2.0	5.9
PM Peak	4.2	0.4	4.6
Total. Wkdy.	18.1	7.7	25.8

2005	HOV	SOV	Total
AM Peak	2.9	3.0	5.9
PM Peak	4.3	0.5	4.8
Total. Wkdy.	15.2	7.2	22.4

2005	HOV	SOV	Total
AM Peak	1.9	1.3	3.2
PM Peak	6.4	2.6	9.0
Total. Wkdy.	17.2	8.2	25.4

2015	HOV	SOV	Total
AM Peak	2.5	0.2	2.7
PM Peak	7.5	1.3	8.8
Total. Wkdy.	21.2	6.3	27.5

2015	HOV	SOV	Total
AM Peak	4.4	2.2	6.6
PM Peak	4.8	0.4	5.2
Total. Wkdy.	19.7	8.0	27.7

2005	HOV	SOV	Total
AM Peak	3.3	3.6	6.9
PM Peak	4.5	0.6	5.1
Total. Wkdy.	16.1	8.0	24.1

2005	HOV	SOV	Total
AM Peak	1.9	1.2	3.1
PM Peak	6.7	2.7	9.4
Total. Wkdy.	18.1	8.4	26.5

2015	HOV	SOV	Total
AM Peak	2.6	0.2	2.8
PM Peak	8.0	1.4	9.4
Total. Wkdy.	22.6	6.4	29.0

2015	HOV	SOV	Total
AM Peak	5.2	2.3	7.5
PM Peak	5.1	0.4	5.5
Total. Wkdy.	21.3	8.1	29.4

2005	HOV	SOV	Total
AM Peak	3.8	3.8	7.6
PM Peak	4.5	0.6	5.1
Total. Wkdy.	17.0	8.4	25.4

2005	HOV	SOV	Total
AM Peak	1.6	0.9	2.5
PM Peak	6.7	2.8	9.5
Total. Wkdy.	17.1	8.2	25.3

2015	HOV	SOV	Total
AM Peak	2.1	0.1	2.2
PM Peak	8.2	1.4	9.6
Total. Wkdy.	21.3	6.3	27.6

2015	HOV	SOV	Total
AM Peak	6.5	2.4	8.9
PM Peak	5.8	0.4	6.2
Total. Wkdy.	26.1	8.2	34.3

2005	HOV	SOV	Total
AM Peak	5.0	4.0	9.0
PM Peak	4.8	0.6	5.4
Total. Wkdy.	20.5	8.7	29.2

2005	HOV	SOV	Total
AM Peak	1.7	0.9	2.6
PM Peak	8.6	3.0	11.6
Total. Wkdy.	20.7	10.4	29.2

2015	HOV	SOV	Total
AM Peak	2.3	0.2	2.5
PM Peak	11.7	1.5	13.2
Total. Wkdy.	27.5	6.9	34.4

2015	HOV	SOV	Total
AM Peak	5.8	2.3	8.1
PM Peak	4.3	0.4	4.7
Total. Wkdy.	22.6	7.5	30.1

2005	HOV	SOV	Total
AM Peak	4.5	3.9	8.4
PM Peak	4.4	0.5	4.9
Total. Wkdy.	18.6	8.1	26.7

2005	HOV	SOV	Total
AM Peak	1.6	0.8	2.4
PM Peak	7.7	2.7	10.4
Total. Wkdy.	18.2	7.3	25.5

2015	HOV	SOV	Total
AM Peak	2.1	0.1	2.2
PM Peak	10.1	1.4	11.5
Total. Wkdy.	23.7	5.9	29.6

2005	HOV	SOV	Total
AM Peak	2.2	0.8	3.0
PM Peak	10.0	2.8	12.8
Total. Wkdy.	24.4	7.4	31.8

2015	HOV	SOV	Total
AM Peak	3.0	0.2	3.2
PM Peak	13.1	1.5	14.6
Total. Wkdy.	31.8	6.1	37.9

2015	HOV	SOV	Total
AM Peak	5.9	2.1	8.0
PM Peak	4.4	0.4	4.8
Total. Wkdy.	23.1	6.6	29.7

2005	HOV	SOV	Total
AM Peak	4.6	3.3	7.9
PM Peak	4.7	0.5	5.2
Total. Wkdy.	19.0	6.9	25.9

2005	HOV	SOV	Total
AM Peak	2.2	0.7	2.9
PM Peak	10.4	2.7	13.1
Total. Wkdy.	25.9	7.3	33.2

2015	HOV	SOV	Total
AM Peak	3.2	0.2	3.4
PM Peak	10.8	1.4	12.2
Total. Wkdy.	31.0	5.8	36.8

In the A.M. peak southbound direction, HOV demand is somewhat lower than in the P.M. peak northbound direction. This permits some additional capacity for SOV traffic. Much less capacity is available to be sold to SOVs in the northbound P.M. condition. It is also interesting to note that as total traffic grows, the SOV traffic in peak periods tends to decline, as less and less capacity is available to be sold. However, on a total weekday basis, SOV traffic does tend to grow; primarily because of an increase in off-peak and shoulder hours (not shown in Figure 4-3).

The peak load points on the managed lanes are generally between Poway Road and Mira Mesa Blvd. in the southbound direction and at the extreme south end of the project in the northbound direction. On a total day basis, total weekday traffic at the south end of the project is estimated at 62,500, of which about 17,600 would be tolled SOV traffic (about 28 percent of the total) and just over 45,000 would be HOV. In the major direction, peak period, SOV traffic would also represent about 28 percent coincidentally. While there is more demand for SOV usage during peak periods, there is less capacity available "to be sold." The SOV demand in peaks is effectively managed by increasing toll rates.

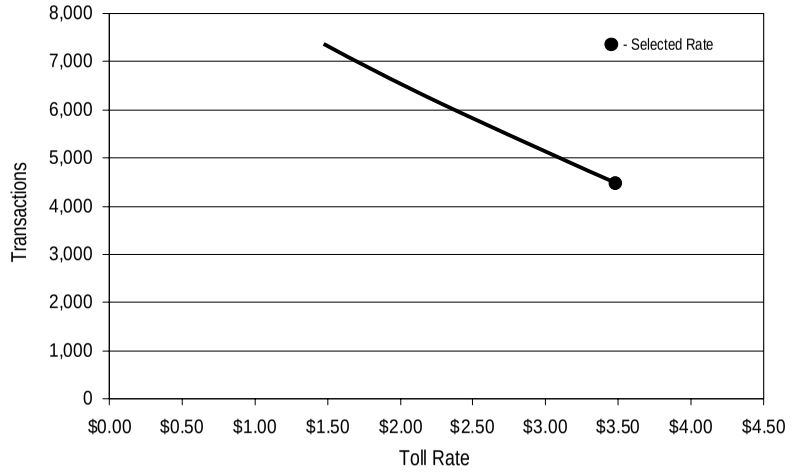
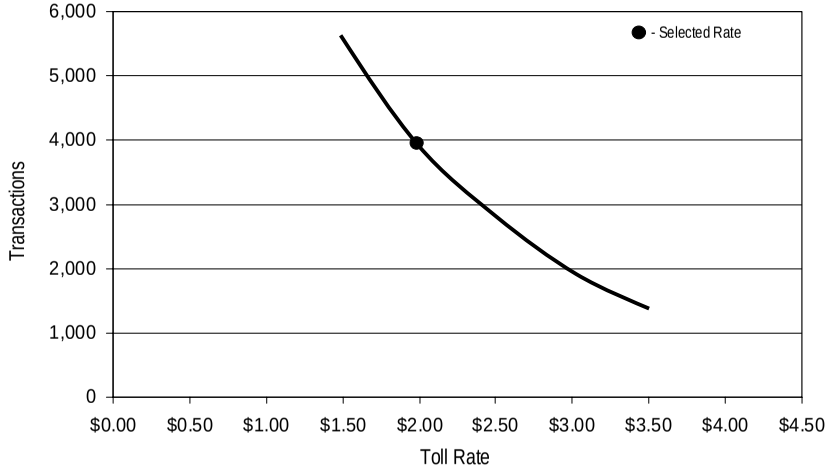
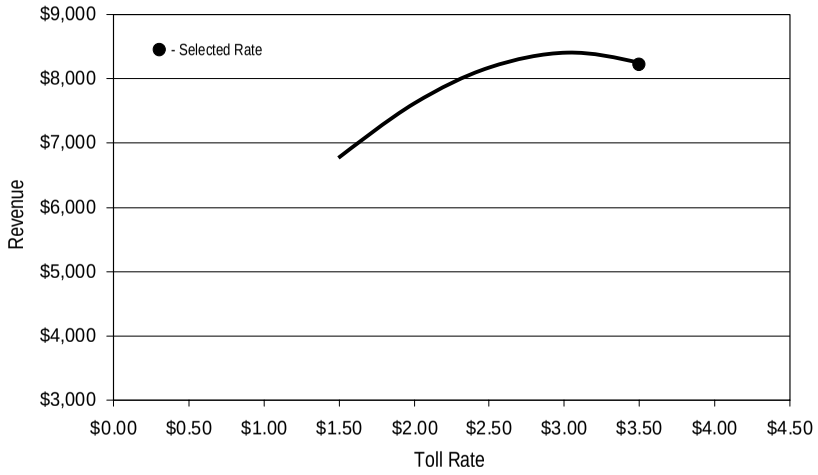
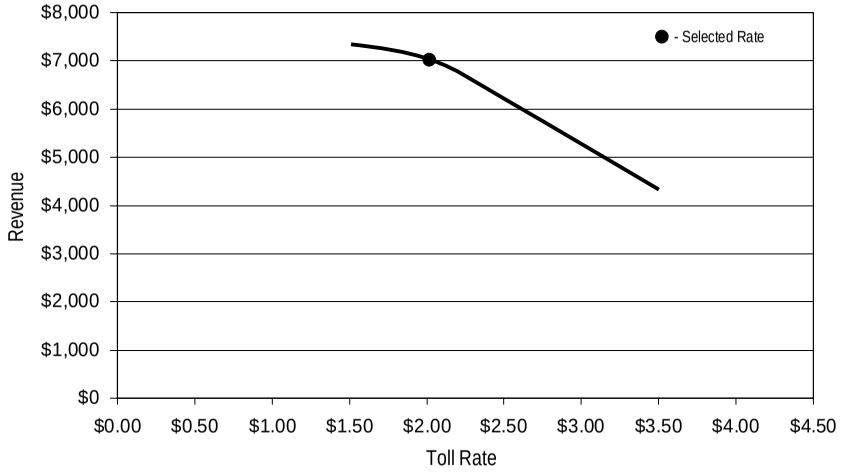
SCENARIO A-2: FLAT TOLLS WITH MAXIMUM LENGTH TRIP

Under Scenario A-2, a flat toll rate would also be used. However, in this case, the toll rate would be different, depending on specific point of entry. At any given moment, the flat toll to enter the managed lanes would be based on the maximum length of trip that could be made from each point of entry. For example, in the southbound direction, the flat toll to enter at Hale Avenue would be much higher than the flat toll to enter at Ted Williams Parkway, since the maximum length of trip on the managed lanes would be much shorter from Ted Williams Parkway.

TOLL RATE SENSITIVITY ANALYSIS

The peak period toll sensitivity curves for Scenario A-2 are shown in Figure 4-4. In this case, the toll rates shown represent the maximum flat rate (the longest distance trip); flat toll rates for less than full-length trips would actually be lower than the values shown on the graph scale.

Under this case, the maximum flat rate toll needed to effectively manage demand in the A.M. peak southbound direction was the highest rate level tested, $3.50. As shown in Figure 4-4, this results in toll revenue which is slightly below the maximum point on the curve; again, in selecting the optimum toll rate, priority was always given to demand management

	A.M. Peak - Southbound	P.M.. Peak - Northbound
Period Transactions		
Period Revenue		

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PEAK PERIOD TOLL SENSITIVITY CURVES - SCENARIO A-2
2005 LEVELS

FIGURE 4-4

requirements. In the northbound P.M. peak period, however, the maximum flat rate of $2.00 was found to be sufficient, comparable to that found for Scenario A-1.

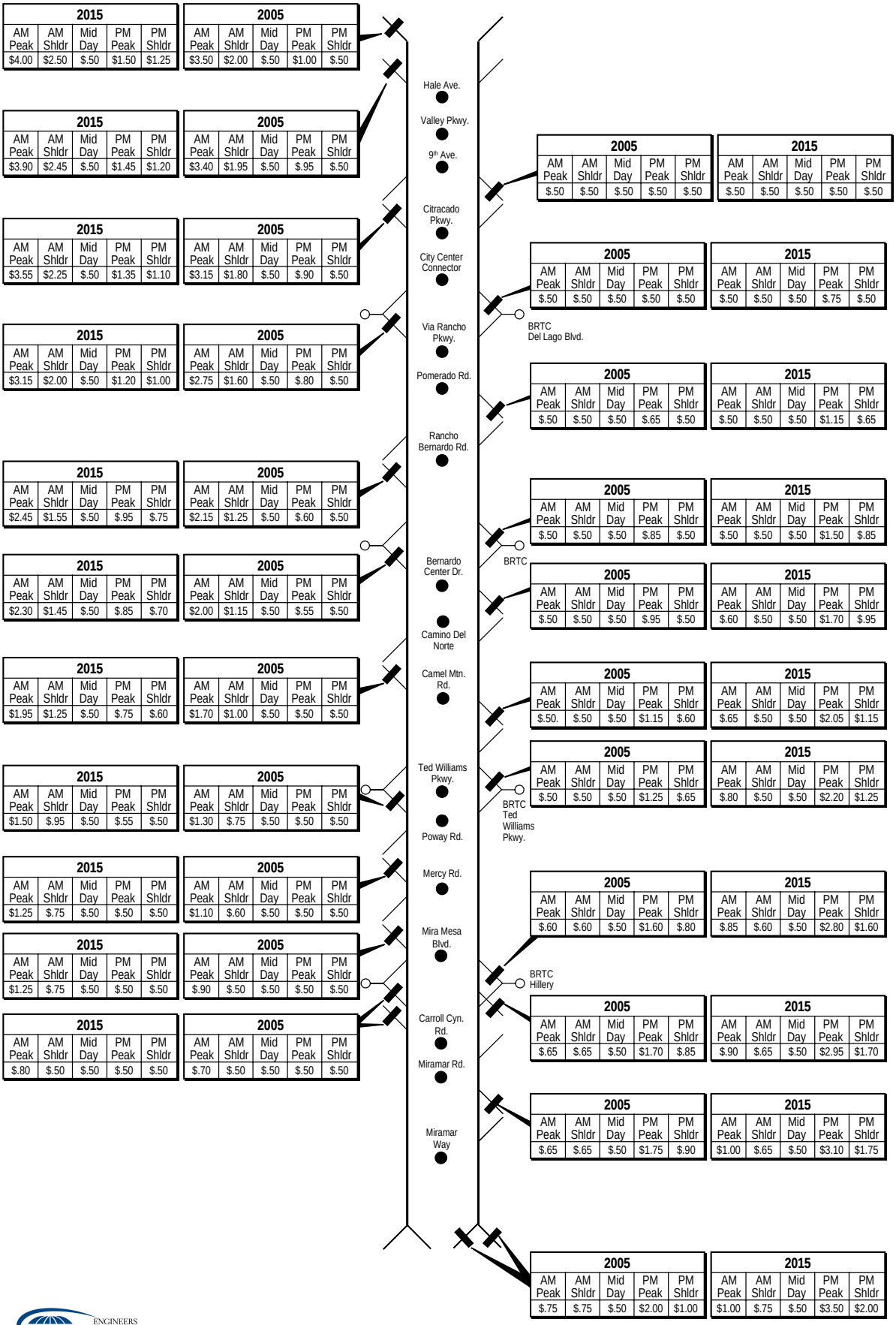
This apparent inconsistency between southbound and northbound optimum tolls can actually be explained by the relative areas of congestion on the managed lanes project with the heaviest demand typically found at the south end of the project. Under Scenario A-2, to effectively manage demand in the southern portion of the project, while still using the graduated flat toll approach, requires the toll for the maximum length trip to be much higher. In the P.M. northbound direction, the maximum length trips begin in the congested areas; and the graduated rates (lower levels) occur in the less congested portions of the project corridor. This phenomena may point to a potential weakness in the graduated flat rate scheme; in essence it tends to reward motorists for making shorter trips; which may encourage increased usage in the most congested portions of the project.

Since the toll rate by period would vary by point of entry under Scenario A-2, the optimum tolls by period for this scenario are shown in Figure 4-5. In the A.M. peak southbound direction, for example, the maximum toll would be assessed to motorists entering at the north end of the project, $3.50. The optimum toll for traffic entering near the mid point, such as Ted Williams Parkway would be just $1.30, and the rate to enter the south end would be $0.70.

Lower rates, of course, would be required during off-peak hours or in the off-peak travel direction. The minimum flat rate used was $0.50; hence, the flat rates during off-peak hours may not be “graduated” in some cases. Optimum midday rates, for example, in both travel directions were found to be $0.40 for any length trip.

It would be possible to use some form of graduated rate structure, but not to the extreme shown in Figure 4-5. The rates shown reflect a per-mile equivalent to the maximum length trip for each of the progressively shorter possible trips. The rate structure could, by contrast, be graduated less; for example, with tolls ranging from $3.50 to, say, $2.00 at the south end of the project. However, for purposes of this analysis, an equivalent per-mile rate was used in determining the graduated rate structure.

As might be expected, optimum tolls tend to increase between 2005 and 2015. It should be kept in mind that all toll rates shown in Figure 4-5 are



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TOLL RATE LEVELS - SCENARIO A-2

FIGURE 4-5

in 2001 levels; that is the future year rates would actually be higher, particularly in 2015, than those values shown.

ESTIMATED WEEKDAY TRAFFIC

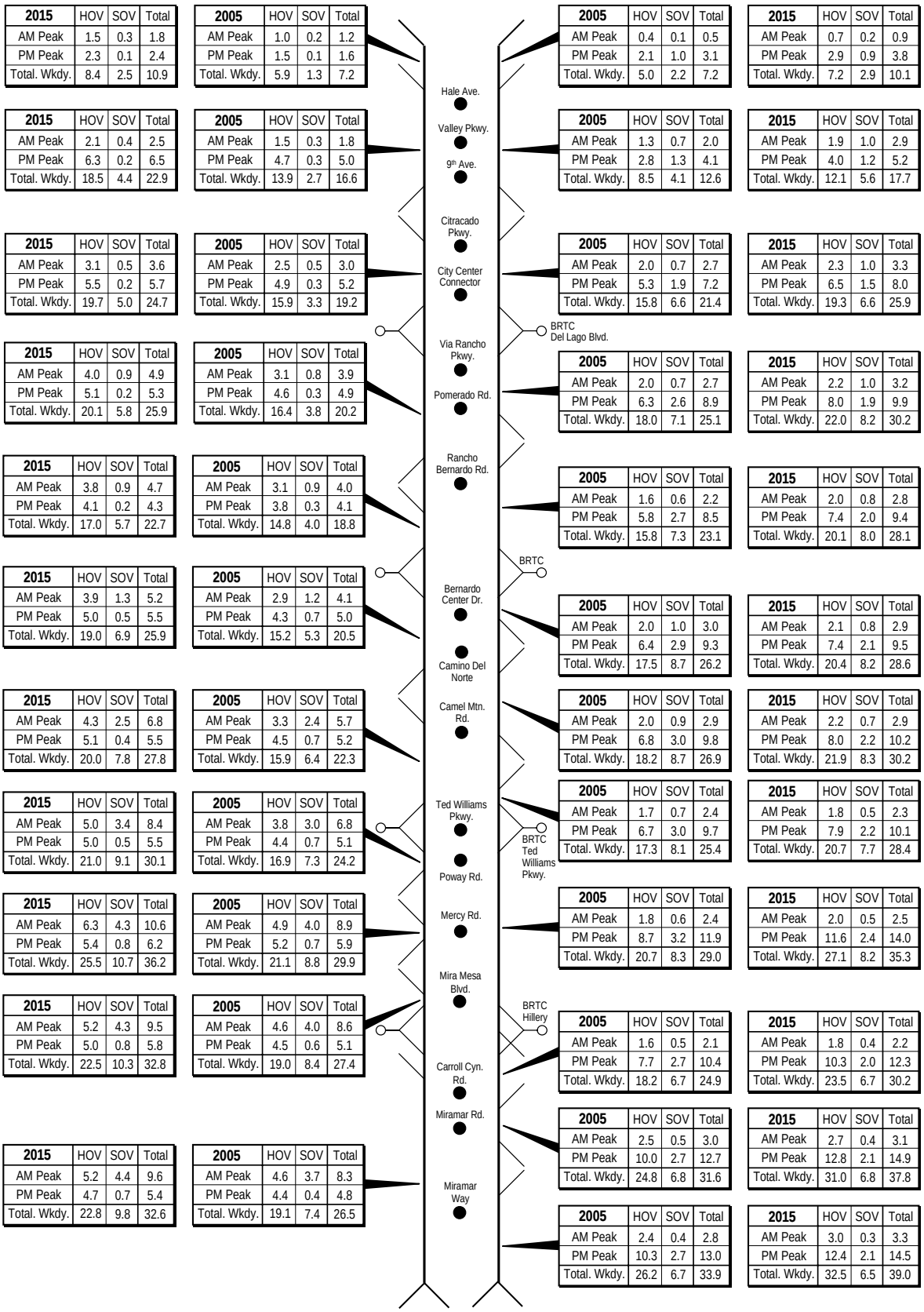
Figure 4-6 shows estimated peak period and weekday traffic, by HOV and SOV categories, in the managed lanes for Scenario A-2. While overall traffic levels are fairly similar to those in Scenario A-1, southbound SOV traffic in the northern portions of the project tend to be considerably lower. This is due to the fact that a higher toll is charged to vehicles entering in these sections of the road, under the graduated flat rate program, to permit sufficient levels of demand management at the south end of the road. SOV traffic at the south end of the project is largely similar to Scenario A-1.

As with the previous figures, the A.M. peak period values represent two hours and the P.M. peak values represent three hours. Again, there are a few isolated cases where total traffic demand in the managed lanes (HOV plus SOV) slightly exceeds the targeted capacity; but in general does not go above 1,600 vehicles per hour per lane. The slight overloads generally occur in 2015 and would, in practice, be able to be dealt with through the dynamic pricing strategies.

SCENARIO B-1: PER-MILE TOLLS

Under Scenario B-1, the toll rate charged at any given time would be based on the distance traveled within the managed lanes. For purposes of this analysis, Scenario B-1 assumed a straight per-mile rate for all travel segments, at any given time of entry. It is recognized that the toll rate level itself expressed on a per-mile basis, may well change "dynamically" from time to time. However, in this analysis, WSA tested a range of per-mile rates for each analysis interval, to determine optimum level.

The optimum per-mile rate would likely be different by travel direction, at any given time. However, the same per-mile rate would be in effect regardless of point of entry, under Scenario B-1. Also, it is assumed that the toll for a given motorist would be based on the per-mile rate that was displayed at the time the vehicle entered the managed lanes, even if the nominal per-mile rate changes while a given trip in the managed lanes is in progress.


2015 HOV SOV Total
AM Peak 1.5 0.3 1.8
PM Peak 2.3 0.1 2.4
Total. Wkdy. 8.4 2.5 10.9
2005 HOV SOV Total
AM Peak 1.0 0.2 1.2
PM Peak 1.5 0.1 1.6
Total. Wkdy. 5.9 1.3 7.2
2005 HOV SOV Total
AM Peak 0.4 0.1 0.5
PM Peak 2.1 1.0 3.1
Total. Wkdy. 5.0 2.2 7.2
2015 HOV SOV Total
AM Peak 0.7 0.2 0.9
PM Peak 2.9 0.9 3.8
Total. Wkdy. 7.2 2.9 10.1
Hale Ave.
2015 HOV SOV Total
AM Peak 2.1 0.4 2.5
PM Peak 6.3 0.2 6.5
Total. Wkdy. 18.5 4.4 22.9
2005 HOV SOV Total
AM Peak 1.5 0.3 1.8
PM Peak 4.7 0.3 5.0
Total. Wkdy. 13.9 2.7 16.6
2005 HOV SOV Total
AM Peak 1.3 0.7 2.0
PM Peak 2.8 1.3 4.1
Total. Wkdy. 8.5 4.1 12.6
2015 HOV SOV Total
AM Peak 1.9 1.0 2.9
PM Peak 4.0 1.2 5.2
Total. Wkdy. 12.1 5.6 17.7
Valley Pkwy.
9th Ave.
2015 HOV SOV Total
AM Peak 3.1 0.5 3.6
PM Peak 5.5 0.2 5.7
Total. Wkdy. 19.7 5.0 24.7
2005 HOV SOV Total
AM Peak 2.5 0.5 3.0
PM Peak 4.9 0.3 5.2
Total. Wkdy. 15.9 3.3 19.2
2005 HOV SOV Total
AM Peak 2.0 0.7 2.7
PM Peak 5.3 1.9 7.2
Total. Wkdy. 15.8 6.6 21.4
2015 HOV SOV Total
AM Peak 2.3 1.0 3.3
PM Peak 6.5 1.5 8.0
Total. Wkdy. 19.3 6.6 25.9
Citracado Pkwy.
City Center Connector
BRTC Del Lago Blvd.
2015 HOV SOV Total
AM Peak 4.0 0.9 4.9
PM Peak 5.1 0.2 5.3
Total. Wkdy. 20.1 5.8 25.9
2005 HOV SOV Total
AM Peak 3.1 0.8 3.9
PM Peak 4.6 0.3 4.9
Total. Wkdy. 16.4 3.8 20.2
2005 HOV SOV Total
AM Peak 2.0 0.7 2.7
PM Peak 6.3 2.6 8.9
Total. Wkdy. 18.0 7.1 25.1
2015 HOV SOV Total
AM Peak 2.2 1.0 3.2
PM Peak 8.0 1.9 9.9
Total. Wkdy. 22.0 8.2 30.2
Via Rancho Pkwy.
Pomerado Rd.
2015 HOV SOV Total
AM Peak 3.8 0.9 4.7
PM Peak 4.1 0.2 4.3
Total. Wkdy. 17.0 5.7 22.7
2005 HOV SOV Total
AM Peak 3.1 0.9 4.0
PM Peak 3.8 0.3 4.1
Total. Wkdy. 14.8 4.0 18.8
2005 HOV SOV Total
AM Peak 1.6 0.6 2.2
PM Peak 5.8 2.7 8.5
Total. Wkdy. 15.8 7.3 23.1
2015 HOV SOV Total
AM Peak 2.0 0.8 2.8
PM Peak 7.4 2.0 9.4
Total. Wkdy. 20.1 8.0 28.1
Rancho Bernardo Rd.
BRTC
2015 HOV SOV Total
AM Peak 3.9 1.3 5.2
PM Peak 5.0 0.5 5.5
Total. Wkdy. 19.0 6.9 25.9
2005 HOV SOV Total
AM Peak 2.9 1.2 4.1
PM Peak 4.3 0.7 5.0
Total. Wkdy. 15.2 5.3 20.5
2005 HOV SOV Total
AM Peak 2.0 1.0 3.0
PM Peak 6.4 2.9 9.3
Total. Wkdy. 17.5 8.7 26.2
2015 HOV SOV Total
AM Peak 2.1 0.8 2.9
PM Peak 7.4 2.1 9.5
Total. Wkdy. 20.4 8.2 28.6
Bernardo Center Dr.
Camino Del Norte
2015 HOV SOV Total
AM Peak 4.3 2.5 6.8
PM Peak 5.1 0.4 5.5
Total. Wkdy. 20.0 7.8 27.8
2005 HOV SOV Total
AM Peak 3.3 2.4 5.7
PM Peak 4.5 0.7 5.2
Total. Wkdy. 15.9 6.4 22.3
2005 HOV SOV Total
AM Peak 2.0 0.9 2.9
PM Peak 6.8 3.0 9.8
Total. Wkdy. 18.2 8.7 26.9
2015 HOV SOV Total
AM Peak 2.2 0.7 2.9
PM Peak 8.0 2.2 10.2
Total. Wkdy. 21.9 8.3 30.2
Camel Mtn. Rd.
2015 HOV SOV Total
AM Peak 5.0 3.4 8.4
PM Peak 5.0 0.5 5.5
Total. Wkdy. 21.0 9.1 30.1
2005 HOV SOV Total
AM Peak 3.8 3.0 6.8
PM Peak 4.4 0.7 5.1
Total. Wkdy. 16.9 7.3 24.2
2005 HOV SOV Total
AM Peak 1.7 0.7 2.4
PM Peak 6.7 3.0 9.7
Total. Wkdy. 17.3 8.1 25.4
2015 HOV SOV Total
AM Peak 1.8 0.5 2.3
PM Peak 7.9 2.2 10.1
Total. Wkdy. 20.7 7.7 28.4
Ted Williams Pkwy.
BRTC Ted Williams Pkwy.
Poway Rd.
2015 HOV SOV Total
AM Peak 6.3 4.3 10.6
PM Peak 5.4 0.8 6.2
Total. Wkdy. 25.5 10.7 36.2
2005 HOV SOV Total
AM Peak 4.9 4.0 8.9
PM Peak 5.2 0.7 5.9
Total. Wkdy. 21.1 8.8 29.9
2005 HOV SOV Total
AM Peak 1.8 0.6 2.4
PM Peak 8.7 3.2 11.9
Total. Wkdy. 20.7 8.3 29.0
2015 HOV SOV Total
AM Peak 2.0 0.5 2.5
PM Peak 11.6 2.4 14.0
Total. Wkdy. 27.1 8.2 35.3
Mercy Rd.
Mira Mesa Blvd.
2015 HOV SOV Total
AM Peak 5.2 4.3 9.5
PM Peak 5.0 0.8 5.8
Total. Wkdy. 22.5 10.3 32.8
2005 HOV SOV Total
AM Peak 4.6 4.0 8.6
PM Peak 4.5 0.6 5.1
Total. Wkdy. 19.0 8.4 27.4
2005 HOV SOV Total
AM Peak 1.6 0.5 2.1
PM Peak 7.7 2.7 10.4
Total. Wkdy. 18.2 6.7 24.9
2015 HOV SOV Total
AM Peak 1.8 0.4 2.2
PM Peak 10.3 2.0 12.3
Total. Wkdy. 23.5 6.7 30.2
BRTC Hillery
Carroll Cyn. Rd.
Miramar Rd.
2015 HOV SOV Total
AM Peak 5.2 4.4 9.6
PM Peak 4.7 0.7 5.4
Total. Wkdy. 22.8 9.8 32.6
2005 HOV SOV Total
AM Peak 4.6 3.7 8.3
PM Peak 4.4 0.4 4.8
Total. Wkdy. 19.1 7.4 26.5
2005 HOV SOV Total
AM Peak 2.5 0.5 3.0
PM Peak 10.0 2.7 12.7
Total. Wkdy. 24.8 6.8 31.6
2015 HOV SOV Total
AM Peak 2.7 0.4 3.1
PM Peak 12.8 2.1 14.9
Total. Wkdy. 31.0 6.8 37.8
Miramar Way
2005 HOV SOV Total
AM Peak 2.4 0.4 2.8
PM Peak 10.3 2.7 13.0
Total. Wkdy. 26.2 6.7 33.9
2015 HOV SOV Total
AM Peak 3.0 0.3 3.3
PM Peak 12.4 2.1 14.5
Total. Wkdy. 32.5 6.5 39.0

TOLL SENSITIVITY ANALYSIS

The results of the toll sensitivity analysis for Scenario B-1 are shown in Figure 4-7. In this case, the toll rates represent the rate per-mile of travel in the managed lanes, not a fixed flat toll rate as with the Scenarios A-1 and A-2 cases. Again, the figure shows peak period major direction rate sensitivity; a similar analysis was done for other time periods for this scenario although not shown in Figure 4-7.

In the A.M. peak southbound direction, the optimum toll at 2005 levels was found to be $0.20 per mile. This would be sufficient for demand management and would optimize revenue.

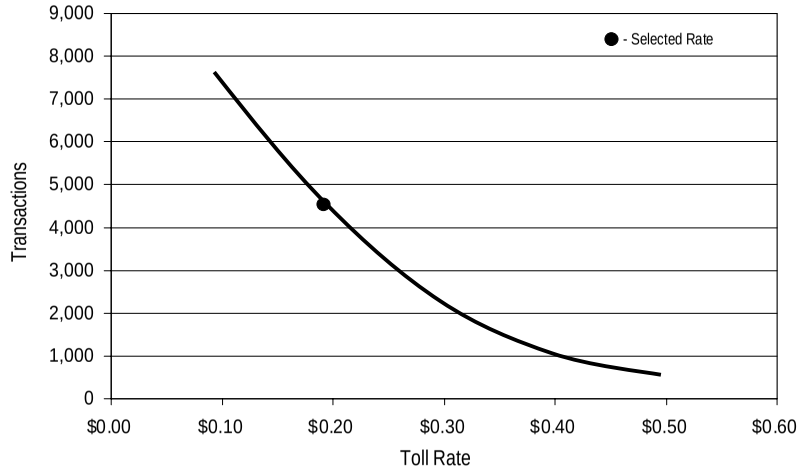
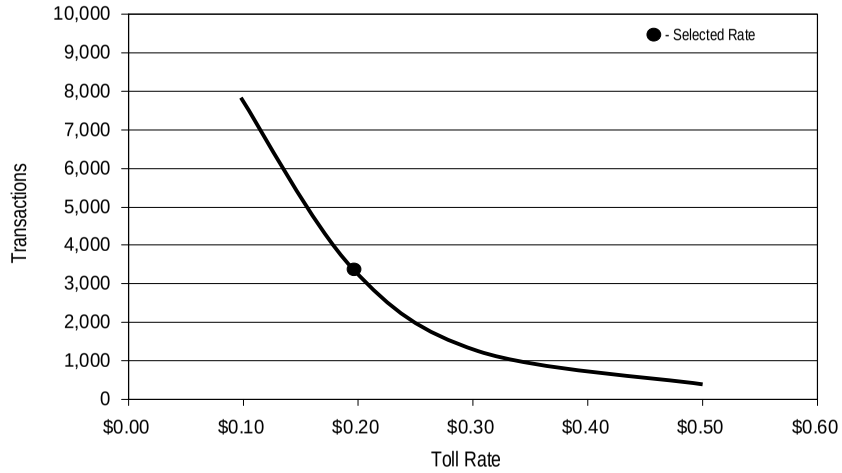
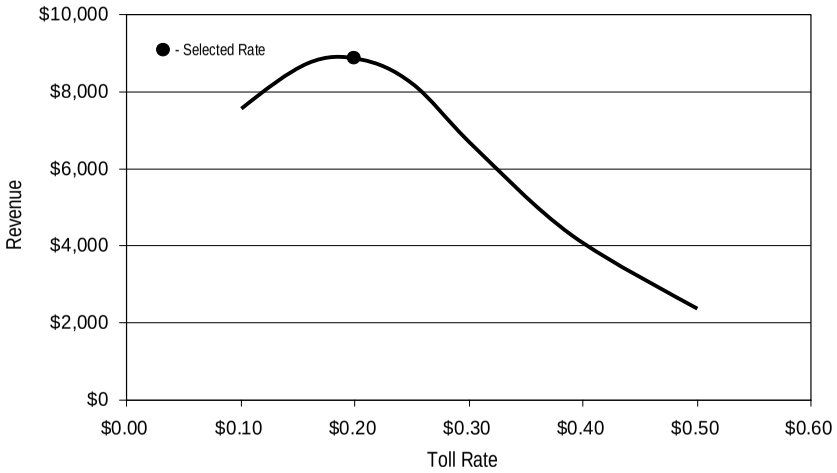
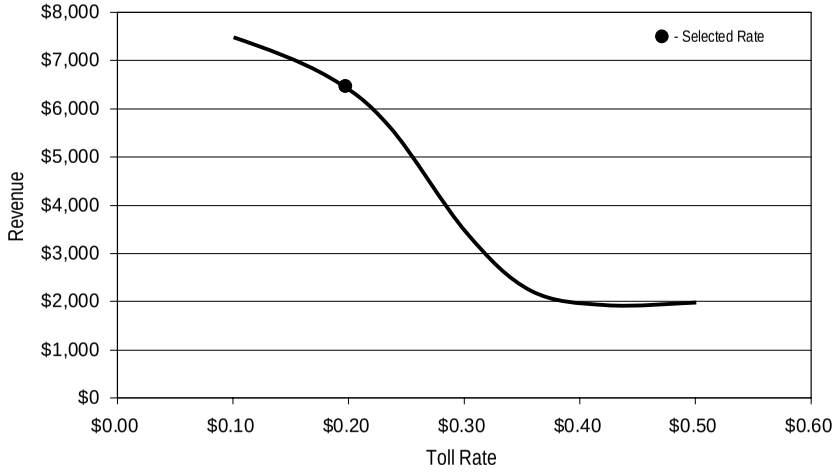
The same optimum rate per mile was found in the P.M. peak northbound direction. However, in this case, that toll rate would produce less revenue than a lower toll rate, but would be required to effectively manage demand.

The selected rates by time period for Scenario B-1 are shown in Table 4-2. Under Scenario B-1, in addition to a per-mile rate, a minimum and maximum toll would also be established. As noted previously, the minimum toll in each case is computed based on a nominal 5-mile trip while the maximum toll is based on a nominal 15-mile trip.

In the southbound direction, for example, the optimum morning peak period toll would be $0.20 per mile, with a minimum of $1.00 and a maximum of $3.00. However, in the midday off-peak hours, the optimum toll would drop to just $0.05 per mile, with a minimum toll of $0.25 and a maximum toll of $0.75.

In general, optimum tolls tend to increase, in real terms, over the years. By 2015, the optimum major direction peak period rate is increased to $0.40 per mile, with a minimum toll of $2.00 and a maximum toll of $6.00. Interestingly, the same high tolls are required in both directions during the P.M. peak. This is due to the fact that with the assumed three/one split of managed lane capacity, by 2015 there is very little available capacity for SOV traffic in the P.M. peak period in either travel direction.

It also should be kept in mind that all figures shown in Table 4-2 are in year 2001 levels. To achieve the same level of demand management, actual rates in the future year would have to be adjusted to reflect inflation.

	A.M. Peak - Southbound	P.M.. Peak - Northbound
Period Transactions		
Period Revenue		

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PEAK PERIOD TOLL SENSITIVITY CURVES - SCENARIO B-1
2005 LEVELS

FIGURE 4-7

Table 4-2
Toll Rate Levels - Scenario B-1

Year/Period	Southbound			Northbound		
	Per-Mile	Minimum	Maximum	Per-Mile	Minimum	Maximum
2005						
A.M. Peak	$0.20	$1.00	$3.00	$0.10	$0.50	$1.50
A.M. Shoulder	0.10	0.50	1.50	0.10	0.50	1.50
Mid-Day	0.05	0.25	0.75	0.05	0.25	0.75
P.M. Shoulder	0.10	0.50	1.50	0.10	0.50	1.50
P.M. Peak	0.20	1.00	3.00	0.20	1.00	3.00
P.M. Shoulder	0.10	0.50	1.50	0.10	0.50	1.50
2010						
A.M. Peak	$0.30	$1.50	$4.50	$0.20	$1.00	$3.00
A.M. Shoulder	0.20	1.00	3.00	0.10	0.50	1.50
Mid-Day	0.05	0.25	0.75	0.05	0.25	0.75
P.M. Shoulder	0.20	1.00	3.00	0.20	1.00	3.00
P.M. Peak	0.30	1.50	4.50	0.30	1.50	4.50
P.M. Shoulder	0.20	1.00	3.00	0.20	1.00	3.00
2015						
A.M. Peak	$0.30	$1.50	$4.50	$0.20	$1.00	$3.00
A.M. Shoulder	0.20	1.00	3.00	0.10	0.50	1.50
Mid-Day	0.05	0.25	0.75	0.05	0.25	0.75
P.M. Shoulder	0.20	1.00	3.00	0.20	1.00	3.00
P.M. Peak	0.40	2.00	6.00	0.40	2.00	6.00
P.M. Shoulder	0.20	1.00	3.00	0.20	1.00	3.00

Note: All Toll Rates in 2001 Dollars

ESTIMATED WEEKDAY TRAFFIC

Peak period and total weekday traffic estimates in the managed lanes under Scenario B-1 are shown in Figure 4-8. Again, the estimates are shown separately by HOV and SOV components. In comparison with the basic flat toll arrangement, SOV traffic under Scenario B-1 tends to be lower at the northernmost portions of the project and slightly higher at the southern end. This is due to the fact that toll rates for shorter trips are considerably lower under Scenario B-1 while toll rates for longer trips are higher, since they are mileage based. This tends to result in higher traffic in the more congested southern portions of the managed lanes and lower long-distance traffic traveling the full length of the project.

As with prior scenarios, the available capacity to be sold to SOV traffic tends to be lower in 2015 than in 2005. The management of this demand is achieved through higher toll rates, which will generate comparable, or perhaps higher toll revenues, with much lower traffic.

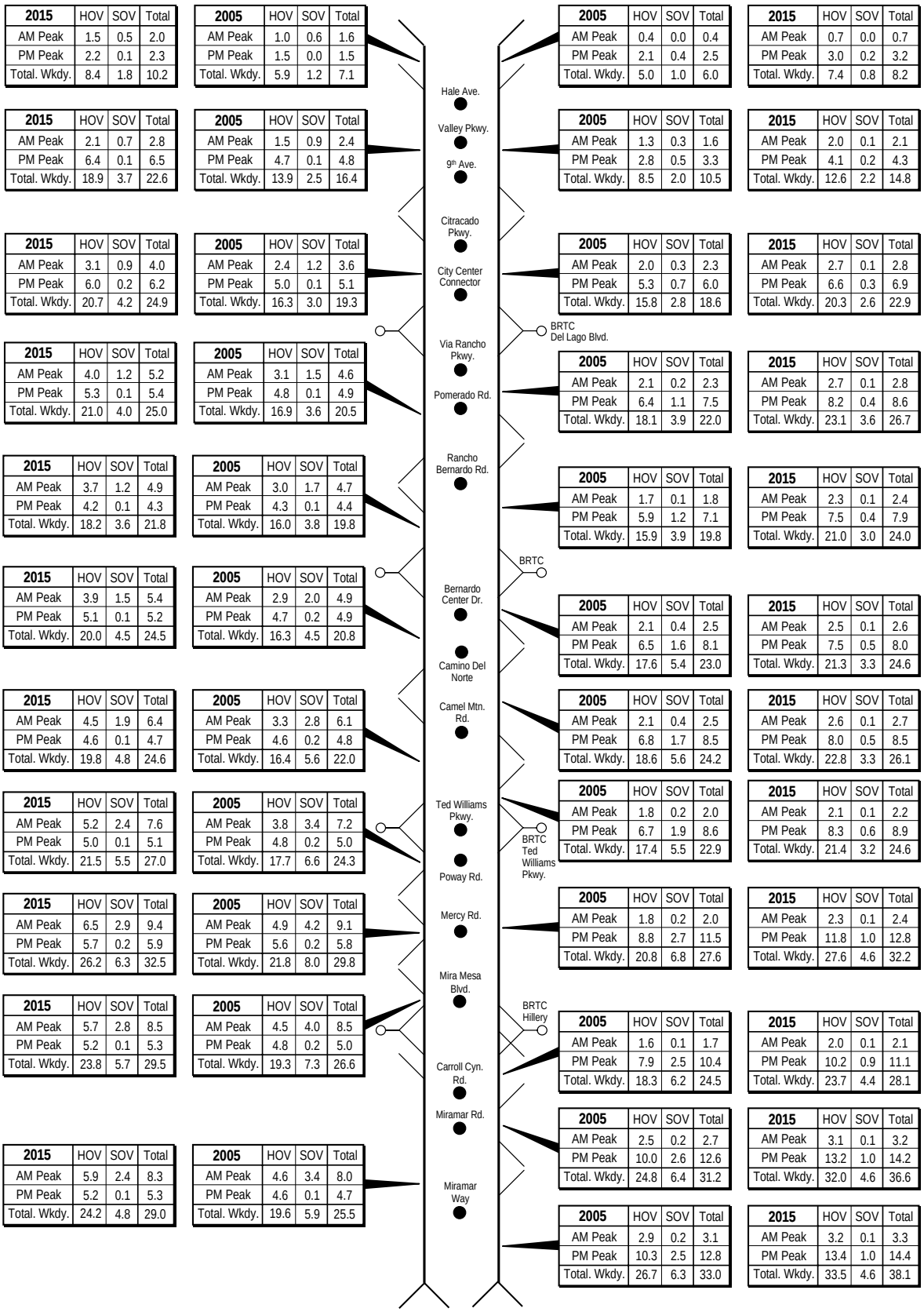
SCENARIO B-2: SKEWED PER-MILE TOLLS

Under this scenario, per-mile toll rates would be used; but the rate per mile at any given time would be potentially different depending on the point of entry. The intent of this "skewing" of the per-mile rates would be to more effectively manage demand in the more congested sections. One of the problems, for example, with the straight per-mile toll rate plan studied under Scenario B-1, was that it would actually encourage short-distance trips particularly at the more congested south end of the project. By charging a higher per-mile rate for traffic entering in the south end of the project, for example, it would be possible to provide increased disincentive for short-distance trips and, to some extent, increased incentive for longer-distance trips.

TOLL SENSITIVITY ANALYSIS

The toll sensitivity curves for this scenario are shown in Figure 4-9. Since the toll rates themselves vary by point of access, the horizontal access of each graph is simply depicted in the form of toll rate "levels." The higher the rate level, the higher the overall toll rates tested, even though the per-mile rates would still be skewed based on actual point of entry.

As shown in Figure 4-9, in the A.M. peak southbound direction, toll rate level 2 was found to provide sufficient demand management to ensure a reasonable level of service in the managed lanes. This was found to produce slightly less than maximum toll revenue.



2015	HOV	SOV	Total
AM Peak	1.5	0.5	2.0
PM Peak	2.2	0.1	2.3
Total. Wkdy.	8.4	1.8	10.2

2005	HOV	SOV	Total
AM Peak	1.0	0.6	1.6
PM Peak	1.5	0.0	1.5
Total. Wkdy.	5.9	1.2	7.1

2005	HOV	SOV	Total
AM Peak	0.4	0.0	0.4
PM Peak	2.1	0.4	2.5
Total. Wkdy.	5.0	1.0	6.0

2015	HOV	SOV	Total
AM Peak	0.7	0.0	0.7
PM Peak	3.0	0.2	3.2
Total. Wkdy.	7.4	0.8	8.2

2015	HOV	SOV	Total
AM Peak	2.1	0.7	2.8
PM Peak	6.4	0.1	6.5
Total. Wkdy.	18.9	3.7	22.6

2005	HOV	SOV	Total
AM Peak	1.5	0.9	2.4
PM Peak	4.7	0.1	4.8
Total. Wkdy.	13.9	2.5	16.4

2005	HOV	SOV	Total
AM Peak	1.3	0.3	1.6
PM Peak	2.8	0.5	3.3
Total. Wkdy.	8.5	2.0	10.5

2015	HOV	SOV	Total
AM Peak	2.0	0.1	2.1
PM Peak	4.1	0.2	4.3
Total. Wkdy.	12.6	2.2	14.8

2015	HOV	SOV	Total
AM Peak	3.1	0.9	4.0
PM Peak	6.0	0.2	6.2
Total. Wkdy.	20.7	4.2	24.9

2005	HOV	SOV	Total
AM Peak	2.4	1.2	3.6
PM Peak	5.0	0.1	5.1
Total. Wkdy.	16.3	3.0	19.3

2005	HOV	SOV	Total
AM Peak	2.0	0.3	2.3
PM Peak	5.3	0.7	6.0
Total. Wkdy.	15.8	2.8	18.6

2015	HOV	SOV	Total
AM Peak	2.7	0.1	2.8
PM Peak	6.6	0.3	6.9
Total. Wkdy.	20.3	2.6	22.9

2015	HOV	SOV	Total
AM Peak	4.0	1.2	5.2
PM Peak	5.3	0.1	5.4
Total. Wkdy.	21.0	4.0	25.0

2005	HOV	SOV	Total
AM Peak	3.1	1.5	4.6
PM Peak	4.8	0.1	4.9
Total. Wkdy.	16.9	3.6	20.5

2005	HOV	SOV	Total
AM Peak	2.1	0.2	2.3
PM Peak	6.4	1.1	7.5
Total. Wkdy.	18.1	3.9	22.0

2015	HOV	SOV	Total
AM Peak	2.7	0.1	2.8
PM Peak	8.2	0.4	8.6
Total. Wkdy.	23.1	3.6	26.7

2015	HOV	SOV	Total
AM Peak	3.7	1.2	4.9
PM Peak	4.2	0.1	4.3
Total. Wkdy.	18.2	3.6	21.8

2005	HOV	SOV	Total
AM Peak	3.0	1.7	4.7
PM Peak	4.3	0.1	4.4
Total. Wkdy.	16.0	3.8	19.8

2005	HOV	SOV	Total
AM Peak	1.7	0.1	1.8
PM Peak	5.9	1.2	7.1
Total. Wkdy.	15.9	3.9	19.8

2015	HOV	SOV	Total
AM Peak	2.3	0.1	2.4
PM Peak	7.5	0.4	7.9
Total. Wkdy.	21.0	3.0	24.0

2015	HOV	SOV	Total
AM Peak	3.9	1.5	5.4
PM Peak	5.1	0.1	5.2
Total. Wkdy.	20.0	4.5	24.5

2005	HOV	SOV	Total
AM Peak	2.9	2.0	4.9
PM Peak	4.7	0.2	4.9
Total. Wkdy.	16.3	4.5	20.8

2005	HOV	SOV	Total
AM Peak	2.1	0.4	2.5
PM Peak	6.5	1.6	8.1
Total. Wkdy.	17.6	5.4	23.0

2015	HOV	SOV	Total
AM Peak	2.5	0.1	2.6
PM Peak	7.5	0.5	8.0
Total. Wkdy.	21.3	3.3	24.6

2015	HOV	SOV	Total
AM Peak	4.5	1.9	6.4
PM Peak	4.6	0.1	4.7
Total. Wkdy.	19.8	4.8	24.6

2005	HOV	SOV	Total
AM Peak	3.3	2.8	6.1
PM Peak	4.6	0.2	4.8
Total. Wkdy.	16.4	5.6	22.0

2005	HOV	SOV	Total
AM Peak	2.1	0.4	2.5
PM Peak	6.8	1.7	8.5
Total. Wkdy.	18.6	5.6	24.2

2015	HOV	SOV	Total
AM Peak	2.6	0.1	2.7
PM Peak	8.0	0.5	8.5
Total. Wkdy.	22.8	3.3	26.1

2015	HOV	SOV	Total
AM Peak	5.2	2.4	7.6
PM Peak	5.0	0.1	5.1
Total. Wkdy.	21.5	5.5	27.0

2005	HOV	SOV	Total
AM Peak	3.8	3.4	7.2
PM Peak	4.8	0.2	5.0
Total. Wkdy.	17.7	6.6	24.3

2005	HOV	SOV	Total
AM Peak	1.8	0.2	2.0
PM Peak	6.7	1.9	8.6
Total. Wkdy.	17.4	5.5	22.9

2015	HOV	SOV	Total
AM Peak	2.1	0.1	2.2
PM Peak	8.3	0.6	8.9
Total. Wkdy.	21.4	3.2	24.6

2015	HOV	SOV	Total
AM Peak	6.5	2.9	9.4
PM Peak	5.7	0.2	5.9
Total. Wkdy.	26.2	6.3	32.5

2005	HOV	SOV	Total
AM Peak	4.9	4.2	9.1
PM Peak	5.6	0.2	5.8
Total. Wkdy.	21.8	8.0	29.8

2005	HOV	SOV	Total
AM Peak	1.8	0.2	2.0
PM Peak	8.8	2.7	11.5
Total. Wkdy.	20.8	6.8	27.6

2015	HOV	SOV	Total
AM Peak	2.3	0.1	2.4
PM Peak	11.8	1.0	12.8
Total. Wkdy.	27.6	4.6	32.2

2015	HOV	SOV	Total
AM Peak	5.7	2.8	8.5
PM Peak	5.2	0.1	5.3
Total. Wkdy.	23.8	5.7	29.5

2005	HOV	SOV	Total
AM Peak	4.5	4.0	8.5
PM Peak	4.8	0.2	5.0
Total. Wkdy.	19.3	7.3	26.6

2005	HOV	SOV	Total
AM Peak	1.6	0.1	1.7
PM Peak	7.9	2.5	10.4
Total. Wkdy.	18.3	6.2	24.5

2015	HOV	SOV	Total
AM Peak	2.0	0.1	2.1
PM Peak	10.2	0.9	11.1
Total. Wkdy.	23.7	4.4	28.1

2005	HOV	SOV	Total
AM Peak	2.5	0.2	2.7
PM Peak	10.0	2.6	12.6
Total. Wkdy.	24.8	6.4	31.2

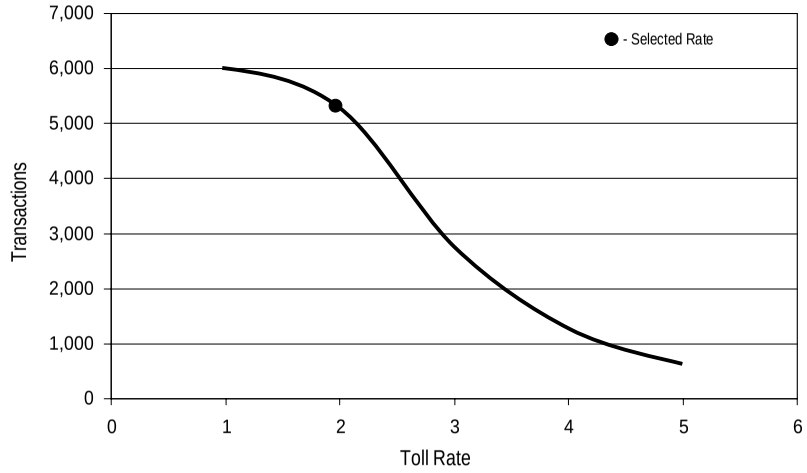
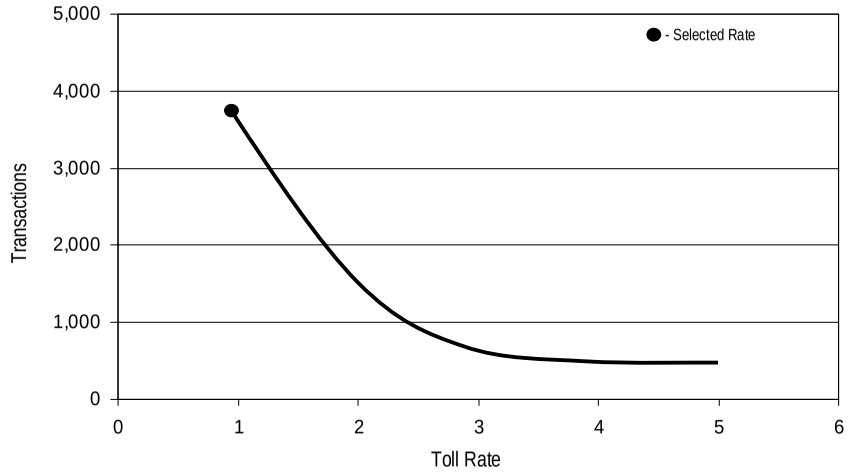
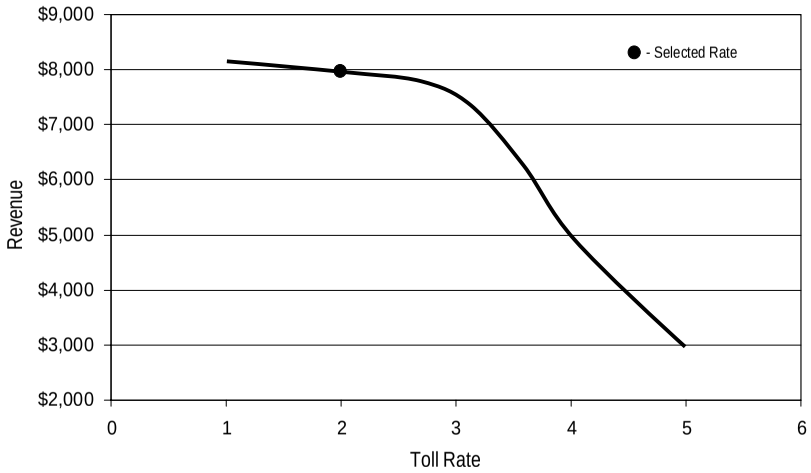
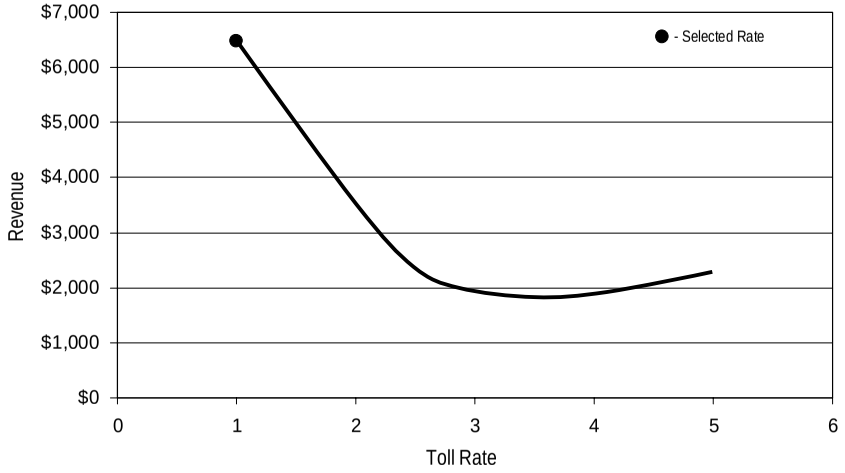
2015	HOV	SOV	Total
AM Peak	3.1	0.1	3.2
PM Peak	13.2	1.0	14.2
Total. Wkdy.	32.0	4.6	36.6

2015	HOV	SOV	Total
AM Peak	5.9	2.4	8.3
PM Peak	5.2	0.1	5.3
Total. Wkdy.	24.2	4.8	29.0

2005	HOV	SOV	Total
AM Peak	4.6	3.4	8.0
PM Peak	4.6	0.1	4.7
Total. Wkdy.	19.6	5.9	25.5

2005	HOV	SOV	Total
AM Peak	2.9	0.2	3.1
PM Peak	10.3	2.5	12.8
Total. Wkdy.	26.7	6.3	33.0

2015	HOV	SOV	Total
AM Peak	3.2	0.1	3.3
PM Peak	13.4	1.0	14.4
Total. Wkdy.	33.5	4.6	38.1

	A.M. Peak - Southbound	P.M.. Peak - Northbound
Period Transactions		
Period Revenue		

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PEAK PERIOD TOLL SENSITIVITY CURVES - SCENARIO B-2
2005 LEVELS

FIGURE 4-9

In the P.M. peak northbound direction, rate level 1 was found to be sufficient from a traffic management standpoint, and also produced maximum toll revenue potential.

Because of this "skewing" affect, it is difficult to draw immediate comparisons between optimum toll rates under Scenarios B-1 and B-2. The selected rates by time period and point of entry for Scenario B-2 are shown in Figure 4-10. The highest per-mile rates tend to be at the south end of the project, regardless of travel direction. This is due to the highest need for traffic management in this area. It has the net effect, however, of decreasing the relatively toll equity by movement, especially in the northbound direction.

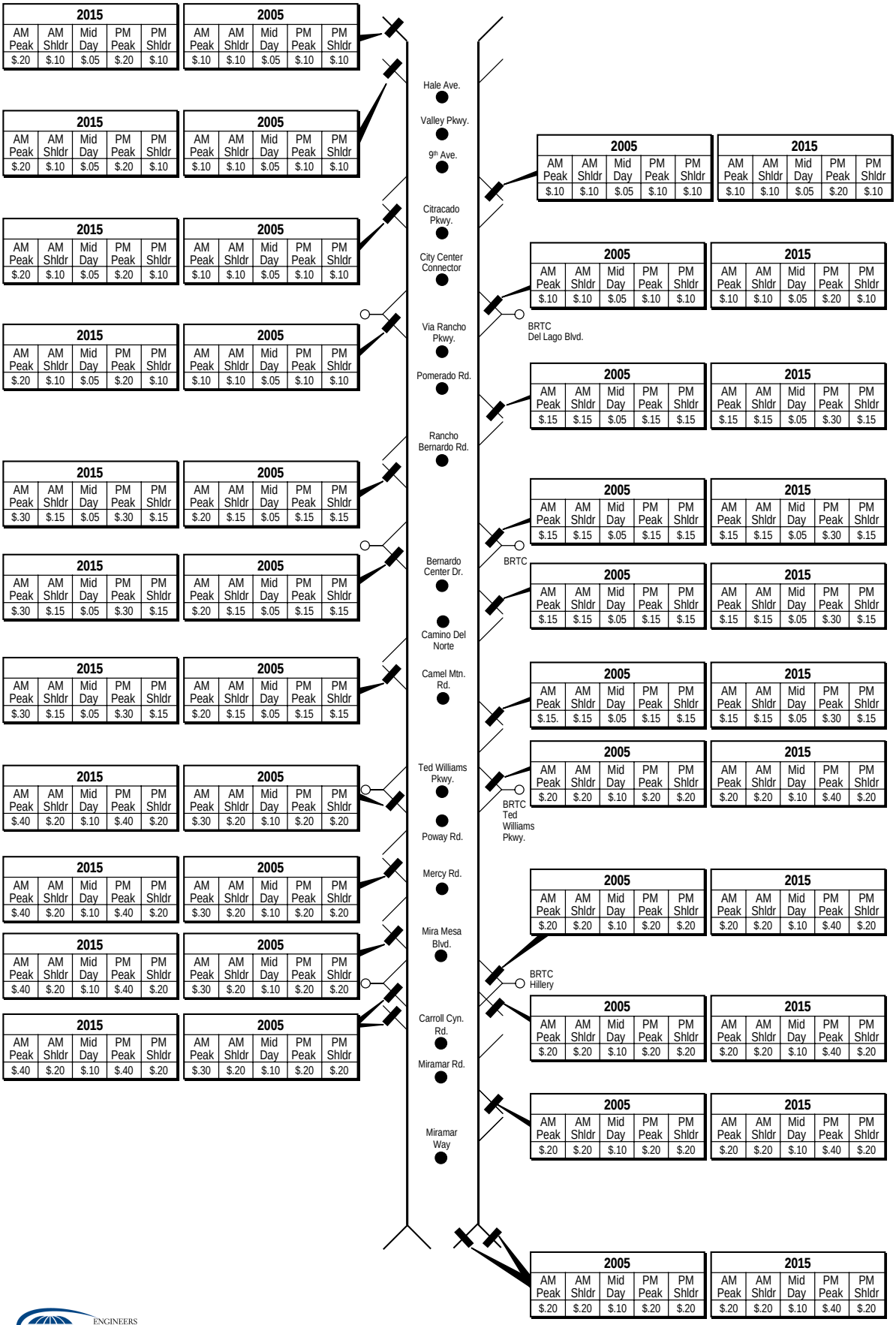
The higher skewed per-mile rates at the south end of the project needed to manage demand in that portion of the road would stay with vehicles traveling the entire length of the project. On the other hand, this would provide a built-in incentive for longer-distance trips to actually enter the managed lanes farther to the north, beyond the more congested portions. The skewing effect would tend to increase the overall efficiency of utilization of the managed lanes by toll traffic; but would decrease the relative toll equity between individual travelers.

ESTIMATED WEEKDAY TRAFFIC

Weekday traffic estimates for Scenario B-2 are shown in Figure 4-11. The same format is used, presenting A.M. peak, P.M. peak and total weekday vehicles, in thousands, stratified by HOV and SOV components. As compared with Scenario B-1, SOV traffic levels in the southbound direction tend to be higher, particularly at the north end of the project. Toll traffic in the northbound P.M. peak tends to be similar to Scenario B-1. This is primarily due to the fact that the heaviest congestion level is at the south end of the project.

SCENARIO C-1: SEGMENT TOLLS

In this scenario, a standard toll level is assessed per travel segment. A segment is defined as the section of the managed lanes between two consecutive access points. Including the direct access points to the various BRTC locations, there are 11 segments in the southbound direction and 12 segments in the northbound direction. While the length of each segment varies, the overall average length is just under two miles in both directions. The segment-based pricing is similar to a straight per-mile system, but might be slightly easier to communicate to motorists on



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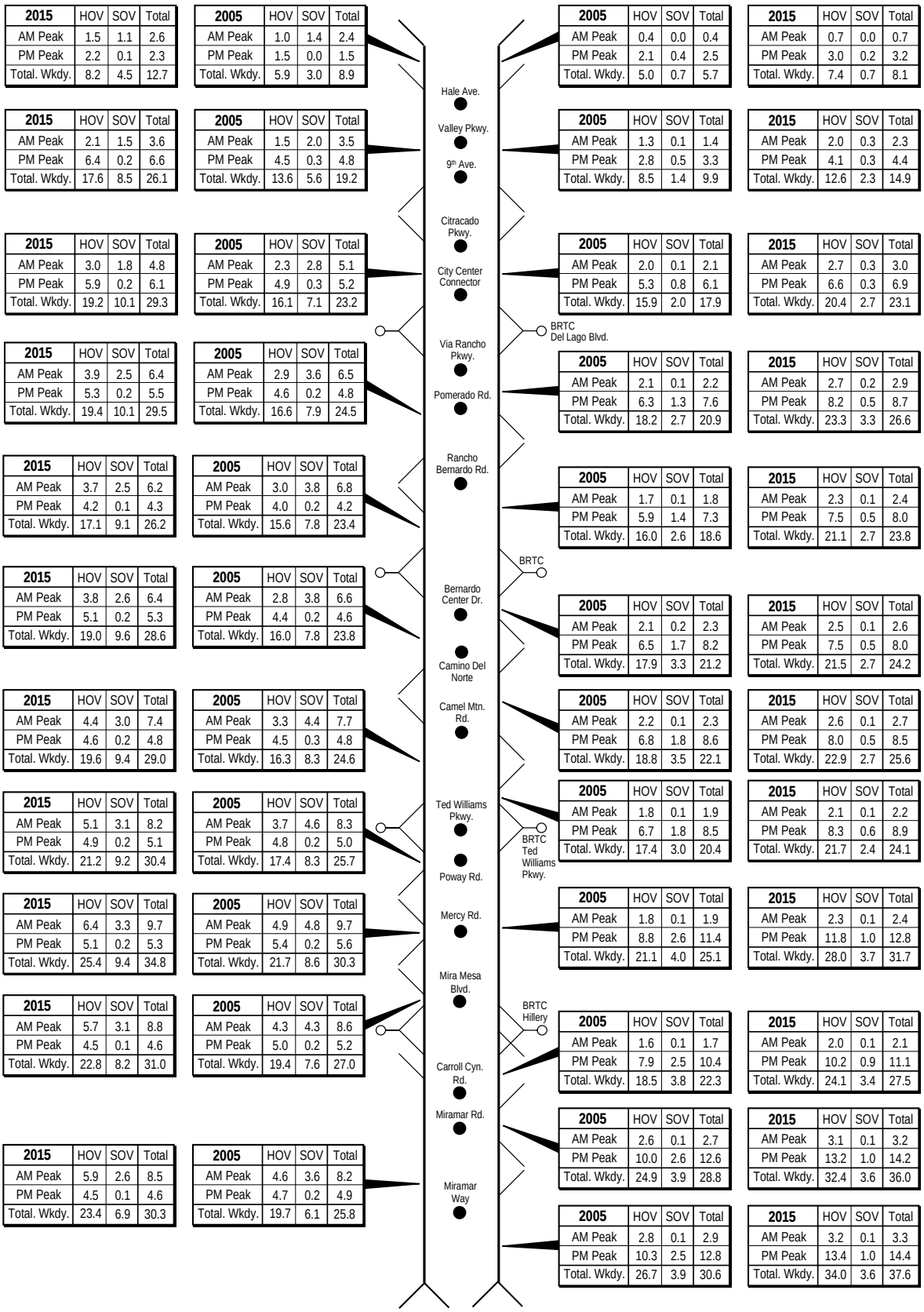
TOLL RATE LEVELS - SCENARIO B-2

FIGURE 4-10


2015 HOV SOV Total
AM Peak 1.5 1.1 2.6
PM Peak 2.2 0.1 2.3
Total. Wkdy. 8.2 4.5 12.7
2005 HOV SOV Total
AM Peak 1.0 1.4 2.4
PM Peak 1.5 0.0 1.5
Total. Wkdy. 5.9 3.0 8.9
2005 HOV SOV Total
AM Peak 0.4 0.0 0.4
PM Peak 2.1 0.4 2.5
Total. Wkdy. 5.0 0.7 5.7
2015 HOV SOV Total
AM Peak 0.7 0.0 0.7
PM Peak 3.0 0.2 3.2
Total. Wkdy. 7.4 0.7 8.1
Hale Ave.
2015 HOV SOV Total
AM Peak 2.1 1.5 3.6
PM Peak 6.4 0.2 6.6
Total. Wkdy. 17.6 8.5 26.1
2005 HOV SOV Total
AM Peak 1.5 2.0 3.5
PM Peak 4.5 0.3 4.8
Total. Wkdy. 13.6 5.6 19.2
2005 HOV SOV Total
AM Peak 1.3 0.1 1.4
PM Peak 2.8 0.5 3.3
Total. Wkdy. 8.5 1.4 9.9
2015 HOV SOV Total
AM Peak 2.0 0.3 2.3
PM Peak 4.1 0.3 4.4
Total. Wkdy. 12.6 2.3 14.9
Valley Pkwy.
9th Ave.
2015 HOV SOV Total
AM Peak 3.0 1.8 4.8
PM Peak 5.9 0.2 6.1
Total. Wkdy. 19.2 10.1 29.3
2005 HOV SOV Total
AM Peak 2.3 2.8 5.1
PM Peak 4.9 0.3 5.2
Total. Wkdy. 16.1 7.1 23.2
2005 HOV SOV Total
AM Peak 2.0 0.1 2.1
PM Peak 5.3 0.8 6.1
Total. Wkdy. 15.9 2.0 17.9
2015 HOV SOV Total
AM Peak 2.7 0.3 3.0
PM Peak 6.6 0.3 6.9
Total. Wkdy. 20.4 2.7 23.1
Citracado Pkwy.
City Center Connector
BRTC Del Lago Blvd.
2015 HOV SOV Total
AM Peak 3.9 2.5 6.4
PM Peak 5.3 0.2 5.5
Total. Wkdy. 19.4 10.1 29.5
2005 HOV SOV Total
AM Peak 2.9 3.6 6.5
PM Peak 4.6 0.2 4.8
Total. Wkdy. 16.6 7.9 24.5
2005 HOV SOV Total
AM Peak 2.1 0.1 2.2
PM Peak 6.3 1.3 7.6
Total. Wkdy. 18.2 2.7 20.9
2015 HOV SOV Total
AM Peak 2.7 0.2 2.9
PM Peak 8.2 0.5 8.7
Total. Wkdy. 23.3 3.3 26.6
Via Rancho Pkwy.
Pomerado Rd.
2015 HOV SOV Total
AM Peak 3.7 2.5 6.2
PM Peak 4.2 0.1 4.3
Total. Wkdy. 17.1 9.1 26.2
2005 HOV SOV Total
AM Peak 3.0 3.8 6.8
PM Peak 4.0 0.2 4.2
Total. Wkdy. 15.6 7.8 23.4
2005 HOV SOV Total
AM Peak 1.7 0.1 1.8
PM Peak 5.9 1.4 7.3
Total. Wkdy. 16.0 2.6 18.6
2015 HOV SOV Total
AM Peak 2.3 0.1 2.4
PM Peak 7.5 0.5 8.0
Total. Wkdy. 21.1 2.7 23.8
Rancho Bernardo Rd.
BRTC
2015 HOV SOV Total
AM Peak 3.8 2.6 6.4
PM Peak 5.1 0.2 5.3
Total. Wkdy. 19.0 9.6 28.6
2005 HOV SOV Total
AM Peak 2.8 3.8 6.6
PM Peak 4.4 0.2 4.6
Total. Wkdy. 16.0 7.8 23.8
2005 HOV SOV Total
AM Peak 2.1 0.2 2.3
PM Peak 6.5 1.7 8.2
Total. Wkdy. 17.9 3.3 21.2
2015 HOV SOV Total
AM Peak 2.5 0.1 2.6
PM Peak 7.5 0.5 8.0
Total. Wkdy. 21.5 2.7 24.2
Bernardo Center Dr.
Camino Del Norte
2015 HOV SOV Total
AM Peak 4.4 3.0 7.4
PM Peak 4.6 0.2 4.8
Total. Wkdy. 19.6 9.4 29.0
2005 HOV SOV Total
AM Peak 3.3 4.4 7.7
PM Peak 4.5 0.3 4.8
Total. Wkdy. 16.3 8.3 24.6
2005 HOV SOV Total
AM Peak 2.2 0.1 2.3
PM Peak 6.8 1.8 8.6
Total. Wkdy. 18.8 3.5 22.1
2015 HOV SOV Total
AM Peak 2.6 0.1 2.7
PM Peak 8.0 0.5 8.5
Total. Wkdy. 22.9 2.7 25.6
Camel Mtn. Rd.
2015 HOV SOV Total
AM Peak 5.1 3.1 8.2
PM Peak 4.9 0.2 5.1
Total. Wkdy. 21.2 9.2 30.4
2005 HOV SOV Total
AM Peak 3.7 4.6 8.3
PM Peak 4.8 0.2 5.0
Total. Wkdy. 17.4 8.3 25.7
2005 HOV SOV Total
AM Peak 1.8 0.1 1.9
PM Peak 6.7 1.8 8.5
Total. Wkdy. 17.4 3.0 20.4
2015 HOV SOV Total
AM Peak 2.1 0.1 2.2
PM Peak 8.3 0.6 8.9
Total. Wkdy. 21.7 2.4 24.1
Ted Williams Pkwy.
BRTC Ted Williams Pkwy.
Poway Rd.
2015 HOV SOV Total
AM Peak 6.4 3.3 9.7
PM Peak 5.1 0.2 5.3
Total. Wkdy. 25.4 9.4 34.8
2005 HOV SOV Total
AM Peak 4.9 4.8 9.7
PM Peak 5.4 0.2 5.6
Total. Wkdy. 21.7 8.6 30.3
2005 HOV SOV Total
AM Peak 1.8 0.1 1.9
PM Peak 8.8 2.6 11.4
Total. Wkdy. 21.1 4.0 25.1
2015 HOV SOV Total
AM Peak 2.3 0.1 2.4
PM Peak 11.8 1.0 12.8
Total. Wkdy. 28.0 3.7 31.7
Mercy Rd.
Mira Mesa Blvd.
2015 HOV SOV Total
AM Peak 5.7 3.1 8.8
PM Peak 4.5 0.1 4.6
Total. Wkdy. 22.8 8.2 31.0
2005 HOV SOV Total
AM Peak 4.3 4.3 8.6
PM Peak 5.0 0.2 5.2
Total. Wkdy. 19.4 7.6 27.0
BRTC Hillery
2005 HOV SOV Total
AM Peak 1.6 0.1 1.7
PM Peak 7.9 2.5 10.4
Total. Wkdy. 18.5 3.8 22.3
2015 HOV SOV Total
AM Peak 2.0 0.1 2.1
PM Peak 10.2 0.9 11.1
Total. Wkdy. 24.1 3.4 27.5
Carroll Cyn. Rd.
Miramar Rd.
2015 HOV SOV Total
AM Peak 5.9 2.6 8.5
PM Peak 4.5 0.1 4.6
Total. Wkdy. 23.4 6.9 30.3
2005 HOV SOV Total
AM Peak 4.6 3.6 8.2
PM Peak 4.7 0.2 4.9
Total. Wkdy. 19.7 6.1 25.8
2005 HOV SOV Total
AM Peak 2.6 0.1 2.7
PM Peak 10.0 2.6 12.6
Total. Wkdy. 24.9 3.9 28.8
2015 HOV SOV Total
AM Peak 3.1 0.1 3.2
PM Peak 13.2 1.0 14.2
Total. Wkdy. 32.4 3.6 36.0
Miramar Way
2005 HOV SOV Total
AM Peak 2.8 0.1 2.9
PM Peak 10.3 2.5 12.8
Total. Wkdy. 26.7 3.9 30.6
2015 HOV SOV Total
AM Peak 3.2 0.1 3.3
PM Peak 13.4 1.0 14.4
Total. Wkdy. 34.0 3.6 37.6

advanced signing. It also would slightly simplify the electronic toll collection system complexity, although this is not considered a significant factor. It has the disadvantage, however, of encouraging short trips, and possibly "queue jump" maneuvers, in and out of the managed lanes.

For purposes of this analysis, no minimum or maximum toll was assumed under segment-based pricing. The "queue jump" program could be reduced if some type of "access fee" were assessed each time the vehicle entered and re-entered the managed lanes. That was not included in the traffic and revenue analysis for Scenario C-1.

TOLL SENSITIVITY ANALYSIS

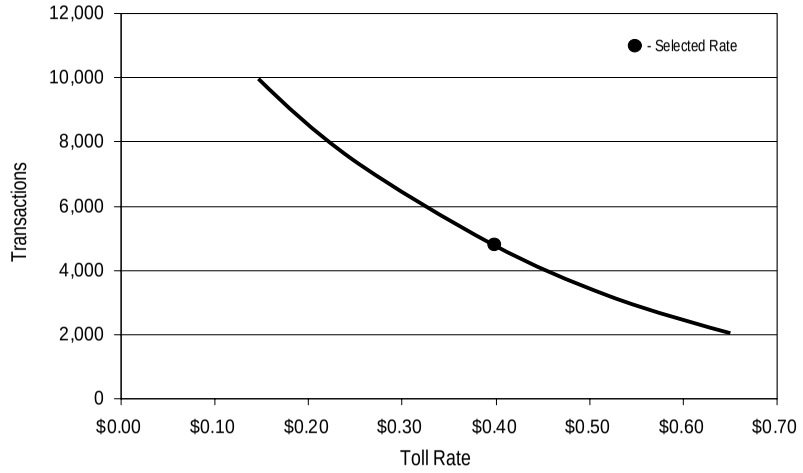
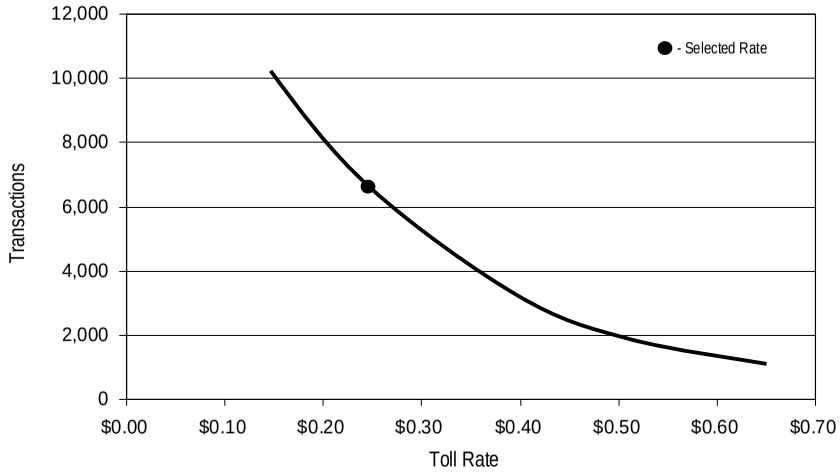
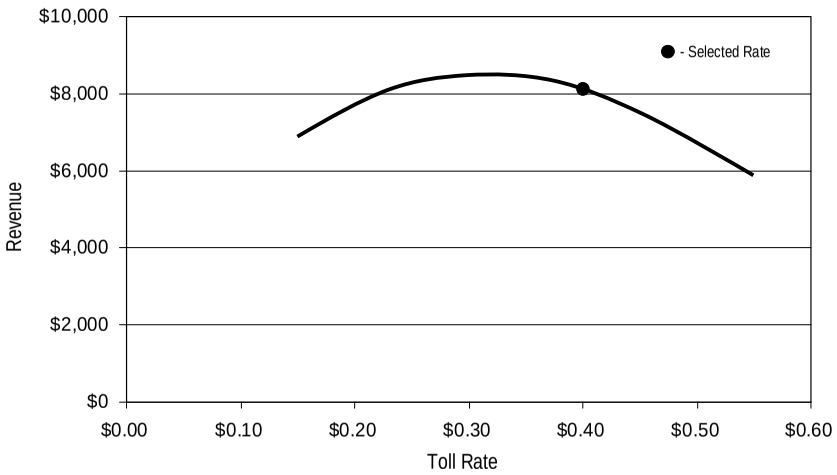
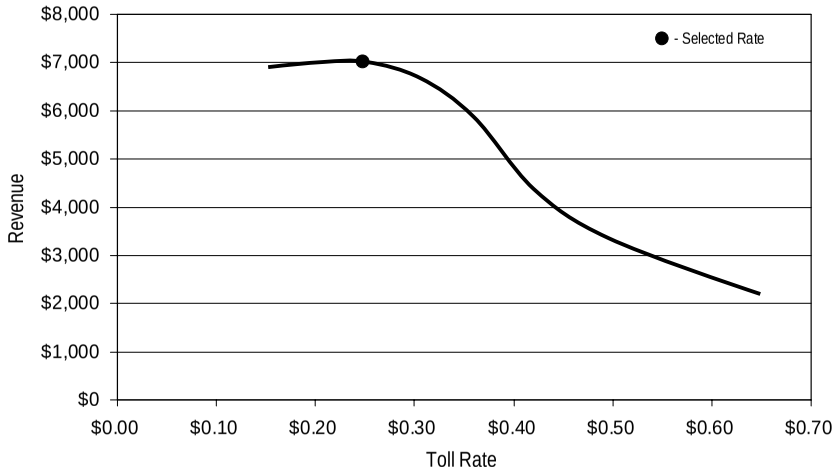
The 2005 peak period toll sensitivity curves for Scenario C-1 are shown in Figure 4-12. In this case, the toll rates shown represent the rate per segment (average length about 1.8 miles). In the A.M. peak southbound direction, the toll rate which effectively managed demand was $0.40 per segment. This would produce slightly less than maximum revenue. However, a full-length trip under this condition would be over $4.00.

In the P.M. peak northbound direction, the optimum segment toll was found to be $0.25, which also tended to produce maximum revenue. The lower optimum segment toll in the northbound direction is again a function of where congestion exists. Since there is no skewing or minimum tolls under Scenario C-1, the per-segment toll must reach $0.40 simply to manage demand among short trips at the south end of the project. In the northbound direction, this tends to be less of a problem.

The segment tolls by time period for Scenario C-1 are shown in Table 4-3. The lowest toll per segment in off-peak hours was found to be $0.15 (generally equivalent to about $0.08 per mile). Over time, the required toll rates would intend to increase in real terms, reaching $0.65 per segment by 2015.

ESTIMATED WEEKDAY TRAFFIC

Weekday traffic estimates for Scenario C-1 are shown in Figure 4-13. Peak period SOV traffic estimates under Scenario C-1 tend to be slightly lower than Scenario B-1 (per-mile rate) in the southbound direction, but slightly higher in the northbound direction. As with the other scenarios, the amount of capacity available to be "sold" to SOV traffic decreases by the year 2015.

	A.M. Peak - Southbound	P.M.. Peak - Northbound
Period Transactions		
Period Revenue		

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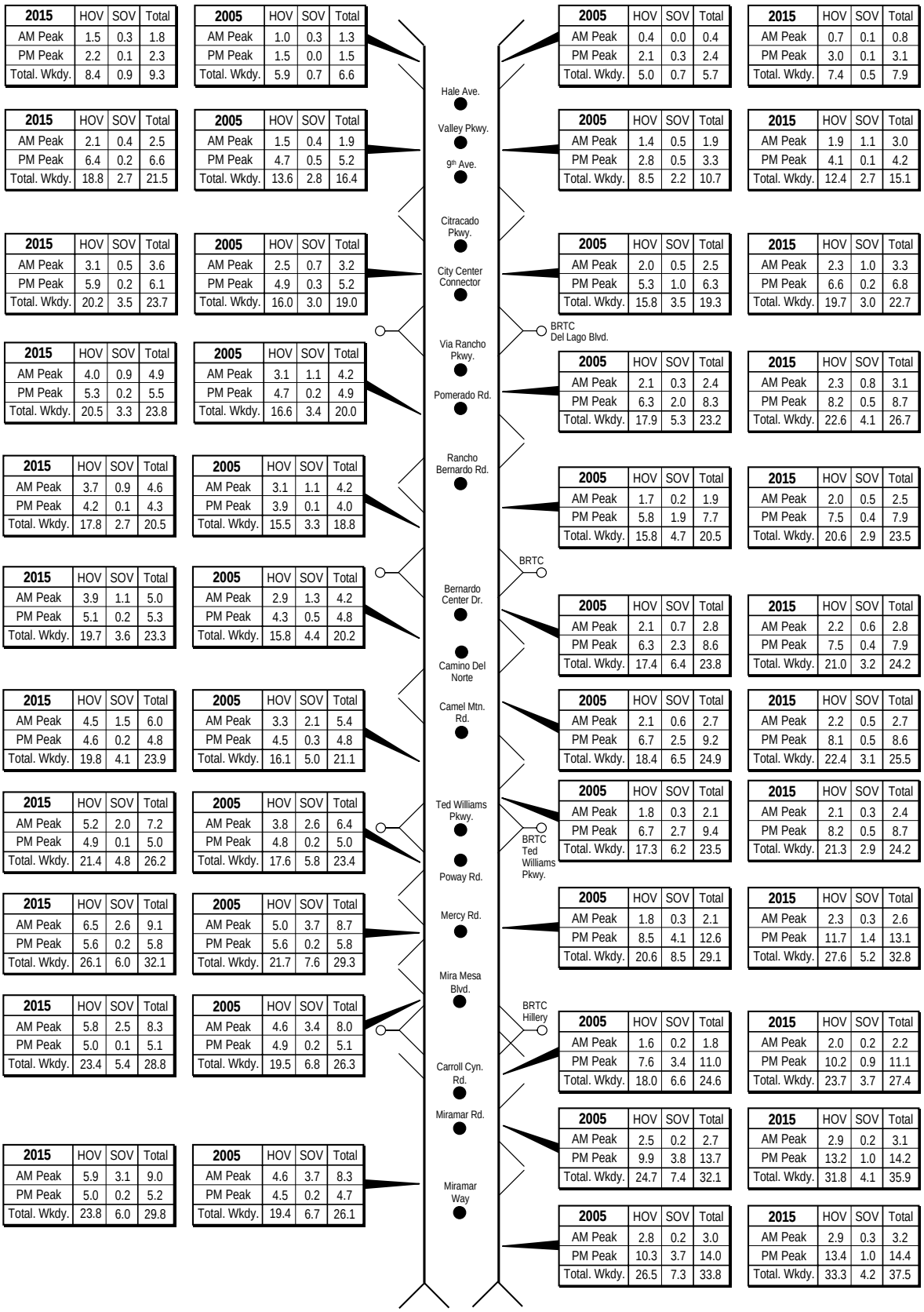
PEAK PERIOD TOLL SENSITIVITY CURVES - SCENARIO C-1
2005 LEVELS

FIGURE 4-12

Table 4-3
Toll Rate Levels - Scenario C-1

Year/Period	Toll Rate Per Segment	
	Southbound	Northbound
2005		
A.M. Peak	$0.40	$0.15
A.M. Shoulder	0.15	0.15
Mid-Day	0.15	0.15
P.M. Shoulder	0.15	0.15
P.M. Peak	0.25	0.25
P.M. Shoulder	0.15	0.15
2010		
A.M. Peak	$0.55	$0.15
A.M. Shoulder	0.25	0.15
Mid-Day	0.15	0.15
P.M. Shoulder	0.25	0.25
P.M. Peak	0.55	0.55
P.M. Shoulder	0.25	0.25
2015		
A.M. Peak	$0.55	$0.15
A.M. Shoulder	0.25	0.15
Mid-Day	0.15	0.15
P.M. Shoulder	0.25	0.25
P.M. Peak	0.65	0.65
P.M. Shoulder	0.40	0.40


2015 HOV SOV Total
AM Peak 1.5 0.3 1.8
PM Peak 2.2 0.1 2.3
Total. Wkdy. 8.4 0.9 9.3
2005 HOV SOV Total
AM Peak 1.0 0.3 1.3
PM Peak 1.5 0.0 1.5
Total. Wkdy. 5.9 0.7 6.6
2005 HOV SOV Total
AM Peak 0.4 0.0 0.4
PM Peak 2.1 0.3 2.4
Total. Wkdy. 5.0 0.7 5.7
2015 HOV SOV Total
AM Peak 0.7 0.1 0.8
PM Peak 3.0 0.1 3.1
Total. Wkdy. 7.4 0.5 7.9
Hale Ave.
2015 HOV SOV Total
AM Peak 2.1 0.4 2.5
PM Peak 6.4 0.2 6.6
Total. Wkdy. 18.8 2.7 21.5
2005 HOV SOV Total
AM Peak 1.5 0.4 1.9
PM Peak 4.7 0.5 5.2
Total. Wkdy. 13.6 2.8 16.4
2005 HOV SOV Total
AM Peak 1.4 0.5 1.9
PM Peak 2.8 0.5 3.3
Total. Wkdy. 8.5 2.2 10.7
2015 HOV SOV Total
AM Peak 1.9 1.1 3.0
PM Peak 4.1 0.1 4.2
Total. Wkdy. 12.4 2.7 15.1
Valley Pkwy.
9th Ave.
2015 HOV SOV Total
AM Peak 3.1 0.5 3.6
PM Peak 5.9 0.2 6.1
Total. Wkdy. 20.2 3.5 23.7
2005 HOV SOV Total
AM Peak 2.5 0.7 3.2
PM Peak 4.9 0.3 5.2
Total. Wkdy. 16.0 3.0 19.0
2005 HOV SOV Total
AM Peak 2.0 0.5 2.5
PM Peak 5.3 1.0 6.3
Total. Wkdy. 15.8 3.5 19.3
2015 HOV SOV Total
AM Peak 2.3 1.0 3.3
PM Peak 6.6 0.2 6.8
Total. Wkdy. 19.7 3.0 22.7
Citracado Pkwy.
City Center Connector
BRTC Del Lago Blvd.
2015 HOV SOV Total
AM Peak 4.0 0.9 4.9
PM Peak 5.3 0.2 5.5
Total. Wkdy. 20.5 3.3 23.8
2005 HOV SOV Total
AM Peak 3.1 1.1 4.2
PM Peak 4.7 0.2 4.9
Total. Wkdy. 16.6 3.4 20.0
2005 HOV SOV Total
AM Peak 2.1 0.3 2.4
PM Peak 6.3 2.0 8.3
Total. Wkdy. 17.9 5.3 23.2
2015 HOV SOV Total
AM Peak 2.3 0.8 3.1
PM Peak 8.2 0.5 8.7
Total. Wkdy. 22.6 4.1 26.7
Via Rancho Pkwy.
Pomerado Rd.
2015 HOV SOV Total
AM Peak 3.7 0.9 4.6
PM Peak 4.2 0.1 4.3
Total. Wkdy. 17.8 2.7 20.5
2005 HOV SOV Total
AM Peak 3.1 1.1 4.2
PM Peak 3.9 0.1 4.0
Total. Wkdy. 15.5 3.3 18.8
2005 HOV SOV Total
AM Peak 1.7 0.2 1.9
PM Peak 5.8 1.9 7.7
Total. Wkdy. 15.8 4.7 20.5
2015 HOV SOV Total
AM Peak 2.0 0.5 2.5
PM Peak 7.5 0.4 7.9
Total. Wkdy. 20.6 2.9 23.5
Rancho Bernardo Rd.
BRTC
2015 HOV SOV Total
AM Peak 3.9 1.1 5.0
PM Peak 5.1 0.2 5.3
Total. Wkdy. 19.7 3.6 23.3
2005 HOV SOV Total
AM Peak 2.9 1.3 4.2
PM Peak 4.3 0.5 4.8
Total. Wkdy. 15.8 4.4 20.2
2005 HOV SOV Total
AM Peak 2.1 0.7 2.8
PM Peak 6.3 2.3 8.6
Total. Wkdy. 17.4 6.4 23.8
2015 HOV SOV Total
AM Peak 2.2 0.6 2.8
PM Peak 7.5 0.4 7.9
Total. Wkdy. 21.0 3.2 24.2
Bernardo Center Dr.
Camino Del Norte
2015 HOV SOV Total
AM Peak 4.5 1.5 6.0
PM Peak 4.6 0.2 4.8
Total. Wkdy. 19.8 4.1 23.9
2005 HOV SOV Total
AM Peak 3.3 2.1 5.4
PM Peak 4.5 0.3 4.8
Total. Wkdy. 16.1 5.0 21.1
2005 HOV SOV Total
AM Peak 2.1 0.6 2.7
PM Peak 6.7 2.5 9.2
Total. Wkdy. 18.4 6.5 24.9
2015 HOV SOV Total
AM Peak 2.2 0.5 2.7
PM Peak 8.1 0.5 8.6
Total. Wkdy. 22.4 3.1 25.5
Camel Mtn. Rd.
2015 HOV SOV Total
AM Peak 5.2 2.0 7.2
PM Peak 4.9 0.1 5.0
Total. Wkdy. 21.4 4.8 26.2
2005 HOV SOV Total
AM Peak 3.8 2.6 6.4
PM Peak 4.8 0.2 5.0
Total. Wkdy. 17.6 5.8 23.4
2005 HOV SOV Total
AM Peak 1.8 0.3 2.1
PM Peak 6.7 2.7 9.4
Total. Wkdy. 17.3 6.2 23.5
2015 HOV SOV Total
AM Peak 2.1 0.3 2.4
PM Peak 8.2 0.5 8.7
Total. Wkdy. 21.3 2.9 24.2
Ted Williams Pkwy.
BRTC Ted Williams Pkwy.
Poway Rd.
2015 HOV SOV Total
AM Peak 6.5 2.6 9.1
PM Peak 5.6 0.2 5.8
Total. Wkdy. 26.1 6.0 32.1
2005 HOV SOV Total
AM Peak 5.0 3.7 8.7
PM Peak 5.6 0.2 5.8
Total. Wkdy. 21.7 7.6 29.3
2005 HOV SOV Total
AM Peak 1.8 0.3 2.1
PM Peak 8.5 4.1 12.6
Total. Wkdy. 20.6 8.5 29.1
2015 HOV SOV Total
AM Peak 2.3 0.3 2.6
PM Peak 11.7 1.4 13.1
Total. Wkdy. 27.6 5.2 32.8
Mercy Rd.
Mira Mesa Blvd.
2015 HOV SOV Total
AM Peak 5.8 2.5 8.3
PM Peak 5.0 0.1 5.1
Total. Wkdy. 23.4 5.4 28.8
2005 HOV SOV Total
AM Peak 4.6 3.4 8.0
PM Peak 4.9 0.2 5.1
Total. Wkdy. 19.5 6.8 26.3
2005 HOV SOV Total
AM Peak 1.6 0.2 1.8
PM Peak 7.6 3.4 11.0
Total. Wkdy. 18.0 6.6 24.6
2015 HOV SOV Total
AM Peak 2.0 0.2 2.2
PM Peak 10.2 0.9 11.1
Total. Wkdy. 23.7 3.7 27.4
BRTC Hillery
Carroll Cyn. Rd.
Miramar Rd.
2015 HOV SOV Total
AM Peak 5.9 3.1 9.0
PM Peak 5.0 0.2 5.2
Total. Wkdy. 23.8 6.0 29.8
2005 HOV SOV Total
AM Peak 4.6 3.7 8.3
PM Peak 4.5 0.2 4.7
Total. Wkdy. 19.4 6.7 26.1
2005 HOV SOV Total
AM Peak 2.5 0.2 2.7
PM Peak 9.9 3.8 13.7
Total. Wkdy. 24.7 7.4 32.1
2015 HOV SOV Total
AM Peak 2.9 0.2 3.1
PM Peak 13.2 1.0 14.2
Total. Wkdy. 31.8 4.1 35.9
Miramar Way
2005 HOV SOV Total
AM Peak 2.8 0.2 3.0
PM Peak 10.3 3.7 14.0
Total. Wkdy. 26.5 7.3 33.8
2015 HOV SOV Total
AM Peak 2.9 0.3 3.2
PM Peak 13.4 1.0 14.4
Total. Wkdy. 33.3 4.2 37.5

COMPARISON OF MANAGED LANES TRAFFIC SHARES

Traffic estimates shown thus far for each scenario reflect estimates in the managed lanes only. Tables 4-4 through 4-7 provide a useful comparison of traffic estimated in managed lanes and in the general purpose lanes, by vehicle category. This enables a measurement of the share of total demand in the corridor accommodated in the managed lanes. Tables 4-4 and 4-5 provide a managed lane share comparison for 2005 levels, A.M. peak and P.M. peak periods, respectively. Tables 4-6 and 4-7 show similar information at 2015 levels for A.M. peak and P.M. peak, respectively. In all cases, information is provided at three selected locations along the managed lane corridor, including:

- Location A – South of Miramar Road;
- Location B – South of Bernardo Center Drive; and
- Location C – South of 9th Avenue.

In all tables, peak period conditions are shown in both the southbound and northbound direction.

At each location, estimated period traffic (in thousands) is shown separately for SOV, HOV and commercial vehicle (CV) categories, together with total traffic. Traffic is broken out by that which is expected to be served in the general purpose lanes and the managed lanes. Trucks (CV) are not assumed to be able to use the managed lanes. Therefore, all truck traffic is shown in the general purpose lanes.

As shown in Table 4-4, which reflects year 2005 A.M. peak period conditions, in the southbound direction under Scenario A-1, the managed lanes would be expected to accommodate between 13.1 and 17.4 percent of total SOV traffic, depending on location. In general, the highest share of SOV traffic is found in the northernmost location for this particular scenario. By contrast, under Scenario B-1, a standard per-mile rate option, the highest share of SOV traffic in the managed lanes is found at the south end of the road. Generally speaking, the share of SOV traffic accommodated in the managed lanes is consistent between the scenarios at the southern portion of the managed lanes, but differs widely at the northern portion.

A majority of HOV traffic is accommodated in the managed lanes under all scenarios, since this is assumed to be toll free. The HOV share

Table 4-4

Managed Lanes Share Comparison for Base Scenarios
2005 AM Peak Period

Direction/Scenario	Vehicle Category	Location A: South of Miramar Road				Location B: South of Bernardo Center Drive				Location C: South of 9th Avenue			
		General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes	General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes	General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes
Southbound													
A-1: Flat Rate/ All Entries	SOV	21.8	3.3	25.1	13.1	15.1	3.0	18.1	16.6	10.0	2.1	12.1	17.4
	HOV	0.7	4.6	5.3	86.8	0.8	2.8	3.6	77.8	0.2	2.4	2.6	92.3
	CV	1.6	0.0	1.6	0.0	1.2	0.0	1.2	0.0	0.8	0.0	0.8	0.0
	Total	24.1	7.9	32.0	24.7	17.1	5.8	22.9	25.3	11.0	4.5	15.5	29.0
A-2: Flat Rate/Max. Trip Per Entry	SOV	21.5	3.7	25.2	14.7	16.6	1.2	17.8	6.7	11.3	0.5	11.8	4.2
	HOV	0.7	4.6	5.3	86.8	0.7	2.9	3.6	80.6	0.2	2.5	2.7	92.6
	CV	1.6	0.0	1.6	0.0	1.2	0.0	1.2	0.0	0.8	0.0	0.8	0.0
	Total	23.8	8.3	32.1	25.9	18.5	4.1	22.6	18.1	12.3	3.0	15.3	19.6
B-1: Standard Per Mile Rate	SOV	21.7	3.4	25.1	13.5	16.0	2.0	18.0	11.1	10.7	1.2	11.9	10.1
	HOV	0.7	4.6	5.3	86.8	0.7	2.8	3.5	80.0	0.2	2.4	2.6	92.3
	CV	1.6	0.0	1.6	0.0	1.2	0.0	1.2	0.0	0.8	0.0	0.8	0.0
	Total	24.0	8.0	32.0	25.0	17.9	4.8	22.7	21.1	11.7	3.6	15.3	23.5
B-2: Skewed Per Mile Rate	SOV	21.6	3.6	25.2	14.3	14.6	3.8	18.4	20.7	9.4	2.8	12.2	23.0
	HOV	0.7	4.6	5.3	86.8	0.8	2.8	3.6	77.8	0.2	2.3	2.5	92.0
	CV	1.6	0.0	1.6	0.0	1.2	0.0	1.2	0.0	0.8	0.0	0.8	0.0
	Total	23.9	8.2	32.1	25.5	16.6	6.6	23.2	28.4	10.4	5.1	15.5	32.9
C-1: Standard Rate Per Segment	SOV	21.6	3.7	25.3	14.6	16.4	1.3	17.7	7.3	11.0	0.7	11.7	6.0
	HOV	0.8	4.6	5.4	85.2	0.7	2.9	3.6	80.6	0.2	2.5	2.7	92.6
	CV	1.6	0.0	1.6	0.0	1.2	0.0	1.2	0.0	0.8	0.0	0.8	0.0
	Total	24.0	8.3	32.3	25.7	18.3	4.2	22.5	18.7	12.0	3.2	15.2	21.1
Northbound													
A-1: Flat Rate/ All Entries	SOV	14.5	0.8	15.3	5.2	12.4	1.3	13.7	9.5	10.9	0.9	11.8	7.6
	HOV	0.7	2.2	2.9	75.9	0.7	1.9	2.6	73.1	0.6	1.8	2.4	75.0
	CV	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0	0.8	0.0	0.8	0.0
	Total	16.2	3.0	19.2	15.6	14.0	3.2	17.2	18.6	12.3	2.7	15.0	18.0
A-2: Flat Rate/Max. Trip Per Entry	SOV	14.9	0.5	15.4	3.2	12.6	1.0	13.6	7.4	11.0	0.7	11.7	6.0
	HOV	0.5	2.4	2.9	82.8	0.6	2.0	2.6	76.9	0.4	1.9	2.3	82.6
	CV	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	16.4	2.9	19.3	15.0	14.1	3.0	17.1	17.5	12.1	2.6	14.7	17.7
B-1: Standard Per Mile Rate	SOV	15.4	0.2	15.6	1.3	13.1	0.4	13.5	3.0	11.4	0.3	11.7	2.6
	HOV	0.5	2.6	3.1	83.9	0.6	2.1	2.7	77.8	0.4	2.0	2.4	83.3
	CV	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	16.9	2.8	19.7	14.2	14.6	2.5	17.1	14.6	12.5	2.3	14.8	15.5
B-2: Skewed Per Mile Rate	SOV	15.3	0.1	15.4	0.6	13.4	0.2	13.6	1.5	11.6	0.1	11.7	0.9
	HOV	0.4	2.6	3.0	86.7	0.6	2.1	2.7	77.8	0.4	2.0	2.4	83.3
	CV	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	16.7	2.7	19.4	13.9	14.9	2.3	17.2	13.4	12.7	2.1	14.8	14.2
C-1: Standard Rate Per Segment	SOV	15.3	0.2	15.5	1.3	12.9	0.7	13.6	5.1	11.2	0.5	11.7	4.3
	HOV	0.5	2.6	3.1	83.9	0.6	2.1	2.7	77.8	0.4	2.0	2.4	83.3
	CV	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	16.8	2.8	19.6	14.3	14.4	2.8	17.2	16.3	12.3	2.5	14.8	16.9

Table 4-5

Managed Lanes Share Comparison for Base Scenarios
2005 PM Peak Period

Direction/Scenario	Vehicle Category	Location A: South of Miramar Road				Location B: South of Bernardo Center Drive				Location C: South of 9th Avenue			
		General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes	General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes	General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes
Southbound													
A-1: Flat Rate/ All Entries	SOV	24.9	0.5	25.4	2.0	19.5	0.5	20.0	2.5	18.0	0.4	18.4	2.2
	HOV	4.0	4.6	8.6	53.5	3.0	4.3	7.3	58.9	1.8	4.9	6.7	73.1
	CV	1.2	0.0	1.2	0.0	0.9	0.0	0.9	0.0	0.9	0.0	0.9	0.0
	Total	30.1	5.1	35.2	14.5	23.4	4.8	28.2	17.0	20.7	5.3	26.0	20.4
A-2: Flat Rate/Max. Trip Per Entry	SOV	25.4	0.4	25.8	1.6	19.5	0.7	20.2	3.5	18.0	0.3	18.3	1.6
	HOV	4.4	4.4	8.8	50.0	2.9	4.3	7.2	59.7	1.8	4.9	6.7	73.1
	CV	1.2	0.0	1.2	0.0	0.9	0.0	0.9	0.0	0.9	0.0	0.9	0.0
	Total	31.0	4.8	35.8	13.4	23.3	5.0	28.3	17.7	20.7	5.2	25.9	20.1
B-1: Standard Per Mile Rate	SOV	25.4	0.1	25.5	0.4	19.9	0.2	20.1	1.0	18.2	0.1	18.3	0.5
	HOV	4.0	4.6	8.6	53.5	2.5	4.7	7.2	65.3	1.7	5.0	6.7	74.6
	CV	1.2	0.0	1.2	0.0	0.9	0.0	0.9	0.0	0.9	0.0	0.9	0.0
	Total	30.6	4.7	35.3	13.3	23.3	4.9	28.2	17.4	20.8	5.1	25.9	19.7
B-2: Skewed Per Mile Rate	SOV	25.4	0.2	25.6	0.8	19.8	0.2	20.0	1.0	18.0	0.3	18.3	1.6
	HOV	3.9	4.7	8.6	54.7	2.8	4.4	7.2	61.1	1.7	5.0	6.7	74.6
	CV	1.2	0.0	1.2	0.0	0.9	0.0	0.9	0.0	0.9	0.0	0.9	0.0
	Total	30.5	4.9	35.4	13.8	23.5	4.6	28.1	16.4	20.6	5.3	25.9	20.5
C-1: Standard Rate Per Segment	SOV	25.3	0.2	25.5	0.8	19.7	0.5	20.2	2.5	18.2	0.3	18.5	1.6
	HOV	4.1	4.5	8.6	52.3	3.0	4.3	7.3	58.9	1.7	5.0	6.7	74.6
	CV	1.2	0.0	1.2	0.0	0.9	0.0	0.9	0.0	0.9	0.0	0.9	0.0
	Total	30.6	4.7	35.3	13.3	23.6	4.8	28.4	16.9	20.8	5.3	26.1	20.3
Northbound													
A-1: Flat Rate/ All Entries	SOV	25.7	2.7	28.4	9.5	18.1	2.6	20.7	12.6	14.9	1.6	16.5	9.7
	HOV	1.0	10.0	11.0	90.9	1.7	6.3	8.0	78.8	0.8	5.4	6.2	87.1
	CV	1.3	0.0	1.3	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	28.0	12.7	40.7	31.2	20.7	8.9	29.6	30.1	16.4	7.0	23.4	29.9
A-2: Flat Rate/Max. Trip Per Entry	SOV	25.8	2.7	28.5	9.5	17.8	2.9	20.7	14.0	14.6	1.9	16.5	11.5
	HOV	1.0	10.0	11.0	90.9	1.7	6.4	8.1	79.0	0.8	5.3	6.1	86.9
	CV	1.3	0.0	1.3	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	28.1	12.7	40.8	31.1	20.4	9.3	29.7	31.3	16.1	7.2	23.3	30.9
B-1: Standard Per Mile Rate	SOV	25.9	2.6	28.5	9.1	18.8	1.6	20.4	7.8	15.6	0.7	16.3	4.3
	HOV	1.0	10.0	11.0	90.9	1.6	6.5	8.1	80.2	0.8	5.4	6.2	87.1
	CV	1.3	0.0	1.3	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	28.2	12.6	40.8	30.9	21.3	8.1	29.4	27.6	17.1	6.1	23.2	26.3
B-2: Skewed Per Mile Rate	SOV	25.8	2.6	28.4	9.2	18.7	1.7	20.4	8.3	15.5	0.8	16.3	4.9
	HOV	1.0	10.0	11.0	90.9	1.6	6.4	8.0	80.0	0.8	5.4	6.2	87.1
	CV	1.3	0.0	1.3	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	28.1	12.6	40.7	31.0	21.2	8.1	29.3	27.6	17.0	6.2	23.2	26.7
C-1: Standard Rate Per Segment	SOV	24.9	3.8	28.7	13.2	18.3	2.3	20.6	11.2	15.4	1.0	16.4	6.1
	HOV	1.0	9.9	10.9	90.8	1.7	6.3	8.0	78.8	0.8	5.3	6.1	86.9
	CV	1.3	0.0	1.3	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	27.2	13.7	40.9	33.5	20.9	8.6	29.5	29.2	16.9	6.3	23.2	27.2

Table 4-6

Managed Lanes Share Comparison for Base Scenarios
2015 AM Peak Period

Direction/Scenario	Vehicle Category	Location A: South of Miramar Road				Location B: South of Bernardo Center Drive				Location C: South of 9th Avenue			
		General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes	General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes	General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes
Southbound													
A-1: Flat Rate/ All Entries	SOV	24.2	2.1	26.3	8.0	16.1	2.0	18.1	11.0	11.1	1.4	12.5	11.2
	HOV	1.1	5.9	7.0	84.3	0.8	3.9	4.7	83.0	0.4	3.0	3.4	88.2
	CV	1.8	0.0	1.8	0.0	1.2	0.0	1.2	0.0	0.8	0.0	0.8	0.0
	Total	27.1	8.0	35.1	22.8	18.1	5.9	24.0	24.6	12.3	4.4	16.7	26.3
A-2: Flat Rate/Max. Trip Per Entry	SOV	22.4	4.4	26.8	16.4	17.0	1.3	18.3	7.1	12.0	0.5	12.5	4.0
	HOV	1.7	5.2	6.9	75.4	0.7	3.9	4.6	84.8	0.2	3.0	3.2	93.8
	CV	1.8	0.0	1.8	0.0	1.2	0.0	1.2	0.0	0.8	0.0	0.8	0.0
	Total	25.9	9.6	35.5	27.0	18.9	5.2	24.1	21.6	13.0	3.5	16.5	21.2
B-1: Standard Per Mile Rate	SOV	24.0	2.4	26.4	9.1	16.5	1.5	18.0	8.3	11.5	0.9	12.4	7.3
	HOV	1.2	5.9	7.1	83.1	0.8	3.9	4.7	83.0	0.4	3.0	3.4	88.2
	CV	1.8	0.0	1.8	0.0	1.2	0.0	1.2	0.0	0.8	0.0	0.8	0.0
	Total	27.0	8.3	35.3	23.5	18.5	5.4	23.9	22.6	12.7	3.9	16.6	23.5
B-2: Skewed Per Mile Rate	SOV	24.0	2.6	26.6	9.8	15.8	2.6	18.4	14.1	10.9	1.8	12.7	14.2
	HOV	1.2	5.9	7.1	83.1	0.8	3.9	4.7	83.0	0.4	3.0	3.4	88.2
	CV	1.8	0.0	1.8	0.0	1.2	0.0	1.2	0.0	0.8	0.0	0.8	0.0
	Total	27.0	8.5	35.5	23.9	17.8	6.5	24.3	26.7	12.1	4.8	16.9	28.4
C-1: Standard Rate Per Segment	SOV	23.7	3.1	26.8	11.6	16.7	1.1	17.8	6.2	11.7	0.5	12.2	4.1
	HOV	1.2	5.9	7.1	83.1	0.8	3.9	4.7	83.0	0.3	3.1	3.4	91.2
	CV	1.8	0.0	1.8	0.0	1.2	0.0	1.2	0.0	0.8	0.0	0.8	0.0
	Total	26.7	9.0	35.7	25.2	18.7	5.0	23.7	21.1	12.8	3.6	16.4	22.0
Northbound													
A-1: Flat Rate/ All Entries	SOV	17.4	0.2	17.6	1.1	13.6	0.2	13.8	1.4	12.6	0.2	12.8	1.6
	HOV	1.0	3.0	4.0	75.0	0.7	2.5	3.2	78.1	0.5	2.7	3.2	84.4
	CV	1.2	0.0	1.2	0.0	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0
	Total	19.6	3.2	22.8	14.0	15.3	2.7	18.0	15.0	14.0	2.9	16.9	17.2
A-2: Flat Rate/Max. Trip Per Entry	SOV	17.2	0.4	17.6	2.3	13.0	0.8	13.8	5.8	12.0	1.0	13.0	7.7
	HOV	1.4	2.7	4.1	65.9	1.1	2.2	3.3	66.7	0.8	2.3	3.1	74.2
	CV	1.2	0.0	1.2	0.0	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0
	Total	19.8	3.1	22.9	13.5	15.1	3.0	18.1	16.6	13.7	3.3	17.0	19.4
B-1: Standard Per Mile Rate	SOV	17.4	0.1	17.5	0.6	13.6	0.1	13.7	0.7	12.6	0.1	12.7	0.8
	HOV	1.0	3.1	4.1	75.6	0.7	2.5	3.2	78.1	0.5	2.8	3.3	84.8
	CV	1.2	0.0	1.2	0.0	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0
	Total	19.6	3.2	22.8	14.0	15.3	2.6	17.9	14.5	14.0	2.9	16.9	17.2
B-2: Skewed Per Mile Rate	SOV	17.5	0.1	17.6	0.6	13.6	0.1	13.7	0.7	12.6	0.3	12.9	2.3
	HOV	1.0	3.0	4.0	75.0	0.7	2.5	3.2	78.1	0.5	2.7	3.2	84.4
	CV	1.2	0.0	1.2	0.0	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0
	Total	19.7	3.1	22.8	13.6	15.3	2.6	17.9	14.5	14.0	3.0	17.0	17.6
C-1: Standard Rate Per Segment	SOV	17.4	0.2	17.6	1.1	13.3	0.6	13.9	4.3	12.1	1.0	13.1	7.6
	HOV	1.1	2.9	4.0	72.5	1.1	2.2	3.3	66.7	1.0	2.3	3.3	69.7
	CV	1.2	0.0	1.2	0.0	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0
	Total	19.7	3.1	22.8	13.6	15.4	2.8	18.2	15.4	14.0	3.3	17.3	19.1

Table 4-7

Managed Lanes Share Comparison for Base Scenarios
2015 PM Peak Period

Direction/Scenario	Vehicle Category	Location A: South of Miramar Road				Location B: South of Bernardo Center Drive				Location C: South of 9th Avenue			
		General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes	General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes	General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes
Southbound													
A-1: Flat Rate/ All Entries	SOV	26.7	0.4	27.1	1.5	20.2	0.4	20.6	1.9	19.2	0.3	19.5	1.5
	HOV	6.1	4.4	10.5	41.9	4.1	4.1	8.2	50.0	2.5	5.9	8.4	70.2
	CV	1.3	0.0	1.3	0.0	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0
	Total	34.1	4.8	38.9	12.3	25.3	4.5	29.8	15.1	22.6	6.2	28.8	21.5
A-2: Flat Rate/Max. Trip Per Entry	SOV	26.5	0.7	27.2	2.6	20.0	0.5	20.5	2.4	19.1	0.2	19.3	1.0
	HOV	5.6	4.7	10.3	45.6	3.2	4.9	8.1	60.5	2.7	5.5	8.2	67.1
	CV	1.3	0.0	1.3	0.0	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0
	Total	33.4	5.4	38.8	13.9	24.2	5.4	29.6	18.2	22.7	5.7	28.4	20.1
B-1: Standard Per Mile Rate	SOV	26.9	0.1	27.0	0.4	20.5	0.1	20.6	0.5	18.9	0.2	19.1	1.0
	HOV	5.1	5.2	10.3	50.5	3.1	5.1	8.2	62.2	2.3	6.0	8.3	72.3
	CV	1.3	0.0	1.3	0.0	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0
	Total	33.3	5.3	38.6	13.7	24.6	5.2	29.8	17.4	22.1	6.2	28.3	21.9
B-2: Skewed Per Mile Rate	SOV	26.9	0.1	27.0	0.4	20.5	0.2	20.7	1.0	18.9	0.2	19.1	1.0
	HOV	5.8	4.6	10.4	44.2	3.1	5.1	8.2	62.2	2.4	5.9	8.3	71.1
	CV	1.3	0.0	1.3	0.0	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0
	Total	34.0	4.7	38.7	12.1	24.6	5.3	29.9	17.7	22.2	6.1	28.3	21.6
C-1: Standard Rate Per Segment	SOV	26.9	0.2	27.1	0.7	20.4	0.2	20.6	1.0	18.9	0.2	19.1	1.0
	HOV	5.4	5.0	10.4	48.1	3.1	5.1	8.2	62.2	2.4	5.9	8.3	71.1
	CV	1.3	0.0	1.3	0.0	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0
	Total	33.6	5.2	38.8	13.4	24.5	5.3	29.8	17.8	22.2	6.1	28.3	21.6
Northbound													
A-1: Flat Rate/ All Entries	SOV	29.2	1.5	30.7	4.9	19.7	1.3	21.0	6.2	15.9	0.9	16.8	5.4
	HOV	1.4	13.1	14.5	90.3	2.3	7.5	9.8	76.5	0.7	6.5	7.2	90.3
	CV	1.4	0.0	1.4	0.0	1.0	0.0	1.0	0.0	0.8	0.0	0.8	0.0
	Total	32.0	14.6	46.6	31.3	23.0	8.8	31.8	27.7	17.4	7.4	24.8	29.8
A-2: Flat Rate/Max. Trip Per Entry	SOV	28.5	2.1	30.6	6.9	19.2	2.1	21.3	9.9	15.4	1.5	16.9	8.9
	HOV	1.8	12.8	14.6	87.7	2.1	7.4	9.5	77.9	0.8	6.5	7.3	89.0
	CV	1.4	0.0	1.4	0.0	1.0	0.0	1.0	0.0	0.8	0.0	0.8	0.0
	Total	31.7	14.9	46.6	32.0	22.3	9.5	31.8	29.9	17.0	8.0	25.0	32.0
B-1: Standard Per Mile Rate	SOV	29.9	1.0	30.9	3.2	20.1	0.5	20.6	2.4	16.4	0.3	16.7	1.8
	HOV	1.2	13.2	14.4	91.7	2.2	7.5	9.7	77.3	0.7	6.7	7.4	90.5
	CV	1.5	0.0	1.5	0.0	1.0	0.0	1.0	0.0	0.8	0.0	0.8	0.0
	Total	32.6	14.2	46.8	30.3	23.3	8.0	31.3	25.6	17.9	7.0	24.9	28.1
B-2: Skewed Per Mile Rate	SOV	29.9	1.0	30.9	3.2	20.1	0.5	20.6	2.4	16.3	0.3	16.6	1.8
	HOV	1.3	13.2	14.5	91.0	2.2	7.5	9.7	77.3	0.7	6.7	7.4	90.5
	CV	1.5	0.0	1.5	0.0	1.0	0.0	1.0	0.0	0.8	0.0	0.8	0.0
	Total	32.7	14.2	46.9	30.3	23.3	8.0	31.3	25.6	17.8	7.0	24.8	28.2
C-1: Standard Rate Per Segment	SOV	29.8	1.0	30.8	3.2	20.1	0.4	20.5	2.0	16.4	0.2	16.6	1.2
	HOV	1.3	13.2	14.5	91.0	2.2	7.6	9.8	77.6	0.7	6.7	7.4	90.5
	CV	1.5	0.0	1.5	0.0	0.9	0.0	0.9	0.0	0.8	0.0	0.8	0.0
	Total	32.6	14.2	46.8	30.3	23.2	8.0	31.2	25.6	17.9	6.9	24.8	27.8

generally varies by location, but not significantly by scenario. The reason the managed lanes do not accommodate 100 percent of HOV traffic is due to the restricted access to and from the managed lanes. Some HOV trips are simply too short to make effective use of the managed lanes.

Similar patterns are shown in the northbound direction. However, as might be expected, in the A.M. peak period, the managed lanes would accommodate a lower proportion of the total SOV traffic, due both to differences in patterns of global demand and less available capacity under an assumed three/one lane split.

The opposite relationship is shown in Table 4-5, covering the year 2005 P.M. peak period. As would be expected, the managed lanes accommodate a higher share of SOV traffic in the northbound direction during the P.M. peak period, again due to the assumed lane split in the managed lanes. Note that the share of SOV traffic in the P.M. peak period accommodating the managed lanes in the minor direction (southbound) is extremely low, generally between 0.4 and 3.5 percent. This is due to the shortage of available capacity for SOVs since only a single managed lane is operated in that direction.

As shown in Tables 4-6 and 4-7, in most cases the share of SOV traffic accommodated in the managed lanes decreases in the year 2015, with a few exceptions. Under Scenario A-2, for example, at the south end of the road, the SOV share accommodating the managed lanes actually increases, due to the fact that the flat toll rate decreases significantly at the south end of the project.

SENSITIVITY SCENARIOS

As described previously, two additional scenarios were run as sensitivity tests, both as variations to Base Scenario B-1. Scenario B-1 was a per-mile rate structure, with a minimum and maximum toll. As with all scenarios, Scenario B-1 assumed a movable barrier in the lower 17 miles of the managed lanes, with three lanes assumed to operate in the major direction and one lane in the minor direction during peak periods. Also, as with all scenarios, Scenario B-1 assumed a continued definition of HOV as vehicles with two or more occupants.

The sensitivity scenarios were run to test the potential impacts on traffic and revenue of the following variations in these assumptions:

- Sensitivity Scenario B-1-a: Assumed a fixed barrier arrangement over the entire length of the managed lanes, limiting managed lane capacity to two lanes in each direction at all times; and

- Scenario B-1-b: Assumed the regionwide definition of HOV was increased from two or more people to three or more people (HOV-3+).

The same analytical approach was used for each of these scenarios. In the case of Scenario B-1-a, the capacity of the managed lanes was adjusted to reflect a static 2x2 configuration all day long. In the case of Scenario B-1-b, it was assumed that the HOV-2 category was also required to pay a toll, along with SOV traffic, and only HOV-3+ would be toll free. In that latter scenario, no toll differential was assumed between SOV and HOV-2 vehicles.

An optimum toll analysis was conducted for each sensitivity test and traffic and revenue estimates prepared for each of the various time intervals.

SCENARIO B-1-A: FIXED BARRIER – TWO LANES PER DIRECTION

With a fixed two lanes per direction at all times, the target traffic capacity in the major direction is reduced. Specifically in the A.M. peak period (two hours) the target total vehicle capacity in each section is 6,000, while in the P.M. peak period (three hours) the target capacity would be 9,000.

Toll rates required to achieve these traffic thresholds are shown in Table 4-8. The per-mile rate for the peak periods in 2005 would be $0.40, or double the levels required under Scenario B-1. This is to effectively reduce SOV demand to within the reduced limitations of two managed lanes in the major direction. The minimum toll would increase to $2.00 and the maximum toll to $6.00. By 2015, the per-mile rate (in 2001 dollars) would increase to $0.50 per mile, with a maximum toll of $7.50, in both peak directions. Again, this is higher than the levels required under Scenario B-1 and reflects the reduced capacity available for SOV traffic in the major direction.

Optimum toll rates in the "minor" direction in peak periods in 2005 would be the same as with Scenario B-1. However, by 2010, minor direction peak period rates would have to be increased under Scenario B-1 (due to the assumption that only one lane is available in the minor direction) whereas such increases do not appear to be needed under Sensitivity Scenario B-1-a.

Table 4-8
Toll Rate Levels - Scenario B-1-a

Year/Period	Southbound			Northbound		
	Per-Mile	Minimum	Maximum	Per-Mile	Minimum	Maximum
2005						
A.M. Peak	$0.40	$2.00	$6.00	$0.10	$0.50	$1.50
A.M. Shoulder	0.30	1.50	4.50	0.10	0.50	1.50
Mid-Day	0.05	0.25	0.75	0.05	0.25	0.75
P.M. Shoulder	0.10	0.50	1.50	0.20	1.00	3.00
P.M. Peak	0.10	0.50	1.50	0.40	2.00	6.00
P.M. Shoulder	0.10	0.50	1.50	0.20	1.00	3.00
2010						
A.M. Peak	$0.40	$2.00	$6.00	$0.10	0.50	1.50
A.M. Shoulder	0.30	1.50	4.50	0.10	0.50	1.50
Mid-Day	0.05	0.25	0.75	0.05	0.25	0.75
P.M. Shoulder	0.10	0.50	1.50	0.30	1.50	4.50
P.M. Peak	0.10	0.50	1.50	0.50	2.50	7.50
P.M. Shoulder	0.10	0.50	1.50	0.30	1.50	4.50
2015						
A.M. Peak	$0.50	2.50	7.50	$0.10	0.50	1.50
A.M. Shoulder	0.30	1.50	4.50	0.10	0.50	1.50
Mid-Day	0.05	0.25	0.75	0.05	0.25	0.75
P.M. Shoulder	0.10	0.50	1.50	0.30	1.50	4.50
P.M. Peak	0.10	0.50	1.50	0.50	2.50	7.50
P.M. Shoulder	0.10	0.50	1.50	0.30	1.50	4.50

Note: All Toll Rates in 2001 Dollars

Estimated weekday traffic for this sensitivity scenario is shown in Figure 4-14. As compared with the base scenario B-1, SOV traffic levels in peak periods are considerably lower in the major direction, as might be expected. In the minor direction, SOV traffic levels are generally similar, or slightly higher in 2005, and significantly higher in most cases in 2015.

On a total daily basis, SOV toll traffic under a 2X2 lane configuration is actually slightly higher in many cases than Scenario B-1, at least at 2015 levels. This is not always the case, and depends on particular location.

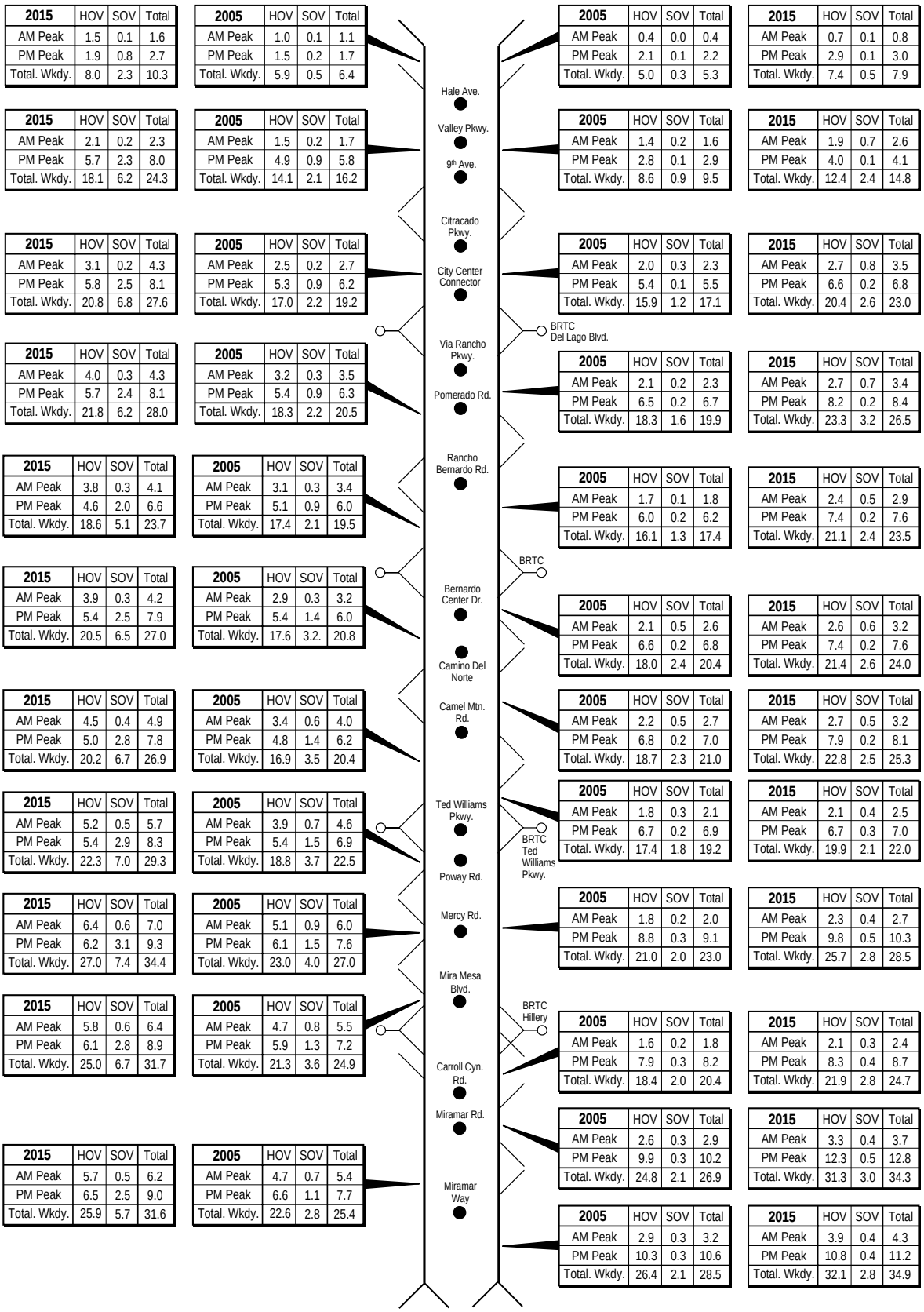
SENSITIVITY SCENARIO B-1-B: HOV INCREASED TO THREE OCCUPANTS

Required toll rate levels for this condition are shown in Table 4-9. For the most part, in 2005 the required rates are similar to base scenario B-1. However, over time, more limited "real increases" in rates are required; hence overall toll rates under Scenario B-1-b are slightly lower than the base scenario B-1.

This is primarily due to the fact that there is considerably more capacity available in the managed lanes to be sold under this condition than under the base case. Two-occupant vehicles represent at least two-thirds of total HOV traffic. By subjecting these to a toll, the amount of capacity used by toll-free vehicles is substantially reduced. With this extra capacity, the results of the analysis show the toll rates needed to manage demand, and optimize revenue, are actually lower than those under the base case assumption of HOV-2+.

Weekday traffic estimates for Sensitivity Scenario B-1-b are shown in Figure 4-15. In this case, the columns headed "SOV" actually refer to total toll traffic, including both SOV and HOV-2 categories. The term HOV in this case refers only to vehicles with three or more occupants.

As might be expected, the estimated traffic demand in the HOV category is dramatically reduced as compared to the base scenario B-1. This clearly shows the significant increase in capacity available for tolled traffic, which results in a significant increase in toll paying vehicles on both the peak period and daily basis. In fact, a significant majority of traffic using the managed lanes during peak periods and, on a daily basis, shift to the "toll-paying" category. This is similar to the relative relationships now being experienced on the S.R. 91 Express Lanes facility in Orange County, which also currently defines HOV traffic as vehicles with three or more occupants. In all cases, the total estimated traffic in the managed lanes, including both HOV and SOV in both directions in both peak


2015 HOV SOV Total
AM Peak 1.5 0.1 1.6
PM Peak 1.9 0.8 2.7
Total. Wkdy. 8.0 2.3 10.3
2005 HOV SOV Total
AM Peak 1.0 0.1 1.1
PM Peak 1.5 0.2 1.7
Total. Wkdy. 5.9 0.5 6.4
2005 HOV SOV Total
AM Peak 0.4 0.0 0.4
PM Peak 2.1 0.1 2.2
Total. Wkdy. 5.0 0.3 5.3
2015 HOV SOV Total
AM Peak 0.7 0.1 0.8
PM Peak 2.9 0.1 3.0
Total. Wkdy. 7.4 0.5 7.9
Hale Ave.
2015 HOV SOV Total
AM Peak 2.1 0.2 2.3
PM Peak 5.7 2.3 8.0
Total. Wkdy. 18.1 6.2 24.3
2005 HOV SOV Total
AM Peak 1.5 0.2 1.7
PM Peak 4.9 0.9 5.8
Total. Wkdy. 14.1 2.1 16.2
2005 HOV SOV Total
AM Peak 1.4 0.2 1.6
PM Peak 2.8 0.1 2.9
Total. Wkdy. 8.6 0.9 9.5
2015 HOV SOV Total
AM Peak 1.9 0.7 2.6
PM Peak 4.0 0.1 4.1
Total. Wkdy. 12.4 2.4 14.8
Valley Pkwy.
9th Ave.
Citracado Pkwy.
2015 HOV SOV Total
AM Peak 3.1 0.2 4.3
PM Peak 5.8 2.5 8.1
Total. Wkdy. 20.8 6.8 27.6
2005 HOV SOV Total
AM Peak 2.5 0.2 2.7
PM Peak 5.3 0.9 6.2
Total. Wkdy. 17.0 2.2 19.2
2005 HOV SOV Total
AM Peak 2.0 0.3 2.3
PM Peak 5.4 0.1 5.5
Total. Wkdy. 15.9 1.2 17.1
2015 HOV SOV Total
AM Peak 2.7 0.8 3.5
PM Peak 6.6 0.2 6.8
Total. Wkdy. 20.4 2.6 23.0
City Center Connector
BRTC Del Lago Blvd.
2015 HOV SOV Total
AM Peak 4.0 0.3 4.3
PM Peak 5.7 2.4 8.1
Total. Wkdy. 21.8 6.2 28.0
2005 HOV SOV Total
AM Peak 3.2 0.3 3.5
PM Peak 5.4 0.9 6.3
Total. Wkdy. 18.3 2.2 20.5
2005 HOV SOV Total
AM Peak 2.1 0.2 2.3
PM Peak 6.5 0.2 6.7
Total. Wkdy. 18.3 1.6 19.9
2015 HOV SOV Total
AM Peak 2.7 0.7 3.4
PM Peak 8.2 0.2 8.4
Total. Wkdy. 23.3 3.2 26.5
Via Rancho Pkwy.
Pomerado Rd.
2015 HOV SOV Total
AM Peak 3.8 0.3 4.1
PM Peak 4.6 2.0 6.6
Total. Wkdy. 18.6 5.1 23.7
2005 HOV SOV Total
AM Peak 3.1 0.3 3.4
PM Peak 5.1 0.9 6.0
Total. Wkdy. 17.4 2.1 19.5
2005 HOV SOV Total
AM Peak 1.7 0.1 1.8
PM Peak 6.0 0.2 6.2
Total. Wkdy. 16.1 1.3 17.4
2015 HOV SOV Total
AM Peak 2.4 0.5 2.9
PM Peak 7.4 0.2 7.6
Total. Wkdy. 21.1 2.4 23.5
Rancho Bernardo Rd.
BRTC
2015 HOV SOV Total
AM Peak 3.9 0.3 4.2
PM Peak 5.4 2.5 7.9
Total. Wkdy. 20.5 6.5 27.0
2005 HOV SOV Total
AM Peak 2.9 0.3 3.2
PM Peak 5.4 1.4 6.0
Total. Wkdy. 17.6 3.2. 20.8
2005 HOV SOV Total
AM Peak 2.1 0.5 2.6
PM Peak 6.6 0.2 6.8
Total. Wkdy. 18.0 2.4 20.4
2015 HOV SOV Total
AM Peak 2.6 0.6 3.2
PM Peak 7.4 0.2 7.6
Total. Wkdy. 21.4 2.6 24.0
Bernardo Center Dr.
Camino Del Norte
2015 HOV SOV Total
AM Peak 4.5 0.4 4.9
PM Peak 5.0 2.8 7.8
Total. Wkdy. 20.2 6.7 26.9
2005 HOV SOV Total
AM Peak 3.4 0.6 4.0
PM Peak 4.8 1.4 6.2
Total. Wkdy. 16.9 3.5 20.4
2005 HOV SOV Total
AM Peak 2.2 0.5 2.7
PM Peak 6.8 0.2 7.0
Total. Wkdy. 18.7 2.3 21.0
2015 HOV SOV Total
AM Peak 2.7 0.5 3.2
PM Peak 7.9 0.2 8.1
Total. Wkdy. 22.8 2.5 25.3
Camel Mtn. Rd.
2015 HOV SOV Total
AM Peak 5.2 0.5 5.7
PM Peak 5.4 2.9 8.3
Total. Wkdy. 22.3 7.0 29.3
2005 HOV SOV Total
AM Peak 3.9 0.7 4.6
PM Peak 5.4 1.5 6.9
Total. Wkdy. 18.8 3.7 22.5
2005 HOV SOV Total
AM Peak 1.8 0.3 2.1
PM Peak 6.7 0.2 6.9
Total. Wkdy. 17.4 1.8 19.2
2015 HOV SOV Total
AM Peak 2.1 0.4 2.5
PM Peak 6.7 0.3 7.0
Total. Wkdy. 19.9 2.1 22.0
Ted Williams Pkwy.
BRTC Ted Williams Pkwy.
Poway Rd.
2015 HOV SOV Total
AM Peak 6.4 0.6 7.0
PM Peak 6.2 3.1 9.3
Total. Wkdy. 27.0 7.4 34.4
2005 HOV SOV Total
AM Peak 5.1 0.9 6.0
PM Peak 6.1 1.5 7.6
Total. Wkdy. 23.0 4.0 27.0
2005 HOV SOV Total
AM Peak 1.8 0.2 2.0
PM Peak 8.8 0.3 9.1
Total. Wkdy. 21.0 2.0 23.0
2015 HOV SOV Total
AM Peak 2.3 0.4 2.7
PM Peak 9.8 0.5 10.3
Total. Wkdy. 25.7 2.8 28.5
Mercy Rd.
Mira Mesa Blvd.
2015 HOV SOV Total
AM Peak 5.8 0.6 6.4
PM Peak 6.1 2.8 8.9
Total. Wkdy. 25.0 6.7 31.7
2005 HOV SOV Total
AM Peak 4.7 0.8 5.5
PM Peak 5.9 1.3 7.2
Total. Wkdy. 21.3 3.6 24.9
2005 HOV SOV Total
AM Peak 1.6 0.2 1.8
PM Peak 7.9 0.3 8.2
Total. Wkdy. 18.4 2.0 20.4
2015 HOV SOV Total
AM Peak 2.1 0.3 2.4
PM Peak 8.3 0.4 8.7
Total. Wkdy. 21.9 2.8 24.7
BRTC Hillery
Carroll Cyn. Rd.
Miramar Rd.
2015 HOV SOV Total
AM Peak 5.7 0.5 6.2
PM Peak 6.5 2.5 9.0
Total. Wkdy. 25.9 5.7 31.6
2005 HOV SOV Total
AM Peak 4.7 0.7 5.4
PM Peak 6.6 1.1 7.7
Total. Wkdy. 22.6 2.8 25.4
2005 HOV SOV Total
AM Peak 2.6 0.3 2.9
PM Peak 9.9 0.3 10.2
Total. Wkdy. 24.8 2.1 26.9
2015 HOV SOV Total
AM Peak 3.3 0.4 3.7
PM Peak 12.3 0.5 12.8
Total. Wkdy. 31.3 3.0 34.3
Miramar Way
2005 HOV SOV Total
AM Peak 2.9 0.3 3.2
PM Peak 10.3 0.3 10.6
Total. Wkdy. 26.4 2.1 28.5
2015 HOV SOV Total
AM Peak 3.9 0.4 4.3
PM Peak 10.8 0.4 11.2
Total. Wkdy. 32.1 2.8 34.9

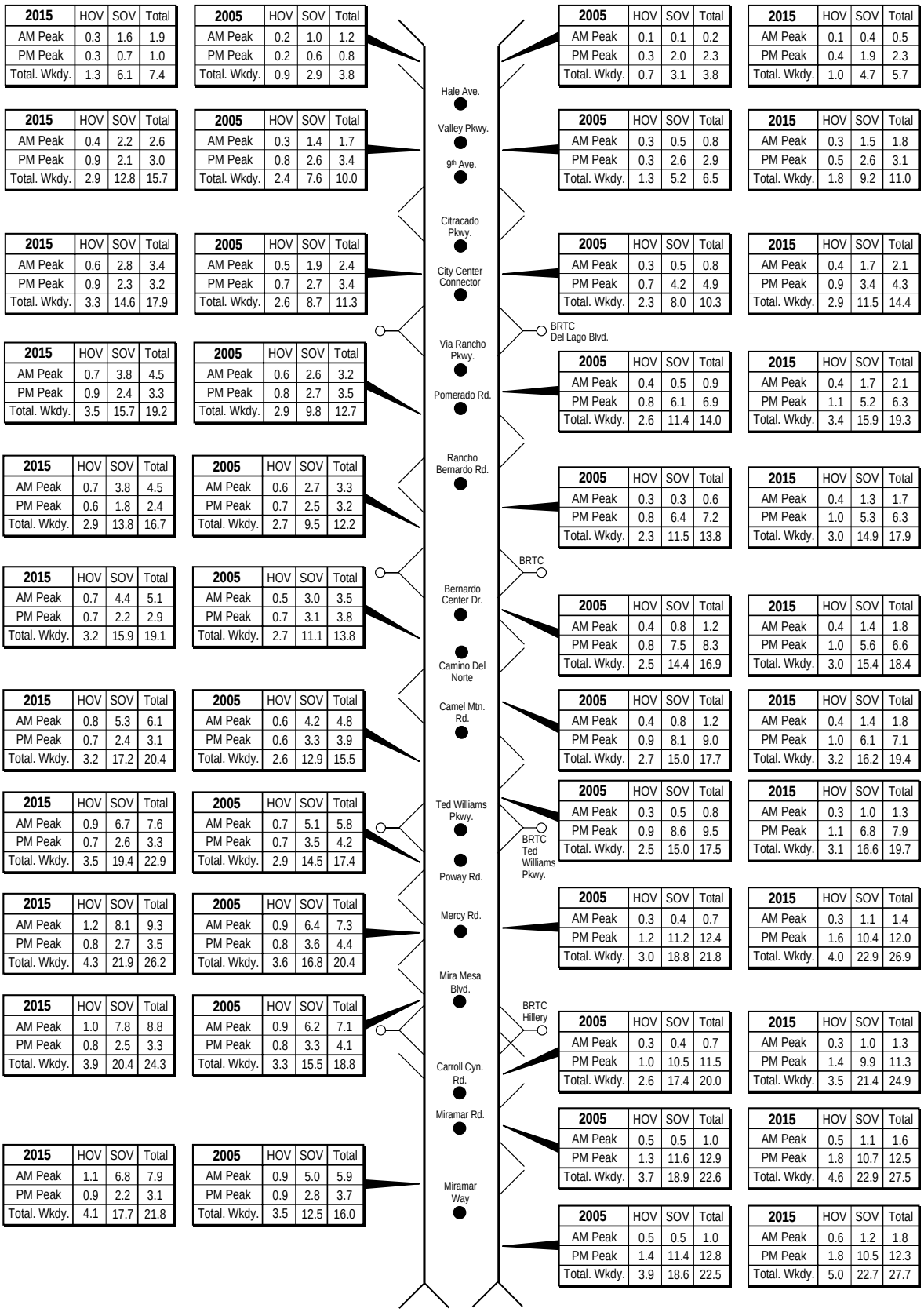

2015 HOV SOV Total
AM Peak 0.3 1.6 1.9
PM Peak 0.3 0.7 1.0
Total. Wkdy. 1.3 6.1 7.4
2005 HOV SOV Total
AM Peak 0.2 1.0 1.2
PM Peak 0.2 0.6 0.8
Total. Wkdy. 0.9 2.9 3.8
2005 HOV SOV Total
AM Peak 0.1 0.1 0.2
PM Peak 0.3 2.0 2.3
Total. Wkdy. 0.7 3.1 3.8
2015 HOV SOV Total
AM Peak 0.1 0.4 0.5
PM Peak 0.4 1.9 2.3
Total. Wkdy. 1.0 4.7 5.7
Hale Ave.
2015 HOV SOV Total
AM Peak 0.4 2.2 2.6
PM Peak 0.9 2.1 3.0
Total. Wkdy. 2.9 12.8 15.7
2005 HOV SOV Total
AM Peak 0.3 1.4 1.7
PM Peak 0.8 2.6 3.4
Total. Wkdy. 2.4 7.6 10.0
2005 HOV SOV Total
AM Peak 0.3 0.5 0.8
PM Peak 0.3 2.6 2.9
Total. Wkdy. 1.3 5.2 6.5
2015 HOV SOV Total
AM Peak 0.3 1.5 1.8
PM Peak 0.5 2.6 3.1
Total. Wkdy. 1.8 9.2 11.0
Valley Pkwy.
9th Ave.
2015 HOV SOV Total
AM Peak 0.6 2.8 3.4
PM Peak 0.9 2.3 3.2
Total. Wkdy. 3.3 14.6 17.9
2005 HOV SOV Total
AM Peak 0.5 1.9 2.4
PM Peak 0.7 2.7 3.4
Total. Wkdy. 2.6 8.7 11.3
2005 HOV SOV Total
AM Peak 0.3 0.5 0.8
PM Peak 0.7 4.2 4.9
Total. Wkdy. 2.3 8.0 10.3
2015 HOV SOV Total
AM Peak 0.4 1.7 2.1
PM Peak 0.9 3.4 4.3
Total. Wkdy. 2.9 11.5 14.4
Citracado Pkwy.
City Center Connector
BRTC Del Lago Blvd.
2015 HOV SOV Total
AM Peak 0.7 3.8 4.5
PM Peak 0.9 2.4 3.3
Total. Wkdy. 3.5 15.7 19.2
2005 HOV SOV Total
AM Peak 0.6 2.6 3.2
PM Peak 0.8 2.7 3.5
Total. Wkdy. 2.9 9.8 12.7
2005 HOV SOV Total
AM Peak 0.4 0.5 0.9
PM Peak 0.8 6.1 6.9
Total. Wkdy. 2.6 11.4 14.0
2015 HOV SOV Total
AM Peak 0.4 1.7 2.1
PM Peak 1.1 5.2 6.3
Total. Wkdy. 3.4 15.9 19.3
Via Rancho Pkwy.
Pomerado Rd.
2015 HOV SOV Total
AM Peak 0.7 3.8 4.5
PM Peak 0.6 1.8 2.4
Total. Wkdy. 2.9 13.8 16.7
2005 HOV SOV Total
AM Peak 0.6 2.7 3.3
PM Peak 0.7 2.5 3.2
Total. Wkdy. 2.7 9.5 12.2
2005 HOV SOV Total
AM Peak 0.3 0.3 0.6
PM Peak 0.8 6.4 7.2
Total. Wkdy. 2.3 11.5 13.8
2015 HOV SOV Total
AM Peak 0.4 1.3 1.7
PM Peak 1.0 5.3 6.3
Total. Wkdy. 3.0 14.9 17.9
Rancho Bernardo Rd.
BRTC
2015 HOV SOV Total
AM Peak 0.7 4.4 5.1
PM Peak 0.7 2.2 2.9
Total. Wkdy. 3.2 15.9 19.1
2005 HOV SOV Total
AM Peak 0.5 3.0 3.5
PM Peak 0.7 3.1 3.8
Total. Wkdy. 2.7 11.1 13.8
2005 HOV SOV Total
AM Peak 0.4 0.8 1.2
PM Peak 0.8 7.5 8.3
Total. Wkdy. 2.5 14.4 16.9
2015 HOV SOV Total
AM Peak 0.4 1.4 1.8
PM Peak 1.0 5.6 6.6
Total. Wkdy. 3.0 15.4 18.4
Bernardo Center Dr.
Camino Del Norte
2015 HOV SOV Total
AM Peak 0.8 5.3 6.1
PM Peak 0.7 2.4 3.1
Total. Wkdy. 3.2 17.2 20.4
2005 HOV SOV Total
AM Peak 0.6 4.2 4.8
PM Peak 0.6 3.3 3.9
Total. Wkdy. 2.6 12.9 15.5
2005 HOV SOV Total
AM Peak 0.4 0.8 1.2
PM Peak 0.9 8.1 9.0
Total. Wkdy. 2.7 15.0 17.7
2015 HOV SOV Total
AM Peak 0.4 1.4 1.8
PM Peak 1.0 6.1 7.1
Total. Wkdy. 3.2 16.2 19.4
Camel Mtn. Rd.
2015 HOV SOV Total
AM Peak 0.9 6.7 7.6
PM Peak 0.7 2.6 3.3
Total. Wkdy. 3.5 19.4 22.9
2005 HOV SOV Total
AM Peak 0.7 5.1 5.8
PM Peak 0.7 3.5 4.2
Total. Wkdy. 2.9 14.5 17.4
2005 HOV SOV Total
AM Peak 0.3 0.5 0.8
PM Peak 0.9 8.6 9.5
Total. Wkdy. 2.5 15.0 17.5
2015 HOV SOV Total
AM Peak 0.3 1.0 1.3
PM Peak 1.1 6.8 7.9
Total. Wkdy. 3.1 16.6 19.7
Ted Williams Pkwy.
BRTC Ted Williams Pkwy.
Poway Rd.
2015 HOV SOV Total
AM Peak 1.2 8.1 9.3
PM Peak 0.8 2.7 3.5
Total. Wkdy. 4.3 21.9 26.2
2005 HOV SOV Total
AM Peak 0.9 6.4 7.3
PM Peak 0.8 3.6 4.4
Total. Wkdy. 3.6 16.8 20.4
2005 HOV SOV Total
AM Peak 0.3 0.4 0.7
PM Peak 1.2 11.2 12.4
Total. Wkdy. 3.0 18.8 21.8
2015 HOV SOV Total
AM Peak 0.3 1.1 1.4
PM Peak 1.6 10.4 12.0
Total. Wkdy. 4.0 22.9 26.9
Mercy Rd.
Mira Mesa Blvd.
2015 HOV SOV Total
AM Peak 1.0 7.8 8.8
PM Peak 0.8 2.5 3.3
Total. Wkdy. 3.9 20.4 24.3
2005 HOV SOV Total
AM Peak 0.9 6.2 7.1
PM Peak 0.8 3.3 4.1
Total. Wkdy. 3.3 15.5 18.8
2005 HOV SOV Total
AM Peak 0.3 0.4 0.7
PM Peak 1.0 10.5 11.5
Total. Wkdy. 2.6 17.4 20.0
2015 HOV SOV Total
AM Peak 0.3 1.0 1.3
PM Peak 1.4 9.9 11.3
Total. Wkdy. 3.5 21.4 24.9
BRTC Hillery
Carroll Cyn. Rd.
Miramar Rd.
2015 HOV SOV Total
AM Peak 1.1 6.8 7.9
PM Peak 0.9 2.2 3.1
Total. Wkdy. 4.1 17.7 21.8
2005 HOV SOV Total
AM Peak 0.9 5.0 5.9
PM Peak 0.9 2.8 3.7
Total. Wkdy. 3.5 12.5 16.0
2005 HOV SOV Total
AM Peak 0.5 0.5 1.0
PM Peak 1.3 11.6 12.9
Total. Wkdy. 3.7 18.9 22.6
2015 HOV SOV Total
AM Peak 0.5 1.1 1.6
PM Peak 1.8 10.7 12.5
Total. Wkdy. 4.6 22.9 27.5
Miramar Way
2005 HOV SOV Total
AM Peak 0.5 0.5 1.0
PM Peak 1.4 11.4 12.8
Total. Wkdy. 3.9 18.6 22.5
2015 HOV SOV Total
AM Peak 0.6 1.2 1.8
PM Peak 1.8 10.5 12.3
Total. Wkdy. 5.0 22.7 27.7

Table 4-9
Toll Rate Levels - Scenario B-1-b

Year/Period	Southbound			Northbound		
	Per-Mile	Minimum	Maximum	Per-Mile	Minimum	Maximum
2005						
A.M. Peak	$0.20	$1.00	$3.00	$0.10	$0.50	$1.50
A.M. Shoulder	0.10	0.50	1.50	0.10	0.50	1.50
Mid-Day	0.05	0.25	0.75	0.05	0.25	0.75
P.M. Shoulder	0.10	0.50	1.50	0.10	0.50	1.50
P.M. Peak	0.10	0.50	1.50	0.10	0.50	1.50
P.M. Shoulder	0.10	0.50	1.50	0.10	0.50	1.50
2010						
A.M. Peak	$0.20	$1.00	$3.00	$0.10	0.50	1.50
A.M. Shoulder	0.10	0.50	1.50	0.10	0.50	1.50
Mid-Day	0.05	0.25	0.75	0.05	0.25	0.75
P.M. Shoulder	0.10	0.50	1.50	0.10	0.50	1.50
P.M. Peak	0.10	0.50	1.50	0.20	$1.00	$3.00
P.M. Shoulder	0.10	0.50	1.50	0.10	0.50	1.50
2015						
A.M. Peak	$0.20	$1.00	$3.00	$0.10	0.50	1.50
A.M. Shoulder	0.10	0.50	1.50	0.10	0.50	1.50
Mid-Day	0.05	0.25	0.75	0.05	0.25	0.75
P.M. Shoulder	0.10	0.50	1.50	0.10	0.50	1.50
P.M. Peak	0.20	$1.00	$3.00	0.20	$1.00	$3.00
P.M. Shoulder	0.10	0.50	1.50	0.10	0.50	1.50

Note: All Toll Rates in 2001 Dollars

periods, is within the targeted amounts, thereby providing a high level of service to HOV traffic, while substantially increasing toll revenue potential from the facility.

It should be recognized that this sensitivity test was run primarily to determine what would happen to traffic and revenue if decisions were made to change the definition of an HOV on a regional basis. It would also, in theory, be possible to only change the HOV definition on the I-15 managed lanes portion, as a means of maximizing revenue. However, that was not the intent of this particular sensitivity test.

By 2015, it is not unlikely that the definition of HOV will need to be increased, largely due to increasing congestion levels of single HOV lanes elsewhere in the region. This would result in a significant change in the character of usage of the proposed managed lanes project, and significantly increase toll revenue potential, as might be expected.

MANAGED LANES SHARE CAPACITY – SENSITIVITY SCENARIOS

Tables 4-10 and 4-11 show, at the same three selected locations along the project, the managed lanes share at 2005 and 2015 levels. In this case, the two sensitivity conditions are compared directly with the base Scenario B-1, which would assume a standard per-mile rate. With the fixed barrier option under Scenario B-1, the share of SOV traffic able to be accommodated in the major travel direction shrinks from about 13.5 percent to just about 3 percent, and even lower at other locations along the corridor. A similar pattern is shown in the northbound direction in P.M. peaks. However, if the definition of HOV is increased to three or more occupants, the share of other vehicles (SOV and HOV-2) accommodated through tolls increases significantly.

The differences between the scenarios tend to become even more pronounced by 2015. The major direction constraints associated with the fixed barrier operation tend to allow an even lower share of SOV traffic to be accommodated in the major direction. By contrast, however, in the "minor" direction in peak periods, the share of SOV traffic is actually increased, since excess capacity in the minor direction is greater due to the assumed 2/2 lane split.

As shown in Table 4-11, by 2015 if the definition of HOV is increased to three persons, the share of non-HOV traffic accommodated by the managed lanes increases significantly. In the southbound A.M. peak, for example, the share of total non-HOV traffic in the managed lanes more than doubles as compared with the base scenario B-1. In the P.M.

Table 4-10

Managed Lanes Share Comparisons - Sensitivity Scenarios - 2005

Direction/Period/Scenario	Vehicle Category	Location A: South of Miramar Road				Location B: South of Bernardo Center Drive				Location C: South of 9th Avenue			
		General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes	General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes	General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes
AM Peak Southbound													
B-1: Standard Per Mile Rate	SOV	21.7	3.4	25.1	13.5	16.0	2.0	18.0	11.1	10.7	1.2	11.9	10.1
	HOV	0.7	4.6	5.3	86.8	0.7	2.8	3.5	80.0	0.2	2.4	2.6	92.3
	CV	1.6	0.0	1.6	0.0	1.2	0.0	1.2	0.0	0.8	0.0	0.8	0.0
	Total	24.0	8.0	32.0	25.0	17.9	4.8	22.7	21.1	11.7	3.6	15.3	23.5
B-1-a: Standard Per Mile Rate with Fixed Barrier (2 lanes/dir.)	SOV	23.0	0.7	23.7	3.0	16.9	0.3	17.2	1.7	11.3	0.2	11.5	1.7
	HOV	0.6	4.7	5.3	88.7	0.7	2.9	3.6	80.6	0.2	2.5	2.7	92.6
	CV	1.5	0.0	1.5	0.0	1.1	0.0	1.1	0.0	0.8	0.0	0.8	0.0
	Total	25.1	5.4	30.5	17.7	18.7	3.2	21.9	14.6	12.3	2.7	15.0	18.0
B-1-b: Standard Per Mile Rate with only HOV-3+ free	SOV	23.4	5.0	28.4	17.6	17.3	3.0	20.3	14.8	11.7	1.9	13.6	14.0
	HOV	0.1	0.9	1.0	90.0	0.1	0.5	0.6	83.3	0.0	0.5	0.5	100.0
	CV	1.6	0.0	1.6	0.0	1.1	0.0	1.1	0.0	0.8	0.0	0.8	0.0
	Total	25.1	5.9	31.0	19.0	18.5	3.5	22.0	15.9	12.5	2.4	14.9	16.1
AM Peak Northbound													
B-1: Standard Per Mile Rate	SOV	15.4	0.2	15.6	1.3	13.1	0.4	13.5	3.0	11.4	0.3	11.7	2.6
	HOV	0.5	2.6	3.1	83.9	0.6	2.1	2.7	77.8	0.4	2.0	2.4	83.3
	CV	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	16.9	2.8	19.7	14.2	14.6	2.5	17.1	14.6	12.5	2.3	14.8	15.5
B-1-a: Standard Per Mile Rate with Fixed Barrier (2 lanes/dir.)	SOV	15.3	0.3	15.6	1.9	13.0	0.5	13.5	3.7	11.4	0.3	11.7	2.6
	HOV	0.5	2.6	3.1	83.9	0.6	2.1	2.7	77.8	0.4	2.0	2.4	83.3
	CV	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	16.8	2.9	19.7	14.7	14.5	2.6	17.1	15.2	12.5	2.3	14.8	15.5
B-1-b: Standard Per Mile Rate with only HOV-3+ free	SOV	17.0	0.5	17.5	2.9	14.8	0.8	15.6	5.1	12.8	0.6	13.4	4.5
	HOV	0.1	0.5	0.6	83.3	0.1	0.4	0.5	80.0	0.1	0.3	0.4	75.0
	CV	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	18.1	1.0	19.1	5.2	15.8	1.2	17.0	7.1	13.6	0.9	14.5	6.2
PM Peak Southbound													
B-1: Standard Per Mile Rate	SOV	25.4	0.1	25.5	0.4	19.9	0.2	20.1	1.0	18.2	0.1	18.3	0.5
	HOV	4.0	4.6	8.6	53.5	2.5	4.7	7.2	65.3	1.7	5.0	6.7	74.6
	CV	1.2	0.0	1.2	0.0	0.9	0.0	0.9	0.0	0.9	0.0	0.9	0.0
	Total	30.6	4.7	35.3	13.3	23.3	4.9	28.2	17.4	20.8	5.1	25.9	19.7
B-1-a: Standard Per Mile Rate with Fixed Barrier (2 lanes/dir.)	SOV	24.8	1.1	25.9	4.2	19.1	1.4	20.5	6.8	17.7	0.9	18.6	4.8
	HOV	2.4	6.7	9.1	73.6	2.1	5.4	7.5	72.0	1.6	5.3	6.9	76.8
	CV	1.2	0.0	1.2	0.0	0.9	0.0	0.9	0.0	0.9	0.0	0.9	0.0
	Total	28.4	7.8	36.2	21.5	22.1	6.8	28.9	23.5	20.2	6.2	26.4	23.5
B-1-b: Standard Per Mile Rate with only HOV-3+ free	SOV	29.5	2.8	32.3	8.7	22.9	3.1	26.0	11.9	20.4	2.7	23.1	11.7
	HOV	0.3	0.9	1.2	75.0	0.2	0.7	0.9	77.8	0.2	0.7	0.9	77.8
	CV	1.2	0.0	1.2	0.0	0.9	0.0	0.9	0.0	0.8	0.0	0.8	0.0
	Total	31.0	3.7	34.7	10.7	24.0	3.8	27.8	13.7	21.4	3.4	24.8	13.7
PM Peak Northbound													
B-1: Standard Per Mile Rate	SOV	25.9	2.6	28.5	9.1	18.8	1.6	20.4	7.8	15.6	0.7	16.3	4.3
	HOV	1.0	10.0	11.0	90.9	1.6	6.5	8.1	80.2	0.8	5.4	6.2	87.1
	CV	1.3	0.0	1.3	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	28.2	12.6	40.8	30.9	21.3	8.1	29.4	27.6	17.1	6.1	23.2	26.3
B-1-a: Standard Per Mile Rate with Fixed Barrier (2 lanes/dir.)	SOV	27.5	0.3	27.8	1.1	19.7	0.2	19.9	1.0	16.1	0.1	16.2	0.6
	HOV	1.0	9.9	10.9	90.8	1.5	6.4	7.9	81.0	0.8	5.4	6.2	87.1
	CV	1.3	0.0	1.3	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	29.8	10.2	40.0	25.5	22.1	6.6	28.7	23.0	17.6	5.5	23.1	23.8
B-1-b: Standard Per Mile Rate with only HOV-3+ free	SOV	26.4	11.6	38.0	30.5	19.9	7.5	27.4	27.4	17.3	4.2	21.5	19.5
	HOV	0.1	1.3	1.4	92.9	0.2	0.8	1.0	80.0	0.1	0.7	0.8	87.5
	CV	1.3	0.0	1.3	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	27.8	12.9	40.7	31.7	21.0	8.3	29.3	28.3	18.1	4.9	23.0	21.3

Table 4-11

Managed Lanes Share Comparisons - Sensitivity Scenarios - 2015

Direction/Period/Scenario	Vehicle Category	Location A: South of Miramar Road				Location B: South of Bernardo Center Drive				Location C: South of 9th Avenue			
		General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes	General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes	General Purpose Lanes Volume (000)	Managed Lanes Volume (000)	Total Volume (000)	Percent in Managed Lanes
AM Peak Southbound													
B-1: Standard Per Mile Rate	SOV	24.0	2.4	26.4	9.1	16.5	1.5	18.0	8.3	11.5	0.9	12.4	7.3
	HOV	1.2	5.9	7.1	83.1	0.8	3.9	4.7	83.0	0.4	3.0	3.4	88.2
	CV	1.8	0.0	1.8	0.0	1.2	0.0	1.2	0.0	0.8	0.0	0.8	0.0
	Total	27.0	8.3	35.3	23.5	18.5	5.4	23.9	22.6	12.7	3.9	16.6	23.5
B-1-a: Standard Per Mile Rate with Fixed Barrier (2 lanes/dir.)	SOV	25.0	0.5	25.5	2.0	17.0	0.3	17.3	1.7	11.9	0.2	12.1	1.7
	HOV	1.3	5.7	7.0	81.4	0.7	3.9	4.6	84.8	0.2	3.1	3.3	93.9
	CV	1.7	0.0	1.7	0.0	1.2	0.0	1.2	0.0	0.8	0.0	0.8	0.0
	Total	28.0	6.2	34.2	18.1	18.9	4.2	23.1	18.2	12.9	3.3	16.2	20.4
B-1-b: Standard Per Mile Rate with only HOV-3+ free	SOV	24.9	6.7	31.6	21.2	17.4	4.4	21.8	20.2	12.2	2.8	15.0	18.7
	HOV	0.2	1.1	1.3	84.6	0.1	0.7	0.8	87.5	0.0	0.6	0.6	100.0
	CV	1.8	0.0	1.8	0.0	1.2	0.0	1.2	0.0	0.8	0.0	0.8	0.0
	Total	26.9	7.8	34.7	22.5	18.7	5.1	23.8	21.4	13.0	3.4	16.4	20.7
AM Peak Northbound													
B-1: Standard Per Mile Rate	SOV	17.4	0.1	17.5	0.6	13.6	0.1	13.7	0.7	12.6	0.1	12.7	0.8
	HOV	1.0	3.1	4.1	75.6	0.7	2.5	3.2	78.1	0.5	2.8	3.3	84.8
	CV	1.2	0.0	1.2	0.0	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0
	Total	19.6	3.2	22.8	14.0	15.3	2.6	17.9	14.5	14.0	2.9	16.9	17.2
B-1-a: Standard Per Mile Rate with Fixed Barrier (2 lanes/dir.)	SOV	17.3	0.4	17.7	2.3	13.3	0.6	13.9	4.3	12.3	0.8	13.1	6.1
	HOV	0.8	3.3	4.1	80.5	0.7	2.5	3.2	78.1	0.5	2.8	3.3	84.8
	CV	1.2	0.0	1.2	0.0	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0
	Total	19.3	3.7	23.0	16.1	15.0	3.1	18.1	17.1	13.7	3.6	17.3	20.8
B-1-b: Standard Per Mile Rate with only HOV-3+ free	SOV	19.5	1.2	20.7	5.8	14.9	1.4	16.3	8.6	13.5	1.6	15.1	10.6
	HOV	0.2	0.5	0.7	71.4	0.2	0.4	0.6	66.7	0.1	0.4	0.5	80.0
	CV	1.2	0.0	1.2	0.0	0.9	0.0	0.9	0.0	0.9	0.0	0.9	0.0
	Total	20.9	1.7	22.6	7.5	16.0	1.8	17.8	10.1	14.5	2.0	16.5	12.1
PM Peak Southbound													
B-1: Standard Per Mile Rate	SOV	26.9	0.1	27.0	0.4	20.5	0.2	20.7	1.0	18.9	0.1	19.0	0.5
	HOV	5.1	5.2	10.3	50.5	2.5	4.7	7.2	65.3	1.7	5.0	6.7	74.6
	CV	1.3	0.0	1.3	0.0	0.9	0.0	0.9	0.0	0.9	0.0	0.9	0.0
	Total	33.3	5.3	38.6	13.7	23.9	4.9	28.8	17.0	21.5	5.1	26.6	19.2
B-1-a: Standard Per Mile Rate with Fixed Barrier (2 lanes/dir.)	SOV	25.9	2.5	28.4	8.8	18.9	2.5	21.4	11.7	17.6	2.5	20.1	12.4
	HOV	4.2	6.5	10.7	60.7	3.1	5.4	8.5	63.5	3.0	5.8	8.8	65.9
	CV	1.3	0.0	1.3	0.0	1.0	0.0	1.0	0.0	0.9	0.0	0.9	0.0
	Total	31.4	9.0	40.4	22.3	23.0	7.9	30.9	25.6	21.5	8.3	29.8	27.9
B-1-b: Standard Per Mile Rate with only HOV-3+ free	SOV	33.1	2.3	35.4	6.5	24.4	2.2	26.6	8.3	22.8	2.2	25.0	8.8
	HOV	0.5	0.9	1.4	64.3	0.4	0.7	1.1	63.6	0.2	0.9	1.1	81.8
	CV	1.2	0.0	1.2	0.0	0.9	0.0	0.9	0.0	0.9	0.0	0.9	0.0
	Total	34.8	3.2	38.0	8.4	25.7	2.9	28.6	10.1	23.9	3.1	27.0	11.5
PM Peak Northbound													
B-1: Standard Per Mile Rate	SOV	29.9	1.0	30.9	3.2	20.1	1.6	21.7	7.4	16.4	0.7	17.1	4.1
	HOV	1.2	13.2	14.4	91.7	1.6	6.5	8.1	80.2	0.8	5.4	6.2	87.1
	CV	1.5	0.0	1.5	0.0	0.9	0.0	0.9	0.0	0.7	0.0	0.7	0.0
	Total	32.6	14.2	46.8	30.3	22.6	8.1	30.7	26.4	17.9	6.1	24.0	25.4
B-1-a: Standard Per Mile Rate with Fixed Barrier (2 lanes/dir.)	SOV	30.3	0.5	30.8	1.6	20.0	0.2	20.2	1.0	16.4	0.2	16.6	1.2
	HOV	1.5	12.3	13.8	89.1	2.2	7.4	9.6	77.1	0.7	6.5	7.2	90.3
	CV	1.5	0.0	1.5	0.0	0.9	0.0	0.9	0.0	0.8	0.0	0.8	0.0
	Total	33.3	12.8	46.1	27.8	23.1	7.6	30.7	24.8	17.9	6.7	24.6	27.2
B-1-b: Standard Per Mile Rate with only HOV-3+ free	SOV	31.7	10.7	42.4	25.2	22.3	5.5	27.8	19.8	18.8	3.4	22.2	15.3
	HOV	0.1	1.8	1.9	94.7	0.2	1.0	1.2	83.3	0.1	0.9	1.0	90.0
	CV	1.4	0.0	1.4	0.0	0.9	0.0	0.9	0.0	0.8	0.0	0.8	0.0
	Total	33.2	12.5	45.7	27.4	23.4	6.5	29.9	21.7	19.7	4.3	24.0	17.9

northbound direction, the share increases from as little as 3.2 percent at the south end of the project to more than 25 percent at the same location. This is due to the fact that HOV demand with an HOV-2 definition, uses up almost all available capacity under Scenario B-1. However, if the definition is changed to HOV-3+, the amount of available capacity increases dramatically.

MANAGED LANES OPERATIONS COMPARISON

Table 4-12 provides a useful comparison between the five base scenarios, and the two sensitivity scenarios, of usage patterns in the managed lanes. For each condition, and at 2005, 2010 and 2015 levels, the total number of trips, vehicle miles of travel (VMT) and average trip length are shown. This is shown for HOV and tolled traffic, as well as total vehicles in the managed lanes. All figures shown in Table 4-12 reflect managed lane traffic only.

In the year 2005, HOV trips are generally similar for all scenarios except Sensitivity Scenario B-1-b. HOV trips generally range from about 92,300 to 95,400 depending on the scenario. The average trip length for HOV trips is generally consistent, averaging about 7.5 miles per trip on the managed lanes. The trip lengths reflect only the portion of the total trip made on the managed lanes itself.

As might be expected, due to the effect of the different pricing strategies, tolled vehicle operating characteristics vary widely between scenarios. Under the base scenarios, the number of tolled trips, for example, ranged from 19,800 vehicles per day to as high as 31,000 vehicles per day. The lowest number of users is found under Scenario B-2, the skewed per-mile rate program, while the highest volume of trips is shown under Scenario C-1. The number of toll trips would be reduced significantly under Scenario B-1-a, due to the assumed reduced capacity in the major direction. Toll trips would increase substantially under Scenario B-1-b, since the HOV-2 category must now pay a toll under that particular test.

It is interesting to see the differences in average trip length. The lowest average trip length is found in the segment tolls, which assume no minimum toll and a nominal toll generally in the range of $0.15 to $0.40 per segment. This strategy would actually encourage short trips and, possibly, frequent “in and out” movements. The effect of this is clearly shown in the low 6.8 mile average trip length of all tolled users under the

Table 4-12

Managed Lane Operations Comparison by Scenario
Average Weekday

Year	Item	Base Scenarios A-1	A-2	B-1	B-2	C-1	Sensitivity Scenarios B-1-a	B-1-b
2005								
HOV	Trips (000s)	92.4	92.7	93.1	93.0	92.3	95.4	14.3
	VMT (000s)	688.0	693.5	707.6	706.9	699.8	737.1	110.4
	Trip Length (mi.)	7.4	7.5	7.6	7.6	7.6	7.7	7.7
Tolled	Trips (000s)	20.6	22.2	21.3	19.8	31.0	11.2	52.4
	VMT (000s)	270.9	243.2	192.6	205.0	211.0	90.3	499.6
	Trip Length (mi.)	13.2	11.0	9.0	10.4	6.8	8.1	9.5
Total	Trips (000s)	113.0	114.9	114.4	112.8	123.3	106.6	66.7
	VMT (000s)	958.9	936.7	900.2	911.9	910.8	827.4	610.0
	Trip Length (mi.)	8.5	8.2	7.9	8.1	7.4	7.8	9.1
2010								
HOV	Trips (000s)	107.8	106.9	108.4	107.7	108.5	110.0	16.8
	VMT (000s)	807.9	803.5	823.9	812.4	814.3	850.2	129.8
	Trip Length (mi.)	7.5	7.5	7.6	7.5	7.5	7.7	7.7
Tolled	Trips (000s)	16.8	20.9	15.8	21.9	23.3	14.7	61.3
	VMT (000s)	233.2	236.0	134.7	215.8	143.3	120.3	587.9
	Trip Length (mi.)	13.9	11.3	8.5	9.9	6.2	8.2	9.6
Total	Trips (000s)	124.6	127.8	124.2	129.6	131.8	124.7	78.1
	VMT (000s)	1,041.1	1,039.5	958.6	1,028.2	957.6	970.5	717.7
	Trip Length (mi.)	8.4	8.1	7.7	7.9	7.3	7.8	9.2
2015								
HOV	Trips (000s)	119.5	116.9	119.8	119.4	118.7	118.9	17.9
	VMT (000s)	865.6	860.9	892.1	878.7	881.7	893.2	136.7
	Trip Length (mi.)	7.2	7.4	7.4	7.4	7.4	7.5	7.6
Tolled	Trips (000s)	18.7	25.2	18.3	23.8	24.6	20.2	69.4
	VMT (000s)	254.5	285.2	161.6	236.4	156.8	177.1	668.8
	Trip Length (mi.)	13.6	11.3	8.8	9.9	6.4	8.8	9.6
Total	Trips (000s)	138.2	142.1	138.1	143.2	143.3	139.1	87.3
	VMT (000s)	1,120.1	1,146.1	1,053.7	1,115.1	1,038.5	1,070.3	805.5
	Trip Length (mi.)	8.1	8.1	7.6	7.8	7.2	7.7	9.2

NOTE: A-1: Flat Rate/All Entries
A-2: Flat Rate/Max. Trip Per Entry
B-1: Standard Per Mile Rate
B-1-a: Standard Per Mile Rate with Fixed Barrier (2 lanes/direction)
B-1-b: Standard Per Mile Rate with Only HOV-3+ Free
B-2: Skewed Per Mile Rate
C-1: Standard Rate Per Segment

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segment tolled bases. The mileage-based rate programs (B-1 and B-2) generally have average trip lengths in the 9.0 to 10.4 range. The highest average trip lengths are found in the flat rate scenarios, as might be expected, with the highest overall average trip length of 13.2 miles for Scenario A-1.

The figures shown in Table 4-12 clearly display the impact of the different pricing strategies and pricing levels. All figures reflect total weekday conditions for all time periods in both travel directions. Most of the differences occur in the peak periods, since that is when the largest range of rates occur.

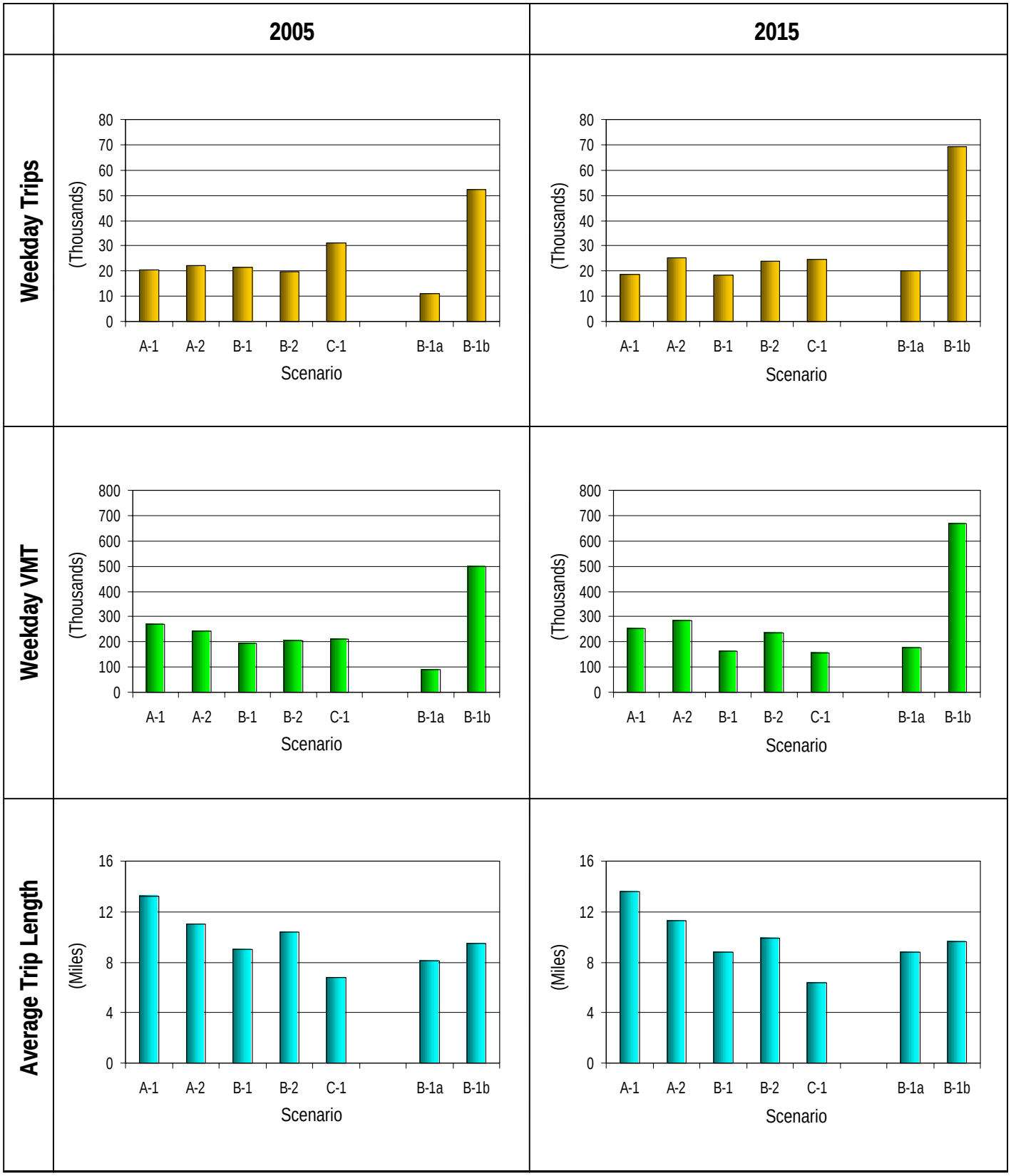
It could be argued that the most efficient utilization of the managed lanes would be that which produces the highest total VMT. These would tend to be under the flat rate program. The highest equity, in terms of toll fairness, would be in the per-mile scenarios, although these result in lower overall levels of travel and average trip lengths. The segment-based pricing, without any minimum toll, would result in the highest number of trips, but not the highest amount of effective utilization.

For ease of interpretation, the operating differences for the toll traffic component only are shown in graphic form in Figure 4-16. Comparisons are made at 2005 and 2015 levels. The effect of the different pricing strategies is clearly shown.

ESTIMATED TOLL REVENUE

Toll revenue was estimated based on the weekday traffic assignments discussed above. Table 4-13 shows a breakdown of estimated weekday trips and revenue by time period, for each of the base and sensitivity scenarios. The net computed average toll is also shown.

Revenue is actually calculated as part of the assignment process. Due to the unique characteristics of each of the various toll scenarios, a toll rate table approach was used in the traffic assignment process. That is, recognizing the parameters of each particular scenario, a toll rate for each combination of entry and exit points to the managed lanes was developed. Based on the point of entry and exit for each trip, revenue is calculated as part of the assignment process. The net average tolls shown in Table 4-13 are simply the computed weekday revenue divided by the number of weekday trips in each category.



COMPARISON OF TOLL TRAFFIC PROFILES BY SCENARIO

FIGURE 4-16

Table 4-13

Estimated Weekday Trips and Revenue

Year/Period	Scenario A-1			Scenario A-2			Scenario B-1			Scenario B-2			Scenario C-1			Scenario B-1-a			Scenario B-1-b		
	Weekday Trips	Weekday Revenue	Average Toll	Weekday Trips	Weekday Revenue	Average Toll	Weekday Trips	Weekday Revenue	Average Toll	Weekday Trips	Weekday Revenue	Average Toll	Weekday Trips	Weekday Revenue	Average Toll	Weekday Trips	Weekday Revenue	Average Toll	W eekday Trips	Weekday Revenue	Average Toll
2005																					
AM Peak	5,843	$9,163	$1.57	5,714	$8,335	$1.46	5,315	$9,286	$1.75	5,660	$8,412	$1.49	6,472	$8,712	$1.35	1,848	$4,034	$2.18	8,311	$14,609	$1.76
AM Shoulder	3,456	3,031	0.88	3,176	2,977	0.94	3,484	3,236	0.93	2,332	3,004	1.29	5,152	3,158	0.61	858	1,329	1.55	4,928	4,643	0.94
Midday	1,814	907	0.50	1,814	907	0.50	2,904	960	0.33	4,903	1,323	0.27	2,390	518	0.22	2,904	960	0.33	4,767	1,890	0.40
PM Shoulder 1	3,577	3,031	0.85	4,010	3,105	0.77	3,663	3,467	0.95	1,807	2,885	1.60	5,442	3,412	0.63	2,082	3,063	1.47	6,767	6,522	0.96
PM Peak	4,125	7,439	1.80	5,068	7,724	1.52	3,838	7,001	1.82	4,403	7,112	1.62	7,914	7,712	0.97	2,830	3,875	1.37	22,012	20,805	0.95
PM Shoulder 2	1,766	1,696	0.96	2,389	1,879	0.79	2,067	1,792	0.87	706	1,025	1.45	3,639	1,890	0.52	725	882	1.22	5,614	5,312	0.95
Total	20,581	$25,267	$1.23	22,171	$24,927	$1.12	21,271	$25,742	$1.21	19,811	$23,761	$1.20	31,009	$25,402	$0.82	11,247	$14,143	$1.26	52,399	$53,781	$ 1.03
2010																					
AM Peak	3,769	$10,149	$2.69	5,410	$9,526	$1.76	3,337	$9,198	$2.76	3,876	$10,077	$2.60	5,673	$8,735	$1.54	2,232	$5,311	$2.38	10,669	$18,910	$1.77
AM Shoulder	2,742	3,727	1.36	3,099	3,539	1.14	2,109	3,639	1.73	2,858	3,680	1.29	4,154	3,968	0.96	1,199	2,436	2.03	6,016	5,601	0.93
Midday	3,480	1,740	0.50	3,480	1,740	0.50	5,077	1,780	0.35	8,220	2,231	0.27	3,886	860	0.22	5,077	1,780	0.35	9,750	4,460	0.46
PM Shoulder 1	2,835	3,905	1.38	3,557	3,972	1.12	1,895	3,562	1.88	2,563	4,114	1.61	3,950	4,025	1.02	1,948	3,030	1.56	8,342	7,769	0.93
PM Peak	2,449	7,282	2.97	3,407	7,806	2.29	2,465	6,505	2.64	3,201	6,653	2.08	2,942	5,349	1.82	3,499	4,814	1.38	19,487	29,994	1.54
PM Shoulder 2	1,480	2,073	1.40	1,935	2,177	1.13	868	1,484	1.71	1,153	1,641	1.42	2,698	2,272	0.84	713	826	1.16	7,036	6,530	0.93
Total	16,755	$28,876	$1.72	20,888	$28,760	$1.38	15,751	$26,168	$1.66	21,871	$28,396	$1.30	23,303	$25,209	$1.08	14,668	$18,197	$1.24	61,300	$73,264	$ 1.20
2015																					
AM Peak	2,921	$9,508	$3.26	6,319	$10,567	$1.67	3,444	$9,823	$2.85	4,140	$10,524	$2.54	6,178	$9,606	$1.55	2,085	$4,595	$2.20	12,152	$20,884	$1.72
AM Shoulder	3,174	4,291	1.35	3,612	4,064	1.13	2,541	4,235	1.67	3,315	4,227	1.28	4,874	4,670	0.96	1,454	3,013	2.07	6,703	6,446	0.96
Midday	5,347	2,674	0.50	5,347	2,674	0.50	6,754	2,600	0.38	9,883	2,767	0.28	4,634	1,183	0.26	6,754	2,600	0.38	14,687	6,930	0.47
PM Shoulder 1	3,206	4,433	1.38	3,996	4,617	1.16	2,426	4,508	1.86	2,982	4,706	1.58	4,730	4,823	1.02	2,698	4,192	1.55	9,167	8,476	0.92
PM Peak	2,581	8,454	3.28	4,209	10,156	2.41	1,773	5,905	3.33	1,872	5,587	2.98	2,599	5,724	2.20	5,819	7,752	1.33	18,690	34,852	1.86
PM Shoulder 2	1,448	2,496	1.72	1,710	2,556	1.49	1,358	2,404	1.77	1,570	2,350	1.50	1,540	2,016	1.31	1,418	1,849	1.30	8,047	7,267	0.90
Total	18,677	$31,856	$1.71	25,193	$34,634	$1.37	18,296	$29,475	$1.61	23,762	$30,161	$1.27	24,555	$28,022	$1.14	20,228	$24,001	$1.19	69,446	$84,855	$ 1.22

NOTE:
A-1: Flat Rate/All Entries
A-2: Flat Rate/Max. Trip Per Entry
B-1: Standard Per Mile Rate
B-1-a: Standard Per Mile Rate with Fixed Barrier (2 lanes/direction)
B-1-b: Standard Per Mile Rate with Only HOV-3+ Free
B-2: Skewed Per Mile Rate
C-1: Standard Rate Per Segment
All Revenue and Toll Rates in 2001 Dollars

Also note that the figures in Table 4-13 reflect both travel directions for each time period. For example, in 2005, A.M. peak period, Scenario A-1, the average toll is shown to be $1.57. In practice, this reflects the overall weighted average of all toll trips in the managed lanes during the A.M. peak period; both northbound and southbound. The average toll in the major direction would tend to be somewhat higher than shown in Table 4-13, while the average toll in the minor direction would be lower.

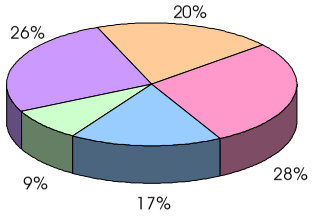
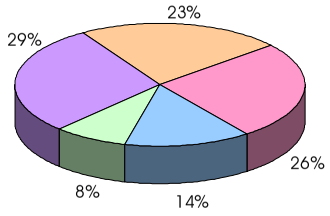
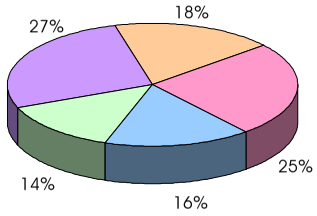
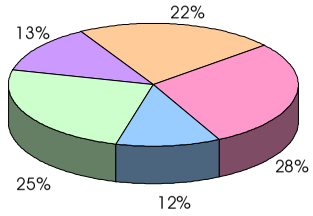
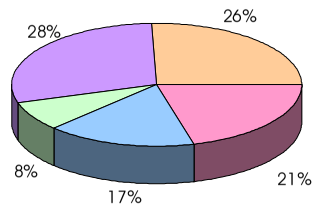
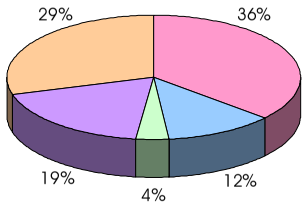
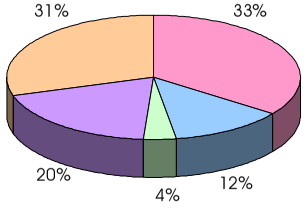
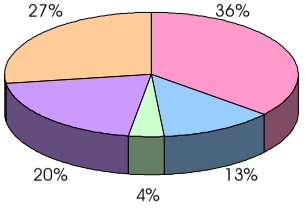
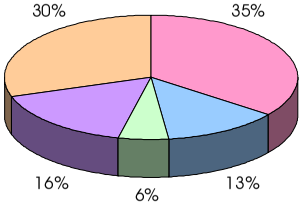
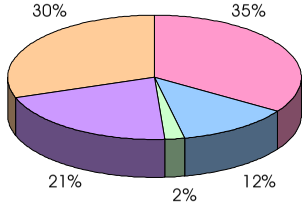
Overall, for Scenario A-1 a total of 20,581 weekday trips per day were estimated, expected to produce over $25,000 in weekday revenue. This yielded a toll for vehicles using the managed lanes of $1.23.

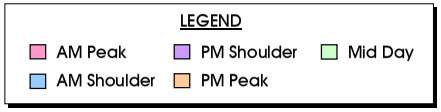
As can be seen in Table 4-13, the average toll per vehicle increases significantly over time, even though all revenue and toll rates are expressed in year 2001 dollars. In some cases, total trips actually decrease, such as in Scenario A-1. This is due to decreasing availability of capacity for SOVs over time. Revenue increases, primarily due to assumed real increases in toll rates.

It is interesting to see the effect on Scenario B-1 of either changes in the project configuration or changes in the HOV-3 definition. Transactions under Scenario B-1-a are considerably lower in 2005. This is due to the fact that in the early years, most managed lane toll traffic occurs in the major direction in the peak periods; hence, the reduction of one lane of capacity significantly reduces near-term revenue. However, by 2015, total trips under a 2/2 condition are actually slightly higher than under a 3/1 split, although much of this growth occurs in shoulders and off-peak hours. As a result, the revenue for a 2/2 scenario is much less than a 3/1 condition.

If the definition of HOV were increased to three or more persons, the total number of toll paying trips would be increased dramatically. By 2015, toll paying trips would be increased by more than three-fold, with weekday revenue increasing from less than $30,000 per day under Scenario B-1 to almost $85,000 per day under Scenario B-1-b.

Estimated toll revenue by scenario was then annualized, as shown in Table 4-14. The entire traffic analysis was done on a weekday basis, and covering six total “time slices” which nominally extend from 6 A.M. to 7 P.M. Some limited additional revenue potential could be expected during the evening hours. For purposes of this analysis, this was estimated as an additional 5 percent of the “modeled” weekday period. This resulted in a total weekday estimate of toll revenue.

	Scenario A-1	Scenario A-2	Scenario B-1	Scenario B-2	Scenario C-1
Weekday Trips					
Weekday Revenue					



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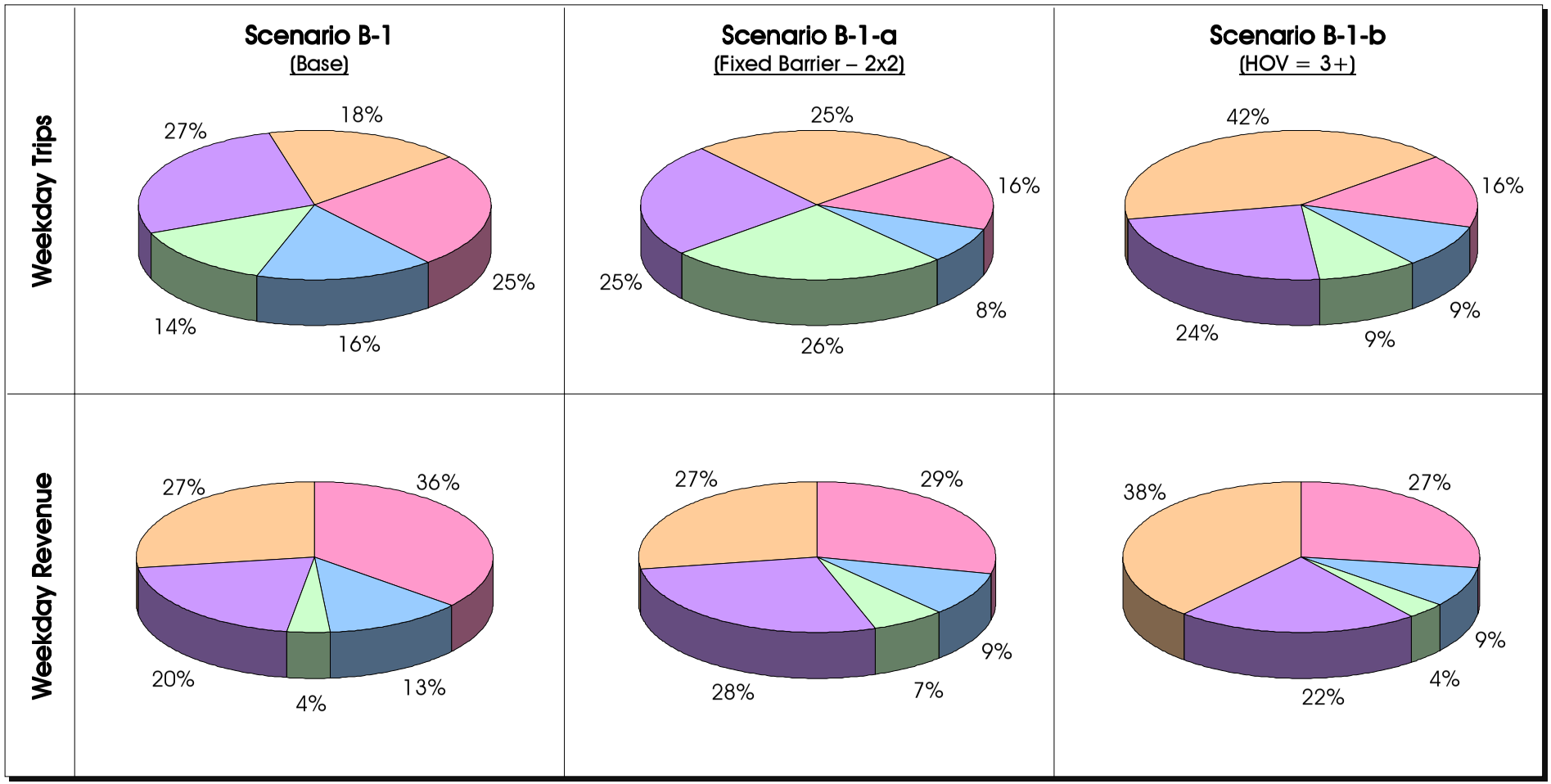
2005 DISTRIBUTION OF TRAFFIC AND REVENUE BY PERIOD – BASE SCENARIOS

FIGURE 4-17



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2005 DISTRIBUTION OF TRAFFIC AND REVENUE BY PERIOD – B-1 SENSITIVITY SCENARIOS

FIGURE 4-18

Table 4-14

Estimated Toll Revenue by Scenario

Year	Base Scenarios					Sensitivity Scenarios	
	A-1	A-2	B-1	B-2	C-1	B-1-a	B-1-b
2005							
Modeled Weekday Periods	$25.3	$24.9	$25.7	$23.8	$25.4	$14.1	$53.8
Weekday Other Hours(1)	1.3	1.2	1.3	1.2	1.3	0.7	2.7
Total Weekday	$26.6	$26.1	$27.0	$25.0	$26.7	$14.8	$56.5
Weekend Day (2)	$8.8	$8.6	$8.9	$8.2	$8.8	$4.9	$18.6
Annual Revenue(3)	$7,654	$7,521	$7,784	$7,183	$7,688	$4,274	$16,259
2010							
Modeled Weekday Periods	$28.9	$28.8	$26.2	$28.4	$25.2	$18.2	$73.3
Weekday Other Hours (1)	1.4	1.4	1.3	1.4	1.3	0.9	3.7
Total Weekday	$30.3	$30.2	$27.5	$29.8	$26.5	$19.1	$77.0
Weekend Day (2)	$10.0	$10.0	$9.1	$9.8	$8.7	$6.3	$25.4
Annual Revenue (000)(3)	$8,719	$8,690	$7,914	$8,576	$7,628	$5,499	$22,162
2015							
Modeled Weekday Periods	$31.9	$34.6	$29.5	$30.2	$28.0	$24.0	$84.9
Weekday Other Hours (1)	1.6	1.7	1.5	1.5	1.4	1.2	4.2
Total Weekday	$33.5	$36.3	$31.0	$31.7	$29.4	$25.2	$89.1
Weekend Day (2)	$11.0	$12.0	$10.2	$10.4	$9.7	$8.3	$29.4
Annual Revenue (000)(3)	$9,629	$10,464	$8,917	$9,111	$8,471	$7,255	$25,645

NOTE: A-1: Flat Rate/All Entries
A-2: Flat Rate/Max. Trip Per Entry
B-1: Standard Per Mile Rate
B-1-a: Standard Per Mile Rate with Fixed Barrier (2 lanes/direction)
B-1-b: Standard Per Mile Rate with Only HOV-3+ Free
B-2: Skewed Per Mile Rate
C-1: Standard Rate Per Segment
All Revenue is in 2001 Dollars

(1) Assumed to be 5 percent of modeled period.
(2) Weekend revenue assumed to be 33 percent of weekday.
(3) Annual revenue based on 250 weekdays and 115 weekend days/holidays.

No analysis of weekend conditions was undertaken as part of this study. However, to help in the development of annual revenue estimates, weekend revenue was assumed to be one-third of computed weekday revenue. Annual revenues were then derived assuming 250 typical weekdays per year and 115 weekend days/holidays per year.

As shown in Table 4-14, using this approach in 2005 under Scenario A-1, annual toll revenue is estimated at $7,654,000. In practice, revenue potential was actually very similar between the five base pricing alternatives, generally ranging from about $7.2 to $7.8 million. The two sensitivity scenarios would have a significant impact on revenue. Going with a fixed 2/2 alternative would dramatically reduce opening year revenue while changing the definition to HOV-3 would result in approximately a doubling of opening year toll revenue.

Preliminary annual toll revenue estimates were also prepared by scenario, as shown in Table 4-15. The annual figures were computed at 2005, 2010 and 2015 levels, as shown previously in Table 4-14. Revenue for intermediate years was developed through interpolation between the control points.

Note that all revenues shown in Table 4-15 (and throughout this report) are in 2001 dollars. That is, they are not adjusted for inflation. If adjusted for inflation, future-year revenue could be significantly increased.

For the five base scenarios, revenues are not substantially different, although revenue tends to grow slightly more under the Flat Rate scenario. The biggest difference in revenue, of course, would result in changing the definition of high-occupant vehicles. This is true in the year 2005; and also results in significantly higher levels of revenue growth in the future.

COMPARATIVE SUMMARY OF RESULTS

Table 4-16 provides a useful comparative summary of the overall traffic and revenue study findings for the various scenarios. Various comparative criteria such as trips, VMT, trip length, revenue and toll rates are compared at both 2005 and 2015 levels. A segment-based pricing structure would have the highest number of trips and the lowest average trip lengths, and generally produce revenues comparable with the other scenarios. The Flat Toll option would have the longest average trip lengths and generally the highest vehicle miles of travel. It would also have the lowest level of toll equity but would probably be considered the

Table 4-15

Estimated Annual Toll Revenue by Scenario

Year	Base Scenarios					Sensitivity Scenarios	
	A-1	A-2	B-1	B-2	C-1	B-1-a	B-1-b
2005	$7,654	$7,521	$7,784	$7,183	$7,688	$4,274	$16,259
2006	7,856	7,741	7,810	7,442	7,676	4,495	17,298
2007	8,063	7,968	7,836	7,711	7,664	4,727	18,403
2008	8,276	8,202	7,862	7,989	7,652	4,972	19,580
2009	8,495	8,442	7,888	8,277	7,640	5,229	20,831
2010	8,719	8,690	7,914	8,576	7,628	5,499	22,162
2011	8,894	9,019	8,105	8,680	7,790	5,812	22,819
2012	9,072	9,360	8,301	8,786	7,955	6,144	23,495
2013	9,254	9,715	8,501	8,893	8,123	6,494	24,191
2014	9,440	10,082	8,707	9,001	8,295	6,864	24,907
2015	9,629	10,464	8,917	9,111	8,471	7,255	25,645

NOTE: A-1: Flat Rate/All Entries
A-2: Flat Rate/Max. Trip Per Entry
B-1: Standard Per Mile Rate
B-1-a: Standard Per Mile Rate with Fixed Barrier (2 lanes/direction)
B-1-b: Standard Per Mile Rate with Only HOV-3+ Free
B-2: Skewed Per Mile Rate
C-1: Standard Rate Per Segment
All Revenue is in 2001 Dollars

Table 4-16

Comparative Summary of Results

	Base Scenarios					Sensitivity Scenarios	
2005 Levels	A-1	A-2	B-1	B-2	C-1	B-1-a	B-1-b
Toll Trips (000')	20.6	22.2	21.3	19.8	31.0	11.2	52.4
Toll VMT (000's)	270.9	243.2	192.6	205.0	211.0	90.3	499.6
Average Toll Trip Length	13.2	11.0	9.0	10.4	6.8	8.1	9.5
Annual Revenue (000)	$7,654	$7,521	$7,784	$7,183	$7,688	$4,274	$16,259
Revenue Per Toll Vehicle	$1.23	$1.12	$1.21	$1.20	$0.82	$1.26	$1.03
Average Peak Period Toll [(1)]	$1.80	$1.52	$1.82	$1.62	$1.35	$2.18	$1.76
2015 Levels							
Toll Trips (000')	18.7	25.2	18.3	23.8	24.6	20.2	69.4
Toll VMT (000's)	254.5	285.2	161.6	236.4	156.8	177.1	668.8
Average Toll Trip Length	13.6	11.3	8.8	9.9	6.4	8.8	9.6
Annual Revenue (000)	$9,629	$10,464	$8,917	$9,111	$8,471	$7,255	$25,645
Revenue Per Toll Vehicle	$1.71	$1.37	$1.61	$1.27	$1.14	$1.19	$1.22
Average Peak Period Toll [(1)]	$3.28	$2.41	$3.33	$2.98	$2.20	$2.20	$1.86
Other Considerations							
Toll Equity	Low	Low	Medium	Medium	High	Medium	Medium
Rate Simplicity (Dynamic)	Simple	Simple	Complex	Complex	Medium	Complex	Complex

Note: All Tolls and Revenue are in 2001 Dollars

[(1)] Highest of AM and PM Period

most simple rate to understand by patrons. The per-mile rate structure would provide reasonable toll equity but would be more complex in terms of patron interpretation. It would tend to have medium-range trip lengths and mid-level revenue potential.

The highest average peak period toll would be associated with Scenarios A-1 and B-1, while the lowest tolls would be under Scenario C-1

INTERIM OPERATIONS

As noted previously, each of the above project alternatives were evaluated assuming the full project completion, that is from S.R. 163 through to S.R. 178. A traffic and revenue analysis will be performed for the interim operation once a preferred pricing strategy is selected.

In general, under an interim operation, and in a major travel direction, results would likely be similar to Sensitivity Scenario B-1-a, the fixed 2X2 lane alternative. In the interim case, the southern half of the managed lanes will continue to be a two-lane reversible roadway. For this reason, it is likely that the first phased extension to the north would also be operated as two lanes in the major direction and two lanes in the minor direction to avoid a forced exiting of traffic in the center of the project.

Therefore, in the southbound A.M. peak, for example, the managed lanes would generally perform as in Scenario B-1-a, assuming a per-mile rate structure was used. In the opposite direction, new managed lane capacity would be available only between Ted Williams Parkway and City Center Drive, and traffic and revenue potential should be considered to be much less.

In interim operations, it is also likely that at least the southern portion of the managed lanes would be closed to traffic during the midday hours, as is currently the case. This would act to further reduce traffic and revenue potential. A more detailed evaluation of the interim operations would be made using the preferred pricing alternative.

CHAPTER 5

TOLL COLLECTION SYSTEM AND OPERATIONS CONCEPT

As with the current I-15 Express Lanes, the expanded managed lanes facility will employ a fully-automated, fully-electronic system of toll collection. To the extent possible, dynamic variable pricing will be used. However, the extension of the managed lanes up to 20 miles, plus the incorporation of intermediate access points, will substantially increase the complexity of the toll collection system.

This Chapter presents a preliminary toll collection system and operations concept. It is not intended to be a detailed specification, but rather an overview of the type of electronic toll system that may be required for the expanded facility. In addition to explaining the overall concept, and various subsystem requirements, preliminary estimates of capital costs for both the interim operation and full build conditions are presented.

In Phase III of the study, a more detailed design of the electronic toll system will be undertaken. It is the intent of this Chapter simply to explain the overall concept as a starting point in the final system design process.

SYSTEM DESIGN PARAMETERS AND ISSUES

There are several issues that will necessarily have a strong influence over the operation of the managed lanes and/or the ETC and enforcement implementation to support those operations.

ETC Technology- California law requires that there be interoperability between the ETC operations of all toll roads in the state. Embedded in that required interoperability is the mandatory use of Title 21 ETC equipment readers and tags. The concept for this project will incorporate

the use of Title 21 ETC equipment. This is discussed further below in the section titled Toll Equipment-Title 21. The system shall be interoperable with other toll agencies in the state and able to bill for charges applied to other agencies' tags used on I-15 as well as to pay other agencies for charges incurred by I-15 tags on those other agencies' roads. This will be done as it is on the existing I-15 value priced lanes.

HOV Usage- HOV traffic will be entitled to use the managed lanes at all times for no charge.

HOV ETC- HOV vehicles will not use tags and ETC account holders will be advised to shield their tags in specially provided bags when qualifying as HOVs.

Rate Announcement- Under those charging scenarios where the tolls vary, either by time of day or in response to traffic demand, the system must ensure that the rate that the motorist saw on the sign prior to entering the managed lanes is the rate applied. Further, the charging rate seen at the entry point must apply to the entire trip in the managed lanes. To ensure that the charging rate is correctly associated with the recorded trip of a tolled motorist, ETC readers will need to be placed over each of the general-purpose lanes prior to each entrance to the managed lanes. All general purpose lanes should have readers to avoid the possibility of missing a read at the sign. The reading of the tags at the reader will permit the system to make a record of the sign location (say entry sign 1), the tag ID, and the toll in effect at the time the tag passed under the sign. This entry sign 1 record of the tag ID and the current charging rate will be transmitted to the Central Processing System so that this record can be utilized when the toll is computed. If the motorist should opt not to enter the managed lanes but to stay in the general-purpose lanes, the process would be repeated at the next managed lane entry point (say entry sign 2). When the Central Processing System receives the entry sign 2 record for this tag it can be inferred that the vehicle did not enter the managed lanes at entry point 1. The entry sign 1 record can be discarded and replaced by the new record of charging rates captured at entry sign 2.

Demand Management- Some potential charging strategies call for adjusting tolls in response to measured traffic demand. Traffic parameters such as counts, occupancy or speed would thus have to be measured at various points in the managed lanes, probably at some number of tolling zones.

Mass Transit- The system shall be capable of providing combinational pricing and incentives for use of managed lanes and mass transit.

Vehicle Classification- The tolls charged will not have to vary based on vehicle type so that there is no requirement for the system to determine vehicle classification.

Traffic Management- In order to effectively monitor and control traffic on the proposed I-15 Managed Lanes, Caltrans District 11 Transportation Management Center (TMC) Operators must have the ability to view "real time" congestion data for all lanes and segments of the facility. To collect congestion data, vehicle detectors will need to be installed at strategic locations along the managed lanes. Detectors shall collect and report vehicle occupancy, speed, and volume to the TMC for all lanes and segments regardless of direction.

PRICING STRATEGIES

As discussed in previous chapters, many charging strategies are being considered. Therefore, the design concept discussed herein reflects an approach that will be able to use any of the charging schemes under consideration. It will also provide the ability to later change schemes merely by adjusting that portion of the software that computes the charge; all the data necessary for the computation of any of the charging schemes is provided for in this design concept approach. The design results in the recording of the time and place of entry into the managed lanes, every tolling zone passed through by the vehicle and the time of passing through the trip's last tolling point. Furthermore the entry points and tolling points selected permit the capture of all significant vehicle movements.

The system concept should be capable of handling the following pricing strategies that have been selected for further evaluation:

- Standard flat rate- A standard rate would be displayed at all entry points and charged regardless of location of entry and regardless of trip length;
- Flat rate with maximum length trip feature- A flat toll rate based on the maximum possible length of trip in the managed lanes from each entry point;
- Standard per-mile rates without minimum toll- Standard per-mile rates at any given time regardless of the specific point of entry;
- Standard per-mile rates with minimum and maximum toll;

- Skewed per-mile rates with minimum and maximum toll- The per mile rate would vary depending on the point of entry; and/or
- Standard rate segment tolls- The motorist would pay based on the number of segments traversed regardless of point of entry.

TOLL EQUIPMENT - TITLE 21

Direct short range communications (DSRC) equipment; the now familiar Title 21 FasTrak tags and readers that are standard, by law, in the state of California will be used on this facility. Initially, consideration was given to the use of a "system of the future." However, the need to let a contract for design and development of the system within approximately 18 months, the inherent difficulty of trying to predict the future course of technology development, and the likelihood that the legal issues could not be clarified in time argue persuasively for targeting Title 21 equipment.

Read-write tags would be useful for the I-15 managed lanes application. Writing on the tag the charging code in effect when the vehicle passed under the variable message sign announcing the charging rate could "lock" the charging rate for the vehicle's entire trip. It would also record the location of entry to managed lanes (the sign location ID would be written to the tag at every sign location so when the vehicle entered the managed lane the last passed sign location would be recorded on the tag, thus identifying the point of entry). In addition, recording on the tag the passage of the vehicle through the managed lane tolling points would facilitate the determination of the trip taken by the vehicle.

Unfortunately, Title 21 is presently a read-only standard; that is there is no requirement for a capability to write to the tag incorporated in Title 21-compliant equipment. As it happens, the two primary Title 21 reader/tag suppliers have provided an unused write capability in their tags and equipment. However, since the tag write facility is not defined in the Title 21 standard, the write storage and protocols are incompatible between these two providers and even between batches from the same provider. Barring a change in the Title 21 specifications and commitment to an upgrade of tags in the field, we assume that the system will use tags in a read-only mode. WSA will continue to monitor this situation during detailed system design and even during the development process with an eye toward the use of read-write capability if it becomes feasible to do so.

MANAGED LANE ACCESS ARRANGEMENTS

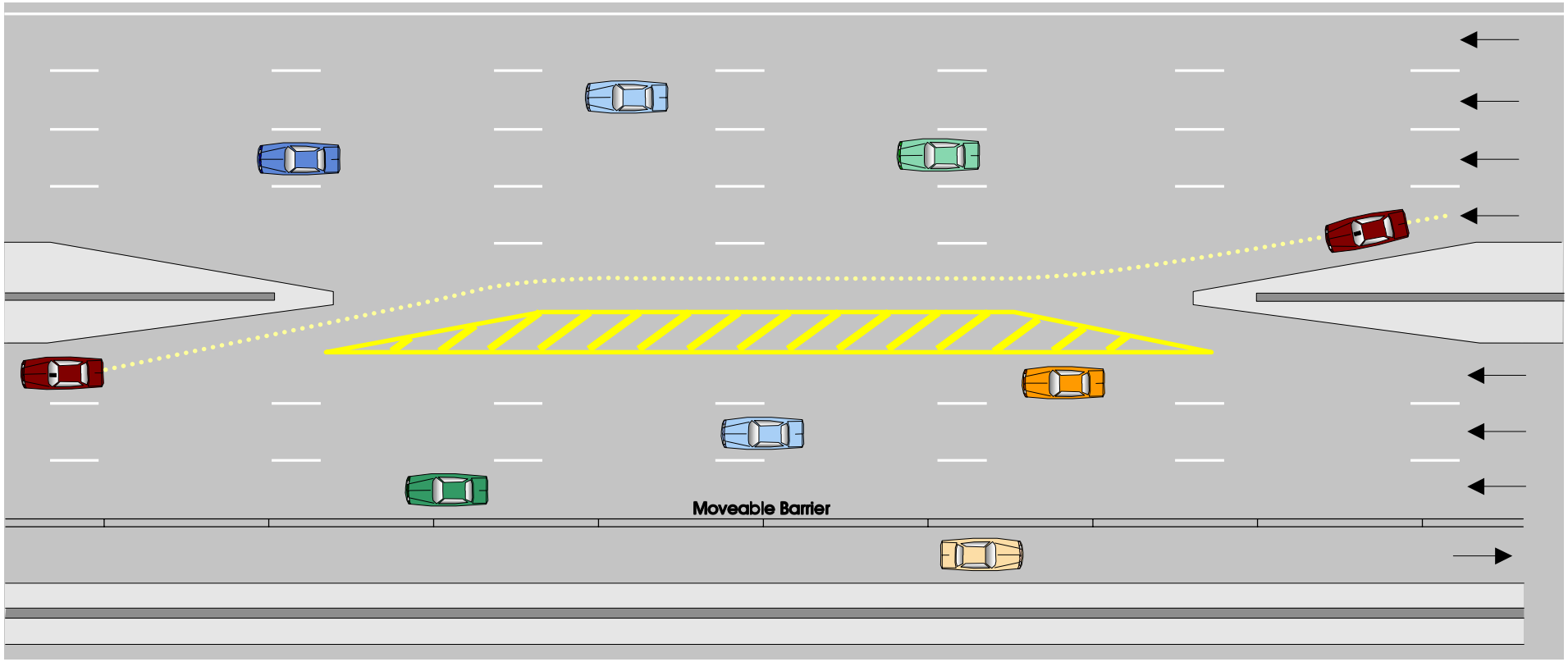
Another important factor which will present a challenge in the toll collection system is the proposed access arrangement between the main lanes and the managed lanes. In a limited number of cases there will be direct access ramps from local roads and/or bus rapid transit centers (BRTC). However, the majority of access will be by means of transition areas, as shown in Figure 5-1. A barrier wall will separate the main lanes from the managed lanes. At the transition areas, there will be an opening in the barrier wall, of a few thousand feet. It is understood that an auxiliary weaving lane will be added adjacent to the main lane in the transition area. The physical separation between the managed lanes and the weaving lanes will be by means of paint striping only.

As shown in Figure 5-1, there will not be physically separated entry and exit lanes in each of the transition areas. Rather, the transition areas will be an opening in the barrier with striping used to delineate traffic. This will present significant challenges in the toll collection system design process. Had physically separated entry and exit slip ramps been provided, it would be possible to place electronic toll collection equipment on these ramps and identify the precise point of entry and exit of the vehicle to and from the managed lanes. Since at least some of the toll options being studied would involve distance-based tolling, this could be accomplished relatively simply if the vehicle point of entry and exit could be definitively determined.

However, given the current physical plans for the transition areas, it would not be possible to positively identify vehicles entering and exiting, without putting some type of physical separation along either the weaving lane or in the slip ramps to and from the managed lanes. In developing the toll system concept, WSA assumed that this would not be possible so a different toll collection arrangement will be necessary.

VARIABLE TOLL RATE STRUCTURE

Under any of the pricing options discussed above, a common element would be the assumed use of some type of variable pricing, probably adjusted dynamically based on continually measured traffic flow rates, as with the existing system. The use of variable tolls will require variable message signs, located immediately prior to each of the entrance points to the managed lanes, to advise motorists of the current toll rates in affect at any given time. As noted above, it will also be critical to design into the



TYPICAL PLANNING TRANSITION AREA ACCESS ARRANGEMENT

FIGURE 5-1

system assurances that the toll rate displayed at the time the vehicle passes the sign will be the same rate that is charged for the entire trip on the managed lanes, even if the nominal toll rate should change while the vehicles managed lane trip is in progress.

OVERALL PROPOSED TOLL SYSTEM CONCEPT

The various criteria and issues discussed above present a considerable electronic toll system design challenge. WSA has developed a preliminary system concept which will be usable with virtually any of the alternative pricing strategies under consideration. In addition, it would be designed to work with the currently planned transition arrangement (i.e., without physically separate slip ramps) and recognizing the difficulty in using the "write" feature of the current generation of Title21 tags. The concept will involve implementation of electronic toll readers on both the managed lanes and the toll-free lanes, although only vehicles entering the managed lanes would actually be charged a toll.

An overview of the proposed toll system configuration, for the full build condition, is shown in Figure 5-2. As shown, there would be four overall "subsystems" used in the toll system, including:

- General purpose lane read zones, with rate signs;
- Managed lane tolling zones;
- Direct entry ramp tolling zones; and
- Special tolling zones, with rate signs, for access to and from bus rapid transit centers.

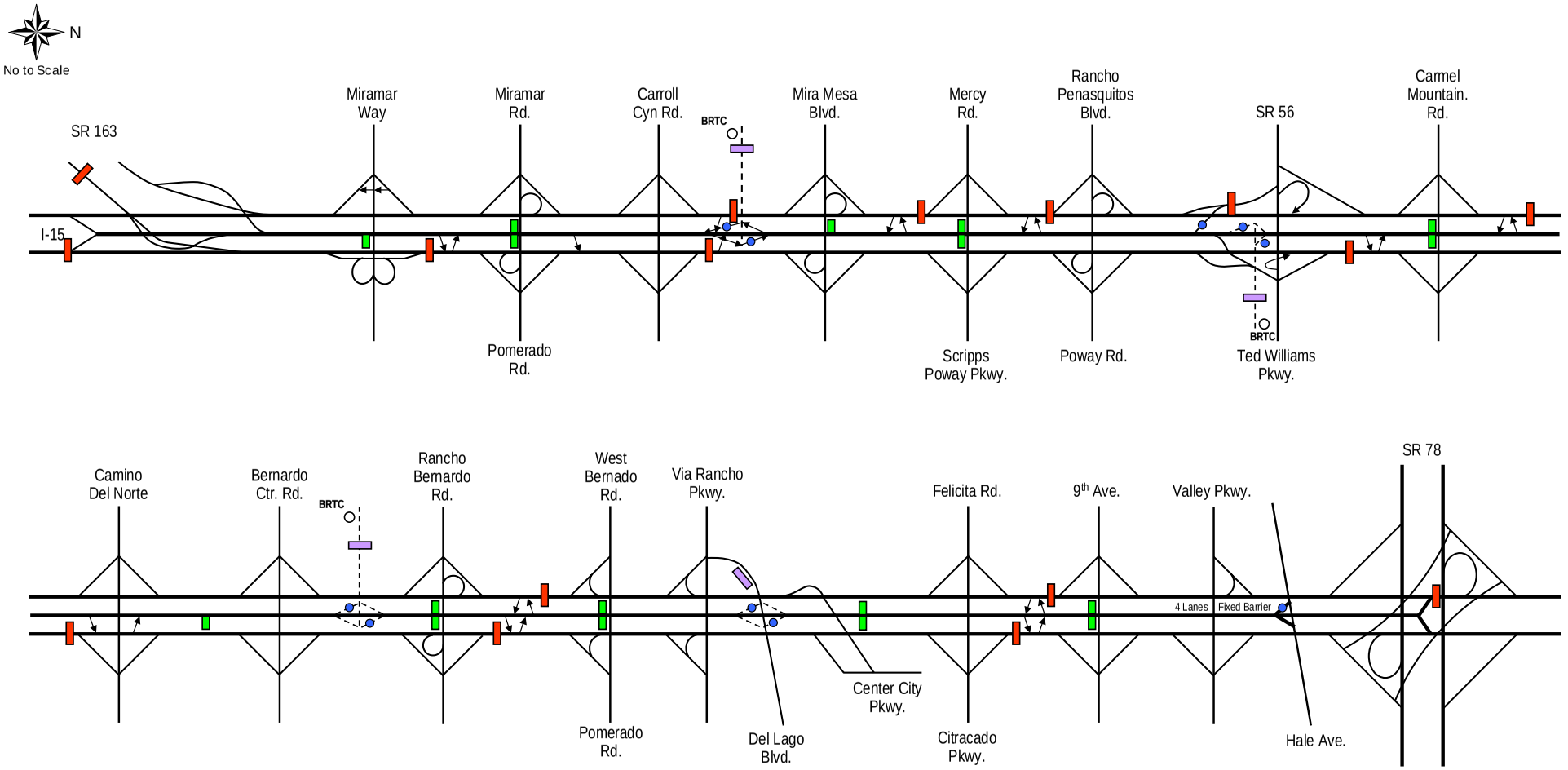
The positioning of each of these types of subsystems is shown, color coded, in Figure 5-2.

The general purpose lane read zones, with rate signs, would typically be located on a gantry mounted across the main lanes immediately prior to each possible point of entry to the managed lanes. As shown in Figure 5-3, an electronic toll antenna would be implemented over each of the main lane travel lanes. A variable message sign would also be mounted, showing the current toll rate in affect.

The purpose of the main lane read zones would be two-fold:

- To advise a motorist of the current toll rate in affect immediately prior to each point of entry; and

I-15 Managed Lanes Concept Plan



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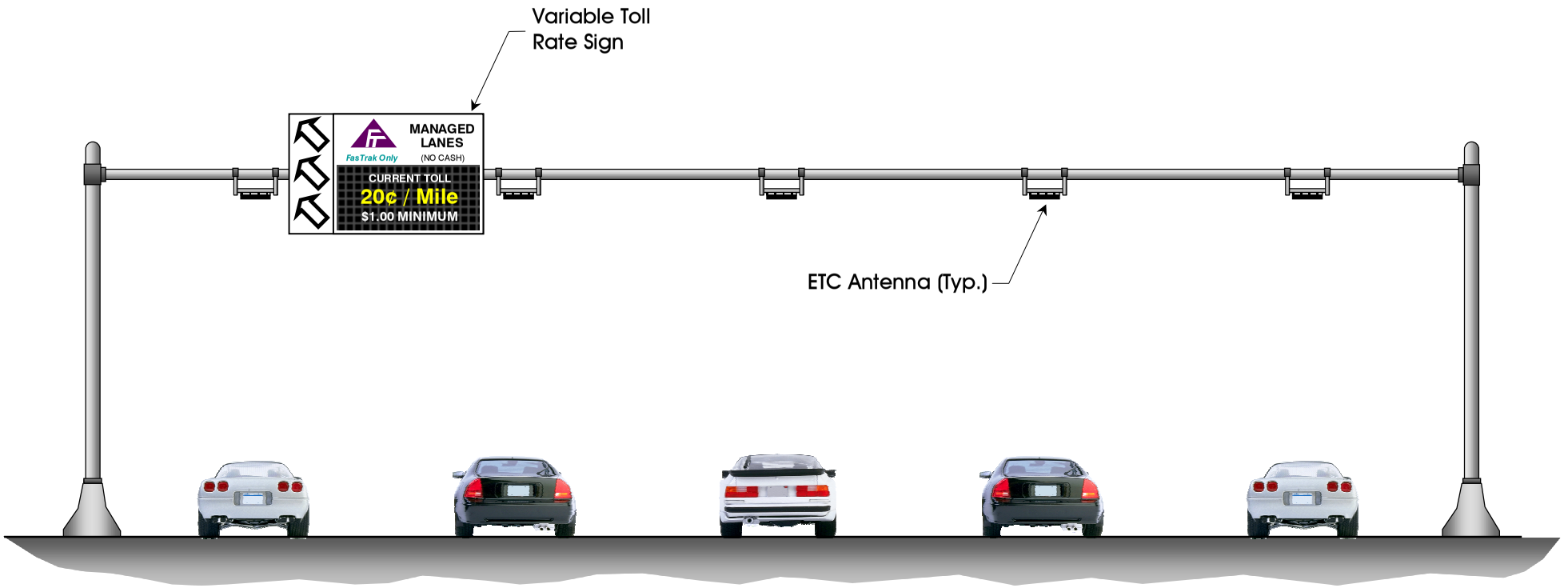
PROPOSED TOLL SYSTEM CONFIGURATION - FULL BUILD CONDITION

FIGURE 5-2

I-15 Managed Lanes Concept Plan



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TYPICAL MAIN LANE READER GANTRY WITH RATE SIGN

FIGURE 5-3

- To open what might be called a "transaction envelope" for that particular transponder in the electronic toll system. The "envelope" actually refers to a form of file which will be associated with each potential transaction in the managed lanes. In addition to the transponder number, time, date and read zone location, this "transaction envelope" would be coded with the toll rate code which was displayed at the time the vehicle passed under the main lane gantry.

A potential transaction "envelope" would be opened for all vehicles passing under the main lane gantry equipped with FasTrak transponders, whether or not the vehicle entered the managed lanes. If the vehicle continued to proceed in the main lanes and did not enter the managed lanes, the "transaction envelope" would be closed upon passage through the next downstream mainlane read point and a new "transaction envelope" opened with the current rate code in affect at that location.

No toll transaction would be generated, since the vehicle did not enter the managed lanes; the entire process would be completely transparent to the motorists.

If desired, the reading of a tag and consecutive main lane read zones could be used as probes to compute traffic speeds in the general purpose lanes for traffic management purposes. However, this would be totally transparent to the user and would in no way result in a toll charge, nor would any information about the identity of the user be retained.

If, on the other hand, the vehicle passes a general purpose read zone, and a "transaction envelope" is opened, and then the vehicle enters the managed lanes, it would pass beneath a series of managed lane tolling zones, generally one tolling zone per segment of the managed lanes. A toll zone passage "event" would be electronically identified and assigned to the appropriate "transaction envelope" in the system. The transaction envelope would contain the last rate code which the motorist saw before entering the managed lane; all further toll zone activity while within the managed lanes would then be assessed that rate code, regardless of how many times the dynamic toll rate may have changed while the vehicle was in the lane.

The "transaction envelope" would be closed any time the vehicle passes beneath another general purpose lane read zone or on a time out basis if no other main lane read zones are passed. Once the "transaction envelope" is closed, an actual transaction message would be generated for revenue

collection purposes. This message would be based on the rate code and any toll zone activity events accumulated during the trip.

Special tolling zones, with rate signs, would be provided at direct access points to and from BRTCs. This would be intended to at least permit the possibility of some type of joint pricing strategy. For example, SANDAG policy might permit "half price" usage of the managed lanes for vehicles which then proceed directly into BRTCs, as an incentive for modal transfer or carpooling. By having separate tolling zones on these direct access roadways, it would be possible to identify vehicles entering or leaving the BRTCs, which could entitle the user to a reduced rate for managed lane travel.

The entire system would be connected by a fiber optic backbone along the full-length of the managed lanes project. This would integrate all readers, variable message signs and other system components on a real-time basis, with the central system.

While this system concept seems complex, this is necessitated by the difficult operational and design challenges associated with current plans for the managed lanes. In practice, all of the electronic toll transaction activity would be transparent to the user and the only visible part to the user would be the toll displays prior to each entry point and a single toll transaction, from each trip, in the final monthly accounting statement.

The system design would be simplified, to some extent, if a standard "write" capability could be utilized on the transponders. However, much of the same elements would still be required due to the nature of the proposed access system.

TOLL COLLECTION SUBSYSTEMS

As noted previously, there would be several basic subsystem elements to the overall system concept. These are described briefly below:

MAIN LANE READER WITH RATE SIGN

As shown previously in Figure 5-3, the main lane read zones would be clear span across the travel lanes, with an ETC reader for each lane. The variable message sign would be mounted on the left side of this structure, and would display the current toll rate. Obviously, the specific legend would be tailored to the particular pricing option to be used. Vehicle transponder reads passing under this gantry would be used only to open or

close "transaction envelopes"; no actual toll transaction will be developed unless the vehicle enters the managed lanes and passes through one of the managed lanes tolling zones.

MANAGED LANE TOLLING ZONES

Figures 5-4 and 5-5 show typical managed lane tolling zones. Figure 5-4 would be a freestanding, gantry-type. The gantry would be constructed from barrier wall to barrier wall across the managed lanes. In some cases, a single gantry would serve both travel directions, but in many cases it would serve only a single travel direction. Sufficient antennas will be provided to cover all four lanes; the center two antennas must be positioned so they can accommodate traffic from either travel direction.

Wherever possible, it may be desirable to mount the managed lane tolling zone equipment on existing structures, such as bridge overpasses. An example of this is shown in Figure 5-5. Several of the locations for tolling zones have been identified as capable of being "bridge mounted."

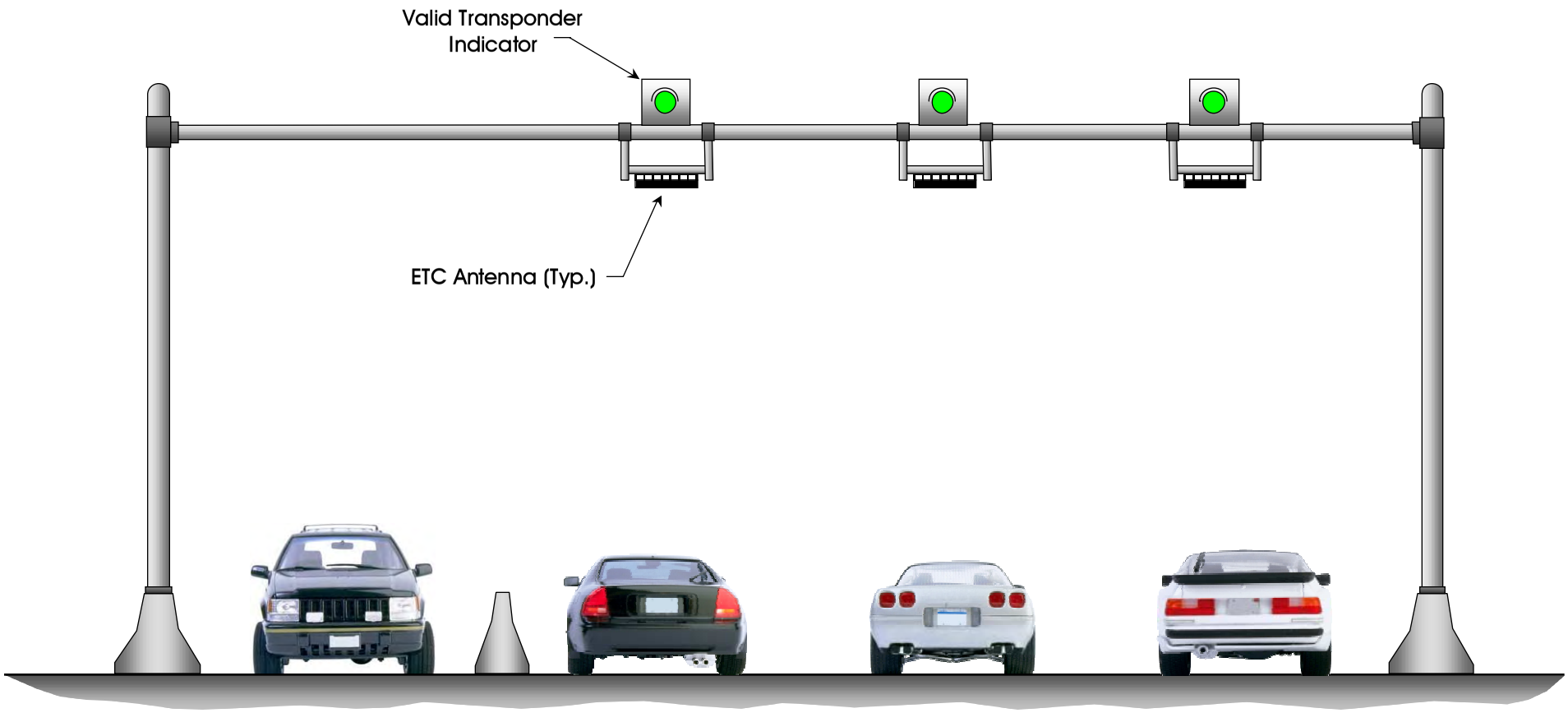
At the northern end of the project a cantilever type approach would be needed since a fixed barrier is proposed in the center of the managed lanes. At this location, there would be no physical barrier wall between the managed lanes and the general purpose lanes in each travel direction. Rather, the toll zone equipment would need to be mounted in the center median barrier, as shown in Figure 5-6.

DIRECT ENTRY/EXIT RAMP READER

At certain locations, ETC antennas would be required on some of the direct entry/exit ramps. This relatively simple configuration is shown in Figure 5-7.

BRTC ACCESS TOLL ZONE

There are four proposed managed lane access arrangements to and from BRTCs. At least three of these will have direct separate roadway access between the managed lane and the BRTC. In such cases, it is proposed that a special BRTC access toll zone be implemented, as shown in Figure 5-8. Traffic entering or exiting the managed lanes at a BRTC would be identified, which could be used to potentially adjust toll rates subsequently in the central processing system. A two-directional entry rate sign would also be required at these locations as shown in Figure 5-8.



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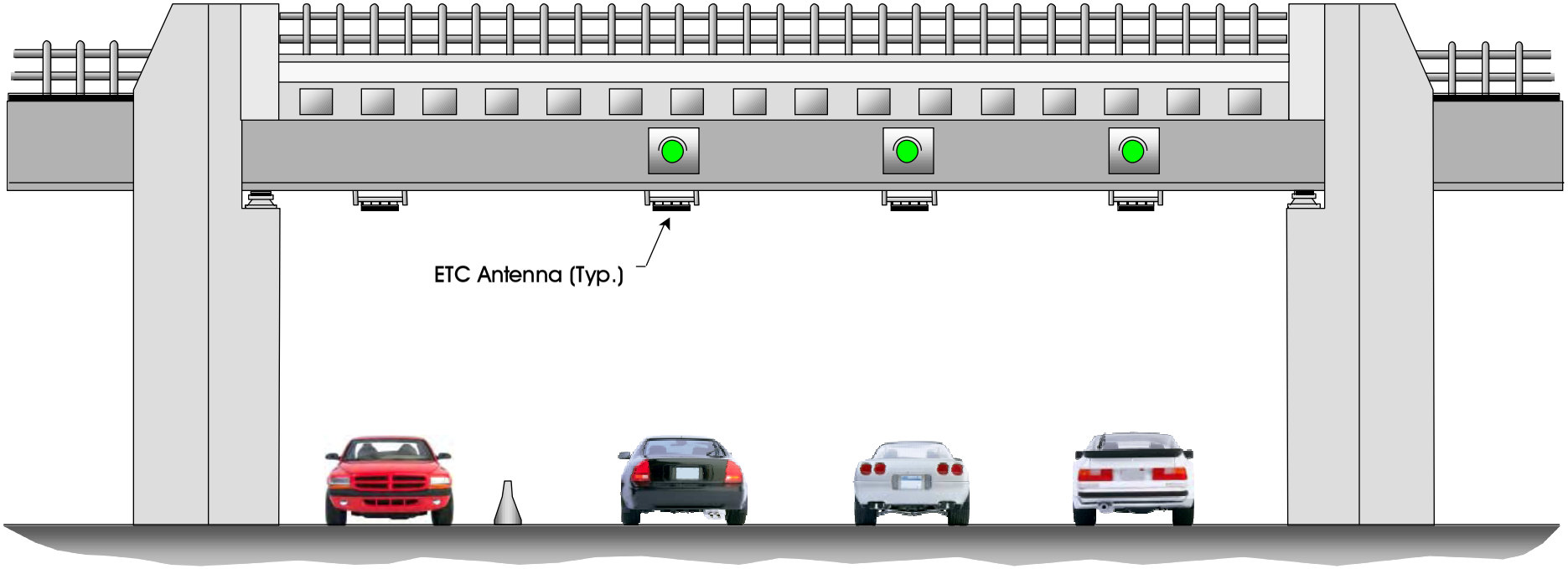
TYPICAL MANAGED LANES TOLLING ZONE - GANTRY TYPE

FIGURE 5-4



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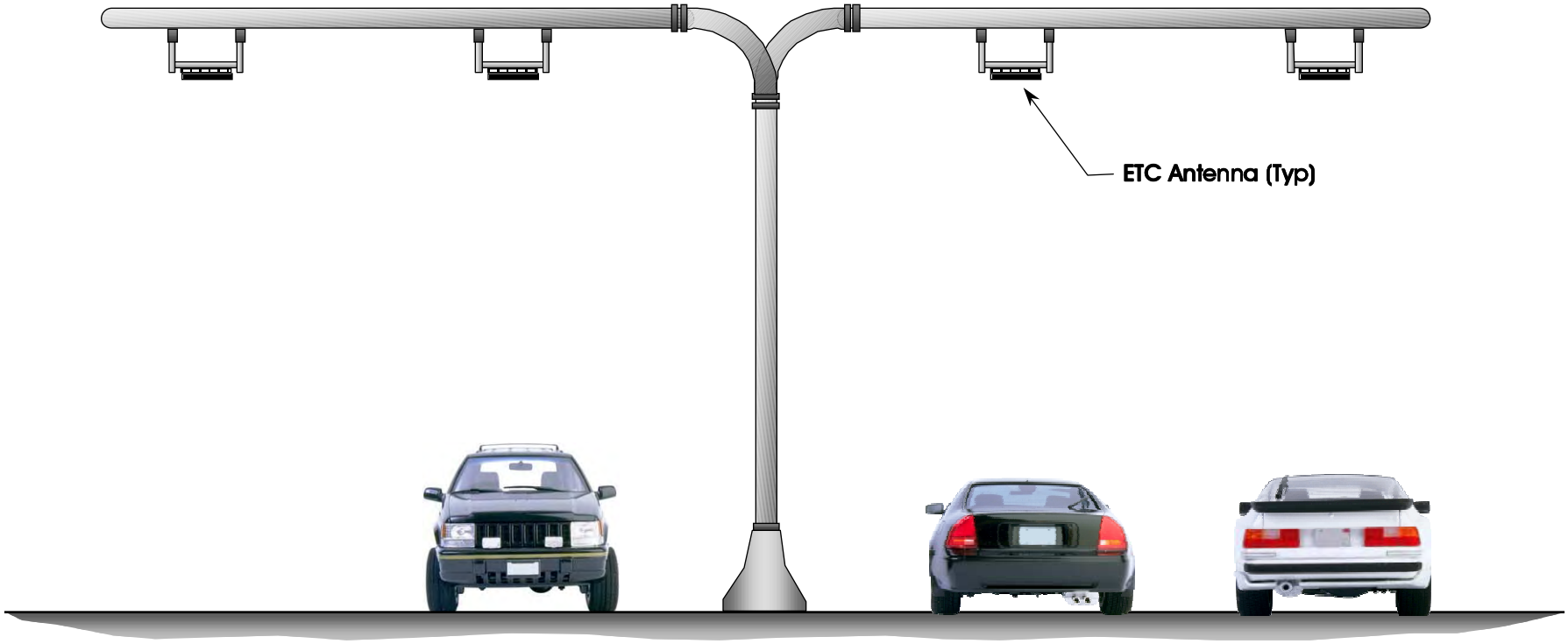
TYPICAL MANAGED LANES TOLLING ZONE – BRIDGE MOUNT

FIGURE 5-5



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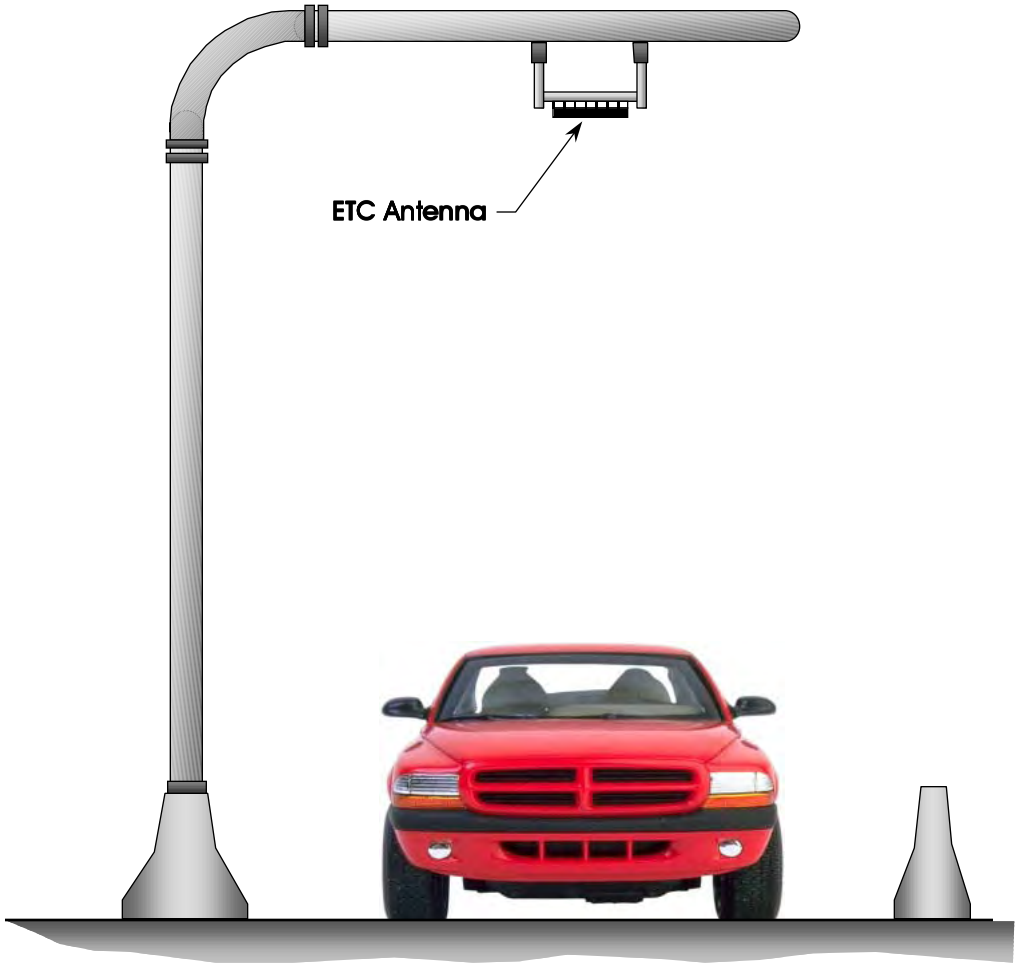
TYPICAL MANAGED LANE TOLLWAY ZONE – CANTILEVERED GANTRY TYPE

FIGURE 5-6



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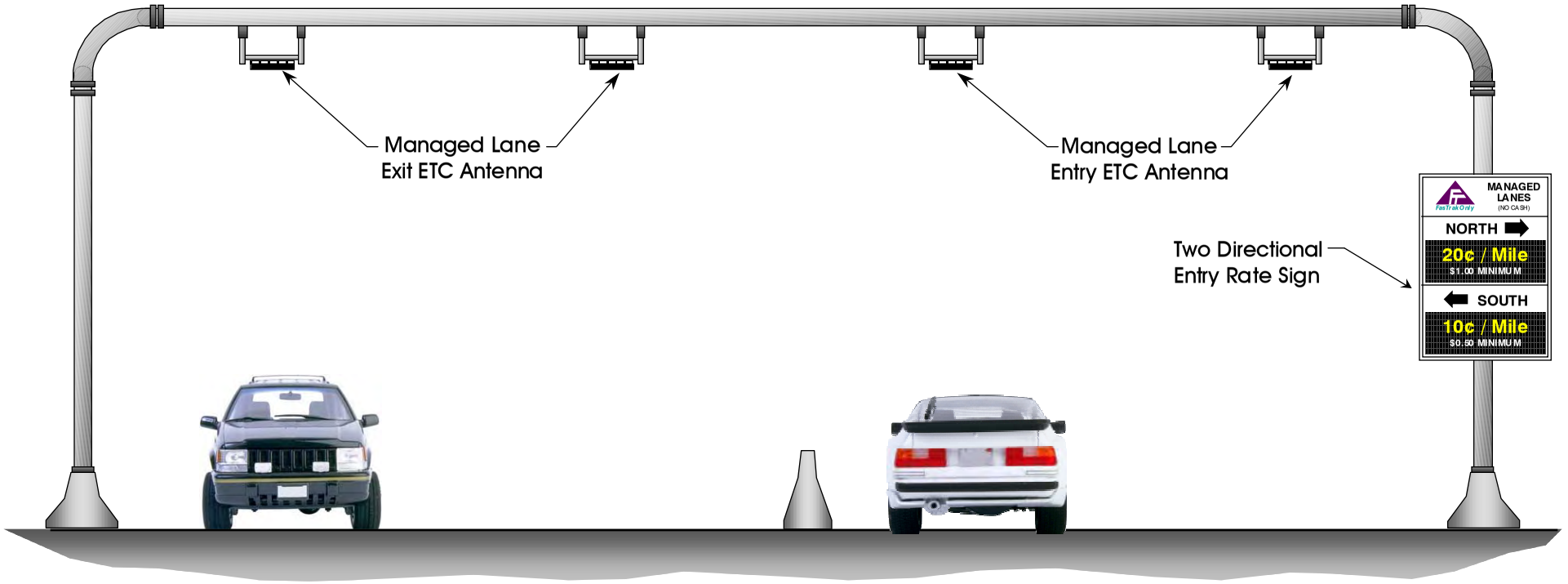
TYPICAL DIRECT ENTRY/EXIT RAMP READER

FIGURE 5-7

I-15 Managed Lanes Concept Plan



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TYPICAL BRTC ACCESS TOLL ZONE WITH RATE SIGN

FIGURE 5-8

SYSTEM CONFIGURATION

The managed lane system will consist of a Central Processing System, and several elements of field equipment. The field equipment will include Sign Subsystems, Tolling Zone Subsystems, and Customer Service Center workstations. All the system elements shall be connected over a high-speed fiber optic backbone. A schematic block diagram of the overall system is depicted in Figure 5-9.

Installed fiber-optic communications cable will be available for this project all along the roadway. All communications between the fixed locations shall be over this fiber. All land communications from the system shall be high speed (100 MBS, minimum). Communications between the Central Processing System and the portable terminals shall be wireless. The equipment and operations for the Central Processing System are described below.

ENFORCEMENT

This section provides a brief discussion of the enforcement challenges in this project so the reader may better understand the solutions proposed in the following sections.

When all traffic on a facility is to be electronically tolled, enforcement can be highly automated. In the I-15 managed lanes free HOV traffic is mixed with the tolled traffic considerably diminishing the ease of enforcement automation. This is because the present technology does not permit accurate, automatic determination of the number of occupants in a vehicle. Occupant count determination must involve a human observer.

An approach to managed lane enforcement is to separate tolled and free traffic into different lanes when passing through the tolling zone. The tolled lanes can then be enforced automatically and in the HOV lane a favorably located observer can note the solo drivers pretending to be HOVs. The observer can then take action against the violator either by pursuit or by system-assisted recording of the license plate. The use of such vantage points can have increased effectiveness if the passing motorist cannot tell when the vantage points are un-staffed. There are four major disadvantages to this approach- the need for weaving maneuvers by motorists, the cost of constructing and staffing the vantage points, the complications introduced by the movable barrier, and perhaps most significant- the lack of room on the roadway. With the relatively large

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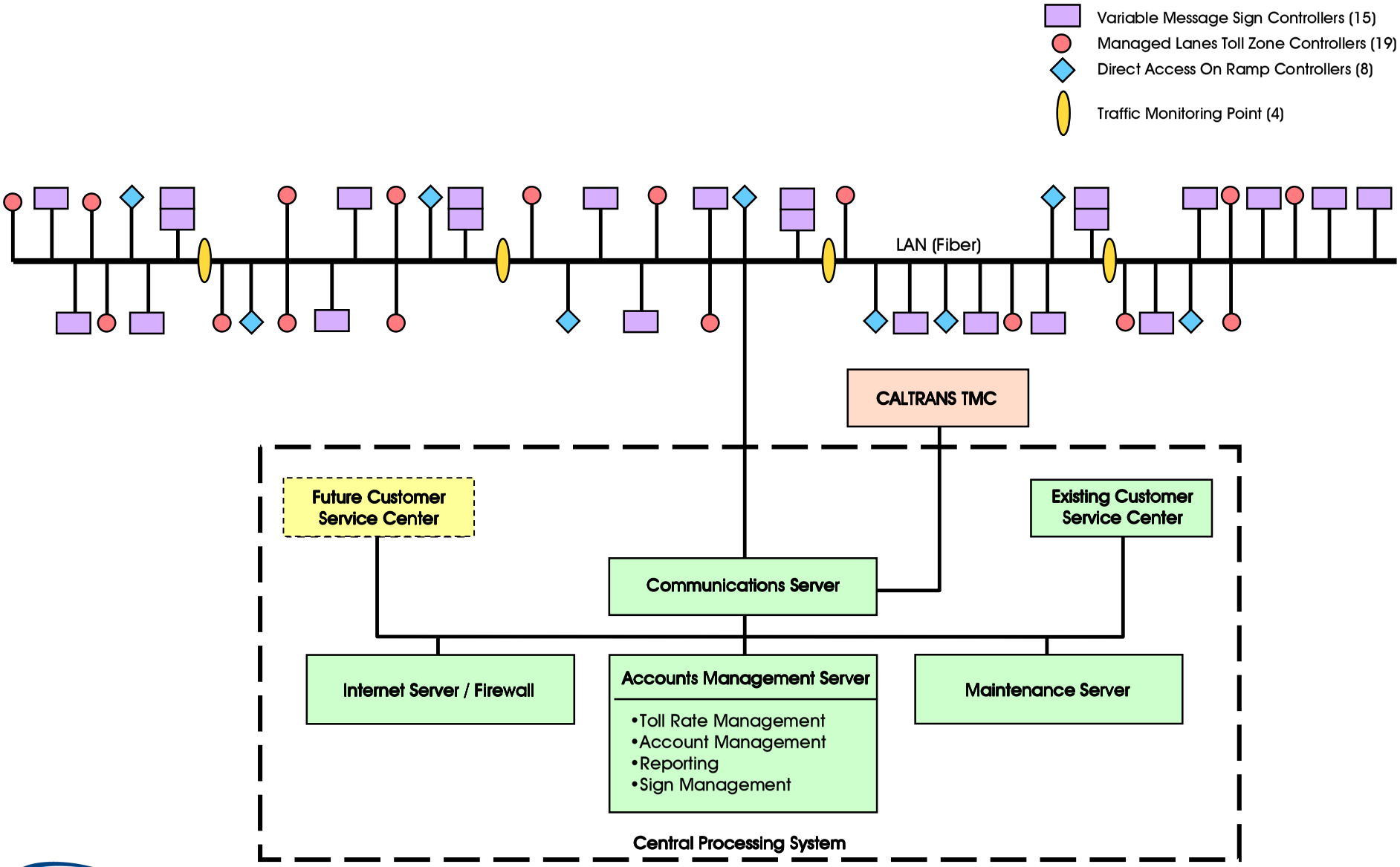

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TOLL SYSTEM CONFIGURATION

FIGURE 5-9

number of tolling points in this facility the disadvantages argue strongly against this approach. Because of these disadvantages we suggest this approach not be considered for this project.

An alternative straightforward approach is to randomly observe vehicles passing thru the tolling zones, note the number of occupants (count heads). Then using a system activated indicator that indicates toll payment violators can be identified. Typically this involves a system-activated overhead light when a toll is paid; with a patrolling or stationary police vehicle in the managed lanes identifying SOVs that don't get this fare paid signal. A major disadvantage with this approach and that makes the enforcement weak is that motorists who observe that no enforcement agents are present in the tolling zone will be tempted to shield their tags especially when the charging rate is high. If the motorist could not tell whether a violation will be detected or not, compliance would be encouraged. An effective way to improve enforcement and discourage violators is to separate the points of enforcement from the points of tolling. When these activities are separated from one another the motorist is in the position of not knowing whether or not a toll evasion taken now will result in enforcement later. Thereby, enforcement is much stronger and compliance is encouraged.

Theoretically one might consider police use of portable tag readers away from the tolling zones to verify the presence of tags. However portable readers that can read vehicle-mounted tags from a distance are not available. It would require very substantial and risky technology development to acquire this capability, probably a greater effort than could be justified for this project.

There is an alternative approach that does not require the chancy and costly development that the method employing a portable reader does. The alternative would call for querying the system for the tolls paid by an SOV. In this alternative approach a terminal consisting of a portable PC equipped with a microphone, a speaker, a speech synthesizer, speech recognition software, and a cellular wireless connection- all standard elements, available off-the-shelf. These elements would be integrated so as to provide the police officer with an in-patrol-car capability along the following lines:

- While parked or cruising downstream of a tolling zone, the police officer speaks the state and number of an observed SOV vehicle's license;

- The terminal's speech recognition software converts the speech and the speech synthesizer 'speaks' the state and number for confirmation or correction by the officer;
- When the plate ID is confirmed, the terminal transmits it to the Central Processing System;
- Using the plate ID the Central Processing System performs a 'reverse' look-up of the tag ID;
- Using the tag ID the Central Processing System looks up the tolls paid by the tag in the last few minutes;
- The tolls paid are transmitted over the wireless connection to the terminal in the police vehicle; and
- The terminal uses the speech synthesizer to communicate the tolls paid to the officer.

All of the above should take no more than a few seconds. Since the SOV is downstream of a tolling zone the lack of a report of paying the toll for that zone would provide evidence of a violation. The feasibility of this approach (technical and legal) would need to be further investigated in Phase III of the study.

In the meantime, WSA recommends that counting heads and the use of the system activated payment indicator be used for enforcement. If the portable enforcement terminal seems useful it would be further developed during the detailed design phase.

OPERATIONAL CONCEPT

The operational characteristics of each of the operating elements in the system from the viewpoint of those elements are described below.

ENTRY POINTS

Every entrance to the managed lanes will be immediately preceded by a Variable Message Sign advising all motorists that an entrance to the managed lanes lies directly ahead. For the benefit of SOV motorists these signs will also announce the toll charge currently in effect. ETC readers shall be placed on each sign structure so as to read every tag passing beneath in the lanes prior to every entrance.

The Central Processing System shall periodically transmit Charge Rate Codes and companion VMS display text updates to the Sign Sub-system Computer. These revisions of the charging rate shall result from the measurement of level of service on the managed lanes and are intended to

ensure the provision of a high level of service on those lanes; decreased levels of service result in increased charging rates that in turn reduce traffic in the managed lanes and improve levels of service. Received VMS display text shall be displayed on the sign immediately upon receipt. When charging rates change, care shall be taken to prevent charging the motorist a higher toll than was read on the Variable Message Sign and indeed to ensure the motorist always receives the benefit of any doubt. If rates are decreased the VMS message and the new rates shall be put into effect immediately. If rates are increased, however, the revised VMS message shall be displayed for a period defined by an operator-settable system parameter (nominally to be about 5 or 10 seconds) before the new rate is actually put in effect (before the subsystem begins writing the higher rate on tags). This should ensure that the SOV motorist is never charged at a higher rate than was read on the VMS at the time the decision to use the managed lanes was made, though the motorist may be charged at a lower rate.

TOLLING ZONES

Tolling Zone locations record tag passage through the zone to charge the tag account for the trip. HOVs are not equipped with tags and pass through the tolling zone unrecorded. The Tolling Zone Sub-system shall be equipped with the following:

- Computer controller;
- Communication link to the Central Processing System;
- ETC Reader(s);
- Overhead light in each managed lane (indicates toll is paid);
- Vehicle Detection Equipment that permit traffic measurements such as vehicle counts, speeds, etc. for level of service measurement at some designated tolling zones.

The ETC antennae shall be mounted on existing structures such as overpasses when possible. When lacking suitable existing structures, gantries will be erected for the purpose. From an examination of the requirements, it seems that all the needed gantries will be for one directional traffic only (half the roadway) and at the existing structures will be for two directional traffic. The antenna mounting on existing structure and newly erected gantries are illustrated in Figures 5-4 and 5-5 respectively.

The Tolling Zone Sub-system shall read each tag passing on the managed lanes. The Tolling Zone Subsystem shall compose and forward a message to the Central Processing System identifying the read tag and the date and

time of the transaction. The Central Computer System (CPS), upon receipt of this message, shall update the tag database record with the following information:

- Date and time stamp for the transaction.

The overhead light shall be turned on for an operator modifiable number of milliseconds (nominally to be approximately one half second) if and only if the read of a valid tag has occurred in the lane below the indicator light.

TRAFFIC LEVEL OF SERVICE

Some of the Tolling Zone Sub-systems shall be equipped vehicle detection equipment to measure traffic flow in each managed lane. This will also permit the determination of vehicle direction of travel in the reversible lanes in case the entry location information normally provided by the sign controllers is not available.

The designated Tolling Zone Sub-systems shall take traffic measurements (traffic count and perhaps speed) that shall be forwarded to the Central Processing System so that it shall compute level of service for use in adjusting the charging rates. The measurements and the computation of charging rate adjustments is left until the detailed design phase but is likely to be similar to the methods currently in use on I-15.

Traffic flow in the managed lanes may be reversed so traffic measurements shall be directional.

Central Processing System - The Entire system shall be administered and controlled by a Central Processing System as shown in Figure 5-9. This computer system shall consist of a number of servers as described below. The Central Processing System shall incorporate the following functionality[1]:

- Create, modify, terminate and replenish ETC accounts;
- Prepare statements for ETC usage on a periodic basis;
- Receive ETC transactions from the field controllers and aggregate them for billing and statement preparation;

[1] System operation will be clarified during the specification development phase. The intention at this point would be to model many of the functions to those in the existing value pricing project. At the time of this writing we have not attempted to identify the operational specifics of that system so this description may deviate from the existing system but those deviations will be adjusted later.

- Send transaction records for away agencies' tags for payment and audit the payments;
- Pay for home agency tag transactions received from away agencies and post these transactions to the accountholder;
- Replenish accounts when transactions reduce the account balance below a specified threshold;
    - Automatically replenish credit-card-linked accounts;
    - Alert cash replenishment accounts that a payment is needed;
- Monitor traffic measurements and adjust toll rates in response;
- Monitor maintenance on-line management system (MOMS) messages, page maintenance technicians when failures are detected and create and maintain emergency, repair, and preventative maintenance work orders;
- Maintain a repair history and compute mean time between failure (MTBF) and mean time to repair (MTTR);
- Maintain inventory records for spare units and parts;
- Provide internet access for customers and potential customers so they may open accounts, check usage and account status, etc.;
- Provide traffic measurement data to the Caltrans District 11 Transportation Management Center;
- Produce reports of system operation, account status and updates, traffic measurement, repair statistics, and parts inventory.

The Central Processing System shall be located at the main customer service center. There is an existing customer service center and in the future system it may be re-located, possibly onto one of the park and ride locations. One or more satellite customer service centers may also be established.

The system will inherit the accounts and tag base from the existing system. The center portion of the expanded facility will be constructed initially, between the northern end of the current project at Ted Williams Parkway and Centre City Parkway, a distance of about 8 miles. This will be constructed as a four-lane facility, but will initially connect to the two-lane project now in use. In subsequent phases, the existing two-lane project will be expanded to four lanes and the northernmost five-mile section will ultimately be added. CPS development will require detailed study due to the impact of this incremental road development. When the CPS begins operation the new computer system will have to incorporate the two-lane project currently in use. Otherwise accountholders would experience separate billing for the two portions of the roadway. The

existing system will be integrated with the new system to produce a seamless whole. The new Central Processing System will likely need to start operating with just the existing southern end of the roadway and be expanded as shown below as roadway sections are added:

- Initially the new computer system will control the existing two reversible lanes;
- The center section would then be built and the section would be added to the mix possibly incrementally;
- The existing two reversible lanes would then be expanded to four possibly incrementally and the system would have to track these changes; and
- Lastly, the northern section would be added to the mix, possibly incrementally.

As illustrated above, the computer system will need to continually adapt to the evolving configuration of the roadway and a flexible table driven system architecture will be essential.

The Central Processing System shall be composed of a number of servers and workstations. The following Servers shall be provided:

- Front End Communications Server- This server shall communicate with all the field equipment. It will off-load the other servers of the communications burden sending to the accounts server only the records of completed trips. This server may also compute the levels of service and compute dynamically varying charges if required, or another server may assume this task. This server shall be a fail-safe design or shall incorporate a redundant configuration to minimize downtime;
- Accounts Management Server - This server manages the ETC accounts in a manner similar to the existing system, creating new accounts, closing accounts, replenishing accounts, preparing and printing account statements and reports, etc.;
- Internet Server - This server provides a firewall-protected interface to the internet enabling motorists to fill out account applications, inquire about their account balance, trips, etc.; and
- Maintenance Server- This server receives diagnostic reports from the field computers concerning the health of the equipment, prepares work orders and alarms for failed equipment, tracks work orders, spares inventory, and equipment reliability.

The Central Processing System shall also have a number of workstations and printers for use by the office staff. The entire process of managing accounts and clearing charges with other California toll agencies would be similar to the methods currently in effect on the existing I-15 Express Lanes.

The Central Computer Operation that would be new for the expanded I-15 managed lanes is the communication process with the Sign Locations, Tolling Zones and the Portable Enforcement Terminals. These activities would be assigned to the front-end communications server.

The Central Processing System's front-end server shall communicate with all of the Field Computer Controllers (Sign Controllers, Tolling Zone Controllers, and if used Enforcement Zone Controllers). The information sent to and from the Sign Controllers is shown below:

<u>To Sign Controller</u>
Time Synchronization
Charging Rate Change
- VMS text
- Charge Rate Code

<u>From Sign Controller</u>
Transactions
- Tag ID
- Charge Rate Code
- Date/Time Stamp

<u>To Tolling Zone Controller</u>
Time Synchronization

<u>From Tolling Zone Controller</u>
Transactions
- Tag ID
- Date/Time Stamp

Level of Service Data

The Central Processing System shall receive transaction messages from each Field Computer Controller (Sign Controllers and Tolling Zone Controllers). The Tolling Zone Sub-systems shall send messages to the Central Processing System detailing the tags that were read in their managed lanes. The Tolling Zone Sub-system shall store the information received. An algorithm shall be used that converts the tag number directly to the address of the table entry, for rapid data access. The data stored in the table entry shall include the following:

- Tag ID [not stored but implied by the table entry position];
- Date and time stamp that was written on the tag at the entering Sign Location
    - Date;
    - Time of day;
- Identity Code for the Sign Sub-system;
- Charge Rate Code in effect at sign;

- A field of flags indicating Tolling Zones at which a toll transaction occurred; and
- Date and time stamp of the latest Tolling Zone passage
    - Date;
    - Time of day.

If a later message is received from a Tolling Zone Sub-system regarding this same tag the data field will simply be overwritten.

Periodically the Tolling Zone Computer shall scan its Tag Data Table entries to search for completed trips. Any entry in the table that is older than an operator settable parameter in minutes (nominally 20 minutes) shall cause the generation of a trip or billing messages. Messages received from tolling zones that are last in the direction of travel can, of course result in immediate billing messages. The data saved in this message shall include the following:

- Tag ID;
- Time of entry to the managed lanes (Sign Controller read time);
- Time of passage past the ending tolling zone;
- Entry point to and exit point from the managed lanes perhaps as the Flag field indicating the Tolling Zones passed in the managed lanes; and
- Charging Rate Code written at entry.

Correct billing for the trip clearly can be computed if the Central Processing System receives the data from sign location and the tolling location ETC reads. If the point of entry information, normally recorded at the sign location is missing from the billing record, the charging code would be unavailable and would have to be reconstructed. In the most extreme example, no entry point and only one tolling point would be recorded and the direction of travel might be ambiguous. The patron would be charged the current rate for the managed lane segment recorded.

The saved charge code shall be used to access the charging rules for the trip. With this charging information plus the recorded point of entry to the managed lanes and the recorded tolling zones passed during the trip, any of the tolling approaches outlined in Technical Memorandum II-1 regarding alternative pricing strategies can easily be computed.

The back office processing functions of account management, cross-charging tag transactions with other agencies and computing new toll rates

in response to traffic patterns will be defined during the specification development phase and will likely be heavily influenced by the existing system's methods.

MOTORIST'S VIEW

The motorist's view of the system is quite uncomplicated. While driving in the general-purpose lanes of I-15, Variable Message Signs placed prior to every entrance to the managed lanes announce the entrance is immediately ahead and state the cost for use by SOVs. HOVs are always free and will not have tags. Account holders will have been advised to shield their tags when traveling in the managed lanes when qualifying as HOVs. SOVs must have a valid tag mounted on the windshield when using the managed lanes.

Both HOVs and SOVs that enter and complete a trip on the managed lanes travel under ETC readers at the tolling points. Passage of SOVs with valid tags results in activation of overhead signals that can be observed by police officers who may be in the vicinity. Several days later this SOV account holder receives a statement which reflects the trip taken and the charging rate that was on the VMS prior to the motorist's entry to the managed lanes.

The following example is offered to further clarify how a typical toll transaction would occur.

1. Traveling south on I-15 main line lanes, a driver decides to enter the managed lanes from a point just North of Rancho Bernardo Road.
2. The SOV driver, with a valid FasTrak tag mounted on the windshield passes a sign just north of the break in the barrier wall allowing exit and entry from and to the managed lanes (illustrated in Figure 5-10).
3. The sign will inform the driver of the toll rate to be charged for the planned trip.
4. As the driver passes under the sign, the ETC transponder on the vehicle is read and the transponder number, charging rate, sign location, date and time are sent to the system communication processor.
5. The system communication processor accesses a “transaction envelope” established for this transponder and records the transmitted information (sign location, charging rate, date and time, with tag number implicit in the memory location of the "transaction envelope").

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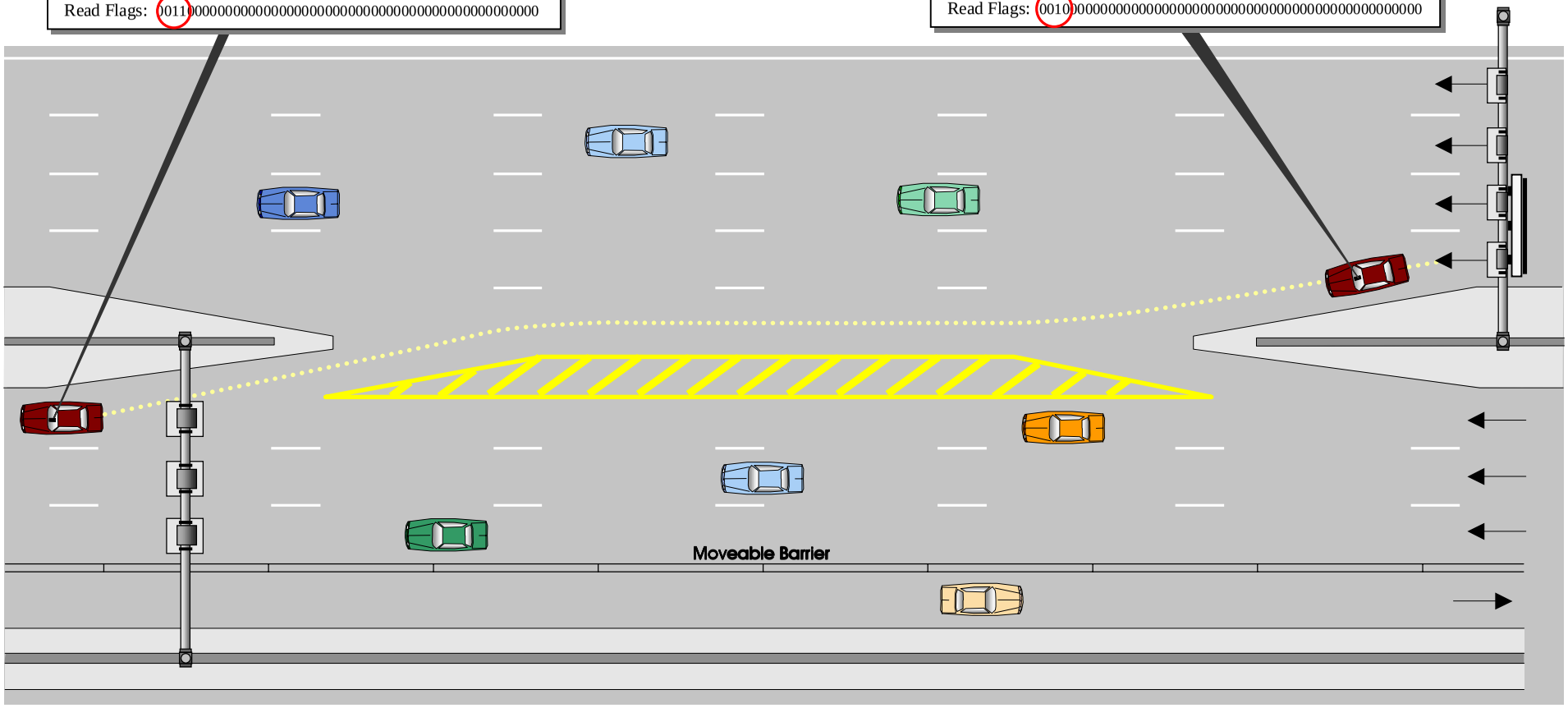
Each read flag represents a sign or reader location in the system.
A "0" represents no read and a "1" represents a read

Tag ID: 1234567890
Date: 1/1/02
Time: 08:00:15
Charge Code: M
Read Flags: 0011000000000000000000000000000000000000000000000000

Tag ID: 1234567890
Date: 1/1/02
Time: 08:00:00
Charge Code: M
Read Flags: 0010000000000000000000000000000000000000000000000000



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MANAGED LANES TOLLING ZONE CONCEPT AT TRANSITION AREAS

FIGURE 5-10

All reader location flags are set to zero except the sign location flag, which is set to one.

6. The driver then proceeds to the entry lane and begins traveling in the managed lanes.
7. As the driver proceeds south, the vehicle transponder will be read at the tolling point for each segment of the managed lane route. With each read, the transponder number, tolling point location, date, and time will be sent to the communication processor.
8. The communication processor will access the "transaction envelope" established for this transponder and set the flag representing the reader location to one and overwrite the date and time for the tolling point read. This process will be repeated at each tolling point passed by the vehicle.
9. When the vehicle reaches the last tolling point on the managed lanes, the communication processor will recognize the end of the trip and send the entire transaction to the Central Processing System where the trip cost will be calculated using the rate recorded when the vehicle crossed under the rate sign at entry and the patron account adjusted. Once the entire transaction has been sent to the Central Processing System, all data elements in the "transaction envelope" will be set to zero.
10. If the vehicle exits the managed lanes prior to the end of the managed lane project, the communication processor will recognize that no tolling activity has taken place for a pre-determined period of time (set by SANDAG) and send the entire transaction to the Central Processing System where the trip cost will be calculated using the rate recorded when the vehicle crossed under the rate sign at entry and the patron account adjusted. Once the entire transaction has been sent to the Central Processing System, all data elements in the "transaction envelope" will be set to zero.
11. The information sent to the Central Processing System will be the data collected when the transponder was read at the sign prior to entry into the managed lanes (rate, date, time, reader location), the location of each tolling point passed by the vehicle (tolling point flags) and the date and time of the last tolling point on the trip.

Thus, the permanent record for the account containing the transponder will have the location of the start of the trip, the date and time of the start, the rate charged, the location of the end of the trip, the date and time of the end of the trip, the intermediate tolling points and the charge for the entire trip.

STAGED DEVELOPMENT

The I-15 managed lane roadway construction will occur over a period of several years and in distinct stages. The stages will occur as follows:
Stage 1- Initially the existing project will remain unchanged with two reversible lanes; undergoing no physical or operational changes, while the center section of the project between the Ted Williams Parkway and the Centre City Parkway (approximately 8 miles) is constructed. The existing toll zone will remain where it is and no additional access points to the managed lanes will be built. When the center section of the managed lane roadway is completed it will be a four-lane facility, but initially will connect to the existing two-lane project.
Stage 2- The existing two-lane project will be expanded to four lanes
Stage 3- The northernmost five-mile section will be added.
The staged development of the project will present both design and operational challenges. Central Processing System development will require great care due to the impact of this incremental road development. When the CPS begins operation the new computer system will have to incorporate the two-lane project currently in use. Otherwise account holders would experience separate billing for the two portions of the roadway. The existing system will be integrated with the new system to produce a seamless whole. The new Central Processing System will likely need to start operating with just the existing southern end of the roadway and be expanded as roadway sections are added: Roadway operations and the computer system will need to continually adapt to the evolving configuration of the roadway.

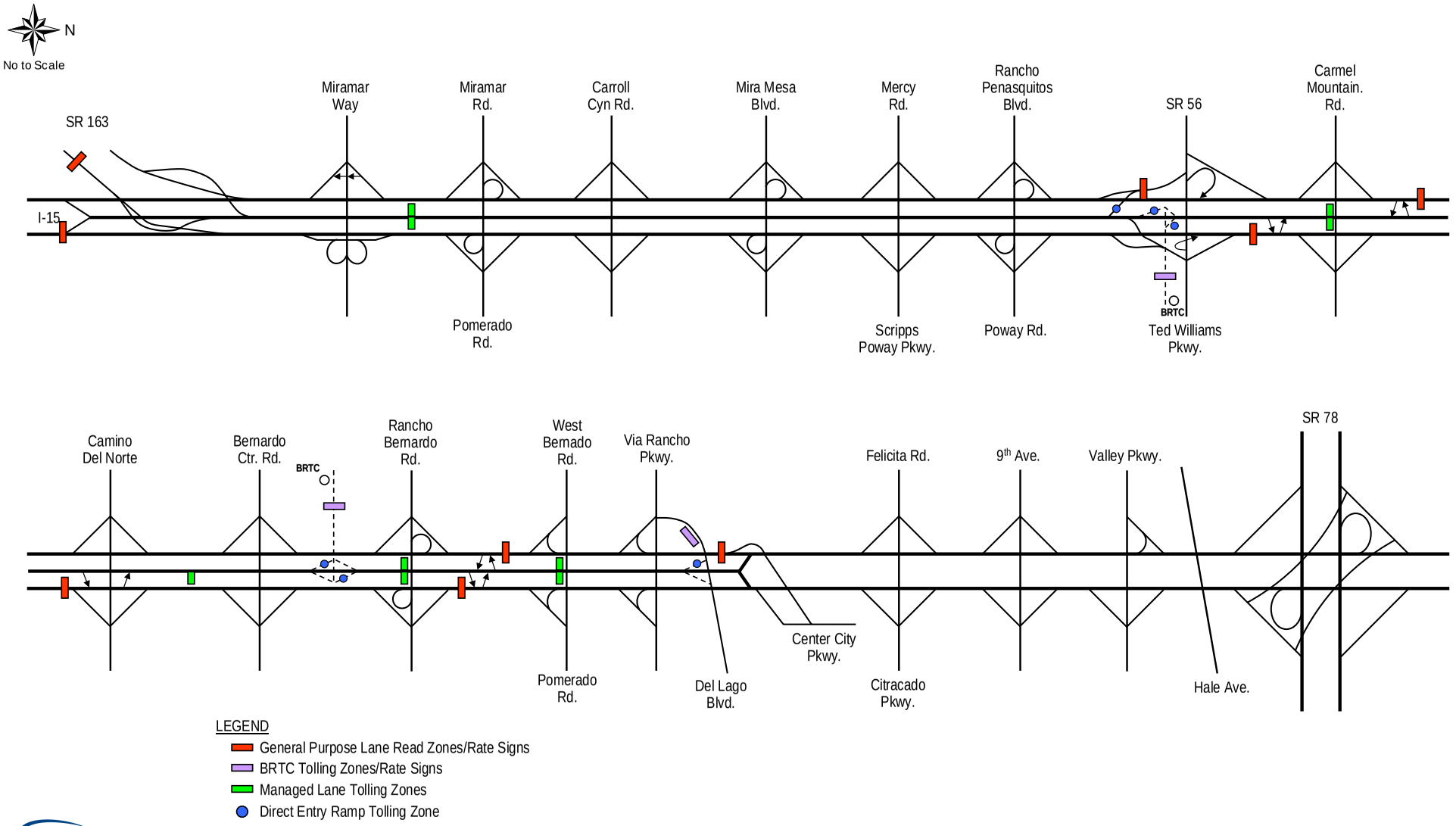
INTERIM PHASE

The proposed interim system configuration is shown in Figure 5-11. During this operation, the existing 8-mile reversible lane section will remain unchanged, without additional access points nor the implementation of the direct access to the BRTC in the south end of the project. As such, it is proposed that the existing tolling zone equipment can be used, although in a different "software context" together with the rest of the system.

New main lane read zones with variable message signs would still be required at the south end access point to the managed lanes.

At the north end, it is understood that the interim project of the managed lanes will end just south of the interchange with City Center Drive in southern Escondido. Therefore, all equipment north of that point would not be included in the interim system.

I-15 Managed Lanes Concept Plan



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PROPOSED TOLL SYSTEM CONFIGURATION - INTERIM CONDITION

FIGURE 5-11

The basic overall system would still function the same way, during the interim phase, although a smaller number of subsystems would be required.

PRELIMINARY SYSTEM COST ESTIMATES

A preliminary estimate of system costs, for both the interim system and the full system, were prepared based on this concept plan. This would be subject to considerable refinement during the detailed design phase in Phase 3.

Table 5-1 presents a summary of capital cost approximations for each of the various subsystems described herein. All costs shown should be considered to be in year 2001 dollars, and would be subject to inflation.

A summary of total system cost is provided for both the interim system and the "full build" condition in Table 5-2. Again, all costs are in year 2001 dollars.

Including the central system, software and development costs, documentation, testing and installation, the total interim system cost is estimated just under $6.8 million. The full system cost is estimated at almost $11.3 million. Both of these figures reflect an implicit assumption that if the system was implemented today, either as an interim or full system, the incremental cost of extending the interim system to the full system would essentially be equal to the difference between the two cost estimates, plus any associated inflation.

OPERATING COSTS

A preliminary analysis of potential operating cost is undertaken. While subject to considerable refinement, operating costs associated with toll collection only (excluding costs of enforcement, roadway maintenance, etc.,) should average in the range of $0.20 per transaction. For the five base alternative scenarios discussed in previous chapters, this would result in a range of toll collection operating costs from about $1.0 to $2.3 million, depending on the scenario and number of transactions processed. Again, this should be considered in year 2001 dollars.

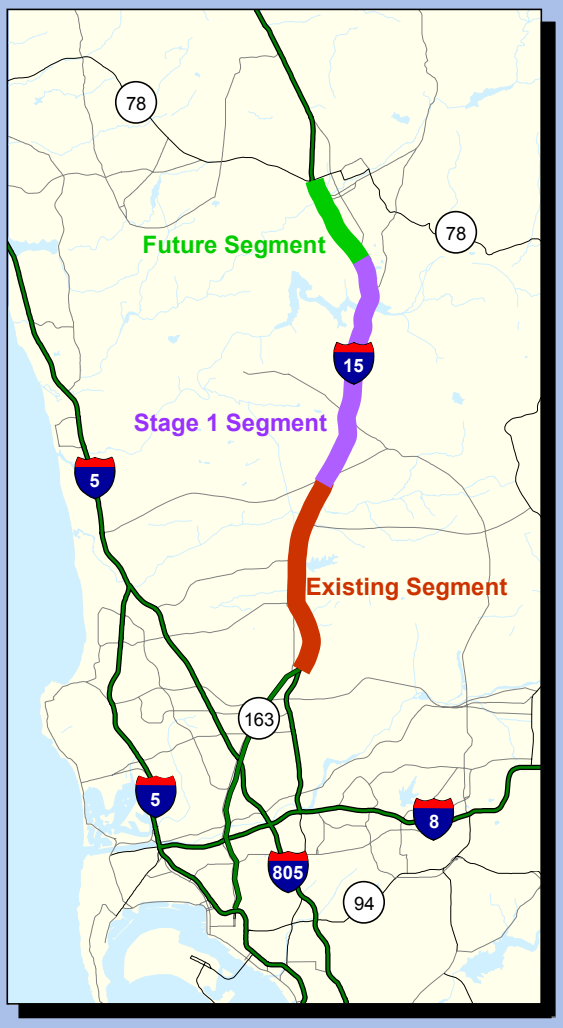
Table 5-1
Subsystem Cost Analysis
(All Costs in 2001 Dollars)

Description	Unit Price	Subsystem Quantity	Subsystem Extended Price	Interim System Quantity	Interim System Cost	Full System Quantity	Full System Cost
Typical Main Lane Reader Gantry With Rate Sign							
Lane Controller	10,000	1	10,000				
ETC Antenna	2,500	5	12,500				
ETC Reader	10,000	2	20,000				
Variable Message Sign	75,000	1	75,000				
Gantry Support (Full Span)	100,000	1	100,000				
Communications (End Equipment)	5,000	1	5,000				
Subtotal			**222,500**	**5**	**$ 1,112,500**	**15**	**$ 3,337,500**
Typical BRTC Access Toll Zone With Rate Sign							
Lane Controller	10,000	1	10,000				
ETC Antenna	2,500	4	10,000				
ETC Reader	10,000	2	20,000				
Variable Message Sign	75,000	1	75,000				
Gantry Support	50,000	1	50,000				
Communications (End Equipment)	5,000	1	5,000				
Subtotal			**170,000**	**2**	**$ 340,000**	**4**	**$ 680,000**
Typical Managed Lanes Toll Zone - Gantry Type							
Lane Controller	10,000	1	10,000				
ETC Antenna	2,500	4	10,000				
ETC Reader	10,000	2	20,000				
Variable Message Sign	75,000	0	0				
Gantry Support	50,000	1	50,000				
Communications (End Equipment)	5,000	1	5,000				
Subtotal			**95,000**	**1**	**$ 95,000**	**3**	**$ 285,000**
Typical Managed Lanes Toll Zone - Bridge Mount							
Lane Controller	10,000	1	10,000				
ETC Antenna	2,500	4	10,000				
ETC Reader	10,000	2	20,000				
Variable Message Sign	75,000	0	0				
Gantry Support	5,000	1	5,000				
Communications (End Equipment)	5,000	1	5,000				
Subtotal			**50,000**	**4**	**$ 200,000**	**10**	**$ 500,000**
Typical Direct Entry/Exit Ramp Reader (2 Lane Cantilever)							
Lane Controller	10,000	1	10,000				
ETC Antenna	2,500	1	2,500				
ETC Reader	10,000	1	10,000				
Variable Message Sign	75,000	0	0				
Gantry Support	20,000	1	20,000				
Communications (End Equipment)	5,000	1	5,000				
Subtotal			**47,500**	**4**	**$ 190,000**	**9**	**$ 427,500**
Typical Direct Entry/Exit Ramp Reader (4 Lane Cantilever)							
Lane Controller	10,000	1	10,000				
ETC Antenna	2,500	4	10,000				
ETC Reader	10,000	2	20,000				
Variable Message Sign	75,000	0	0				
Gantry Support	40,000	1	40,000				
Communications (End Equipment)	5,000	1	5,000				
Subtotal			**85,000**	**0**	**$ -**	**1**	**$ 85,000**
			TOTAL		**$ 1,937,500**		**$ 5,315,000**

Table 5-2
Estimated System Cost
(All Costs in 2001 Dollars)

Description	Unit Price	Interim System Quantity	Interim System Cost	Full System Quantity	Full System Cost
Typical Main Lane Reader Gantry With Rate Sign	222,500	5	$ 1,112,500	15	$ 3,337,500
Typical BRTC Access Toll Zone With Rate Sign	170,000	2	$ 340,000	4	$ 680,000
Typical Managed Lanes Toll Zone - Gantry Type	95,000	1	$ 95,000	3	$ 285,000
Typical Managed Lanes Toll Zone - Bridge Mount	50,000	4	$ 200,000	10	$ 500,000
Typical Direct Entry/Exit Ramp Reader (2 Lane Cantilever)	47,500	4	$ 190,000	9	$ 427,500
Typical Direct Entry/Exit Ramp Reader (4 Lane Cantilever)	85,000	0	$ -	1	$ 85,000
Communications Equipment		1	$ 50,000	1	$ 50,000
Central Computer System		1	$ 150,000	1	$ 150,000
System Software And Development		1	$ 2,000,000	1	$ 2,000,000
Documentation		1	$ 500,000	1	$ 500,000
Testing		1	$ 150,000	1	$ 150,000
Installation		1	$ 600,000	1	$ 850,000
Contingency And Engineering			$ 1,409,000		$ 2,254,000
TOTAL			**$ 6,796,500**		**$ 11,269,000**

Concept Plan



Volume 2
Public Outreach

I-15 MANAGED LANES VALUE PRICING PROJECT PLANNING STUDY

ENGINEERS
PLANNERS
ECONOMISTS

Wilbur Smith Associates

In association with

- FPL and Associates
- Judith Norman Transportation Consultant
- Fairfax Research
- Frank Wilson Associates
- ESTC
- ALESC

San Diego
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February 2002

San Diego
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I-15 Managed Lanes Value Pricing Project Planning Study

Community Outreach Program Executive Summary

January 21, 2002

Prepared by:
Redman Consulting/Judith Norman—Transportation Consultant
In cooperation with Fairfax Research and Frank Wilson and Associates
Project Outreach Subconsultants to Wilbur Smith Associates

TABLE OF CONTENTS

Community Outreach Program

I. EXECUTIVE SUMMARY OF COMMUNITY OUTREACH PROGRAM

A. Introduction and Organization of Community Outreach Reports

The San Diego Association of Governments (SANDAG) and Caltrans propose to implement value pricing on the future Interstate 15 (I-15) Managed Lanes through the San Diego I-15 Value Pricing Program. This program will allow solo drivers to use the I-15 Managed Lanes for a fee. The fee will be collected through electronic toll collection equipment. This report summarizes the four Community Outreach tasks, conducted from July to October 2001, and an Environmental Justice assessment of those tasks, that collectively make up the public outreach portion of the (I-15) Managed Lanes Value Pricing Planning Study.

This document incorporates the reports on the specific outreach tasks, including the stakeholder interviews, focus groups, transit rider/carpooler intercept surveys and the telephone opinion survey, plus the Environmental Justice. Because the reports may be read individually by people interested in particular aspects of the outreach program, explanatory material describing the Managed Lanes project and an overview of the Community Outreach program itself, are provided in each of the separate reports, presented here as “chapters” of an overall outreach program. Each report (chapter) contains its own executive summary, key findings and recommendations pertaining to the results of its respective research goals.

II. I-15 MANAGED LANES VALUE PRICING PROJECT DESCRIPTION

The 20-mile Managed Lanes project will build four Managed Lanes with a movable barrier in the median of I-15 to accommodate three lanes in the peak direction. The Managed Lanes will give priority to High Occupancy Vehicles (HOVs) and a Bus Rapid Transit System (BRTS). However, other vehicle types will be allowed to use the facility in a “managed” way to always provide a premium Level of Service. The lanes will be barrier separated from the general purpose lanes. Access will occur through as many as seven intermediate access locations (at-grade openings in the barrier) and five direct access ramps, along the 20-mile length. The five direct access ramps will be located at Hillery Drive, Ted Williams Parkway, Bernardo Center Drive, Del Lago Boulevard, and Hale Avenue. The Managed Lanes will be in operation at all times.

A continuous 6.6-meter wide enforcement area is planned, consisting of the 3.0-meter main lane inside shoulder and the 3.0-meter Managed Lane shoulder separated by a concrete barrier. This configuration would allow California Highway Patrol (CHP) officers to position themselves on either the main lane shoulder or the Managed Lanes shoulder to cite violators.

The I-15 Managed Lanes project will also include a Bus Rapid Transit (BRT) System that will incorporate direct access ramps at five locations to and from the Managed Lanes. The Metropolitan Transit Development Board (MTDB) is designing the BRT. Transit stations/park

and ride lots will be located adjacent to the I-15 corridor. Express buses will travel from the park and ride lots to the I-15 Managed Lane facility using the direct access ramps.

Construction of the I-15 Managed Lanes facility will occur in three phases. The middle segment from SR 56 to Centre City Parkway (Stage 1) will be built first with an estimated completion date of 2005. The northern segment from Centre City Parkway to SR 78 and the southern segment from SR 163 to SR 56 will be constructed later. The southern segment would involve widening the existing reversible I-15 HOV facility from two lanes to four lanes and installing intermediate access locations. Completion dates have not been determined for the northern and southern segments.

III. COMMUNITY OUTREACH OVERVIEW

A. Brief Description and Interrelation of Outreach Tasks

In June 2001, the San Diego Association of Governments (SANDAG) began a comprehensive, two year study of a proposed extension of the eight-mile I-15 Express Lane facility, known as the I-15 Managed Lanes Value Pricing Project Planning Study. Integral to the study is an assessment of public attitudes and concerns about both the existing and proposed projects. A series of community outreach tasks were incorporated into the project scope of work to allow SANDAG to examine these attitudes from a variety of perspectives. These tasks employed a number of specific qualitative and quantitative assessment techniques including 1) focus groups, 2) stakeholder interviews, 3) intercept surveys and 4) a telephone survey of 800 I-15 corridor users.

The sequencing of tasks was designed so that the early insights and direction gained from the results of focus groups, stakeholder interviews and intercept surveys could be used to help design the telephone survey questionnaire, as well as to provide stand-alone conclusions and recommendations to the project planners.

Focus Groups—In the Request for Proposals (RFP) for this project, SANDAG had already defined the target profiles for participants of three focus groups: I-15 main lane users, Express Lane users and transit riders. Three focus groups composed of 14 participants each were conducted. This qualitative research technique was used to provide insight into general responses, attitudes and opinions of a demographically and behaviorally relevant group of San Diego commuters, and not to provide “statistically reliable” data. The insights obtained from the focus groups provided guidance for the telephone survey instrument development process, as well as information for project planners to consider during the design phase.

Stakeholder Interviews—This was another qualitative research activity in which twenty-five key individuals were identified and interviewed for their opinions and concerns about the existing Express Lanes as well as the proposed Managed Lanes project. Stakeholders included four elected officials from I-15 corridor communities, 15 agency stakeholders (primarily senior technical staff involved in project development) and six public interest/advocacy group members. Stakeholders were asked about their general perceptions of existing and proposed lanes; new expectations and goals for the Managed Lanes; their assessment of community attitudes and concerns; their recommendations for reaching any identifiable underrepresented

groups; and their concerns about project concept specifics as well as suggestions for improvement. Stakeholders were also specifically asked about their opinion regarding their views on any equity issues related to the proposed project.

Intercept Surveys—Intercept surveys of 50 carpoolers and 50 transit riders were administered by the outreach team. The surveys took place at park-and-ride lots and transit interface points along the I-15 corridor within the new Managed Lanes project area. The purpose of the intercept surveys was to directly target carpoolers and transit riders along the corridor and solicit their opinions on the current Express Lanes as well as the proposed extension. This task was directed at obtaining more data on peak period commuters from "low-incidence" travel behavior categories (i.e., carpoolers and transit riders, who make up only a small fraction of corridor commuters) than would occur through the random-sample data gathering effort used in the telephone survey.

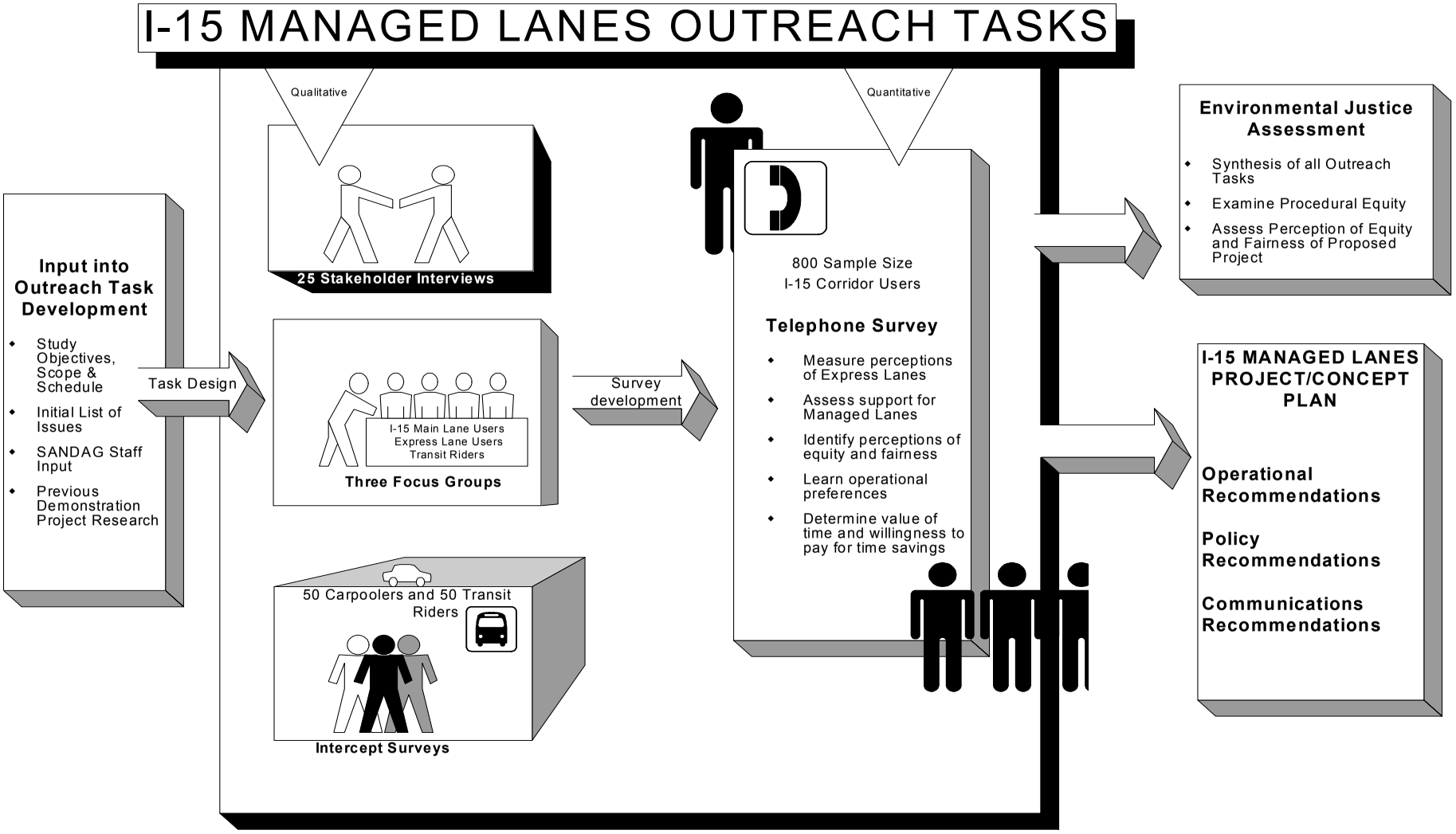
Telephone Survey—This task involved a detailed telephone survey of 800 peak period corridor users (600 main lane users and 200 transponder-owners). This quantitative research method benefits from a number of findings and observations gained through the previous three qualitative community outreach tasks. The survey research provides the opportunity to evaluate trends from a statistically reliable vantage point, and can determine the validity of the conclusions tentatively drawn from the qualitative side of the overall assessment of community opinion with respect to the project and its various features.

Environmental Justice Assessment —This assessment was a synthesis and elaboration of elements of all community outreach and public involvement study tasks, with a specific examination of two issues:

- **Procedural fairness** in gathering public input *(was the process sufficiently inclusive?)*
- **Perception of equity** and fairness from the viewpoints of low-income individuals and/or members of ethnic (non-Caucasian) minorities.

The environmental justice focus in this task is designed primarily to ensure methodological adequacy of quantitative and qualitative efforts in obtaining lower- income and ethnic representation within the community outreach/public input process, and in consideration of the relative affluence of the project corridor. It remains outside the scope of this Environmental Justice Assessment, as defined, to make any determination with respect to equity of overall transportation investment or operational impacts related to the proposed Managed Lanes Project.

Linking Outreach Task Results to the Project Concept/Plan—recommendations flowing from the four Community Outreach tasks described above are linked to the development of the Managed Lanes Project Concept/Plan report through incorporation of key findings into that report. Both formal and informal communications between and among the consultant team and the SANDAG project development team serve to enhance the integration of public opinion with the overall project development and refinement process. A flow diagram illustrating the project's community outreach tasks and their relationship to the Project/Concept Plan is found in Figure A (page 4).



Flow Chart of I-15 Managed Lanes Value Pricing Community Outreach Tasks Showing Links to Environmental Justice Assessment and Project Concept/Plan

Redman Consulting/Judith Norman–Transportation Consultant
Outreach Team Subconsultants to Wilbur Smith Associates

Figure A
October 2001

IV. KEY FINDINGS FROM EACH OUTREACH TASK

A. Stakeholder Interview Findings

Can We Communicate to the Public a Clear Vision for "Managed Lanes?" The Managed Lanes concept is one which, in the eyes of key stakeholders, is responsive to a number of community concerns: ambivalence about growth and current trends in land use along the corridor; frustration with traffic; concern about fundamental fairness; a preference for more rapid transit solutions to congestion ills. In the words of one stakeholder, "Managed lanes represent a *transportation solution*—not a highway solution." Communicating this rather complex set of strategies that are combined into the managed lanes concept may present a challenge for SANDAG and Caltrans.

Equity—Lexus Lanes or Robin Hood? Responses about equity were deliberately elicited, and ran the gamut from "Yes, it is a concern," to "If revenues are put back into the corridor, it shouldn't be a problem." However, for all but two stakeholders, concerns about potential unfairness were mitigated by proposed project features. Two key features of the project, in particular, decrease the stigma of "Lexus Lanes." These features include intermediate access throughout the facility, which allows a more diverse population to make use of the facility's time advantages; and the introduction of bus rapid transit on the Managed Lanes. Several of the access points will be constructed as direct access ramps accommodating a number of new bus rapid transit routes serving residents along the I-15 corridor. Finally, the fact that the lanes present an additional *option* for corridor travelers is seen by many stakeholders as a bulwark against claims that value pricing is unfair.

Project Champion—Who will it be? Several respondents familiar with the current I-15 Express Lanes cited the existence of a project champion as an important success factor during the demonstration project phase. The extension of the project to new areas would be well served to have such a champion. Although advocates may yet emerge from the ranks of community leaders or average citizens, especially those living in the Escondido area, it appears at this time that a set of champions has might indeed arise from the business community along the corridor. Stakeholders concerned about area commerce recognize in the Managed Lanes project an opportunity to keep the lifeblood of people and goods flowing, and those interviewed thus far have articulated a balanced and reasoned position of support for the lanes as described. Further, one important business stakeholder has expressed a definite willingness to state that support publicly in order to advocate for the project and to assist SANDAG through various political and institutional hurdles.

New Project Goals to Test with Managed Lanes Can the extension incorporate value pricing effectively and safely within a multiple access configuration? Can tolls be kept reasonably affordable while maintaining their demand management function? What are the operational impacts of the new access? A number of stakeholders expressed project goals for the extension that focused on testing the innovative (and more complex) technical and operational aspects of the project, including ingress and egress combined with moveable barriers and value pricing. A key set of goals relates to incorporating those technologies and policies that could

enhance the lanes' ability to provide mobility benefits and travel and transit options beyond what FasTrak currently offers.

Congestion Relief or Mobility Options? A number of stakeholders—even those with HOV and technical highway operational experience — identified "congestion relief" as a goal of the project. It should be noted that this characterization of the goal of the lanes (i.e., "reducing" congestion) could become problematic, in that it can mislead people about what is possible. Along a corridor with such high travel demand and growth projections, the congestion relief that will result from additional capacity will be short-lived. It is only the congestion relief offered by the *choice to use the managed lanes as carpooler, transit rider or toll-payer* that will endure. In fact, for that reason, previous interviews with technical stakeholders indicated diminished emphasis on this goal, in favor of the more realistic one of providing corridor mobility options.

B. Focus Group Findings

Solid Support for the Managed Lanes Project was Found in All Three Focus Groups
Strong support for the proposed extension to the lanes existed in all three focus groups, though it was strongest in the FasTrak users group. Current FasTrak users strongly supported plans to extend the lanes; in fact, those who had indicated during the participant screening process that they were "dissatisfied" with the lanes revealed during the discussions that they were dissatisfied primarily with the fact that the facility was only eight miles long. Support for the Managed Lanes extension was notably stronger among the Transit Riders users group than among the Main Lane users group, although support among both groups increased based on the transit components of the proposed project.

We Need Improvements NOW All groups mentioned the length of time until project completion as a disadvantage of the project. "Too little, too late" was a refrain echoed in all of the focus groups. There was a sense of frustration expressed that Caltrans and regional planners are forever "catching up."

Equity is Not a Deal Breaker: Express Bus Service Is Key A number of people in each focus group did express concern about the fairness of tolls for lower income drivers. However, a crucial finding was that when these 42 participants (14 in each of three groups) gained a clear understanding of the features of the project, including the proposed Bus Rapid Transit component, nearly all reservations concerning equity dissolved, and support for the project became strong and widespread through all three focus groups. Generally, after a full explanation of all Managed Lane project features, approximately 85 percent of each group thought the proposal was fair, and did not pose a fatal equity issue, in their opinion. Most people in this group based their approval on the fact that the project provides options that work for people in a variety of different situations, and that solo drivers help support transit and carpool alternatives. Some looked at the potential for personal benefit, whether from transit, carpool or solo driver buy-in opportunities, and determined that the lanes were fair "for them." Others felt that, as long as a person was willing to pay for premium service, they should be permitted to do so as long as they didn't take anything away from anyone else. Finally, the fact that the lanes would ease congestion for everyone on the main lanes was viewed as a balancing force in the "equity equation."

There were a few people in each group who did not change their position, and who simply thought tolls were elitist and unfair, offering advantages based on ability to pay.

Equity vs. Fairness or "Double Taxation" Fairness (as opposed to equity) also arose as an issue, and was typically expressed in the phrase, "I've paid once for the lanes, and now I have to pay again. That's unfair." Still, participants agreed that people *are willing to pay*, and many participants expressed desire for the Managed Lanes extension to be built quickly so that they could use them. .

Participants Propose Alternative Tolling Scenario: Lower Tolls, Slightly Lower Speeds In part as a response to equity concerns, but also because they saw a chance to spread project benefits to a wider range of commuters, both Main Lane and FasTrak users spontaneously developed an alternative to the proposed project, which consisted of lowering the tolls, and permitting a moderate degradation of the level of service (to 45 miles per hour or so) on the Express Lanes or the proposed Managed Lanes, in order to allow more people to use the lanes. As long as a relative time and speed advantage between the main lanes and the managed lanes was retained, both groups generally agreed that this was acceptable, and would help the main lanes by getting more people diverted to the Managed Lanes.

Lack of Understanding of FasTrak Program Details The members of each focus group were asked whether they knew how the FasTrak toll operations on the Express Lanes worked. In both the Main Lane and Transit Riders groups, there was confusion about where and how to pay tolls. Numerous questions were asked about whether information was posted on the freeways (few recalled seeing any such information) and how someone could even find out who to call to sign up for the FasTrak program. With one exception, no one—including current transponder owners—was aware of how the toll revenues were spent.

Suggested Use of Toll Revenues Transit Riders made the most suggestions, focusing primarily on transit improvements or fare subsidies; lane expansion and better signage were suggested by Main Lane users and Express Lane users, respectively.

C. Transit Rider/Carpooler Intercept Survey Findings

Support for Express Lanes/Managed Lanes Among Transit Riders and Carpoolers Support for the existing Express Lanes, as well as the Managed Lanes extension is very strong among carpoolers and transit riders. Those surveyed mentioned the lanes' travel time and stress reduction benefits they see as valuable to them.

Value Pricing (FasTrak) on Express Lanes Seen as "Fair" by Large Majority FasTrak was deemed "fair" by 94 percent of transit riders and 92% of carpoolers surveyed. Respondents cited the fact that tolls were optional as one reason for their determination. Travel time savings and stress reduction benefits were also given as reasons for viewing the lanes as fair. Respondents in both transit and carpool groups believed the lanes provided encouragement to carpool, and saw this as an additional benefit to the lanes.

Managed Lanes May Play Role in Carpool Formation Seventy percent of carpoolers surveyed stated that the existence of the Express Lanes was a factor in their decision to begin carpooling. If this result is not atypical, it represents a promising finding relative to the Managed

Lanes' potential to create new carpools, as opposed to merely diverting existing carpools from the main lanes.

Suggested Use of Toll Revenue Transit riders favor using toll revenues for more express bus service, and secondarily to extend the I-15 carpool lanes. Carpoolers, on the other hand, favor carpool lane maintenance and expansion, and secondarily favor spending toll revenues on adding regular lanes to the I-15. For carpoolers, spending money on transit is a much lower priority than for transit riders.

D. Telephone Survey Findings

Support for the FasTrak Program and Extension of the Managed Lanes is Strong, and Unaffected by Ethnicity/Income The attitudes and opinions expressed by these I-15 corridor users underscores their frustration with the congestion and delays endemic on the I-15 during the peak morning commute. The respondents supported the Managed Lane concept and the extension of the existing lanes. They are aware of the FasTrak program that offers free access to carpoolers and allows SOV drivers to buy access through a toll charge. A majority of the respondents expressed approval of the FasTrak program. In addition, 92 percent of them like a time saving option on the I-15. In the opinion of the respondents, the FasTrak program reduces congestion. They expressed a need for the extension and support constructing the extension. A notable 84 percent of the respondents said they favored the Managed Lanes Extension.

FasTrak (Value Pricing) Program Seen as "Fair" by Majority The majority of the respondents have no objection to the FasTrak concept either philosophically or practically. They consider the extension fair to regular lane users (71%) and Managed Lane users (75%). Very few differences in opinions and attitudes about the fairness of the lanes exist based on ethnicity or income. Though not central to their perception of FasTrak, the idea of "double taxation" remains problematic for FasTrak. Asked specifically, half of the respondents deemed the tolling of SOV drivers an unfair double taxation. The benefit of FasTrak (avoiding the congestion) outweighs the cost of entry (paying a toll). This should remain only a peripheral issue, unless the project encounters cost overruns and generates subsequent negative publicity. Explaining the purpose and use of the tolls should diminish this sentiment.

Transit is Not a Central Issue for Most I-15 Corridor Commuters In contrast to results from the focus group effort, which specifically included the opinions of a large percentage of transit riders, the telephone survey respondents do not view transit in its current incarnation as a solution to the congestion problem. They still generally drive alone in their own vehicles. Express bus service carries some small cachet among the respondents. The express bus may reduce congestion, but it will not sell the extension. However, after hearing about transit options, approximately 5 percent to 8 percent of the respondents who previously did not support the project changed their minds to support the project. Some strong transit supporters (5 percent of the respondents) would rather add rapid express bus service rather than build the extension. Another 3 percent of the respondents preferred building a trolley/train to extending the Managed Lanes.

Public is Unaware of How Toll Revenues are Used A general lack of knowledge exists about the use of FasTrak revenues. Just 2 percent of the respondents knew that FasTrak tolls fund the Inland Breeze.

V. RECOMMENDATIONS

A. Stakeholder Interview Recommendations

Enhance Public Outreach and Marketing Communicate features and benefits of proposed project and to avoid opposition based on misinformation. Incorporate information from the project operations plan, now in development. Previous Express Lane marketing programs provide an excellent example of the kind of effort now needed, and might include specific products such as an Operational Plan Fact sheet, designed to allay concerns about technical project details. Consider additional stakeholder interviews targeting community leaders and opinion makers less familiar with the project as well as presentations to community groups.

Speed up Project Delivery Implement the project on an expedited schedule in order to avoid falling further behind the growth curve and minimize construction impacts.

Ensure the Implementation of Customer-oriented Transit and Carpool/vanpool Services Develop transit service and facilities designed to be truly competitive with automobile travel. Regional coordination between SANDAG, corridor communities and all transit operators will be required.

Continue and Step-up Regional Planning Efforts Support enhanced inter-county planning and coordination, the development of seamless and attractive transit alternatives, and land use and development policies and strategies that begin to redress the causes of jobs/housing imbalances that exacerbate highway congestion.

B. Focus Group Recommendations

Speed Up Project Delivery From both the construction-impact perspective and the need for new travel options, faster is better in the minds of many of the focus group participants. In addition, quicker project construction will reduce the impact of construction-related delays—a concern mentioned by many in all three focus groups.

Better Promotion of and Information about Existing Express Lanes There is a continued need for providing information about FasTrak sign-up procedures, as new drivers enter the environment of I-15, or as their travel needs change and the Express Lanes may become a more viable option—one that they might use if they knew more about it. It is suggested that SANDAG consider re-vamping and implementing the kind of successful marketing program that helped position the original demonstration project. The “rail-station-like” aspect of the proposed direct access ramps and the ability of the bus to compete with rail in the minds of the public could play an important role in winning public support for Managed Lanes.

Provide Convenient Transit Service The transit element is critical in garnering support from all three focus groups. The kind of service described and required to satisfy expectations and needs would necessitate improvements in service (more frequent, reliable service, more evening service) operational policies (better timed routes and extended-time, reversible transfers and more coordination of service between local operators) as well as facilities (better security, cleaner and more reliable buses). Both Transit Riders and Main Lane users expressed the need for local transit access (transit feeder service) to support the Bus Rapid Transit component of the project. Finally, many members of the focus groups favored a trolley-like

transit system for the corridor. According to these focus group participants (who constituted a majority of each group, and especially the current main lane users), the more the Bus Rapid Transit service looks, feels and operates like a trolley, the better.

Consider Increasing Cross-Freeway Connections for Community Needs In order to remove local trips from the freeway, project planners might consider how to coordinate improvements in cross-freeway (underpass or overpass) roadway connections to permit communities along the east and west sides of the I-15 corridor to meet social, personal and business needs without using the freeway for short trips. This could have a significant impact on localized congestion hot spots.

Explore Possible Trade-Offs between Level of Service and Tolls Within the statutory and institutional constraints pertaining to Express Lane level of service commitments, it is recommended that project designers explore the suggestion made by participants in two groups, to permit greater solo driver affordability by lowering the tolls. Participants indicated willingness to tolerate a somewhat lower peak speed, in the area of 45 miles per hour—still significantly higher than peak speeds on the main lanes.

Address Long Range Planning Issues Participants in all groups stressed their disappointment in government, Caltrans and regional planners inability either to keep up with highway demand, or to address broader multi-modal needs. Further, the issues of growth, inter-county travel patterns, development, land use and affordability of housing should be included in future communications with the public.

C. Transit Rider/Carpooler Intercept Survey Recommendations

Introduce Improvements in Transit/Carpool Facilities Transit improvements (schedule, frequency and maintenance) would increase the likelihood of satisfying and retaining existing customers, and attracting new ones. A shortage of park-and-ride lot spaces were noted by a large number of transit riders. Facility improvements, such as expanding limited park-and-ride lot space, could increase transit or carpool usage on both main lanes and the Express Lanes/Managed Lanes.

Inform Public about Toll Revenue Use The fact that only two of the transit riders knew that toll revenues were supporting transit service on the Express Lanes indicates a need for improved public information strategies designed to provide area residents with information about project features.

D. Telephone Survey Recommendations

Public Information, Communications and Messaging In project-related communications, it is recommended to repeatedly emphasize the timesaving of the extension with a strong linkage to quality of life issues. When presented with the benefits of the extension, most respondents think in terms of saving time as opposed to consistency in arrival time. They like the extension because they believe it will reduce congestion, engender less stress, and save them time. This means more time to do things they enjoy, e.g., sleep, work, spend time with family, etc. Ameliorate concerns about construction delays and costs. They support the extension, but they

anticipate construction delays. Keep them informed about anticipated delays and, where possible, mitigate all potential construction delays.

Provide Public with Better Explanation of Purpose of Tolls and Use of Toll Revenues
Educate the corridor users on the relationship between the real and perceived benefits of the lanes, the demand management function of the tolls and the uses of the toll revenues. Respondents believe that the tolls do manage demand. However, some philosophical opposition exists to the concept of tolls and the potential to exclude some segments of the population. Avoid a message of economic exclusivity and exclusion. When explaining managed demand, *carefully* articulate a message that emphasizes the benefits of the lanes. The lanes help all commuters, particularly with the free access to carpoolers (and all the benefits of carpooling) and the inclusion of the express bus service. Framing the message in these terms generates overwhelming support for the extension. Explain how the toll revenues are used.

Consider Peak-Only Operation SANDAG and its partners might consider addressing concerns about fairness by opening the lanes to all I-15 commuters during off peak hours, restricting access only during peak commute times. FasTrak users oppose this idea and may initially complain about it, but opening the lanes during off peak hours appeals to the other I-15 travelers.

Target Potential Transit Market with Enhanced Service and Promotion of that Service
With proper positioning, pricing, and promotion, a market exists for the express bus service on the extended Managed Lanes. Capturing just a fraction of those who professed interest in the service will provide a sufficient customer base.

E. Recommendations Common to All Outreach Tasks

Though the details and emphases differ according to the specific focus of the respective outreach tasks, the following recommendations were common to all or most of the tasks:

- Speed Up Project Delivery
- Enhance Public Education and Information about Project
- Enhance Customer-Oriented Marketing of Managed Lane Services and Features
- Provide Transit Service That Responds to Local Needs
- Consider Operational Flexibility (Lowered Level of Service/Peak-Only Operations)
- Address Long-Range, Comprehensive and Inter-County Planning Issues

VI. ENVIRONMENTAL JUSTICE ASSESSMENT

This Environmental Justice Assessment reviews, evaluates and documents the methodological adequacy of quantitative and qualitative efforts in obtaining lower-income and ethnic representation within the community outreach/public input process, within the context of the relative affluence of the I-15 Managed Lanes project corridor. Procedural fairness with respect to Community Outreach must address whether the methods used in assessing public opinion were sufficiently inclusive to ensure that non-Caucasian and low-income members of the affected community were able to voice their opinion and provide their input to the process.

The goals of Environmental Justice were kept in mind through the entire process of outreach task development and implementation. A review of the methodology, implementation and results of the qualitative research efforts (stakeholder interviews, focus groups and transit/carpooler intercept surveys) suggest that, within the defined scope of work and the affected population (I-15 corridor commuters) no range of income, or ethnic viewpoint was excluded. The careful methodological process used to develop the sample for the quantitative research (telephone survey of 800 I-15 corridor commuters) resulted in a sample that, within statistical limits, accurately represents the ethnic and income composition of I-15 corridor users It appears that efforts to ensure that SANDAG received representative information about public opinion, attitudes and concerns from a broad range of ethnicities and income levels were sufficient to satisfy Environmental Justice requirements appropriate to the Community Outreach program for the Managed Lanes study.

For the most part, the public does not perceive the Managed Lanes project to pose an equity problem, though some respondents would not be able to afford the tolls to access the lanes as solo drivers. Perceived need for the project to address severe corridor congestion is high. No significant differences in responses based on income or ethnicity of respondents were detected.

San Diego Association of Governments
I-15 Managed Lanes Value Pricing
Project Planning Study

Stakeholder Interview Report
January 21, 2002

Prepared by:
Redman Consulting/JNTC
Frank Wilson & Associates
Project Outreach Subconsultants to Wilbur Smith Associates

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I. EXECUTIVE SUMMARY

This report summarizes the results of stakeholder interviews conducted as one of four community outreach research activities performed as part of the I-15 Managed Lanes Value Pricing Planning Project Study. Between July and October 2001, a total of 25 key stakeholders were identified and interviewed in order to measure their attitudes and perceptions about the current value pricing project (the Express Lanes) as well as the proposed Managed Lanes extension from Ted Williams Parkway north to Escondido.

Stakeholders (identified by name and organization in Appendix A) can be categorized as follows:

- Four elected officials from cities along the I-15 corridor.
- Fifteen staff representatives from agencies directly or indirectly involved in project planning and design.
- Six representatives of a range of public interest or advocacy groups, including one regulatory agency.

Previous stakeholder evaluations conducted for this project offered operational suggestions and indicated overall satisfaction with the project, especially by those most familiar with the operational features and rationale of the project. Likewise, interviewees in this effort who are most involved in the Managed Lanes project development, indicated overall satisfaction with the existing Express Lanes project and optimistic expectations for the Managed Lanes extension. The majority of those stakeholders less familiar with project details (elected officials and public interest group stakeholders) also expressed satisfaction with the Express Lanes and support for the Managed Lanes extension. However, several individuals explicitly conditioned their project support on the continued promotion of carpool/vanpool usage, implementation of the expanded plans for bus rapid transit, and the simultaneous pursuit of regional, multi-dimensional solutions to transportation problems.

Table 1 (page 4, below) provides a summary matrix of stakeholder opinions on key topics discussed, and is intended for reference and comparison. Within an overall context of stakeholder support for the project, here are the main observations and conclusions:

Can We Communicate to the Public a Clear Vision for "Managed Lanes?"— The Managed Lanes concept is one which, in the eyes of key stakeholders, is responsive to a number of community concerns: ambivalence about growth and current trends in land use along the corridor; frustration with traffic; concern about fundamental fairness; a preference for more rapid transit solutions to congestion ills. In the words of one stakeholder, "Managed lanes represent a *transportation solution*—not a highway solution." Communicating this rather complex set of strategies that are combined into the managed lanes concept may present a challenge for SANDAG and Caltrans.

Equity—Lexus Lanes or Robin Hood? Responses about equity were deliberately elicited, and ran the gamut from "Yes, it is a concern," to "If revenues are put back into the corridor, it shouldn't be a problem." Two key features of the project, in particular, decrease the stigma of "Lexus Lanes." These features include intermediate access throughout the facility, which allows a more diverse

population to make use of the facility's time advantages; and the introduction of bus rapid transit on the Managed Lanes. Several of the access points will be constructed as direct access ramps accommodating a number of new bus rapid transit routes serving residents along the I-15 corridor. Finally, the fact that the lanes present an additional *option* for corridor travelers is seen by many stakeholders as a bulwark against claims that value pricing portion is unfair.

Project Champion—Who will it be? Several respondents familiar with the current I-15 Express Lanes cited the existence of a project champion as an important success factor during the demonstration project phase. The extension of the project to new areas would be well served to have such a champion. Although advocates may yet emerge from the ranks of community leaders or average citizens, especially those living in the Escondido area, it appears at this time that a set of champions has might indeed arise from the business community along the corridor. Stakeholders concerned about area commerce recognize in the Managed Lanes project an opportunity to keep the lifeblood of people and goods flowing, and those interviewed thus far have articulated a balanced and reasoned position of support for the lanes as described. Further, one important business stakeholder has expressed a definite willingness to state that support publicly in order to advocate for the project and to assist SANDAG through various political and institutional hurdles.

New Project Goals to Test with Managed Lanes—Can the extension incorporate value pricing effectively and safely within a multiple access configuration? Can tolls be kept reasonably affordable while maintaining their demand management function? What are the operational impacts of the new access? A number of stakeholders expressed project goals for the extension that focused on testing the innovative (and more complex) technical and operational aspects of the project, including ingress and egress combined with moveable barriers and value pricing. A key set of goals relates to incorporating those technologies and policies that could enhance the lanes' ability to provide mobility benefits and travel and transit options beyond what FasTrak currently offers.

Congestion Relief or Mobility Options?— A number of stakeholders—even those with HOV and technical highway operational experience — identified "congestion relief" as a goal of the project. It should be noted that this characterization of the lanes' ultimate goals (i.e., "reducing" congestion) could become problematic, in that it can mislead people about what is possible. Along a corridor with such high travel demand and growth projections, the congestion relief that will result from additional capacity will be short-lived. It is only the congestion relief offered by the *choice to use the managed lanes as carpooler, transit rider or toll-payer* that will endure. In fact, for that reason, previous interviews with technical stakeholders indicated diminished emphasis on this goal, in favor of the more realistic one of providing corridor mobility options.

Key recommendations flowing from these and other salient findings detailed in the body of this report include the following:

- **Enhance public outreach and marketing** to communicate features and benefits of proposed project and to avoid opposition based on misinformation.

Incorporate information from the project operations plan, now in development. Previous Express Lane marketing programs provide an excellent example of the kind of effort now needed, and might include specific products such as an Operational Plan Fact sheet, designed to allay concerns about technical project details. Consider additional stakeholder interviews targeting community leaders and opinion makers less familiar with the project as well as presentations to community groups. Respondents liked the idea of a quarterly newsletter to keep them updated on the most current progress of the project.

- **Speed up project delivery**, to avoid falling further behind the growth curve and minimize construction impacts.
- **Ensure the implementation of customer-oriented transit and carpool/vanpool services** and facilities designed to be truly competitive with automobile travel. Regional coordination between SANDAG, corridor communities and all transit operators will be required.
- **Continue and step-up regional planning efforts** that include inter-county coordination, the development of seamless and attractive transit alternatives, and land use and development policies and strategies that begin to redress the causes of jobs/housing imbalances that exacerbate highway congestion.

Table 1: Summary of Stakeholder Opinions on Selected Topics on I-15 Managed Lanes Value Pricing Project

Stake-holder Category	Assessment of Existing Express Lane Performance	Stakeholder Support for Managed Lanes Extension	Suggested Uses for Toll Revenues	Opinion about Project Equity (real or perceived)	Issues of Concern or Problems Identified	Suggestions for Project Improvement
Elected Officials from Cities Along I-15 Corridor (4 stakeholders)	• Moderate to strong support expressed (3 of 4). • Unsuccessful because of underutilization (1 of 4) • Length of existing lanes (too short) and lack of intermediate access identified as a problem. • FasTrak more effective than Express Pass • Gets commuters off the freeway, helps carpool formation; maximizes use of HOV lanes.	• Generally good to strong support for extension (all 4 electeds) • Recognition that extension serves needs of North County commuters and offers benefits. • Recognition that, though tolls are often viewed as unpopular, pricing may be the only solution for corridor congestion.	• Enhance public transit. • Retire bonds. • Keep revenue in San Diego County; limit spending to transportation projects only.	• Three of four electeds did not identify an equity issue connected with the Managed Lanes project. • One of four believed that if an equity issue existed, it could be effectively addressed through better transit and greater access to the facility associated with Managed Lanes extension.	• Project funding. • Growing reverse direction demand is equalizing capacity needs northbound and southbound along corridor. • Tendency of planning vision to be shortsighted; need to address long range and regional issues to extent possible. • Look at traffic from Riverside County residential areas; need for more affordable housing in North San Diego County.	• Accelerate project delivery to extent possible. • Encourage transit use. • Better information and marketing of FasTrak along corridor. • Coordinate with Riverside County to integrate their plans for HOV on I-15. • Keep lanes open longer.
Staff from Agencies Directly Involved in Project (15 stakeholders)	• Very successful in most original project objectives (maximize use of infrastructure; test dynamic pricing; • Some concern over performance in promoting HOV usage.	• Unanimous support for Managed Lanes extension. • Multiple access and direct access transit ramps seen as positive. • Agency mission-specific concerns about implementation details. • Some see value pricing as one among many tools in toolbox; for others, toll revenue and pricing's demand management function is crucial to project success.	• Use toll revenue to address equity issues (convenient, attractive bus rapid transit service) • Support non-SOV modes. • Enforcement. • More options for traffic relief. • Need to wait and see how much revenue is available. • "100% to public transportation" (transit agencies) • Fund more over/underpasses.	• Equity largely seen as perception problem or fairness issue rather than Environmental Justice. Project planners should not take issue lightly, however. • Examine potential of direct ramps for transit to address equity issue, esp. Escondido ramp. • Look at benefit of providing reverse-commute transit service. • Equity enhanced by easier access for HOV.	• Technical staff recognize challenges of multiple access for tolling, safety, enforcement. • Project cost associated with 3 + 1 lane configuration. • Project noise impacts. • Impacts to businesses during interchange reconstruction. • Role of value pricing in Managed Lanes. • Inland Breeze underfunded. • Environmental issues. • Need to ensure buses don't lose travel time advantage when they merge back to main lanes.	• Better customer service. • Better signage. • Address bottleneck issue (4 lanes to 2). • Noise walls. • New transit facilities along parallel arterials. • Attend to I-15/78 capacity issues. • Take care with engineering of connecting phases. • More data on violators
Public Interest /Advocacy Auto Club, Taxpayer, Voters Business Regulatory, Environmental (6 stakeholders)	• Successful (2 of 6) • Moderately successful (2 of 6) • Not successful (1 of 6) • Insufficient data to determine success (1 of 6)	• Strong support (4 of 6) • Strong opposition (1 of 6) • Insufficient information to make determination. (1 of 6)	• Fast, convenient transit on corridor. • "Green cars"—shuttles at both ends of transit trips. • Regional arterial and surface street improvements to reduce load on freeways. • Infrastructure and regional solutions	• Tolls might be too low (encouraging CBD workforce to reside in outlying areas) (1 of 6) • Need to look at project location and benefits and who can afford it. (1 of 6) • "No problem" with equity; transit feature was a factor. (2 of 6) • "Inequitable" (1 of 6) • Insufficient information to form an opinion on equity. (1 of 6)	• Concern about enough room for moveable barrier. • Need to maintain level of service on Express Lanes. • Construction impacts. • Tolls might be too low (encouraging more sprawl) • Ingress/egress problems (safety, merging) • Expanding highways is not the solution. • People do not have enough information about the project costs and benefits.	• Address regional transportation issues. • More outreach and education. • Talk with major corridor employers. • Minimize construction impacts. • Accelerate project delivery date (provide incentives to contractors). • Develop transit centers for bus connections.

II. STAKEHOLDER INTERVIEW TASK PURPOSE AND METHODOLOGY

A. Brief Description and Interrelation of Outreach Tasks

In June 2001, the San Diego Association of Governments (SANDAG) began a comprehensive, two year study of a proposed extension of the eight-mile I-15 Express Lane facility, known as the I-15 Managed Lanes Value Pricing Project Planning Study. Integral to the study is an assessment of public attitudes and concerns about both the existing and proposed projects. A series of community outreach tasks were incorporated into the project scope of work to allow SANDAG to examine these attitudes from a variety of perspectives. These tasks employed a number of specific qualitative and quantitative assessment techniques including 1) focus groups, 2) stakeholder interviews, 3) intercept surveys and 4) a telephone survey of 800 I-15 corridor users.

The sequencing of tasks was designed so that the early insights and direction gained from the results of focus groups, stakeholder interviews and intercept surveys could be used to help design the telephone survey questionnaire, as well as to provide stand-alone conclusions and recommendations to the project planners

Throughout the Community Outreach effort, the outreach team was challenged to balance the need to replicate previous research (in terms of methodology and/or topic focus) in order to develop data that could permit a comparison of attitudes over time, and, on the other hand, the need to examine new issues specific to the Managed Lanes extension, and to include a slightly different population of potential users. The specific balance struck for each outreach task is described in the report for that task, in subsection B of this section.

In order to provide some context in which to understand how the stakeholder interviews (the subject of this report) relate to the larger Community Outreach work effort as well as to the Environmental Justice assessment and the overall Concept/Plan, a summary of the subtasks is presented below:

Focus Groups—In the Request for Proposals (RFP) for this project, SANDAG had already defined the target profiles for participants of three focus groups: I-15 main lane users, Express Lane users and transit riders. Three focus groups composed of 14 participants each were conducted. This qualitative research technique was used to provide insight into general responses, attitudes and opinions of a demographically and behaviorally relevant group of San Diego commuters, and not to provide “statistically reliable” data. The insights obtained from the focus groups provided guidance for the telephone survey instrument development process, as well as information for project planners to consider during the design phase.

Stakeholder Interviews—This was another qualitative research activity in which twenty-five key individuals were identified and interviewed for their opinions and concerns about the existing Express Lanes as well as the proposed Managed Lanes project. Stakeholders included four elected officials from I-15 corridor communities, 15 agency stakeholders (primarily senior technical staff involved in project development) and six public interest/advocacy group members. Stakeholders were asked about their general perceptions of existing and proposed lanes; new expectations and goals for the Managed Lanes; their assessment of community attitudes and concerns; their

recommendations for reaching any identifiable underrepresented groups; and their concerns about project concept specifics as well as suggestions for improvement. Stakeholders were also specifically asked about their opinion regarding their views on any equity issues related to the proposed project.

Intercept Surveys—Intercept surveys of 50 carpoolers and 50 transit riders were administered by the outreach team. The surveys took place at park-and-ride lots and transit interface points along the I-15 corridor within the new Managed Lanes project area. The purpose of the intercept surveys was to directly target carpoolers and transit riders along the corridor and solicit their opinions on the current Express Lanes as well as the proposed extension. This task was directed at obtaining more data on peak period commuters from "low-incidence" travel behavior categories (i.e., carpoolers and transit riders, who make up only a small fraction of corridor commuters) than would occur through the random-sample data gathering effort used in the telephone survey.

Telephone Survey—This task involved a detailed telephone survey of 800 peak period corridor users (600 main lane users and 200 transponder-owners). This quantitative research method benefits from a number of findings and observations gained through the previous three qualitative community outreach tasks. The survey research provides the opportunity to evaluate trends from a statistically reliable vantage point, and can determine the validity of the conclusions tentatively drawn from the qualitative side of the overall assessment of community opinion with respect to the project and its various features.

Environmental Justice Assessment —The assessment was a synthesis and elaboration of elements of all community outreach and public involvement study tasks, with a specific examination of two issues:

- **Procedural fairness** in gathering public input *(was the process sufficiently inclusive?)*
- **Perception of equity** and fairness from the viewpoints of low-income individuals and/or members of ethnic (non-Caucasian) minorities.

The environmental justice focus in this task is designed primarily to ensure methodological adequacy of quantitative and qualitative efforts in obtaining lower-income and ethnic representation within the community outreach/public input process, and in consideration of the relative affluence of the project corridor. It remains outside the scope of this Environmental Justice Assessment, as defined, to make any determination with respect to equity of overall transportation investment or operational impacts related to the proposed Managed Lanes Project.

Linking Outreach Task Results to the Project Concept/Plan—recommendations flowing from the four Community Outreach tasks described above are linked to the development of the Managed Lanes Project Concept/Plan report through incorporation of key findings into that report. Both formal and informal communications between and among the consultant team and the SANDAG project development team serve to enhance the integration of public opinion with the overall project development and refinement process.

A flow diagram illustrating the project's community outreach tasks and their relationship to the Project/Concept Plan is found in Figure A (page 8).

B. Previous Stakeholder Research

This task, and the larger Community Outreach effort is part of an ongoing determination on the part of SANDAG and its project partners to keep abreast of public opinion, and to provide multiple opportunities for the public to express views on various value pricing scenarios, and, in this case, "Managed Lanes" in which value pricing is more formally recognized as but one element of a lane management strategy toolbox.

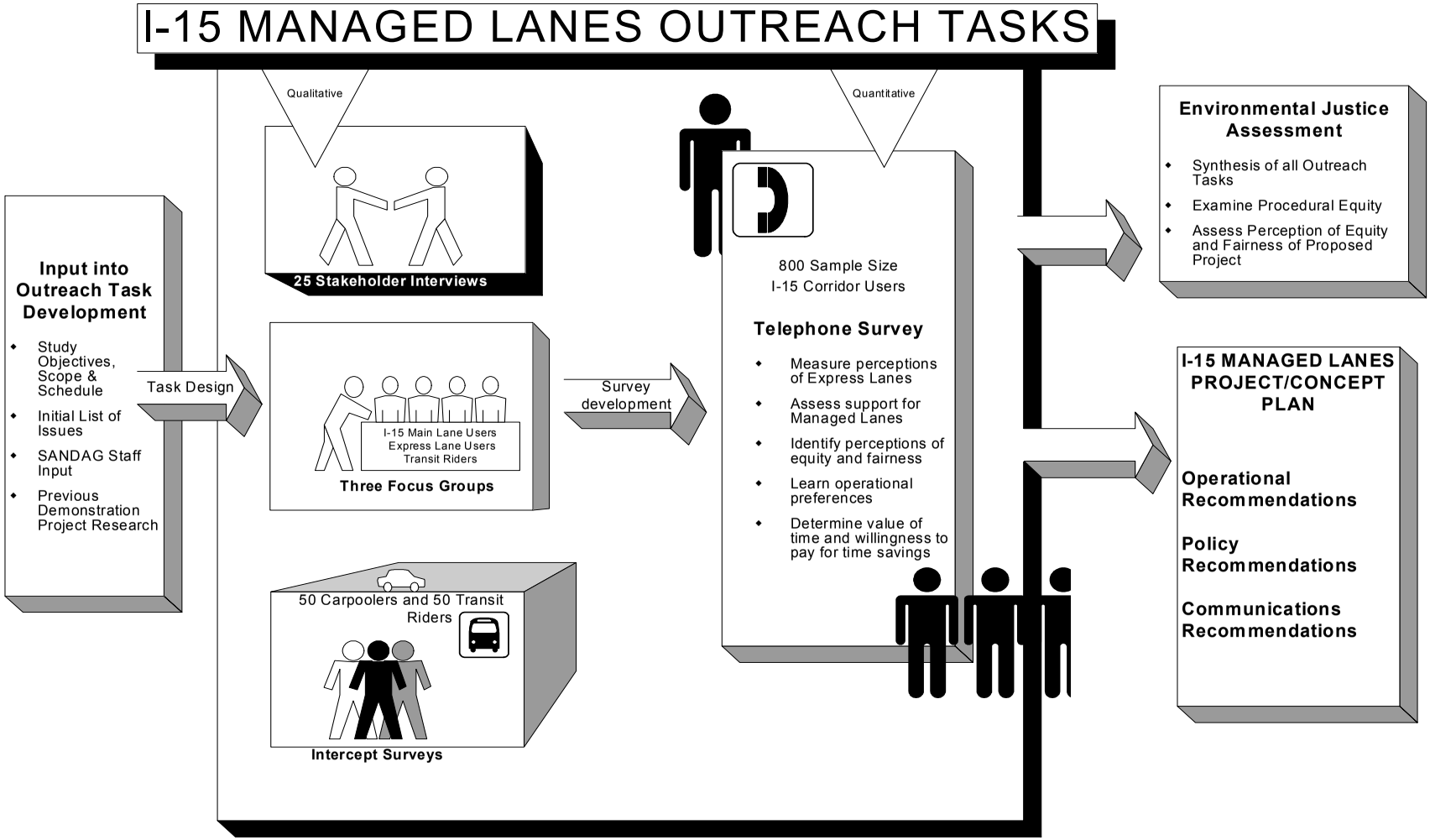
Throughout the Community Outreach effort, the outreach team was challenged to balance the need to replicate previous research (in terms of methodology and/or topic focus) in order to develop data that could permit a comparison of attitudes over time, and, on the other hand, the need to examine new issues specific to the Managed Lanes extension, and to include a slightly different population of potential users. The specific balance struck for each outreach task is described in the report for that task.

Previous stakeholder interviews were conducted according to the research needs associated with successive phases of the I-15 Value Pricing demonstration project (Pre-Project, Express Pass and then FasTrak programs). Approximately 31 individual stakeholders were identified and interviewed in three successive waves of interviews, held November 1997, July 1998 and December 1999. Twenty stakeholder interviews were conducted during the most recent (December 1999) wave. Many of the 31 stakeholders were interviewed multiple times, thus creating a record of their views, concerns and assessment of the project over time. Of the 25 stakeholders recently interviewed as part of the July-October 2001 wave for the Managed Lanes Project, nine were also included as stakeholders during the demonstration phase for the existing I-15 Express Lanes.

The 1999 interviews were designed to elicit stakeholder opinion and assessment on the entire three-year demonstration program. Key findings (from the Executive Summary of the 1999 wave of interviews) were as follows:

- The project matched or exceeded expectations of many stakeholders.
- The objective most often cited as being critical to the project, and having been fulfilled, was the more efficient use of existing HOV lane capacity.
- The reduction of main lane congestion was seen as unrealized, and perhaps as unrealistic.

The continued operation of FasTrak beyond the federally funded demonstration project period was viewed as testimony to the technical and political viability of the use of variable pricing to guarantee solo driver toll-payers a reliable trip time on the I-15.



Flow Chart of I-15 Managed Lanes Value Pricing Community Outreach Tasks Showing Links to Environmental Justice Assessment and Project Concept/Plan

Redman Consulting/Judith Norman Transportation Consultant
Frank Wilson & Associates, Outreach Subs to Wilbur Smith Associates

Figure A
October 2001

C. Stakeholder Interview Task Purpose

The purpose of this study task is to measure key stakeholders' attitudes and perceptions about the current value pricing project as well as their attitudes and expectations of the project expansion. Key stakeholders are defined as individuals and organizations who are directly or indirectly involved with the development of the managed lanes project and individuals and organizations that will either be impacted by the project or represents citizens who will be impacted.

D. Stakeholder Interview Methodology

Selection of Stakeholders

Between July and October 2001, a total of 25 key stakeholders were identified and interviewed in order to measure their attitudes and perceptions about the current value pricing project (the Express Lanes) as well as the proposed Managed Lanes extension from Ted Williams Parkway to the SR-78/I-15 interchange in Escondido.

Stakeholders (identified by name and organization in Appendix A) can be categorized as follows:

- Four elected officials from cities along the I-15 corridor:
  - Escondido *(two stakeholders)*
  - Poway
  - San Marcos

- Fifteen staff representatives from agencies directly involved in project planning and design:
  - SANDAG *(four stakeholders)*
  - Federal Highway Administration (FHWA) *(four stakeholders)*
  - Caltrans District 11 and Headquarters *(four stakeholders)*
  - Metropolitan Transit Development Board (MTDB) *(two stakeholders)*
  - California Highway Patrol (CHP)

- Six representatives of a range of public interest or regulatory constituencies:
  - Automobile Club of Southern California
  - League of Women Voters
  - Taxpayers Association
  - Endangered Habitat League
  - San Diego Economic Development Corporation
  - Air Pollution Control District (APCD)

Development of Stakeholder Interview Guide

In order to assess stakeholder attitudes and expectations, Redman Consulting/Judith Norman-Transportation Consultant (JNTC) and Frank Wilson & Associates (FW&A) used a semi-structured interview guide developed by Deborah Redman of Redman Consulting and Julie Chay of FW&A, and reviewed and approved by SANDAG. (See Appendix B.)

The research specifically sought to determine stakeholders' general perceptions of the current project, support for the Managed Lanes extension project concept, and concerns about equity in the design or operation of the Managed Lanes project. The questions also explored stakeholder Knowledge of community issues affecting public support, or having salience for project design or implementation.

The interview guide designed to elicit insights on these topics was organized as follows:

- **General perceptions** of the Express Lanes and the Managed Lanes extension.
  (five questions)
- **New expectations** with respect to agency roles and goals for the Managed Lanes; expected sources of public support for or opposition to the project, and new ideas for toll revenue use.
  (four questions)
- **Stakeholder suggestions for outreach efforts**.
  (three questions)
- **Potential problems** and ideas for improvement of the project concept, including stakeholders' assessment of community concerns and equity issues.
  (five questions)
- **Information preference** for keeping up with project developments.
  (one question)
- **Identification of additional stakeholders for possible future interviews.**
  (one question)

Development of Stakeholder Interview Guide

Interviews were conducted by Deborah Redman (Redman Consulting), Julie Chay and John Votava (Frank Wilson and Associates). Most of these one-on-one interviews were conducted by telephone, though a handful were conducted in person. The average interview lasted approximately 25 minutes. The respondents were asked 19 specific scripted questions, together with additional non-scripted follow-up questions as appropriate. In contrast to previous stakeholder interviews conducted during the demonstration phase of the I-15 Express Lanes, stakeholders in this study were told that their comments would not be published as verbatim or summarized individual transcripts, but would be grouped and summarized for assessment. This reporting approach was intended to elicit as much candor on the part of stakeholders as possible.

Methodological Divergence from Previous Studies Limits Direct Comparisons

As mentioned earlier, an extensive body of community outreach, public involvement and market research has been conducted over the past several years in connection with the planning and implementation of the I-15 Express Pass and FasTrak program introduction phases. In ideal circumstances, research that can build upon previous studies can help decision-makers understand how opinions and projects change and influence each other over time, and can provide implementing agencies with knowledge to improve new proposed projects. With respect to continuity in stakeholder opinion, the

challenge is that, despite some overlap of general topic categories with the 1999 wave of interviews (project goals and objectives, assessment of success and the reasons therefore, project concerns or problems) the primarily "institutional" and "retrospective" focus of that set of interviews resulted in an approach not entirely suited to the current study. The divergence in issues, project description and project impact area, as well as the necessarily "prospective" viewpoint that now includes new stakeholders, resulted in an approach that precludes many direct comparisons with previous research. However, where possible, points of comparison between results from this and previous work efforts will be mentioned.

III. GENERAL PERCEPTIONS OF EXPRESS LANES AND NEW MANAGED LANE EXTENSION

The five questions asked of stakeholders in this segment of the interview were designed to elicit both personal and professional opinions about the existing I-15 Express Lanes and the proposed Managed Lanes extension:

- *Do you have any involvement with the current FasTrak project on the I-15 Express Lanes?*
- *How would you describe the success of the I-15 FasTrak project so far?*
- *Is there a particular aspect of the project that you think has contributed to its success or lack thereof? Is there anything that you think could/should have been done to make it more successful?*
- *What do you personally think about FasTrak?*
- *What do you think of the plans to expand value pricing on I-15 through the Managed Lanes Project?*

A. Perception of I-15 Express Lanes Performance

Assessment of Success/Lack of Success

Sixty percent of stakeholders participating in this opinion survey found the existing I-15 Express Lanes to be successful or very successful at this point in time. Another 32 percent of those interviewed expressed more moderate or mixed reactions to the Express Lanes. Only two stakeholders, or eight percent of those queried, labeled the project unsuccessful.

Express Lanes are Successful or Very Successful

As might be expected, those stakeholders involved with the goal-setting, design and planning of the original Express Lanes—i.e., those most familiar with the details of ongoing performance and operational issues—overwhelmingly consider the existing Express Lanes a success. According to the positive characterization of one agency stakeholder, "The current program met a lot of the goals and demonstrated that value pricing is acceptable, makes the system financially self sustaining, supports transit, and

does not harm carpool lanes—pricing can manage the system better, and provide people with mobility options."

Notwithstanding this trend, however, two agency stakeholders remain less than completely convinced that the lanes are sufficiently equitable, or that they go far enough to encourage an increase in utilization by carpoolers. And even those that rated the lanes a success admitted that the level of air quality benefits hoped for had not been realized.

Two of four elected officials consider the Express Lanes a success, especially with the introduction of FasTrak (as opposed to the introductory pass program) and both support the proposed extension. A third elected official thinks the lanes are underutilized and the fourth prefers LA County-style diamond lanes, but both these stakeholders expressed support for the Managed Lane extension, making support for the extension lane among elected officials unanimous.

Express Lanes are a Moderate or Mixed Success

Two elected officials, two Caltrans representatives, the transit agency stakeholders and three of the six public interest stakeholders expressed more moderate support of the existing Express Lanes. Concerns arose around issues of equity and fairness, the efficacy of the lanes in promoting carpools, and the design, funding support for and implementation of the transit alternative (the Inland Breeze). The auto club stakeholder, representing motorists in general, indicated moderate support for the lanes' ability to use highway infrastructure effectively, while expressing a somewhat cautious "wait and see" approach to the concept of value pricing. Two stakeholders, representing taxpayers and environmental interests, objected to the basic concept behind the Express Lanes, and its effectiveness in moving traffic and addressing the larger issues of growth in the area, respectively.

Specific stakeholder comments reflecting moderate or mixed reviews of the performance on the existing I-15 Express Lanes indicated that some stakeholders simply want the lanes to go father north and/or south, and to include intermediate access.

Express Lanes are Not Successful

An elected official and a public interest stakeholder each gave the Express Lanes low marks for failing to utilize the lanes sufficiently or increase traffic flow through the corridor, respectively. Because their assessments, perhaps based on misinformation, do not reflect the actual performance of the Express Lanes relative to the two stated criteria, there is the potential for more knowledge about the lanes to cause a shift in these stakeholders to a more accurate and positive assessment.

Selected, representative stakeholder comments below are categorized according to their views on the performance of the existing eight-mile I-15 Express Lane facility:

Appraisal of I-15 Express Lane Performance	Characterizations Used by Stakeholders to Support their Appraisal
Successful to Very Successful	• Gets commuters off the freeways and adds carpools, reducing main lane trips. It's an acceptable way to maximize use of the HOV lanes, and that's the goal. (elected official) • People use it when they need it. It's an alternative that gives people choices about quality of life issues. (agency) • It is self-financing, takes advantage of available space and pays for two Inland Breeze buses. (public interest)
Moderately Successful/Mixed Opinion	• Though they utilized previously underutilized space, they are only moderate success. (public interest) • They should be open more often. (elected official) • Successful in terms of overall vehicle throughput; unclear about impact on carpools. (agency) • Mixed personal reaction because of concern about affordability. (agency) • Didn't support at first; prefers carpool lanes. (public interest)
Not Successful	• They're underutilized. There are suggestions to open them to everyone. (elected official) • Lanes don't increase corridor throughput. (public interest)
Cannot Determine Performance	• No way to measure project success.

B. Characteristics of Express Lanes that Account for Success/Lack of Success

Success

Stakeholders offered several recurring explanations to account for the success, or lack of success, of the Express Lanes. Many stakeholders gave credit for the I-15 Express Lane successes to its performance, primarily shortening commute times for users. Also mentioned was the fact that no lanes were "taken" to provide this new mobility option.

Several stakeholders believed that the I-15 Managed Lanes was an intelligent way to raise money to be spent on transit in the corridor. Others felt their success lay in providing an alternate choice of travel for commuters.

Some other responses to the success of the project were attributed to an inclusive and elaborate project planning process, agency cooperation and flexibility and a strong marketing plan that was fully implemented.

Lack of Success

Respondents cited several factors to account for what they considered the project's lack of success. Several stakeholders noted that a factor in creating an unfavorable impression of the lanes is the public perception that the lanes aren't being fully utilized, because the faster moving vehicles create the visual impression of "wasted capacity." In fact, one stakeholder explicitly stated this "underutilization" as a reason for judging the lanes a failure.

Other negative features or performance failures identified by stakeholders included:

- Need for more entrances and exits into the managed lanes
- Need for better enforcement against violators
- Unpopularity of carpooling
- Need for improvement in transponder readers/technology
- Need for better marketing of the lanes
- Failure to involve the public earlier in the process

Stakeholders View Value Pricing through Different Lenses

Value pricing itself is seen variously as an innovative traffic management tool, a revenue stream for transit and carpool/vanpool alternatives, and, by one, as a necessary evil. While most stakeholders interviewed saw value pricing as the very factor that makes the lanes desirable and effective, a few viewed it as the fly in an otherwise attractive ointment. Several stakeholders who understood the demand management function of tolls cited concerns about public perception of unfairness as problematic. One stakeholder attributed the increase in carpooling to the fact that the tolls put a monetary value on carpooling, thus increasing its attractiveness to the public. Finally, as one elected official declared, "I'm not a toll advocate, but this is probably what we need to do to solve our transportation problems."

C. Level of Involvement with Express Lanes and Perception of Project Success

From those who participated in the stakeholder interviews, 56 percent have direct involvement with the existing Express Lanes project—past or present, 22 percent have some involvement and 22 percent have no involvement. Of those who have or had direct involvement, 9 out of 10 found the I-15 Express Lanes to be a success.

As Table I (see page 4) indicates, assessment of success of the Express Lanes varied somewhat according to the stakeholder category. Not surprising, perhaps, is the tendency among stakeholders, when assessing the performance of the existing Express Lanes, to focus on issues relevant to their respective agency or constituency goals and concerns. For example, Caltrans stakeholders were focused on a number of operational and revenue issues that varied according to departmental goals; SANDAG stakeholders were oriented toward innovative value pricing features in the context of regional transportation; and Metropolitan Transit Development Board (MTDB) stakeholders weighted transit operations and investment issues more heavily. Elected officials and the Auto Club representative considered the interests of constituents/motorists along the corridor; the business, and taxpayer representatives focused on economic costs and benefit to business and taxpayers, respectively.

Those involved in the original project continued to view the Express Lanes as having successfully demonstrated the viability of value pricing, dynamic tolling technology and as having used the existing capacity most effectively through the combination of pricing, carpooling and transit. They reiterated that equity had not been raised as a local issue by members of the community, despite original fears about public perception.

D. Support for the Managed Lanes Extension

Following the query about the existing Express Lanes, stakeholders were asked for their thoughts about the proposed Managed Lanes extension from Ted Williams Parkway north through the I-15/SR-78 interchange. As one might expect, those stakeholders who viewed the existing Express Lanes as successful or very successful were in favor of the new proposed project. However, somewhat surprising is the response of those with mixed or negative views of the Express Lanes: for the most part, even these stakeholders *support* the Managed Lanes.

Because many of the agency stakeholders involved in creating the (successful) Express Lanes project are also the technical experts overseeing the Managed Lanes project development, it is perhaps natural that they almost unanimously see great potential in the proposed project. Transportation planners see the Managed Lanes as "another tool in the toolbox" that enables them to provide mobility in an area of very high and growing demand for peak period travel options. However, the support of several agency stakeholders is contingent upon features they deem important: continued support for carpooling and transit on the lanes.

All four of the elected officials interviewed, representing cities along the I-15 north of the existing facility's current terminus, thought the extension was a "very good idea", although one expressed misgivings about the necessity of pricing to ensure higher levels of service. In recognition that the extension would serve North County commuters, one elected official said, "This is the project we should have done to begin with."

More cautious support came from the Auto Club stakeholder, who acknowledged "moderate success" of the lanes' ability to make use of previously underutilized HOV capacity. Among issues to be resolved to gain support from this stakeholder are those related to the operations of the lanes with multiple ingress/egress.

Only one stakeholder, representing taxpayers, stood in opposition to the Managed Lanes, citing unspecified policy issues, and the need for a stronger transit focus as reasons.

More Information Needed

One stakeholder reported having insufficient information about the project to make a decision in favor or in opposition to the Managed Lanes.

IV. NEW EXPECTATIONS

It was deemed important to understand how stakeholder goals have changed over time. Change might come from new people cycling into the mix of stakeholders; from changes in political climate; from individual changes in opinion or understanding, and from attitudinal changes related to the differences between the former project (the 8 mile existing Express Lanes) and the new 20 mile Managed Lanes extension project. In addition, the outreach team wanted to know where stakeholders thought support or opposition would come from, based on their unique perspective. Finally, the issue of toll revenues for the Managed Lanes raises once again the question of how any "net"

revenues should be spent. Questions designed to help SANDAG understand these issues were:

- *What goals does your agency or organization want to test with value pricing on the Managed Lanes?*
- *What will your (your agency or organization's) role be in planning and/or implementing the new project?*
- *Where do you see support/opposition coming from on the Managed Lanes project? What would be the basis for support/opposition?*
- *How would you like to see toll revenues from this project spent?*

A. New Agency/Organizational Goals for the I-15 Managed Lanes

Project goals are important to keep in mind because, ultimately, performance measures based upon them will determine the success of a project in the minds of many stakeholders and the public. In order to provide some context, the original goals of the demonstration project, as listed in the *Phase II Year 2 Overall Report*, and cited in the *Phase II, Year Three Implementation Procedures, Policies, Agreements, Implementation Barriers and Overall Institutional Findings Final Report (01-22-01, p. 2)* were to:

- Maximize the use of the I-15 Express Lanes
- Test whether allowing solo drivers to use the lanes' excess capacity can help relieve congestion of the I-15 main lanes
- Fund new transit and HOV improvements in the I-15 corridor
- Use dynamic pricing to set tolls

The report states that for the most part, stakeholders believed that all but the second goal (reducing main lane congestion) were met. Of course, these goals were refined, elaborated and reprioritized by various agencies and individuals over the life of the demonstration project, but the basic thrust of the project remains constant.

Agency Stakeholders

Core Goals Shared by Most Agency Stakeholders

As was the case during the I-15 Value Pricing demonstration project phase, a majority of the15 technical agency stakeholders who are more directly involved in planning the project continue to share a core of common goals relative to the Managed Lanes extension that do not differ significantly from original demonstration project goals. In fact, several agency stakeholders explicitly said that the goals for the new project were the same as for the demonstration project. These relative constancy of these share goals are illustrated by the following list of project goals most often mentioned:

- Test new project features, including the viability of value pricing in a multiple-access environment.
- Reduce traffic congestion.

- Support transit operations on Managed Lanes.
- Optimize mobility by using infrastructure most efficiently through "managed lane" toolbox of strategies (maximizing people throughput vs. vehicle throughput)
- Support carpooling
- Measure and address equity impacts
- Test viability of movable barrier technology

Elected Officials and Public Interest Groups

Given that the elected officials and public interest groups have not been directly involved in the project development process, it is not surprising that few of them provided specific institutional goals that they would want to see tested as part of the implementation of Managed Lanes. However, the table below shows the goals they did identify coincide with project goals from the agency perspective.

Goals identified for testing as part of Managed Lanes project	Elected	Agency	Public Interest
Support/accommodate public transit (bus)	1	4	3
Test new managed lane/value pricing scenarios (tolling technology, safety and multiple access issues)		7	
Reduce traffic congestion		6	1
Support carpooling		2	2
Maximize use of lanes/maximize public infrastructure		3	1
Consider, measure and address equity impacts		2	1
Technology feasibility, movable barrier technology		2	
Analyze enforcement; continue to reduce violation rate		2	
Examine potential to improve air quality be reducing congestion		2	
Overall performance		1	
Cost/Benefit of project		1	
Move more people than vehicles		1	
Socioeconomic research on users			1
Identify another source of income to support traffic management		1	
Develop measurable standards that clearly show success or failure			1
Ensure safe, efficient movement of people and goods		1	

B. Stakeholder Assessment of Community Support/Opposition for Managed Lanes Extension

Within the interview format, support and opposition for the Managed Lanes were assessed from two different perspectives: first, the stakeholders' own support or opposition to the project (discussed in section III-E, above) and, second, the stakeholders' *opinion about likely support and opposition from within their agencies, communities or constituencies.* Although the stakeholders' assessment of community support for the project is unlikely to prove to be 100 percent accurate, it was thought important in particular to get the viewpoints from elected officials and representatives of public interest group on this issue.

The responses were grouped in order to organize the contents and avoid duplication.

Sources of Potential Support (according to stakeholders interviewed)

- Those who are willing to use the lanes as toll-payers, including current FasTrak customers
- Carpoolers
- The public, and especially the commuting public looking for easier, faster commute options
- Businesses and employers along the corridor
- Residents of the corridor and as far north as Temecula
- Federal and state government
- SANDAG Board members—particularly ones representing the I-15, customers and businesses
- Transit agencies will support it because it's another funding stream
- Environmental Defense Fund supports value pricing nationally

Sources of Potential Opposition (according to stakeholders interviewed)

- Those who view tolls as "double taxation."
- Commuters who view toll lanes as "Lexus Lanes"
- People concerned about lane violations
- Main lane users who hold the view that more general lanes would mean traffic would move for everyone, and would solve congestion problems.
- Those opposed to funding this effort, including the public, taxpayers and environmentalists.
- Some Sacramento legislators, based on their view of a potential equity issue.
- National criticism of HOV facilities in general could be a general source of opposition for the Managed Lanes project.
- Citizens and other advisory groups along the corridor. "Groups involved in the CAC are breaking off from the main group and opposing everything," according to one stakeholder.

Interestingly, a number of stakeholders mistakenly expected an "opposed" position from various other stakeholders interviewed as part of this study task. For example, some stakeholders thought the Southern California Auto Club and the California Highway Patrol would oppose the project. However, discussions with these stakeholders revealed caution, not opposition, and both made suggestions on how to address their specific concerns. Likewise, some stakeholders believed that transit operators might move from a support to an oppose position, should the primacy of transit on the corridor be threatened in any way. This belief was more accurate, as transit operators did express support, but highly conditioned upon maintaining operational advantages for transit buses using the Managed Lanes.

C. Toll Revenues

Respondents were asked how they would like to see toll revenues from the I-15 managed lanes spent. Although several stakeholders thought it advisable to wait until the amount of revenue was determined, many quickly responded that the net revenues

should fund Bus Rapid Transit on the lanes, both to improve people throughput on the lanes, as well as to diminish equity concerns. There were a number of other suggestions, as well, though none received as much support as the transit option.

Following are the opinions of respondents on how toll revenues should be spent:

Support for Alternatives to Solo Driving

- Improved public transit service.
- "Green" shuttles at both ends of express bus routes.
- Regional solutions

Physical Improvements to I-15

- Corridor transportation uses (in general)
- Regional arterial improvements, including construction of additional under- and over-crossings to reduce corridor community use of the I-15 freeway for local travel needs

Other

- Retire bonds
- More enforcement by the California Highway Patrol

V. OUTREACH EFFORT EXPECTATIONS

Another set of questions was posed to stakeholders in order to understand whether and how the SANDAG survey research and other public outreach and involvement study tasks might respond to community leaders' concerns. Thus, the outreach team solicited information about the stakeholders' own public opinion research agenda for the project. In addition, the questions allowed the team to take advantage of stakeholders' deeper familiarity with their own communities, in order to improve the likelihood of input from hard-to-reach populations that would be affected by the project. The following questions were asked:

- *What answers would you like to find out from the outreach and survey effort?*
- *What areas of the community, or what specific groups do you think have a special interest in the project? How do you think we should involve them?*
- *What areas of the community, especially along the corridor tend to be underrepresented in community discussions? How do you think we might involve these communities more effectively?*

A. Suggested Topics for Outreach Research Efforts

Most stakeholders expressed general interest in the public's attitude toward the project. Some indicated concerns specifically related to the public's perception of equity and the potential for the project to encourage changes in travel behavior (from solo driving to transit or carpool/vanpool usage). It was hoped the outreach process would help explore those issues.

Specific topic areas identified through the stakeholder interview process and how these issues were or were not incorporated into the telephone survey are summarized below:

Stakeholders' Public Opinion Research Requests	2001 Telephone Survey Response to Requests
Obtain socioeconomic information on users	Demographic questions included in survey
Assess public attitude toward tolls	Included in survey
Travel behavior, mode, destination	Travel behavior, mode, destination not included because of limited sample size and other research priorities
Test public's willingness to pay	Included in survey
Test attitudes toward proposed Bus Rapid Transit	Included in survey
Test public views on equity and fairness	Included in survey
Determine what motivators would "get Californians out of their cars"	Project-specific questions included; Survey measures stated preference to shift to transit or carpool/vanpool on Managed Lane
Elicit suggestions to improve transit on express lanes	Not included; topic is beyond the scope of this survey
Determine where people need transit service	Not included; topic is beyond the scope of this survey
Determine if carpooling is seen as benefit by the public at large	Not included; topic is beyond the scope of this survey

B. Stakeholder Identification of Community Groups and/or Underrepresented Groups for Special Outreach Attention

When asked to identify groups within the community who might be underrepresented in a public outreach process, many of the most appropriate groups or individuals identified had already been listed as part of this community outreach task. Among those who were not included as part of this task, the following were mentioned:

- Drivers for Highway Safety are interested in HOT lanes
- Environmental Defense Fund and other environmental groups
- Military base personnel

In addition, several stakeholders, and in particular, elected officials, stated that some groups might be *over-represented.* That is, the fact that community planning groups tend to include citizens with more leisure available for meetings—such as the retired population—may tend to skew the viewpoints of those groups that are supposed to represent the community as a whole, and might especially misrepresent the interests of commuters who typically have little time to participate in civic meetings.

VI. POTENTIAL PROBLEMS & SUGGESTED PROJECT IMPROVEMENTS

As a means of providing additional stakeholder input into improving the project during the planning and design phase, and to assess stakeholder opinions about project-related equity issues, the following questions were asked:

- *What potential problems do you see in the project concept as it currently stands?*
- *What suggestions do you have for improving the project?*
- *What current community issues could affect the outcome of the new project? How?*
- *What steps do you think could/should be taken with regard to any issues that could affect the project?*
- *How do you see the issue of equity relative to this project?*

A. Potential Problems or Concerns Identified by Stakeholders

Stakeholders identified the following issues as potential problems posed by the Managed Lanes extension.

Operational Issues

Ensuring travel priority for transit and carpooling remains an issue for many stakeholders.

Ingress and egress issues (safety, weaving, toll complications) are a top concern for many of the technically oriented stakeholders.

Level of service issues—how will the project continue its commitment to carpoolers and transit users, with all the new ingress/egress opportunities for new transponder users?

Stakeholders frequently identify enforcement as an issue that needs to be addressed. Specifically, better data collection, and more accurate enforcement of the system were mentioned.

Bottlenecks at the point where four lanes meet the original lanes, and at Managed Lane/main lane merge points pose travel delays, congestion and safety concerns.

Construction Issues

Travel disruption related to project construction was a concern for a number of stakeholders.

Cost of the project is a concern, especially increased costs associated with new structures that must be built to accommodate four traffic lanes and moveable barriers.

Moveable barrier component presents challenges, according to a few stakeholders. There is concern that there is no room to accommodate the moveable barrier, and that the technology itself is unproven on a facility of such length as the proposed Managed Lanes (20 miles, including the eight-mile existing facility).

Transit centers must be designed and sited so as to improve regional bus connections and raise the level of service for transit riders.

Value Pricing Issues

Toll collection system does not appear feasible to some stakeholders. They understand the complexity, and cannot visualize how the toll system can work fairly and

efficiently to keep the lanes flowing smoothly and safely. Integrating pricing with project geometrics is a concern.

B. Current Community Issues that Could Affect the Project

Stakeholders were asked to report any current issues within their communities, or within the communities along the corridor, that might affect the project or public opinion about the project. A number of stakeholders identified both issues and suggestions for approaching them:

Coordination with Development Projects will improve the success of the Managed Lanes project, according to elected officials. Currently, for example, plans are underway to construct a 200 acre industrial park that will ultimately provide 5,000 jobs in the Escondido area, on the west side of the I-15 corridor. Transit and highway improvements should be designed to facilitate access to such new developments and reduce area congestion.

Inter-county Coordination between San Diego and Riverside counties is an issue important to elected official in North San Diego County. The designers of the Managed Lanes should communicate with staff of the Riverside County Transportation Commission to review and coordinate Riverside County plans for HOV lanes along the I-15 that extend to the border with San Diego County.

Location of Transit Centers within NIMBY ("Not In My Back Yard") areas will be a challenge to the transit component of the project. A related issue is how best to provide home-to-transit center service to increase transit ridership.

Growth is an issue—both for those promoting more development along the corridor, and for those who seek slower growth, or an end to growth altogether. The extension is viewed as both good and bad. This underlying conflict of desires and policy ambivalence is likely to play out in the public sphere.

Noise was sited by several planning staff stakeholders as a potential project impact that could affect the communities along the corridor.

C. Perception of Equity Issues Relative to the Managed Lanes Project

For the most part, the stakeholders questioned in previous waves of interviews have a sophisticated understanding of the purpose of pricing, and believe that the total Managed Lane package provides sufficient options for transit riders and carpoolers to address the issue of equity. Although some respondents discounted the issue of equity entirely, because of the relative affluence of that section of the I-15 corridor, there was also wide agreement that the issue of Environmental Justice must be taken seriously, and further investigated and evaluated. In addition, the public perception of fairness must be addressed, apart from technical definitions of investment and impact equity.

Position on Equity	Elected Officials	Agency	Public Interest
Equity *IS* an Issue ("Lexus Lanes" argument or "Perception" argument)	One of four believes equity can be addressed with greater facility access + enhanced transit service.	Recognition that the perception of unfairness must be seriously addressed. Concern about socioeconomic differences between FasTrak users and non-users. Equity issues might re-arise as maximum tolls rise with facility length. Long- vs. short-distance commuters might be differentially impacted.	"Lexus Lanes" argument is accurate, according to one stakeholder. One stakeholder concerned about toll affordability to average motorist.
Equity *IS NOT* an Issue ("Robin Hood" argument)	Three of four do not consider equity to be an issue for this project.	Bus Rapid Transit addresses equity issue. Corridor is affluent. Project provides an *option.* Carpooling is free; off-peak tolls are lower cost. Not a problem if revenues are invested in corridor.	Affordability concerns (cited above) are offset by relative affluence of I-15 corridor. Seamless, convenient rapid transit addresses any equity issue.
Insufficient Information to Form Opinion	N/A		One stakeholder needs to see more information before making a decision on equity.

None of the agency stakeholders expressed the opinion that the equity issue was a "deal-killer." However, an on-going dilemma facing those involved in public decision making is whether providing increased mobility options in a highly congested corridor justifies a project which could result in furthering the divide, however minimally, between the "haves" and "have-nots." One agency stakeholder advised that "We need to look at other options [in addition to value pricing], perhaps opening the lanes to everyone during off-peak, and/or finding other technologies to regulate traffic flow on the managed lanes."

Do Enhanced Transit and Carpool Opportunities Fully Address Equity Concerns?

A majority of those interviewed echoed the sentiments of a public interest stakeholder when in his statement that, "The creation of seamless, rapid transit on the corridor is an equity benefit, especially as it is supported by toll revenue." However, while one elected official supported that position by reiterating, "Transit use of the lanes would address the naysayers who think it's a road for rich folks," an agency stakeholder warned against assuming that the only equity issue is that of transit-dependent populations. "I'm not sure the Bus Rapid Transit service answers all the equity questions. It kind of pigeonholes low-income people by labeling them transit-dependent vs. those using their transponders." Still, the stakeholder acknowledged that the carpooling option was also a benefit to lower-income car owners who could take advantage of the carpool option.

Also noted during the interviews was an unexpected consequence of providing the Inland Breeze as part of the FasTrak project—that is, the level of transit ridership for the reverse commute. This was theoretically attributed to travel undertaken by those who work in mid-San Diego County, but who cannot afford to live there. This new access to jobs was seen as an unintended equity benefit of the original FasTrak lanes.

VII. INFORMATION PREFERENCE

In order to determine how SANDAG might address ongoing needs for communication about project development issues, stakeholders were asked:

- *How would you like to be kept apprised of new developments as this project planning study goes forward?*

Respondents listed a variety of preferences for receiving information about the status of the I-15 managed lanes upgrade. For the most part, a brief quarterly newsletter would be a popular information tool. Many people involved in the project are currently kept informed through the monthly project meetings and email. Elected officials are generally kept informed through their formal relationships with SANDAG.

Some other preferred methods include:

- Advisory committee participation
- Phone calls
- Web site, with postings of the newsletters
- Those methods used for the original FasTrak project (quarterly newsletters for FasTrak customers, public workshops)

It was also suggested that SANDAG or Caltrans provide presentations to Community Planners Council, SANDAG committees and Bicycling and Pedestrian Facilities Committees.

VIII. IDENTIFICATION OF OTHER STAKEHOLDERS

Interviewees were asked if they could think of anyone else who would qualify as a stakeholder, and who might have been overlooked in the initial makeup of the list. They responded with a host of general suggestions such as mayors and city engineers along the corridor, transit Citizen Advisory Committees, transit agencies, FHWA staff, the San Diego Tourism Board/Chamber of Commerce and community planning groups organized by the City of San Diego.

Follow up was conducted on approximately half the names mentioned, and further information and discussion with SANDAG staff indicated that the individuals were not appropriate for inclusion in this task at this time. However, a number of individuals or organizations identified by stakeholders, who might be usefully interviewed if future stakeholder interviews are conducted are as follows:

- Kevin MacNamara –A former Chairman of the Rancho Penasquitos Planning Commission, and outspoken critic of the Express Lanes, who now resides in Poway.

- Representatives of I-15 corridor employers of 500+ employees, including
    - Sony
    - Hewlett Packard
    - Geico
    - Management for North County Fair
    - Pomerado Hospital
    - Cal State San Marcos

IX. CONCLUSION: IMPLICATIONS FOR THE STUDY

A. Project Implications

A number of implications for project design and implementation arise from issues elicited during the stakeholder interviews. It will be important for project designers and engineers to address the following stakeholder concerns:

- Specific design issues such as widening over Lake Hodges, noise along the corridor.
- Enforcement ability and safety issues associated with multiple access points.
- Increased traffic friction and degradation of level of service on the main lanes, associated with increased weaving to and from facility access points.
- Bottlenecks at the I-15/SR 78 interchange.
- Construction-related impacts and plans for linking project stages.
- The toll cost for drivers using the entire a 20-mile facility.
- Appropriate location of needed transit centers, given the NIMBY phenomenon.
- Need for comprehensive inter-agency transit service coordination to facilitate high levels of service that will attract I-15 solo drivers.
- Need for expanded hours of coverage for FasTrak customer service center.

B. Recommendations

Because stakeholders, during the verbal interview process, did not always present recommendations for project improvement based on their assessment of the goals, potential and foreseeable problems associated with the Managed Lanes extension, the outreach team, based on what stakeholders did present, developed the recommendations below. Thus, though they may be “operational elaborations” on explicit stakeholder concerns, they are an attempt to follow through with practical suggestions that are offered for consideration by SANDAG and its project partners.

Recommendation: Speed up project delivery. Not only will this result in bringing benefits on-line sooner, it will help avoid falling further behind the growth curve and will minimize construction impacts.

Recommendation: Ensure the implementation of customer-oriented transit and carpool/vanpool services and facilities. In order to design transit service that can be truly competitive with automobile travel, a commitment to regional coordination between SANDAG, corridor communities and all transit operators will be required.

Recommendation: Enhance public outreach and marketing. Communicate the features and benefits of the proposed project to avoid opposition based on

misinformation. Incorporate information from the project operations plan, now in development. Previous Express Lane marketing programs provide an excellent example of the kind of effort now needed, and might include specific products such as an Operational Plan Fact sheet, and further outreach activities such as additional stakeholder interviews targeting those community leaders and opinion makers less familiar with the project and presentations to community groups.

***Recommendation: Develop and distribute an Operational Plan Fact Sheet to stakeholders immediately*.** This document needs to be carefully drafted and would be designed to address, at least in a preliminary manner, the technical and operational issues raised by stakeholders (as well as concerns raised in other outreach tasks). However, it should be written with a non-technical tone and be clearly illustrated where necessary. It should be also be posted to SANDAG's website and mailed to stakeholders and other opinion leaders. Desires on the part of stakeholders for more information and fuller disclosure about project operations dictate that this effort should be conducted sooner, not later, in project development. Such an effort could move neutral, uninformed, misinformed and/or concerned stakeholders into a position of support for the overall project concept.

Recommendation: Conduct second wave of interviews including those less familiar with the project. Interviewees could include those individuals whose names were mentioned by previous interviewees, including other area transit providers, and should also focus specifically on members of the business and political community along the corridor. The interview discussion guide should be revised to reflect a closer focus on issues already identified, and to address issues posed by the most recently refined project scenario.

Follow up efforts could also include some of the elected officials and public interest group stakeholders already interviewed. Prior to the recent interviews, many of them had not been prompted to consider their own agency or constituency goals. However, since strong interest was indicated by most of those people contacted, a follow-up interview might be repaid with more in-depth responses to project-related questions, especially if preceded with the provision of more detailed project information.

Recommendation: Continue and step-up regional planning efforts. These include inter-county coordination, the development of seamless and attractive transit alternatives, and land use and development policies and strategies that begin to redress the causes of jobs/housing imbalances that exacerbate highway congestion.

APPENDIX A: STAKEHOLDER INTERVIEW PARTICIPANTS

SAN DIEGO ASSOCIATION OF GOVERNMENTS (SANDAG)
I-15 Managed Lanes Value Pricing Project Planning Study

October 15, 2001

Organization	Interviewee
ELECTED OFFICIALS	1. Lori Pfeiler, Mayor of Escondido
	2. Mickey Cafagna, Mayor of Poway, SANDAG Board Member
	3. Ed Gallo, Councilman, City of Escondido
	4. F.H. "Corky" Smith, Mayor of San Marcos
SANDAG	5. Gary Gallegos, Executive Director
	6. Eric Pahlke, Transportation Director
	7. Brian Pessaro, Project Manager
	8. Kim Kawada, Transportation Planning Manager
CALTRANS	9. Lynn Barton, Project Manager
	10. Susanne Glasgow
	11. Joel Haven, Chief of Operations
	12. Antonnette Clark
Federal Highway Administration (FHWA)	13. Jeff Lewis, Sr. Transportation Engineer
	14. Jeff Holm, Design/Traffic Operations Engineer
	15. Theresa Smith
FHWA/KT Analytics	16. Tom Higgins
California Highway Patrol	17. Sgt. George Griffith
Metropolitan Transit Development Board (MTDB)	18. Tom Larwin (General Manager)
MTDB	19. Dave Schumacher
San Diego Air Pollution Control District (Regulatory)	20. Andy Hamilton
PUBLIC INTEREST ORGANIZATIONS	
	21. Dan Beal (So. Cal Auto Club)
	22. Harvey Goodfriend (San Diego Taxpayers Association)
	23. Michael Beck (Endangered Habit League)
	24. Grace Roos (League of Women Voters)
	25. Erik Bruvold (S.D. Economic Development Corp.)

APPENDIX B: STAKEHOLDER INTERVIEW QUESTIONNAIRE

SAN DIEGO ASSOCIATION OF GOVERNMENTS
I-15 MANAGED LANES VALUE PRICING PROJECT PLANNING STUDY

STAKEHOLDER INTERVIEWS

Introduction:

Hello. My name is _____, and I am working as a consultant for the San Diego Association of Governments on the community outreach effort for SANDAG's I-15 Managed Lanes Value Pricing Project Planning Study. The study is examining various options for extending the existing FasTrak lanes northward to Escondido. You have been identified by SANDAG staff as a key stakeholder, whose opinion and concerns we want to incorporate within the study parameters. I would like to schedule an interview, lasting approximately 30 minutes, with you, at your convenience.

General Perceptions

- Do you have any involvement with the current FasTrak project on the I-15 Express Lanes?
- How would you describe the success of the I-15 FasTrak project so far?
- Is there a particular aspect of the project that you think has contributed to its success or lack thereof? Is there anything that you think could/should have been done to make it more successful?
- What do you personally think about FasTrak?
- What do you think of the plans to expand value pricing on I-15 through the Managed Lanes Project?

New Expectations

- What goals does your agency or organization want to test with value pricing on the Managed Lanes?
- What will your (your agency or organization's) role be in planning and/or implementing the new project?
- Where do you see support/opposition coming from on the Managed Lanes project? What would be the basis for support/opposition?
- How would you like to see toll revenues from this project spent?

Outreach Effort (Interviewer to provide brief overview of focus group, intercept survey and telephone survey efforts.)

- What answers would you like to find out from the outreach and survey effort?
- What areas of the community, or what specific groups do you think have a special interest in the project? How do you think we should involve them?
- What areas of the community, especially along the corridor tend to be underrepresented in community discussions? How do you think we might involve these communities more effectively?

Potential Problems

- What potential problems do you see in the project concept as it currently stands?

- What suggestions do you have for improving the project?
- What current community issues could affect the outcome of the new project? How?
- What steps do you think could/should be taken with regard to any issues that could affect the project?
- How do you see the issue of equity relative to this project?

Information Preference

- How would you like to be kept apprised of new developments as this project planning study goes forward?

Who else should we talk to?

SAN DIEGO ASSOCIATION OF GOVERNMENTS

I-15 Managed Lanes Value Pricing Project Planning Study

Telephone Survey
January 18, 2002

Prepared by:
The Fairfax Research Group
Project Outreach Subconsultant to Wilbur Smith Associates

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

This section presents an overview of the research and the key findings.

A. Purpose

SANDAG undertook this task to gain a greater understanding of public attitudes, perceptions, expectations, and opinions towards the proposed extension of and pricing options for the I-15 Managed Lanes. The following objectives shaped the development of the telephone survey:

- ❑ Measure awareness and perceptions of the existing Managed Lanes, including safety and enforcement;
- ❑ Determine the current level of I-15 corridor users understanding of how SANDAG spends revenue collected from FasTrak toll payers. Compare their understanding of revenue expenditures to their preferences for the expenditure of revenues collected from FasTrak toll payers;
- ❑ Assess support for the proposed I-15 Managed Lanes Extension, including the likes and dislikes of the proposed extension;
- ❑ Measure interest in using and impact on usage of the I-15 Managed Lanes Extension;
- ❑ Explore perceptions of the need for the extension;
- ❑ Identify perceptions of fairness and equity of the proposed extension;
- ❑ Learn preferences for the hours of operation and access to the Managed Lanes; and,
- ❑ Determine the value of time and willingness to pay for time savings.

B. Methodology

The study consisted of eight hundred (800) telephone interviews—600 regular lane users (non-FasTrak customers) and 200 FasTrak customers. Fairfax Research used a combination of Random Digit Dial (RDD) sample and a list of FasTrak customers from the FasTrak database to complete the interviews. The survey population included individuals living in the zip codes 92025, 92026, 92027, 92029, 92064, 92069, 92126, 92127, 92128, 92129, and 92131 who were 18 years of age or older and who traveled on any part of the I-15 between SR 78 in Escondido and SR 163 in Kearny Mesa, Monday through Friday between 5:45 and 9:15 a.m.

Following a pretest of the questionnaire, Fairfax Research conducted the interviews between September 25 and October 7, 2001 on weekday evenings and weekends. Because of differences in lifestyle-driven schedules and the difficulty of reaching all people within a given time of day or day of the week, the interviewers called each number up to three times. To ensure the accuracy and validity of the sample, the callbacks occurred on different days of the week and at different times of the day. The telephone center conducted the interviews in English and Spanish. The actual interviews lasted an average of 15 minutes and 23 seconds.

C. Key Findings

The following highlights the key findings from the telephone survey.

Attitudes towards FasTrak

The respondents are aware of and support the FasTrak program. A majority of the respondents has no objection to the FasTrak concept either philosophically or practically. They believe that the tolls manage demand. However, for a segment of the sample (9 percent), the cost of the Managed Lanes toll represents a significant barrier to entry. Respondents with household incomes of $70,000 or more voiced higher levels of approval of the FasTrak program than did respondents with household incomes of less than $70,000.

The safety of the Managed Lanes is not a concern to the respondents. They judged the Managed Lanes as safe as or safer than the regular lanes. A majority of the respondents thought the CHP effectively enforces the Managed Lanes. However, a sizeable number of respondents lacked the necessary information or experience to evaluate the efficacy of the enforcement.

A general lack of knowledge exists about the use of FasTrak revenues. Few respondents knew that FasTrak tolls funded the Inland Breeze. Furthermore, the respondents do not consider the Inland Breeze a high funding priority. They believe that SANDAG expends FasTrak revenues to improve or maintain San Diego's freeway system, including the Managed Lanes. They focused their spending priorities on the San Diego freeway system, including the I-15 and the Managed Lanes.

Respondents with annual incomes of $70,000 or more a year expressed more interest in using the FasTrak funds to extend the I-15 Managed Lanes than did respondents earning less than $70,000 a year. More Asian Americans (21 percent) than either Hispanics (10 percent) or Caucasians (8 percent) expressed uncertainty about how to use the FasTrak revenues.

Attitudes towards Managed Lanes Extension

The attitudes and opinions expressed by the I-15 corridor users in the study underscores their frustrations with the congestion and delays endemic on the I-15 during the peak morning commute. They expressed a need for the extension and favored extending the Managed Lanes up to SR 78 in Escondido. Despite some concerns about construction delays and costs, they support the extension.

Overall, they indicated that extending the Managed Lanes would increase their use of the Managed Lanes. Those groups who claimed they were more likely to use the extension included 18-to-34 years olds, Hispanics, households with at least two licensed drivers, and those who attained no more than a high school degree.

The results suggest an increased interest in carpooling to access the Managed Lane extension. Of course, expressed interest does not automatically translate into either readily available opportunity or easy modifications in ingrained behavior.

When presented with the benefits of the extension, most respondents think in terms of saving time as opposed to consistency in arrival time. Significantly more Asians in the study valued saving time than either Hispanics or Caucasians. More respondents with annual household

incomes over $70,000 than respondents earning under $70,000 a year also placed importance on saving time rather than on a consistent arrival time.

A majority of the respondents preferred opening access to the Managed Lanes to all I-15 Travelers during off-peak hours of operation, limiting access *only* during peak commute times. However, some FasTrak account holders will resist this change in the operation of the Managed Lanes. The majority of the FasTrak account holders favored the existing operational guidelines.

Express bus service carries some small cachet among the respondents. While the express bus may reduce congestion, it will not sell the extension. However, it persuades approximately 5 percent to 8 percent of the respondents to support the project. Of note, 5 percent of the respondents preferred adding rapid express bus rather than building the extension. Another 3 percent of the respondents preferred building a trolley/train to extending the Managed Lanes. With proper positioning, pricing, and promotion, a market exists for the express bus service on the extended Managed Lanes. Capturing just a fraction of those who professed interest in the service will provide a sufficient customer base.

Fairness and Equity Issues

Seventy-one percent of them (not all of them FasTrak users) deem the FasTrak concept fair. These respondents recognize and accept that some corridor users cannot afford the toll ("It's fair to pay for what you get even if others can't"). More Hispanics (38 percent) disagreed with this concept than either Asians (19 percent) or Caucasians (23 percent). In addition, fewer respondents earning less than $100,000 agreed with the statement. Few respondents associated a lack of fairness or equity with the Managed Lanes. They consider the extension fair to regular lane users and Managed Lane users. With their support of the extension, most respondents think using FasTrak to drive on the Express Lane extension is fair to I-15 regular travelers and I-15 Managed Lane travelers. Respondents in the survey with an annual household income between $40,000 and $70,000 are more likely to consider the use of FasTrak fair to regular lane users (83 percent) and Managed Lane users (82 percent) than are other respondents.

Though not central to their perception of FasTrak, the idea of "double taxation" remains problematic for FasTrak. Asked specifically, half of the respondents deemed the tolling of SOV drivers an unfair double taxation. More Asian Respondents agreed that the toll represents a double taxation than did Caucasian respondents. In fact, more Caucasians (26 percent) than either Asians (11 percent) or Hispanics (16 percent) "strongly" disagreed with the statement. Respondents with annual incomes between $40,000 and $70,000 expressed more agreement with this concept than respondents earning between $70,000 and $100,000 a year. However, just 1 percent of the respondents *volunteered* this as a major concern with extension. The benefit of FasTrak (avoiding the congestion) outweighs the cost of entry (paying a toll). Consequently, it remains only a peripheral issue. Setting tolls to manage demand and explaining the purpose of the tolls should address this sentiment.

Pricing and Time Value

The respondents expressed a willingness to pay mean tolls of $1.56 to save 15 minutes, $1.94 to save 20 minutes, $2.35 to save 25 minutes, and $3.01 to save 30 minutes. FasTrak customers placed a higher value on the timesaving than did those who do not have a FasTrak account.

II. TASK DEFINITION AND PURPOSE

SANDAG undertook this task to gain a greater understanding of public attitudes, perceptions, expectations, and opinions towards the proposed I-15 Managed Lanes extension, which extends the existing I-15 Managed Lanes from their current terminus at Ted Williams Parkway, north to the SR 78 interchange in Escondido. Together with the existing lanes, the new project will extend 20 miles. The proposed project includes new intermediate access points to the existing Managed Lanes; multiple access points along the new 12 mile segment; and direct ramps to serve bus rapid transit at various points along the entire alignment.

As a necessary step in understanding public attitudes, opinions, and perceptions, Fairfax Research designed and conducted a telephone survey. In general, telephone surveys provide information, in the form of attitudes and opinions, from populations of relevant interest. This particular telephone survey, consisting of eight hundred (800) telephone interviews, was conducted with I-15 users 18 years of age or older living within pre-selected zip codes that defined the impacted section of the I-15 corridor. This survey provides current information on their attitudes, perceptions, expectations, and opinions towards the issues tested in the survey.

The following research objectives shaped the development of the telephone survey:

- ❑ Measure awareness and perceptions of the existing Managed Lanes, including safety and enforcement;
- ❑ Determine the current level of I-15 corridor users understanding of how SANDAG spends revenue collected from FasTrak toll payers. Compare their understanding of revenue expenditures to their preferences for the expenditure of revenues collected from FasTrak toll payers;
- ❑ Assess support for the proposed I-15 Managed Lanes Extension, including the likes and dislikes of the proposed extension;
- ❑ Measure interest in using and impact on usage of the I-15 Managed Lanes Extension;
- ❑ Explore perceptions of the need for the extension;
- ❑ Identify perceptions of fairness and equity of the proposed extension;
- ❑ Learn preferences for the hours of operation and access to the Managed Lanes; and,
- ❑ Determine the value of time and willingness to pay for time savings.

Survey samples of a larger population measure opinions, beliefs and attitudes within identifiable statistical limits of accuracy at specific points in time. While using the most sophisticated procedures to collect and analyze the data, surveys provide information and direction, not necessarily formulas and predictions.

The following is an overview of the methods used to develop and conduct the telephone survey.

III. METHODOLOGICAL APPROACH

The section of the report reviews the design of the study and the methods used to obtain a sample representative of I-15 peak period travelers, including FasTrak customers, carpooling Managed Lane users, and I-15 regular lane users.

A. Questionnaire Design

Guided by the existing goals of the study, Fairfax Research developed a first draft of the questionnaire. Developing the first draft involved the evaluation and assimilation of multiple sources of idea input. These sources included SANDAG, previous survey research (focus groups and telephone surveys) on the I-15 Managed Lanes, and the focus group and stakeholder interviews conducted for this project. The questionnaire subsequently evolved through a series of two additional drafts before arriving at a final version. Each of the two additional drafts reflected direction provided by SANDAG.

Fairfax Research proposed a questionnaire length of 15 minutes. Given the scope of the RFP, questionnaires of a shorter duration would have limited the ability of the research, in conjunction with the focus group and stakeholder interviews, to answer these questions. Conversely, questionnaires of longer than a 15-minute duration tax the patience of the respondents, often resulting in the reluctance of respondents to participate in the survey. This has the potential to bias the data with an unrepresentative sample. Even a survey length of 15-minutes necessarily limited the number of questions asked of the respondents. Therefore, the questionnaire development process required the prioritization of questions, which resulted in the necessary exclusion of some questions, culminating in the final version of the questionnaire used in the telephone interviewing (Appendix A).

The final version of the questionnaire consisted of an introduction, qualifying questions, and 53 substantive questions, which are a combination of categorical questions, open-end questions, and demographic questions. Following review and approval by SANDAG, a professional translator translated the questionnaire into Spanish.

B. Questionnaire Programming

Following the finalization of the questionnaire, Fairfax Research programmed the final version of the questionnaire for computer-assisted telephone interviewing (CATI). An interactive PC-based software, CATI displays the question wording on a computer screen for the interviewer to read to the respondent. The interviewer enters each response directly into the computer via the computer's keyboard. CATI programs accept both alpha and numeric responses. The CATI program manages the logic of the questionnaire, determining which question the interviewer asks the respondent.

C. Sample Design

Fairfax Research used a combination of a Random Digit (RDD) sample and a listed sample of FasTrak users from the FasTrak customer database for the study. A computer generates the RDD sample from a database of *working blocks* in the zip codes. A block consists of 100 contiguous telephone numbers identified by the first two digits of the last four digits of a telephone number. For example, in the telephone number 923-5347, "53" is the block. A

working block contains one or more listed telephone numbers. The computer program assigns each exchange, the first three digits of a telephone number, to one or more zip codes.

The computer generates the RDD sample using a stratified random sampling procedure. A stratified random sample divides the population of sampling units into subpopulation called strata. The computer algorithm selects a separate sample from the sampling units in each stratum. Fairfax Research used the zip codes to stratify this sample.

The computer algorithm used for this sample distributes the telephone numbers across all eligible blocks in proportion to their density of listed telephone households. The algorithm organizes all blocks within a zip code in ascending order by area code, exchange, and block number. After determining a quota (number of completed interviews) for the zip codes, the algorithm calculates a sampling interval by summing the number of listed residential numbers in each eligible block within the zip codes and dividing that sum by the number of sampling points assigned to the zip codes. Since telephone exchange boundaries do not correspond precisely to zip code boundaries, the algorithm assigns telephone exchanges to a zip code based on the proportion of the exchange falling within the zip code. The greater the proportion of telephone numbers for a particular exchange falling within a zip code, the more precise the sample. For this study, Fairfax Research used an 81 percent cutoff for inclusion in the sample frame, meaning any exchange where 81 percent or more of the exchange was in the target zip code was included in the sample frame.

From a random start point between zero and the sampling interval, the computer systematically selects blocks in proportion to their density of listed households. After selecting a block for inclusion in the sample, the computer algorithm appends a two-digit random number in the range 00 to 99 to the exchange and block to form a 10-digit telephone number.

This process eliminates problems resulting from unpublished telephone numbers. Phone books fail to represent the important population of people with unlisted phone numbers; that is, those people who do not allow the telephone company to publish their telephone number. Over 50 percent of all San Diego County households do not allow the telephone companies to publish their telephone numbers. This process provided a representative sample of the I-15 corridor users.

By definition, samples represent a larger population or universe of interest. All sample surveys are subject to sampling error; that is, the extent to which the results may differ if Fairfax Research conducted a complete census of the opinions of every eligible individual in the sample area. The size of the potential error depends on the percentage distributions (i.e., the number of respondents selecting each answer category) and the number of interviews. The more disproportionate the percentage distributions or the larger the sample size, the smaller the probability of error resulting from a sample.

A sample size of 800 has a confidence interval estimate of $\pm$ 3.5 percentage points at the 95 percent confidence level assuming conservative 50/50 response proportions. Smaller subgroups of the population, e.g. age groups, income segments, have larger confidence intervals. Table 1 displays the sampling errors for different sample sizes and proportions. The percentages indicate the range (plus or minus the figure shown) within which the results may vary 95 times out of 100 for each sample size.

As Table 1 indicates, the sampling error increases as the sample size decreases. This means less reliable results with small subgroup sample sizes. Occasionally a small sample size for a particular subgroup precludes any reliable analysis.

Table 1:
Sampling Error
(Percentage Points)

Sample Size	Percentage Distribution				
	50/50	60/40	70/30	80/20	90/10
800	3.5	3.4	3.2	2.8	2.1
600	4.0	3.9	3.7	3.2	2.4
400	4.9	4.8	4.5	3.9	2.9
200	6.9	6.8	6.4	5.5	4.2

For example, assume 800 people responded to a particular question. In their responses, 60 percent said answer 1 and 40 percent said answer 2. In Table 1, the cell representing 800 interviews and responses of 60 percent and 40 percent has a confidence interval of 3.4 percentage points. Therefore, 95 times out of 100, the average of repeated samples (conducting a complete census) would be somewhere between 56.6 percent and 63.4 percent for response 1, with 60 percent the most likely or probable result.

The study consisted of eight hundred (800) telephone interviews—600 regular lane users (non-FasTrak customers) and 200 FasTrak customers. After discussing the merits of different sampling approaches to achieve the objectives of the study, the decision was reached to over-sample FasTrak users. This approach facilitated an analysis of the opinions and attitudes of FasTrak users, who are likely to reflect attitudes and needs common to new toll-paying customers of the Managed Lanes. To achieve this goal, Fairfax Research used a combination of RDD and listed sample. With the precise proportion of I-15 users (different from population figures) in each zip code unknown and indeterminate, Fairfax Research treated the target market zip codes as a single sample frame. Using this approach, the interviewing proceeded until the interviewers completed approximately 687 interviews (600 regular lane users and 87 FasTrak customers) using the RDD sample. The interviewers then completed the remaining 113 interviews using a listed sample of FasTrak customers from the FasTrak customer database. This process yielded a total sample file consisting of 600 I-15 regular lane users (non-FasTrak customers) and 200 I-15 FasTrak customers.

The survey population included individuals living in the zip codes 92025, 92026, 92027, 92029, 92064, 92069, 92126, 92127, 92128, 92129, and 92131 who were 18 years of age or older and who traveled on any part of the I-15 between SR 78 in Escondido and SR 163 in Kearny Mesa Monday through Friday between 5:45 and 9:15 a.m. All eligible respondents lived in one of the zip codes displayed in Table 2. The table contains a distribution of interviews by zip code. The study used zip codes consistent with the ones used to define the sample frame in previous I-15 Managed Lane survey research. Additionally, given the proposal to add access points to the existing Managed Lanes, this survey included respondents living in the zip codes 92126 and 92131.

Table 2:
Sample Distribution

Zip Code	Unweighted	Weighted
92025	70	74
92026	76	86
92027	63	69
92029	48	47
92064	100	90
92069	21	19
92126	66	82
92127	56	52
92128	128	105
92129	114	107
92131	58	68
Total	800	800

Achieving a representative sample of I-15 users required Fairfax Research to weight the sample back to the representative portions of respondents who do not have a FasTrak account and respondents with a current FasTrak account. Fairfax Research derived the weights by dividing the total number of FasTrak account holders (Source: FasTrak customer database) in the sample area zip codes by the total number of residents 18 years of age or older (Source: Census database) living in the sample area zip codes. This approach to deriving the weights resulted in a conservative estimation of the FasTrak proportion of all I-15 travelers. Applying these weights to the data file created a data file representative of I-15 peak period travelers residing in the sample zip codes.

SANDAG conducted an Attitudinal Panel Study consisting of five waves of data collected over three years (1997 to 1999). By definition, a panel study attempts to re-interview the same respondents over the course of the study and track changes in attitudes and opinions. The proposed changes to the Managed Lanes included in the project necessitated a different sample design for this study. The Attitudinal Panel included respondents who traveled the *entire length* of the I-15 between the Ted Williams Parkway and the I-15/163 split. Given the proposed extension of the Managed Lanes and the proposed addition of intermediate access points, this study interviewed respondents who traveled on *any section* of the I-15 between SR 78 in Escondido and SR 163 in Kearny Mesa. These necessary differences in sample design resulted in similar though not identical samples.

Table 3 compares the sample demographics from this survey with the sample demographics from Phase I of the Attitudinal Panel Study conducted in the fall of 1997. The Attitudinal Panel Study did not include the respondent's ethnicity. Lacking this information, the report cannot compare the ethnic composition of this study with the ethnic composition of the Attitudinal Panel Study. The table compares the sample demographics for the ExpressPass/FasTrak samples and for the I-15 regular lane samples. With few exceptions, the demographic attributes of the two samples match closely. The FasTrak customer sample and the I-15 regular lane sample in this study contain more respondents with college degrees and more respondents with annual household incomes greater than $120,000. For reporting purposes, the Attitudinal Panel Study

treated the FasTrak customers and I-15 regular lane users as two separate samples. They did not attempt to weight the two groups to their representative proportions in the zip codes.

Table 3:
Sample Comparison: Phase I Attitudinal Panel

	ExpressPass Fall 1997	FasTrak Fall 2001	I-15 Regular lane Fall 1997	I-15 Regular lane Fall 2001
Education				
High School	8%	3%	15%	13%
Some college	20%	15%	36%	28%
Bachelor's Degree	39%	52%	26%	40%
Graduate Work	33%	29%	23%	18%
Age				
18-to-24 years old	1%	3%	11%	10%
25-to-34 years old	13%	13%	22%	21%
35-to-44 years old	42%	33%	34%	27%
45-to-54 years old	33%	34%	21%	23%
55-to-64 years old	9%	13%	8%	12%
65 and over	3%	3%	5%	6%
Income				
Less than $20,000	0%	0%	4%	3%
$20,000 up to $40,000	4%	3%	12%	16%
$40,000 up to $60,000	13%	5%	29%	21%
$60,000 up to $100,000	33%	32%	35%	31%
$100,000 or more	50%	60%	20%	29%
Gender				
Men	57%	49%	57%	53%
Women	43%	51%	43%	47%
Sample size	501	200	557	600

The CATI software contained a sample manager. The sample manager program monitored the sample and the disposition of each number. This ensured each telephone number in the sample universe an equal probability of selection. The application of scientific methods including the use of an RDD sample, careful sample administration, and adherence to thorough callback procedures assured all I-15 travelers residing in the corridor an equal probability of inclusion in the survey. Fairfax Research followed accepted industry standards to obtain a sample inclusive of the attitudes and opinions of all ethnic and socioeconomic groups comprising I-15 corridor users. By design and definition, I-15 corridor users differ from I-15 corridor residents. The results of the Attitudinal Panel Study and this study suggest that I-15 corridor users are younger (25 to 54 years old) and are more affluent than I-15 corridor residents. The Attitudinal Panel Study did not ask the respondent his or her ethnicity. Table 4 compares Census population data (18 years of age or older) for the target zip codes with the survey findings on the attributes of age, income and ethnicity. Please remember that in voluntary opinion and attitude telephone surveys certain respondents refuse to answer questions about their age, income, or ethnicity.

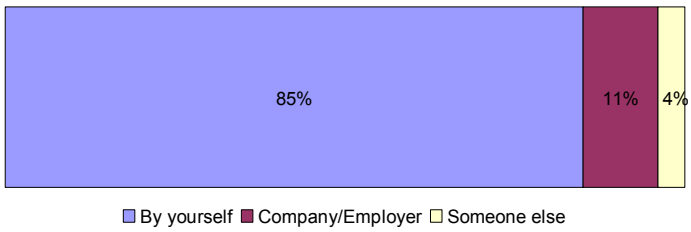
Table 4:
Sample Comparison: U.S. Census

	Census Population 18+	2001 Survey Corridor Users
Ethnicity		
Hispanic	15%	10%
African American	2%	2%
Asian	13%	8%
Caucasian	70%	73%
Refused	-%	8%
Income		
Less than $50,000	44%	22%
$50,000-$100,000	39%	35%
Over $100,000	17%	25%
Refused	-%	18%
Age		
18-24 years old	13%	10%
25-34 years old	20%	21%
35-44 years old	22%	27%
45-54 years old	18%	23%
55-64 years old	11%	12%
65 and older	16%	5%
Refused	-%	2%

FasTrak I-15 Customers

The study design stipulated the completion of interviews with 200 self-identified FasTrak customers, that is, respondents who currently have a FasTrak account and a transponder. The RDD sample yielded 87 of these interviews. The remaining 113 interviews were obtained using the FasTrak customer database. Figure 1 displays the breakdown of payment sources used by the FasTrak customers. Most of them pay for their FasTrak account. Employers pay for 11 percent of the respondents' FasTrak accounts.

Figure 1:
How Pay for FasTrak Account



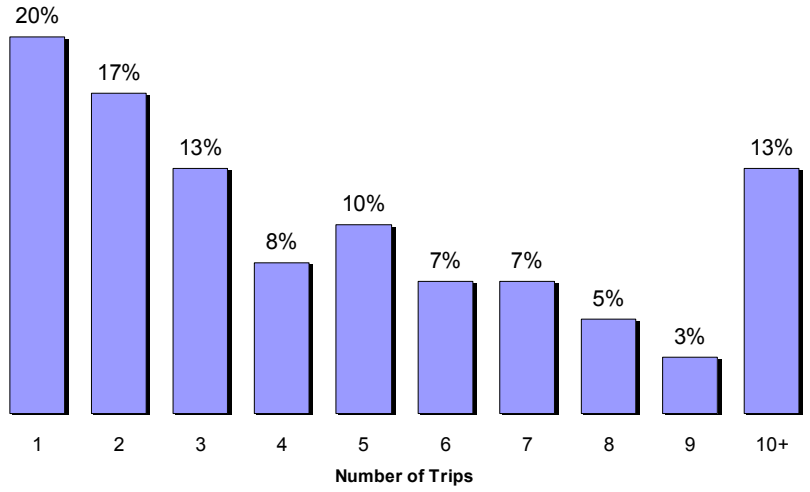
In Wave 5 of the Attitudinal Panel Study, the FasTrak customers averaged 4.62 one-way weekday trips per week using FasTrak. The respondents in this research averaged a similar 4.53 one-way weekday trips per week using FasTrak. Table 5 compares the average weekly FasTrak usage measured in four waves of the Attitudinal Panel Study and this study.

Table 5:
Total Weekly FasTrak Usage

	APS Wave 2 Spring 1988	APS Wave 3 Fall 1998	APS Wave 4 Spring 1999	APS Wave 5 Fall 1999	Fall 2001
Average	4.97	5.27	4.66	4.62	4.53
Base	400	517	456	458	200

Figure 2 shows the distribution of FasTrak usage during a typical week for the FasTrak customers. These numbers present the total number of weekly peak morning and peak afternoon trips.

Figure 2:
FastTrak Trips per Week



Travel Patterns and Mode Split

Eligible respondents typically made a least one trip weekly on the I-15 between SR 78 and SR 163 on weekday mornings between 5:45 and 9:15 a.m. In Figure 3, 81 percent of the respondents drove alone (SOV), 10 percent of them drove alone some days and carpooled other days, and 9 percent of them carpooled (HOV) exclusively. No significant differences exist between the mode used by respondents who are FastTrak customers and respondents who do not have a FasTrak account.

Figure 3:
Mode Used to Travel on I-15

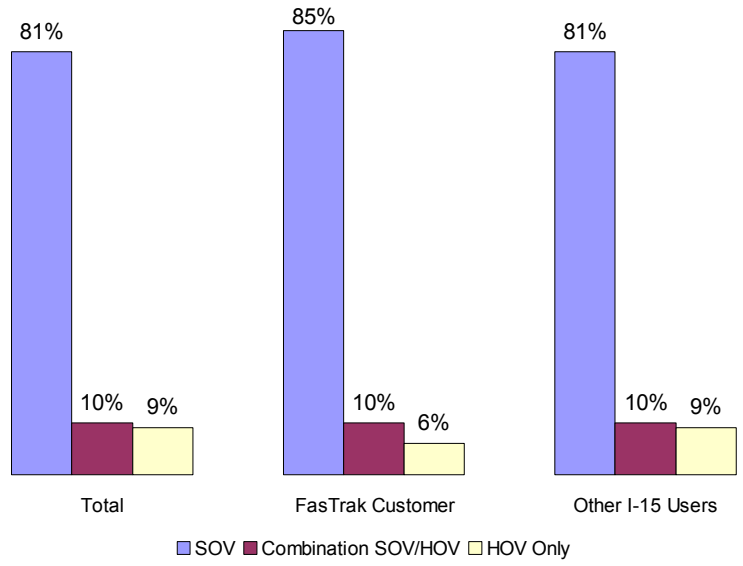


Table 6 shows the respondents' reported mode split by lane use for their typical peak morning travel on the I-15.

Table 6:
Mode Split

	Total	FasTrak Customer	Other I-15 Users
SOV Managed Lane	7%	31%	6%
SOV Regular Lane	72%	30%	73%
SOV Managed Lanes and Regular Lanes	2%	25%	2%
HOV Managed Lanes	4%	4%	4%
HOV Regular Lanes	5%	2%	5%
HOV Managed and Regular Lanes	1%	0%	1%
SOV Managed Lanes and HOV Regular Lanes	4%	1%	4%
SOV Managed Lanes and HOV Managed	0%	3%	0%
SOV Regular Lanes and HOV Regular Lanes	3%	1%	4%
Other	2%	5%	2%
Base: 800			

D. Data Collection

A professional call center with extensive experience interviewing diverse respondent populations completed the actual interviews. The use of a centralized facility allowed full monitoring of the interviewing process. The call center trained each interviewer in standardized interviewing techniques to ensure uniform interviewing standards. Fairfax Research briefed the interviewers selected to conduct the interviews on the specific nuances of this project. The telephone center maintained an average ratio of one supervisor to ten interviewers throughout the interviewing process. The supervisors monitored at least 15 percent of the interviews. These quality control procedures maximized the accuracy of the interviewing.

Before conducting the actual telephone interviews, Fairfax Research conducted a test of the questionnaire. This "pretesting" of the questionnaire helped ascertain:

- ❑ The clarity, viability, and impartiality of the questions;
- ❑ Potential question order problems;
- ❑ Questions that yield the wrong information due to misinterpretation and validity problems; and,
- ❑ The overall efficacy of the survey instrument.

Please keep in mind, that of necessity, this study was conducted shortly after the events of September 11, 2001. Careful monitoring of the interviewing process did not indicate any discernible or quantifiable adverse affects to the quality of the data collected. On September 17, 2001, the telephone center called and conducted interviews with a random sample of 30 individuals. The interviews lasted an average of 13 minutes and 41 seconds. The results of the pretest suggested the need for the following changes to the questionnaire:

- ❑ Eliminate redundant descriptions of the area of the I-15 in question; and,
- ❑ Clarify the four pricing questions with a more precise description of the scenario: SOV drivers making one-way weekday trips.

Following the pretest and final revisions to the questionnaire, the telephone center completed the 800 interviews. After greeting the potential respondent and identifying themselves, the professional telephone interviewers used the following questions to identify the appropriate respondent in each household. The interviewers first established the age of the respondent (Question A), including only individuals 18 years of age of older. If they could not speak with an individual in the household who was at least 18 years of age, then the interviewer politely concluded the interview.

A. Are you 18 or older? (IF "NO," ASK:) May I please speak with someone in your household who is 18 or older?

1. Yes
2. No
3. (Don't Know/Refused)

After determining the age eligibility of the respondent, the interviewers then asked them for their home zip code (Question B). The interviewer continued the interview only with those individuals residing in the target zip codes.

B. What is your zip code at your home address?

The final eligibility question determined their travel on the I-15. The interviewers asked each potential respondent whether they traveled on the I-15 between SR 78 and SR 163 weekday mornings between 5:45 and 9:15 a.m. (Question C). The interviewers proceeded to the body of the question only with the eligible respondents.

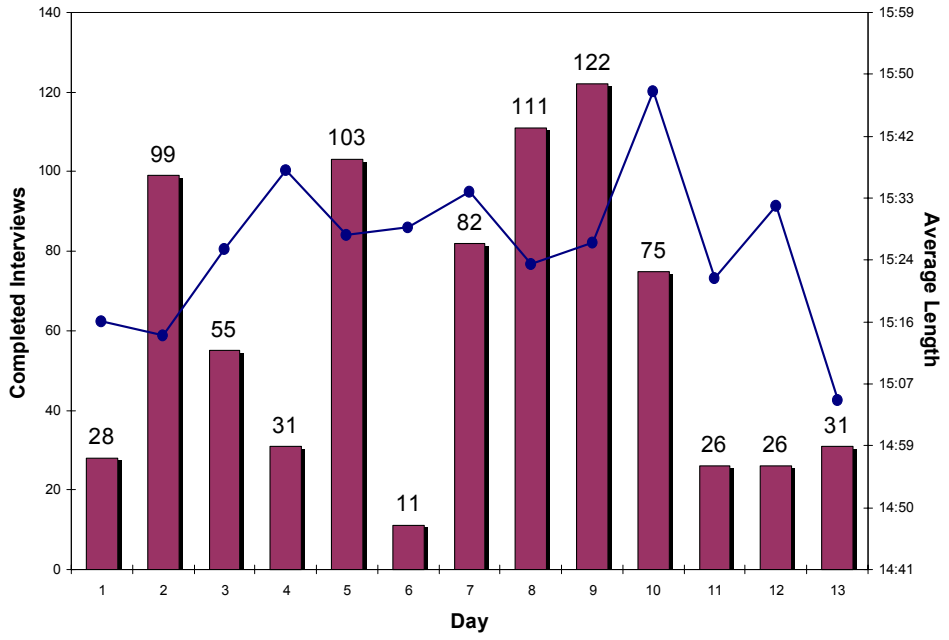
C. As you may know, there is a section of the I-15 between Highway 78 in Escondido and Highway 163 in Kearny Mesa. Please think about last week, weekday mornings, Monday through Friday only. Did you travel on **any** part of this section of the I-15 freeway between 5:45 and 9:15 a.m.?

1. Yes
2. No
3. (Don't Know/Refused)

They conducted the interviews between September 25 and October 7, 2001 on weekday evenings and weekends. Because of differences in lifestyle-driven schedules and the difficulty of reaching all people within a given time of day or day of the week, the interviewers called each number up to three times. To ensure the accuracy and validity of the sample, the callbacks occurred on different days of the week and at different times of the day.

The interviewers conducted only one interview per household. The actual interviews lasted an average of 15 minutes and 23 seconds. The call center conducted 795 interviews in English and 5 interviews in Spanish. Figure 4 displays the distribution of the completed interviews and the average length of the interviews by day.

Figure 4:
Distribution of Interviewing by Day and Average Length



E. Data Coding

After the completion of the data collection, Fairfax Research reviewed one-third of the verbatim responses to the open-end questions. The code development process involved the actual reading of the verbatim responses to the questions and then the developing of a list of classifications or codes of similar responses. This process resulted in the code categories found in Table 7.

Table 7:
Open End Codes

Question 22: What do you like most about the extension, that is, what do you think could be the benefits?

1. Reduce Traffic Congestion on I-15/Regular lanes
2. Reduce Traffic on Surface Streets and Ramps
3. Extends Further North/Length/Speeds Up Commute for Northern Commuters
4. Provide Multiple Access Points
5. Save Time/Faster Commute/Faster in Case of Emergency/Less Waiting
6. Encourage Carpooling
7. Fewer Accidents/Safer/Optional Route Around Accidents
8. Reduce Emissions/Less Gas Use
9. Improve Business Climate/City More Inviting to Industry/Benefits Local Business
10. Less Frustration/Road Rage/Happier Commuters
11. Give More Commuters Access to Express Lanes
12. Adds Options to Commute/Can Opt to Pay
13. Commuters Bypass Traffic
14. Open 24 Hours Both Directions
15. No Benefits/Nothing
98. Other
99. Don't Know

Question 23: What do you like least about the extension, that is, what do you think would be the drawbacks?

1. Increase Congestion on Surface Streets
2. Increase Congestion General
3. Not Enough Would Use
4. Construction Related Congestion/Construction Time Too Long
5. Traffic Jams at Entrances/Merging Problems
6. Expensive to Use/Don't Like Paying Tolls
7. Unfair/Benefits the Rich
8. Too Much Development/Too Many People
9. Expensive to Build/Taxes Pay for Construction
10. Double Taxation
11. Too Little/Temporary Fix
12. Difficulty Enforcing Legitimate Access
13. More Accidents
14. Not Enough Access Points
15. Negative Environmental Impact/Natural Habitats Affected
16. People Will Not Carpool
17. No Room for New Lanes
18. Prefer Build Train/Trolley
19. Noise Pollution/Traffic Noise
20. Nothing
98. Other
99. Don't Know

Question 26:
Why would you be unlikely to use the extended Express Lanes?

1. Not Needed
2. Don't Have Access/Access Points Not Convenient
3. Too Expensive
4. Don't or Can't Carpool
5. Short Commute/One or Two Exits
6. Live South of Extension
7. Reverse Commute/Time of Day
98. Other
99. Don't Know

Following the development and approval of the codes, Fairfax Research read each verbatim response and classified it into one or more of the most appropriate code categories. This process facilitated the quantifying of the verbatim responses for analysis.

F. Data Processing

After coding of the verbatim responses to the open-end questions, Fairfax Research cleaned and tabulated the data. The process of cross tabulating the data allowed response comparisons by income level, ethnicity, education level, gender, etc. The cross tabulation analysis used the following demographic and geographic subgroups. The cross tabulation analysis did not include subgroups with small sample sizes. For example, the sample accurately approximated the African American proportion of the corridor user population (2.1 percent), but this sample represented only 17 respondents. A sample size of 17, with a confidence interval of ±24 percentage points at the 95 percent confidence level (assuming conservative 50/50 response proportions) precludes any reliable analysis.

Q.Zip Code
- 92126/92131 (Mira Mesa/Miramar/Miramar Ranch North/Scripps Miramar Ranch)
- 92127/92129 (West Rancho Bernardo/Rancho Penasquitos)
- 92064/92128 (Poway/East Rancho Bernardo/Carmel Mountain/Sabre Springs)
- 92029/92069 (Southwest Escondido/San Marcos)
- 92025/92026/92027 (Escondido)

Q.14 FasTrak Customer
- Yes
- No

Q.25 Use Extension
- Likely
- Unlikely

Q.44 Marital Status
- Married
- Never Married
- Widowed/Divorced/Separated

Q.45 Household Size
- One
- Two
- Three or more

Q.46 Number of Children Under Age 16
- None
- One
- Two or more

Q.47 Number of Licensed Drivers in the Household
- One
- Two
- Three or more

Q.48 Number of Vehicles in the Household
- One
- Two
- Three
- Four or more

Q.49 Education
- Some High School/High School Degree
- Some College/Vocational School
- College Degree
- Postgraduate Degree

Q.50 Age
- 18-to-24 years old
- 25-to-34 years old
- 35-to-44 years old
- 45-to-54 years old
- 55 years old or older

Q.51 Employment Status
- Full-time
- Part-time
- Other

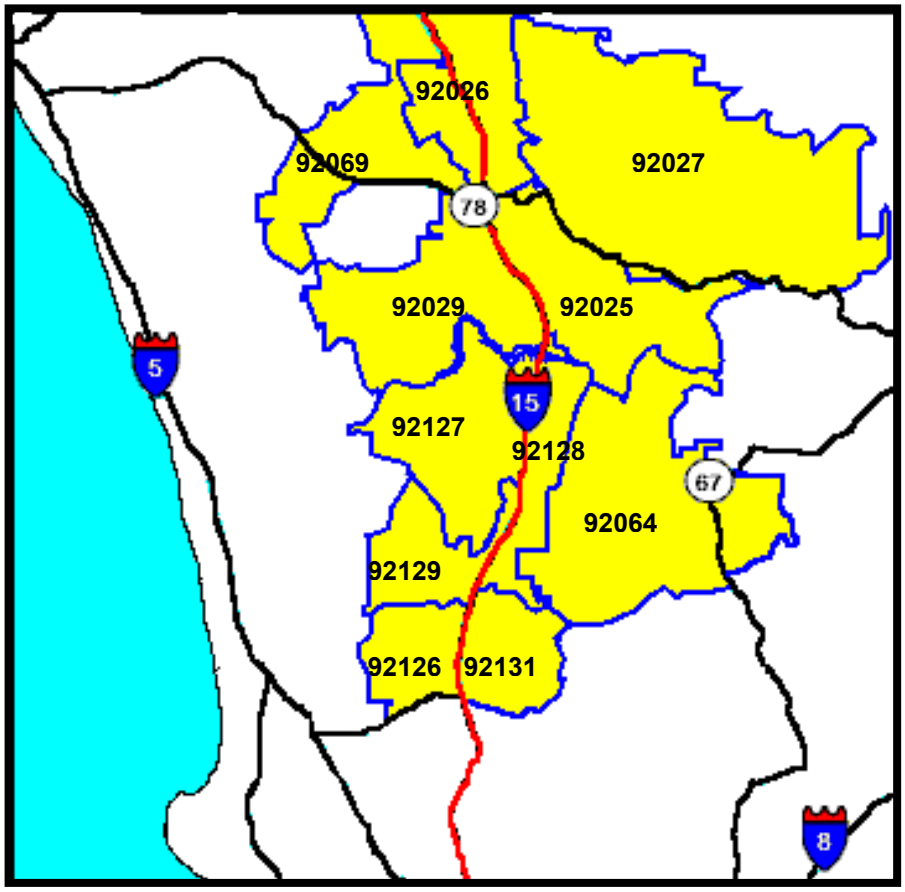
Q.52 Ethnic Heritage
- Asian/Indian American
- Hispanic
- White

Q.53 Annual Income
- Less than $40,000 a year
- $40,000-to-$70,000 year
- $70,000-to-$100,000 year
- More than $100,000 a year

Q.54 Gender
- Men
- Women

In the analytical process, Fairfax Research used frequency distributions, means, and crosstabulation tables. Fairfax Research utilized the software packages SPSS and Wincross to run and review thousands of crosstabulation tables and means looking for significant or relevant findings. In analyzing the data, Fairfax Research used Independent T-Tests to measure differences in means and Independent Z-Tests and Chi-Square values for percentages. The analysis reports all statistically significant differences at the 95 percent level.

Map 1:
Zip Code Sample Area



Section III contains the detailed findings from the telephone survey organized into the following sections. The focus group discussions revealed that corridor users tend to refer to the lanes as the “Express Lanes.” Consequently, in the questionnaire Fairfax Research used the term “Express Lanes” when referring to the lanes. This report refers to the lanes as “Managed Lanes” unless quoting a question verbatim.

A. Attitudes Towards FasTrak

Addresses the respondent’s awareness and perceptions of FasTrak.

B. Attitudes Towards Managed Lanes Extension

Explores the respondents’ attitudes towards the Managed Lanes extension.

C. Fairness and Equity Issues

Assesses the respondents’ perceptions of the fairness and equity of the Managed Lanes extension.

D. Pricing and Time Value

Discusses the respondents’ perceptions of toll pricing, demand, and value of timesaving.

IV. DETAILED RESULTS

This section of the report presents a more detailed analysis of the findings.

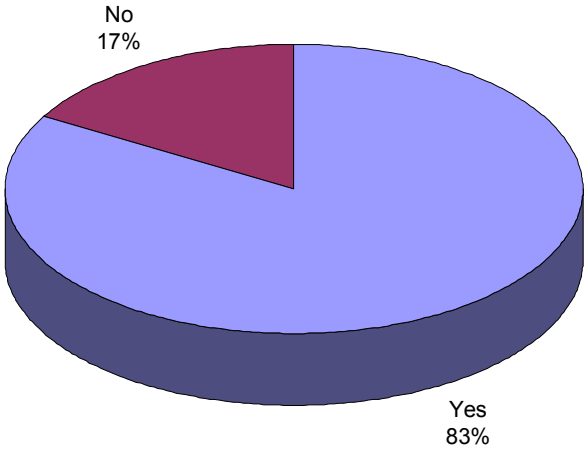
A. Attitudes Towards FasTrak

This section reports the results to a series of attitudinal questions about the FasTrak program.

Awareness of FasTrak

While not universal, awareness of the Managed Lanes is fairly high among respondents in the study. The respondents were asked: "There is a section of the I-15 freeway between Ted Williams Parkway and the I-15/163 split that includes lanes that allow people on buses and in cars with more than one occupant to drive free and cars with only one occupant to drive for a fee. Were you aware of these lanes before this interview?" As Figure 5 shows, 83 percent of the respondents had heard of the existing I-15 Managed Lanes.

Figure 5:
Aware of Managed Lanes



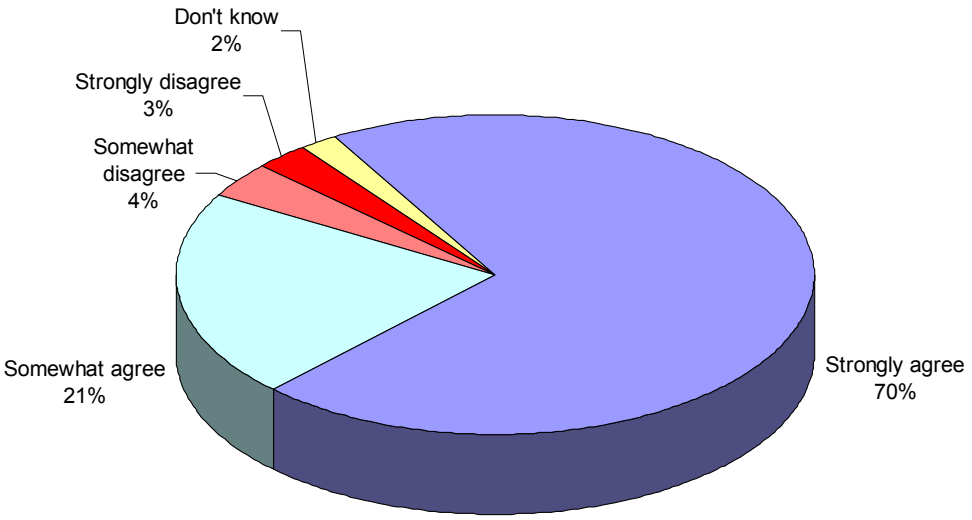
In particular,

- Awareness of the Managed Lanes is lower among respondents 18-to-24 years old (66 percent), those with only one vehicle in the household (68 percent), and those earning under $40,000 a year (69 percent).
- Not surprisingly, FasTrak customers are more aware of the Managed Lanes than are those respondents who do not have a transponder.

Perceptions of FasTrak

Experienced veterans of the congestion on the I-15, the respondents in the study revealed nearly universal interest in some type of a time saving option on the I-15—something the Managed Lanes offer to them. Respondents were asked to agree or disagree with the statement: "It's a good idea to have a time saving option on the I-15 always available." In agreeing with this statement, 92 percent of the respondents expressed support for this concept. Just 6 percent of the respondents in the survey disagreed with this statement. As Figure 6 illustrates, 70 percent of the respondents in the study "strongly" agreed that a time saving option on the I-15 is a good idea.

Figure 6:
Good Idea to Have Time Saving Option on I-15



As the results in Table 8 indicated, support for a time saving option cuts across all demographic groups, including income and ethnicity.

Table 8:
Good Idea to Have Time Saving Option on I-15

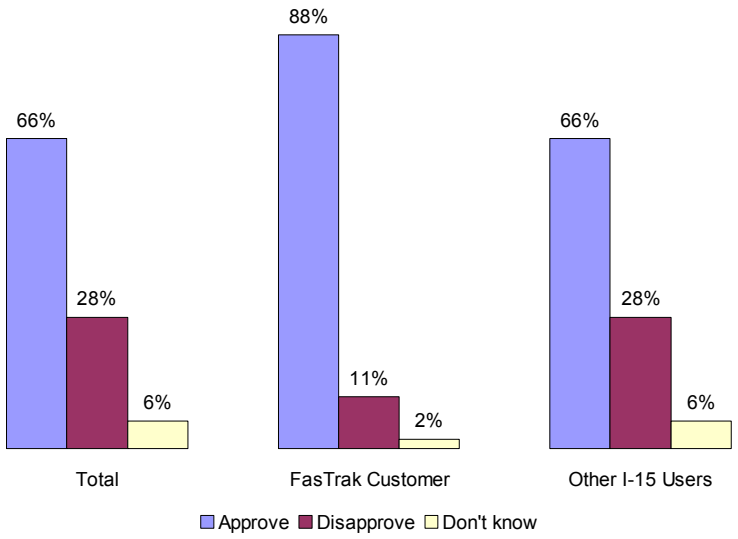
	Agree	Disagree	Don't know
Total	92%	6%	2%
Age			
18-to-24 years old	97%	3%	0%
25-to-34 years old	96%	3%	1%
35-to-44 years old	92%	7%	1%
45-to-54 years old	89%	8%	3%
55 and older	86%	8%	6%
Ethnicity			
Asian	94%	2%	4%
Hispanic	90%	9%	2%
Caucasian	93%	5%	2%
Income			
Less than $40,000	89%	8%	3%
$40,000 to $70,000	93%	5%	2%
$70,000 to $100,000	94%	5%	1%
More than $100,000	93%	6%	1%
Gender			
Men	90%	8%	2%
Women	93%	5%	2%
Household size			
1 person	90%	6%	4%
2 people	91%	7%	2%
3 or more	93%	6%	2%
Licensed drivers			
1	92%	4%	4%
2	91%	7%	1%
3 or more	93%	5%	2%
Children			
None	91%	7%	2%
1 child	92%	7%	1%
2 or more children	94%	3%	3%
Education			
H.S. degree	97%	3%	*%
Some College/Vocational	92%	5%	3%
College graduate	91%	7%	2%
Postgraduate degree	90%	9%	1%
Base: 800			

* Denotes less than 0.5%

A majority of the respondents expressed approval of the FasTrak program. Respondents were asked: "The FasTrak program allows motorists who are driving alone to travel in the Express Lanes for a fee that is charged electronically each time they use the lanes. The price varies with the amount of traffic in the Express Lanes. From what you know about the FasTrak program, do you strongly approve, somewhat approve, somewhat disapprove, or strongly disapprove of it?" Two-thirds (66 percent) of the respondents said they approved of the FasTrak program. Thirty-one percent (31 percent) of them "strongly" approved of it while 35 percent "somewhat" approved of it. By contrast, 28 percent of the respondents expressed disapproval of the FasTrak program. Seventeen percent (17 percent) of them "strongly" disapproved of it and 11 percent "somewhat" disapproved of it.

As Figure 7 shows, significantly more FasTrak customers approved (88 percent) of the program than do those respondents who do not have a FasTrak account (66 percent).

Figure 7:
Approve/Disapprove of FasTrak Program



As the numbers in Table 9 indicate,

- Approval of FasTrak decreases with an increase in the age of the respondents. Respondents 18-to-24 years of age voiced the highest approval of the program while those 55 or older expressed the lowest levels of approval.
- The respondents' ethnicity had no significant impact on their approval of the FasTrak program.
- Respondents with household incomes of $70,000 or more voiced higher levels of approval of the FasTrak program than did respondents with household incomes of less than $70,000.

Table 9:
Approve/Disapprove of FasTrak Program

	Approve	Disapprove	Don't know
Total	66%	28%	6%
Age			
18-to-24 years old	79%	21%	0%
25-to-34 years old	70%	22%	8%
35-to-44 years old	67%	28%	5%
45-to-54 years old	66%	30%	4%
55 and older	56%	36%	9%
Ethnicity			
Asian	61%	25%	14%
Hispanic	67%	24%	9%
Caucasian	68%	28%	4%
Income			
Less than $40,000	60%	29%	11%
$40,000 to $70,000	59%	29%	12%
$70,000 to $100,000	72%	27%	2%
More than $100,000	70%	27%	3%
Base: 800			

In addition to gauging their approval or disapproval of the FasTrak program, the respondents were asked to agree or disagree with the statement: "People who drive alone should be allowed to use the I-15 Express Lanes for a fee." Interestingly, more of the respondents agreed with this statement (77 percent) than approved of the FasTrak program itself (66 percent). Some 53 percent of the respondents "strongly" agreed that SOV drivers should have access to the Managed Lanes for a fee. Another 24 percent of them "somewhat" agreed with this concept. These findings suggest support for the FasTrak program and, more particularly, for the concept of SOV drivers paying a fee for access to the Managed Lanes.

- Fully 96 percent of all FasTrak customers in the study agreed that fee-paying SOV drivers be allowed to use the I-15 Managed Lanes. Seventy-nine percent (79 percent) of them "strongly" agreed with this concept.

- As Table 10 confirms, neither ethnicity nor income factor into the respondents' position on the concept of SOV drivers buying access to the Managed Lanes. Agreement does not vary significantly by ethnicity or income.

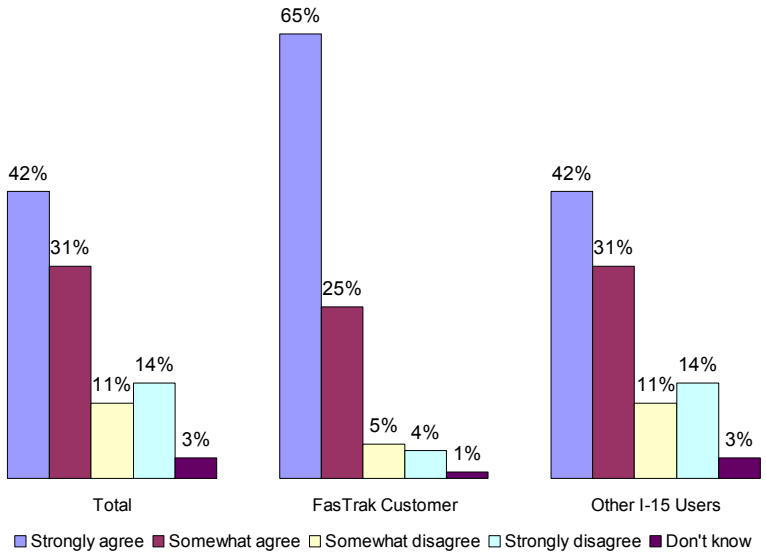
Table 10:
Agree/Disagree SOV Drivers Allowed to Use I-15 Managed Lanes for a Fee

	Agree	Disagree
Total	77%	21%
Ethnicity		
Asian	85%	15%
Hispanic	79%	21%
Caucasian	78%	22%
Income		
Less than $40,000	78%	18%
$40,000 to $70,000	77%	23%
$70,000 to $100,000	79%	21%
More than $100,000	78%	22%
Base: 800		

FasTrak Reduces Traffic Congestion

Respondents were asked to agree or disagree with the statement: "FasTrak helps reduce traffic congestion on the I-15." Seventy-three percent (73 percent) of the respondents agreed that the FasTrak program reduces congestion on the I-15. As Figure 8 indicates, significantly more FasTrak customers (90 percent) than non-customers (72 percent) agreed that FasTrak helps to reduce congestion on the I-15. A sizeable 65 percent of FasTrak customers "strongly" agreed that FasTrak reduces congestion on the I-15.

Figure 8:
FasTrak Program Reduce Traffic Congestion on the I-15



In addition,

- More respondents residing in zip codes West of the I-15 than living in the zip codes East of the I-15 agreed that FasTrak reduces congestion on the I-15.
- More of the respondents who live alone, particularly those who are widowed, divorced, or separated disagreed that FasTrak reduces congestion on the I-15.
- No significant differences exist based on income and ethnicity.

Tolls Manage Demand

As a general concept, the respondents in the study believed that tolls effectively manage demand for the Managed Lanes. The respondents were asked to agree or disagree with the statement: "The toll is a good way to keep the Express Lanes moving quickly." Seventy-one percent (71 percent) of the respondents agreed with this statement—41 percent "strongly" agreed and 30 percent "somewhat" agreed. Just over one-quarter (26 percent) of the respondents disagreed that tolls effectively manage demand on the Managed Lanes. Table 11 shows a breakdown of the findings by age, education, and income. Each of the demographic subgroups in the table expressed majority agreement with the concept of tolls as effective demand managers.

Table 11:
Agree/Disagree Toll Good Way Keep Managed Lanes Moving

	Agree	Disagree	D.K
Total	71%	26%	3%
Age			
18-to-24 years old	88%	12%	0%
25-to-34 years old	78%	20%	2%
35-to-44 years old	69%	27%	4%
45-to-54 years old	64%	32%	4%
55 and older	66%	32%	2%
Education			
H.S. degree	81%	16%	3%
Some College/Vocational	73%	26%	1%
College graduate	67%	30%	3%
Postgraduate degree	70%	25%	6%
Income			
Less than $40,000	75%	22%	2%
$40,000 to $70,000	65%	30%	4%
$70,000 to $100,000	71%	27%	2%
More than $100,000	75%	20%	5%
Base: 800			

- Agreement with this concept tends to decline with an increase in the age of the respondent or an increase in the educational attainment of the respondent. Respondents 18-to-24 years old or those with only a high school degree evidenced the highest levels of agreement with this concept.

- Respondents earning between $40,000 and $70,000 voiced less agreement with the statement than other respondents.
- Agreement did not vary significantly by ethnicity.

Use of FasTrak Revenues

Respondents were asked two questions about the revenue collected from FasTrak. They were first asked the question: "To the best of your knowledge, how do you think the money collected from FasTrak is being spent?" Wave 5 of the Attitudinal Panel Study conducted in the fall of 1999 asked the same question. As Table 12 shows, fewer I-15 corridor users today than in 1999 know how the revenues from FasTrak are spent. At least half of the respondents (57 percent) volunteered that they did not know. Those respondents with at least some knowledge said that the revenues collected from FasTrak are used to improve and maintain the I-15 and other San Diego freeways. Specifically, they volunteered that the revenues from FasTrak are used to improve and maintain the I-15 regular lanes (15 percent), improve and maintain all San Diego freeways (15 percent), and improve and maintain the I-15 Managed Lanes (12 percent).

In particular, the findings indicate significant erosion in awareness among FasTrak customers of revenue expenditures on the Inland Breeze express bus service. Evidently, with little or no information on the allocation of FasTrak revenues reaching them, their awareness of expenditures on the Inland Breeze has declined noticeably over the past two years from 34 percent to 5 percent. Few of the I-15 regular lane users ever knew that the FasTrak revenues were spent on the Inland Breeze Bus service (7 percent in 1999 and 2 percent in 2001).

Table 12:
How FasTrak Revenues are Spent

	Total	FasTrak Customer		I-15 Regular Lane	
	Fall 2001	Fall 1999	Fall 2001	Fall 1999	Fall 2001
Improve/Maintain I-15 regular lanes	15%	12%	16%	16%	15%
Improve/Maintain all San Diego freeways	15%	14%	13%	24%	15%
Improve/Maintain I-15 Express Lanes	12%	21%	16%	24%	12%
Add more/Extend I-15 Express Lanes	4%	6%	2%	7%	4%
Add more I-15 regular lanes	3%	1%	2%	2%	3%
Add more regular freeway lanes to all San Diego	3%	3%	2%	5%	3%
Add carpool lanes to other San Diego freeways	3%	1%	2%	2%	3%
Inland Breeze Bus	2%	34%	5%	7%	2%
Other express bus service	1%	12%	2%	2%	1%
Inefficiently/Improperly	1%	-%	1%	-%	2%
Police/CHP/Enforcement	1%	-%	0%	-%	1%
Other	3%	41%	4%	43%	3%
Don't know	57%	-%	52%	-%	57%
Base	800	300	200	245	600

- Respondents 55 years of age or older evidenced a very low awareness of how FasTrak revenues are spent. Seventy-four percent (74 percent) of them said they did not know how the monies from FasTrak were spent.

Respondents were then asked: "In your opinion, how *should* the money collected from FasTrak be spent?" Table 13 displays the respondents' preferences. Principally, the respondents prefer spending the FasTrak revenues to improve and maintain existing freeways and Managed Lanes. Secondarily, they favor funding new Managed Lane and regular lane construction (both the I-15 and all San Diego freeways) with the FasTrak revenues. Specifically, 15 percent of them suggested allocating these funds to extend the 1-15 Managed Lanes. Few of them elected to spend FasTrak monies to fund the Inland Breeze express bus (2 percent) or any other express bus service (6 percent).

Two noteworthy differences appeared in the spending preferences the respondents identified in this study and those they identified in the 1999 study. More of them now compared to two years ago would apportion the FasTrak revenues to improve and maintain all San Diego freeways and the I-15 regular lanes.

Table 13:
How Should Spend FasTrak Revenues

	Total	FasTrak Customer		I-15 Regular Lane	
	Fall 2001	Fall 1999	Fall 2001	Fall 1999	Fall 2001
Improve/Maintain all San Diego freeways	31%	16%	22%	17%	31%
Improve/Maintain I-15 regular lanes	28%	18%	27%	18%	28%
Improve/Maintain I-15 Express Lanes	20%	21%	20%	19%	20%
Add more/Extend I-15 Express Lanes	15%	23%	23%	16%	15%
Add more I-15 regular lanes	12%	9%	8%	12%	12%
Add more regular freeway lanes to all San Diego	8%	5%	6%	5%	9%
Other express bus service	6%	3%	5%	2%	6%
Add carpool lanes to other San Diego freeways	6%	3%	9%	4%	6%
Police/CHP/Enforcement	2%	-%	1%	-%	2%
Inland Breeze Bus	2%	9%	2%	2%	2%
Trolley/Rail	1%	-%	1%	-%	1%
Other	3%	46%	5%	49%	3%
Don't know	9%	-%	6%	-%	9%
Base	800	441	200	527	600

Other findings revealed that,

- Respondents with annual incomes of $70,000 or more a year expressed more interest in using the FasTrak funds to extend the I-15 Managed Lanes than did respondents earning less than $70,000 a year.
- More Asian Americans (21 percent) than either Hispanics (10 percent) or Caucasians (8 percent) expressed uncertainty about how to use the FasTrak revenues.

Safety of Managed Lanes

Addressing concerns about safety, the respondents were asked to compare the safety of traveling in the Managed Lanes to the safety of traveling in the regular freeway lanes. Specifically, they were asked: "How would you compare the safety of traveling in the Express Lanes to the safety of the regular freeway lanes …

Much less safe than the regular freeway lanes
Somewhat less safe than the regular freeway lanes
About as safe as the regular freeway lanes
Somewhat safer than the regular freeway lanes
Much safer than the regular freeway lanes?"

Most of the respondents consider travel in the I-15 Managed Lanes as safe or safer than travel in the regular lanes of the I-15. In Table 14, 24 percent of the respondents think the Managed Lanes are "somewhat safer" and 39 percent considered them "much safer" than the regular lanes of the I-15. Twenty-two percent (22 percent) of them considered the Managed Lanes "about as safe" as the regular Lanes. This compares with 4 percent who deemed them "somewhat less safe" and 3 percent who felt they are "much less safe" than the regular lanes.

Table 14:
Safety of Managed Lanes Compared to the Regular I-15 Freeway Lanes

	Much Less Safe	Somewhat Less Safe	About as Safe	Somewhat Safer	Much Safer	Don't Know
Total	3%	4%	22%	24%	39%	7%
Age						
18-to-24 years old	7%	7%	26%	26%	34%	0%
25-to-34 years old	2%	2%	30%	25%	37%	5%
35-to-44 years old	2%	5%	21%	21%	41%	10%
45-to-54 years old	4%	4%	21%	29%	34%	8%
55 and older	5%	1%	17%	19%	51%	8%
Base: 800						

- In Particular, respondents 55 years of age or older said that travel in the Managed Lanes was "much safer" than travel in the regular lanes.
- Not surprisingly, more FasTrak customers (79 percent) than I-15 regular lane travelers (64 percent) consider traveling in the Managed Lanes safer than traveling in the regular lanes. Interestingly, 8 percent of the FasTrak customers do not deem the Managed Lanes as safe as the regular lanes.
- No significant differences exist based on income and ethnicity.

Enforcement of Managed Lanes

The respondents were also asked their opinion about the enforcement of the Managed Lanes eligibility requirements. They were asked the question: "The California Highway Patrol provides enforcement for the Managed Lanes to make sure only carpoolers and toll payers who are driving alone use the Managed Lanes. Do you think the enforcement is very effective, somewhat effective, somewhat ineffective, or very ineffective?" Few of the respondents expressed displeasure with the CHP's enforcement of FasTrak—14 percent considered the enforcement ineffective. Rather than judging it effective or ineffective, a significant proportion of the respondents (29 percent) said they could not evaluate the efficacy of the enforcement. Perhaps lacking information on the enforcement policies and procedures of the Managed Lanes, they felt unable to express an opinion. As Figure 9 depicts, 57 percent of the respondents (25 percent very effective and 32 percent "somewhat" effective) think that the CHP effectively enforces FasTrak eligibility requirements.

Figure 9:
Effectiveness of Managed Lane Enforcement

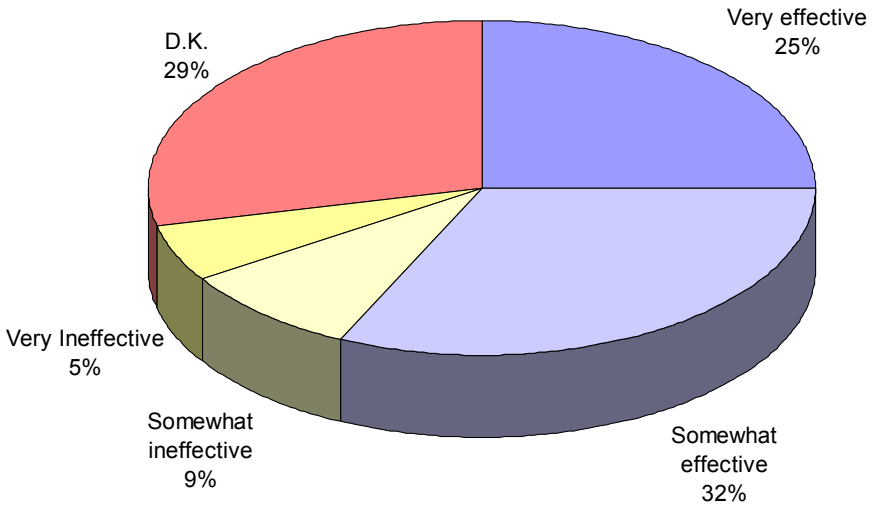


Table 15 shows the following.

- Respondents 45 years of age and older knew less about the effectiveness of the enforcement than respondents under age 45 did.
- No important differences exist in perceptions of the efficacy of the enforcement between different income and ethnic groups.

Table 15:
Effectiveness of Managed Lane Enforcement

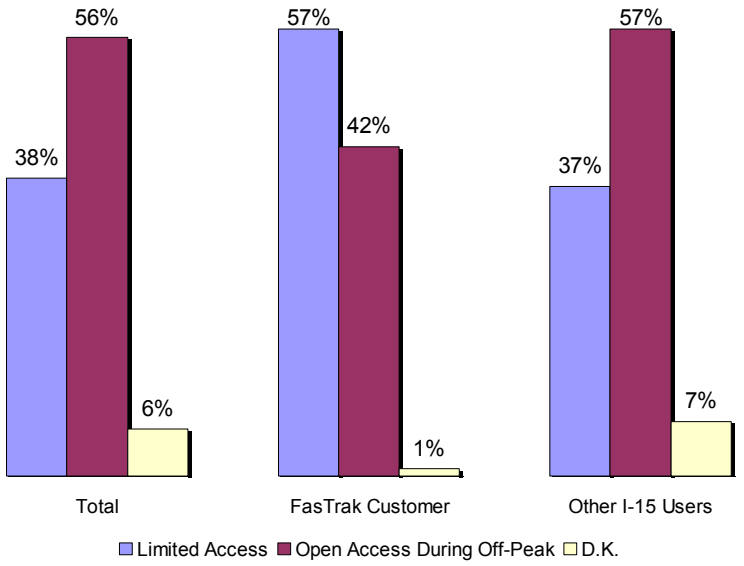
	Effective	Ineffective	Don't know
Total	57%	14%	29%
Ethnicity			
Asian	65%	19%	16%
Hispanic	64%	14%	22%
Caucasian	55%	15%	30%
Income			
Less than $40,000	52%	21%	27%
$40,000 to $70,000	54%	10%	36%
$70,000 to $100,000	65%	13%	22%
More than $100,000	56%	16%	28%
Age			
18-to-24 years old	66%	12%	22%
25-to-34 years old	64%	16%	20%
35-to-44 years old	62%	13%	25%
45-to-54 years old	52%	14%	33%
55 and older	46%	15%	40%
Base: 800			

Managed Lane Operational Preferences

Currently, the reversible Managed Lanes operate in one direction only during the peak commute times. Only carpools, transit riders, and SOV drivers who pay a toll can access the Managed Lanes during these limited hours of operation. The survey tested the operational concept of opening the Managed Lanes to all drivers during off-peak commute times. The respondents were asked the question, “Which of the following statements comes closest to your own opinion: The Express Lanes should *only* be used by carpools, buses, and people who drive alone who pay a fee to use the lanes, or during the peak commute times in the morning and afternoon the Express Lanes should only be used by carpools, buses, and people who drive alone who pay a fee to use the lanes. The rest of the time the lanes should be open for anyone to use them without paying a fee.” The results in Figure 10 indicate that more of the respondents (56 percent) preferred expanding access to the Managed Lanes to all I-15 travelers during off-peak periods. Thirty-eight percent (38 percent) of them opted for the more limited access of the current system.

Opinions on the question of access differed markedly between FasTrak customers and I-15 regular lane users. A majority of the respondents with a FasTrak account preferred to limit access to the Managed Lanes. By contrast, respondents without a FasTrak account preferred opening access to all I-15 travelers during off-peak commute times.

Figure 10:
Managed Lane Operational Preferences



- Preferences in the operation of the Managed Lanes do not vary by income or ethnicity.
- More 35-to-44 year old respondents (48 percent) than respondents in other age groups favored retaining limited access to the Managed Lanes.
- Respondents with only one vehicle in the household (66 percent) and respondents with no children under age 16 living in the household (61 percent) voiced support for opening the Managed Lanes to all travelers during non-peak operating hours.

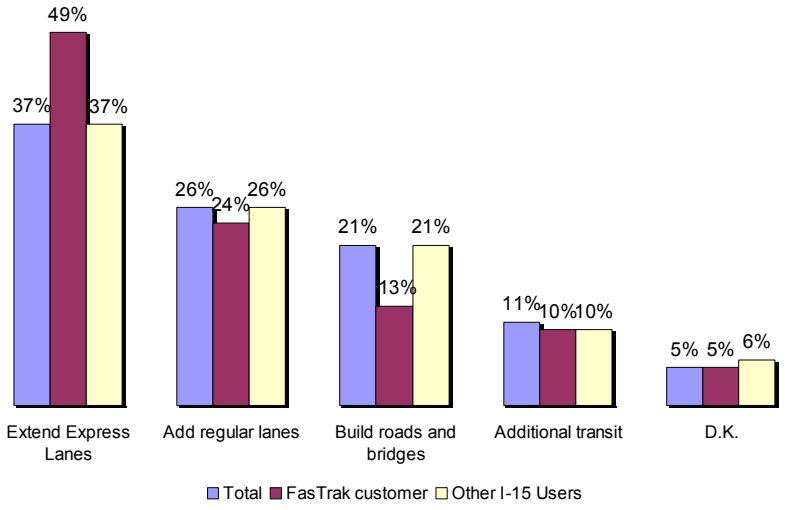
B. Attitudes Towards Managed Lanes Extension

This section reports the results to a series of attitudinal questions about the proposed extension of the Managed Lanes.

Solutions to Reduce Congestion on I-15

Respondents were asked the question, "Which of the following do you think would be the single most effective way to reduce existing and future congestion on this section of the I-15 between 5:45 and 9:15 a.m.?" The interviewers then read them the following list of options to reduce congestion: add additional regular lanes to the I-15, provide additional transit service, build additional roads and bridges over the I-15 that would allow drivers to make local trips without getting on the I-15, or extend the Managed Lanes to Escondido. In Figure 11, none of the options presented to the respondents attracted clear majority support. A plurality of the respondents (37 percent) opted to extend the Managed Lanes to Escondido as the most effective way to reduce congestion on the I-15 during the peak morning commute. However, constructing additional regular lanes and building additional roads and bridges over the I-15 attracted noteworthy interest from the respondents.

Figure 11:
Single Most Effective Way to Reduce Congestion on I-15



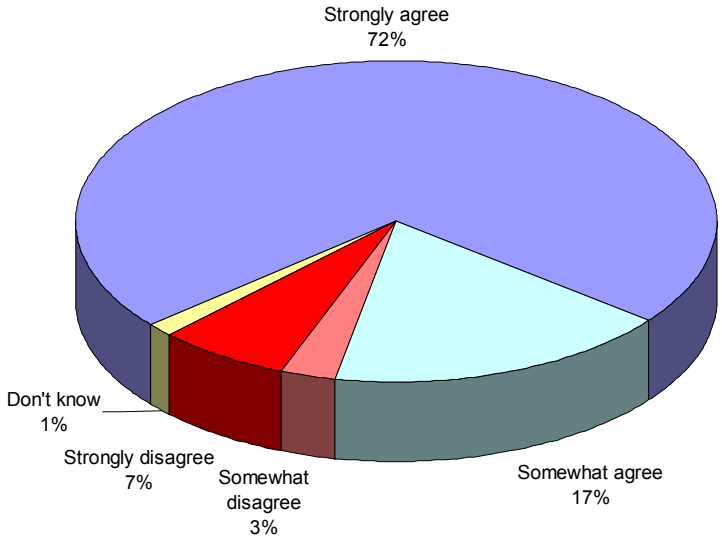
In addition,

- More FasTrak customers (49 percent) than regular lane users (37 percent) selected the Managed Lanes Extension as the best solution to the congestion problem.
- Respondents 18-to-24 years old expressed significant interest in constructing additional regular lanes.
- Interest in providing additional transit is notably lower among respondents with only a high school diploma.
- Preferences for the best alternative to reduce congestion on the I-15 during the peak morning commute do not significantly vary by ethnicity or income.

Perceptions of Need for Extension

Respondents were asked to agree or disagree with the statement, "There is a need to extend the Express Lanes." Eighty-nine percent (89 percent) of the respondents agreed that there is a need to extend the Managed Lanes. As Figure 12 indicates, 72 percent of the respondents "strongly" agreed with this statement.

Figure 12:
There is a Need to Extend the Managed Lanes



- Agreement cuts across all demographic groups.
- Ninety-five percent (95 percent) of the respondents living in Escondido expressed the need to extend the Managed Lanes.
- Both FasTrak customers (95 percent) and regular lane users (89 percent) overwhelming agreed with the need to extend the Managed Lanes.

Favor or Oppose the Managed Lanes Extension

The respondents in the study favored extending the Managed Lanes. They were asked: "Now I would like to read you a brief description of a project that will extend the existing Express Lanes on the I-15 freeway. When completed, the project will provide four lanes that will extend from SR 163 in Kearny Mesa north to SR 78 in Escondido. The project will have multiple access points and be open in both directions all day long. Carpoolers will continue to travel free, there will be new rapid express bus service, and people who are driving alone can pay a toll to use the Express Lanes. Based just on this information, do you strongly favor, somewhat favor, somewhat oppose, or strongly oppose this project?" Fully 84 percent of the respondents said they favored the Managed Lanes Extension compared to 13 percent of them who opposed it. A majority of the respondents (59 percent) indicated that they "strongly" favored building the extension. Another 25 percent of them "somewhat" favored extending the Managed Lanes to SR 78. Just 7 percent of the respondents expressed strong opposition to the project.

A telephone survey cannot convey the complete details of a project like the proposed Managed Lanes extension. The findings in Table 16 show extensive, broad based support for the Managed Lanes extension project as outlined in the question. At least 50 percent of every demographic subgroup displayed in the table said that they "strongly" favored extending the Managed Lanes to SR 78 in Escondido. Even 73 percent (34 percent "strongly" favored) of the respondents who indicated that they were unlikely to use the extension expressed support for it.

Table 16:
Favor or Oppose the Managed Lanes Extension

	Strongly Favor	Somewhat Favor	Somewhat Oppose	Strongly Oppose	D.K.
Total	59%	25%	6%	7%	3%
Ethnicity					
Asian	55%	33%	6%	6%	0%
Hispanic	66%	24%	5%	3%	2%
Caucasian	62%	24%	5%	7%	3%
Income					
Less than $40,000	59%	23%	9%	5%	4%
$40,000 to $70,000	54%	30%	6%	8%	2%
$70,000 to $100,000	66%	21%	3%	6%	4%
More than $100,000	67%	20%	5%	5%	3%
Age					
18-to-24 years old	54%	34%	3%	5%	4%
25-to-34 years old	63%	27%	5%	2%	2%
35-to-44 years old	61%	26%	7%	6%	1%
45-to-54 years old	55%	24%	8%	11%	3%
55 and older	62%	18%	2%	12%	6%
Household size					
1 person	51%	25%	7%	13%	3%
2 people	55%	26%	6%	10%	4%
3 or more	63%	25%	5%	5%	2%
Licensed drivers					
1	52%	25%	9%	9%	4%
2	61%	24%	5%	7%	3%
3 or more	60%	27%	4%	7%	1%
Children					
None	56%	25%	6%	9%	3%
1 child	56%	29%	4%	6%	4%
2 or more children	72%	21%	5%	3%	0%
Education					
H.S. degree	63%	28%	4%	5%	0%
Some College/Vocational	55%	31%	5%	7%	2%
College graduate	64%	20%	5%	8%	3%
Postgraduate degree	51%	26%	10%	8%	5%
Base: 800					

Like and Dislike about the Managed Lanes Extension

Recognizing that they only possessed a limited understanding of the project, yet desiring to better understand their likes and dislikes about the proposed Managed Lanes Extension, the respondents were asked two open-end questions about the project. First, they were asked: "What do you *like most* about the extension, that is, what do you think would be the benefits?" Then they were asked, "What do you *like least* about the extension, that is, what do you think would be the drawbacks?"

Like Most About Extension

As the numbers in Table 17 indicate, two related reasons manifestly drive their support for the Managed Lanes extension. The respondents firmly believe that extending the Managed Lanes will reduce congestion and save them time. Every demographic subgroup in the sample voiced the same feelings in the same proportions. Very few of the respondents (5 percent) insisted that there was nothing they liked about the extension.

Table 17:
What Like Most About Extension

	Total
Reduce Traffic Congestion on I-15/Regular lanes	64%
Save Time/Faster Commute/Faster in Emergency/Less Waiting	21%
Extends Further North/Length/Faster Commute for Northern Commuters	7%
Fewer Accidents/Safer/Optional Route Around Accidents	6%
Provide Multiple Access Points	6%
Encourage Carpooling	5%
Give More Commuters Access to Express Lanes	4%
Adds Options to Commute/Can Opt to Pay	2%
Reduce Emissions/Less Gas Use	2%
Commuters Bypass Traffic	2%
Open 24 Hours Both Directions	1%
Less Frustration/Road Rage/Happier Commuters	1%
Improve Business Climate/More Inviting to Industry/Benefits	1%
Reduce Traffic on Surface Streets and Ramps	*%
Other	4%
No Benefits/Nothing	5%
Don't Know	2%
Base: 800	

* Denotes less than 0.5%

- In particular, respondents 18-to-34 years of age liked the prospect of saving time with the extension.
- The further north the respondent lives, the more they felt the extension would shorten the time it takes for them to make their commute.

Like Least About Extension

The respondents cited a number of issues they least liked about the proposed extension of the Managed Lanes. Table 18 details the respondents' concerns. The principal concern they mentioned actually complements what they like about the extension. They fear more delays resulting from construction of the extension. Their other major concern is also construction related. They expressed concerns about the cost of construction and the source of those construction funds—the taxpayers. They also listed concerns about the expense of the tolls, the possibility that the extension will actually increase congestion, and doubts about the sufficiency of the access points. A few considered the extension a temporary fix to the congestion problems. Twenty-one percent (21 percent) of the respondents volunteered that nothing about the proposed extension bothered them.

Table 18:
What Like Least About Extension

	Total
Construction Related Congestion/Construction Time Too Long	21%
Expensive to Build/Taxes Pay for Construction	17%
Expensive to Use/Don't Like Paying Tolls	8%
Increase Congestion General	6%
Not Enough Access Points	4%
Unfair/Benefits the Rich	4%
Too Little/Temporary Fix	4%
Prefer Build Train/Trolley	3%
Too Much Development/Too Many People	3%
Traffic Jams at Entrances/Merging Problems	2%
No Room for New Lanes	2%
Negative Environmental Impact/Natural Habitats Affected	2%
People Will Not Carpool	2%
Not Enough People Would Use It	1%
Double Taxation	1%
Noise Pollution/Traffic Noise	1%
More Accidents	1%
Difficulty Enforcing Legitimate Access	1%
Increase Congestion on Surface Streets	*%
Nothing	21%
Other	7%
Don't Know	5%
Base: 800	

* Denotes less than 0.5%

Among the sample subgroups,

- Younger respondents 18-to-24 years old expressed more concern about construction-related delays and general increases in congestion resulting from the extension.
- More respondents with a college or postgraduate degree than those with less formal education wondered whether the project included enough access points.

- Single respondents 55 year of age or older who are widowed, divorced, or separated wondered about the cost of construction and the source of the funds for the construction.

Managed Lanes: Time Savings or Trip Reliability

Many respondents suggested that they think in terms of saving time as opposed to consistency in arrival time. The respondents were asked the question, "What would be more important to you saving the 40 minutes or knowing when you will arrive at your destination?" As the results in Table 19 indicate, two-thirds (65 percent) of the respondents think about saving time. Twenty-seven percent (27 percent) of the respondents think in terms of arriving at a consistent time.

Table 19:
Managed Lanes: Time Savings or Trip Reliability

	Time Saving	Consistent Arrival	D.K.
Total	65%	27%	8%
Ethnicity			
Asian	81%	15%	4%
Hispanic	59%	31%	11%
Caucasians	65%	27%	8%
Income			
Less than $40,000	61%	36%	2%
$40,000 to $70,000	58%	29%	13%
$70,000 to $100,000	69%	24%	7%
More than $100,000	68%	25%	7%
Base: 800			

- Significantly more Asians in the study valued saving time than either Hispanics or Caucasians.
- More respondents with annual household incomes over $70,000 than respondents earning under $70,000 a year placed importance on saving time rather than on a consistent arrival time.
- Saving time is particularly important to respondents 35-to-44 years old (74 percent).

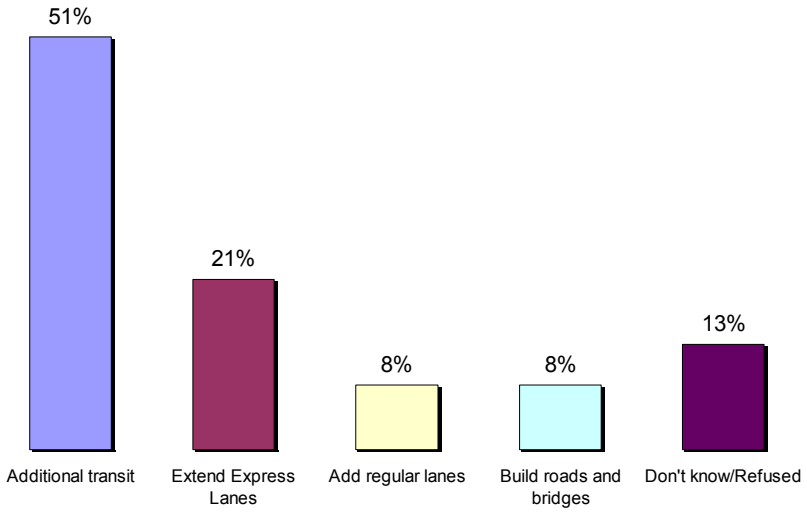
Transit on the Managed Lanes

Express bus service does not interest the vast majority of the sample. While not unimportant, particularly if they all started using the express bus rather than drive their cars, just 11 percent of the respondents see additional transit as the solution to the peak morning commute problem (See Figure 11). When asked what they liked most about the proposed extension, none of the respondents mentioned the "new rapid express bus service." Including the express bus in the extension package persuades between 5 percent and 8 percent of the respondents to support the extension. These respondents might otherwise oppose extending the Managed Lanes.

The proposed extension of the Managed Lanes contains provisions for expanded express bus service. The 11 percent of the respondents who felt that additional transit was the most

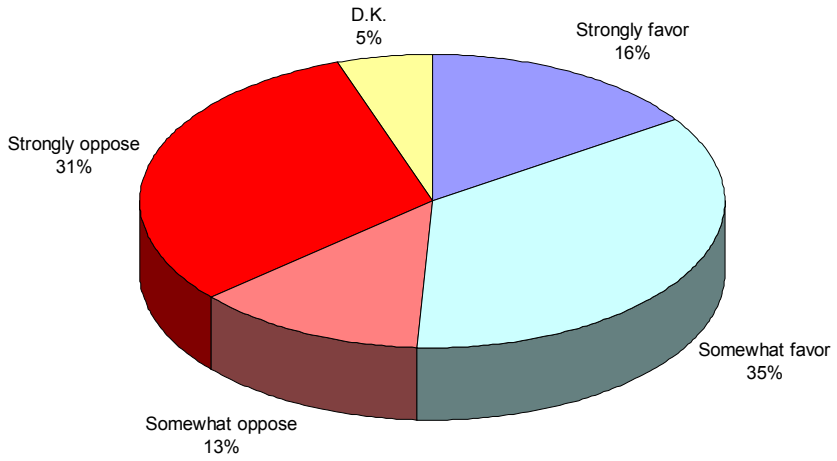
effective approach to reducing congestion were asked the question: "If you learned that the Express Lanes project includes high quality rapid transit service that would run every 15 minutes with only limited stops and that would not leave the Express Lanes, which do you then think would be the best way to reduce existing and future congestion?" As Figure 13 indicates, 21 percent of these respondents, given this reminder, supported the Managed Lanes Extension as the best solution to reducing congestion. However, 51 percent of these respondents persisted in their preference for additional transit without extending the lanes. These strong transit-only advocates represent 5 percent of the total sample. While the small sample size constrains any in-depth analysis of this group, two noteworthy observations bear mentioning: 1) none of them currently ride the bus (they generally drive alone in the regular lanes) and 2) over half of them live in the zip codes 92126, 92131, and 92129.

Figure 13
If Learn Extension Include High Quality Rapid Transit
Single Most Effective Way to Reduce Congestion on I-15



The interviewers gave those respondents who opposed or offered no opinion about the extension of the Managed Lanes (16 percent of the sample) some additional information related to the express bus service. They read the question: "If you learned that the toll revenues from FasTrak will be used to support high quality express bus service along the extension, would you then strongly favor, somewhat favor, somewhat oppose, strongly oppose this project?" As Figure 14 shows, upon learning that FasTrak toll revenues will help fund high quality express bus service, 51 percent of the respondents who initially opposed the extension would now favor it. These 64 respondents comprise 8 percent of the total sample. However, most of those who switched only "somewhat" favored the extension.

Figure 14:
Favor or Oppose Extension If Toll Revenues Used to Support High Quality Managed Bus Service Along Extension



The results in Table 20 show how the opinions of the respondents who initially opposed the Managed Lanes extension shifted when presented with the additional information about funding the express bus service with FasTrak revenues. Over half of those who "somewhat" opposed the project shifted to "somewhat" favor. Just over half of the respondents who "strongly" opposed the extension still "strongly" opposed it after learning about the use of FasTrak revenues to fund the express bus service.

Table 20:
Those Who Opposed Extension Given Additional Information About Express Bus

	Strongly Favor	Somewhat Favor	Somewhat Oppose	Strongly Oppose	D.K.
Somewhat oppose	15%	57%	15%	11%	2%
Strongly oppose	20%	14%	14%	53%	0%
D.K.	5%	50%	5%	15%	25%
Base: 126					

Usage of Managed Lanes Extension

Nineteen percent (19 percent) of the respondents currently use the existing Managed Lanes either as SOV drivers or as part of a carpool. When asked, "Would you be very likely, somewhat likely, somewhat unlikely, or very unlikely to use these extended Express Lanes?" a notably higher 70 percent of the respondents claimed they would be likely to use the extension. Forty-two percent (42 percent) of them stated that they would be "very" likely to use the extension while 28 percent of them said they would be "somewhat" likely to use it. Their interest in using the extension underscores their desire for some solution to the congestion problems on the I-15. The tolls will doubtless mitigate demand for the extension.

Table 21 provides an analysis of the findings to this question by several demographic subgroups. The numbers in the table indicate that a clear majority in each subgroup suggested they would be likely to use the Managed Lanes Extension.

Table 21:
Likely or Unlikely to Use Managed Lanes Extension

	Likely	Unlikely	D.K.
Total	70%	28%	3%
Age			
18-to-24 years old	81%	15%	3%
25-to-34 years old	77%	21%	2%
35-to-44 years old	68%	31%	1%
45-to-54 years old	70%	27%	4%
55 and older	60%	35%	5%
Ethnicity			
Asian	77%	21%	2%
Hispanic	86%	12%	2%
Caucasian	70%	28%	2%
Licensed drivers			
1	61%	35%	3%
2	71%	26%	3%
3 or more	74%	25%	1%
Education			
H.S. degree	82%	15%	3%
Some College/Vocational	70%	28%	2%
College graduate	70%	27%	3%
Postgraduate degree	60%	38%	3%
Base: 800			

Please note in Table 21 that,

- Those groups who claimed they were more likely to use the extension included 18-to-34 years olds, Hispanics, households with at least two licensed drivers, and those who attained no more than a high school degree.

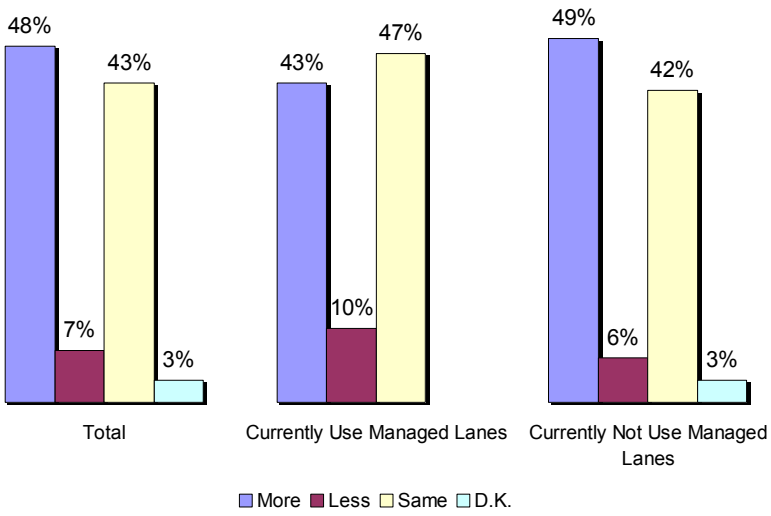
Those respondents who said they were unlikely to use the extended Managed Lanes were asked the follow-up question: “Why would you be unlikely to use the extended Express Lanes?” As Table 22 shows, several issues explain why respondents do not anticipate using the extended Managed Lanes. The cost of the tolls tops their list of reasons (the sample size is very small, but these respondents appear to be younger, Hispanic, and less affluent). They also said they do not or cannot carpool or they live south of the extension (these respondents do live more southerly in the zip codes 92126, 92131, 92064, and 92128). Some only access the I-15 for one or two exists (parents with children), or, not knowing the access point, they believe they will not have convenient access to the extension. A few will not use it because they feel it is not necessary to build the extension.

Table 22:
Why Unlikely to Use Managed Lanes Extension

	Total
Too Expensive	31%
Don't or Can't Carpool	23%
Live South of Extension	14%
Short Commute/One or Two Exits	14%
Not Needed	14%
Don't Have Access/Access Points Not Convenient	8%
Reverse Commute/Time of Day	5%
Other	9%
Don't Know	1%
Base: 221	

The respondents were also asked: "With the extension, would you use the Express Lanes more than you currently use them, less than you currently use them, or about the same amount as you currently use them?" Figure 15 shows that 48 percent of the respondents overall said they would use the extended lanes more than they currently use the existing Managed Lanes. Forty-three percent (43 percent) of them said they will not change their usage of the Managed Lanes, and 7 percent claimed they would use the extended Managed Lanes less frequently than they use the existing Managed Lanes. No significant differences exist between those respondents who currently use the Managed Lanes and those who do not currently use them in their projected usage of the extended lanes. In Figure 15 note that 43 percent of the respondents who currently use the Managed Lanes stated that they would use the extended lanes more often. By comparison, 49 percent of those who currently do not use the Managed Lanes indicated that they would begin using them after the extension to SR 78 in Escondido is completed.

Figure 15:
With Extension Use Managed Lanes More, Less, Same as Currently Use Them



How Access Managed Lanes Extension

The respondents selected a number of means to access the Managed Lanes extension. They were presented with the options in the question, "With the Express Lane extension would you …

Carpool to use the extended lanes
Use an existing FasTrak transponder in the extended lanes
Get a FasTrak transponder to use the extended lanes
Ride the new express bus service to use the extended lanes
Not use the extended lanes"

Table 23 shows that 35 percent of the respondents said they would carpool to use the extended lanes. Twenty-eight percent (28 percent) of them said they planned to get a FasTrak transponder. Another 13 percent of them stated that they would use the new express bus service while 11 percent of them planned on using an existing FasTrak transponder. Just over one quarter (26 percent) of the respondents do not plan to use the extended Managed Lanes.

Interestingly, 34 percent of those who typically drive alone on the I-15 claimed that they would carpool to use the extended Managed Lanes. The respondents who already carpool, at least occasionally, plan to use a carpool to access the extended lanes.

Table 23:
How Use Extended Managed Lanes

	Total	SOV Driver	Carpool/ SOV Driver	Carpool Only
Carpool to use the extended lanes	34%	28%	50%	73%
Get a FasTrak transponder	28%	29%	31%	11%
Ride the new express bus service	13%	12%	19%	12%
Use an existing FasTrak transponder	11%	11%	18%	2%
Not use the extended lanes	26%	29%	14%	12%
Don't know/Refused	8%	8%	12%	9%
Base:	800	649	77	79

C. Fairness and Equity Issues

This section reports the results to a series of attitudinal questions about the fairness and equity of the FasTrak program.

Fair to Purchase What Others Cannot Purchase

Four percent (4 percent) of the respondents suggested that the extension unfairly benefited the rich. Addressing the concept of fairness, respondents were asked to agree or disagree with the statement, "It's fair to pay for what you get even if others can't." Seventy-one percent (71 percent) of the respondents agreed with the statement—40 percent "strongly" agreed with it and 31 percent "somewhat" agreed with it. Juxtaposed to this 71 percent are the 25 percent of the respondents (15 percent "strongly" disagreed) who considered money an unacceptable barrier to entry. Table 24 displays the findings by pertinent demographic groups.

Table 24:
Fair to Purchase What Others Cannot Purchase

	Agree	Disagree	D.K.
Total	71%	25%	4%
Income			
Less than $40,000	69%	27%	4%
$40,000 to $70,000	70%	25%	6%
$70,000 to $100,000	71%	26%	3%
More than $100,000	77%	22%	1%
Age			
18-to-24 years old	81%	19%	0%
25-to-34 years old	74%	23%	3%
35-to-44 years old	75%	24%	1%
45-to-54 years old	67%	28%	4%
55 and older	63%	28%	9%
Ethnicity			
Asian	79%	19%	2%
Hispanic	62%	38%	0%
Caucasian	73%	23%	4%
Base: 800			

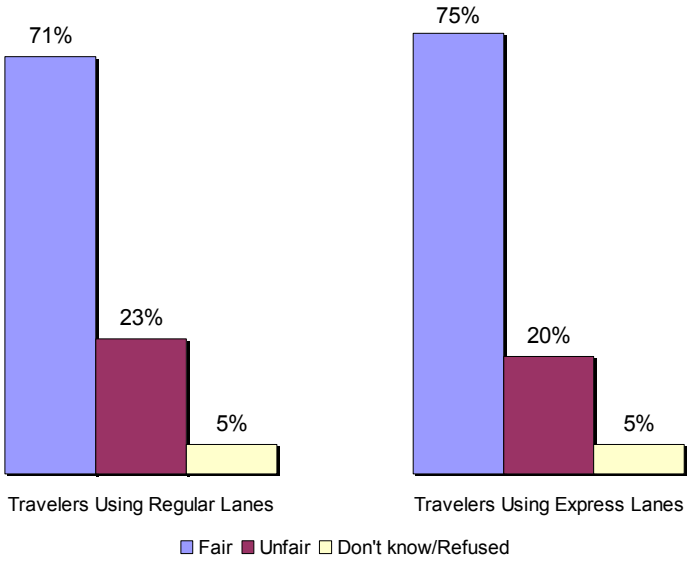
Recalling that at least 62 percent of each demographic subgroup agreed with the statement, the following observations occur from the data in the table:

- Fewer respondents earning less than $100,000 agreed with the statement.
- As the age of the respondents increased their agreement with the statement decreased.
- Significantly more Hispanics disagreed with this concept than either Asians or Caucasians.
- Notably more widowed, divorced, or separated respondents disagreed with the statement.

Fairness to Regular Lane and Managed Lane Drivers

The respondents were asked the questions: "Overall, do you believe having FasTrak on this extension would be fair or unfair for travelers using the *regular* lanes of I-15?" and "Overall, do you believe having FasTrak on this extension would be fair or unfair for travelers using the I-15 Express Lane extension?" As Figure 16 portrays, a solid majority of the respondents felt that having access to and using FasTrak on the proposed extension is fair to both travelers using the regular lanes (71 percent) and travelers using the Managed Lanes (75 percent).

Figure 16:
Having FasTrak on Extension Fair or Unfair



The data also shows that:

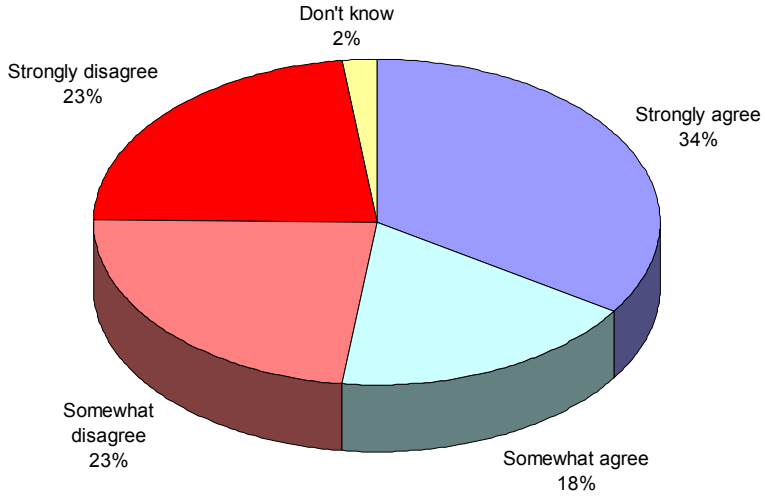
- Perceptions of fairness decrease among older respondents. Significantly fewer of the respondents 55 years of age or older think the FasTrak program is fair to regular lane travelers (59 percent) or to Managed Lane travelers (64 percent).
- Interestingly, respondents with an annual household income between $40,000 and $70,000 are more likely to consider the use of FasTrak fair to regular lane users (83 percent) and Managed Lane users (82 percent) than are other respondents.
- Hispanics, Asian, and Caucasians do not differ significantly in their perception of the fairness of the use of FasTrak to regular lane users and Managed Lane users.
- Among those respondents who disagreed with the statement, "it's fair to pay for what you get even if others can't," 36 percent of them felt that using FasTrak was fair to regular lane users and 39 percent of them felt that using FasTrak was fair to Managed Lane users.

Managed Lane Toll Unfair Double Taxation

In the focus group conducted with FasTrak customers, several of the participants insisted that charging SOV drivers a toll to access the Managed Lanes represented a double tax. These FasTrak customers reasoned that they paid to build the Managed Lanes with their tax dollars and now they must pay again (unfairly in their mind) to access the lanes. Exploring the extent of

this attitude required a question in the telephone survey. The respondents were asked to agree or disagree with the statement, "Paying taxes and paying to use the Express Lanes is unfair double taxation." The opinions of the respondents split almost equally, suggesting divisiveness in their perceptions of the toll as a form of double taxation. In Figure 17, 52 percent agreed with the statement compared to 46 percent who disagreed with it. One third (34 percent) of the respondents felt "strongly" that the toll was, in effect, "double taxation." By contrast, 23 percent of them felt just the opposite. They did not view the toll as an unfair "double tax."

Figure 17:
FasTrak Toll Unfair Double Taxation



As Figure 18 depicts, significantly more FasTrak customers (61 percent) than I-15 regular lane users (46 percent) disagreed that the FasTrak toll represents an unfair double tax.

Figure 18:
FasTrak Toll Unfair Double Taxation by FasTrak Ownership

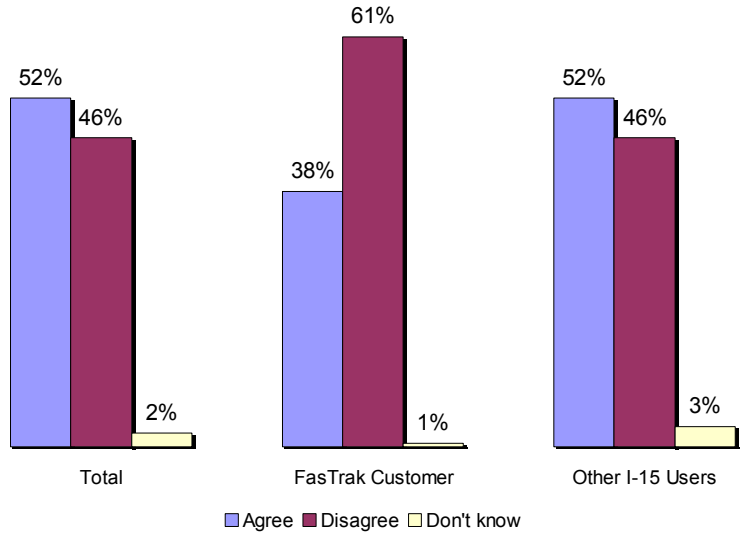


Table 25 contains several interesting findings,

- More Asian Respondents agreed that the toll represents a double taxation than did Caucasian respondents. In fact, more Caucasians (26 percent) than either Asians (11 percent) or Hispanics (16 percent) "strongly" disagreed with the statement.
- Respondents with annual incomes between $40,000 and $70,000 expressed more agreement with this concept than respondents earning between $70,000 and $100,000 a year.
- Opinions differed by age. More of the respondents 45 year of age or older "strongly" agreed that the toll is a double tax.
- Sixty percent (60 percent) of the households with two or more children disagreed with the statement.

Table 25:
FasTrak Toll Unfair Double Taxation

	Strongly Agree	Somewhat Agree	Somewhat Disgree	Strongly Disagree	D.K.
Total	34%	18%	23%	23%	3%
Ethnicity					
Asian	38%	29%	21%	11%	2%
Hispanic	38%	21%	26%	16%	0%
White	31%	16%	24%	26%	3%
Income					
Less than $40,000	31%	17%	23%	23%	6%
$40,000 to $70,000	37%	21%	22%	17%	3%
$70,000 to $100,000	28%	18%	22%	31%	1%
More than $100,000	35%	13%	29%	22%	2%
Age					
18-to-24 years old	26%	19%	29%	24%	2%
25-to-34 years old	29%	23%	26%	18%	4%
35-to-44 years old	30%	18%	26%	25%	1%
45-to-54 years old	40%	15%	22%	21%	3%
55 and older	42%	14%	16%	27%	2%
Children					
None	37%	19%	19%	22%	3%
1 child	38%	14%	23%	24%	1%
2 or more children	19%	18%	36%	24%	3%
Base: 800					

D. Pricing and Time Value

This section reports the results to a series of behavioral questions exploring the value of the respondents' time and their willingness to pay to save time by using the extended Managed Lanes. The respondents were read the question, "Thinking about occasions when you are driving alone and might use the extended Managed Lanes on the I-15, what is the most you would be willing to pay one way for a weekday trip to save 15 minutes, 20 minutes, 25 minutes, and 30 minutes?" The figures in Table 26 indicate the mean and median amounts respondents would pay to save the time indicated at the top of each column. The mean calculation includes those respondents who said they would not be willing to pay anything to save the specified time. The average amount the respondents are willing to pay for each timesaving increased significantly. Table 26 also lists the proportion of respondents unwilling to pay anything for the hypothetical timesaving. The share of respondents who are unwilling to pay something to save the stipulated time declines from 25 percent of them at 15 minutes to 17 percent of them at 30 minutes.

Table 26:
Highest Amount Willing to Pay One-Way for Weekday Trip to Saving

	15 minutes	20 minutes	25 minutes	30 minutes
Mean	$1.56	$1.94	$2.35	$3.01
Median	$1.00	$1.00	$1.25	$1.50
FasTrak Account				
Yes	$2.32	$2.59	$3.07	$3.41
No	$1.54	$1.93	$2.34	$3.00
Pay nothing	25%	21%	20%	17%
Base: 800				

- Respondents with a FasTrak account placed a greater value on their timesaving than respondents who do not have a FasTrak account.

Table 27 displays the average value the respondents placed on each incremental time saving, e.g., they placed a value of $0.38 on the saving of 5 additional minutes when the hypothetical time savings went from 15 to 20 minutes.

Table 27:
Increase in Willingness to Pay by Time Savings

	Time Savings	Difference
15 to 20 minutes	5 minutes	$0.38
15 to 25 minutes	10 minutes	$0.80
15 to 30 minutes	15 minutes	$1.45
20 to 25 minutes	5 minutes	$0.41
20 to 30 minutes	10 minutes	$1.07
25 to 30 minutes	5 minutes	$0.66
Base: 800		

- Significant proportions of certain demographic subgroups placed no value (unwilling to pay anything to save time) on the four timesaving scenarios. Those most unwilling to pay to save time include respondents 55 years of age or older, respondents earning between $40,000 and $70,000 annually, and respondents who are Caucasian.
- The mean amount the respondents are willing to pay for each of the four timesaving scenarios does not vary significantly by income or ethnicity.

Figure 19 displays a type of demand curve for each timesaving scenario for all respondents in the survey. The demand curves were derived using the responses to these four questions. The demand curve shifts to the right with each 5-minute timesaving increment, i.e. respondents will pay more to save the additional time. Looking at Figure 19, note that as the toll increases (see axis labeled "Toll") the number of respondents willing to pay that toll to obtain the timesaving (see axis labeled "Willing to Pay") decreases. Not surprisingly, at no charge (labeled "$0.00"), all respondents would use the Managed Lanes if it would save them time. At a $4.00 toll, the number of respondents willing to pay drops precipitously to 6 percent to save 15 minutes, 8 percent to save 20 minutes, 12 percent to save 25 minutes, 16 percent to save 25 minutes.

Figure 19:
Highest Amount Willing to Pay One-Way for Weekday Trip
(All Respondents n=800)

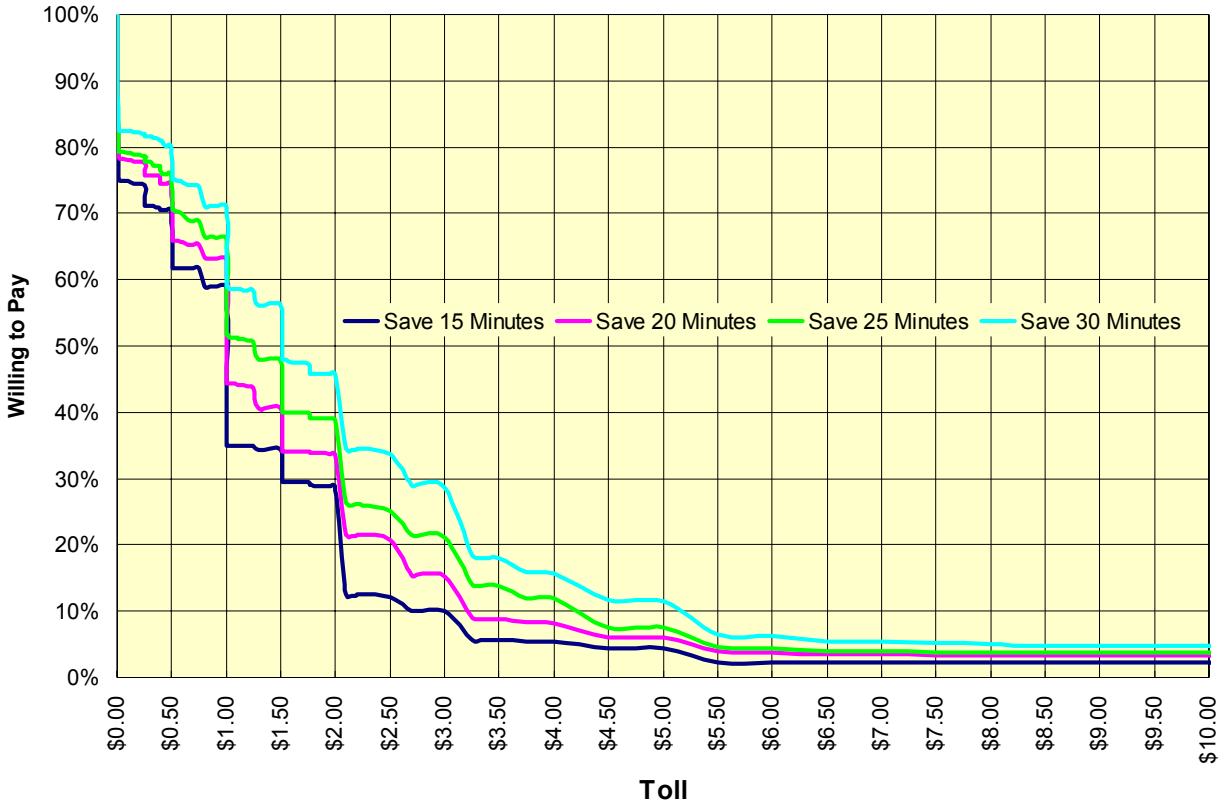
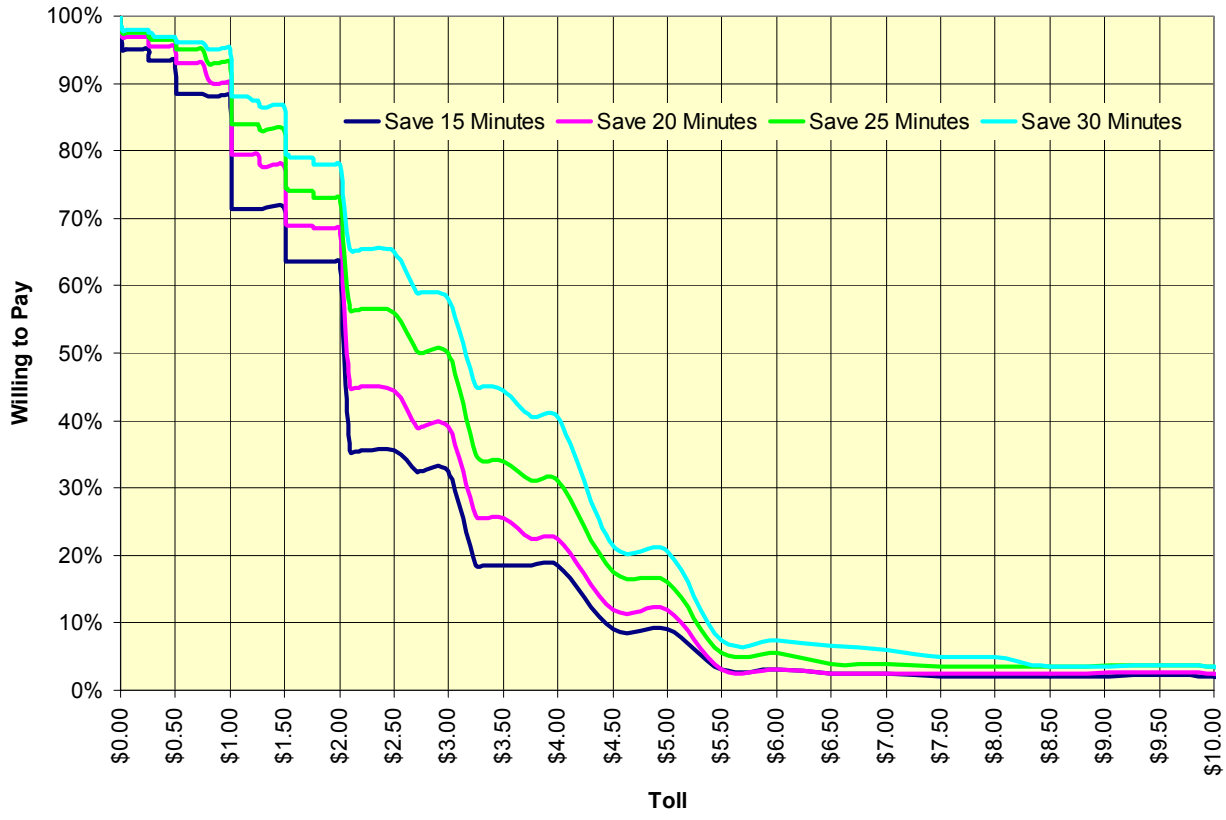


Figure 20 displays demand curves for each timesaving scenario for respondents with a FasTrak account. Note that all of the demand curves shifted to the right compared to Figure 19, indicating the higher value they placed on their time.

Figure 20:
Highest Amount Willing to Pay One-Way for Weekday Trip
(FasTrak Customers n=200)



APPENDIX A: TELEPHONE QUESTIONNAIRE

Hello, I'm [**NAME OF INTERVIEWER**] of Fairfax Research, a national research firm. We're conducting a survey today on behalf of the San Diego Association of Governments, also known as SANDAG about issues related to travel on San Diego freeways. We would like to include your opinions. Let me assure you that I am not selling anything and that your responses are entirely confidential.

A. Are you 18 years of age or older? (**IF "NO," ASK:**) May I please speak with someone in your household who is 18 or older?

1. Yes (**ASK Q. B**)
2. No (**THANK AND TERMINATE**)
3. (Don't Know/Refused) (**THANK AND TERMINATE**)

B. What is your zip code at your home address?

1. 92025 (**ASK Q.C**)
2. 92026 (**ASK Q.C**)
3. 92027 (**ASK Q.C**)
4. 92029 (**ASK Q.C**)
5. 92064 (**ASK Q.C**)
6. 92069 (**ASK Q.C**)
7. 92126 (**ASK Q.C**)
8. 92127 (**ASK Q.C**)
9. 92128 (**ASK Q.C**)
10. 92129 (**ASK Q.C**)
11. 92131 (**ASK Q.C**)
12. Other (**THANK AND TERMINATE**)

C. As you may know, there is a section of the I-15 between Highway 78 in Escondido and Highway 163 in Kearny Mesa. Please think about last week, weekday mornings, Monday through Friday only. Did you travel on **any** part of this section of the I-15 freeway between 5:45 and 9:15 a.m.?

1. Yes (**ASK Q.1**)
2. No (**ASK Q.D**)
3. (Don't Know/Refused) (**ASK Q.D**)

IF "NO" OR "DON'T KNOW" IN Q.C, ASK:

D. May I please speak with an adult in your household who did travel on any part of this section of the I-15 freeway?

1. Yes (**ASK Q. A**)
2. No (**THANK AND TERMINATE**)
3. (Don't Know/Refused) (**THANK AND TERMINATE**)

1. Thinking about a typical week, how many trips do you make, Monday through Friday, on **any part of this section** of the I-15 between 5:45 and 9:15 a.m.? (**IF DON'T KNOW, ASK:**) Approximately how many one-way trips do you make? (**99 = DON'T KNOW/REFUSED**) ☐☐

Of the [**NUMBER IN Q.3**] trips you make in a typical week, on how many do you …

2. Drive alone in the Express Lanes ☐
3. Drive alone in the regular lanes ☐
4. Drive other passengers in the Express Lanes ☐
5. Drive other passengers in the regular lanes ☐
6. Ride as a passenger in a car in the Express Lanes ☐
7. Ride as a passenger in a car in the regular lanes ☐
8. Ride the Inland Breeze ☐
9. Ride another bus ☐

---

10. There is a section of the I-15 freeway between Ted Williams Parkway and the I-15/163 split that includes lanes that allow people on buses and in cars with more than one occupant to drive free and cars with only one occupant to drive for a fee. Were you aware of these lanes before this interview?

    1. Yes
    2. No

I will be asking you some questions about these lanes. To avoid any confusion, I will refer to these lanes as the "Express Lanes."

11. The California Highway Patrol provides enforcement for the Express Lanes to make sure only carpoolers and toll payers who are driving alone use the Express Lanes. Do you think the enforcement is (**ROTATE READING CHOICES**)?

    1. Very effective
    2. Somewhat effective
    3. Somewhat ineffective
    4. Very ineffective
    5. (Don't know/Refused) (**DO NOT READ**)

---

12. How would you compare the safety of traveling in the Express Lanes to the safety of the **regular** freeway lanes? Would you say the Express Lanes are (**ROTATE READING CHOICES**)

    1. Much less safe than the regular freeway lanes
    2. Somewhat less safe than the regular freeway lanes
    3. About as safe as the regular freeway lanes
    4. Somewhat safer than the regular freeway lanes
    5. Much safer than the regular freeway lanes
    6. (Don't know/Refused) (**DO NOT READ**)

Now I'd like to ask you a few questions about FasTrak.

13. The FasTrak program allows motorists who are driving alone to travel in the Express Lanes for a fee that is charged electronically each time they use the lanes. The price varies with the amount of traffic in the Express Lanes. From what you know about the FasTrak program, do you (**ROTATE ORDER TOP TO BOTTOM AND BOTTOM TO TOP**) of it?

    1. Strongly approve
    2. Somewhat approve
    3. Somewhat disapprove
    4. Strongly disapprove
    5. (Don't know) (**DO NOT READ**)

14. Do you **currently** have a FasTrak account and transponder to use the I-15 Express Lanes?

    [**IF "NO," ASK:**] Have you ever had a FasTrak account?

    [**IF "NO," ASK:**] Have you already applied or are you planning to apply for one?

    1. Current customer (**ASK Q.15**)
    2. Former customer (**SKIP TO Q.17**)
    3. Applied (**SKIP TO Q.17**)
    4. Never applied (**SKIP TO Q.17**)
    5. (Refused) (**SKIP TO Q.17**)

IF "CURRENT CUSTOMER" RESPONSE "1" IN Q.14, ASK:

15. How is your FasTrak account paid for … (**READ CHOICES**)?

    1. By yourself
    2. Your company or employer
    3. Or someone else
    4. (Don't Know/Refused)

16. On average, in a typical week, how many times do you use FasTrak in the **afternoon** to drive in the Express Lanes, that is Monday to Friday, including all **northbound and southbound** trips?

    ☐☐

17. To the best of your knowledge, how do you think the money collected from FasTrak is being spent? (**DO NOT READ. ACCEPT MORE THAN ONE ANSWER**)

    1. Improve/Maintain I-15 regular lanes
    2. Add more I-15 regular lanes
    3. Improve/Maintain I-15 Express Lanes
    4. Add more/Extend I-15 Express Lanes
    5. Inland Breeze Bus
    6. Other express bus service
    7. Improve/Maintain all San Diego freeways
    8. Add more regular freeway lanes to all San Diego freeways
    9. Add carpool lanes to other San Diego freeways
    98. Other (**SPECIFY**)
    99. (Don't know)

18. In your opinion, how should the money collected from FasTrak be spent? (**DO NOT READ. ACCEPT MORE THAN ONE ANSWER**)

    1. Improve/Maintain I-15 regular lanes
    2. Add more I-15 regular lanes
    3. Improve/Maintain I-15 Express Lanes
    4. Add more/Extend I-15 Express Lanes
    5. Inland Breeze Bus
    6. Other express bus service
    7. Improve/Maintain all San Diego freeways
    8. Add more regular freeway lanes to all San Diego freeways
    9. Add carpool lanes to other San Diego freeways
    98. Other (**SPECIFY**)
    99. (Don't know)

19. Now I would like to read you a brief description of a project that will extend the existing Express Lanes on the I-15 freeway. When completed, the project will provide four lanes that will extend from Highway 163 in Kearny Mesa north to Highway 78 in Escondido. The project will have multiple access points and be open in both directions all day long. Carpoolers will continue to travel free, there will be new rapid express bus service, and people who are driving alone can pay a toll to use the Express Lanes. Based just on this information, do you … (**ROTATE READING RESPONSE CHOICES**) … this project?

    1. Strongly favor
    2. Somewhat favor
    3. Somewhat oppose
    4. Strongly oppose
    5. (Don't know/Refused) (**DO NOT READ**)

20. Which of the following do you think would be the single most effective way to reduce existing and future congestion on this section of the I-15 between 5:45 and 9:15 a.m.? (**ROTATE READING CHOICES. ACCEPT ONLY ONE ANSWER**)

    1. Add additional regular lanes to the I-15 (**SKIP TO Q.22**)
    2. Provide additional transit service (**ASK Q.21**)
    3. Build additional roads and bridges over the I-15 that would allow drivers to make local trips without getting on the I-15 (**SKIP TO Q.22**)
    4. Extend the Express Lanes to Escondido (**SKIP TO Q.22**)
    5. (Don't know/Refused) (**DO NOT READ**) (**SKIP TO Q.22**)

IF ADDITIONAL TRANSIT SERVICE RESPONSE "2" IN Q.20, ASK:

21. If you learned that the Express Lanes project includes high quality rapid transit service that would run every 15 minutes with only limited stops and that would not leave the Express Lanes, which do you then think would be the best way to reduce existing and future congestion? (**ROTATE READING CHOICES. ACCEPT ONLY ONE ANSWER**)

    1. Add additional regular lanes to the I-15
    2. Provide additional transit service
    3. Build additional roads and bridges over the I-15 that would allow drivers to make local trips without getting on the I-15
    4. Extend the Express Lanes to Escondido
    5. (Don't know/Refused) (**DO NOT READ**)

22. What do you **like most** about the extension, that is, what do you think would be the benefits? (**PROBE**) What else?

[**RECORD VERBATIM RESPONSE**]

23. What do you **like least** about the extension, that is, what do you think would be the drawbacks? (**PROBE**) What else?

[**RECORD VERBATIM RESPONSE**]

IF "OPPOSE" OR "DON'T KNOW" RESPONSES "3" "4" OR "5" IN Q.19, ASK:

24. If you learned that the toll revenues from FasTrak will be used to support high quality express bus service along the extension, would you then … (**ROTATE READING RESPONSE CHOICES**) … this project?

    1. Strongly favor
    2. Somewhat favor
    3. Somewhat oppose
    4. Strongly oppose
    5. (Don't know/Refused) (**DO NOT READ**)

25. Would you be … (**ROTATE READING RESPONSE CHOICES**) … to use these extended Express Lanes?

    1. Very likely (**SKIP Q.27**)
    2. Somewhat likely (**SKIP Q.27**)
    3. Somewhat unlikely (**ASK Q.26**)
    4. Very unlikely (**ASK Q.26**)
    5. (Don't know) (**SKIP TO Q.27**)

IF "VERY UNLIKELY" OR "SOMEWHAT UNLIKELY," IN Q.25, ASK:

26. Why would you be unlikely to use the extended Express Lanes? (**PROBE**) Why else would you be unlikely to use them?

    [**RECORD VERBATIM RESPONSE**]

27. With the extension, would you use the Express Lanes (**ROTATE**) more than you currently use them … less than you currently use them … or … about the same amount as you currently use them?

    1. Use more
    2. Use less
    3. Use same
    4. (Don't know/Not sure)

28. Overall, do you believe having FasTrak on this extension would be fair or unfair for travelers using the **regular** lanes of I-15?

    1. Fair
    2. Unfair
    3. (Don't know/Refused) (**DO NOT READ**)

29. Overall, do you believe having FasTrak on this extension would be fair or unfair for travelers using the I-15 Express Lane extension?

    1. Fair
    2. Unfair
    3. (Don't know/Refused) (**DO NOT READ**)

30. With the Express Lane extension would you … (**ROTATE READING CHOICES. ACCEPT MORE THAN ONE ANSWER**)?

    1. Carpool to use the extended lanes
    2. Use an existing FasTrak transponder in the extended lanes
    3. Get a FasTrak transponder to use the extended lanes
    4. Ride the new express bus service to use the extended lanes
    5. Not use the extended lanes
    6. (Don't know/Refused) (**DO NOT READ**)

Assume for just a moment that extending the lanes would save you 40 minutes for commutes between Highway 78 in Escondido and Highway 163 in Kearny Mesa during peak commute times.

31. What would be more important to you (**ROTATE READING CHOICES**)?

    1. Saving the 40 minutes

    … or …

    2. Knowing when you will arrive at your destination
    3. (Don't know/Refused) (**DO NOT READ**)

I'm going to read you several statements about the I-15 and the Express Lanes. For each one I read you, please tell me whether you … (**ROTATE READING**) strongly agree … somewhat agree … somewhat disagree … or … strongly disagree? (**ROTATE**)

		Strongly Agree	Smwht Agree	Smwht Disagree	Strongly Disagree	DK
32.	People who drive alone should be allowed to use the I-15 Express Lanes for a fee.	1	2	3	4	9
33.	There is a need to extend the Express Lanes.	1	2	3	4	9
34.	FasTrak helps reduce traffic congestion on the I-15.	1	2	3	4	9
35.	It's a good idea to have a time saving option on the I-15 always available.	1	2	3	4	9
36.	It's fair to pay for what you get even if others can't.	1	2	3	4	9
37.	The toll is a good way to keep the Express Lanes moving quickly.	1	2	3	4	9
38.	Paying taxes and paying to use the Express Lanes is unfair double taxation.	1	2	3	4	9

Thinking about occasions when you are driving alone and might use the extended Express Lanes on the I-15, what is the most you would be willing to pay one way for a weekday trip … (**READ IN ORDER**)(**ENTER 9999 FOR DON'T KNOW**)

39. To save 15 minutes? $ ☐☐.☐☐

40. To save 20 minutes? (**MUST BE EQUAL TO OR GREATER THAN Q.39**) $ ☐☐.☐☐

41. To save 25 minutes? (**MUST BE EQUAL TO OR GREATER THAN Q.40**) $ ☐☐.☐☐

42. To save 30 minutes? (**MUST BE EQUAL TO OR GREATER THAN Q.41**) $ ☐☐.☐☐

43. Which of the following statements comes closest to your own opinion? (**ROTATE READING CHOICES**)

1. The Express Lanes should **only** be used by carpools, buses, and people who drive alone who pay a fee to use the lanes.

or

2. During the peak commute times in the morning and afternoon the Express Lanes should only be used by carpools, buses, and people who drive alone who pay a fee to use the lanes. The rest of the time the lanes should be open for anyone to use them without paying a fee.

3. (Don't know/Refused) (**DO NOT READ**)

Now I have just a few more questions for statistical purposes.

44. Are you married now and living with your spouse, or are you widowed, divorced, separated, or have you never married?

1. Now married
2. Widowed
3. Divorced
4. Separated
5. Never married
6. (Refused)

45. Including yourself, how many people live in this household?

☐☐

IF 2 OR MORE IN Q.45, ASK Q.46:

46. How many children under the age of 16 are currently living in your household?

☐☐

47. How many members of your household have a current drivers license?

☐☐

48. Altogether, how many vehicles, including automobiles, vans, trucks, and highway motorcycles are available for use by members of your household?

---

49. What is the highest level of schooling you have completed? (**READ CHOICES**)

1. Less than high school
2. High school graduate
3. Some college/Community college/Vocational school
4. College graduate
5. Post-graduate degree
6. (Refused)

---

50. What is your age, please?

1. 18-to-24 years old
2. 25 to 29 years old
3. 30 to 34 years old
4. 35 to 39 years old
5. 40 to 44 years old
6. 45 to 49 years old
7. 50 to 54 years old
8. 55 to 59 years old
9. 60 to 64 years old
10. 65 to 69 years old
11. 70 to 74 years old
12. 75 or older
13. (Refused)

---

51. Which of the following best describes your current employment status? Are you (**READ CHOICES**)?

1. Working part-time, less than 30 hours a week
2. Working full-time, 30 or more hours a week
3. Unemployed/Laid off
4. Retired
5. Permanently disabled
6. Homemaker
7. Student
8. Student and working
9. (Refused)(**DO NOT READ**)

---

52. What is your main ethnic or racial heritage? (**READ CHOICES**)

1. Asian/American, Indian or Pacific Islander
2. Black/African American
3. Hispanic or Latino
4. Native American
5. White/Caucasian
6. Other (**SPECIFY**)
7. (Refused)

---

53. And what is your total annual family income before taxes? Please stop me when I read the right category. (**READ CATEGORIES**)

1. Less than $10,000
2. $10,000 to $19,999
3. $20,000 to $29,999
4. $30,000 to $39,999
5. $40,000 to $49,999
6. $50,000 to $59,999
7. $60,000 to $69,999
8. $70,000 to $79,999
9. $80,000 TO $99,999
10. 100,000 TO $119,999
11. $120,000 or more
12. (Refused) (**DO NOT READ**)

54. Sex

1. Male
2. Female

55. Language

1. English
2. Spanish

SAN DIEGO ASSOCIATION OF GOVERNMENTS

I-15 Managed Lanes Value Pricing Project Planning Study

Focus Group Report
January 21, 2002

Prepared by:
Redman Consulting/Judith Norman—Transportation Consultant
Project Outreach Subconsultants to Wilbur Smith Associates

TABLE OF CONTENTS

San Diego Association of Governments

I. EXECUTIVE SUMMARY

A. Focus Group Purpose and Format

This report presents findings from three focus groups of I-15 commuters, conducted from July 31 to August 2, 2001, as part of the public outreach work effort associated with the Interstate 15 (I-15) Managed Lanes Planning Study. The focus groups represent one aspect of a four-part community outreach plan to gauge public response to implementing value pricing in the future Managed Lanes on the I-15. The other three tasks defined for the community outreach plan include interviews of 25 key stakeholders, intercept surveys of 50 carpoolers and 50 transit riders at two park-and-ride lot locations, and a telephone survey of 800 residents who commute on the I-15 commuters within the project area.

The focus groups were structured to provide public opinion input from a typical group of main lane users, Express Lane users (including carpoolers and transponder-owners) and transit riders. Issues discussed included perception of traffic conditions, familiarity with and perception of the existing I-15 Express Lanes, the FasTrak program, and attitudes toward the proposed managed lanes project. The perception of fairness and equity was specifically explored with the three groups, each of which included 14 participants, screened to ensure a balance of gender, ethnicity, and income, as well as an appropriate mix of travel modes and freeway usage characteristics. All participants were provided with a meal and a $50 stipend to thank them for two hours of their time.

B. Key Findings

The following are the major observations and findings, listed in order of importance to assessing public acceptance of the project:

Solid Support for the Managed Lanes Project was Found in All Three Focus Groups Strong support for the proposed extension to the lanes existed in all three focus groups, though it was strongest in the FasTrak users group. Current FasTrak users strongly supported plans to extend the lanes; in fact, those who had indicated during the participant screening process that they were “dissatisfied” with the lanes revealed during the discussions that they were dissatisfied primarily with the fact that the facility was only eight miles long. Support for the Managed Lanes extension was notably stronger among the Transit Riders users group than among the Main Lane users group, although support among both groups increased based on the transit components of the proposed project.

We Need Improvements *NOW* All groups mentioned the length of time until project completion as a disadvantage of the project. “Too little, too late” was a refrain echoed in all of the focus groups. There was a sense of frustration expressed that Caltrans and regional planners are forever “catching up.”

Equity is Not a Deal Breaker: Express Bus Service Is Key A number of people in each focus group did express concern about the fairness of tolls for lower income

drivers. However, a crucial finding was that when these 42 participants (14 in each of three groups) gained a clear understanding of the features of the project, including the proposed Bus Rapid Transit component, nearly all reservations concerning equity dissolved, and support for the project became strong and widespread through all three focus groups. Generally, after a full explanation of all Managed Lane project features, approximately 85 percent of each group thought the proposal was fair, and did not pose a fatal equity issue, in their opinion. Most people in this group based their approval on the fact that the project provides options that work for people in a variety of different situations, and that solo drivers help support transit and carpool alternatives. Some looked at the potential for personal benefit, whether from transit, carpool or solo driver buy-in opportunities, and determined that the lanes were fair "for them." Others felt that, as long as a person was willing to pay for premium service, they should be permitted to do so as long as they didn't take anything away from anyone else. Finally, the fact that the lanes would ease congestion for everyone on the main lanes was viewed as a balancing force in the "equity equation."

There were one or two people in each group of 14 who did not change their position, and who simply thought tolls were elitist and unfair, offering advantages based on ability to pay.

Equity vs. Fairness or "Double Taxation" Fairness (as opposed to equity) also arose as an issue, and was typically expressed in the phrase, "I've paid once for the lanes, and now I have to pay again. That's unfair." Still, participants agreed that people *are willing to pay*, and many participants expressed desire for the Managed Lanes extension to be built quickly so that they could use them. Fairness ("double taxation") was most often raised by higher-income Caucasian participants among the Main Lane and FasTrak users groups. It proved challenging to help people understand that the tolls served primarily to regulate the flow of traffic, as opposed to being a hidden tax.

Participants Propose Alternative Tolling Scenario: Lower Tolls, Slightly Lower Speeds In part as a response to equity concerns, but also because they saw a chance to spread project benefits to a wider range of commuters, both Main Lane and FasTrak users spontaneously developed an alternative to the proposed project, which consisted of lowering the tolls, and permitting a moderate degradation of the level of service (to 45 miles per hour or so) on the Express Lanes or the proposed Managed Lanes, in order to allow more people to use the lanes. As long as a relative time and speed advantage between the main lanes and the managed lanes was retained, both groups generally agreed that this was acceptable, and would help the main lanes by getting more people diverted to the Managed Lanes.

Negative Attitudes toward Tolls are Shared by All Groups Within each group, one or two participants strongly presented the "double taxation" objection to tolls. That is, the roads are paid for by taxpayers, so no one should be charged to use them again. Some participants making this type of argument, when reminded that the tolls are intended to keep the lanes flowing faster than the main lanes, would back away somewhat from their statement. Additionally, when it was pointed out that, before tolls, *no solo driver* could use the lanes at all, the double taxation argument would soften somewhat. However, many participants held the view that the tolls were "useful" and "unfair" at the same time.

The group typical group dynamic that occurred was that, once the "double taxation" argument was made, it found agreement in half the group, though not voiced as strongly as by the original proponents. The other negative view expressed about tolls—that they are simply too high— was also shared across all groups, and was spread throughout the range of ethnicity, income and commute mode represented in each group.

Existing Conditions All participants indicated increasing levels of frustration with the current traffic conditions, and affirmed that these problems had significantly worsened within the last three years. During this introductory discussion, Main Lane users had the most to say about the impact of peak period freeway traffic congestion on their lives (stress, loss of time, frustration), while transit riders focused on "the particulars of bus routes, low service frequencies, and lengthy travel time required to land them at their destinations. Participants in the Express Lane users group also noted the economic impact of daily traffic delays on local businesses

Perceived Causes of Congestion Unprompted by the moderators, participants in all three focus groups made a connection between recent residential development in North San Diego County and southern Riverside County and their personal daily frustration with traffic on the I-15. There was a perceived lack of accountability and/or enforcement with respect to developers' responsibilities to mitigate traffic generated by new housing. Current freeway conditions were also blamed on the fact that "everyone wants to move to California" along with the failure of planners and Caltrans to "keep up with growth". A common feeling was that because more and more people are driving into the San Diego area from as far away as Temecula and Murrieta, "something needs to be done *now*" to reduce congestion. Also contributing to area congestion, according to many, is a lack of cross-freeway connections (bridges or underpasses) to accommodate short local trips, thus forcing area residents onto the freeway

Familiarity with the FasTrak Program The members of each focus group were asked whether they knew how the FasTrak toll operations on the Express Lanes worked. In both the Main Lane and Transit Riders groups, one or two people could describe, fairly accurately and completely, how to obtain and use a transponder, and a few from each group understood that the toll was designed to rise as congestion increased. Participants did not, however, volunteer an explanation that distinguished whether it was the main lane or the Express Lane level of congestion that triggered changes in tolls. This was an area of confusion in both groups. Similarly, both Main Lane and Transit groups, as well as among non-transponder owners from the Express Lanes user group, there was general confusion about where and how to pay tolls. Numerous questions were asked about whether information was posted on the freeways (few recalled seeing any such information) and how someone could even find out who to call to sign up for the FasTrak program. With one exception, no one—including current transponder owners—was aware of how the toll revenues were spent.

Perceptions of Enforcement Participants in all groups expressed satisfaction with the effectiveness and fairness of current enforcement practices on the Express Lanes.

Suggested Use of Toll Revenues Transit Riders made the most suggestions, focusing primarily on transit improvements or fare subsidies; lane expansion and better signage were suggested by Main Lane users and Express Lane users, respectively.

C. Key Recommendations

Speed Up Project Delivery

From both the construction-impact perspective and the need for new travel options, faster is better in the minds of many of the focus group participants. In addition, quicker project construction will reduce the impact of construction-related delays—a concern mentioned by many in all three focus groups.

Better Promotion of and Information about Existing Express Lanes There is a continued need for providing information about FasTrak sign-up procedures, as new drivers enter the environment of I-15, or as their travel needs change and the Express Lanes may become a more viable option—one that they might use if they knew more about it. It is suggested that SANDAG consider re-vamping and implementing the kind of successful marketing program that helped position the original demonstration project.

The need for better information about the purpose and rationale for the existing value priced facility is underscored by the observation from the focus group effort that any misunderstanding participants had about the purpose and operation of tolls to manage demand on the existing FasTrak lanes carried into the discussion of the Managed Lanes extension project. Thus, better information provided now, about the existing lanes, could indirectly improve public understanding of the Managed Lanes extension.

Finally, because the feature that represented the “swing vote” was the Bus Rapid Transit element of the Managed Lanes, it is recommended that this feature be fleshed out, clearly explained and emphasized in any public information effort associated with the project. Information campaigns should stress the toll revenue support for this popular feature of the lanes. The “rail-station-like” aspect of the proposed four direct access ramps and the ability of the bus to compete with rail in the minds of the public could play an important role in winning public support for Managed Lanes.

Provide Convenient Transit Service The transit element is critical in garnering support from all three focus groups. The kind of service described and required to satisfy expectations and needs would necessitate improvements in service (more frequent, reliable service, more evening service) operational policies (better time routes and extended-time, reversible transfers) as well as facilities (better security, cleaner and more reliable buses). Both Transit Riders and Main Lane users expressed the need for local transit access (transit feeder service) to support the Bus Rapid Transit component of the project. Finally, many members of the focus groups favored a trolley-like transit system for the corridor. According to these focus group participants (who constituted a majority of each group, and especially the current main lane users), the more the Bus Rapid Transit service looks, feels and operates like a trolley, the better.

Consider Increasing Cross-Freeway Connections for Community Needs In order to remove local trips from the freeway, project planners might consider how to coordinate

improvements in cross-freeway (underpass or overpass) roadway connections to permit communities along the east and west sides of the I-15 corridor to meet social, personal and business needs without using the freeway for short trips. This could have a significant impact on localized congestion hot spots.

Explore Possible Trade-Offs between Level of Service and Tolls Within the statutory and institutional constraints pertaining to Express Lane level of service commitments, it is recommended that project designers explore the suggestion made by participants in two groups, to permit greater solo driver affordability by lowering the tolls. Participants indicated willingness to tolerate a somewhat lower peak speed, in the area of 45 miles per hour—still significantly higher than peak speeds on the main lanes.

Address Long Range Planning Issues Participants in all groups stressed their disappointment in government, Caltrans and regional planners inability either to keep up with highway demand, or to address broader multi-modal needs. Further, the issues of growth, inter-county travel patterns, development, land use and affordability of housing should be included in future communications with the public.

II. I-15 MANAGED LANES VALUE PRICING PROJECT DESCRIPTION

The San Diego Association of Governments (SANDAG) and Caltrans propose to implement value pricing on the future Interstate 15 (I-15) Managed Lanes through the San Diego I-15 Value Pricing Program. This program will allow solo drivers to use the I-15 Managed Lanes for a fee. The fee will be collected through electronic toll collection equipment.

The 20-mile Managed Lanes project will build four Managed Lanes with a movable barrier in the median of I-15 to accommodate three lanes in the peak direction. The Managed Lanes will give priority to High Occupancy Vehicles (HOVs) and a Bus Rapid Transit System (BRTS). However, other vehicle types will be allowed to use the facility in a "managed" way to always provide a premium Level of Service. The lanes will be barrier separated from the general purpose lanes. Access will occur through as many as seven intermediate access locations (at-grade openings in the barrier) and five direct access ramps, along the 20-mile length. The five direct access ramps will be located at Hillery Drive, Ted Williams Parkway, Bernardo Center Drive, Del Lago Boulevard, and Hale Avenue. The Managed Lanes will be in operation at all times.

A continuous 6.6-meter wide enforcement area is planned, consisting of the 3.0-meter main lane inside shoulder and the 3.0-meter Managed Lane shoulder separated by a concrete barrier. This configuration would allow California Highway Patrol (CHP) officers to position themselves on either the main lane shoulder or the Managed Lanes shoulder to cite violators.

The I-15 Managed Lanes project will also include a Bus Rapid Transit (BRT) System that will incorporate direct access ramps at five locations to and from the Managed Lanes. The Metropolitan Transit Development Board (MTDB) is designing the BRTS project. Transit stations/park and ride lots will be located adjacent to the I-15 corridor. Express buses will travel from the park and ride lots to the I-15 Managed Lane facility using the direct access ramps.

Construction of the I-15 Managed Lanes facility will occur in three phases. The middle segment from SR 56 to Centre City Parkway (Stage 1) will be built first with an estimated completion date of 2005. The northern segment from Centre City Parkway to SR 78 and the southern segment from SR 163 to SR 56 will be constructed later. The southern segment would involve widening the existing reversible I-15 HOV facility from two lanes to four lanes and installing intermediate access locations. Completion dates have not been determined for the northern and southern segments.

III. COMMUNITY OUTREACH OVERVIEW

A. Brief Description and Interrelation of Outreach Tasks

In June 2001, the San Diego Association of Governments (SANDAG) began a comprehensive, two year study of a proposed extension of the eight-mile I-15 Express Lane facility, known as the I-15 Managed Lanes Value Pricing Project Planning Study. Integral to the study is an

assessment of public attitudes and concerns about both the existing and proposed projects. A series of community outreach tasks were incorporated into the project scope of work to allow SANDAG to examine these attitudes from a variety of perspectives. These tasks employed a number of specific qualitative and quantitative assessment techniques including 1) focus groups, 2) stakeholder interviews, 3) intercept surveys and 4) a telephone survey of 800 I-15 corridor users.

The sequencing of tasks was designed so that the early insights and direction gained from the results of focus groups, stakeholder interviews and intercept surveys could be used to help design the telephone survey questionnaire, as well as to provide stand-alone conclusions and recommendations to the project planners.

Throughout the Community Outreach effort, the outreach team was challenged to balance the need to replicate previous research (in terms of methodology and/or topic focus) in order to develop data that could permit a comparison of attitudes over time, and, on the other hand, the need to examine new issues specific to the Managed Lanes extension, and to include a slightly different population of potential users. The specific balance struck for each outreach task is described in the report for that task, in subsection B of this section.

In order to provide some context in which to understand how the results from three focus groups conducted in July and August 2001 (the subject of this report) relate to the larger Community Outreach work effort as well as to the Environmental Justice assessment and the overall Concept/Plan, a summary of the subtasks is presented below.

Focus Groups—In the Request for Proposals (RFP) for this project, SANDAG had already defined the target profiles for participants of three focus groups: I-15 main lane users, Express Lane users and transit riders. Three focus groups composed of 14 participants each were conducted. This qualitative research technique was used to provide insight into general responses, attitudes and opinions of a demographically and behaviorally relevant group of San Diego commuters, and not to provide “statistically reliable” data. The insights obtained from the focus groups provided guidance for the telephone survey instrument development process, as well as information for project planners to consider during the design phase.

Stakeholder Interviews—This was another qualitative research activity in which twenty-five key individuals were identified and interviewed for their opinions and concerns about the existing Express Lanes as well as the proposed Managed Lanes project. Stakeholders included four elected officials from I-15 corridor communities, 15 agency stakeholders (primarily senior technical staff involved in project development) and six public interest/advocacy group members. Stakeholders were asked about their general perceptions of existing and proposed lanes; new expectations and goals for the Managed Lanes; their assessment of community attitudes and concerns; their recommendations for reaching any identifiable underrepresented groups; and their concerns about project concept specifics as well as suggestions for improvement. Stakeholders were also specifically asked about their opinion regarding their views on any equity issues related to the proposed project.

Intercept Surveys—Intercept surveys of 50 carpoolers and 50 transit riders were administered by the outreach team. The surveys took place at park-and-ride lots and transit interface points along the I-15 corridor within the new Managed Lanes project area. The purpose of the

intercept surveys was to directly target carpoolers and transit riders along the corridor and solicit their opinions on the current Express Lanes as well as the proposed extension. This task was directed at obtaining more data on peak period commuters from "low-incidence" travel behavior categories (i.e., carpoolers and transit riders, who make up only a small fraction of corridor commuters) than would occur through the random-sample data gathering effort used in the telephone survey.

Telephone Survey—This task involved a detailed telephone survey of 800 peak period corridor users (600 main lane users and 200 transponder-owners). This quantitative research method benefits from a number of findings and observations gained through the previous three qualitative community outreach tasks. The survey research provides the opportunity to evaluate trends from a statistically reliable vantage point, and can determine the validity of the conclusions tentatively drawn from the qualitative side of the overall assessment of community opinion with respect to the project and its various features.

Environmental Justice Assessment —This assessment was a synthesis and elaboration of elements of all community outreach and public involvement study tasks, with a specific examination of two issues:

- **Procedural fairness** in gathering public input *(was the process sufficiently inclusive?)*
- **Perception of equity** and fairness from the viewpoints of low-income individuals and/or members of ethnic (non-Caucasian) minorities.

The environmental justice focus in this task is designed primarily to ensure methodological adequacy of quantitative and qualitative efforts in obtaining lower- income and ethnic representation within the community outreach/public input process, and in consideration of the relative affluence of the project corridor. It remains outside the scope of this Environmental Justice Assessment, as defined, to make any determination with respect to equity of overall transportation investment or operational impacts related to the proposed Managed Lanes Project.

Linking Outreach Task Results to the Project Concept/Plan—recommendations flowing from the four Community Outreach tasks described above are linked to the development of the Managed Lanes Project Concept/Plan report through incorporation of key findings into that report. Both formal and informal communications between and among the consultant team and the SANDAG project development team serve to enhance the integration of public opinion with the overall project development and refinement process.

A flow diagram illustrating the project's community outreach tasks and their relationship to the Project/Concept Plan is found in Figure A (page 10).

B. Previous Focus Group Research

Previous Focus Group Efforts for the I-15 Value Pricing Project

The tasks included in this Community Outreach research program represent an ongoing effort on the part of SANDAG and its project partners to keep abreast of public opinion, and to provide multiple opportunities for the public to express views on various value pricing scenarios, and, in this case, "Managed Lanes" in which value pricing is more formally recognized as but one element of a lane management strategy toolbox.

Previous focus groups were composed according to the research needs associated with successive phases of the I-15 Value Pricing demonstration project (Pre-Project, Express Pass and then FasTrak programs) and were conducted as follows:

July 1996 **Three Focus Groups (Facilitator: Frank Wilson & Associates)**
(Pre-Project)

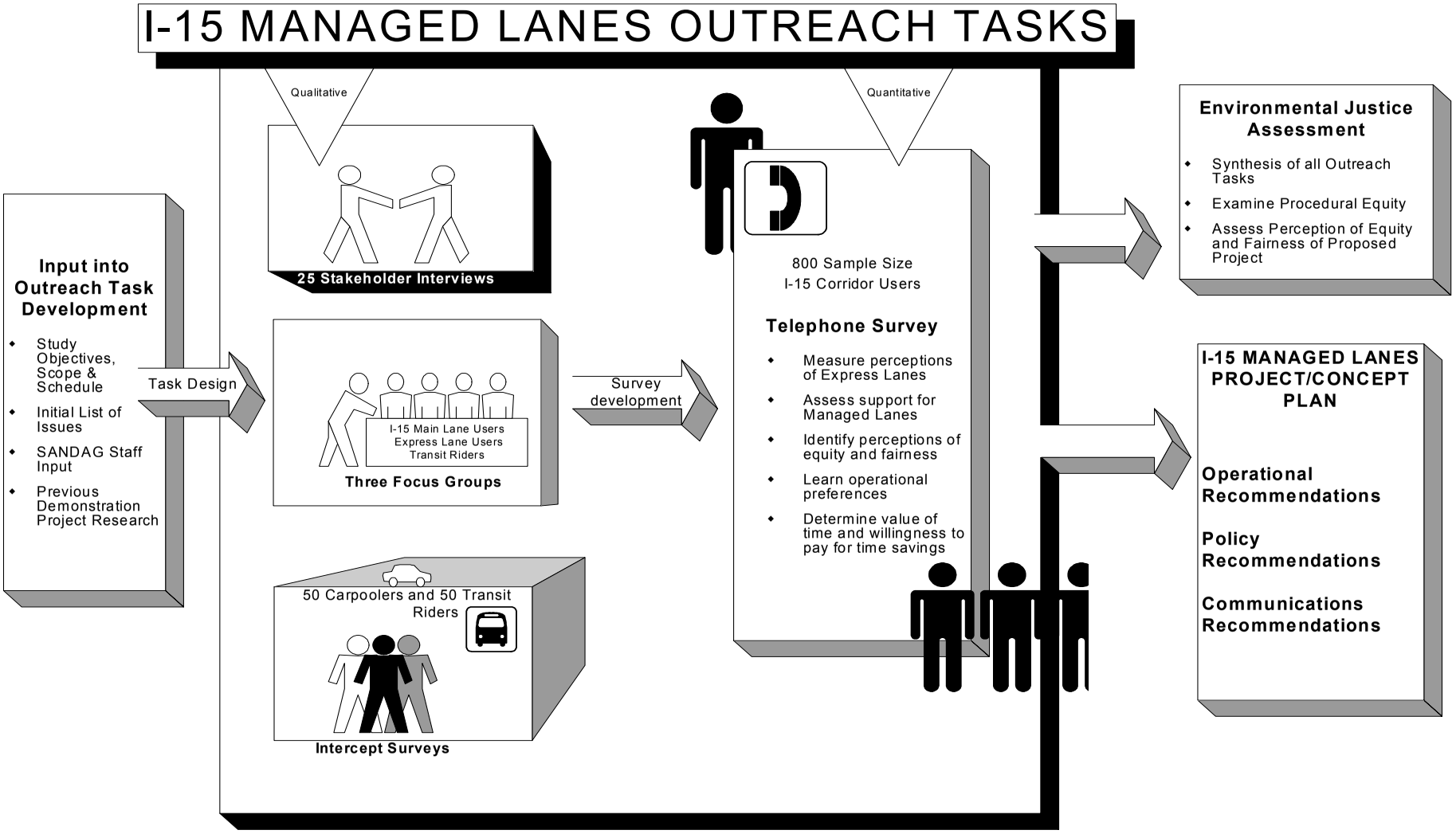
- I-15 Corridor travelers
- Frequent commuters
- High-Occupancy Vehicle (HOV) users

July 1997 **Four Focus Groups (Facilitator: Godbe Research & Analysis)**
(ExpressPass Phase)

- Express Pass users
- Former Express Pass users
- High-Occupancy Vehicle (HOV) users
- SOV users (solo drivers)

August 1998: **Four Focus Groups (Facilitator: Godbe Research & Analysis)**
(FasTrak Phase)

- Full-time FasTrak users (8+ trips/week)
- Part-time FasTrak users (fewer than 8 trips/week)
- High-Occupancy Vehicle (HOV) users on main lanes
- SOV users (solo drivers) on main lanes



Flow Chart of I-15 Managed Lanes Value Pricing Community Outreach Tasks Showing Links to Environmental Justice Assessment and Project Concept/Plan

Redman Consulting/Judith Norman–Transportation Consultant
Outreach Team Subconsultants to Wilbur Smith Associates

Figure A
October 2001

C. Focus Group Task Purpose

The primary purposes and research objectives of the focus group portion of the outreach and public involvement effort for the I-15 Managed Lanes Value Pricing Project Planning Study include:

- To measure the public's attitudes and perceptions of the existing Express Lanes and the planned Managed Lanes project.
- To provide SANDAG with insight into how corridor commuters are thinking about issues related to the project.
- To provide guidance to the telephone survey of 800 households that is also included in the outreach effort.

D. Focus Group Methodology

Limitations of Focus Group Research

It is important to understand that a key advantage of employing focus groups as a qualitative research technique is that the intimate, lengthy format permits more in-depth exploration of issues than is usually possible in a telephone survey. In addition, the group dynamic of the focus group format permits researchers to make observations relative to social learning and interaction relative to complex topics, and the impact of group discussion on the perception of hot-button issues. However, an inherent limitation associated with focus group research is that, given the small size and non-random selection process, no statistically binding conclusions can be drawn from the results.

Participant Recruitment Process

A primary factor in the ultimate usefulness of any focus group effort is the suitability of the participants selected for the research objectives delineated. Though selection of participants is not "random," care was taken at all steps to ensure that each focus group would include a relevant range of opinions from a meaningfully diverse population

Luth Research was the focus group facility operator selected to recruit participants, using screeners (specially designed telephone scripts that assist recruiters in selecting an appropriately balanced group) developed by the consultant and approved by SANDAG. Screeners for each focus group are provided in Appendix A.

As is the case with all professional focus group facilities, Luth Research has developed and maintained an "opt-in" (built from voluntary potential participants) database over its years of conducting social research in the area. The database is not random, but it represents an approximation of the population of the San Diego region with respect to key demographic variables, so that it offers utility to social researchers and marketers. This means that specific groups drawn at random from the non-random database will also, in all likelihood, display a range of demographic variables found in the general population. However, no statistical analysis can be made upon a focus group sample.

Focus groups participants were drawn randomly from the following "non-random" sources:

Focus Group	Participant Selection Source
Express Lane User group:	Randomly selected telephone numbers from 800-person customer lists from FasTrak and RideLink databases, using zip codes along the I-15 corridor.
Main Lane User group:	Random digit dial to telephone numbers within zip codes along the I-15 corridor, using Luth Research in-house database.
Transit Rider group:	Random digit dial to telephone numbers within zip codes along the I-15 corridor, using Luth Research in-house database. This population was then screened for transit ridership on identified bus routes that use Express Lanes or I-15 main lanes within the project area.

In order to obtain a relevant group of transit riders, Luth Research directed its screening efforts on those riding bus routes that utilize both the main lane and the Express Lanes along the I-15 corridor, and including the Inland Breeze (Routes 990 and 980). The entire list of included routes is found on the screener for the transit-rider group included in Appendix A. Of the 14 participants in the Transit Riders group, six stated that they did not use a mode other than transit for their peak period commute on the I-15.

Although the previous round of focus groups conducted for SANDAG for the original I-15 Express Pass/FasTrak program required Luth's recruiters to physically visit bus stops in order to fill the transit rider focus group, Luth was able to recruit directly from its in-house database of potential focus group participants, which had grown substantially since the last effort (Godbe Research and Analysis, August 1998).

To ensure adequate representation from another low-incidence population—carpoolers--the Express Lane and Main Lane user groups were supplemented with carpoolers drawn randomly from a list of 800 names supplied by RideLink, the regional rideshare and transportation demand management service agency managed by SANDAG. This recruitment effort yielded five carpoolers among the 14 participants in the Express Lanes users group. The remaining nine Express Lane participants were solo drivers who paid tolls to use the lanes.

Focus Group Number per Mode	Express Lane Users	Main Lane Users	Transit Riders
Solo drivers	9 (toll payers)	12	0
Carpoolers	5 (4 or more times per week)	2 (occasional commuters)	0 (8 identified carpooling or vanpooling as secondary commute mode)
Transit Riders	0 (some used Inland Breeze previously)	0	14 (for 8 people, transit was their primary mode, for 6 people of the 8, transit was their only mode used for the peak period commute)

Focus Group Participant Demographic Composition

An effort was made to screen potential participants in order to achieve a balanced, though not statistically representative, focus group composition with respect to gender, income, level of satisfaction with the existing lanes, and a number of other travel-behavior variables that differed somewhat according to the specific focus group. Within the Express Lane users group, the screening process was designed to obtain dissatisfied as well as satisfied participants, in order to elicit a range of opinions about various features of the lanes.

The goal was to have 12-14 participants at each group; actual participant count was 14 for each group. In cases where more than 14 people arrived at the focus group facility, those chosen for participation were weighted toward lower income and ethnic diversity (that is, when there was an option, non-Caucasians and people representing the lower range of the income spectrum were invited to stay for the focus group.)

Appendix B, *Focus Group Participant Profiles*, Tables 1, 2 and 3 list the participants for each focus group and provide summary statistics for each group. Although no statistical conclusions can be drawn from a qualitative methodology such as focus groups, it is interesting to note the relative disparities within the groups and between the groups, and to keep these income/ethnic dynamics in mind when reviewing comments made by members of the various groups.

As the focus group profiles illustrate, transit riders, as a group, had the lowest average income of the three groups:

- Average income for transit riders was only 63 percent of the average income for FasTrak users, and 64 percent of the average income for members Main Lane users focus group.

- In addition, transit riders included more African American participants than the other two groups, and fewer Caucasians.

In addition, judging from statements made during the focus group, four of the six participants who reported no secondary commute mode choice appeared to be “transit-dependent” riders; that is, people without another reliable travel option available to them for most trips. All four of these participants reported incomes of $30,000 per year or less; two were Caucasian, and two were African-American. A fifth “transit only” commuter explained that he used transit in order to familiarize himself with the routes so that he could advise those in his career counseling practice on how to use the area bus service. The remaining “transit only” commuter also appeared to be a transit rider “by choice.” These “choice” riders reported incomes of $87,000 and $59,000, respectively.

Also of note is the income differential within each group, related to ethnicity:

- Among the 14 FasTrak users, the average income for non-Caucasians was only 31 percent of the average income for Caucasian participants.

- Among the Main Lane users, the average income for non-Caucasians was 80 percent of the average income for the Caucasian participants.

- This ratio was reversed among members of the Transit Riders group, where the average income of the Caucasians was 84 percent of the non-Caucasian participants.

Conducting the Focus Groups

The focus groups were held at Luth Research's professional focus group facility in downtown San Diego. The location was chosen because of its good transit access and because commuters using the Express Lanes are likely to have work locations south of Kearny Mesa (i.e., where the Express Lanes terminate.) The groups were conducted on Tuesday, Wednesday and Thursday evenings as follows:

Group 1, FasTrak Users:	July 31, 2001	5:30-7:30 p.m.
Group 2, Main Lane Users:	August 1, 2001	5:30-7:30 p.m.
Group 3, Transit Riders:	August 2, 2001	5:30-7:30 p.m.

The facilitators for the focus groups were Deborah Redman (Redman Consulting) and Judith Norman, Judith Norman-Transportation Consultant (JNTC)—both principles at their respective firms. Additional members of the project outreach team observed the groups' interactions. The SANDAG project manager for the study observed the Main Lane and Transit Riders groups.

Participants were provided with dinner, free parking and a $50 cash stipend, per person, for their participation.

E. Discussion Guide

Development of Discussion Guide

An extensive body of community outreach, public involvement and market research has been conducted over the past several years in connection with the planning and implementation of the I-15 Express Pass and FasTrak program introduction phases. In ideal circumstances, research that can build upon previous studies can help decision-makers understand how opinions and projects change and influence each other over time, and can provide implementing agencies with knowledge to improve new proposed projects. With respect to the I-15 Managed Lanes Value Pricing Project Planning Study, a very different set of complex issues to be tested was presented to the focus group participants than those involved in the first three waves of focus groups conducted during the demonstration project phase. In addition, to some extent, the later focus group waves have demonstrated the effects of increasing familiarity with Express Lane operations.

Although each of the three discussion guides (see Appendix C) were developed to elicit responses relative to issues of most concern to the members of the three different focus groups conducted in 2001, a number of core topic areas were included in all three groups.

The table below illustrates points of discussion overlap and differences for the three focus groups:

Discussion Topics Common to all Three Focus Groups	Discussion Topics Unique to Particular Focus Groups

• Introduction (ground rules/self-introductions)
• Opinions about existing Express Lanes
• Managed Lanes project understanding
  o Awareness of plans for project
  o List of pros and cons
• Potential of Managed Lanes extension to cause change in current travel behavior (e.g., mode-switching)
• Willingness to pay tolls under varying scenarios
• Suggestions for Toll Revenue Use
• Perception of Equity
• Fairness and effectiveness of enforcement on Express Lanes
• Opinions about Expanding Value Pricing beyond I-15 Corridor
• Wrap-Up
	• **Express Lane Users (SOV and HOV):**
	• Existing FasTrak (transponder) usage
	  o How users decide when to pay tolls
	• **Main Lane Users (SOV and HOV):**
	• Commute Experience on Main Lanes
	• **Transit Riders:**
	• Current Travel Behavior from Transit Perspective
	• Satisfaction with Transit Service on I-15 Corridor

F. Project Background Description

The focus group participants were provided, at various relevant points within the discussion, with an oral presentation regarding elements of the project description, drawn from material developed by the consultant and approved by SANDAG staff. (See Appendix D.) At pertinent points in the discussion, Caltrans-generated project strip maps were introduced and briefly described, in order to give participants a visual orientation of the various proposed corridor improvements, such as proposed new ingress/egress points.

IV. EXISTING CONDITIONS

A. Attitudes about Current Traffic Congestion and Its Causes

As part of the warm-up exercise for each focus group, participants were invited to share the experience of their individual commutes along the I-15. All participants indicated increasing levels of frustration with current traffic conditions, and affirmed that these problems had significantly worsened over the last three years.

During this introductory discussion, Main Lane users had the most to say about the impact of peak period freeway traffic congestion on their lives (stress, loss of time, frustration), while transit riders focused on "the particulars of bus routes, low service frequencies, and lengthy travel time required to land them at their destinations. As one Transit Rider lamented, "It takes me three buses and three hours from Golden Hills to Miramar Road every day, twice a day." This type of transit experience was not unique among participants in the focus group.

Unprompted by the moderators, participants in all three focus groups made a connection between recent residential development in North San Diego County and southern Riverside County and their personal daily frustration with traffic on the I-15. There was a perceived lack of accountability and/or enforcement with respect to developers' responsibilities to mitigate traffic generated by new housing. Current freeway conditions were also blamed on the fact that "everyone wants to move to California" along with the failure of planners and Caltrans to "keep up with growth". A common feeling was that because more and more people are driving into the San Diego area from as far away as Temecula and Murrieta, "something needs to be done *now*" to reduce congestion.

Also contributing to area congestion, according to many, is a lack of cross-freeway connections (bridges or underpasses) to accommodate short local trips, thus forcing area residents onto the freeway. As one participant explained, "We have to jump on the freeway to get a pizza."

What Participants Said About Their Commutes on the I-15 Corridor		
Express Lane Users Group	**I-15 Main Lane Users Group**	**Transit Riders Group**
Traffic is often "horrendous." Accidents exacerbate delays. "I work longer hours to avoid the rush."	Congestion wastes time, zaps energy. "I feel like a hostage." Traffic getting heavier—"you almost can't leave early enough."	The infrequency of area bus service is "stressful and frustrating." "You wait all day for a bus."

Corridor "Hot Spots" Identified

In discussion about the high peak period traffic volumes on the I-15 corridor, participants from all three focus groups identified similar features of traffic delay. Although specific details (location and perceived cause of the problem) differed somewhat depending upon variations in commute pattern and mode, the pinch points most often mentioned were the bottlenecks at freeway exits, entrances and interchange merge points, including those near Rancho Bernardo, the Lake Hodges Bridge, and the "dead stop" when the Express Lanes are loaded back onto the main lanes northbound near Ted Williams Parkway.

Congestion Affects Business, Too

Participants in the Express Lane users group also noted the economic impact of daily traffic delays on local businesses. One long-time Escondido resident commented that he had watched for 15 years as it became increasingly difficult to conduct business in North County due to congestion. "If trucks can't move, and you tie up the drivers– large companies decide that this is not the place to be. If you can't move things and people economically, you go elsewhere."

V. UNDERSTANDING AND PERCEPTIONS OF THE EXPRESS LANES VALUE PRICING (FASTRAK) CONCEPT AND OPERATIONS

A. Familiarity with the FasTrak Program

The members of each focus group were asked whether they knew how the FasTrak toll operations on the Express Lanes worked. In both the Main Lane and Transit Riders groups, one or two people could describe, fairly accurately and completely, how to obtain and use a transponder, and a few from each group understood that the toll was designed to rise as congestion increased. Participants did not, however, volunteer an explanation that distinguished whether it was the main lane or the Express Lane level of congestion that triggered changes in tolls. This was an area of confusion in both groups. Similarly, both Main Lane and Transit groups, as well as among non-transponder owners from the Express Lanes user group, there was general confusion about where and how to pay tolls. Numerous questions were asked about whether information was posted on the freeways (few recalled seeing any such information) and how someone could even find out who to call to sign up for the FasTrak program. As one participant reflected, "I know the lane's there, but who has the key to it?"

Virtually no one—including current transponder owners—was aware of how the toll revenues were spent. The only exception was one woman in the Transit Riders group, who knew that the Inland Breeze was supported by toll revenue.

People unfamiliar with transponders wanted to know whether a transponder was an actual device, and how toll charges were subtracted ("like a phone card" volunteered one participant). Finally, most people (including many FasTrak toll payers) did not understand how a person is charged if the toll changes while they are still traveling within the Express Lanes.

B. Attitudes about the Express Lanes

Express Lane users—those most familiar with the facility—offered the most detailed and extensive list of "pros and cons" with respect to the current eight-mile Express Lane facility. On the positive side, they enjoyed the benefits of faster trips, which they associated with less stress to themselves and their vehicles. Their primary complaint about the lanes was a really a "back-handed compliment"—the lanes, they felt, are too short. They should be extended southward to downtown San Diego, and northward through the SR 78 interchange. Express Lane users did have operational criticisms, however. They noted more congestion on the lanes recently, and as the lanes become more crowded, the feeling of safety previously enjoyed by users was

diminished. If accidents or breakdowns occur on the Express Lanes, emergency vehicles and tow trucks are required to backtrack because of lack of intermediate access—a design flaw, according to some participants.

Main Lane users approached the topic of satisfaction with the Express Lanes from their own perspective, as motorists using the general purpose lanes. Thus, a major concern for participants in this group was the congestion caused when the Express Lane traffic is forced back into the main lanes. From an operational perspective, one frustrated Main Lane user noted that the northern terminus of the Express Lanes coincides with a section on the main lanes where two lanes are lost—one at Carmel Ranch, and one at Rancho Bernardo, thus aggravating the merge-related congestion problem in the northbound evening peak period. . Now, they report problems on the main lanes in the evening, as the northbound FasTrak traffic merges near Carmel Mountain Road, forcing main lane drivers to the outside lanes in an effort to keep moving.

In order to provoke further discussion among Main Lane users, the moderator asked what they thought were the original goals of the Express Lanes. Main Lane users stated that the purpose of the Express Lanes was to promote HOV usage to reduce congestion and fuel consumption for air quality purposes, though they did not judge the lanes to be effective in increasing the use of carpools or vanpools along the corridor. Additionally, the Main Lane users believed that the Express Lanes' related goal of moving traffic off the I-15 main lanes was achieved only temporarily. Main Lane users reported initial benefits (on the main lanes) when FasTrak began operations. They reported peak period drive time savings of 5 to 10 minutes on their commutes, or roughly 20 percent of their average trip. These time advantages have dissipated, however.

Participants in the Transit Riders offered little feedback on the issue of the Express Lanes, apart from their facilitation of transit service used by a number of group members.

Participants' Comments on the Existing I-15 Express Lanes

	Express Lane Users	I-15 Main Lane Users	Transit Riders
Positive	Get where you're going quicker Less road rage Less fuel consumption Easier on your car—no "stop and go" Use less gas.	When X-lanes were first built, main lane conditions temporarily improved. Fridays are lighter on the main lanes because more people use Express Lanes.	(no specific comments)
Negative	Unfair to pay twice to ride the same road. Too expensive at peak congestion times. Even Express Lanes are getting crowded and feel less safe as a result. Backtracking required for emergency vehicles, due to lack of intermediate access. Carpool lanes simply too short—it's frustrating. Should be extended (southward to Downtown and northward through the SR-78 interchange).	"Where FasTrak ends, Hell begins"—frustration with congestion caused by merging and weaving. Express Lanes only "minimally" effective in encouraging carpooling or moving traffic off main lanes.	Lanes are too short; need to extend father north. "The city just wants to get paid off the tolls."

C. Attitudes about Enforcement on the Express Lanes

Participants in all groups expressed satisfaction with the effectiveness and fairness of current enforcement practices on the Express Lanes. One Main Lane user suggested more enforcement during the after-dark evening commute in the winter; others agreed that the cover of darkness provided opportunities for would-be carpool violators. Additionally, reference was made to a greater scofflaw problem at on-ramps to the I-15, where people increasingly fail to wait for the green light to enter the main lanes, and where solo drivers illegally use the carpool bypass lanes to enter the freeway main lanes.

FasTrak customer service representatives, as well as the California Highway Patrol (CHP) were viewed as reasonable and flexible by frequent Express Lane users who had experienced a variety of small mishaps on the lanes, such as forgetting to take their transponder out of the silver bag when driving solo, or forgetting to protect the transponder when using the lanes as a carpool. Allowances and account adjustments were well handled, according to participants.

Attitudes about I-15 Express Lane Enforcement		
Express Lane Users Group	**I-15 Main Lane Users Group**	**Transit Riders Group**
Access to lanes well and fairly enforced. Increase in active CHP monitoring observed by members. FasTrak customer service was responsive to accidental lane violation issues.	Need for more enforcement to catch violators of HOV by-pass on on-ramps and after dark during the winter.	Were aware of CHP presence on occasion. Penalty judged to be severe enough to stop violators.

VI. AWARENESS OF THE MANAGED LANE PROPOSAL AND INITIAL REACTIONS

When asked what they had heard about any plans to extend the existing Express Lanes, several Express Lane users indicated they knew something about such plans, and were enthusiastic about learning more. Main Lane users revealed less awareness of specific project plans than did Express Lane users—only one person knew enough about the proposal to describe it. Whereas Express Lane users initial response to the extension was one of straightforward support, Main Lane users' immediate reaction, upon learning more about details of the proposed Managed Lanes was that project delivery would occur long after it could provide them with any personal benefit. A typical comment was, "I'll be retired by then, so it won't do me any good."

Perhaps surprising is the fact that a larger portion of Transit Riders than either of the other two groups—five of 14 people—had heard about the extension. In fact, discussion of the issue of extending the lanes was anticipated by one person with the hopeful question, "Are there any plans to extend it?" Despite their general interest in the idea, most Transit Riders were vague about details of the Managed Lanes project. Although a number of participants discussed details of zipper technology associated with the project, no one in any of the three groups had

heard that express Bus Rapid Transit service was to be included as part of the proposed Managed Lanes.

VII. ATTITUDES ABOUT MANAGED LANES AND VALUE PRICING

A. Participants' Understanding of the Traffic Demand Function of FasTrak Tolls

A notable "disconnect" in many participants' understanding of the primary function of the FasTrak tolls appeared to be consistent through all three focus groups. For example, FasTrak users were asked if they felt that tolls were a useful mechanism to keep the Express Lanes flowing. One FasTrak participant stated, "You have to have some mechanism because if you did not price somewhat, the thing would come to a total stop." Following that statement, there was general agreement from the other participants. Thus, on one hand, people seemed to clearly understand that the Express Lanes *weren't like any other road*, and further, were able to explain that the *reason* they weren't like any other road was because the tolls provided a mechanism to keep them flowing smoothly by imposing a fee that some solo drivers would choose not to pay. In subsequent discussions, however, despite having agreed explicitly recognized the critical function of the tolls in maintaining free-flowing Express Lanes, many participants would express frustration and declare that the freeways simply had to move faster, and insist that this better level of service be provided at no additional cost to them, beyond the taxes they'd already paid. It was as if participants' frustration with traffic and far-off solutions caused them to "forget" the entire logic of the value pricing concept that they had apparently affirmed only moments before. A similar dynamic was found within each focus group, and may indicate a need for an intensive informational campaign to re-introduce and reinforce the various purposes and rationales underlying SANDAG's value pricing concept.

B. Probing Attitudes Toward Value Pricing (Tolls)

Negative Attitudes toward Tolls are Shared by All Groups

Within each group, one or two participants strongly presented the "double taxation" objection to tolls. That is, because roads are paid for by taxpayers, no one should be charged to use them again. Some participants making this type of argument, when reminded that the tolls are intended to keep the lanes flowing faster than the main lanes, would back away somewhat from their statement. Additionally, when it was pointed out that, before tolls, *no solo driver* could use the carpool lanes at all, the double taxation argument would soften somewhat. However, many participants held the view that the tolls were "useful" and "unfair" at the same time. The typical group dynamic that occurred was that, once the "double taxation" argument was made, it found support in roughly half the group, though not voiced as strongly as by the original proponents.

The other negative view expressed about tolls—that they are simply too high— was also shared across all groups, and the sentiment was spread throughout the range of ethnicity, income and commute mode found in each group.

Express Lane Users: FasTrak Transponder Better than Old Express Passes

Several of the FasTrak users had been customers since the inception of the project. By far, the transponder was preferred by those who had experience with the monthly pass, because it allows greater flexibility in deciding when to use the Express Lanes, and gives drivers more

control about when to pay a toll. It was felt that the Express Pass program "required" people to pay whether or not they used it, since they had already paid a monthly fee, thus incurring a sunk cost. With the advent of the transponder program, they liked being able to put the transponder in the silver bag and carpool, or choose not to use the lanes at all on a particular day, thus avoiding the toll.

Main Lane Users: Confusion as Well as Clarity

Despite numerous moderator efforts to clarify toll operations, essential misunderstandings about the purpose of the lanes and the function of the tolls related to "keeping the lanes moving" (described in Section VII. A.) were evident and persistent throughout much of the discussion within the Main Lane users group. Several of the participants in this group had a conceptual difficulty retaining the demand management purpose of the tolls in mind while considering other aspects of the project. However, other Main Lane users were able to offer another perspective to the discussion, responding like one man who pointed out, "But the people who are driving by themselves are paying for the people who are carpooling. So that's their [highway planners'] way of balancing it out, that the people who are driving by themselves are actually paying for the carpoolers."

Transit Riders: Revenue Support for Better Transit Service is Appealing

Once Transit Riders learned that the toll revenue would support express bus service, and were assured that tolls were an *option for solo drivers, not a requirement*, there was general support for the idea.

The following summary of participant views about value pricing highlight the finding that, while negative perceptions were identical across all three focus groups, the groups differed in their assessment of positive features of value pricing.

How Participants View Value Pricing Tolls as Used on the I-15 Express Lanes			
	Express Lane Users Group	**I-15 Main Lane Users Group**	**Transit Riders Group**
Positive	Tolls were placed third (behind length of and access to facility) in list of reasons for dissatisfaction. Believed tolls were effective in keeping lanes moving. Transponders (FasTrak) much preferred to former Express Pass program. Savvy users plan their usage to minimize overall toll costs.	High toll cost (equity issue) is balanced by solo driver subsidy of alternate modes. Recognized tradeoff between toll costs and family time/free time. Basic misunderstanding of demand management function of pricing.	Favored tolls that support express bus service. General support for tolling as a new mobility option. Concern over spending on tolls was distributed across ethnic and income categories
Negative	"We already paid for the roads" (double taxation argument) Concern about cost of tolls was distributed across ethnic and income categories among participants in group.	"We already paid for the roads" (double taxation argument) Concern about cost of tolls was distributed across ethnic and income categories among participants in group.	"We already paid for the roads" (double taxation argument) Concern about cost of tolls was distributed across ethnic and income categories among participants in group.

C. Value of Time, Willingness to Pay and Reasons for Using or Not Using the Express Lanes

The Decision to Use FasTrak On a Given Day (Transponder Owners Only)

Tolls for the 20-mile Managed Lanes project could be significantly higher than those currently imposed on the eight-mile Express Lane facility. Therefore, it was important to explore the process by which current transponder owners (FasTrak users comprised nine of the 14 Express Lane user focus group) made daily decisions whether to pay a toll to avoid congestion, or stay in the main lanes to avoid a toll charge.

It appears that most FasTrak users plan carefully to maximize their budget relative to tolls, in consideration of their own priorities. They adjust their hours of travel to take advantage of shoulder and off-peak pricing, they listen to traffic reports, look at the traffic ahead and weigh that against any time pressure they feel that day, as well as the current posted toll. Some FasTrak users tend to cluster their use closer to their payday, when they have more discretionary funds available. Like the other focus group participants, FasTrak users' concern over spending on tolls was distributed across ethnic and income categories.

Discussions with FasTrak users sought to gain insight into how people balanced toll costs against other priorities in their budgets and in their lives. For most regular FasTrak users, a toll of 50 cents or 75 cents is always worth the gamble, since traffic reports are not viewed as sufficiently accurate to rely on during peak commute periods. Even when the toll is $1.00, FasTrak users reported almost always willing to take the Express Lanes. Though for some, $2 represents an upper limit, while $3 is the ceiling for several other regular FasTrak users when they "must be in a certain place at a certain time. But, as one moderate income ($50,000 per year) FasTrak user said, when there's a bottleneck, she will use it for business purposes regardless of cost, because "good clients don't wait." Another part time FasTrak user stated that when carpooling, he would of course take the Express Lanes; and when driving alone he would pay "whatever it took" on those days when he simply *had* to get home quickly. Likewise, one of the lower-income carpoolers also pays to take the lanes on days when she is late for work and driving alone.

Interestingly, the transponder owners were actually willing to pay more than they initially *said* they were willing to pay. That is, when probed, it was evident that within the previous week, they had, in fact, paid more than what they'd indicated was, for them, the maximum acceptable toll.

Finally, employer subsidies play a role in the usage pattern of some in the Express Lane users group. One frequent user (with an income of $9,000 per year) uses her transponder only because her employer pays the tolls to ensure timely deliveries of commercial goods; on other days, she carpools. Another relatively high-income FasTrak user only uses the lanes when his employer pays for it. A third participant said that her corporate office would pay for the lanes in Orange County, but not in San Diego, causing her some frustration.

Attitudes/Comments About Tolls and Willingness to Pay Tolls to Use Express Lanes/ Managed Lanes		
Express Lane Users Group	**I-15 Main Lane Users Group**	**Transit Riders Group**
A variety of strategies to minimize tolls while using Express Lanes according to individual priorities. Regular users (3+ trips per week) they will pay $3 (and admitted to paying $4 in previous week.) Occasional users state $2 as upper limit per trip, except in emergencies. Low-income respondent uses FasTrak for business, because employer pays.	Cost of tolls discourages FasTrak use. $4 toll is too high to save 20 minutes. Toll too high; don't like the bus; don't have time to find carpool partner.	Unlikely to pay tolls, except for a limited number of situations related to work and child-care responsibilities. Enthusiastic response to potential use of Bus Rapid Transit on Express Lanes. "TCA tolls are only $2 for 20 miles!" Two people have transponders for emergencies or special days.

Why Main Lane Users and Transit Riders Don't Use the Express Lanes Now

A majority of non-transponder owners from both Main Lane users and Transit Riders groups admit to be willing to avail themselves of time savings at relatively high cost when faced with an urgent situation. However, the tradeoff is difficult for most of these respondents. So, while a few participants asked, "How do you put a value on time with your family?" others stated, "I can't afford to I can't afford $4.00 to get on FasTrak just to save me twenty minutes or half an hour because that adds up."

Three Main Lane users had considered obtaining a transponder in the past. It was primarily the fact that the facility didn't extend far enough north to serve their needs that prevented these participants from acting on the impulse to use the toll lanes as solo-drivers. The cost of tolls was a secondary reason for these drivers. Likewise, two Transit Riders had transponders, and upon occasion, used them. One man stated that, having enjoyed the benefits of the Express Lanes as a toll payer, but no longer being able to afford daily toll charges, he was happy to discover the bus service that used the lanes, and had kept his transponder for special needs.

Conflicted and contradictory messages came from several participants. For example, some participants said they valued their time, but they neither wanted to pay for tolls, nor did they want to take the bus, and further, they had no time to find a carpooler. For some Main Lane users, their income precluded paying tolls to access the Managed Lanes. For many participants in the Transit Riders focus group, both vehicle and toll costs were impediments to using the Express Lanes as a solo driver. For a couple of people, access issues were primary in their decision not to use the lanes.

Although Main Lane users expressed sufficient frustration with traffic that would seemingly motivate them to use the Express Lanes, there are three main factors that discourage them from signing up with FasTrak. In order of frequency of a given response are the following issues:

Cost: Cost was a prohibitive factor precisely when it was needed most—at peak periods. Further, many participants had difficulty in distinguishing the occasional (and entirely optional) targeted use of the lanes with the burden of daily tolls. Many mistakenly viewed the situation as an "all or nothing" choice.

Confusion about using the lanes and/or signing up: Ten people of 14 thought there was insufficient information available about how to sign up for FasTrak. Several participants were confused about how to obtain a transponder, the mechanism for toll payments. Further, they did not know where to find out about signing up. As one person asked, "Is there a phone number or something on any of the signs?"

Access: Four out of 14 Main Lane users said they were discouraged from using the Express Lanes because of the limited access points; a number of them had origins or destinations along the existing route. For others, the lanes did not extend far enough to make it worth their while. "There's no way out of it once you're in there."

D. Likelihood to Use the Managed Lanes Extension

Based on their responses, FasTrak users are the most likely to expand their usage on the new Managed Lanes as toll payers. Though no one stated they would try carpooling as a result of the extension, one participant said that she would definitely consider transit if offered a Bus Rapid Transit option. Current Express Lane carpoolers would likely continue carpooling, but might expand their use of the carpool lanes with the new access points.

The new flexibility inherent to the design of the Managed Lanes (extension of the alignment, new access points, transponder per-trip toll assessment vs. the old Express Pass Program) was attractive to several Main Lane users who had previously considered signing up for FasTrak, but then decided against it. Noting that, with a transponder, there's no time limit on using the "scrip," one participant said, referring to funds allocated to the transponder account. "You would use it on days that traffic was really bad. On Thursday and Friday I would jump on it. The rest of the time I would take the freeway." In addition, the new transit option was attractive to six of the 14 Main Lane users, where as carpooling was deemed "too inflexible."

In addition to using the Managed Lanes new Bus Rapid Transit services, Transit Riders could imagine several reasons to avail themselves of the transponder option on an extension of the FasTrak, including getting to a sick child, or showing up at work on time. Similar to the Main Lane group, many Transit Riders felt that carpooling was not as convenient as taking public transit, and that it required more planning and more schedule consistency than many could handle. Still, one low-income participant in the Transit Rider users group said that although he didn't view it as "the ideal solution" he would use it and I think it's better than what we have now and I would definitely pay for it if they extend it that far."

The summary, below, of participants' stated willingness to consider changing their commutes if Managed Lanes was implemented, indicate that more than half the Main Lane users would stop driving alone—six would try the new Bus Rapid Transit, while two would consider carpool with a 20 mile facility to entice them. In contrast, the Managed Lanes would intensify transponder usage for current FasTrak customers, who could take advantage of the longer facility to save more time each day. If buses came on time, at 15-minute intervals during the peak, three Transit Riders indicated that they would increase their use of transit.

Would Participants Change Commute Mode to Use the Managed Lanes Extension?						
Mode	**Express Lane Users**		**Main Lane Users**		**Transit Riders**	
	Before	*After*	*Before*	*After*	*Before*	*After*
Solo Driver	9	Most would maintain usage pattern, but take advantage of longer Managed Lanes facility	12	6	(1 occasional toll payer)	2-3 would try it
Carpooler	5	5	0	2	(8 carpool as secondary mode)	Probably continue same commute pattern.
Transit	0	1 or 2 solo drivers would try improved Bus Rapid Transit	0	6	14 (8 full time transit riders)	Most would increase their use if there were improved transit service.

VIII. PERCEPTIONS OF EQUITY

Equity issues, whether real or perceived, have become associated with value pricing projects in large part because the means of paying for transportation facilities until now has been through fuel taxes and local or state sales taxes—revenue sources that are not as direct or obvious to most people as tolls. In each of the three focus groups, participants' assessment of whether permitting solo drivers to pay tolls to use carpool lanes was "fair" were mixed—both pro and con—through the entire range of income levels, and across ethnic groups. (See Appendix B for the participant demographic profiles.) Although a focus group does not provide the basis for statistical analysis, these results indicate that neither income, ethnicity nor choice of commute mode seem to dictate a person's perception with respect to the equity, or fundamental fairness, of value pricing.

Generally, after a full explanation of all Managed Lane project features, approximately 85 percent of each group thought the proposal was fair, and did not pose a fatal equity issue, in their opinion. Most people in this group based their approval on the fact that the project provides *options* that work for people in a variety of different situations, and the fact that solo drivers help support transit and carpool alternatives.

Some participants considered the potential for personal benefit from Managed Lanes, whether stemming from transit, carpool or solo driver buy-in opportunities, and determined that the lanes were fair "for them." Others felt that, as long as a person was willing to pay for premium service, they should be permitted to do so. In their view, there was no equity issue involved, since the project didn't take anything away from anyone else. Finally, the fact that the lanes would ease congestion for everyone on the main lanes was viewed as a balancing force in the "equity equation."

There were a few people in each group who did not change their position, and who simply thought tolls were elitist and unfair, offering advantages based on ability to pay. (Within the Express Lane users group, these individuals were, however, willing to use the lanes, and enjoyed the time savings offered by the toll buy-in option for solo drivers.)

A. Express Lane Users

Express Lane users emphasized the fact value pricing offers commuters another choice about how to use the lanes, and expressed the belief that if a person is willing and able to pay, they should have the option. However, many also express concern about socioeconomic disparities, and the relative disadvantage of the less well off. As one relatively high income Express Lane user put it, "We have to consider poor people that might want to drive on that road – nobody spoke up for those people – they only have a couple bucks in their pocket and don't make as much as some other people. It's probably not fair to give a discount, but maybe we should consider that, too." Of the 14 participants in this focus group, nine were Caucasian, three were African-American, and two were Hispanic.

B. Main Lane Users

Eight out of the 14 Main Lane users thought the Express Lanes/Managed Lanes were "generally fair" to travelers. However, Main Lane users wanted to see more transit solutions, and, like the FasTrak users, were impressed with the Bus Rapid Transit component of the Managed Lanes. In fact, six participants said they would be likely to use transit along the new alignment. This group saw transit as the most flexible, attractive and affordable option included as part of the Managed Lanes proposal.

Notwithstanding a suggestion (described below) to reduce tolls, thus allowing more solo drivers access to the facility, there was concern among some participants about maintaining mobility benefits for carpoolers in the Managed Lanes. Thus, equity or fairness for one group (solo drivers who might be priced out of the lanes) had to be weighed against fairness to carpoolers (who might be slowed down by the impact of additional solo drivers.)

C. Transit Riders

As with the other focus groups, the Transit Riders were asked whether they thought that the project, as described (with transit and carpool enhancements, and additional access) was fair, given that some people would have to pay to use the lanes. General response indicated participants viewed the tolls as fair. Reasons cited included 1) tolls went back into the system, and supported transit and carpooling; and, 2) tolls are an option for premium service.

When pushed, with the question, "Is it fair to charge solo drivers whatever it takes to keep the lanes flowing free for the bus riders and carpoolers?" one participant pointed out that the more people who use the lanes for free, the less money is available for transportation uses. "Who's going to pay for the maintenance and the upkeep? The taxpayers again."

In fact, some Transit Riders thought the carpoolers should be paying for the express lanes. Two participants stated that they should pay something—a dollar or two, at a discounted rate. Another participant believed that, because carpoolers received a benefit, they should pay. Two other participants countered, however, saying, "We just talked about how difficult it is to carpool. Why not keep it free for them? They deserve it."

Effect of the Direct Access Ramps and Bus Rapid Transit/Park and Ride Lots on Perception of Equity

Participants believed that increased access to the facility would render the whole project fairer by allowing drivers to make more affordable, selective choices in the segment to use, instead of having to purchase a trip on the entire segment. One member of the Express Lane users group stated, "When they give you more options for everybody, it is always better - you can't lose there." There was substantial agreement with this assessment, by other members of the group.

In addition, the overall impact of providing direct ramp access for a Bus Rapid Transit, with supporting facilities such as transit centers and park and ride lots, and more neighborhood transit service combined to make a strong sell that overcame most equity-based objections to the project. Like the FasTrak users, the Main Lane users and Transit Riders were impressed with the Bus Rapid Transit component of the Managed Lanes, but were more insistent upon the necessity of transit service improvements.

Concern about fairness for carpoolers was also expressed, and the enhanced carpool access to the project was appealing for participants in all three focus groups.

Double Taxation: "It's unfair to pay gas tax plus tolls for the same road."

After the explanation of Managed Lane access, carpooling and Bus Rapid Transit features, Express Lane users moved to a strong position of support, feeling that the number and quality of travel options included in the proposal made "all the difference in the world." As on participant who had been concerned about equity before, stated, "You can't lose by giving people choices, provided the cost is not prohibitive." Though the equity issue was resolved for participants, the "double taxation" problem remained for one person who said, "I'm still paying twice for the same thing." One Transit Rider agreed it was unfair, but couldn't think of a viable alternative that would accomplish the same mobility objectives.

Need for Improved Transit Service

When asked, eight out of 14 of the Transit Riders said that public transit served as their primary mode of transportation, and seven of those eight had to transfer at least once to reach their destination. Because transit is so often mentioned as a practical mitigation of any potential equity impact (real or perceived) it is therefore important to ensure that the proffered transit service is adequate and presents an attractive alternative.

Transit Riders were extremely knowledgeable about local transit service issues, although there was some difference of opinion. For example, one low-income ($25,000 per year) frequent rider gave the transit provider good grades for improving the condition of the buses in the fleet, and had bus-driver friends who had explained to him how many new customer service training programs they'd been taking recently. However, this assessment was met with some amount of cynicism from other participants.

Concerns about bus frequency (the group recommended peak period headways of no more than 15 minutes) the number of transfers, wait time, broken air conditioning systems, premature expiration of transfers, lack of feeder services, crowding (requiring standing for 40 minute rides) and cleanliness were nearly unanimous among the transit riders. Although one participant noted very specific improvements in bus service, calling it "outstanding," others noted the lack of coordination between transit agencies, and expressed doubt about significant transit service

improvements. Suggestions for improved service would meet many of the thresholds put forth by the group as a minimum for "good service" included low headways, better security, cleaner buses, more night service, extension on the amount of time a transfer is valid, reversible transfers,

Participants Propose an Alternative Pricing Scenario: Reducing Tolls to Permit More Access by Solo Drivers

Following a brief recap of how pricing served to keep the lanes flowing, a segment of the FasTrak users continued to lament the fact that so many drivers were excluded in order to ensure quick travel for a relative few on the Express Lanes. This led to the suggestion by one participant to permit more solo payers to use the lanes by lowering the tolls and allowing the lanes to degrade to 45 miles per hour. The group took up this idea and came to quick general agreement that they would still be happy traveling at 45 miles per hour, if the main lanes were operating in stop-and-go conditions. One participant stated, "I understand the proposed premiere service concept, but there's a balance so if there's more people over in the FasTrak at 45 miles per hour, maybe some of those poor folks over in the other lanes can move from 8 to 15 miles per hour."

When asked about whether reducing the travel speeds on the Express Lanes from the speed limit (or above) to 45 miles per hour would be fair to carpoolers, one response was that even when the FasTrak lanes were "full" they were still traveling at least at 60 miles per hour (i.e., this person was not able to imagine the hypothetical case, and relied on empirical experience with the existing toll schedule in assuming that free flow conditions would, in fact, result). Others, who were able to conceptualize the hypothetical, felt that even if the lanes moved slower than the speed limit, that "anything was better than a dead stop." A regular FasTrak carpooler sided with those supporting the low toll/45 miles per hour plan, saying, "I'm with the majority. I believe in fairness. Therefore if traffic is flowing and it's allowing people to flow along at a lower speed that's fine with me." A show of hands indicated that 12 of the 14 participants liked the idea of reducing the tolls and the speeds to allow more access.

IX. PERCEIVED PROJECT BENEFITS AND CONCERNS

A. Project Pros and Cons

After discussing details of the proposed Managed Lanes project from a variety of perspectives, members of each focus group were asked to list the pros and cons of the project. The highlights are summarized in the Table 1, below. Although the top "negative" reactions to the Managed Lanes project were shared in common by participants of all three focus groups, the perception of project benefits tended to be expressed in terms that were specific to perspectives that distinguished each focus group from the others.

Express Lane Users

FasTrak users immediately personalized the potential benefits of the extension, and in fact, most expressed a strong desire for extension of the Express Lanes in their introductory comments at the beginning of the focus group discussion. Appealing features of the Managed Lanes were the added length of the facility and the increased opportunities to enter and exit according to varying travel needs. The extension of the express lanes would personally help eight of the 14 participants. The others already have access to the lanes that meets their living

and working arrangements, and so they would not specifically benefit from the additional length or the additional access, but did not object to the project.

Main Lane Users

Main Lane also looked for immediate personal benefits of the lanes. From their perspective, it was important to keep in mind the advantages to travel along the corridor due to new capacity offered by the project.

Main Lane users were able to articulate the tradeoff between spending time and spending money, if they were to pay to use the Managed Lanes. The transit option was also attractive to a number of participants, who identified potential savings in insurance, wear and tear, and gasoline if they were to leave their car at home and take advantage of Bus Rapid Transit.

Main Lane users also thought the Managed Lanes represented a more efficient transportation investment than would the construction of carpool-only lanes. When faced with a choice of either building carpool lanes or Managed Lanes (with value pricing,) nine out of 14 participants chose the Express Lanes, while the remaining five chose to build carpool lanes only.

Transit Riders

For transit riders, the benefits of the Managed Lanes project flow from the reduction in travel time associated with a high quality express bus service. Transit riders also felt that the concept offered them a number of good choices. “Everyone likes choice and I think it encourages people to take an alternate way.” Transit Riders also believed that the enticement to carpool on the Managed Lanes would take traffic off the main lanes, thus providing benefits to main lane users who could not take direct advantage of the Managed Lanes.

B. Negative Reactions to and Concerns About Project Operations

Core Concerns Shared by All Three Focus Groups

A number of common operational concerns were raised by individuals in all three groups: safety and congestion at ingress/egress points; traffic delays to be endured through a lengthy construction process. Likewise, the cost of tolls for a longer facility, as well as the issue of “paying twice” (through taxes and tolls) for the same facility were presented as philosophical objections by several members of each of the three focus groups. Issues are detailed below.

Merging and Weaving Caused by Multiple Access to Managed Lanes Concerns about both safety and slowdowns related to merging and weaving at the new access points and general driver confusion were mentioned in all three focus groups. All groups expressed concern about how the Managed Lanes will handle feeding traffic back into the main lanes at its northern terminus at the Highway 78 interchange. Traffic from Temecula and Murrieta was mentioned repeatedly as a factor that must be considered by planners and local governments. Additional concerns were expressed about the traffic impacts of slow-moving commercial vehicles. Construction impacts were feared as another factor to worsen existing commutes.

However, the underlying reasons for concern about merging and weaving differed among the groups. Express Lane users were primarily concerned about the *congestion delays*. In

contrast, Main Lane users focused on *safety implications* of merging and weaving. Transit Riders expressed concern about *both congestion and safety risks* posed by the multiple access configuration.

Construction-related Highway Congestion All groups are concerned about impacts (for commuters and business) of years of corridor construction. This concern is exacerbated by negative opinion with respect to the **length of time to complete the project.** Not only does an extended construction period cause more delay in the minds of participants, it also delays the delivery of desired project benefits—more capacity, more choices and quicker travel times. In some cases, project delivery will occur after participants plan to retire.

Zipper Lane Confusion People tended to like the zipper lanes because that configuration would provide "maximum lanes" for the facility. However, operationally, people were concerned that drivers would find the whole facility somewhat confusing, especially at the beginning, and that this confusion could translate into a safety issue.

More Effective Public Communication Program Needed Increasing the publicity and information about the project was mentioned as an improvement in the overall project concept. This was meant not only to let the public know about the project and its options now under consideration, but upon project implementation, participants felt more marketing of transit and carpooling facilities would be useful. Support for keeping the lanes open on weekends and holidays was strong.

Need to Balance Access with Demand Management Both Express Lane and Main Lane users were concerned that the new project could entice so much traffic onto the Managed Lanes that they would become congested; however, the concern for Express Lane users was for their own mobility, while Main Lane users expressed concern for carpoolers' level of service if too many solo drivers were permitted access to the lanes. Balancing these concerns was the desire by many participants in the same groups to open the lanes to as many solo drivers as possible by lowering the tolls, making the Express Lanes/Managed Lanes more affordable.

Better Transit Feeder Service Both Transit Riders and Main Lane users expressed the need for local transit access to support the Bus Rapid Transit component of the project.

Table 1: Summary of Perceived Managed Lane Project Benefits and Disadvantages

FOCUS GROUP	Pros	Cons
Express Lane Users	• Extension would personally benefit 8 of 15 current FasTrak users. • Much more flexibility, more access. • More people would use it because it would be longer. • Relieves the burden of traffic between Escondido and Ted Williams Parkway. • Transit component makes sense because "we're running out of space with all these cars."	• **Construction-related highway congestion.** • **Length of time to complete.** • **Cost of tolls.** • **"Paying twice" for same road.** • New access will cause merging delays and more congestion. • Lanes might become too popular and get congested. • Consider more options; look to broader solutions (mass transit/land use).
Main Lane Users	• Good idea, because it works for some people. • Theoretically can meet more people's needs because of increased access • Would help ease the traffic going across Lake Hodges. • It will help ease congestion right now. • Multi-modal Managed Lanes seen as more "progressive" solution than general purpose lanes • Time savings. • Better utilization of carpool lanes • Save on gas spent sitting in traffic.	• **Construction-related highway congestion.** • **Length of time to complete.** • **Cost of tolls.** • **"Paying twice" for same road.** • Having to pay tolls at all. • Express Lanes are only a temporary solution. • Additional ingress and egress could interfere with carpooler's level of service. • With new access it could become congested. • Driver confusion and merging could cause safety problems.
Transit Riders	• Could use it to keep your job; to tend to a sick child; to keep social appointments • Offers choices • If you pay for quicker transportation, you immediately get it • Keeps carpools as a free option • Get there faster* • Less stress* • Closer to destination* • Fewer transfers* • Less waiting time* • Convenience—you're not driving; can do something else* • Saves you money* • Saves wear and tear on your vehicle*	• **Construction-related highway congestion.** • **Length of time to complete.** • **Cost (tolls).** • **"Paying twice" for same road.** • Safety/congestion due to new weaving and merging. • Cons for transit riders related primarily to suggestions for improving bus service; presumably the service offered on the Managed Lanes will meet many of the thresholds put forth by the riders as a minimum for "good service." These include low headways, better security, cleaner buses, more night service, extension on the amount of time a transfer is valid, reversible transfers,

BOLD comments are common to all three focus groups.

* Asterisked "Pros" for Transit Riders relate to advantages of high quality Bus Rapid Transit System proposed for deployment on the Express Lanes.

X. SUGGESTED USE OF TOLL REVENUES

Each group was asked for specific suggestion on the best use of future revenues from the Managed Lanes. The only suggestion from the Express Lane users group was to improve the signage that informs the user what the current toll is.

Main Lane users supplied two suggestions for using revenues—expand the lanes, or provide a rebate to offset tolls for those solo drivers who paid to use the Managed Lanes. The moderator then asked the group whether they would favor using the tolls to fund express bus service with shuttles at either end of the trip. Responses were somewhat muted, but generally the group felt that this would be a good option for some people. A proposal to implement rail or trolley service came up as a counter-suggestion to Bus Rapid Transit.

Among the three focus groups, Transit Riders provided the most suggestions for using toll revenues, many of which benefited transit, which is not surprising. Riders in some areas, faced with daily waiting for the bus and uncomfortable levels of crowding when they boarded the bus, wanted toll revenues directed to putting more buses on the street. And, like the Main Lane users, Transit Riders devised strategies whereby their own commute expenditures could be reduced through a variety of "frequent flyer" scenarios, fare reductions for everyone and/or bus pass subsidies for children. However, suggestions made by Transit Riders were not entirely limited to transit-oriented expenditures; one participant would favor spending money on improving local streets and related transportation projects.

Suggestions for Use of Managed Lanes Toll Revenues		
Express Lane Users Group	**I-15 Main Lane Users Group**	**Transit Riders Group**
More signs advertising the toll	Expand the Managed Lane facility even further. Offset the cost of tolls with a rebate.	Reduce bus fares, or provide "frequent flyer" benefits. Free bus pass for kids. Buy more buses. Improve local streets.

XI. EXPANSION OF VALUE PRICING BEYOND I-15

Participants were asked whether value pricing should be expanded beyond the I-15 corridor. A majority of respondents in all groups thought expansion of the concept to other regional corridors would be a good idea. When prompted to provide specific suggestions for new value pricing express lanes, participants suggested the following: Torrey Pines Road, the I-5/I-15 interchange, the SR 78, the I-805, and the I-8.

XII. CONCLUSION AND RECOMMENDATIONS

A. Conclusions

Project Enjoys Strong Support among Most Participants of All Three Groups Strong support for the proposed extension to the lanes existed in all three focus groups, though it was strongest in the FasTrak users group. Current FasTrak users strongly supported plans to

extend the lanes; in fact, those who had indicated during the participant screening process that they were "dissatisfied" with the lanes revealed during the discussions that they were dissatisfied primarily with the fact that the facility was only eight miles long. Support for the extension (the Managed Lane concept) was notably stronger among Transit Riders than among the Main Lane users group.

Bus Rapid Transit System Allays Most Equity Concerns for Participants Early in each discussion with participants, concerns about how value pricing would affect low-income drivers arose. However, these initial objections to the project on the basis of equity turned into strong support after the plans for the Bus Rapid Transit were explained. The Bus Rapid Transit component of the proposed extension was appealing to all groups. The Transit Riders welcomed the improved service; non-transit riders liked the idea that an alternative to driving alone or carpooling was being considered. It addressed the concerns nearly all focus group participants with respect to the equity issue. It is therefore important that transit service meet the needs of those who it is designed to serve, if it is to serve as the "equalizer" that people perceive it to be. This will require local, regional, and inter-county coordination to accommodate the current and expanding multi-modal needs of corridor commuters, and to provide adequate feeder service to and from express route stops.

"Double Taxation" vs. Managing Demand: An Information and Education Issue? In general, issues related to fairness (i.e., "double taxation") stemmed from the difficulty on the part of participants to retain the concept of the toll's purpose in managing demand while considering the impacts of "opening up the lanes to more people." Confusion about the operations, purpose, and rationale for the tolls for the existing Express Lanes was not uncommon among members of these focus groups. Again, the focus groups bring home the lesson that familiarity with successfully implemented and well-conceived value pricing projects brings great support and relatively little opposition. This illustrates the potential for miscommunication and misunderstanding about specific operational features of the Managed Lanes project. The situation presents a challenge, and suggests the need for a sustained program of clear communication with and information dissemination to the public.

B. Comparing 2001 and 1998 Focus Group Waves

Although three previous waves of focus groups were conducted (in 1996, 1997 and 1998) only the 1998 effort offers sufficient commonality of program context and research agenda to allow some relevant comparisons to be made. As the table below indicates, the findings for overlapping topics were very similar for the 1998 and 2001 focus group waves. The main perceived benefits of the lanes (reduced drive times and less commute-related stress) have remained stable over the past three years. Support for extending the lanes found in 1998 continues to this day. And misinformation or lack of information about details of the pricing program (how to sign up, how toll-payers are charged, and what the toll revenue is used for) is still a problem that must be addressed. The only notable difference (among this limited range of overlapping topics) is that the year 2001 participants were generally more familiar with Express Lane hours of operations, and knew more about enforcement of the lanes and about the stiff fines for lane violations.

1998 Focus Group Wave Key Overall Finding (Overlapping Topics Only)	Year 2001 Express Lane Group *Similar findings?*	Year 2001 Main Lane Group *Similar findings?*	Year 2001 Transit Riders *Similar findings?*
Benefits of lanes are time savings, stress reduction	Yes	Yes	Yes
Support extending lanes to Escondido	Yes	Yes	Yes
Unfamiliarity with variable pricing methodology	Somewhat	Yes	Yes
Extend lanes to Escondido	Yes	Yes	Yes
Unfamiliarity with variable pricing methodology	Somewhat	Yes	Yes
Didn't know how revenue was being used	Yes	Yes	Yes
Groups unfamiliar with hours of operation or fines	No	No	No
Poor signage for FasTrak	Yes	Yes	N/A

C. Recommendations

Speed Up Project Delivery From both the construction-impact perspective and the need for new travel options, faster is better in the minds of many of the focus group participants. In addition, quicker project construction will reduce the impact of construction-related delays—a concern mentioned by many in all three focus groups.

Better Promotion of and Information about Existing Express Lanes There is a continued need for providing information about FasTrak sign-up procedures, as new drivers enter the environment of I-15, or as their travel needs change and the Express Lanes may become a more viable option—one that they might use if they knew more about it. It is suggested that SANDAG consider re-vamping and implementing the kind of successful marketing program that helped position the original demonstration project.

The need for better information about the purpose and rationale for the existing value priced facility is underscored by the observation from the focus group effort that any misunderstanding participants had about the purpose and operation of tolls to manage demand on the existing FasTrak lanes carried into the discussion of the Managed Lanes extension project. Thus, better information provided now, about the existing lanes, could indirectly improve public understanding of the Managed Lanes extension.

Finally, because the feature that represented the "swing vote" was the Bus Rapid Transit element of the Managed Lanes, it is recommended that this feature be fleshed out, clearly explained and emphasized in any public information effort associated with the project. Information campaigns should stress the toll revenue support for this popular feature of the lanes. The "rail-station-like" aspect of the proposed four direct access ramps and the ability of the bus to compete with rail in the minds of the public could play an important role in winning public support for Managed Lanes.

Provide Convenient Transit Service The transit element is critical in garnering support from all three focus groups. The kind of service described and required to satisfy expectations and needs would necessitate improvements in service (more frequent, reliable service, more evening service) operational policies (better time routes and extended-time, reversible transfers) as well as facilities (better security, cleaner and more reliable buses). Both Transit Riders and Main Lane users expressed the need for local transit access (transit feeder service) to support the Bus Rapid Transit component of the project. Finally, it was obvious that San Diegans love

their trolleys. According to the focus group participants, the more the Bus Rapid Transit service looks, feels and operates like a trolley, the better.

Consider Increasing Cross-Freeway Connections for Community Needs In order to remove local trips from the freeway, project planners might consider how to coordinate improvements in cross-freeway (underpass or overpass) roadway connections to permit communities along the east and west sides of the I-15 corridor to meet social, personal and business needs without using the freeway for short trips. This could have a significant impact on localized congestion hot spots.

Explore Possible Trade-Offs between Level of Service and Tolls Within the statutory and institutional constraints pertaining to Express Lane level of service commitments, it is recommended that project designers explore the suggestion made by participants in two groups, to permit greater solo driver affordability by lowering the tolls. Participants indicated willingness to tolerate a somewhat lower peak speed, in the area of 45 miles per hour—still significantly higher than peak speeds on the main lanes.

Address Long Range Planning Issues Participants in all groups stressed their disappointment in government, Caltrans and regional planners inability either to keep up with highway demand, or to address broader multi-modal needs. Further, the issues of growth, inter-county travel patterns, development, land use and affordability of housing should be included in future communications with the public.

Operational Recommendations: Focus group participants favored keeping the lanes open on weekends and holidays. They also suggested keeping the customer service center open more often, including weekends.

APPENDIX A: I-15 MANAGED LANES FOCUS GROUP SCREENERS

SANDAG Focus Group Screener
(SOV and HOV Groups/FasTrak Users)

Hello, may I please speak to _____?

Hello. I'm _____ from Luth Research. Today I'm recruiting people to take part in an important research project concerning people who drive on I-15. Would you be interested in participating in a focus group? Participants will be paid $50.

(IF INTERESTED, PROCEED WITH:)

Before I sign you up with the group, I need to ask a few questions to make sure the group is balanced.

1. Do you work in market research, advertising or for a government such as a city, county or state agency?

   YES ---------- TERMINATE
   NO ---------- CONTINUE

2. How many trips Southbound trips do you make on I-15 during the morning commute period each week?

   CURRENT ---------- 1
   PAST ---------- TERMINATE
   DK/NA OR REFUSED ---------- TERMINATE

3. When you are driving alone in your car, how many one-way trips do you make on an average week using the I-15 Express Lanes as a FasTrak customer?

   RECORD NUMBER:-------(LESS THAN 8 TRIPS)-------- 1 (PART-TIME GROUP)
   RECORD NUMBER:-------(8 TRIPS OR MORE)--------- 1 (FREQUENT GROUP)
   DK/NA OR REFUSED ----------TERMINATE

4. When you are carpooling with others in your car, how many trips do you make on an average week using the I-15 Express Lanes?

   LESS THAN 4 TRIPS ---------- 1
   4 TRIPS OR MORE ---------- 2
   DK/NA OR REFUSED ----------TERMINATE

5. What is the purpose of most of your trips on I-15?

   WORK ---------- 1
   SCHOOL ---------- 2

SHOPPING ---------- 3
RECREATION ---------- 4
OTHER ---------- 5
DK/NA or Refused ---------- 6

6. Are you satisfied or dissatisfied with the I-15 FasTrak program? (GET ANSWER, THEN ASK:) Are you very (satisfied/dissatisfied) or somewhat satisfied/dissatisfied)?

VERY SATISFIED ---------- 1
SOMEWHAT SATISFIED ---------- 2
SOMEWHAT DISSATISFIED ---------- 3
VERY DISSATISFIED ---------- 4
NO STRONG OPINIONS ---------- 5
DK/NA OR REFUSED ---------- 6

7. In what year were you born?

1982 AND AFTER ----------TERMINATE
(RECORD YEAR) ---------- 1
DK/NA OR REFUSED ---------- 2

8. What was your total household income before taxes in 2000?

(RECORD AMOUNT) ---------- 1
DK/NA OR REFUSED ---------- 2

9. (RECORD GENDER)

Male 1
Female 2
Thank you. I would be interested in having you participate in a group discussion on:

AUGUST 5 AT 6:00 PM (FREQUENT USER) ---------- 1
AUGUST 5 AT 8:00 PM (PART-TIME USER) ---------- 2
AUGUST 6 AT 6:00 PM (HOV GROUP) ---------- 3

To thank you for your participation, we will pay you $50 on the night of the discussion and serve light refreshments. The discussion will last about two hours and you can come dressed in whatever makes you comfortable. Are you interested in participating?

YES ---------- 1
NO ---------- 2

CALL BACK ON _____ AT _____ ---------- 3

SANDAG Focus Group Screener
(SOV and HOV Groups/I-15 Main Lane Users

(This screener was also used to identify transit riders)

Hello, may I please speak to _____?

Hello. I'm _____ from Luth Research. Today I'm recruiting people to take part in an important research project concerning people who drive on I-15. Would you be interested in participating in a focus group? Participants will be paid $50.

(IF INTERESTED, PROCEED WITH:)

Before I sign you up with the group, I need to ask a few questions to make sure the group is balanced.

10. Do you work in market research, advertising or for a government such as a city, county or state agency?

YES ---------- TERMINATE
NO ---------- CONTINUE

11. How many trips Southbound trips do you make on I-15 during the morning commute period each week?

RECORD NUMBER ----------(2 or More) 1
RECORD NUMBER----------(1 or Less)-----TERMINATE
DK/NA or Refused TERMINATE

12. Have you ever owned a FasTrak transponder that allows you to use the I-15 Express Lanes as a solo driver?

Yes---------- 1 (ASK 3-A)
No----------2 (SKIP to 4)
DK/NA or Refused----------TERMINATE

3-A. Are you currently an I-15 FasTrak customer?

Yes----------GO TO USER SCREENER
No----------CONTINUE

13. What is the purpose of most of your trips on I-15?

Work ---------- 1
School ---------- 2
Shopping ---------- 3
Recreation ---------- 4

Other ---------- 5
DK/NA or Refused ---------- 6

14. When you travel on I-15 during peak hours, do you usually drive alone, carpool, vanpool, take a bus or do you use some other means of traveling on I-15? (RECORD PRIMARY COMMUTE METHOD ONLY)

Drive alone 1 (SOV Segment)
Carpool----------2 (HOV Segment)
Vanpool----------3 (HOV Segment)
Take a bus----------4 (GO TO TRANSIT USER SCREENER)
DK/NA or Refused ----------TERMINATE

15. In what year were you born?

1982 and after ----------TERMINATE
(RECORD YEAR) ---------- 1
DK/NA or Refused ---------- 2

16. What was your total household income before taxes in 2000?

(RECORD AMOUNT) 1
DK/NA or Refused 2

17. (RECORD GENDER)

Male ---------- 1
Female ---------- 2

Thank you. I would be interested in having you participate in a group discussion on:

July 31 at 5:30 pm (FasTrak Users) ---------- 1
August 1 at 5:30 pm (I-15 Main Lane User) ---------- 2
August 2 at 5:30 pm (Transit User) ---------- 3

To thank you for your participation, we will pay you $50 on the night of the discussion and serve light refreshments. The discussion will last about two hours and you can come dressed in whatever makes you comfortable. Are you interested in participating?

Yes ---------- 1
No ---------- 2

Call back on _____ at _____ ---------- 3

SANDAG I-15 Managed Lanes Study Focus Group Screener
(Transit Riders Along I-15 Corridor)

(MTS bus routes include 810, 820, 850, 860, 870, 980, 990, 210, 20, /20/A, 20/C, 40, 60 and 70); NCTD bus routes include 1,3,6,7,11,13, 15, 19, 25, 27, 81 and 115)

Hello, may I please speak to _____?

Hello. I'm _____ from Luth Research. Today I'm recruiting people to take part in an important research project concerning people who travel on I-15. Would you be interested in participating in a focus group? Participants will be paid $50.

(IF INTERESTED, PROCEED WITH:)

Before I sign you up with the group, I need to ask a few questions to make sure the group is balanced.

18. Do you work in market research, advertising or for a government such as a city, county or state agency?

YES TERMINATE
NO CONTINUE

19. (ASK AT TRANSIT STOPS) How many bus trips Southbound trips do you make on the I-15, anywhere between Escondido and San Diego, during the morning commute period each week?

RECORD NUMBER ----------(2 or More) 1
RECORD NUMBER----------(1 or Less)-----TERMINATE
DK/NA or Refused TERMINATE

20. What is the purpose of most of your trips on I-15?

WORK ---------- 1
SCHOOL ---------- 2
SHOPPING ---------- 3
RECREATION ---------- 4
OTHER ---------- 5
DK/NA OR REFUSED ---------- 6

21. When you travel on I-15 during peak hours, do you ever drive alone, carpool, or vanpool, or do you use some other means of traveling on I-15 other than the bus? (RECORD SECONDARY COMMUTE METHOD ONLY)

DRIVE ALONE ---------- 1
CARPOOL- ---------- 2
VANPOOL---------- ---------- 3
DK/NA OR REFUSED ---------- ----------TERMINATE

22. In what year were you born?

1982 and after TERMINATE
(RECORD YEAR) 1
DK/NA or Refused 2

23. What was your total household income before taxes in 2000?

(RECORD AMOUNT) ---------- 1
DK/NA or Refused ---------- 2

24. (RECORD GENDER)

Male ---------- 1
Female ---------- 2

Thank you. I would be interested in having you participate in a group discussion on:

July 31 at 5:30 pm (FasTrak Users) ---------- 1
August 1 at 5:30 pm (I-15 Main Lane User) ---------- 2
August 2 at 5:30 pm (Transit User) ---------- 3

To thank you for your participation, we will pay you $50 on the night of the discussion and serve light refreshments. The discussion will last about two hours and you can come dressed in whatever makes you comfortable. Are you interested in participating?

Yes ---------- 1
No ---------- 2
Call back on _____ at _____ ---------- 3

APPENDIX B: FOCUS GROUP PROFILES

Table 1: SANDAG GROUP 1
EXPRESS LANE USERS
JULY 31, 2001 5:30 PM

#	NAME	SEX	# of A.M. SOUTHBOUND TRIPS ON I-15 Corridor	USE OF EXPRESS LANES AS TOLL PAYER	# of CARPOOLING TRIPS ON EXPRESS LANES	TRIP PURPOSE	HOW SATISFIED With FASTRAK	YEAR BORN	ETHNICITY	ANNUAL HOUSEHOLD INCOME
1.	Evelyn L.	F	5	3 + 1-way job-related trips/week (Employer pays)	5	Work	Somewhat Satisfied	1965	Hispanic	$9K
2.	Phyllis H.	F	3	2 or fewer 1-way trips per week	Fewer than 4	School	Somewhat Dissatisfied	1948	African-American	$17K
3.	Alisha C.	F	5	2 or fewer 1-way trips per week	4+	Work	Somewhat Satisfied	1971	African-American	$22K
4.	Rodney S.	M	8	2 or fewer 1-way trips per week	4+	Work	No Strong Opinions	1958	African-American	$38K
5.	Joan C.	F	5	2 or fewer 1-way trips per week	4+	Work	Very Dissatisfied	1951	Hispanic	$40K
6.	Steve G.	M	2	Doesn't use transponder	Fewer than 4	Recreation	Very Satisfied	1942	Caucasian	$50K
7.	Lin B.	F	2-3	3 + 1-way trips/week	Fewer than 4	Work	Very Satisfied	1950-1960	Caucasian	$50K+
8.	Craig T.	M	5	3 + 1-way trips/week	Fewer than 4	Work	Somewhat Dissatisfied	1947	Caucasian	$50K+
9.	Susan B	F	5	2 or fewer 1-way trips per week	Fewer than 4	Work	Somewhat Satisfied	1961	Caucasian	$60K
10.	David G.	M	5	3 + 1-way trips/week	4+	Work	Very Satisfied	1970	Caucasian	$75K
11.	James B. (Dave)	M	8	3 + 1-way trips/week	Fewer than 4	Work	Somewhat Satisfied	1957	Caucasian	$89K
12.	William W.	M	4	3 + 1-way trips/week	Fewer than 4	Work	Somewhat Satisfied	1944	Caucasian	$120K
13.	Karen K.	F	2	2 or fewer 1-way trips per week	Fewer than 4	Work	Very Dissatisfied	1951	Caucasian	$150K
14.	Bill H.	M	8	3 + 1-way trips/week	Fewer than 4	Work	Very Dissatisfied	1928	Caucasian	Refused

Average Income = $55,000 per year; Average Non-Caucasian income: $25,200; Average Caucasian Income: $80,500 (excluding Bill H., Participant #14)
Male: 7 Female: 7 Age Range: 30 to 73
Ethnicity: 9 Caucasian, 3 African American, 2 Hispanic

Table 2: SANDAG GROUP 2
MAINLANE USERS
AUGUST 1, 2001 5:30 PM

#	NAME	SEX	# of A.M. SOUTH-BOUND TRIPS PER WEEK	EVER OWNED FASTRAK	TRIP PURPOSE	PRIMARY COMMUTE MODE	YEAR BORN	ETHNICITY	ANNUAL HOUSEHOLD INCOME
	Danielle T.	F	3	No	Work	Drive Alone	1962	Caucasian	$10K
	Camilia T.	F	5	No	Work	Drive Alone	1963	African-American	$15-20K
	Adrienne M.	F	5	No	Work	Drive Alone	1974	Hispanic	$21K
	Jim C.	M	2+	No	Work	Drive Alone	1956	Caucasian	$30K
	Jeff M.	M	7	No	Work	Drive Alone	1964	Caucasian	$35K
	Waymon M.	M	2+	No	Work, Other	Drive Alone	1954	African-American	$45K
	Kathy W.	F	2+	No	Work	Drive Alone	1962	Caucasian	$53K
	Jeff W.	M	5	No	Work	Drive Alone	1966	Caucasian	$60K
	Cedric M.	M	2+	No	Work, Other	Drive Alone	1962	African-American	$70K
	Larry M.	M	2+	No	Work	Carpool	1946	Caucasian	$70-80k
	Linda F.	F	2+	No	Visit	Drive Alone	1970	African-American	$80K
	Mathew M.	M	2+	No	Work, Shopping, Recreation	Drive Alone	1954	Caucasian	$90k
	James I.	M	5	No	Work	Drive Alone	1942	Caucasian	$115K
	Barbara N.	F	2+	No	Work, Other	Carpool	1937	Caucasian	Refused

Average income: $53,900 per year; Average Non-Caucasian Income: $46,640;
Average Caucasian Income: $58,500 (excluding Participant # 14)
Male: 8 Female: 6
Age Range: 27 to 64
Ethnicity: 9 Caucasian, 4 African Americans, 1 Hispanic

Table 3: SANDAG GROUP 3
TRANSIT RIDERS
AUGUST 2, 2001 5:30 PM

#	NAME	SEX	# OF A.M. SOUTH-BOUND TRIPS IN I-15 CORRIDOR	TRIP PURPOSE	SECONDARY COMMUTE MODE	YEAR BORN	ETHNICITY	ANNUAL HOUSEHOLD INCOME
	Leroy J.	M	2	Other	N/A	1956	African-American	10K
	Richard C.	M	3+	Shopping	Vanpool	1955	Caucasian	10K
	Doris P.	F	2+	Other	Carpool	1946	African-American	16K
	Anthony N.	M	2+	Work	N/A	1969	Caucasian	25K
	Johnnie W.	F	4+	Work	Drive Alone	1957	African-American	25K
	Irishalynn E.	F	4	Work	N/A	1971	African-American	25K
	Pamela W.	F	3	Work	N/A	1952	Caucasian	30K
	Carrie W.	F	5	Work	Drive Alone	1957	Caucasian	30-35K
	John Z.	M	5	Work	Carpool	1968	Hispanic	34K
	Sal O.	M	5	Work	Drive Alone	1948	Hispanic	50K
	Armondo S.	M	2+	Work	Carpool	1960	African-American	50K
	Jeri M.	F	2+	Work	N/A	1949	Caucasian	59K
	Darren J.	M	2+	Work	N/A	1970	African-American	87K
	Apriel B.	F	2	Work	Drive Alone, Carpool, Vanpool	1961	African-American	Refused

Average Income = $34,800 per year: Average Non-Caucasian Income: $37,125 (excluding Participant #14)
Average Caucasian Income: $31,300
Male: 7 Female: 7
Age range: 30 to 55
Ethnicity: 7 African American, 5 Caucasian, 2 Hispanic

APPENDIX C: FOCUS GROUP DISCUSSION GUIDES

SANDAG I-15 Managed Lanes Value Pricing Project Planning Study

Focus Group Discussion Guide
Group 1: FasTrak Users
July 31, 2001

Moderators: Judith Norman and Deborah Redman

Introduction

20 minutes

- Introduce moderators and purpose of focus group
  - On behalf of SANDAG and Caltrans
  - Explore new mobility options on I-15 corridor
- Confidentiality and anonymity—findings will be reported in aggregate; no individuals will be identified
- Audio taping for analysis only; request everyone to participate; avoid talking over other participants
- Brief discussion of existing FasTrak and general proposal for extension (Managed Lanes)
- Warmups: Self introductions (name, commute route, employment situation, number of years in area, where you live and why, what you like about the area)
- Brief discussion of what transportation situation is like in San Diego region

Existing FasTrak Usage

15 minutes

- More detail about individual commute trips (fill out trip diary for previous week)
  - How often do you use FasTrak?
  - How do you decide when to use the lanes?
  - Describe the major benefits of the lanes? Major drawbacks?
  - Do you use Park and Ride lots? Why/why not? Any problems with the lots? Do you know where they are? Perception of conditions?
- Any problems, suggestions for improvement of existing lanes?
- What are your impressions about issues related to enforcement (fairness and effectiveness)?
- Ideas for increasing flexibility of payment options (casual use, e.g.)
- Participants' awareness of current use of revenues
  - Approval/disapproval of revenue use for Inland Breeze

Managed Lanes Project Understanding

25 minutes

- What, if anything, have you heard about the extension project?
- Moderators to describe proposed project
    - Configuration
    - Stages of construction
    - Tolling options
    - New access issues *(Probe on this issue)*
        - More access opportunities for carpoolers and transit as well as
        - Potential for complicated tolling/enforcement scenarios
- Ask for project "pro" and "con" traits; use colored-dot technique to rank the most important pros and cons
    - Probe for concerns about safety, enforcement, level of service, access and fairness
- Ask participants to re-explain project, with the pro/con perspective, as if talking to a neighbor about the project
    - Discuss/explain impact on transit riders
- Suggestions for improving on the project concept as it currently stands.

Potential for Changes in Behavior Due to Managed Lanes Extension/Willingness to Pay/Attitude Toward Tolls

15 minutes

- Would the extension (i.e., new access points and increased time savings) encourage you to drive alone and pay tolls under certain circumstances? If so, why? If not, why not?
    - How much would you pay for X minutes of time savings? (Discuss additional total, per mile, per time savings)
- Do you think the tolls should always be high enough to keep the lanes free flowing, no matter how high that charge was (up to the max toll)? (Probe for: understanding that tolls mean good level of service for solo drivers, as well as transit vehicles and carpoolers)
- Would you use transit more often if the extension improved transit trip times by XX minutes?
- Is there any improvement to transit service that would induce you to use it along the I-15 corridor?
- Would you try carpooling, or would you carpool more often, if the lanes were extended? Why/why not?

Use of Revenues

10 minutes

- Awareness of current use of revenues
- Suggestions for use of future revenues from Managed Lanes extension

Time /Cost Benefit

10 minutes

- What's the highest they've ever personally paid?
- What do they believe they're purchasing when they pay a toll?
- How much would they pay for 12 more miles? (total, per mile, per time savings)
    - Would they use the whole facility?
- Do they think the tolls should always be high enough to keep the lanes free flowing, no matter how high that charge was (up to the max toll)?

Perceptions of Equity

15 minutes

- What is your overall impression of the "fairness" of the existing lanes
- How do the Express Lanes impact you in terms of equity?
- Are there any new or different equity issues connected with the managed lanes?
- Can you identify any groups who they believe would be treated unfairly if this project were implemented? Which groups? What is the nature of the unfairness? Can the project be modified to reduce any real/perceived unfairness?

Expansion of Value Pricing/Managed Lanes

5 minutes

- Discussion: should value pricing be expanded beyond the I-15 corridor? If so, where, if not, why not?

Wrap-up

5 minutes

- Ask for any clarification questions or final comments
- Remind participants of confidentiality
- Thank them for their time
- Reimburse participants at $50 each

SANDAG I-15 Managed Lanes Value Pricing

Project Planning Study

Focus Group Discussion Guide

Group 2: I-15 Main Lane Users

August 1, 2001

Moderators: Judith Norman and Deborah Redman

Introduction

20 minutes

- Introduce moderators and purpose of focus group
  - On behalf of SANDAG and Caltrans
  - Explore new mobility options on I-15 corridor
- Confidentiality and anonymity—findings will be reported in aggregate; no individuals will be identified
- Audio taping for analysis only; request everyone to participate; avoid talking over other participants
- Probe on familiarity with existing Express Lanes
- Brief discussion of existing Express Lanes and general proposal for extension (Managed Lanes)
- Warmups: Self introductions (name, commute route, employment situation, number of years in area, where you live and why, what you like about the area)
- Brief discussion of what transportation situation is like in San Diego region

Existing Commute Experience on I-15 Main Lanes and Opinions about Existing Express Lanes

20 minutes

- More detail about individual commute trips (fill out trip diary for previous week)
- What is the impact of traffic on their daily lives?
- How has traffic changed over the past 3 years?
- Have the I-15 Express Lanes affected the lanes you use? If so, how?
- Have the Express Lanes changed your commute time? How?
- Why do you think the Express Lanes were constructed? Have they achieved their goals, as you understand them?
- What do you think about the enforcement on the lanes? (Probe on issues of fairness and effectiveness.)
- What, if any, has been the impact of the Express Lanes on your own commuting behavior?
- Has the limited access of the existing Express Lanes discouraged you from using them?
- Has the price of the FasTrak discouraged you from using it?
- Have you ever/will you ever consider making use of the FasTrak? Probe.

Managed Lane Project Understanding

25 minutes

- What, if anything, have you heard about the extension project?
- Moderators to describe proposed project
    - Configuration
    - Stages of construction
    - Tolling options
    - New access issues *(Probe on this issue)*
        - More access opportunities for carpoolers and transit as well as FasTrak customers
        - Potential for complicated tolling/enforcement scenarios
- Ask for project "pro" and "con" traits; use colored-dot technique to rank the most important pros and cons
    - Probe for concerns about safety, enforcement, level of service, access and fairness
- Ask participants to re-explain project, with the pro/con perspective, as if talking to a neighbor about the project
    - Discuss/explain impact on transit riders
- Suggestions for improving on the project concept as it currently stands

Potential for Changes in Behavior Due to Managed Lanes Extension/Willingness to Pay/Attitude Toward Tolls

20 minutes

- Are there any circumstances under which you would use the current Express Lanes, as either carpooler or FasTrak customer? What and when?
- Would the extension (i.e., new access points and increased time savings) encourage you to drive alone and pay tolls under certain circumstances? If so, why? If not, why not?
    - How much would you pay for X minutes of time savings? (Discuss additional total, per mile, per time savings)
- Do you think the tolls should always be high enough to keep the lanes free flowing, no matter how high that charge was (up to the max toll)? (Probe for: understanding that tolls mean good level of service for transit vehicles and carpoolers)
- Awareness of transit service on I-15 Main Lanes and Express Lanes (Probe)
    - Would you use transit more often if the extension improved transit trip times by XX minutes?
- Would you try carpooling if the lanes were extended? If you already carpool, would you switch to FasTrak if the lanes were extended? Why/why not?

Perceptions of Equity

15 minutes

- What is your overall impression of the "fairness" of the existing lanes
- How do the Express Lanes impact you, in terms of equity?
- Are there any new or different equity issues connected with the Managed Lanes?

- Can you identify any groups who they believe would be treated unfairly if this project were implemented? Which groups? What is the nature of the unfairness? Can the project be modified to reduce any real/perceived unfairness?

Use of Revenues

10 minutes

  - Awareness of current use of revenues
  - Suggestions for use of future revenues from Managed Lanes extension

Expansion of Value Pricing/Managed Lanes

5 minutes

- Discussion: should value pricing be expanded beyond the I-15 corridor? If so, where, if not, why not?

Wrap-up

5 minutes

- Ask for any clarification questions or final comments
- Remind participants of confidentiality
- Thank them for their time
- Reimburse participants at $50 each

SANDAG I-15 Managed Lanes Value Pricing Project Planning Study

Focus Group Discussion Guide

Group 3: I-15 Transit Riders

August 2, 2001

Moderators: Judith Norman and Deborah Redman

Introduction

20 minutes

- Introduce moderators and purpose of focus group
  - On behalf of SANDAG and Caltrans
  - Explore new mobility options on I-15 corridor
- Confidentiality and anonymity—findings will be reported in aggregate; no individuals will be identified
- Audio taping for analysis only; request everyone to participate; avoid talking over other participants
- Probe on familiarity with existing Express Lanes
- Brief discussion of existing Express Lanes and general proposal for extension (Managed Lanes)
- Warmups: Self introductions (name, commute route, employment situation, number of years in area, where you live and why, what you like about the area)
- Brief discussion of what transportation situation is like in San Diego region

Managed Lanes Project Understanding

25 minutes

- What, if anything, have you heard about the extension project?
- Moderators to describe proposed project
  - Configuration
  - Stages of construction
  - Tolling options
  - New access issues *(Probe on this issue)*
    - More access opportunities for carpoolers and transit as well as
    - Potential for complicated tolling/enforcement scenarios
- Ask for project "pro" and "con" traits; use colored-dot technique to rank the most important pros and cons
  - Probe for concerns about safety, enforcement, level of service, access and fairness
- Ask participants to re-explain project, with the pro/con perspective, as if talking to a neighbor about the project
  - Discuss/explain impact on transit riders

- Suggestions for improving on the project concept as it currently stands, especially with respect

Discussion of Current Travel Behavior and Satisfaction with Transit Service Along I-15 Corridor

25 minutes

- Commute behavior/preference questions:
  - Fill out trip diary for previous week
  - What other modes do transit riders use, when not riding bus? Carpool? Drive alone?
  - Do you ever consider paying with FasTrak under existing conditions? Why/why not? Would new access points make the lanes more attractive? For which modes? (carpool/SOV/transit?)
  - How convenient are Park and Ride lots? Do transit riders use these lots?
- Discuss bus service along the corridor—
  - General likes/dislikes,
  - Most important service issues (convenience, travel time, transfers, etc.)
  - Suggestions for improvement.

Perceptions of Equity

15 minutes

- What is your overall impression of the "fairness" of the existing lanes
- How do the Express Lanes impact you in terms of equity?
- Are there any new or different equity issues connected with the Managed Lanes?
- Can you identify any groups who they believe would be treated unfairly if this project were implemented? Which groups? What is the nature of the unfairness? Can the project be modified to reduce any real/perceived unfairness?

Potential for Changes in Behavior Due to Managed Lanes Extension/Willingness to Pay/Attitude Toward Tolls

15 minutes

- Are there any circumstances under which you would use the current Express Lanes, as either carpooler or toll-payer? What and when?
- Would the extension (i.e., new access points and increased time savings) encourage you to drive alone and pay tolls under certain circumstances? If so, why? If not, why not?
  - How much would you pay for X minutes of time savings? (Discuss additional total, per mile, per time savings)
- Do you think the tolls should always be high enough to keep the lanes free flowing, no matter how high that charge was (up to the max toll)? (Probe for: understanding that tolls mean good level of service for transit vehicles and carpoolers)
- Would you use transit more often if the extension improved transit trip times by XX minutes?
- Would you switch to routes that take advantage of the Managed Lanes?
- Would you try carpooling if the lanes were extended? Why/why not?

Use of Revenues

10 minutes

- Awareness of current use of revenues
- Suggestions for use of future revenues from Managed Lanes extension

Expansion of Value Pricing/Managed Lanes

5 minutes

- Discussion: should value pricing be expanded beyond the I-15 corridor? If so, where, if not, why not?

Wrap-up

5 minutes

- Ask for any clarification questions or final comments
- Remind participants of confidentiality
- Thank you for your time
- Reimburse participants at $50 each

APPENDIX D: I-15 MANAGED LANES VALUE PRICING PROJECT DESCRIPTION (JULY 2001)

I-15 Managed Lanes Value Pricing Project Planning Study
Community Outreach Background Material: July 2001

I. Previous Project History

A three-year, federally funded demonstration project of value pricing on the I-15 Express Lanes in San Diego County was completed at the end of 1999. The original project utilized an already existing two-lane reversible roadway which had been previously restricted to HOV traffic. Single-occupant vehicles were progressively allowed to use excess capacity in the lanes, with the demonstration project culminating in a sophisticated, per-transaction electronic pricing program.

Following a phase where users purchased monthly express passes, The facility began to implement dynamic pricing on March 30, 1998, continuing to the present. Traffic flow is now monitored in the HOV lanes to ensure that service is maintained at free-flow conditions. Charges vary by time of day and level of congestion. The 2-lane facility, with entrances only at the northern and southern end, is designed with the electronic toll collection equipment over both lanes. On days that solo-occupancy drivers choose to carpool, they place their transponders in a static bag that prevents the transponder from being read.

Charges can change every 6 minutes, jumping by 75-cent increments. Several variable message signs are posted in the areas prior to the entrance to the lanes, and if the toll changes during a patron's trip on the lanes, the system algorithms are set up to charge the user the lowest toll they may have seen. To respond to those drivers who may choose to shift modes, an express bus service, "Inland Breeze" was introduced as part of the pricing program, and is supported by toll revenues.

The study was completed in 1999; however the FasTrak express lane program continues in operation to the present. A California Sentate Bill signed in October 1999 extends the program until January 1, 2002. SANDAG is working with the California Legislature to pass legislation that would allow the project to continue indefinitely. The project was unique in that it was the first application of dynamic variable pricing on a road facility in the world. The project is seen throughout the world as a prime example of "pricing done right." The lanes have successfully used excess capacity on the existing HOV lanes, while continuing to provide necessary levels of service to carpoolers using the lanes.

II. I-15 Managed Lanes Value Pricing Project

Managed Lane Extension Concept Plan

It is now planned to extend and expand the managed lanes facility along I-15. The project will consist of three overall phases, and will ultimately extend about 20 miles from the current southern terminus at SR 163 to the junction with SR 78 in Escondido. The ultimate project will provide four travel lanes and will make use of a moveable median barrier over most of its length,

recognizing directional imbalances in peak period travel demand along the I-15 corridor. In addition to expanding the facility, a significant increase in access will also be provided, with up to seven intermediate access points added over the 20-mile length of the facility between the managed lanes and the toll-free mixed-flow lanes.

In addition to the intermediate access points, a limited number of direct access ramps will be provided, including several to strategically located park and ride and transit center access points. This would provide opportunities for potential innovative pricing strategies which might be able to be used to encourage intermodal transfer and/or enhanced carpooling along the route.

The center portion of the expanded facility will be constructed initially between the northern end of the current project at Ted Williams Parkway and Centre City Parkway, a distance of about 8 miles. This will be constructed as a four-lane facility, but will connect to the two-lane project now in use. In subsequent phases, the existing two-lane portion will be expanded to four lanes and the northern most five-mile section will be added. Strategies will be developed to deal with the temporary imbalance in lane capacity and directionality resulting form construction of the center portion in Stage 1.

Using reversible barrier technology, the final project would provide up to three lanes in the major travel direction, and possibly only one lane in the minor travel direction.
Stage 1 of the project is scheduled to open for operations by 2004.

Range of Alternative Pricing Scenarios to be Considered

The current I-15 FasTrak program uses dynamic pricing, in which the toll rate may be altered as often as every six minutes based on actual measured traffic within the managed lanes. The current project permits access only at its end points; hence all vehicles using the road travel the same distance. When the facility is extended and expanded, new intermediate access locations will be provided, including some new access in the existing seven-mile reversible lane section. With the addition of new ingress/egress points, it will be necessary to test a variety of tolling strategies, including the following:

- Mileage-based
- Time-of-day-based
- Dynamic variable pricing
- Flat tolls
- Combinations of the above strategies

Range of Toll Levels to be Considered

Motorists' willingness to pay tolls is primarily a function of their perceived time savings over the toll-free general use lanes, and the value they place on those time savings. Tolls will be adjusted, within a range to be defined, in order to ensure achievement of the optimum balance of revenue production and optimal distribution of traffic between the general purpose and managed lanes, in accordance with SANDAG and Caltrans goals for delay reduction and revenue enhancement.

Traffic Operations Issues from Users' Perspective

The study will also examine operational issues related to the following:

- Construction issues—how to handle phasing
- Barriers
  - Reversible/zipper technology
- Ingress/egress safety
  - Ramped
  - Barrier breaks
- Enforcement complications with new access
- Signage and toll information provided to motorists
- Hours of operation

Technology Issues

Toll collection operations would be based heavily on those now in successful use on the existing FasTrak reversible lanes. However, additional tolling locations, probably between each pair of access points, will be required. Depending on the pricing concept used, this may require development of trip linking capabilities, whereby data from multiple toll read zones would need to be evaluated to determine appropriate minimum or maximum tolls per trip for a given vehicle.

Transit and Rideshare Alternatives

To provide as many alternatives to tolls as possible, attention will be directed to transit and rideshare issues, including:

- Use of revenues for corridor-related mobility options
- Adequacy of existing transit along I-15 corridor, including Inland Breeze
- Bus Rapid Transit or other TransitWorks projects
- Relationship of FasTrak to park and ride lots

Financing Issues

At this time, it is not clear what portion of the project, if any, will be financed by tolls.

SAN DIEGO ASSOCIATION OF GOVERNMENTS

I-15 Managed Lanes Value Pricing Project Planning Study

Intercept Survey Report
January 21, 2002

Prepared by:
Redman Consulting/Judith Norman—Transportation Consultant
Project Outreach Subconsultants to Wilbur Smith Associates

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

A. Intercept Survey Purpose and Format

This report presents findings from 100 intercept survey (50 transit riders and 50 carpoolers) conducted at three park-and-ride and/or transit stops on August 1 and 2, 2001, as part of the public outreach work effort associated with the Interstate 15 (I-15) Managed Lanes Value Pricing Planning Study. The intercept surveys represent one aspect of a four-part community outreach plan to gauge public response to implementing value pricing in the future Managed Lanes on the I-15. The other three tasks defined for the community outreach plan include three focus groups of I-15 commuters (main lane users, Express Lane users and transit riders) interviews of 25 key stakeholders, and a telephone survey of 800 residents who commute on the I-15 commuters within the project area.

The surveys took place at park-and-ride lots and transit interface points along the I-15 corridor within the new Managed Lanes project area. The purpose of the intercept surveys was to directly target carpoolers and transit riders along the corridor to solicit their opinions on the current Express Lanes as well as the proposed extension. This task was directed at obtaining more data on peak period commuters from "low-incidence" travel behavior categories (i.e., carpoolers and transit riders, who make up only a small fraction of corridor commuters) than would occur through the random-sample data gathering effort used in the telephone survey.

B. Key Findings

Strong Support for Express Lanes/Managed Lanes Among Transit Riders and Carpoolers Support for the existing Express Lanes, as well as the Managed Lanes extension is very strong among carpoolers and transit riders. Those surveyed mentioned the lanes' travel time and stress reduction benefits they see as valuable to them.

Value Pricing (FasTrak) on Express Lanes Seen as "Fair" by Large Majority FasTrak was deemed "fair" by 94 percent of transit riders and 92 percent of carpoolers surveyed. Respondents cited the fact that tolls were optional as one reason for their determination. Travel time savings and stress reduction benefits were also given as reasons for viewing the lanes as fair. Respondents in both transit and carpool groups believed the lanes provided encouragement for people to carpool, and saw this as an additional benefit to the lanes.

Managed Lanes May Play Role in Carpool Formation Seventy percent of carpoolers surveyed stated that the existence of the Express Lanes was a factor in their decision to begin carpooling. If this result is not atypical, it represents a promising finding relative to the Managed Lanes' potential to create new carpools, as opposed to merely diverting existing carpools from the main lanes.

Suggested Use of Toll Revenue Transit riders favored using toll revenues for more express bus service, and secondarily to extend the I-15 carpool lanes. Carpoolers, on the other hand, favored carpool lane maintenance and expansion, and secondarily favor spending toll revenues

on adding regular lanes to the I-15. For carpoolers, spending money on transit was a lower priority.

C. Recommendations

Introduce Improvements in Transit/Carpool Facilities Transit improvements (schedule, frequency and maintenance) would increase the likelihood of satisfying and retaining existing customers, and attracting new ones. A shortage of park-and-ride lot spaces were noted by a large number of transit riders. Facility improvements, such as expanding limited park-and-ride lot space, could increase transit or carpool usage on both main lanes and the Express Lanes/Managed Lanes.

Inform Public about Toll Revenue Use The fact that only two of the transit riders knew that toll revenues were supporting transit service on the Express Lanes indicates a need for improved public information strategies designed to provide area residents with information about project features.

II. I-15 MANAGED LANES VALUE PRICING PROJECT DESCRIPTION

The San Diego Association of Governments (SANDAG) and Caltrans propose to implement value pricing on the future Interstate 15 (I-15) Managed Lanes through the San Diego I-15 Value Pricing Program. This program will allow solo drivers to use the I-15 Managed Lanes for a fee. The fee will be collected through electronic toll collection equipment.

The 20-mile Managed Lanes project will build four Managed Lanes with a movable barrier in the median of I-15 to accommodate three lanes in the peak direction. The Managed Lanes will give priority to High Occupancy Vehicles (HOVs) and a Bus Rapid Transit System (BRTS). However, other vehicle types will be allowed to use the facility in a "managed" way to always provide a premium Level of Service. The lanes will be barrier separated from the general purpose lanes. Access will occur through as many as seven intermediate access locations (at-grade openings in the barrier) and five direct access ramps, along the 20-mile length. The five direct access ramps will be located at Hillery Drive, Ted Williams Parkway, Bernardo Center Drive, Del Lago Boulevard, and Hale Avenue. The Managed Lanes will be in operation at all times.

A continuous 6.6-meter wide enforcement area is planned, consisting of the 3.0-meter main lane inside shoulder and the 3.0-meter Managed Lane shoulder separated by a concrete barrier. This configuration would allow California Highway Patrol (CHP) officers to position themselves on either the main lane shoulder or the Managed Lanes shoulder to cite violators.

The I-15 Managed Lanes project will also include a Bus Rapid Transit (BRT) System that will incorporate direct access ramps at five locations to and from the Managed Lanes. The Metropolitan Transit Development Board (MTDB) is designing the BRT project. Transit stations/park and ride lots will be located adjacent to the I-15 corridor. Express buses will travel from the park and ride lots to the I-15 Managed Lane facility using the direct access ramps.

Construction of the I-15 Managed Lanes facility will occur in three phases. The middle segment from SR 56 to Centre City Parkway (Stage 1) will be built first with an estimated completion date of 2005. The northern segment from Centre City Parkway to SR 78 and the southern segment from SR 163 to SR 56 will be constructed later. The southern segment would involve widening the existing reversible I-15 HOV facility from two lanes to four lanes and installing intermediate access locations. Completion dates have not been determined for the northern and southern segments.

III. COMMUNITY OUTREACH OVERVIEW

A. Brief Description and Interrelation of Outreach Tasks

In June 2001, the San Diego Association of Governments (SANDAG) began a comprehensive, two year study of a proposed extension of the eight-mile I-15 Express Lane facility, known as

the I-15 Managed Lanes Value Pricing Project Planning Study. Integral to the study is an assessment of public attitudes and concerns about both the existing and proposed projects. A series of community outreach tasks were incorporated into the project scope of work to allow SANDAG to examine these attitudes from a variety of perspectives. These tasks employed a number of specific qualitative and quantitative assessment techniques including 1) focus groups, 2) stakeholder interviews, 3) intercept surveys and 4) a telephone survey of 800 I-15 corridor users.

The sequencing of tasks was designed so that the early insights and direction gained from the results of focus groups, stakeholder interviews and intercept surveys could be used to help design the telephone survey questionnaire, as well as to provide stand-alone conclusions and recommendations to the project planners.

In order to provide some context in which to understand how the results from the Intercept Surveys conducted in August 2001 (the subject of this report) relate to the larger Community Outreach work effort as well as to the Environmental Justice assessment and the overall Concept/Plan, a summary of the subtasks is presented below.

Focus Groups—In the Request for Proposals (RFP) for this project, SANDAG had already defined the target profiles for participants of three focus groups: I-15 main lane users, Express Lane users and transit riders. Three focus groups composed of 14 participants each were conducted. This qualitative research technique was used to provide insight into general responses, attitudes and opinions of a demographically and behaviorally relevant group of San Diego commuters, and not to provide “statistically reliable” data. The insights obtained from the focus groups provided guidance for the telephone survey instrument development process, as well as information for project planners to consider during the design phase.

Stakeholder Interviews—This was another qualitative research activity in which twenty-five key individuals were identified and interviewed for their opinions and concerns about the existing Express Lanes as well as the proposed Managed Lanes project. Stakeholders included four elected officials from I-15 corridor communities, 15 agency stakeholders (primarily senior technical staff involved in project development) and six public interest/advocacy group members. Stakeholders were asked about their general perceptions of existing and proposed lanes; new expectations and goals for the Managed Lanes; their assessment of community attitudes and concerns; their recommendations for reaching any identifiable underrepresented groups; and their concerns about project concept specifics as well as suggestions for improvement. Stakeholders were also specifically asked about their opinion regarding their views on any equity issues related to the proposed project.

Intercept Surveys—Intercept surveys of 50 carpoolers and 50 transit riders were administered by the outreach team. The surveys took place at park-and-ride lots and transit interface points along the I-15 corridor within the new Managed Lanes project area. The purpose of the intercept surveys was to directly target carpoolers and transit riders along the corridor and solicit their opinions on the current Express Lanes as well as the proposed extension. This task was directed at obtaining more data on peak period commuters from “low-incidence” travel behavior categories (i.e., carpoolers and transit riders, who make up only a small fraction of corridor commuters) than would occur through the random-sample data gathering effort used in the telephone survey.

Telephone Survey—This task involved a detailed telephone survey of 800 peak period corridor users (600 main lane users and 200 transponder-owners). This quantitative research method benefits from a number of findings and observations gained through the previous three qualitative community outreach tasks. The survey research provides the opportunity to evaluate trends from a statistically reliable vantage point, and can determine the validity of the conclusions tentatively drawn from the qualitative side of the overall assessment of community opinion with respect to the project and its various features.

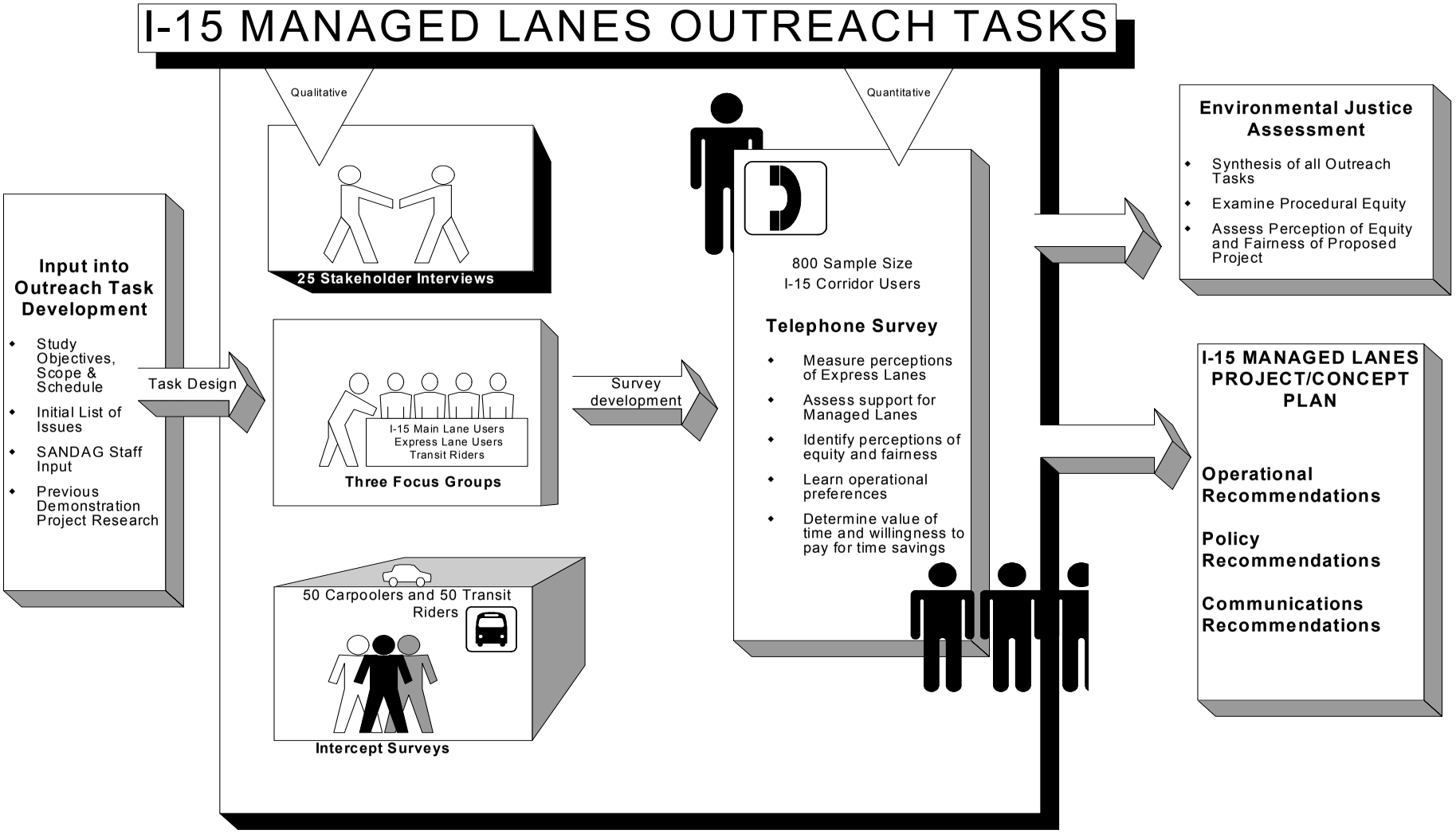
Environmental Justice Assessment —The assessment was a synthesis and elaboration of elements of all community outreach and public involvement study tasks, with a specific examination of two issues:

- **Procedural fairness** in gathering public input *(was the process sufficiently inclusive?)*
- **Perception of equity** and fairness from the viewpoints of low-income individuals and/or members of ethnic (non-Caucasian) minorities.

The environmental justice focus in this task is designed primarily to ensure methodological adequacy of quantitative and qualitative efforts in obtaining lower- income and ethnic representation within the community outreach/public input process, and in consideration of the relative affluence of the project corridor. It remains outside the scope of this Environmental Justice Assessment, as defined, to make any determination with respect to equity of overall transportation investment or operational impacts related to the proposed Managed Lanes Project.

Linking Outreach Task Results to the Project Concept/Plan—recommendations flowing from the four Community Outreach tasks described above are linked to the development of the Managed Lanes Project Concept/Plan report through incorporation of key findings into that report. Both formal and informal communications between and among the consultant team and the SANDAG project development team serve to enhance the integration of public opinion with the overall project development and refinement process.

A flow diagram illustrating the project's community outreach tasks and their relationship to the Project/Concept Plan is found in Figure A (page 6).



Flow Chart of I-15 Managed Lanes Value Pricing Community Outreach Tasks Showing Links to Environmental Justice Assessment and Project Concept/Plan

Redman Consulting/Judith Norman–Transportation Consultant
Outreach Team Subconsultants to Wilbur Smith Associates

Figure A
October 2001

B. Intercept Survey Task Purpose

The surveys took place at park-and-ride lots and transit interface points along the I-15 corridor within the new Managed Lanes project area. The purpose of the intercept surveys was to directly target carpoolers and transit riders along the corridor to solicit their opinions on the current Express Lanes as well as the proposed extension. This task was directed at obtaining more data on peak period commuters from "low-incidence" travel behavior categories (i.e., carpoolers and transit riders, who make up only a small fraction of corridor commuters) than would occur through the random-sample data gathering effort used in the telephone survey.

It is important to understand that a key advantage of using the intercept survey technique as a qualitative research tool to boost information on a small, non-random population that will not be reached through survey techniques of cost-effective sample size. However, an inherent limitation associated with the intercept survey method in this case is that, given the small size and non-random selection process, the results can not be said to be statistically refletive of all carpoolers and transit riders.

C. Intercept Survey Methodology

Transit users were surveyed on Thursday, August 2, from 6:00 a.m. to 8:06 a.m. at two locations: (1) the Route 980/860 bus stop across the street from the park and ride lot/structure at 10211 Rancho Carmel, and (2) the Route 850 bus stop adjacent to the park and ride lot at the intersection of Carmel Mountain Road and Paseo Cardiel, which is also immediately accessible to the Express Lanes. All three routes (980, 860 and 850) make use of the Express Lanes, and the stops selected were those stops scheduled immediately before the respective buses enter the Express Lanes facility heading south toward downtown San Diego.

Twenty-six of the 50 respondents were surveyed at the Route 980 bus stop; the remaining 24 surveys were conducted at the Route 850 stop. In most cases, a flurry of transit riders would arrive very shortly before the bus was scheduled to reach the stop. This meant that the outreach team staff had to hand out surveys, provide a brief project description, answer various questions and collect the surveys from perhaps a dozen people in a matter of minutes. The effort did result in 50 completed surveys, however.

Carpoolers were surveyed on Wednesday, August 1, from 6:00 a.m. to 8:32 a.m. Surveys were conducted at the Ted Williams Parkway park-and-ride lot, at the northern terminus of the Express Lanes. Two members of the outreach team set up a small table with morning snack food and beverages at a central location within the carpool lot. When it became apparent that most people drove alone into the lot, and then waited in their cars until their carpool partner(s) arrived, the outreach team staff actively approached each arriving vehicle with a survey and a snack, and either handed out the survey form and collected it, or asked the questions and took notes for the respondent, in accordance with each individual's preference. The team provided brief verbal project descriptions of the proposed Managed Lanes as surveys were handed out.

The surveys were designed to be able to be completed in a minute or so, as respondents waited for their ride or their bus. The brevity of the survey form meant that not all questions that were asked of carpoolers were asked of transit riders, in order to permit exploration of mode-specific issues. The limitation of that strategy is that comparisons between carpoolers and transit riders cannot be made on some issues.

The questionnaire did not include questions on household income or ethnicity. This decision was made out of concern that, given the personal interaction inherent to the intercept survey format, such questions might be deemed offensive or intrusive by those interviewed. In addition, the main research objective was to gain insight into behavior and opinions of people now using the Express Lanes in the two specific modes—carpooling/vanpooling and transit. A particular focus of the questionnaire was the issue of whether or not people currently availing themselves of the benefits of the Express Lanes as non-toll payers would think it fair to themselves as transit riders and carpoolers to include the value pricing program along with the extension of the carpool lanes, in the Managed Lanes program.

Survey questionnaires for the transit and carpool/vanpool groups are included in Appendix A.

IV. SUMMARY OF TABULATED SURVEY RESPONSES

A. Demographics

Of the 50 transit riders surveyed, 23 were male and 27 were female. Their ages range from 18 to 56, though many respondents declined to state their age. In the carpool group, half of the 50 respondents were female; half were male. Carpoolers surveyed were somewhat older than the transit riders, and included people ranging in age from 22 to 64 years old.

B. Respondents' Frequency of Use on the I-15 Corridor

Respondents were asked how many times per week they used public transit or carpooled on the I-15, southbound, during the morning peak period. The chart below summarizes responses, and shows that the majority of those surveyed are regular, frequent transit riders or carpoolers who make use of the I-15 Express Lanes.

	TRANSIT RIDERS (50 completed surveys)		**CARPOOLERS (50 completed surveys)**	
Number of southbound peak period trips on I-15	**Number of Responses**	**Percentage**	**Number of Responses**	**Percentage**
5 trips per week	41	82%	25	50%
4 trips per week	3	6%	13	26%
3 trips per week	3	6%	9	18%
2 trips per week	1	2%	2	4%
1 trip per week	1	2%	0	0%
rarely/varies			1	2%

C. Trip Destinations of Respondents

All transit rider respondents use the bus to travel to work-related destination points in downtown San Diego. Undoubtedly, this is dictated primarily by the bus routes. Most carpool destinations were work-related as well (including trips to school), although a handful of recreational were also made. Most destinations ranged from Kearny Mesa southward to downtown San Diego.

D. Transit-Specific Survey Responses

Why Transit Riders Use Public Transportation

In an open-ended question, transit riders were asked why they chose public transit for their commute. The survey form prompted respondents with four responses serving as examples: (1) No other choice; (2) Easier than driving a car; (3) Lower cost; and (4) Less stress. Space was provided for respondents to provide their own reason for using transit, and more than one response was permitted. Responses, listed in descending order of frequency of response, were:

- Lower stress (28)
- Lower cost (24)
- Easier/more convenient (23)
- Parking costs or inconvenience (7)
- Avoiding traffic (7)
- No other option (3)
- Receive subsidy/discount from City or employer (3)
- More comfortable (1)
- Make use of HOV lane (1)
- Can do other things on bus (1)
- Arrival time more consistent with bus (1)

According to these responses, 94 percent of the transit riders surveyed were not "transit-dependent" riders. Rather, they chose to use transit to avoid stress, the cost of driving and because they viewed the service as easy and convenient compared to alternatives. Parking cost played a role in 14 percent of decisions to use transit.

Respondent Suggestions for Improving the Public Transportation System

Transit riders made the following suggestions (listed in decreasing order of frequency of response) for improving the transit environment:

- More parking (Ted Williams at Rancho Carmel Plaza) (13)
- Better bus maintenance (10)
- More buses/better frequency (6)
- Schedule extended earlier in the morning and later in the evening (6)
- Newer, quieter buses (5)
- Extend the HOV lanes (2)
- Add HOV lane to SR 56 (1)
- Trains (1)
- More routes (1)
- On time (1)
- Build carpool lanes like Orange County and Los Angeles County (1)

The number one problem was lack of parking, according to those boarding Route 980 at Ted Williams Parkway and Rancho Carmel. Half those surveyed at that transit stop cited this as an area for improving transit service. Explanations from the respondents indicated that, although covered spaces had been reserved for transit riders at Rancho Carmel Plaza, the transit riders

were often displaced by carpoolers and vanpoolers who preferred the covered spaces to the surface park-and-ride lot located only a short distance away. Because many carpoolers left the area for work prior to the first bus pick up, the "first come-first served" parking arrangement put the later-arriving transit riders at a disadvantage relative to the carpoolers, thus frustrating current transit riders and perhaps discouraging transit use by others who may not be able to locate other secure parking nearby.

Comments about poor bus maintenance—the number two issue for transit riders— were primarily related to lack of cleanliness, especially in the on-board restrooms. Specific mention was made by several transit riders of the need for better maintenance of the disabled seat on board the express buses. According to many transit riders, problems with the seat caused the drivers to delay departures, because the buses could not get underway until the seats were operating correctly.

E. Carpool-Specific Survey Responses

Carpool Vehicle Occupancy

Of 50 people surveyed, 11 were in three-person carpools, one was in a four-person carpool, and one was in a five-person vanpool. The remaining 37 respondents traveled in two-person carpools. The average vehicle occupancy for this group of respondents was 2.32.

Carpoolers Use Both Main Lanes and Express Lanes to Commute

Of the 50 people surveyed, 13 (or 26 percent) used the main lanes, rather than the Express Lanes when carpooling. An evaluation of the destinations of this group of people indicates that it is likely that the Express Lanes simply doesn't serve their route. Personal comments by several respondents suggest, as well, that the lack of intermediate access was a problem—some people were unable to get off the Express Lanes where they wanted to. A very few of those carpoolers not using the Express Lanes stated that they were not in much of a hurry, and for them it made no difference which lane they chose.

Why People Choose to Carpool

When asked, in an unprompted open-ended survey question, how carpooling on the Express Lanes had affected their commutes, the vast majority of respondents emphasized time and cost savings, and less stress to themselves and their vehicle. One respondent claimed to save 15 to 20 minutes per day; two people said their travel time was cut in half. Several respondents mentioned the benefit of new friendships as an advantage of carpooling.

Respondents were asked whether the availability of the Express Lanes had been an incentive for them in forming a carpool. Thirty-five respondents (70 percent of those surveyed) said that the lanes did provide an incentive for them to begin carpooling.

FasTrak Use of Express Lanes When Not Carpooling

Eight respondents paid a toll via FasTrak to use the Express Lanes when not traveling in a carpool. These eight people paid tolls to save time for business and family-related matters, and to avoid traffic jams or accidents on the main lanes.

Of the 42 respondents who did not use the express lanes when they were not riding in a carpool nine people cited cost of tolls as the primary factor in their decision. Two people did not use the lanes as solo drivers because they did not have a transponder. Others simply didn't need to use it, either because there was no congestion or because they were not under time pressures.

F. How the Managed Lanes Would Affect Commute Patterns

Mode Choice

Next, transit riders were asked whether the extension of the lanes would cause them either to drive alone or carpool more often. Seven people indicated they might carpool more often; 26 respondents said they would not alter their mode; the remaining 17 respondents declined to state.

For 34 of the carpoolers questioned, an extension of the FasTrak would not cause them to change their commute pattern. Seven respondents said they would likely change their access point to the lanes; several would enter the carpool lanes at Escondido if they could. A couple of carpoolers indicated they would likely use a transponder and commute as a solo driver more often. One person said he would try transit.

Frequency of Transit Use

For the majority of current transit riders (31 of 50) there would be no change in their frequency of transit use if the Managed Lanes project were implemented. This makes sense, since 35 of 50 people are already taking the bus five days per week. Ten respondents indicated that they would use transit "much more frequently." Three respondents said they would increase their use somewhat; two indicated they would use transit less often.

Impacts on Choice of Transit Stop Access to Bus Routes

Riders were asked whether the extension, with its additional length and multiple access points, would cause them to change where they picked up the bus. Thirty-nine said there would be no change. This response might be due in part because the people boarding the bus at the survey locations are self-selected, in the sense that they have already determined for themselves that this is relatively convenient location.

Ten people indicated they would change their stop location, with Escondido being mentioned as the primary new origin point. One of those ten respondents also said he would get the bus at an earlier time if the extension were built. One respondent declined to answer.

Impacts on Frequency of Carpooling

If the Managed Lanes were implemented, 29 of 50 carpoolers surveyed would not change how often they carpooled. Eight respondents would carpool "much more frequently" and 11 respondents would carpool "somewhat more frequently." One respondent would carpool "somewhat less frequently." The survey did not probe into the reasons for stated changes in frequency of carpooling.

G. Suggestions for Use of FasTrak Toll Revenues

Transit Riders' Preferences for Spending Toll Revenues

The Only two of 50 transit riders knew how FasTrak toll revenues were spent. (This question was posed only to transit riders) However, they did provide their opinions on how such toll revenue should be spent. A short checklist of transportation-related options for allocating toll revenues was included on the survey form, along with an opportunity to add other suggestions. Respondents could check off as many as they liked. Results were as follows (the number in parentheses indicates how many people checked that box or provided that answer):

- Other I-15 express bus service (32)
- Add more or extend I-15 carpool lanes (20)
- I-15 Inland Breeze express bus service (18)
- Improve/maintain all SD freeways (12)
- Improve/maintain I-15 carpool lanes (11)
- Improve/maintain I-15 regular lanes (10)
- Add carpool lanes on other SD freeways (9)
- Add more I-15 regular lanes (8)
- Add more regular lanes on all SD freeways (7)
- Other (2)
    - "Trolley to Escondido"
    - "More convenient parking"

The clear favorite here is to add more express bus service to the I-15 corridor; a somewhat distant second is to spend toll revenue on extending the I-15 carpool lane. Third in order of preference is to support the Inland Breeze (Route 980/990).

Carpoolers' Preferences for Spending Toll Revenues

As with the transit riders, a short checklist of transportation-related options for allocating toll revenues was provided to carpoolers, along with an opportunity to add their own suggestions. Respondents could check off as many as they liked. Results were as follows (the number in parentheses indicates how many people checked that box or provided that answer):

- Add more or extend I-15 carpool lanes (18)
- Improve/maintain I-15 carpool lanes (15)
- Add more I-15 regular lanes (10)
- Add carpool lanes on other SD freeways (9)
- Other I-15 express bus service (7)
- Add more regular lanes on all SD freeways (5)
- Improve/maintain I-15 regular lanes (5)
- I-15 Inland Breeze express bus service (5)
- Improve/maintain all SD freeways (4)
- Other (5)
    - "Build a subway."
    - "Encourage train/trolley extension."
    - "We need a rail system."
    - "More mass transit."
    - "Light rail/monorail."

Carpoolers clearly favor supporting maintenance and expansion of the I-15 carpool lanes. Third in order of preference was to add more regular lanes to the I-15. Carpoolers' fourth suggestion for use of toll revenues also focused on benefits to carpools, by targeting those revenues to expand carpool lanes on other San Diego area freeways.

H. Are the FasTrak Lanes Fair?

The vast majority of those surveyed found the lanes to be fair to themselves as travelers. Among transit riders surveyed, only three of 50 respondents thought the lanes weren't fair. Reasons cited were (1) increased volume of solo drivers threatened carpools; (2) the fact that everyone already pays taxes; and (3) frustration with using pre-paid device—would prefer to be able to pay cash as on the SR 73 toll facility in Irvine. Among the reasons cited by the 47 transit riders who thought the FasTrak lanes were "fair to them" were the quicker transit trips made possible by the lanes, and a belief that the lanes encouraged more people to carpool.

Of the 50 carpoolers who participated in the intercept survey, only one respondent thought the FasTrak program was unfair. This respondent did not provide an explanation for his opinion. Forty-six people (92 percent of carpoolers) thought the lanes were fair, and provided a variety of reasons for their opinions, including the fact that the use of FasTrak represented another mobility option for travelers, and afforded travel time advantages to carpoolers.

	TRANSIT RIDERS (50 completed surveys)		**CARPOOLERS (50 completed surveys)**	
Survey Question	**Number of Responses**	**Percentage**	**Number of Responses**	**Percentage**
Is FasTrak fair to you as a traveler?	Yes: 47 No: 3	Yes: 94% No: 6%	Yes: 46 No: 1 Abstained: 3	Yes: 92% No: 2% Abstained: 6%
Additional Comments from Respondents	• Express Lanes mean faster buses, shorter travel time. • Revenues are used to improve transit. • Anyone willing to pay can use it. • It encourages carpooling. • Less traffic for a price.		• Saves time, encourages carpooling. • Relieves tension. • Express Lanes are still free for carpoolers.	

V. KEY FINDINGS

It was important to note the near unanimity of positive response for both carpoolers and transit riders when asked whether they thought the FasTrak lanes (value pricing) were fair "for them." Had there been much negative feeling among these two commuter groups, this would have been a signal for SANDAG to investigate further the causes of motorist attitudes. Although this outreach task asked a non-random sample of commuters to provide their opinions, and so is not amenable to statistical extrapolation to the larger regional population, the unequivocal tilt of the answers in support of the Express Lanes does provide some reassurance that the Managed Lanes will be seen as a benefit to current high-occupancy vehicle commuters.

Key findings from the observed data are as follows:

Support for Express Lanes/Managed Lanes Among Transit Riders and Carpoolers Support for the existing Express Lanes, as well as the Managed Lanes extension is very strong among carpoolers and transit riders. Those surveyed mentioned the lanes' travel time and stress reduction benefits they see as valuable to them.

Value Pricing (FasTrak) on Express Lanes Seen as "Fair" by Large Majority FasTrak was deemed "fair" by 94 percent of transit riders and 92% of carpoolers surveyed. Respondents cited the fact that tolls were optional as one reason for their determination. Travel time savings and stress reduction benefits were also given as reasons for viewing the lanes as fair. Respondents in both transit and carpool groups believed the lanes provided encouragement to carpool, and saw this as an additional benefit to the lanes.

Managed Lanes May Play Role in Carpool Formation Seventy percent of carpoolers surveyed stated that the existence of the Express Lanes was a factor in their decision to begin carpooling. If this result is not atypical, it represents a promising finding relative to the Managed Lanes' potential to create new carpools, as opposed to merely diverting existing carpools from the main lanes.

Suggested Use of Toll Revenue Transit riders favor using toll revenues for more express bus service, and secondarily to extend the I-15 carpool lanes. Carpoolers, on the other hand, favor carpool lane maintenance and expansion, and secondarily favor spending toll revenues on adding regular lanes to the I-15. For carpoolers, spending money on transit is a much lower priority than for transit riders.

VI. RECOMMENDATIONS

Introduce Improvements in Transit/Carpool Facilities Transit improvements (schedule, frequency and maintenance) would increase the likelihood of satisfying and retaining existing customers, and attracting new ones. A shortage of park-and-ride lot spaces were noted by a large number of transit riders. Facility improvements, such as expanding limited park-and-ride lot space, could increase transit or carpool usage on both main lanes and the Express Lanes/Managed Lanes.

Inform Public about Toll Revenue Use The fact that only two of the transit riders knew that toll revenues were supporting transit service on the Express Lanes indicates a need for improved public information strategies designed to provide area residents with information about project features.

APPENDIX A: INTERCEPT SURVEY QUESTIONNAIRES

SANDAG I-15 Managed Lanes Value Pricing
Project Planning Study
Intercept Survey: Transit Riders

1. DateTime AM PM
___Male ___Female ___Age
Bus Route_____

1. How many times per week do you use public transportation on the I-15, southbound, during the morning peak periods (6:00AM to 10:00AM)? (check box)

- ❑ Once
- ❑ 2 X
- ❑ 3X
- ❑ 4X
- ❑ 5X

2. What is your primary destination and trip purpose when using public transportation during the morning peaks?
Destination_____
Trip Purpose_____

3. Why public transportation? Do you have another choice? Easier than driving your own car? Lower cost? Less stress?
_____
_____

4. If the FasTrak lanes were extended to Escondido, and four Bus Rapid Transit/Park and Ride Lot Direct Ramps were added to accommodate transit, would you…..? (check one)

- ❑ Use transit much more frequently
- ❑ Use transit somewhat more frequently
- ❑ Use transit somewhat less frequently
- ❑ Use transit much less frequently
- ❑ No change

5. If the extension were built, would you change where you get the bus?
- ❑ Yes How?_____
- ❑ No

6. If the extension were built would you change how you commute?
- ❑ Drive alone more often? _____
- ❑ Carpool more often?_____)

7. What improvements to the public transportation system would you like to see? Why?
_____
_____

8. Do you know how revenues from the Toll Lanes are being used?

- ❑ Yes How?_____
- ❑ No

9. How would you like to see toll revenues from the I-15 project spent?

- ❑ Improve/maintain I-15 regular lanes
- ❑ Add more I-15 regular lanes
- ❑ Improve/maintain I-15 carpool lanes
- ❑ Add more or extend I-15 carpool lanes
- ❑ I-15 Inland Breeze express bus service
- ❑ Other I-15 express bus service
- ❑ Improve/maintain all SD freeways
- ❑ Add more regular lanes on all SD freeways
- ❑ Add carpool lanes on other SD freeways
- ❑ Other_____

10. Overall, do you feel the FasTrak lanes are fair to you as a traveler?
    a. Yes Why?_____
    b. No Why not?_____

Thank you for your help!

SANDAG I-15 Managed Lanes Value Pricing

Project Planning Study

Intercept Survey: Carpoolers/Vanpoolers

Date Time AM PM
___Male ___Female ___Age

1. How many times per week do you carpool/vanpool on the I-15, southbound, during the morning peak periods (6:00AM to 10:00AM)? (check box)

- ❑ Once
- ❑ 2 X
- ❑ 3X
- ❑ 4X
- ❑ 5X

2. How many people, including yourself, ride in your carpool or vanpool on an average day?
- ❑ O
- ❑ 2
- ❑ 3
- ❑ 4
- ❑ 5+

3. What is your primary destination and trip purpose when using carpooling or vanpooling on the I-15 during the morning peaks?
Destination_____
Trip Purpose_____

4. Do you use FasTrak when carpooling?

- ❑ Yes
- ❑ No

5. Was FasTrak an incentive for forming a car pool?

- ❑ Yes
- ❑ No

6. Have you ever used the FasTrak lanes when not carpooling?

- ❑ Yes If yes, why?_____
- ❑ No If not, why not?_____

5. Have you ever used the I-15 main lanes (regular freeway lanes) when in a carpool?
- ❑ Yes If yes, why?_____
- ❑ No

8. How has carpooling affected your daily commute?
_____
_____

9. A proposed extension of the FasTrak lanes, north to Escondido would include four direct access ramps located at park and ride lots, and would add new entrances and exits to the existing lanes. How would this affect your decision to carpool?

- ❑ I would carpool/vanpool on FasTrak much more frequently
- ❑ I would carpool/vanpool on FasTrak somewhat more frequently
- ❑ I would carpool/vanpool on FasTrak somewhat less frequently
- ❑ I would carpool/vanpool on FasTrak much less frequently
- ❑ No change

10. If the extension were built, would you change….? (check one)

- ❑ How you commute? (If so, would you drive alone_____; take transit_____)
- ❑ Where you access the FasTrak lanes? (If so, how?_____)

11. How would you like to see toll revenues from the I-15 project spent?

- ❑ Improve/maintain I-15 regular lanes
- ❑ Add more I-15 regular lanes
- ❑ Improve/maintain I-15 carpool lanes
- ❑ Add more or extend I-15 carpool lanes
- ❑ I-15 Inland Breeze express bus service
- ❑ Other I-15 express bus service
- ❑ Improve/maintain all SD freeways
- ❑ Add more regular lanes on all SD freeways
- ❑ Add carpool lanes on other SD freeways
- ❑ Other_____

12. Overall, do you feel the FasTrak lanes are fair to you as a traveler?

c. Yes Why?_____

d. No Why not?_____

Thank you for your help!

APPENDIX B: INTERCEPT SURVEY DATA SUMMARIES

SANDAG I-15 Managed lanes Value Pricing
Project Planning Study
Transit Riders Intercept Survey, Route 850
Date: August 2, 2001

	Time	M/F	Age	Bus	Trips	Destination	Purpose	Why?	If	If #2	If #3	Improvements	Q8	How	Fair?
1.	6:30	M		580	5	Downtown	Work	No	4	N	2	-	N	3,4,6	Yes. Faster for transit
2.	6:08	M		850	1	Downtown	Work	Less stress, parking	1	N	2	Trains, more routes	N	1,4,6	Y. less traffic for a price
3.	6:30	F	56	850	5	Downtown	Work	All of the above	5	N	-	More buses, more often	N	4	Y
4.	7:00	F		850	5	Downtown SD	Work	Lower cost, less stress, easier, keep mileage low on car	5	N	N, N	Bus Maintenance better, earlier times to leave & come home in morning and evening	N	1,2,4,6,7,8,9	N, because single drivers allowed – getting to be more & more – defeating purpose of carpooling (sic)
5.	6:08	F	40	850	5	Downtown	Work	Could drive; easier parking, cost	5	N	-	Better maintenance on buses; doors don't work; same doors over and over; on time!; disabled access, restrooms clean	N	1,2,4	Yes, as long as single use doesn't affect carpool users
6.	7:00	M		850	5	Downtown	Work	-Yes, 3,4,5	5	Y, Escondido	-	Better maintained	N	6	Y, faster for transit
7.	7:00	F	53	850	5	Downtown SD	Work	Easier, no stress	5	N	N,N	On time; the disabled access seat should be workable, if no disabled people available for abled folks	N	1,3,4,5,6,7,8,9	Y, the $ help improve
8.	7:02	M	18	850	3	Downtown	Work	Lower cost	5	N	-,N	None. It's pretty good for what I pay.	N		Y, Because it's cheap
9.	7:05	F	21	850	5	Work	Work	All of above	2	N	?		N	1,2,3,4,7,8,9	Y
10.	6:00	F		850	5	Downtown	Work	Less stress	1	N	CP		N	3,4,6,9	Y
11.	7:05	F	40	850	5	Work		Very comfortable, less stress	5	N	-	-	N	6	Y
12.	8:06	F		850	5	Downtown	Work	All of the above	1	Y	-	-	N	4,6	Y
13.	6:00			850	4	SD	Work	No car	5	Y	-	Cleaner; restrooms cleaned	N	4,6	Y
14.	6:30	M		850	5	10th & B	Work	Cost/less wear & tear on car/less stress	5	N	-	-	N	2	Y, Anyone willing to pay for it can use it
15.	6:30	F		850	5	Downtown SD	Work	Traffic	1	N	N	Added more public throughout the day – express from SD Downtown to P.Q.	N	1,2,3	Y; encourage carpooling
16.	7:35	M		850	5	Federal Bldng	Work	No traffic, less stress, parking costs	5	-, N	-, 2	Extend carpool lane	N	6	Y
17.	7:30	F	50	850	5	Downtown	Work	Yes, yes, yes	5	N		Later bus in the evening	N	2,5,6	Y
18.	7:35	F		850	2	Downtown	Work	Cost, city discount, traffic congestion	1	Y, Escondido	N,N	Extended HOV Lane, relive traffic congestion	N	3	Yes
19.	7:38	M		850	2/yr	Convention Center	Conference Attendance	I don't want to drive in traffic. I wish I could get to Point Loma. I'd ride the bus all the time.	-	-	-	-	-	-	-
20.	7:30				5	Downtown	Work	All of the above	5	N	-	-	N	7,9	-

21.	7:30	F		850	5	Work	Work	3,4,5	5	N	-	All day pick-up	N	6	Y
22.	7:30	M		850	4	Downtown SD	Work	Easier than driving a car	5	Y, Escondido	-	-	N	4,6	Y
23.	7:35	F		850	5	Downtown	Work	Convenience/car/yes/yes/ yes	3	Y, Escondido	CP	More frequent, cleaner	N	4,6,9	Y
24.	7:35	M	48	850	5	Downtown	Work	Lower cost, less stops	1	Y, Escondido	CP		N	3,4,6	Y
25.	6:30	F			3	Work			1	N	CP		Y	1	Y, easy to drive on it
26.	6:00	M	35	850	5	SD	Work	Parking cost; stress	5	N	-	Cleaner, better maintenance	N	6	Y, Easy to use, pay for what you get

SANDAG I-15 Managed Lanes Value Pricing
Project Planning Study
Transit Riders Intercept Survey, Route 980/860
Date: August 2, 2001

Time	M/F	Age	Bus	Trips	Destination	Purpose	Why?	If	If #2	If #3	Improvements	Q8	How	Fair?
6:05	F	37	980	5	Downtown	Work	Less Stress; I-15 is very stressful. I live in Eastern Ramona and wish there was more options coming from Ramona	5	N	N	There are many commuters coming from Ramona	N	5,8,9	Y
6:00	M		980	3-4	Downtown	Work	Easier than driving, lower cost, less stress, can do other things – read, write	2	N	N/A	A car pool lane similar to Orange County & LA	N	3,4,5,6	Y
6:00	F	31	980	5	Downtown	Work	3,4,5	5	N	N	More parking	N	1,4,5,6,7	Y
6:00	F	35	980	5	Downtown	Work	3,4,5	5	N	N	More parking! Underground parking fills up too fast!	N	5,6,7	Y
6:05	M	41	980	5	Downtown	Work	Convenience	5	N	N	More park and rides; more parking here. Underground parking fills up fast. Buses need to be better maintained. Bus broke down yesterday and we were all stranded.	N	5,6,7	Y
6:10	M	43	980	5	San Diego	Work	4,5	2	Y, Get on earlier	N	Cleaner buses; better maintained; quieter; newer buses	N	5,6,7,8	Y
6:10	F	43	980/ 860	5	Downtown SD	Work	3,4,5	5	N	N	Better bus service; more frequent buses; quieter & cleaner buses	N	7	Y
6:10	M		980	5	Work		Transit subsidy; work pays	1	Y, get on in Escondido	N	A route along SR56 when completed	Y*	3,4	Y, Convenient
6:00	F	39	980	5	Downtown	Work	3,4,5, Because more convenient	5	N	N, -	More frequent times; leave every 15 minutes	N	5,6	Y
6:00	M	44	860	5	Downtown	Work	Lower cost; less stress; arrival more consistent	5	N	N	More buses	N	1,2	N – taxes everybody pays
6:05	M		980	3	San Diego	Work	Easier/parking	1	N	N/A	More parking; different place for vanpoolers	Y	1	Y
6:05	F	50	980/ 860	5	Downtown	Work	Work supplements; don't want to drive	5	N	N	More frequent servicing; more Park & Rides	N	8,9	Y, I take bus
6:40	M	55	980/ 860	5	Downtown	Work	3,4,5	5	N	Poss .	More often; frequent stops; newer buses; quieter, especially the red one	N	7,8	Y, good for me
6:40	F	50	980	5	Work		Easier, less cost (parking)	5	N	N	Carpoolers using the bus park and ride; doesn't leave parking for bus riders	N	4,5,6,7	Y
6:40	F		980	5	Downtown	Work	Convenient	5	N	N	Much more parking; carpoolers use parking and don't leave enough spaces	N	3,4,5,6	Y
7:15	M	54	880	5	5TH & b	Work	Better than driving; Convenient hours	5	N	N	Better parking near Ted Williams & Rancho Carmel	N	Trolley to Escondido	Y
7:15	M		980	5	Downtown	Work	No	5	N	N	None	N	3,4,5,6	Y
7:15	M		860/ 980/ 990	5	5th & B	Work	Avoid traffic; 2,3,4,5	5	N	N	More parking where bus is caught	N	5,6,7	Y
6:45	F	53	860	5	Harbor & Bwy	Work	1,2,3,4,5	5	N	N	More parking at Park & Ride	N	5,6	Y

6:45	M	51	980/ 860	5	Broadway	Work	Traffic I-15	1	Y	N	More parking at bus stop/park & ride	N	5,6	Y
6:40	M	31	980	5	Downtown	Work	Lower cost, less stress, no parking concerns	N	N	N	Newer buses; more comfortable ride; afternoon express routes	N	5,6,9	N; must use pre-paid device. Would [be] nice to pay only when needed (cash lanes like on 73 in Irvine
6:40	M	40	980	5	Downtown	Work	1,2,3,4,5	5	N	N	Better scheduling; noisy old buses	N	2,4,6	Y
6:40			980/ 860	5	Downtown	Work	Less stress, relaxing, save money	1	N	N	Better parking; keep/prohibit carpoolers from parking where bus riders park	N	5,6, More Convenient parking	Y
7:15	F	43	980 990	5	Downtown	Work	Avoid traffic; make use of HOV lane	5	N	N	More space to park; more park & rides; overflow parking now goes to Rancho Carmel Plaza and gets tickets	N	5,6	Y

*Subsidize 990/980 bus

SANDAG I-15 Managed Lanes Value Pricing
Project Planning Study
CARPOOLERS/VANPOOLERS INTERCEPT SURVEY
August 1, 2001 at Ted Williams Parkway Park and Ride Lot

Time	M/F	Age	#	#P	Destination	Purpose	Use	Inc	Use2	I-15	Effect	Q9	Change	Q11	Q12
6:20	F	36	3	2	San Diego	Work	Y	Y	N	N	Saves time & wear & tear on car; share expenses	5	NC		
6:00	M	51	5	2	San Diego	Work	Y	Y	N	N	Save gas, time, $	2	NC	4	Y
6:15	F	40	5	3	Mission Viejo	Work	Y	Y	N	N	Saves gas, time, $	2	2	2	Y
6:00	F	45	5	3	Mission Valley	Work	Y	Y	N, money	N	Less stress, traffic	5	NC	5,6	Y
6:00	M	35	5	2	San Diego	Work	Y	Y	N,cost	N	Saves money, time	1	2;get on at Escondido	6	Y
6:05	F	43	5	2	La Jolla	Work	Y	Y	N	N	Saves stress & time	5	NC	4	Y
8:20	M	30	5	3	Kearney Mesa	Work	Y	Y	N, too expensive	Y1	Saves time	1	2, get on in RB	4	Y
8:25	F	28	4	3	RB	Work	Y	Y	N	N	Save time	5	NC	1,2,3,4	Y, still save time
8:15	M	32	3	2	Torrey Pines	Work	Y	Y	N2	N	Saved gas, small inconvenience, schedule conflicts	2	1 Take transit	5,6	Y
8:15	M		4	3	La Jolla	Work	N	N	N, no need	Y3	Made it shorter	5	NC	2, build a subway	Y
7:45	F	30	5	2-3	Claremont	Work	Y	Y	N4	Y5	Less stress	5	-	3	Y
8:00	F	45	4	2	Mission Valley	Work	Y	N	Y6	Y7	Made it bearable	5	NC	3,5, encourage train/trolley extension	Y, encourages carpooling, allows better access
8:05	M	54	4	2	Mission Valley	Work	Y	Y	Y8	N	Saves 15-20 minutes a day	1	2Y	3,4	Y, It works
7:45	M	42	5	2	San Diego Area	Work	Y	Y	N, not in a hurry	N	Good for me; faster	1	1-9	1	N
7:25	M	35	5	2	North County	Work	Y	Y	N	Y10	None	5	NC	2	Y
8:00	F	35	4	2	Fashion Valley	Work	Y	Y	Y, Heavy traffic	Y	Quicker	5	NC	4	Y
8:00	F	50	5	2	La Jolla	School, work	N	N	N	Y11	Easier	5	NC	We need a rail system	Y
8:00	M		3	2	Always changing	Work	N	N	N	N	No	2	NC	2	Y
8:00	F	30	4	2	Fashion Valley	Work	Y	Y	Y12	N	Much quicker, easier and safer	5	NC	4	Y13
6:05	M	22	4	3	Depends		Y	Y	N, no need	Y, destination	Easier, less stress	5	NC	9	Y, Easier
7:30	M	26	5	2	Work		N	N	N	Y, work	Saving gas, and wear on vehicles	5	1, some	2	Y, Relieve tension
8:30	M		3	2	Old Town	Commuter	Y	Y	N, no pay	N	Saved time, frustration and gas	5	NC	4,9, more mass transit	Y
8:30	F	36	3	2	Old Town	Work	Y	Y	Y14	N	Yes, made it quicker	5	NC	2,7,8,9	Y
8:30	M		1	2	WE Portal		N	N	N	N	No	4	NC	3	Y

8:20	M	36	5	2	Mission Valley	Work	Y	Y	N	N15	Positively only	5	NC16	2,3,4,6,9	Y
8:15	M		4	2	Murphy Canyon	Work	N	N	N	Y17	Helped save gas, camaraderie, made me feel good about environment	5	NC	3	Y, car pooling
8:35	M	77	3	2	Downtown SD	Pleasure Golf	Y	N	N18	N	Easier – to airport; great early in am	1	-	8,9	Y
8:35	M	83	3	2-3	San Diego	Golf, shopping, Dr.	Y	Y	N	N	Save money, gas, time, wear & tear on nerves	5	NC	3	-
8:20	F	42	5	2	Mission Valley	Work	Y	Y	N, don't have device	Y19	It has eliminated a great deal of stress. Don't have to suffer other people's road rage.	1	NC	6	Y20
8:30	F	25	5	3	Kearney Mesa/Arrow Drive	Work	Y	Y	N	N	Makes it nicer; travel time cut in half	5	Transit	4,8	Y, no problem
7:15	F		5	2	Work	Work	Y	Y	Y, faster, less traffic	N	Less traffic and quicker getting to work	5	NC		Y
7:30	F		3	2	Aero Drive	Work	N	N	N	N	Save travel time & less stress	2	NC	3,4	Y
7:30	F		3	2	Aero Drive	Work	N	N	N	N	Travel time	2	NC	1,3	Y
7:35	F	40	4	3	Clairemont Mesa	Work	Y	Y	Y, save time	N	Save time and money	5	NC	9	Y21
7:08	F	56	4	2	La Jolla-Thornton Hosp.	Work	Y	Y	N, $	Y	Saved money, wear/tear on car and more friendship	2	2Y, Escondido	2	Y
7:15	F	51	4	2	La Jolla-Hosp	Work	Y	Y	N, Money	Y	Save money and mileage and wear and tear on car; helped build friendship	2	2Y	2	Y
7:10	F	42	5	2	Balboa Hosp.	Work	Y	N	N, no interest	N	Less stressful	5	NC	1,3	-
7:10	F	64	5	2	Navy Hospital	Work	Y	Y	N	Y22	Good, makes it easier; parking is reserved	5	NC	8	Y
6:50	M	50	5	2	Kearney Mesa	Work commute	Y	Y	Y, Habit, by mistake	N	Cut time by ½-3/4, more consistent commute – 15 minutes max any time of day, arrive at work without stress of traffic	5	NC	3,4,5,6,9	Y, no cost if you carpool
7:00	M	52	5	2	Kearney Villa	Work	N	N	N, no transponder	N	Great!	5	-	Light Rail – Monorail	Y23
6:45	F	60	5	3	Kearney Mesa Dr.	Work	Y	Y	Y, Friday	N	Makes drive easier; less stress	5	NC	9	Y
7:20	M	37	5	5	SDSU	Work	Y	Y	N, don't want to pay	N	Less time consuming; relaxing	5	NC	Extend carpool lanes past St. RB	Y
7:30	M	34	1	2	Temecula	Work	N	Y	N, haven't used it	N	It saves gas when I don't have to drive	5	NC	4	Y24
7:15	F	27	5	4	SDSU	Work	N	N	N	N	Great, I love it	1	NC	4,9	Y, for people in a hurry
7:20	F	46	5	2	SD Downtown	Work	Y	Y	Y, Traffic save time	N	Much easier, less stressful	5	NC	4	Y25
7:25	M	42	5	2	Airport	Travel	Y	Y	N	N	Quicker	1	! Use it more; 2 Take it more	7	Y
8:15	F		4	2	Work		N	N	N, too expensive	Y26	Speeds up commute time, less time spent in traffic	2	NC	1,3,7	Y27
6:05	M	34	4	2		Work	Y	Y	N	N	Quicker	2	2(28)	3,4	Y
6:15	M	26	5	2	Old Town	Work	Y	Y	N	N	Less stress	2	NC	3,4,5,6	Y
8:32	M	24	0	0	Patrol	San Diego Area	N	N	N	N	-	-	-	7,8, s	Y

Y1 – Only when HOV lanes are closed N2 – Haven't gone to the trouble of getting the FasTrak device Y3 – Need other exits N4 – No transponder Y5 – Exit in wrong spot Y6 – Business, family Y7 – Only if route prevents usage Y8 – Rider on vacation 1-9 – I'm a tile layer; depends on where the job is Y10 – Sometimes it doesn't matter Y11 – If need to get off before exit or if carpool lane is clogged Y12 – Traffic is jammed, accidents, etc. Y13 - , It encourages carpools and decreases traffic Y14 – Traffic (I have a transponder) N15 – Problems/accident within Express lanes	NC16 – Access at Ted Williams Y17 – Got on at Poway Road N18 – Didn't need to – travel personal Y19 – Need to exit at a different point Y20 – Incentive to carpool and save money and reduce pollution Y21 - Convenient and saves time and money Y22 - Forget to get on Y23 – Make them pay to ride alone Y24 – I think it would save time Y25 – Can still carpool and can use it as solo driver Y26 - Accident, low traffic Y27 – Rewards carpoolers (except on-ramp lights need to be more open to all drivers, not just carpoolers 2(28) – Sometimes – it depends on where I'd be going and when

SAN DIEGO ASSOCIATION OF GOVERNMENTS

I-15 Managed Lanes Value Pricing Project Planning Study

Environmental Justice Assessment for the Project Planning Study Community Outreach Program

January 29, 2002

Prepared for SANDAG by:
Redman Consulting/Judith Norman—Transportation Consultant
Project Outreach Subconsultants to Wilbur Smith Associates

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

A. Purpose of the Environmental Justice Assessment

Four community outreach tasks were conducted from July to October 2001, as part of the Interstate 15 (I-15) Managed Lanes Value Pricing Planning Study. This report reviews and evaluates the effectiveness of those efforts in achieving the goal of providing meaningful opportunity for input into the public opinion assessment process included as a critical component of Managed Lanes project development. An additional task included under the umbrella of Environmental Justice was to assess public perception of the overall fairness of value pricing on the proposed Managed Lanes.

The Community Outreach tasks defined for the project were as follows:

- Stakeholder interviews with 25 key individuals in agencies, communities and public interest organizations
- 100 intercept surveys of transit riders and carpoolers on the I-15 corridor (50 interviews each)
- Three focus groups of I-15 commuters (Express Lane users, main lane users and transit riders)
- 800-person telephone survey of I-15 commuters (English and Spanish questionnaire)

It remains outside the scope of this Environmental Justice Assessment, as defined, to make any determination with respect to equity of overall transportation investment or operational impacts related to the proposed Managed Lanes Project.

B. Findings: Procedural Fairness *(Inclusiveness of Outreach Program)*

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, was signed by the President on February 11, 1994. The Executive Order (EO) and accompanying memorandum focuses Federal Attention on the environmental and human health conditions in minority and low-income communities, enhances the provision of nondiscrimination in Federal programs affecting human health and the environment, and promotes meaningful opportunities to access of public information and participation in matters relating to minority and low-income communities and their environment.

As stated by Federal Highway Administration Interim Guidance (December 2000) the EO requires each Federal agency to take the appropriate steps to identify and avoid any disproportionately high and adverse human health or environmental effects of Federal programs, policies and activities on minority and low-income populations.

The goals of Environmental Justice were kept in mind through the entire process of outreach task development and implementation. A review of the methodology, implementation and

results of the qualitative research efforts (stakeholder interviews, focus groups and transit/carpooler intercept surveys) suggest that, within the defined scope of work and the affected population (I-15 corridor commuters) no range of income, or ethnic viewpoint was excluded. It appears that efforts to ensure that SANDAG received representative information about public opinion, attitudes and concerns from a broad range of ethnicities and income levels were sufficient to satisfy Environmental Justice requirements appropriate to the Community Outreach program for the Managed Lanes study.

C. Findings: Perception of Equity *(Is Value Pricing Fair?)*

Findings from Qualitative Outreach Tasks

Stakeholder Interviews: Equity is Not a Deal Breaker, but Must Be Considered
For the most part, the 15 transportation and planning agency stakeholders questioned have a sophisticated understanding of the purpose of pricing, and believe that the total Managed Lane package provides sufficient options for transit riders and carpoolers to address the issue of equity. None of the agency stakeholders or the four elected officials interviewed expressed the opinion that the equity issue was a "deal-killer." Of the six public interest stakeholders, only one person stated that equity was a major issue for the Managed Lanes project.

Although some respondents discounted the issue of equity entirely, because of the relative affluence of that section of the I-15 corridor, there was also some agreement that the issue of Environmental Justice must be taken seriously, and should be further investigated and evaluated. In addition, the public perception of fairness must be addressed, apart from technical definitions of investment and impact equity

Transit/Carpool Intercept Surveys: Value Pricing (FasTrak Tolls) on Express Lanes Seen as "Fair" to Transit Riders and Carpoolers
FasTrak was deemed "fair" by all but a handful of transit riders and carpoolers surveyed. Respondents cited the fact that tolls were optional as one reason for their determination. Travel time savings and stress reduction benefits were also given as reasons for viewing the lanes as fair. Respondents in both transit and carpool groups believed the lanes provided encouragement for people to carpool, and saw this as an additional benefit to the lanes.

Focus Groups: Express Bus Service is Key to Perceived Fairness of Value Pricing on Managed Lanes
After a full explanation of all Managed Lane project features, including the express bus lanes and direct access ramps, approximately 85 percent of each of the three focus groups thought the proposal was fair, and did not pose an equity issue. Most people based their approval on the fact that the project provides *options* that work for people in a variety of different situations, as well as the fact that solo drivers help support transit and carpool alternatives.

Findings from Quantitative Outreach Tasks

Telephone Survey: Equity Not a Problem for Majority of Respondents
Few respondents associated a lack of fairness or equity with the Managed Lanes. They consider the extension fair to regular lane users and Managed Lane users. Approximately two

thirds of respondents approved of the existing FasTrak value pricing program. Very few differences in opinions and attitudes based on ethnicity or income were found.

Respondents believe that the tolls manage demand. However, for a segment of the sample (9 percent), the cost of the Managed Lanes toll represents a significant barrier to entry.

II. I-15 MANAGED LANES VALUE PRICING PROJECT DESCRIPTION

The San Diego Association of Governments (SANDAG) and Caltrans propose to implement value pricing on the future Interstate 15 (I-15) Managed Lanes through the San Diego I-15 Value Pricing Program. This program will allow solo drivers to use the I-15 Managed Lanes for a fee. The fee will be collected through electronic toll collection equipment.

The 20-mile Managed Lanes project will build four Managed Lanes with a movable barrier in the median of I-15 to accommodate three lanes in the peak direction. The Managed Lanes will give priority to High Occupancy Vehicles (HOVs) and a Bus Rapid Transit (BRT) System. However, other vehicle types will be allowed to use the facility in a "managed" way to maintain a premium Level of Service at all times. The lanes will be barrier separated from the general purpose lanes. Access will occur through as many as seven intermediate access locations (at-grade openings in the barrier) and five direct access ramps, along the 20-mile length. The five direct access ramps will be located at Hillery Drive, Ted Williams Parkway, Bernardo Center Drive, Del Lago Boulevard, and Hale Avenue. The Managed Lanes will be in operation at all times.

A continuous 6.6-meter wide enforcement area is planned, consisting of the 3.0-meter main lane inside shoulder and the 3.0-meter Managed Lane shoulder separated by a concrete barrier. This configuration would allow California Highway Patrol (CHP) officers to position themselves on either the main lane shoulder or the Managed Lanes shoulder to cite violators.

The I-15 Managed Lanes project will also include a Bus Rapid Transit (BRT) System that will incorporate direct access ramps at five locations to and from the Managed Lanes. The Metropolitan Transit Development Board (MTDB) is designing the BRT project. Transit stations/park and ride lots will be located adjacent to the I-15 corridor. Express buses will travel from the park and ride lots to the I-15 Managed Lane facility using the direct access ramps.

Construction of the I-15 Managed Lanes facility will occur in three phases. The middle segment from SR 56 to Centre City Parkway (Stage 1) will be built first with an estimated completion date of 2005. The northern segment from Centre City Parkway to SR 78 and the southern segment from SR 163 to SR 56 will be constructed later. The southern segment would involve widening the existing reversible I-15 HOV facility from two lanes to four lanes and installing intermediate access locations. Completion dates have not been determined for the northern and southern segments.

III. COMMUNITY OUTREACH OVERVIEW

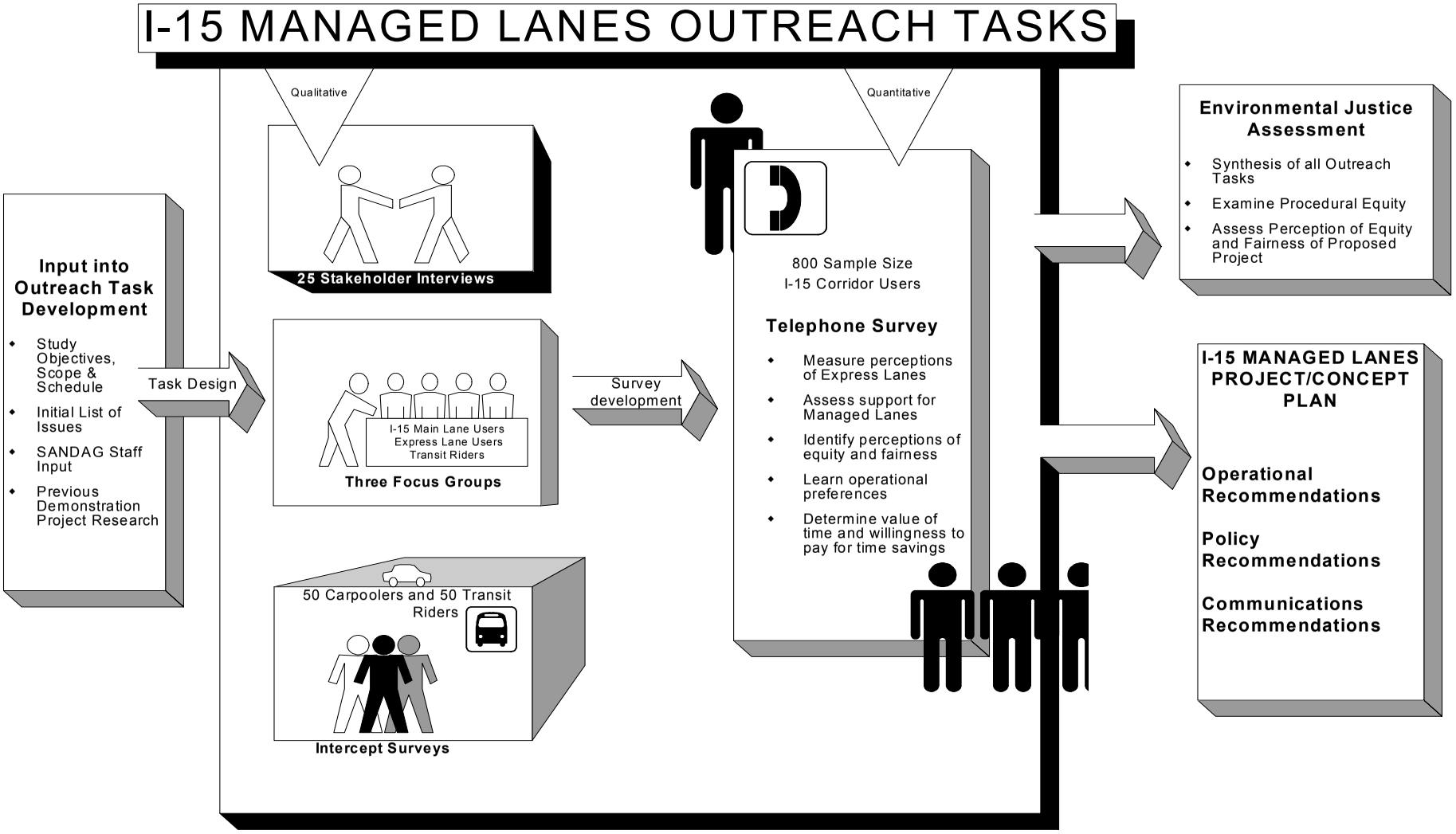
A. Brief Description and Interrelation of Outreach Tasks

In June 2001, the San Diego Association of Governments (SANDAG) began a comprehensive, two year study of a proposed extension of the eight-mile I-15 Express Lane facility, known as the I-15 Managed Lanes Value Pricing Project Planning Study. Integral to the study is an

assessment of public attitudes and concerns about both the existing and proposed projects. A series of community outreach tasks were incorporated into the project scope of work to allow SANDAG to examine these attitudes from a variety of perspectives. These tasks employed a number of specific qualitative and quantitative assessment techniques including 1) focus groups, 2) stakeholder interviews, 3) intercept surveys and 4) a telephone survey of 800 I-15 corridor users.

The sequencing of tasks was designed so that the early insights and direction gained from the results of focus groups, stakeholder interviews and intercept surveys could be used to help design the telephone survey questionnaire, as well as to provide stand-alone conclusions and recommendations to the project planners.

A flow diagram illustrating the project's community outreach tasks and their relationship to the Project/Concept Plan is found in Figure A (page 6).



Flow Chart of I-15 Managed Lanes Value Pricing Community Outreach Tasks Showing Links to Environmental Justice Assessment and Project Concept/Plan

Redman Consulting/Judith Norman–Transportation Consultant
Outreach Team Subconsultants to Wilbur Smith Associates

Figure A
October 2001

IV. ENVIRONMENTAL JUSTICE (EJ) ASSESSMENT TASK PURPOSE, BACKGROUND AND METHODOLOGY

A. Background on Origins and Intent of EJ Guidelines

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, was signed by the President on February 11, 1994. The Executive Order (EO) and accompanying memorandum focuses Federal Attention on the environmental and human health conditions in minority and low-income communities, enhances the provision of nondiscrimination in Federal programs affecting human health and the environment, and promotes meaningful opportunities to access of public information and participation in matters relating to minority and low-income communities and their environment.

As stated by Federal Highway Administration Interim Guidance (December 2000) the EO requires each Federal agency to take the appropriate steps to identify and avoid any disproportionately high and adverse human health or environmental effects of Federal programs, policies and activities on minority and low-income populations.

SANDAG and Caltrans are committed to the principles of President Clinton's Executive Order 12898 and EPA's "Environmental Justice Strategy: Executive Order 12898" released in May 1995. It is important to note that this executive order was originally developed out of concern for waste treatment and other hazardous facility siting, and that to some extent, transportation projects such as the I-15 Managed Lanes present a different set of problems to be addressed by environmental justice principles. The practice of evaluation of environmental justice (EJ) is evolving, and each project must be addressed within a rational and flexible analytical framework that is appropriate to unique project details, context and set of relevant demographics. It is important to keep in mind the fact that the lanes remain free to transit riders and carpoolers/vanpoolers, and that the toll revenues are likely to continued to be directed to supporting transit enhancements.

B. Environmental Justice Methodology

In an effort to document compliance with Federal and State Environmental Justice policy, this assessment compiles relevant elements of all community outreach and public involvement study tasks, in order to accomplish specific examination of two issues:

- **Procedural fairness** in gathering public input *(was the process sufficiently inclusive?)*
- **Perception of equity** and fairness from the viewpoints of low-income individuals and/or members of ethnic (non-Caucasian) minorities.

The environmental justice focus in this task is designed primarily to ensure methodological adequacy of quantitative and qualitative efforts in obtaining lower- income and ethnic representation within the community outreach/public input process.

Section V of this report provides details necessary to evaluate whether the outreach research methodology was inclusive for the following tasks:

- Stakeholder Interviews
- Intercept Surveys included one-on-one surveys of 50 carpoolers and 50 transit riders along the study corridor
- Focus Groups included main lane users, FasTrak users (i.e., toll-payers) and transit riders.
- Telephone survey

It was important to reach the full range of diversity of people within the I-15 corridor who could be affected by the Managed Lanes project, including non-Caucasian and lower-income commuters, in order to effectively solicit their own opinions with respect to "fairness" of value pricing. Apart from any actual impact that may or may not be associated with the provision of a new mobility option (solo driver buy-in to high-occupancy vehicles lanes) policy-makers are concerned with public perception of the fundamental fairness of that transportation management strategy. Section VI of this report addresses this issue.

It remains outside the scope of this Environmental Justice Assessment, as defined, to make any determination with respect to equity of overall transportation investment or operational impacts related to the proposed Managed Lanes Project.

V. SUMMARY OF PROCEDURAL EQUITY ISSUES, BY OUTREACH TASK

A. Introduction

The issue of procedural equity relates to the uniform application of governing rules, regulations, policies, procedures and decision criteria. With respect to the community outreach task associated with the I-15 Managed Lanes Value Pricing Planning Project Study, the issues are:

- Were efforts made to include ethnic and low-income populations likely to be affected by implementation of the project?

- Were the outreach tasks designed to solicit input from ethnic and low-income populations and individuals likely to be affected by implementation of the project?

This section provides detailed information about the methodology employed to be able to answer these questions in the positive.

A previous community outreach effort (reported in Task 3.3.5, Phase I Community Outreach and Impacts, prepared by San Diego State University Foundation for SANDAG in August 1998, and found on the SANDAG website, www.sandag.ca.gov) included three public meetings designed to address EJ issues at which there was extremely low public attendance. At that time, Caltrans District 11 staff advised future community outreach efforts to utilize more effective methods, including focus groups. Three focus groups (discussed in this report) were incorporated into the 2001 Community Outreach research program.

B. Stakeholder Interviews

Selection of Stakeholders

Between July and October 2001, a total of 25 key stakeholders were identified and interviewed in order to measure their attitudes and perceptions about the current value pricing project (the Express Lanes) as well as the proposed Managed Lanes extension from Ted Williams Parkway to the SR-78/I-15 interchange in Escondido. Though the primary purpose of the stakeholder interviews was general public outreach as opposed to Environmental Justice, interviewers asked each participant about his or her perception of equity and asked stakeholders to identify any low income or minority groups that would be affected by the project, in their opinion and according to their knowledge of the area.

Stakeholders (identified by name and organization in Appendix A) can be categorized as follows:

- Four elected officials from cities along the I-15 corridor:
  - Escondido *(two stakeholders)*
  - Poway
  - San Marcos

- Fifteen staff representatives from agencies directly involved in project planning and design:
  - SANDAG *(four stakeholders)*
  - Federal Highway Administration (FHWA) *(four stakeholders)*
  - Caltrans District 11 and Headquarters *(four stakeholders)*
  - Metropolitan Transit Development Board (MTDB) *(two stakeholders)*
  - California Highway Patrol (CHP)

- Six representatives of a range of public interest or regulatory constituencies:
  - Automobile Club of Southern California
  - League of Women Voters
  - Taxpayers Association
  - Endangered Habitat League
  - San Diego Economic Development Corporation
  - Air Pollution Control District (APCD)

Stakeholder Identification of Community Groups and/or Underrepresented Groups for Special Outreach Attention

When asked to identify groups within the community who might be underrepresented in a public outreach process, many of the most appropriate groups or individuals identified had already been listed as part of this community outreach task. No low-income or ethnic communities were specifically identified by community leaders as potential impacted groups. Two public agencies referred the consultants to the previous community outreach effort (mentioned above, and reported in Task 3.3.5, Phase I Community Outreach and Impacts.) In this 1998 document, the authors refer to prepared by San Diego State University Foundation for SANDAG in August 1998, and found on the SANDAG website, www.sandag.ca.gov). The SDSU researchers identified South Escondido and Rancho Pensaquitos as areas of higher carpooling rates, relatively lower income and higher ethnic

concentrations included three public meetings designed to address EJ issues at which there was extremely low public attendance. At that time, Caltrans District 11 staff advised future community outreach efforts to utilize more effective methods, including focus groups. Three focus groups (discussed in this report) were incorporated into the 2001 Community Outreach research program.

C. Focus Groups

Ethnic and Income Diversity Incorporated into Focus Group Participant Selection Process

An effort was made to screen potential participants in order to achieve a balanced, though not statistically representative, focus group composition with respect to gender, income, level of satisfaction with the existing lanes, and a number of other travel-behavior variables that differed somewhat according to the specific focus group. Within the Express Lane users group, the screening process was designed to obtain dissatisfied as well as satisfied participants, in order to elicit a range of opinions about various features of the lanes.

The goal was to have 12-14 participants at each group; actual participant count was 14 for each group. In cases where more than 14 people arrived at the focus group facility, those chosen for participation were weighted toward lower income and ethnic diversity (that is, when there was an option, non-Caucasians and people representing the lower range of the income spectrum were invited to stay for the focus group.)

Appendix B of the Focus Group Report, *Focus Group Participant Profiles*, Tables 1, 2 and 3 list the participants for each focus group and provide summary statistics for each group. Although no statistical conclusions can be drawn from a qualitative methodology such as focus groups, it was important to include members of diverse backgrounds (ethnicity and income, in particular) in order to obtain the kind of in-depth input inherent to the focus group format, from people across a range of demographic variables.

As the focus group profiles illustrate, transit riders, as a group, had the lowest average income of the three groups:

- Average income for transit riders was only 63 percent of the average income for FasTrak users, and 64 percent of the average income for members Main Lane users focus group.

- In addition, transit riders included more African American participants than the other two groups, and fewer Caucasians.

In addition, judging from statements made during the focus group, four of the six participants who reported no secondary commute mode choice appeared to be “transit-dependent” riders; that is, people without another reliable travel option available to them for most trips. All four of these participants reported incomes of $30,000 per year or less; two were Caucasian, and two were African-American. A fifth “transit only” commuter explained that he used transit in order to familiarize himself with the routes so that he could advise those in his career counseling practice on how to use the area bus service. The remaining “transit

only" commuter also appeared to be a transit rider "by choice." These "choice" riders reported incomes of $87,000 and $59,000, respectively.

Also of note is the income differential within each group, related to ethnicity:

- Among the 14 FasTrak users, the average income for non-Caucasians was only 31 percent of the average income for Caucasian participants.
- Among the Main Lane users, the average income for non-Caucasians was 80 percent of the average income for the Caucasian participants.
- This ratio was reversed among members of the Transit Riders group, where the average income of the Caucasians was 84 percent of the non-Caucasian participants.

D. Opinions of Commuters Now Using Alternatives to Tolls

The purpose of the intercept surveys was to directly target carpoolers and transit riders along the corridor to solicit their opinions on the current Express Lanes as well as the proposed extension. This task was directed at obtaining more data on peak period commuters from "low-incidence" travel behavior categories (i.e., carpoolers and transit riders, who make up only a small fraction of corridor commuters) than would occur through the random-sample data gathering effort used in the telephone survey.

The surveys took place at park-and-ride lots and transit interface points along the I-15 corridor within the new Managed Lanes project area. It is important to understand that a key advantage of using the intercept survey technique as a qualitative research tool to boost information on a small, non-random population that will not be reached through survey techniques of cost-effective sample size. However, an inherent limitation associated with the intercept survey method in this case is that, given the small size and non-random selection process, no statistically binding conclusions can be drawn from the results.

E. 800 Household Telephone Survey of Corridor Commuters

Adequacy of the Survey Sample

Fairfax Research followed accepted industry standards to obtain a sample inclusive of the attitudes and opinions of all ethnic and socioeconomic groups comprising I-15 corridor users. The study consisted of eight hundred (800) telephone interviews—600 regular lane users (non-FasTrak customers) and 200 FasTrak customers. Fairfax Research used a combination of Random Digit (RDD) sample and a list of FasTrak customers from the FasTrak database to complete the interviews. The survey population included individuals living in the zip codes 92025, 92026, 92027, 92029, 92064, 92069, 92126, 92127, 92128, 92129, and 92131 who were 18 years of age or older and who traveled on any part of the I-15 between SR 78 in Escondido and SR 163 in Kearny Mesa, Monday through Friday between 5:45 and 9:15 a.m.

The table below compares the sample demographics from this survey with the sample demographics from Phase I of the Attitudinal Panel Study conducted in the fall of 1997. The table compares the sample demographics for the ExpressPass/FasTrak samples and for the

I-15 regular lane samples. With few exceptions, the demographic attributes of the two samples match closely. The FasTrak customer sample and the I-15 regular lane sample in this study contain more respondents with college degrees and more respondents with annual household incomes greater than $120,000. For reporting purposes, the Attitudinal Panel Study treated the FasTrak customers and I-15 regular lane users as two separate samples. They did not attempt to weight the two groups to their representative proportions in the zip codes.

Table 1: Sample Comparison: Phase I Attitudinal Panel

	ExpressPass Fall 1997	Express Lanes Fall 2001	I-15 Regular lane Fall 1997	I-15 Regular lane Fall 2001
Education				
High	8%	3%	15%	13%
Some	20%	15%	36%	28%
Bachelor's	39%	52%	26%	40%
Graduate	33%	29%	23%	18%
Age				
18-to-24	1%	3%	11%	10%
25-to-34	13%	13%	22%	21%
35-to-44	42%	33%	34%	27%
45-to-54	33%	34%	21%	23%
55-to-64	9%	13%	8%	12%
65 and	3%	3%	5%	6%
Income				
Less than	0%	0%	4%	3%
$20,000	4%	3%	12%	16%
$40,000	13%	5%	29%	21%
$60,000	33%	32%	35%	31%
$100,000	50%	60%	20%	29%
Gender				
Men	57%	49%	57%	53%
Women	43%	51%	43%	47%
Sample	501	200	557	600

The application of scientific methods including the use of an RDD sample, careful sample administration, and adherence to thorough callback procedures assured all I-15 travelers residing in the corridor an equal probability of inclusion in the survey. Fairfax Research followed accepted industry standards to obtain a sample inclusive of the attitudes and opinions of all ethnic and socioeconomic groups comprising I-15 corridor users. By design and definition, I-15 corridor users differ from I-15 corridor residents. The results of the Attitudinal Panel Study and this study suggest that I-15 corridor users are younger (25 to 54

years old) and are more affluent than I-15 corridor residents. The Attitudinal Panel Study did not ask the respondent his or her ethnicity. Table 2 compares Census population data (18 years of age or older) for the target zip codes with the survey findings on the attributes of age, income and ethnicity. Please remember that in voluntary opinion and attitude telephone surveys certain respondents refuse to answer questions about their age, income, or ethnicity.

Table 2: Sample Comparison: U.S. Census

	Census Population 18+	2001 Survey Corridor Users
Ethnicity		
Hispanic	15%	10%
Black	2%	2%
Asian	13%	8%
Caucasian	70%	73%
Refused	-%	8%
Income		
Less than	44%	22%
$50,000-	39%	35%
Over $100,000	17%	25%
Refused	-%	18%
Age		
18-24 years old	13%	10%
25-34 years old	20%	21%
35-44 years old	22%	27%
45-54 years old	18%	23%
55-64 years old	11%	12%
65 and older	16%	5%
Refused	-%	2%

Fairfax Research used a Random Digit (RDD) sample to include all segments of the I-15 user population. Typically, households with unpublished telephone numbers come from the two ends of the income spectrum. The RDD sample compensated for any problems associated with unpublished telephone numbers. In addition, careful sample management eliminated potential bias by monitoring each sample point in the sample frame. The CATI software contained a sample manager that monitored the sample and the disposition of each telephone number in the sample frame. This ensured each telephone number in the sample universe an equal probability of selection. Because of differences in lifestyle-driven schedules and the difficulty of reaching all people within a given time of day or day of the week, the interviewers called each number up to three times. To ensure the accuracy and validity of the sample, the callbacks occurred on different days of the week and at different times of the day. To minimize language as a barrier to participation, the interviewers conducted the interviews in English and Spanish.

The use of supervised professional interviewers in a centralized telephone center together with the application of these scientific methods, including the use of an RDD sample, careful

sample administration, and adherence to thorough callback procedures assured all I-15 travelers residing in the corridor an equal probability of inclusion in the survey. This process resulted in a sample that, within statistical limits, accurately represents the ethnic and income composition of I-15 corridor users.

Federal Highway Administration (FHWA) Poverty Guidelines

For the 48 contiguous states and the District of Columbia, the following table illustrates the poverty guidelines used by FHWA as of this date (January 2002):

Table 3: 2001 U.S. Department of Health and Human Services Poverty Guidelines

Size of Family Unit	Income
1	$ 8,590
2	$11,610
3	$14,630
4	$17,650
5	$20,670
6	$23,690
7	$26,710
8	$29,730
For each additional person, add	$ 3,020

When examining the issue of income relative to the proposed Managed Lanes project, it is important to keep in mind that the methodology of the study explicitly considered the impact of the project on *I-15 corridor users*. As this study and prior research in the corridor also reveals, people currently using the I-15 corridor during commute peak periods do not tend to be those included within the FHWA definition of poverty. It is likely that people using the corridor during peak periods (i.e., those who will be affected by the project) are either employed or attending school and either have an automobile available for those purposes, or are able to carpool or use transit to reach their destinations.

It should be noted that there are several common and notorious challenges to obtaining complete and accurate income data from survey respondents. First, non-response rates tend to be higher at both the low- and high-income extremes, so that the very data required to determine poverty tends to be the data that is missing. The 2001 survey for this study had a non-response rate of 18%.

Second, because the poverty thresholds for various family sizes are placed at increments of only several thousand dollars, one would have to inquire of respondents their actual income (rather than the typical income range used in this survey, for example “from $20,000 to $29,999”) in order to correlate family size to income and determine whether an individual respondent fell within the FHWA definition of poverty. This kind of questioning is not only less likely to produce a response, but lengthens the survey time and precludes other project-related questions necessary to the study.

Although there are data limitations with respect to determining poverty among survey respondents, due both to budget-related sample size and the reluctance of people to state their precise income, the 2001 survey only shows six of 800 respondents who would fall

under the FHWA definitions of poverty shown in Table x. Because of the known limitations of survey research just described, however, the study was designed to gauge income *levels* sufficient to provide policy makers with an understanding of how people under various economic conditions respond to the project concept. Thus, even though only six people can be identified who fall within the definition of poverty, 24 people state that their income is less than $20,000. Within the North San Diego County standards of living, this can be considered a low-income category, no matter what the household size is. So, although it is not likely that all 24 of the individuals whose responses are analyzed below are officially within the FHWA poverty guidelines, and although we cannot say anything statistically valid about a sample of 24 people, the following data is provided for the sake of comprehensiveness.

Identification of Areas of Ethnic or Low-Income Concentration

Table 4 lists the Thomas Brothers geographic labels for each zip code along the project alignment from which random surveys were drawn.

Table 4:
Zip Code Designation

Zip Code	Area
92025	Escondido/San Pasqual
92026	Escondido/Hidden Meadows/Jesmond Dene
92027	Escondido/Bear Valley
92029	Escondido/Del Dios/Harmony Grove
92064	Poway
92069	San Marcos
92126	Miramar/Mira Mesa
92127	West Rancho Bernardo
92128	Carmel Mountain Ranch/Rancho Bernardo/Sabre Springs
92129	Rancho Pensasquitos
92131	Miramar Ranch North/Scripps Miramar Ranch

Please note that the percentages in Tables 5 to 9 sum to 100 percent reading across. In Table 5, for example, in the zip code 92025 24.3 percent of the respondents classified themselves as an ethnic group other than Caucasian, 72.8 percent classified themselves as Caucasian, and 6.4 percent refused to answer question. Table 3 indicates one zip code (92126, MiraMar/Mira Mesa) as containing the highest non-Caucasian ethnic concentration. However, the poorest respondents reside in zip code 92025 (Escondido/San Pasqual).

Table 5:
Ethnic Distribution by Zip Code

Zip Code	Ethnic	Caucasian	Refused
Total	**20.9%**	**72.8%**	**6.4%**
92025 (74)	24.3%	68.9%	6.8%
92026 (85)	21.2%	75.3%	3.5%
92027 (69)	17.4%	81.2%	1.4%
92029 (47)	17.0%	68.1%	14.9%
92064 (91)	11.0%	81.3%	7.7%
92069 (18)	27.8%	72.2%	0.0%
92126 (82)	36.6%	58.5%	4.9%
92127 (53)	20.8%	73.6%	5.7%
92128 (105)	20.0%	76.2%	3.8%
92129 (107)	24.3%	67.3%	8.4%
92131 (69)	11.6%	76.8%	11.6%
800	167	582	51

Table 6:
Poverty by Zip Code
(Based on Income and Household Size)

Zip Code	At or below poverty line	All others
Total	**2.9%**	**97.1%**
92025 (74)	12.2%	87.8%
92026 (86)	4.7%	95.3%
92027 (69)	4.3%	95.7%
92029 (47)	0.0%	100.0%
92064 (90)	1.1%	98.9%
92069 (19)	0.0%	100.0%
92126 (82)	1.2%	98.8%
92127 (52)	1.9%	98.1%
92128 (106)	2.8%	97.2%
92129 (107)	0.9%	99.1%
92131 (68)	0.0%	100.0%
800	23	777

Table 7:
Income by Zip Code

Zip Code	Under $20,000	$20,000 or more	Refused
Total	**2.6%**	**79.0%**	**18.4%**
92025 (74)	12.2%	71.6%	16.2%
92026 (85)	4.7%	82.6%	12.8%
92027 (69)	4.3%	78.3%	17.4%
92029 (47)	0.0%	68.1%	31.9%
92064 (91)	1.1%	81.1%	17.8%
92069 (18)	5.3%	73.7%	21.1%
92126 (82)	1.2%	86.6%	12.2%
92127 (53)	1.9%	75.0%	23.1%
92128 (105)	1.0%	83.8%	15.2%
92129 (107)	0.0%	78.5%	21.5%
92131 (69)	0.0%	76.8%	23.2%
800	21	632	147

Table 8:
Income by Ethnicity

	Asian	African American	Hispanic	Native American	Caucasian	Refused
Total	**8.0%**	**2.1%**	**9.6%**	**1.4%**	**72.6%**	**6.4%**
At or below $20,000 (24)	0.0%	4.2%	29.2%	0.0%	66.7%	0.0%
All others (778)	8.2%	2.1%	9.0%	1.4%	72.8%	6.6%
802	64	17	77	11	582	51

Table 9:
Ethnicity by Income

	At or below $20,000	All others
Total	**3.0%**	**97.0%**
Asian (64)	0.0%	100.0%
African American (17)	5.9%	94.1%
Hispanic (77)	9.1%	90.9%
Native American (11)	0.0%	100.0%
Caucasian (582)	2.7%	97.3%
Refused (51)	0.0%	100.0%
802	24	778

Environmental Justice Elements Included in Questionnaire Design

A number of specific questions were designed to address environmental justice (fairness, willingness to pay, attitude toward tolls, and others) either explicitly or implicitly. The following research objectives, incorporated EJ issues as they contributed to the overall content of the telephone survey:

- Measure awareness and perceptions of the existing Managed Lanes, including safety and enforcement;
- Determine the current level of I-15 corridor users understanding of how SANDAG spends revenue collected from FasTrak toll payers. Compare their understanding of revenue expenditures to their preferences for the expenditure of revenues collected from FasTrak toll payers;
- Assess support for the proposed I-15 Managed Lanes Extension, including the likes and dislikes of the proposed extension;
- Measure interest in using and impact on usage of the I-15 Managed Lanes Extension;
- Explore perceptions of the need for the extension;
- Learn preferences for the hours of operation and assess to the Managed Lanes; and,
- Determine the value of time and willingness to pay for time savings.

All questions were designed to be amenable to analysis according to ethnicity and/or income of the respondents, in order to identify any “red flag” concerns relevant to Environmental Justice issues.

VI. PERCEPTION OF EQUITY OR FAIRNESS

A. Stakeholder Interview Findings

Stakeholders View Value Pricing through Different Lenses

Value pricing itself is seen variously as an innovative traffic management tool, a revenue stream for transit and carpool/vanpool alternatives, and, by one, as a necessary evil. While most stakeholders interviewed saw value pricing as the very factor that makes the lanes desirable and effective, a few viewed it as the fly in an otherwise attractive ointment. Several stakeholders who understood the demand management function of tolls cited concerns about public perception of unfairness as problematic. One stakeholder attributed the increase in carpooling to the fact that the tolls put a monetary value on carpooling, thus increasing its attractiveness to the public. Finally, as one elected official declared, “I’m not a toll advocate, but this is probably what we need to do to solve our transportation problems.”

Stakeholders’ Perception of Equity Issues Relative to the Managed Lanes Project

For the most part, the stakeholders questioned in previous waves of interviews have a sophisticated understanding of the purpose of pricing, and believe that the total Managed Lane package provides sufficient options for transit riders and carpoolers to address the issue of equity. Although some respondents discounted the issue of equity entirely,

because of the relative affluence of that section of the I-15 corridor, there was also wide agreement that the issue of Environmental Justice must be taken seriously, and further investigated and evaluated. In addition, the public perception of fairness must be addressed, apart from technical definitions of investment and impact equity.

Table 10: Summary of Stakeholder Comments on Fairness and Equity

Position on Equity	Elected Officials	Agency	Public Interest
Equity *IS* an Issue ("Lexus Lanes" argument or "Perception of Unfairness" argument)	One of four believes equity can be addressed with greater facility access + enhanced transit service.	Recognition that the perception of unfairness must be seriously addressed. Concern about socioeconomic differences between FasTrak users and non-users. Equity issues might re-arise as maximum tolls rise with facility length. Long- vs. short-distance commuters might be differentially impacted.	"Lexus Lanes" argument is accurate, according to one stakeholder. One stakeholder concerned about toll affordability to average motorist.
Equity *IS NOT* an Issue ("Robin Hood" argument)	Three of four do not consider equity to be an issue for this project.	Bus Rapid Transit addresses equity issue. Corridor is affluent. Project provides an *option.* Carpooling is free; off-peak tolls are lower cost. Not a problem if revenues are invested in corridor.	Affordability concerns (cited above) are offset by relative affluence of I-15 corridor. Seamless, convenient rapid transit addresses any equity issue.
Insufficient Information to Form Opinion	N/A		One stakeholder needs to see more information before making a decision on equity.

None of the agency stakeholders expressed the opinion that the equity issue was a "deal-killer." However, an on-going dilemma facing those involved in public decision making is whether providing increased mobility options in a highly congested corridor justifies a project which could result in furthering the divide, however minimally, between the "haves" and "have-nots." One agency stakeholder advised that "We need to look at other options [in addition to value pricing], perhaps opening the lanes to everyone during off-peak, and/or finding other technologies to regulate traffic flow on the managed lanes."

Do Enhanced Transit and Carpool Opportunities Fully Address Equity Concerns?

A majority of those interviewed echoed the sentiments of a public interest stakeholder when in his statement that, "The creation of seamless, rapid transit on the corridor is an equity benefit, especially as it is supported by toll revenue." However, while one elected official supported that position by reiterating, "Transit use of the lanes would address the naysayers who think it's a road for rich folks," an agency stakeholder warned against assuming that the only equity issue is that of transit-dependent populations. "I'm not sure the Bus Rapid

Transit service answers all the equity questions. It kind of pigeonholes low-income people by labeling them transit-dependent vs. those using their transponders." Still, the stakeholder acknowledged that the carpooling option was also a benefit to lower-income car owners who could take advantage of the carpool option.

Also noted during the interviews was an unexpected consequence of providing the Inland Breeze as part of the FasTrak project—that is, the level of transit ridership for the reverse commute. This was theoretically attributed to travel undertaken by those who work in mid-San Diego County, but who cannot afford to live there. This new access to jobs was seen as an unintended equity benefit of the original FasTrak lanes.

B. Focus Group Findings

Equity issues, whether real or perceived, have become associated with value pricing projects in large part because the means of paying for transportation facilities until now has been through fuel taxes and local or state sales taxes—revenue sources that are not as direct or obvious to most people as tolls. In each of the three focus groups, participants' assessment of whether permitting solo drivers to pay tolls to use carpool lanes was "fair" were mixed—both pro and con—through the entire range of income levels, and across ethnic groups. (See Appendix B of the Focus Group Report for the participant demographic profiles.) Although a focus group does not provide the basis for statistical analysis, these results indicate that neither income, ethnicity nor choice of commute mode seem to dictate a person's perception with respect to the equity, or fundamental fairness, of value pricing.

Generally, after a full explanation of all Managed Lane project features, approximately 85 percent of each group thought the proposal was fair, and did not pose a fatal equity issue, in their opinion. Most people in this group based their approval on the fact that the project provides *options* that work for people in a variety of different situations, and the fact that solo drivers help support transit and carpool alternatives.

Some participants considered the potential for personal benefit from Managed Lanes, whether stemming from transit, carpool or solo driver buy-in opportunities, and determined that the lanes were fair "for them." Others felt that, as long as a person was willing to pay for premium service, they should be permitted to do so. In their view, there was no equity issue involved, since the project didn't take anything away from anyone else. Finally, the fact that the lanes would ease congestion for everyone on the main lanes was viewed as a balancing force in the "equity equation."

There were a few people in each group who did not change their position, and who simply thought tolls were elitist and unfair, offering advantages based on ability to pay. (Within the Express Lane users group, these individuals were, however, willing to use the lanes, and enjoyed the time savings offered by the toll buy-in option for solo drivers.)

Express Lane Users

Express Lane users emphasized the fact value pricing offers commuters another choice about how to use the lanes, and expressed the belief that if a person is willing and able to pay, they should have the option. However, many also express concern about socioeconomic disparities, and the relative disadvantage of the less well off.

Main Lane Users

Eight out of the 14 Main Lane users thought the Express Lanes/Managed Lanes were "generally fair" to travelers. However, Main Lane users wanted to see more transit solutions, and, like the FasTrak users, were impressed with the Bus Rapid Transit component of the Managed Lanes. In fact, six participants said they would be likely to use transit along the new alignment. This group saw transit as the most flexible, attractive and affordable option included as part of the Managed Lanes proposal.

Notwithstanding a suggestion (described below) to reduce tolls, thus allowing more solo drivers access to the facility, there was concern among some participants about maintaining mobility benefits for carpoolers in the Managed Lanes. Thus, equity or fairness for one group (solo drivers who might be priced out of the lanes) had to be weighed against fairness to carpoolers (who might be slowed down by the impact of additional solo drivers.)

Transit Riders

As with the other focus groups, the Transit Riders were asked whether they thought that the project, as described (with transit and carpool enhancements, and additional access) was fair, given that some people would have to pay to use the lanes. General response indicated participants viewed the tolls as fair. Reasons cited included 1) tolls went back into the system, and supported transit and carpooling; and, 2) tolls are an option for premium service.

Effect of the Direct Access Ramps and Bus Rapid Transit/Park and Ride Lots on Perception of Equity

Participants believed that increased access to the facility would render the whole project fairer by allowing drivers to make more affordable, selective choices in the segment to use, instead of having to purchase a trip on the entire segment. One member of the Express Lane users group stated, "When they give you more options for everybody, it is always better - you can't lose there." There was substantial agreement with this assessment, by other members of the group.

In addition, the overall impact of providing direct ramp access for a Bus Rapid Transit, with supporting facilities such as transit centers and park and ride lots, and more neighborhood transit service combined to make a strong sell that overcame most equity-based objections to the project. Like the FasTrak users, the Main Lane users and Transit Riders were impressed with the Bus Rapid Transit component of the Managed Lanes, but were more insistent upon the necessity of transit service improvements.

Concern about fairness for carpoolers was also expressed, and the enhanced carpool access to the project was appealing for participants in all three focus groups.

C. Transit Rider/Carpooler Intercept Survey Findings

Value Pricing (FasTrak) on Express Lanes Seen as "Fair" by Transit Riders and Carpoolers Surveyed

It is important to note the near unanimity of positive response for both carpoolers and transit riders when asked whether they thought the FasTrak lanes (value pricing) were fair "for them." (See table, below.) Had there been much negative feeling among these two

commuter groups, this would have been a signal for SANDAG to investigate further the causes of motorist attitudes. Although this outreach task asked a non-random sample of commuters to provide their opinions, and so is not amenable to statistical extrapolation to the larger regional population, the unequivocal tilt of the answers in support of the Express Lanes does provide some reassurance that the Managed Lanes will be seen as a benefit to current high-occupancy vehicle commuters.

FasTrak was deemed "fair" by 94 percent of transit riders and 92 percent of carpoolers surveyed. Respondents cited the fact that tolls were optional as one reason for their determination. Travel time savings and stress reduction benefits were also given as reasons for viewing the lanes as fair. Respondents in both transit and carpool groups believed the lanes provided encouragement to carpool, and saw this as an additional benefit to the lanes.

Of the 50 carpoolers who participated in the intercept survey, only one respondent thought the FasTrak program was unfair. This respondent did not provide an explanation for his opinion. Forty-six carpoolers (92 percent of those questioned) thought the lanes were fair, and provided a variety of reasons for their opinions, including the fact that the use of FasTrak represented another mobility option for travelers, and afforded travel time advantages to carpoolers. Responses are presented as percentages in the table below to allow easy understanding and comparison of results, and are not meant to imply statistical significance.

Table 11	**TRANSIT RIDERS (50 completed surveys)**		**CARPOOLERS (50 completed surveys)**	
Survey Question	**Number of Responses**	**Percentage**	**Number of Responses**	**Percentage**
Is FasTrak fair to you as a traveler?	Yes: 47 No: 3	Yes: 94% No: 6%	Yes: 46 No: 1 Abstained: 3	Yes: 92% No: 2% Abstained: 6%
Additional Comments from Respondents	• Express Lanes mean faster buses, shorter travel time. • Revenues are used to improve transit. • Anyone willing to pay can use it. • It encourages carpooling. • Less traffic for a price.		• Saves time, encourages carpooling. • Relieves tension. • Express Lanes are still free for carpoolers.	

D Perception of Fairness and Equity Issues: Results of the Telephone Survey

This section reports the results of the 800-sample size telephone survey that was the fourth component of the community outreach program. The results refer to a series of attitudinal questions about the fairness and equity of the FasTrak program. Further details can be found in the Public Outreach Telephone Survey Report (Task II-4)

Commuters' perception of fairness of the lanes was researched using a number of questions emphasizing different aspects of the issue. Overall, the majority of respondents did not identify equity (fairness) as a significant problem.

Majority thinks Proposed Extension, Including FasTrak, is Fair to Motorists in All Lanes

The respondents were asked the questions: "Overall, do you believe having FasTrak on this extension would be fair or unfair for travelers using the *regular* lanes of I-15?" and "Overall, do you believe having FasTrak on this extension would be fair or unfair for travelers using the I-15 Express Lane extension?" A solid majority of the respondents felt that having access to and using FasTrak on the proposed extension is fair to both travelers using the regular lanes (71 percent) and travelers using the Managed Lanes (75 percent). Hispanics, Asian, and Caucasians did not differ significantly in their perception of the fairness of the use of FasTrak to regular lane users and Managed Lane users.

Two-Thirds of Respondents Approve of Existing FasTrak Program

Respondents were asked: "The FasTrak program allows motorists who are driving alone to travel in the Express Lanes for a fee that is charged electronically each time they use the lanes. The price varies with the amount of traffic in the Express Lanes. From what you know about the FasTrak program, do you strongly approve, somewhat approve, somewhat disapprove, or strongly disapprove of it?" Two-thirds (66 percent) of the respondents said they approved of the FasTrak program. Thirty-one percent (31 percent) of them "strongly" approved of it while 35 percent "somewhat" approved of it. By contrast, 28 percent of the respondents expressed disapproval of the FasTrak program. Seventeen percent of them "strongly" disapproved of it and 11 percent "somewhat" disapproved of it. Although the respondents' ethnicity had no significant impact on their approval of the FasTrak program, respondents with household incomes of $70,000 or more voiced higher levels of approval of the FasTrak program than did respondents with household incomes of less than $70,000.

Approval for Value Pricing Concept

When asked if they agreed that solo drivers should be allowed to use the I-15 Managed Lanes for a fee, 77 percent of respondents said "yes." As the table below confirms, neither ethnicity nor income factor into the respondents' position on the concept of SOV drivers buying access to the Managed Lanes. Agreement does not vary significantly by ethnicity or income.

Table 12: 2001 Telephone Survey Results: Agree/Disagree SOV Drivers Should be Allowed to Use I-15 Managed Lanes for a Fee

	Agree	Disagree
Total	77%	21%
Ethnicity		
Asian	85%	15%
Hispanic	79%	21%
Caucasian	78%	22%
Income		
Less than $40,000	78%	18%
$40,000 to $70,000	77%	23%
$70,000 to $100,000	79%	21%
More than $100,000	78%	22%

Base: 800

Nearly 90 Percent of Respondents Believe There is a Need to Extend the Lanes.

Respondents were asked to agree or disagree with the statement, "There is a need to extend the Express Lanes." Eighty-nine percent (89 percent) of the respondents agreed that there is a need to extend the Managed Lanes. Seventy-two percent of the respondents "strongly" agreed with this statement. Again, this belief cut across all demographic groups.

Is It Fair to Purchase What Others Cannot Purchase?

When the issue of fairness was framed as "Do you agree with the statement that it is fair to pay for what you get even if other's can't?", the question produced the largest ethnicity-related variations, despite the fact that at least 62% of each subgroup agreed with the statement.

The following observations can be made from the survey results from this question:

- Fewer respondents earning less than $100,000 agreed with the statement.
- As the age of the respondents increased, their agreement with statement decreased.
- Significantly more Hispanics (38 percent) disagreed with this concept than either Asians or Caucasians. (However, 62 percent) of Hispanics agreed with the statement—a comfortable majority.)
- Notably more widowed, divorced, or separated respondents disagreed with the statement.

VII. CONCLUSIONS

Based on a review of the methodology used for each Community Outreach task, it is concluded that the overall outreach program was effective in obtaining the opinions of low-income and non-Caucasian members of the affected group (I-15 commuters in the project area.)

For the most part, the public does not perceive the Managed Lanes project to pose an equity problem, though some respondents would not be able to afford the tolls to access the lanes as solo drivers. Perceived need for the project to address severe corridor congestion is high. No significant differences in responses based on income or ethnicity of respondents were detected.

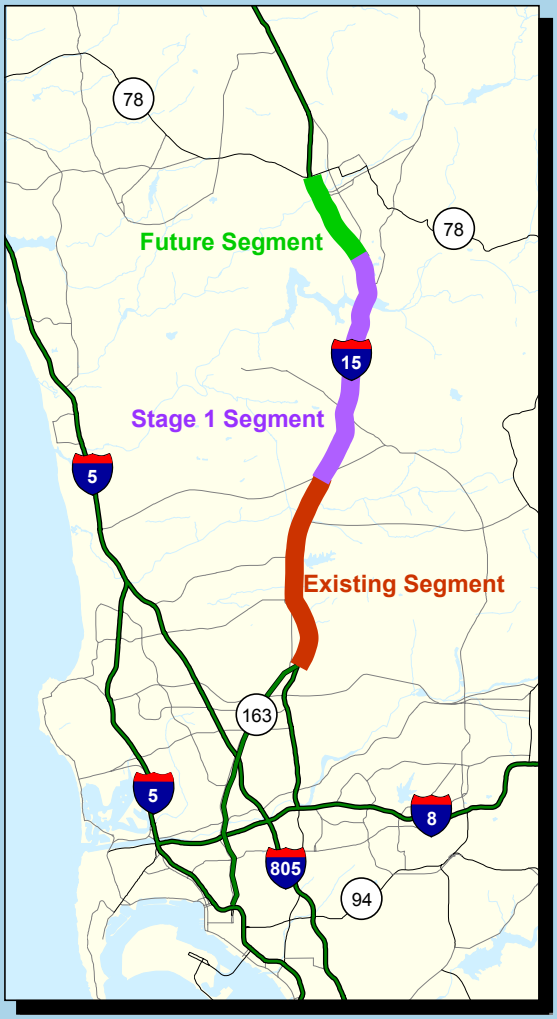
Table 13: Perception of Equity Probed with Multiple Questions in Fall 2001 Telephone Survey of I-15 Corridor Commuters

Question	Yes	No	DK
"It's a good idea to have a time saving option on the I-15 always available." *(No income or ethnicity effect)*	92%	6%	
[Brief description of FasTrak] "Do you approve of the FasTrak program?" *(Respondents with more than $70K household income voiced higher approval.)*	66%	28%	6%
"People who drive alone should be allowed to use the I-15 Express Lanes for a fee." *(No income or ethnicity effect)*	77%	23%	
"The toll is a good way to keep the Express Lanes moving quickly."	71%	26%	3%
"There is a need to extend the Express Lanes." *(No income or ethnicity effect; 95% of Escondido residents see need to extend lanes.)*	89%	10%	1%
[Brief description of Managed Lanes project.] "Based on information you heard, do you approve?" (*At least 50% of every ethnic, income, age, HH size, # children favor project.)*	84%	13%	3%
"It's fair to pay for what you get even if others can't." (*38% of Hispanics disagreed with the statement, compared to 19% of Asians, and 23% of Caucasians)*	71%	25%	4%
"Overall, do you believe having FasTrak on this extension would be fair to regular lane users?"	71%	23%	5%
"Overall, do you believe having FasTrak on this extension would be fair to Express Lane users?" *(No ethnicity effect; income between $70-100 K more likely to consider it fair to both users)*	75%	20%	5%
"Paying taxes and paying to use the Express Lanes is unfair double taxation." *(67% of Asians agreed with statement, compared to 47% of Caucasians; Income between $40-70K agreed more)*	52%	46%	2%

Table 14: Summary of Procedural Equity and Perception of Equity in I-15 Managed Lanes Study Outreach Effort

Outreach Task	Procedural Equity	Perception of Equity
Stakeholder Interviews 25 community leaders, technical stakeholders, public interest groups	• Obtained opinions of elected officials and public interest groups • Survey asked local electeds and community leaders where to find "hard to reach" potential affected groups; no low-income or minority populations were identified by stakeholders.	• Equity is not an issue for elected officials (for one, this is because of the transit component of the project). • Equity is a concern for a larger percentage of technical stakeholders than either elected or public interest stakeholders, though it is not viewed as "fatal." • Optional nature of toll buy-in seen as avoiding all equity issues by many stakeholders. • Transit and carpool enhancements seen as adequate mitigation for "perception" of equity issue by others. • The fact that the corridor is relatively affluent was a factor for some in diminishing equity concerns. • One stakeholder pointed to reverse commute benefit of Inland Breeze—providing mobility to lower income people traveling north for work.
Focus Groups 14 Express Lane Users 14 Main Lane Users 14 Transit Riders	• Balanced demographics (gender, income, ethnicity) • Average income of transit riders group was 63% of average income of FasTrak users and 64% of average income of main lane users. • Transit riders group included more African-American participants than the other two groups, and fewer Caucasians. • Inclusion of all modes and corridor user options. (SOV, HOV, transponder, Main Lane and Express Lanes)	• Following full explanation of all Managed Lane project features, approximately 85% of each group thought the proposal was fair. • Those approving the project thought the lanes provided more options that work for people in a variety of situations, and support the idea of solo drivers helping to pay for transit and carpool alternatives. • A few in each focus group felt that tolls were elitist or unfair. Some of those objecting to unfairness of tolls also indicated personal willingness to pay tolls (and were, in fact, transponder users.)
Intercept Surveys 50 Transit Riders 50 Carpoolers	• Carpooling and transit use are the two alternatives to using the toll on the Managed Lanes that still provide the mobility benefits of FasTrak (tolls), thus it was important to get opinions of these populations. Intercept surveys mitigate the problem of "low incidence" within the telephone survey.	• 92% of carpoolers and 94% of transit riders thought FasTrak (value pricing toll lanes) were "fair to them."
Telephone Survey Sample size 800, I-15 Corridor Commuters; (600 main lane users + 200 FasTrak customers)	• Demographically representative of region's I-15 Commuters; approximated previous survey results • Survey questionnaire provided in Spanish (only 5 respondents chose to be interviewed in Spanish) • Questionnaire designed to solicit equity/perception of fairness issues from a number of perspectives, both general and project-specific. • All survey question responses can be broken down by ethnicity and/or income.	• Solid majority of respondents do not see equity as a problem; approximately two thirds of respondents support the Express Lanes, support FasTrak and support the idea of tolling to create a mobility alternative; 84% support Managed Lanes project, as described. • Only very minor differences in response rates between low-income and/or non-Caucasian responses and high income/ Caucasian responses.

Concept Plan



Volume 3
Monitoring and Evaluation Plan

I-15 MANAGED LANES VALUE PRICING PROJECT PLANNING STUDY

ENGINEERS
PLANNERS
ECONOMISTS

Wilbur Smith Associates

In association with

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May 2002

San Diego ASSOCIATION OF GOVERNMENTS

Concept Plan
Volume 3
Monitoring and Evaluation Plan

I-15 Managed Lanes
Value Pricing Project
Planning Study

Final Report
May 31, 2002

Prepared for:
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CONTENTS

Chapter 1
Purpose

INTRODUCTION TO PLANNING STUDY

The I-15 Managed Lanes Value Pricing Planning Study is divided into three phases. Phase I included collection and analysis of traffic data and projections from the I-15 corridor. This information was used to assess the operational implications and traffic impacts of various pricing scenarios evaluated in Phase II. Phase II, of which this report is a part, is divided into three volumes. Volume 1 discussed Traffic, Revenue and Toll Operations Issues. That information was used by the San Diego Association of Governments (SANDAG) staff and the I-15 Project Management Team as a basis to make recommendations to the SANDAG Board on a preferred pricing scenario for the managed lanes. Volume 2 summarized the results of an extensive Public and Community Outreach process. This report represents Volume 3 of Phase II. It includes a Monitoring and Evaluation Plan for assessing the ultimate impacts of the Value Pricing project that will be implemented as part of the new I-15 Managed Lanes project.

Phase III of the study will include a set of technical specifications for the future I-15 Managed Lanes project as part of a Systems Requirements Plan.

OVERVIEW OF VALUE PRICING PROJECT

SANDAG and Caltrans propose to implement Value Pricing (formerly called Congestion Pricing) on the future I-15 Managed Lanes, similar to the existing FasTrak system on the I-15 Express Lanes from SR 163 to SR 56. The new I-15 Managed Lanes program will allow single occupant vehicles to use the I-15 Managed Lanes for a fee. The fee may vary by length of travel, time of day or access point. The fee will be collected through an electronic toll collection system, compatible with the current FasTrak system.

The 20-mile Managed Lanes project will include four lanes with a moveable barrier in the median of I-15 to accommodate 2-3 lanes in the peak direction and at 1-2 lanes in the opposite direction. The Managed Lanes facility will provide priority to High Occupancy Vehicles (HOVs) such as carpools and vanpools, regular transit services, and a Bus Rapid Transit (BRT) System. Excess capacity in these lanes will be “sold” to drivers of single occupant vehicles for a fee, as is the case with the FasTrak program. The Managed Lanes will be separated from the general purpose lanes by a barrier with access provided through as many as seven points located at openings in the barrier. There will also be five direct access ramps. The Managed Lanes facility will be operated seven days a week, 24 hours a day, unlike the existing FasTrak system.

A continuous 6.6 meter-wide enforcement area is planned, consisting of shoulders on both sides of the fixed barrier to allow California Highway Patrol enforcement from either side of the fixed barriers. The project will also include a BRT System that will use the Managed Lanes facility and a network of transit stations and Park-and-Ride lots with access to the Managed Lanes.

Construction of the 20-mile I-15 Managed Lanes facility is planned to occur in three stages. The middle segment of the designated corridor, from SR 56 (the northern terminus of the existing Express Lanes) to Centre City Parkway will be built first with an estimated completion date of July 2008. The existing eight-mile Express Lanes segment will then be widened from two to four lanes. The northern segment from Centre City Parkway to SR 78 will be built last.

There are several key differences between this project and the I-15 Congestion Pricing project on the Express Lanes. The unique aspects of the Managed Lanes project are:

- Multiple access points;
- Bi-directional travel;
- 24-hour operations;
- High frequency bus rapid transit operations;
- Direct access between the managed lanes and park & ride/BRT facilities; and
- Use of a substantially more advanced toll collection system and toll structure.

PURPOSE OF THE MONITORING AND EVALUTATION PLAN

The Monitoring and Evaluation Plan (MEP), like the System Requirements Plan, is intended to give SANDAG and Caltrans the information necessary to prepare a work scope for the future contractor or evaluation team that would be tasked with monitoring, evaluating, and summarizing the impacts of the Value Pricing project on the new I-15 Managed Lanes. The MEP outlines the evaluation needed to measure and document the impacts of the Value Pricing Project. As such, the MEP includes the following sections:

- Evaluation Objectives
- Overview of Evaluation Approach
- Performance Measures
- Recommended Before Data Set
- Monitoring Activities
- Recommended “After” Data Set
- Timeline and Budget

A description of the preferred pricing scenario is provided in the next chapter.

The inclusion of a recommended “before” data set is a critical part of the MEP. This Evaluation Plan will specify a complete before data set so as to allow the evaluators of the Managed Lanes Value Pricing project to have adequate time and resources to plan, coordinate, and carry-out the before data collection tasks.

The MEP is designed to be compatible with the studies performed by San Diego State University as part of the I-15 Congestion Pricing Project. Similar data sets will be assembled, compatible analyses used, and comparisons made between the earlier Congestion Pricing pilot project and the new Managed Lanes Value Pricing project.

A few components from the Congestion Pricing evaluation effort are not recommended to be included in the Managed Lanes Value Pricing project. These include the Business and Land Use impact assessments and the use of a control corridor. The results of the Business and Land Use impacts studies are complete. Further studies on these topics are unlikely to yield additional information. Regarding control corridors, some pricing studies have benefited from the use of a control, but others have not. Given the high cost of data collection in the I-15 corridor, study managers, in concurrence with FHWA, have decided to drop the use of a control corridor for this evaluation effort. However, Caltrans should contribute traffic volume data and other indicators normally collected by the agency for other facilities in the region.

The Managed Lanes Value Pricing evaluation will focus on the pricing system and the response of users and non-users alike. Given that the middle segment of the Managed Lanes system will be constructed first, this evaluation plan should be implemented during that initial phase and could be applied to later phases as they are constructed. The evaluation plan will only address the BRT or Moveable Barrier system in regards to the impact on operations and acceptance of the pricing system and not the success of these systems.

Chapter 2
Preferred Pricing Option

As part of the I-15 Managed Lanes Value Pricing Project Planning Study, five basic pricing scenarios were developed for in-depth analysis. The pricing scenarios varied by toll type (flat toll, per mile toll and segment toll) and by method of toll variation (fixed schedule, preset variable rate, and dynamic variable pricing). Finally, within the variable toll options, standard per-mile rates were tested along with skewed per-mile rates. With "skewed" rates, the tolls are skewed higher or lower depending on which end of the facility the solo commuter enters and the direction of congestion.

The I-15 Project Management Team recommended two of the scenarios to SANDAG's Transportation Committee: Option A-1 (Standard Flat Rate) and Option B-2 (Skewed Per Mile Rate with Minimum Toll). The Transportation Committee selected Option B-2 at its December 2001 meeting, and that recommendation was ratified by the SANDAG Board at its January 2002 meeting.

Option B-2, the Skewed Per Mile Rate with Minimum Tolls, was selected because it is more equitable to users (fee based on distance traveled) and it offered the best approach to manage demand at bottlenecks, because the per mile rate would be "skewed" higher toward the southern end of the corridor where the worst a.m. and p.m. congestion occurs. The main disadvantage of this option is the complexity involved in explaining the toll concept to commuters in a way they can understand. The tolls would be displayed as a rate per mile, and the user would have to calculate the total toll, based on their desired trip length, in their head.

SANDAG policy-makers reserved the right to convert to Option A-1, the simple flat rate, if Option B-2 proved too cumbersome or difficult to understand. The revenue generated from Option B-2 was estimated to be approximately $7.2 million at full project build-out (all three segments). Operating costs were estimated to be between $1.0 and $2.3 million.

GUIDING EVALUATION PRINCIPLES

Based on the pricing concept as described above, one of the critical evaluation issues will be user and general public understanding of the toll system and how they relate to the objectives of the overall Value Pricing Project. The ultimate evaluation that is implemented as a result of this Monitoring and Evaluation Plan should strive to meet the following evaluation principles:

1. The evaluation should be objective in nature and not influenced by project partners with a stake in the outcome.

2. To assure objectivity, the evaluation should be conducted by an independent third party that is not part of the funding, implementing or oversight agencies or their contracts. This is consistent with Federal evaluation practices.

3. The evaluation should strive to fulfill Federal, state, and regional needs for measuring the impacts of the project and reporting on the reasons for success, failure, or inconclusive results.

4. The evaluation should be timely in order to collect adequate before data, to collect ongoing data at key points in the project, and to report results in a timely manner to support policy-making on future phases and fulfill federal requirements.

Chapter 3
Evaluation Objectives

This chapter outlines the evaluation objectives for various stakeholders, including the federal sponsors and the state and regional implementing agencies. The overall purpose of the evaluation is to assess the fulfillment of federal demonstration and regional project objectives.

FEDERAL EVALUATION OBJECTIVES

The Federal Highway Administration will be a partner in funding the Value Pricing Project, as it was with the original Congestion Pricing Demonstration project. The evaluation interests of the Federal sponsors includes:

- Test the concept of Managed Lanes as a new type of High Occupancy Toll (HOT) lane in terms of implementation, operation, enforcement, costs/revenues, and user acceptance.
- Test new pricing structures (skewed per-mile rate) and their impact on travel demand in the Managed and General Purpose lanes.
- Quantify the impact of the Value Pricing pilot project on toll users, other HOV users, and non-users (general public, including other I-15 travelers) through a sound "before" and "after" evaluation of project impacts and outcomes.

STATE AND REGIONAL EVALUATION OBJECTIVES

The Public and Community Outreach portion of this study explored the project objectives of the Value Pricing projects as perceived by key agency staff, elected officials and public interest groups. The aim of the evaluation will be to gauge fulfillment of these stated objectives and explore any issues as to why the objective were or were not fulfilled.

The objectives mentioned by these stakeholders include:

- Test the viability and equity of Value Pricing in a multiple access environment
- Optimize peak period capacity and mobility through the use of moveable barrier technology
- Test whether allowing solo drivers to use the Managed Lanes' excess capacity can help relieve congestion on the I-15 "main lanes"
- Fund new transit (BRT) and HOV (carpool and vanpool) improvements in the I-15 corridor and assess impact of project on transit and HOV usage.

Chapter 4
Overview of Evaluation Approach

FOUR TIERED EVALUATION APPROACH

In order to assess the fulfillment of project objectives, measure project impacts, and to explain "why" the Managed Lanes Value Pricing project produced these measured impacts, a four-tiered evaluation approach is recommended:

1. Measurement of System Impacts
2. Measurement of Utilization
3. Measurement of Acceptance
4. Assessment of Operations

Each tier is discussed below.

MEASUREMENT OF SYSTEM IMPACTS

Measuring project impacts will entail an evaluation of before and after conditions and a translation of that data into changes. For example, changes in mode split will be measured to see if the new managed lanes encourage more HOV use, in addition to maximizing efficiency by allowing SOV to buy into the managed lanes. A before data set will be recommended so that a baseline of travel behavior is established. After data collection will be collected in "waves" so that time series data can be analyzed to determine not only before and after changes, but changes over time during project implementation.

MEASUREMENT OF UTILIZATION

Utilization of the toll system will assess the level and frequency of use and characteristics of toll users. Information on toll use can be collected on a monthly basis via account information as well as traffic counts in the managed lanes. Information on toll user characteristics should, if the budget allows, be collected via a panel survey of users as was conducted with the I-15 Congestion Pricing evaluation.

MEASUREMENT OF ACCEPTANCE

Attitudes toward the toll system and Managed Lanes will be an important component to explaining why certain changes were observed. The attitudes of users, non-users and project stakeholders (PMT members, elected officials, etc.) will be assessed to evaluate issues related to value pricing acceptance, equity, and perceptions on project success.

ASSESSMENT OF OPERATIONS

The performance of the toll system and managed lanes will be evaluated in terms of reliability, user perceptions, costs, revenue generation, enforcement, etc.

SUMMARY OF EVALUATION APPROACH

The recommended evaluation approach can be summarized as a before/after study to measure the impact of introducing a new tolling scheme to a High Occupancy Toll facility that will manage demand through both SOV price and HOV capacity. To the extent possible, the evaluation approach from the I-15 Congestion Pricing project will be used to allow comparative results.

The impact of pricing on the efficient use of the managed lanes can be evaluated through this effort. The larger impacts of the Managed Lanes concept, including the BRT, on mode split and person throughput probably cannot be separated out from the pricing aspect of the overall project. Since the Managed Lanes project will introduce "movable" HOV lanes, BRT service, and pricing all at the same time, the ability to sort out the relative influence of each on travel behavior may be difficult. However, panel surveys of all travelers in the corridor (toll users, other SOVs, transit users, carpools, vanpools, etc.) can, overtime, shed some light on the influence of various project components on changes in travel mode, time, etc.

USE OF A CONTROL CORRIDOR

The research design for the I-15 Congestion Pricing evaluation included the use of a control corridor to measure "natural" changes in traffic volumes, occupancy, speeds, etc. Finding a control with similar driving and corridor characteristics was proven difficult in the previous demonstration project evaluation. Therefore, while the evaluation should monitor changes in traffic volumes, occupancy, and speeds on all main freeway corridors in the San Diego region using readily available data, a full control data set is not recommended.

Chapter 5
Key Performance Measures

In order to realize the evaluation of system impacts and key utilization findings, several measures of effectiveness or performance indicators are recommended, which include:

- Level of Service
- Toll User Volumes
- Changes in Mode Split
- Changes in Vehicle Occupancy
- Changes in Vehicle Classification
- Changes in Trip-making
- Changes in Park-and-Ride Usage
- Changes in Delay, Travel Time and Speeds
- Changes in Emissions

Each performance measure is discussed in more detail below.

Level of Service – a policy standard will be set for the Level of Service (LOS – defined as the ratio of vehicle volume to capacity) on the Managed Lanes. Pricing and access for SOVs will be used to maximize the number of people and vehicles using the lanes while maintaining the LOS target. In the I-15 Congestion Pricing demonstration project, the LOS threshold was set at LOS C. The LOS threshold is extremely important to maintain free flow conditions in the Managed Lanes. This offers travel time savings and travel time reliability for HOV users as well as SOV toll users. Travel time saving and reliability are key factors in attracting and maintaining HOV use. The Managed Lanes Value Pricing evaluation will need to measure LOS by time of day, day of the week and by month to assess the ability of the pricing element to maintain the policy LOS threshold. The pricing system Concept Plan calls for four traffic monitoring points along the corridor that will allow for dynamic pricing and the recording of LOS at each point.

Changes in Delay, Travel Time and Speeds – observed changes in travel time, speeds and resulting delay in the main lanes (and possibly the Managed Lanes) will be an important indication of the impact of the Managed Lanes and the pricing concept on the general purpose lanes. However, confounding this issue is the fact that capacity improvements are being made on the general purpose lanes prior to construction of the Managed Lane (such as extra lanes through Lake Henshaw and Rancho Bernardo). Delay and travel time can be derived from changes in average speeds.

Toll Utilization – the volume of toll usage will be monitored also to assess the ability of the pricing system to maximize the efficiency of the facility by allowing and attracting the maximum number of SOV toll users without compromising the LOS threshold. Toll usage by time of day, day of the week, and month will be collected and analyzed. Toll/HOV violation rates could also be included within this measure.

Changes in Mode Split – as stated earlier, the Managed Lanes Value Pricing project differs from the existing Congestion Pricing project in that it will introduce managed HOV lanes and Bus Rapid Transit at the same time as pricing. It will be very important, therefore, to measure not only toll user activity, but changes in mode split as motorists decide whether to continue driving alone in the main lanes or switch to carpooling, vanpooling, existing bus service, or new BRT service. This will likely be measured via a panel survey or, if a panel survey is infeasible, a before/after survey that is designed to pick-up changes in mode split.

Changes in Vehicle Occupancy – related to changes in mode split, the evaluation should measure observed changes in vehicle occupancy to gauge changes in HOV use in the main lanes, modified Express Lanes and new Managed Lanes. Vehicle occupancy is generally measured by observing (counting) the number of passengers in private vehicles passing a given point.

Changes in Vehicle Classification – the percent of vehicles in various classifications will also be measured over time. This includes automobiles and light duty trucks, trucks and motorcycles. It would be good also to measure changes in the percentage of Inherently Low Emission Vehicles (ILEVs) that are now allowed in HOV lanes in California. These classifications will also need to be counted in a similar manner to vehicle occupancy.

Changes in Trip-Making – likely changes in travel behavior will include more than mode. Changes in time of day, frequency of travel, length of toll trips, and even route of travel might occur as result of the Managed Lanes Value Pricing project. Changes in trip-making will be measured for toll users, non-users, HOV users and transit users. The primary instrument for collecting this information will be a panel survey or other before/after user and non-user survey. The user surveys can also be used to inquire about the perceived importance of travel time reliability.

Changes in Park and Ride Use – changes in the use of Park and Rides in the I-15 corridor may be affected by the new Managed Lanes, by the new BRT service, and by the Value Pricing element. Changes in Park and Ride lot usage should be measured via counts of lot usage by time of day and day of the week.

Changes in Emissions – changes in modes and speeds can be used to calculate changes in emissions in the corridor. This will largely be a result of mode switching to HOV and transit modes and improvements in speeds for toll and HOV users.

The next three chapters enumerate the recommended data needs and potential data collection methods for the 1) “before” data set, 2) ongoing monitoring, and 3) “after” data set and key assessments.

Chapter 6
Recommended Before Data Set

A key purpose of this Monitoring and Evaluation Plan is to ensure that a robust "before" data set, from which to assess change in travel behavior and system performance, is collected. The "before" data set can be categorized by the four tier system suggested in Chapter 4:

- System Impact Data
- Utilization Data
- Acceptance Data
- Operational Data

The traffic data collected as part of the Traffic, Revenue and Toll Operations Volume of the Concept Plan can serve to provide some historic data and one before data point. However, before data should be collected one year prior to the first wave of "after" data collection. For example, if the first phase of the Managed Lanes project is implemented (i.e., lanes constructed and tolls initiated) in the Summer of 2008, a round of "before" data collection should occur in the Summer of 2007. If semi-annual waves of data collection are adopted (as was the case with the I-15 Congestion Pricing evaluation), another round of "before" data should be collected to account for seasonality and assure adequate before/after comparisons are possible.

The preferred source for user and non-user behavior data will be a panel survey similar to that used with the earlier evaluation. If the panel survey is deemed infeasible for budget or other reasons, a before and after survey of users and non-users (randomly selected samples for each instead of a panel of the same individuals) could be implemented

SYSTEM IMPACT DATA

System impact data includes four primary data items: 1) traffic volumes and speeds, 2) vehicle occupancy and classification data, 3) mode split data, and 4) emission analysis.

Traffic Data – traffic volumes and LOS can be derived from normal traffic counts conducted on I-15, in the Express Lanes, in the parallel main lanes at Mira Mesa Blvd, and in the Phase 1 segment at Carmel Mountain Road and at Via Rancho Parkway. Volume 1 of the Concept Plan: Traffic, Revenue and Toll Operations, provides historical data for the period 1990 – 2000. This data should be summarized by location, direction, time of day, day of week and month. Traffic speeds should be collected, in the before case, consistent with the traffic time/distance studies conducted in the past (floating car method). A set of travel time and distance observations was made by Wilbur Smith Associates in July 2001. However, it appears only one day was used. Any travel time/distance studies conducted the year before implementation (before case) should include several days of the week (3-5 days total).

Vehicle Occupancy and Classification Data – Vehicle occupancy in the Express Lanes can be approximated from traffic counts and FasTrak data. However, direct observation is recommended to get at the actual occupancy of HOV vehicles. Vehicle occupancy and classification data for the main lanes in the south and central Managed Lanes sections will need to be collected via "overpass counts." Wilbur Smith Associates conducted vehicle occupancy and classification counts on the Carroll Canyon Road (south section) and Bernardo Center Drive (central section) in July 2001. These should be replicated, again over multiple days, the year before Value Pricing implementation on the central section. Vehicle classification counts should also be accomplished during the same period, including counts of automobiles, light duty trucks, heavy duty trucks, motorcycles and buses.

Mode Split Data – In addition to vehicle occupancy and classification, mode split data should be assembled from the panel surveys that will be conducted of toll users and non-users. The panel survey should be designed to gather sufficient data to measure the baseline mode split for comparison of mode shares after opening of the Managed Lanes and toll system. Thus, specific sub-samples (with adequate sample sizes) within the panel survey should include: toll users, SOV mainline users, carpoolers and vanpoolers, and transit riders.

UTILIZATION DATA

Utilization data includes counts of various user groups, including toll users, HOV users, and transit users.

Toll User Data – utilization data will include the number of active user accounts, frequency of use, average distance of toll use, and socioeconomic data on FasTrak toll users the year prior to Managed Lanes implementation. Utilization data will be derived from automated account data. Socioeconomic data will come from user survey data from the panel survey.

Carpooler and Vanpooler Data – Information on the frequency of HOV use, origin and destination (O/D), HOV duration (how long they have been in the carpool or vanpool), and mode to access the HOV arrangement will be derived from the non-user panel survey HOV user sub-sample.

Transit Rider Data – Ridership on existing transit services will be tracked. Socioeconomic and O/D data on transit riders will be derived from the non-user panel survey transit user sub-sample. Mode of access to transit service will also be included in the panel survey.

Park and Ride Counts – Utilization of Park and Ride lots in the corridor should be conducted the year before implementation to assess occupancy levels. The BRT system will add several new Park and Ride lots that can be used by Bus Rapid Transit users as well as carpoolers and vanpoolers. These counts should be taken at the same time as the vehicle occupancy and classification counts and should be taken over multiple days of the week.

ACCEPTANCE DATA

Acceptance information refers to the set of more qualitative attitudes about the success, fairness, and project objectives. Attitudes will be documented for three groups: users, non-users, and stakeholders. Users and non-users can be captured through the "before" wave of the panel survey. The stakeholder interviews should be undertaken prior to construction of the first segment to gauge expectations that may have evolved from 2001 to 2008.

User Perceptions – the panel survey of FasTrak toll users will explore respondent perceptions as to the benefits of the current pricing program, anticipated benefits of the new Value Pricing system, reasons for using the Express Lanes, likely use of the Managed Lanes, and awareness of project objectives. One wave of the panel survey during the "before" data collection period should be sufficient to gauge pre-project perceptions the year before implementation.

Non-user Perceptions – non-user perceptions are also very important in gauging the overall acceptance of the project. Travelers in the main lanes will be included in the non-user panel survey. Again, a non-user portion to the panel survey should be conducted in the year prior to construction and implementation of the new toll system. Questions on perceived equity can be included. Carpools and vanpools and transit riders should also be included in specific sub-samples that might require over-sampling of these groups. Perceptions on fairness and the impacts of the toll program on HOV use can be explored, along with attitudes toward these alternative modes.

Stakeholder Perceptions – the perceptions of Project Management Team members, decision-makers at the key partner agencies, elected officials, and community leaders can be very useful in assessing attitudes toward Value Pricing concepts and anticipated impacts or outcomes. This can be accomplished via another round of stakeholder surveys, as was conducted in 2001 and summarized in the Public and Community Outreach Volume 2 report. In the "before" interviews, perceptions of likely outcomes, benefits and key issues can be explored.

OPERATIONAL DATA

Operational issues of concern in the before case include existing HOV violation rates and safety statistics in the main lanes.

Enforcement – the before data set should include historic violation rates in the Express Lanes and other HOV facilities in the region and the state. Additional violation counts are also recommended to accurately measure violation rates on the Express Lanes prior to implementation. These should be made 2-4 times over multiple days in year prior to implementation. Enforcement information might also include data on CHP citations in the Express Lanes and main lanes.

Safety – records on the number of type of accidents in the corridor should be collected to compare to safety statistics after implementation of the Managed Lanes with its increased access points.

SUMMARY OF BEFORE DATA SET

To summarize the data collection elements of the recommended "before" data set, it should include:

- Traffic counts in the Express Lanes and main lanes in both sections
- Travel time/distance studies for main lanes in both sections
- Vehicle occupancy and classification counts in both sections
- Park and Ride lot counts
- Panel survey of FasTrak users
- Panel survey of non-users including SOV, HOV and transit users
- Stakeholder interviews
- HOV violation statistics for the Express Lanes and other HOV facilities
- Ongoing Caltrans traffic data from other corridors in the region (volumes, occupancy, speeds)
- Accident rates for the Express Lanes and for the entire corridor.

Chapter 7
Ongoing Monitoring Activities

During the actual Value Pricing demonstration period (presumed to be during the initial operation of the central section), certain data will be collected on an ongoing basis, between "waves" of surveys and special counts. The ongoing monitoring activities mirror that undertaken during the Congestion Pricing project evaluation on the I-15 Express Lanes. Ongoing data collection can be used for time series analyses of trends. Monitoring data should include monthly updates on:

- Traffic volumes and LOS on the Managed Lanes (by time of day, day of week, location and direction for the four traffic monitoring points)
- Traffic volumes and LOS on the main lanes
- Toll use statistics, including
  - Daily usage
  - Average trip length in toll zone
  - Daily revenue
- Customer service information
  - Active accounts
  - Prospective customer inquiries
  - Complaints
- Semi-annual violation rate in the Managed Lanes (taken over multiple days)
- Monthly citation data from CHP
- Monthly accident data for corridor from CHP

The sources of these data are the Caltrans Traffic Management Center for traffic data; the FasTrak Customer Service Center for toll user data; the CHP for citation and accident data; and semi-annual violation counts conducted by the evaluation contractor or institution.

Chapter 8
After Data Set and Assessments

Much of the "after" data set parallels the before data so that consistent comparisons can be made to measure changes in key performance indicators. Additionally, several analyses, that use the before and after data, are described. This includes the cost of delay, air quality assessment, institutional assessment, technical assessment, and a cost/revenue assessment.

The "after" data set can be categorized by the same four-tier system suggested in Chapter 4:

- System Impact Data
- Utilization Data
- Acceptance Data
- Operational Data

Semi-annual waves of data collection are recommended (as was the case with the I-15 Congestion Pricing evaluation), and should be consistent with the dates of the "before" data to account for seasonality and assure adequate before/after comparisons are possible.

Appropriate statistical tests should be conducted to determine whether changes in behavior between the before and after situation or between difference user groups is real and measurable. This might include difference of means (such as t-tests) and analysis of the variance around these mean estimates.

SYSTEM IMPACT DATA

System impact data includes four primary data items: 1) traffic volumes and speeds, 2) vehicle occupancy and classification data, 3) mode split data, and 4) emission analysis.

Traffic Data – traffic volumes and LOS can be derived from normal traffic counts conducted on I-15. Before data was analyzed for the Express Lanes and in the parallel main lanes at Mira Mesa Blvd, and in the Phase 1 segment at Carmel Mountain Road and at Via Rancho Parkway. The Concept Plan calls for four future traffic monitoring points at locations within the separate toll zones. This data should be summarized by location, direction, time of day, day of week and month for each of these zones.

Traffic Speeds - Traffic speeds can be collected, in the after case, using transponder data of toll users in the Managed Lanes. This data can be compiled by toll zone segment, direction, time of day, and day of the week. Speeds in the main lanes will need to be periodically collected with the floating car method and compared to the transponder data for the toll users.

Vehicle Occupancy and Classification Data – Vehicle occupancy in the Managed Lanes and main lanes should be counted as part of semi-annual data collection efforts consistent with the time period of "before" data collection and at approximately the same time as other key data collection elements (such as the panel surveys). Vehicle occupancy and classification data for the Managed and main lanes will need to be collected via "overpass counts" within each toll zone. These should be roughly consistent with the locations where the July 2001 vehicle occupancy and classification counts on the Carroll Canyon Road (south section) and Bernardo Center Drive (central section). These should be replicated, again over multiple days. Vehicle classification counts should also be accomplished during the same period and same locations, including counts of automobiles, light duty trucks, heavy duty trucks, motorcycles and buses.

Mode Split Data – In addition to vehicle occupancy and classification, mode split data should be assembled from the panel surveys that will be conducted of toll users and non-users. The panel survey should be designed to gather sufficient data to measure shifts in travel behavior to alternative modes (HOV and transit). Observed data (counts) cannot measure *shifts* in travel mode, only aggregate occupancy at specific points in time. It will be important to track the magnitude, timing and reasons for shifting from SOV to toll use, from SOV to HOV, from SOV and HOV to transit use, and from HOV and transit use to SOV toll use. Thus, specific sub-samples within the panel survey should include toll users, SOV mainline users, carpools and vanpools, and transit riders.

Emission Analysis – Changes in the amount of automobile emissions generated by travelers in the I-15 north corridor can be calculated using changes in mode, changes in travel time, changes in vehicle type, and changes in vehicle operating speeds. Changes in vehicle trips, vehicle miles of travel and speeds can be used with California Air Resources Board emission factors for a specific year to derive changes in emissions from automobiles. Thus, shifts to HOV and transit use can reduce automobile trips and miles of travel. Use of the Managed Lanes can also improve travel speeds for all travelers. These two changes could results in net emission reductions.

Cost of Delay Analysis – the impact of changes in delay in the overall corridor can be measured in terms of cost to the traveler and society in lost time. If the Value Pricing project results in reduced travel times for users and non-users, the cost savings to the individual and society can be calculated using standard factors of the value of time and its opportunity costs.

UTILIZATION DATA

Utilization data includes counts of various user groups, including toll users, HOV users, and transit users.

Toll User Data – utilization data will include the number of active user accounts, frequency of use, average distance of toll use, and socioeconomic data on Managed Lanes toll users. Utilization data will be derived from automated account data. Socioeconomic data will come from user survey data from the panel survey.

Carpool and Vanpool Data – Information on the frequency of HOV use, origin and destination (O/D), HOV duration (how long they have been in the carpool or vanpool), and mode to access the HOV arrangement will be derived from the non-user panel survey HOV user sub-sample.

Transit Rider Data – Ridership on existing and new BRT transit services will be tracked. Socioeconomic and O/D data on transit riders will be derived from the non-user panel survey transit user sub-sample. Mode of access to transit service will also be included in the panel survey. A separate on-board survey is not recommended if a sufficient sub-sample can be included in the non-user panel survey.

Park and Ride Counts – Utilization of Park and Ride lots in the corridor should be conducted during the demonstration period to assess changes in total Park and Ride usage and volumes and occupancy levels in existing and new lots. The BRT system will add several new Park and Ride lots that can be used by Bus Rapid Transit users as well as carpools and vanpools. These counts should be taken at the same time as the vehicle occupancy and classification counts and should be taken over multiple days of the week.

ACCEPTANCE DATA

Acceptance information refers to the set of more qualitative attitudes about the success, fairness, and project objectives. Attitudes will be documented for three groups: users, non-users, and stakeholders.

User Perceptions – the panel survey of toll users will explore respondent perceptions as to the benefits of the Managed Lanes Value Pricing program, comparisons to the FasTrak program, perceived benefits of the new Value Pricing system, reasons for using the Managed Lanes, and awareness of project objectives. Two waves of the panel survey should be conducted each year of implementation and should correspond to the vehicle occupancy and classification counts. Questions can also be included on equity and perceived travel time savings and reliability.

Non-user Perceptions – non-user perceptions are also very important in gauging the overall acceptance of the project. Travelers in the main lanes will be included in the non-user panel survey. Again, a non-user panel survey should be conducted at the same time as the user panel and the counts. Questions on perceived equity can be included. Responses from the user, non-user and stakeholder data will be used, along with socioeconomic data, to perform an *equity assessment* to determine whether any group or groups are disproportionately disadvantaged by the Value Pricing program. Carpoolers and vanpoolers and transit riders should also be included in specific sub-samples that might require over-sampling of these groups. Perceptions on fairness and the impacts of the toll program on HOV use can be explored, along with attitudes toward these alternative modes.

Stakeholder Perceptions – the perceptions of Project Management Team members, decision-makers at the key partner agencies, elected officials, and community leaders can be very useful in assessing why the Value Pricing concepts were successful. This can be accomplished via annual stakeholder interviews and be consistent with the information and interviewees in the Public and Community Outreach Volume 2 report. In the "after" interviews, perceptions of benefits, key issues, fulfillment of objectives, and future phases can be explored. These responses will be summarized and analyzed as part of the *institutional assessment* to address questions as to why certain project outcomes were realized and certain objectives fulfilled or not fulfilled.

OPERATIONAL DATA

Operational issues of concern in the before case include existing HOV violation rates and safety statistics in the main lanes.

Enforcement – periodic (monthly) violation counts are recommended to accurately measure violation rates (SOVs without transponders in the Managed Lanes). These should include multiple days and days of the week and occur at the same locations at which other counts are being made. Enforcement information might also include data on CHP citations in the Express Lanes and main lanes.

Safety – records on the number of type of accidents in the corridor should be collected to compare to safety statistics after implementation of the Managed Lanes with its increased access points.

Technical Assessment – information on the performance and reliability of the Toll system will be included in a technical assessment that will focus on how the new and enhanced technology used in the Value Pricing project influenced the outcomes reported.

Cost/Revenue Assessment – operational data will be used to assess the ongoing cost of operating the pricing program and the revenue generated therein. An assessment of the use of the revenue, including user and non-user attitudes will also be included.

SUMMARY OF AFTER DATA SET

To summarize the data collection elements of the recommended "after" data set, it should include:

- Traffic counts in the Managed Lanes and main lanes in both sections
- Travel times and speeds from transponder data
- Vehicle occupancy and classification counts in both sections
- Park and Ride lot counts
- Panel survey of Managed Lanes toll users
- Panel survey of non-users including SOV, HOV and transit users

- Stakeholder interviews
- HOV violation statistics for the Managed Lanes and other HOV facilities
- Ongoing Caltrans traffic data from other corridors in the region (volumes, occupancy, speeds)
- Accident rates for the Managed Lanes and for the entire corridor.

Key assessments will include:

- Cost of Delay
- Emissions Analysis
- Institutional Assessment
- Equity Assessment
- Technical Assessment
- Cost/Revenue Assessment

Overall, the evaluation will seek to quantify changes in the key performance measures enumerated in Chapter 5, including changes in travel time, changes in mode, and other important measures of effectiveness.

Chapter 9
Summary, Schedule and Budget

A summary of the recommended data elements within the MEP is displayed in Table 1 shown on the next page. The data element, source, method, application before and after, and frequency of data collection are included. The evaluation should be conducted by a "third-party" that is neither the implementing agencies (e.g., SANDAG or Caltrans) nor the funding agency (FHWA).

SCHEDULE

Since the projected implementation date for the first section of the Managed Lanes and Value Pricing project have not been specified, specific evaluation dates cannot be recommended. However, it is important to initiate the evaluation activities at least one year prior to implementation. In fact, the evaluation contractor should be retained at about the same time as the Value Pricing planning or pre-implementation consultant. In this manner, evaluation can be integrated into planning and pre-implementation activities. Data collected from Phase I of this study will likely not be adequate for use as a before data set given the number of years involved (2001 to 2007). In that period, travel behavior, attitudes and other corridor characteristics could change.

This MEP is intended to give SANDAG the information necessary to develop a scope of work for that evaluation contractor. Once the evaluation is initiated, pre-project activities should include one full wave of data collection, including panel surveys. If two waves are to be used each year after implementation they should be performed the year before implementation to match the times of year (e.g., spring and fall) of future data collection waves.

BUDGET

The budget for the Managed Lanes Value Pricing project should be similar to that of the Congestion Pricing evaluation or approximately 10% of the total project budget, about $300,000 per year. The only elements missing from the Managed Lanes Value Pricing evaluation will be: 1) original data collection in a control corridor, 2) business impact survey, and 3) land use/resident survey. However, several of the remaining data collection elements will require additional budget, including: 1) oversampling of HOV and transit non-users, and 2) more frequent violation counts. The first item, adequate sub-samples for HOV and transit travelers, could add substantial costs in the form of increased sample sizes overall.

Table 1 - Summary of Data Elements

Data Element	Source	Method	Before/After	Frequency
Traffic Counts	Caltrans TMC	Machine Counts	B/A	Monthly
FasTrak Counts	CSC	Transponder Data	Before	Monthly
Toll Counts	CSC	Transponder Data	After	Monthly
Time/Distance	Evaluator	Floating Car	Before	2 times in year before
Time/Distance	CSC	Transponder Data	After	2 times per year
Occupancy	Evaluator	Observation	B/A	2/year
Classification	Evaluator	Observation	B/A	2/year
Violation Rates	Evaluator	Observation	B/A	2/year
Park and Ride Lot Counts	Evaluator	Observation	B/A	2/year
Accidents	CHP	Records	B/A	Annual
Citations	CHP	Records	B/A	Annual
User Panel: FasTrak Users	Evaluator	Panel Survey	Before	1 time before
User Panel: Managed Lanes Toll Users	Evaluator	Panel Survey	After	2/year after
Non-User Panel: SOV	Evaluator	Panel Survey	B/A	1 time before; 2/year after
Non-User Panel: HOV	Evaluator	Panel Survey	B/A	1 time before; 2/year after
Non-User Panel: Transit		Panel Survey	B/A	1 time before; 2/year after
Stakeholders	Evaluator	Interviews	B/A	1 time before; annual after

B/A = before and after