



401 B Street, Suite 800
 San Diego, CA 92101-4231
 (619) 699-1900
 Fax (619) 699-1905
 www.sandag.org

July 15, 2004

Ms. Susan Lee
 Federal Highway Administration
 Office of Transportation Policy Studies, HPTS
 400 Seventh St. SW, Room 3324
 Washington, DC 20590

MEMBER AGENCIES

- Cities of*
- Carlsbad*
- Chula Vista*
- Coronado*
- Del Mar*
- El Cajon*
- Encinitas*
- Escondido*
- Imperial Beach*
- La Mesa*
- Lemon Grove*
- National City*
- Oceanside*
- Poway*
- San Diego*
- San Marcos*
- Santee*
- Solana Beach*
- Vista*
- and*
- County of San Diego*

ADVISORY MEMBERS

- California Department of Transportation*
- Metropolitan Transit System*
- North San Diego County Transit Development Board*
- United States Department of Defense*
- San Diego Unified Port District*
- San Diego County Water Authority*
- Baja California/Mexico*

Dear Ms. Lee:

The San Diego Association of Governments (SANDAG) is pleased to submit this proposal in response to the to the Federal Highway Administration (FHWA) Solicitation of Proposals for the fiscal year (FY) 2004 Value Pricing Pilot Program. SANDAG operates the award-winning I-15 FasTrak™ program in which SOV users pay a per-trip fee to use an eight-mile HOT facility on Interstate 15. SANDAG routinely hosts visits from interested agencies and officials from around the world who look to this exciting program as a model for HOT lane facilities.

In effort to improve upon the success of the I-15 FasTrak™ program, SANDAG plans to expand the existing facility to a 20-mile managed lanes facility. SANDAG is requesting Value Pricing Pilot Program funds for pre-project study activities, design, implementation and evaluation of the Interstate-15 Managed Lanes (I-15 ML) Value Pricing—Violation Enforcement Pilot Project. This effort will address a growing concern regarding the efficacy of violation enforcement systems (VES) when applied to high occupancy toll (HOT) lanes.

The pilot project proposed by SANDAG would be developed in conjunction with the I-15 ML project which began construction in November 2003 (expected completion in 2007). The VES would be designed to integrate with the I-15 ML Value Pricing—Electronic Toll Collection (ETC) system that is currently under development.

The proposed pilot project will address violation enforcement policies, systems, and technologies, and will implement a demonstration VES that will field test the effectiveness and reliability of a preferred enforcement strategy. The results of the study and field test would formulate the basis for an expanded VES on the I-15 ML and are expected to help agencies and toll operators nationwide improve toll operations accountability and safety. The products of the pilot project will benefit toll operators nationwide by demonstrating effective violation enforcement policies and technologies with proven success in a managed/HOT lanes application. Effective toll and HOV enforcement are critical to protecting eligible vehicles travel-time savings and operational safety of managed lanes/HOT facilities.

The ability to rationally and equitably enforce toll and high occupancy provisions is important to any region that contemplates such a mobility management system. Thus, this project is important not only to San Diego, but also to other agencies that are contemplating or planning for a network of managed/HOT lanes.

Sincerely,



for GARY L. GALLEGOS
Executive Director

GG/RT/lg

Enclosure

APPLICATION FOR FEDERAL ASSISTANCE

1. TYPE OF SUBMISSION: Application <input checked="" type="checkbox"/> Construction <input type="checkbox"/> Non-Construction		2. DATE SUBMITTED July 15, 2004		Applicant Identifier	
		3. DATE RECEIVED BY STATE		State Application Identifier	
		4. DATE RECEIVED BY FEDERAL AGENCY		Federal Identifier	
5. APPLICANT INFORMATION Legal Name: San Diego Association of Governments (SANDAG)		Organizational Unit: Department:			
Organizational DUNS:		Division: Mobility Management			
Address: Street: 410 B Street Suite 800		Name and telephone number of person to be contacted on matters involving this application (give area code) Prefix: Mr. First Name: Ray Middle Name:			
City: San Diego		Last Name Traynor			
County: San Diego		Suffix: Project Manager			
State: CA Zip Code 92101		Email: rtr@sandag.org			
Country: United States		Phone Number (give area code) (619) 699-1900		Fax Number (give area code) (619) 699-1905	
6. EMPLOYER IDENTIFICATION NUMBER (EIN): 95-2784997		7. TYPE OF APPLICANT: (See back of form for Application Types) Other (specify) Municipal Planning Organization			
8. TYPE OF APPLICATION: <input type="checkbox"/> New <input checked="" type="checkbox"/> Continuation <input type="checkbox"/> Revision If Revision, enter appropriate letter(s) in box(es) (See back of form for description of letters.)		9. NAME OF FEDERAL AGENCY: Federal Highway Administration (FHWA)			
10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER: 20-205 TITLE (Name of Program): Highway Planning and Construction (Federal Aid Highway Program)		11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT: Preliminary engineering and implementation of the I-15 Value Pricing Program - Violation Enforcement System			
12. AREAS AFFECTED BY PROJECT (Cities, Counties, States, etc.): San Diego County		14. CONGRESSIONAL DISTRICTS OF: a. Applicant 49,50,51,52,53 b. Project 50,52,53			
13. PROPOSED PROJECT Start Date: 2/15/04 Ending Date: 10/27/08		16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS? a. Yes <input type="checkbox"/> THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON DATE: b. No <input checked="" type="checkbox"/> PROGRAM IS NOT COVERED BY E. O. 12372 OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW			
15. ESTIMATED FUNDING:		17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT? <input type="checkbox"/> Yes If "Yes" attach an explanation. <input checked="" type="checkbox"/> No			
a. Federal \$ 1,268,400.00 b. Applicant \$.00 c. State \$.00 d. Local \$ 317,100.00 e. Other \$.00 f. Program Income \$ 429,000.00 g. TOTAL \$ 2,014,500.00		18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT. THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.			
a. Authorized Representative Prefix: Mr. First Name: Gary Last Name: Gallegos		Middle Name: L. Suffix:		c. Telephone Number (give area code) (619) 699-1900	
b. Title: Executive Director		e. Date Signed July 15, 2004		d. Signature of Authorized Representative: <i>[Signature]</i>	

SAN DIEGO INTERSTATE 15 VALUE PRICING-VIOLATION ENFORCEMENT SYSTEM PILOT

Sketch Plan

This proposed sketch plan for the San Diego Interstate 15 (I-15) Value Pricing Program has been developed in accordance with the application guidelines for the Value Pricing Pilot Program authorized by Section 1216(a) of the Transportation Equity Act for the 21st Century (TEA-21).

1. Congestion problem to be addressed:

The proposed San Diego I-15 Value Pricing – Violation Enforcement System (VES) Pilot Project would evaluate the feasibility of applying various violation enforcement strategies to address expanded managed lanes (ML) operations on Interstate 15 in the San Diego region. Currently a combination of routine visual and special violation enforcement strategies are used on the existing eight-mile segment of two-lane, reversible high occupancy toll (HOT) lanes on Interstate 15. The existing ML system currently handles 22,000 ADT (75% HOV and 25% paying SOV) with violation rates estimated between 5 to 20%.

Existing enforcement is conducted to protect travel-time savings for eligible users (transit riders, high occupancy vehicle (HOV) users, and paying FasTrak™ solo drivers) and to ensure safety on the existing facility. However, the efficacy of the existing system for the expanded managed lanes on I-15 is uncertain. The successful implementation of an accurate, reliable and equitable VES is challenged by operational requirements of the expanded managed lane facilities, including a movable concrete center barrier, multiple ingress and egress points, and increased demand (including additional transit, HOV users, and paying SOV users).

Public acceptance of the ML concept currently runs high in the region, and regional transportation and land use plans are predicated upon the successful implementation of value pricing and the ML concept. Therefore, proper violation enforcement strategies, fully integrated with the planned electronic toll collection (ETC) system, are critical to preserving the travel-time savings and safety of the managed lane system and the continued public support for the HOT lanes system.

Violation enforcement policies, systems, and appropriate technologies that support the operational requirements of ML must be researched, developed, implemented and field tested prior to region-wide implementation of ML. The results of this study are expected to help agencies and toll operators improve toll operation accountability and safety by demonstrating effective violation enforcement policies and technologies for ML. The recommended VES and enforcement strategies that will result from the pilot project would be applicable not only to HOT lanes, but also to conventional HOV lanes included in SANDAG's 2030 Regional Transportation Plan, with potential for nationwide applicability.

2. Nature of proposed pricing project to respond to the problem, including overall project goals, potential facilities to be included, timeline for study and possible implementation of value pricing projects:

Proposed Pricing Project

The San Diego I-15 Value Pricing Program proposes to evaluate the feasibility of applying various violation enforcement strategies, including development of an automated VES and corresponding policies for the I-15 ML, that would complement the planned value pricing ETC system and ensure

the excess capacity of the I-15 ML facility in the north I-15 corridor is managed in an efficient manner. The ML facility will consist of four HOV lanes with a movable barrier to accommodate peak directional traffic and multiple ingress and egress points. The ML facility will allow solo drivers to pay a per-trip fee electronically to use the ML facility as is currently done on the existing 8-mile reversible HOT lanes on I-15. Enforcement of toll evasion on the I-15 ML will be highly complicated if current violation enforcement policies and practices are simply carried forward. The proposed pilot will establish an improved VES and maximize efficient, proper use of the system. Revenue that is raised through collection of toll violation fines and penalties would be used to augment funding for a bus rapid transit system (BRTS) that will operate in the I-15 ML facility.

Overall Project Goals

The goals of the San Diego I-15 Value Pricing – Violation Enforcement System Pilot Project include:

- Leverage the ETC system and technologies being developed for the I-15 ML facility to support integration of an automated VES;
- Develop improved practices and sound policies for enforcement on the I-15 ML facility to ensure justice and fairness are upheld in administration of the ETC/VES;
- Effectively manage the capacity of the I-15 ML facility to preserve travel-time savings for eligible users of the I-15 ML and help relieve traffic congestion throughout the north I-15 corridor;
- Demonstrate the effectiveness of the automated VES and refined enforcement policies through a pilot test of the system/strategies on the existing I-15 HOT lanes;
- Lower the toll violation rate on the I-15 ML lanes to an acceptable level (less than five percent);
- Improve accountability of violation enforcement for the I-15 ML to ensure that toll evasion vs. enforcement of toll violations is revenue positive (i.e., process violators so that revenues pay for on-going enforcement costs as well as subsidy of transit/ridesharing in the corridor).

Major Tasks

The Interstate-15 Value Pricing – Violation Enforcement System (VES) Pilot Project would be developed following the two-phase, systems engineering process to maximize the quality of the developed VES and to ensure that the deployed system adequately meets the needs and objectives envisaged by FHWA, SANDAG and Caltrans (in accordance with US DOT Final Rule, Part 940-Intelligent Transportation System Architecture and Standards Section 940.11 Project Implementation). SANDAG would conduct pre-project studies, preliminary engineering, and implementation of a managed lanes violation enforcement system that includes toll and HOV provisions. Strategies, underlying support policies and technologies would be examined and developed to address the complex operational requirements of the planned I-15 Managed Lanes project (Stage 1).

The Pilot Project would be conducted in two phases which include seven major tasks:

Phase 1: Definition (Pre-Project Study)

This phase would incorporate pre-project planning activities and would include satisfying all federal, state and local approvals needed for the demonstration project.

1. User Needs and Concept of Operations

Needs assessment activities will be conducted with project stakeholders. User needs evaluations will be solicited from HOV, paying SOV users, and transit users of the Managed Lanes system, as well as SOV users of the I-15 general purpose lanes. A Concept of Operations will then be developed to help stakeholders understand how the system would be used in daily operations. User and public acceptance would be included and would examine the issue of social and environmental equity.

2. System Requirements

The Needs Assessment and Concept of Operations would be used to derive the requirements for the behavior of the VES. Requirements statements would be generated as a sequence of user actions with sufficient detail to facilitate communication between project stakeholders during implementation and testing. The output of this step would be the System Requirements Document.

3. VES Strategy and Technology Trade Studies

During the System Engineering Process, a strategy analysis would be conducted that evaluates the impacts of implementing various violation enforcement strategies and systems. This pre-project study would examine various enforcement policies and available technologies, evaluate a series of alternative strategies and systems, and recommend a preferred alternative with supporting policies and systems, including integration. In addition, a trade analysis of technologies and vendor offerings would be conducted. The recommendations would then be incorporated into the Phase 2 Design process.

Phase 2: Design, Integration and Testing

4. System Design, Prototyping, and Proofs of Concept

System Design will culminate with the preparation of construction documents for the VES. During this step, the VES will be developed as an integrated element of the overall ETC that is defined in the Concept Plan for the I-15 ML Value Pricing Study. In addition, the communication system will be specified, along with computer equipment, or Commercial Off-the-Shelf (COTS) software to be procured; or designing custom software such as a centralized VES management system. This step would conclude with the implementation of a small-scale field test of the preferred VES on the existing eight-mile, reversible I-15 Managed lanes facility.

5. Implementation and Testing

This step consists of software development, integration of subsystems, procurement of necessary hardware and COTS software, installation of equipment (including field elements on I-15 ML), and system integration testing. The Acceptance Testing will be conducted to verify that the system meets the requirements defined in Volume One of the I-15 ML Value Pricing Project Study. The activity concludes with a system integration test to ensure full interoperability with the planned ETC and other CTOC toll agency systems, followed by final acceptance testing.

Implementation of the VES and enforcement strategies on the expanded ML facility in 2007 would also be included as a task incorporating public relations, marketing, full VES system installation including roadway improvements and VES equipment on the ML facility, acceptance testing of the VES, final approvals, and all operational activities.

In conjunction with the deployment of the VES, a new routine enforcement agreement with the California Highway Patrol (CHP) would also be completed and implemented.

6. Commission System Operations Maintenance

Operational launch of the VES would follow the successful conclusion of acceptance testing and the VES system would transition into maintenance mode. This activity continues until the pilot project is concluded; after which time the VES would conceivably be formally adopted and incorporated.

7. Monitoring and Evaluation

An independent consultant would be hired to evaluate the effects of the VES operations and enforcement activities as well as attitudes of ML users and the general public. In this step, the VES would be evaluated compared to the established criteria. An evaluation report will be prepared at the conclusion of this task which includes recommendations and issues to be considered for future ML/HOT lanes applications within the region. The lessons reported in this step would potentially have applications to any managed lanes implementation across the country.

Potential Facilities to be Included

There is an existing eight-mile, two-lane reversible HOT lanes facility located in the median of Interstate 15 that is the site of the I-15 Value Pricing Program. The I-15 Value Pricing Program is interoperable with other toll bridges and roads in California through a series of cooperative agreements governed by the California Toll Operators Committee (CTOC). The CTOC facilities are branded as FasTrak™ facilities.

Caltrans and SANDAG are currently constructing new lanes in the median of I-15 that would extend this existing HOT lane facility and create an expanded ML facility an additional 13 miles from its north end at the I-15/SR 56 junction to the junction of I-15 and SR 78.

In November 2003, Caltrans began construction of the first of three stages for the I-15 ML project that will ultimately extend the HOT lanes through the most heavily congested segments of the north I-15 corridor (SR 52 to SR 78).

A continuous 6.6-meter wide enforcement area is planned, consisting of the main lane inside shoulder and the ML shoulder. This configuration will allow CHP officers to position themselves on the main lane or ML shoulder while citing violators stopped on the HOT lanes.

The configuration of the expanded four-lane ML facility would operate either with two lanes operating in each direction (2+2), or with three lanes in the peak direction and one in the off-peak direction (3+1). Five direct access ramps to the facility are planned to provide priority access from local streets for eligible vehicles (BRT vehicles, HOVs, and paying SOVs). In addition, seven intermediate access areas would be incorporated along the full, 20-mile facility. The five direct access ramps would be located at Hillery Drive, Ted Williams Parkway, Bernardo Center Drive, Del Lago Blvd., and Hale Ave.

Support for the I-15 HOV/ML Project

Analysis of HOV usage and traffic demand has revealed a long-term need for a new four-lane facility. The four-lane ML facility was included in SANDAG's 2030 Regional Transportation Plan (RTP) that was approved by the SANDAG Board in March 2003.

Extensive public outreach for the I-15 Value Pricing Program and recent region-wide surveys indicate strong support for the expansion of ML facilities throughout the San Diego region, with over 60% of respondents indicating that they approve of the FasTrak program administered by SANDAG. Further, nearly 70% of respondents indicate that they would likely use the expanded ML system when it becomes available. And more than 70% of respondents indicated that tolls are an effective way to keep the HOV/ML moving quickly.

In order to provide congestion relief for I-15 as soon as possible, and to meet expectations from surrounding communities, the four-lane ML facility is being constructed in phased segments: (1) the middle segment from SR 56 to Centre City Parkway; (2) the northern segment from Centre City Parkway to SR 78; and (3) the southern segment from SR 163 to SR 56 (which would involve expanding the existing HOV facility from two to four lanes and adding intermediate access locations.)

Middle Segment (Stage 1)

Currently, construction work is underway by Caltrans for the middle segment of the HOV/ML, called Stage 1. The cost estimate for Stage 1 is to \$375 million. This initial I-15 ML project adds four ML from SR 56 to Centre City Parkway, three BRT stations, and direct access ramp facilities. Additional funding is being sought to complete the funding package required for Stages 2 and 3 which would complete the entire 20-mile ML facility.

HOVs and BRT vehicles would have the first priority to use the ML facility. Any excess capacity not used by HOVs and buses would be made available to SOVs for a per-trip fee.

Timeline for Study and Possible Implementation of Violation Enforcement System Pilot Project

Stage 1 of the ML project will be constructed and open to operations by 2007. Concurrent with the Stage 1 construction, SANDAG would conduct a pre-project study, develop the violation enforcement system (VES), design, and install the system on Stage 1 of the I-15 ML facility. The evaluation and monitoring tasks would begin upon completion of the installation of the VES and would conclude approximately 12 to 18 months later with a final evaluation report.

The VES would be implemented concurrent with the opening of Stage 1 of the ML project in 2007.

3. Parties proposed as being signatories to the cooperative agreement with FHWA. Indications of support from affected parties, including representatives of business, labor, industry, transportation users, and/or local residents, or plans for obtaining such support should be included.

At a minimum, SANDAG, as the Metropolitan Planning Organization (MPO) and transportation planning agency for the San Diego region, and Caltrans, the owner/operator of the freeway system, would be signatories to the cooperative agreement with FHWA for the San Diego I-15 Value Pricing Program - Violation Enforcement System Pilot Project. SANDAG already has agreements with both Caltrans and the CHP for operations and enforcement of the current I-15 FasTrak™ program.

SANDAG also would seek the individual support and participation of the I-15 corridor cities, including the Cities of San Diego, Poway, and Escondido. Other public agencies and private sector groups, such as the Metropolitan Transit System (MTS), the North San Diego County Transit District (NCTD), and the Automobile Club also would be asked to support and participate in the project.

4. Extent of public participation in the development of the proposal, or of plans for future public participation activities. Potential equity consequences of any proposed projects should be portrayed in general terms, and if adverse impacts are anticipated, preliminary plans for responding to such problems should be identified.

Extent of public participation in the development of the proposal, or of plans for future public participation activities.

In 2002, SANDAG conducted an outreach effort as a part of the development of its thirty-year Regional Transportation Plan (RTP), MOBILITY 2030. A local public relations and marketing firm,

Bailey-Gardiner, provided professional services in this effort to increase public awareness and understanding of growth issues in the region. The 2030 RTP helped to identify strong public support of value pricing concepts in the region.

In 2003 and 2004, an extensive public outreach program to the region's decision-makers, residents, and civic, community, and special interest groups was conducted as a part of SANDAG's Regional Comprehensive Plan (RCP). The RCP provides a more comprehensive picture of growth management issues, and sought to better integrate land use and transportation planning. It focused attention on where and how we want to grow, providing a vital alternative to where we could end up if we continue with business as usual. The RCP contains several provisions supporting the expansion of ML throughout the region and is scheduled for adoption by SANDAG's Board of Directors on July 23, 2004.

Once the VES is implemented, future public participation will be available through monthly meetings of the I-15 FasTrak™ Project Management Team (PMT), for a committee that was created during the development of the I-15 Value Pricing Program. The PMT would continue to function as a joint-agency project oversight committee comprised of staff from SANDAG, Caltrans, FHWA, and the CHP, and may expand to include staff from the Federal Transit Administration (FTA), MTS, or other community, civic and special interest representatives appointed by SANDAG's Board of Directors.

Potential equity consequences of any proposed projects should be portrayed in general terms, and if adverse impacts are anticipated, preliminary plans for responding to such problems should be identified.

The San Diego I-15 Value Pricing Program – Violation Enforcement System Pilot Project proposes to dedicate the revenue raised from collection of toll violation fines and penalties towards the operating expense of the BRTS being developed by SANDAG. The BRTS will operate on the expanded ML facility as a high-speed, bus system with similar service frequencies as light rail. Main line routes would consist of a limited number of stations at the direct access ramp

Secondary routes that would connect major residential areas and major employment centers to the main line BRTS would operate during peak periods. The planned BRTS will utilize electronic fare payment technologies to allow transit riders to pay fares before boarding the buses.

The I-15 Value Pricing Program – Violation Enforcement System Pilot Project would mitigate potential impacts to lower-income groups, because the violation program revenue would support improved transit service in the I-15 corridor, providing additional transportation options for lower-income groups. As part of Tasks 1 and 2 described above, the project would identify and evaluate any potential adverse effects of the VES pilot on low-income groups.

Equity of value pricing projects was addressed as part of SANDAG's MOBILITY 2030 RTP, and the I-15 Value Pricing Study public involvement program. The input received was used to tailor this submittal. Further, this project scope also will include environmental justice activities to revisit and address any equity issues in an effort to minimize any adverse effects.

5. Legal and administrative authority needed to carry out a value pricing project, extent to which these have been obtained, and further steps needed to obtain necessary authority.

FHWA would need to approve the proposal and allow the proposed I-15 ML ETC and HOV violation provisions to be enforced in accordance with the requirements of the Value Pricing VES Pilot Project and with applicable provisions of the Value Pricing Program element of TEA-21. If approved by FHWA, cooperative agreements would be signed between FHWA, Caltrans, and SANDAG.

The SANDAG Board of Directors would need to approve any cooperative agreements that would be entered into between SANDAG and FHWA, Caltrans, or other party as a result of the San Diego I-15 Value Pricing Program – VES Pilot Project.

Existing California state law (Chapter 275, Statutes of 2001) authorizes SANDAG, in cooperation with Caltrans, to operate the current I-15 Value Pricing Project (I-15 FasTrak™ program). Additionally, SANDAG has secured state and federal approval to extend value pricing to the expanded ML on I-15. Value pricing was included in the environmental impact report (EIR) that was prepared by Caltrans for the ML project. No other state approvals are needed.

6. Plans for pre-project study, or findings from pre-project studies that have already been completed.

There are several previous interrelated local efforts to develop long-term solutions to traffic congestion on I-15. These include a Major Investment Study (MIS) that was conducted by the San Diego Metropolitan Transit Development Board (now consolidated into SANDAG), and the Project Report (PR) and EIR that were prepared by Caltrans for the I-15 ML.

I-15 Major Investment Study

Joint work on the I-15 MIS was completed by MTDB, Caltrans District 11, SANDAG, and the North San Diego County Transit Development Board (NCTD). MTDB was the lead agency for the MIS and Parsons Brinckerhoff, under contract to MTDB, prepared the \$3.5 million study.

The I-15 MIS included four major tasks: (1) define and compare alternative highway and transit improvement strategies; (2) prepare an MIS Evaluation Report recommending preferred transportation improvement plans for the short-range, mid-range and long-range; (3) analyze land use factors that impact the ability to service the corridor with alternative modes and develop recommendations that could improve access to the preferred improvements plans; and (4) prepare a financing plan for implementing the preferred improvement plans.

The MIS short-range to mid-range plan (Phase 2) recommends improvements that could be constructed over the next decade. The recommendations include (1) auxiliary lane improvements; (2) an ML facility between SR 163 and SR 78; (3) the completed BRTS for the full I-15 corridor; and (4) on-line BRTS stations at two locations (El Cajon Boulevard and University Avenue). MTDB and Caltrans are currently working on environmental and preliminary engineering studies for the Phase 2 short- to mid-range plan.

The MIS long-range plan (Phase 3) was completed in 2001. This phase included: (1) a southern extension of an ML project between the I-15/SR 163 junction (the existing south of the current I-15 HOV lane facility) and the junction of I-15 and I-5, with direct access ramps; and (2) a light rail line or hybrid (light rail/BRTS) alternative with rail in the south I-15 corridor and BRTS in the north I-15 corridor.

Caltrans Project Report

In addition to the I-15 MIS, Caltrans prepared a Project Report (PR) and EIR evaluating the feasibility of proposed transportation improvements for the north I-15 corridor from SR 163 to SR 78.

The \$2.5 million PR and EIR included an analysis of four HOV/ML alternatives and the locally preferred alternative is the current I-15 ML 4-lane HOT lanes alternative. The selected alternative was the only alternative that satisfied the purpose and need for the project and corridor. The preferred I-15 ML alternative was included in SANDAG's 2020 and MOBILITY 2030 RTPs.

Caltrans' PR and EIR were completed in 2001 and were followed by the development of plans, specifications and detailed cost estimates (PS&E) for Stage 1 of the ML. To date, PS&E for Phases 1, 2, and 3 of the Stage 1 ML are complete and Phase 4 and Phase 5 PS&E are nearing completion. Construction of the ML project began in 2003 and Stage 1 is scheduled for completion in 2007 with Stages 2 and 3 planned for completion between 2007 and 2010.

Prior Value Pricing Evaluations

Reports covering the demonstration periods have been completed. The findings from the evaluation and monitoring efforts of the original Congestion Pricing demonstration on I-15 were concluded in 2002. These reports covered a wide variety of issues, including traffic, attitudes toward the project, park and ride lot usage, cost of delay, air quality, transit service, enforcement and violations, land use, marketing, media, and public response. The evaluation and monitoring reports, along with reports prepared for the I-15 Managed Lanes Value Pricing Study, were used to develop the San Diego I-15 Value Pricing – Violation Enforcement System Pilot Project proposal.

I-15 Managed Lanes Value Pricing Reports

Several elements of the I-15 Managed Lanes Value Pricing Study were developed that include an assessment of Alternative Pricing Strategies, and Traffic and Revenue Analysis. A Toll Collection System and Operations Concept Report was completed in 2002 that provided a general overview of the type of ETC system that will be required for the ML facility. It explains the overall concept, the various subsystem requirements, and preliminary estimates of capital costs for both the interim operation and full build-out.

A Public Outreach Report summarizes the results of the public outreach that was conducted as part of the I-15 Managed Lanes Value Pricing Study. Contents include the Executive Summary, Stakeholder Interview Report, the Telephone Survey Report, the Focus Group Report, the Intercept Survey Report, and the Environmental Justice Assessment.

A Traffic Operations Plan and a System Requirements document were developed and completed in 2002. The findings from these various reports were used to develop the San Diego I-15 Value Pricing – Violation Enforcement System Pilot Project proposal.

INTERSTATE 15 MANAGED LANES VIOLATION ENFORCEMENT SYSTEM

PILOT PROJECT PROPOSAL

I. INTRODUCTION

No toll agency to-date has successfully demonstrated a fully automated violation enforcement system (VES) that supports a managed lanes system that contains multiple entry and exit points, and that provides reliable, accurate and cost-effective enforcement of both toll and high occupancy vehicle (HOV) provisions. Identifying an effective VES and enforcement strategies is becoming increasingly important given the growing number of high occupancy toll (HOT) lanes proposals across the country.

From what we know, no technology or enforcement strategy exists that enables a tolling authority to rigorously enforce a random mixture of paying single occupant vehicle (SOV) users (equipped with electronic transponders, or toll tags) and HOV users (who are not required to carry transponders). As a result, enforcement of HOV and toll provisions in such a setting relies largely on traditional, non-automated techniques, including routine patrols by law enforcement personnel. Providing HOV/toll enforcement by these means constitutes a substantial portion of the operating costs of HOT lanes with less than desirable results. Evaluating alternative, cost-effective ways of providing efficient violation enforcement is a key issue.

Applicability to HOT Lanes in the San Diego region

SANDAG currently operates the award-winning I-15 FasTrak™ program in which SOV users pay a per-trip fee to use an 8-mile HOT facility on Interstate 15. A major expansion to the existing HOT lanes facility is underway. The I-15 Managed Lanes (ML) will be a 20-mile, four-lane facility, with seven entry and exit points (in each direction of travel).

A significant issue related to implementation of ML systems, such as the I-15 Managed Lanes, is the need for an accurate, reliable, cost-effective automated VES. To date, there has been no VES in wide application that has demonstrated the capability of accurately and reliably determining vehicle occupancy. (Most VES require all vehicles using the toll facility to be equipped with electronic transponders.)

In addition to the I-15 Managed Lanes, SANDAG has over 70 miles of ML facilities planned for the San Diego region, and these facilities will face the same operational challenges enforcing toll and HOV provisions as faced on I-15. By allowing HOVs to freely enter and exit the ML system with no other means of determining eligibility, the region's ML system must rely upon routine visual enforcement by law enforcement personnel.

When I-15 HOT lanes operations first began, violation rates dropped dramatically (from the pre-project rate of 15% to less than 5%), largely due to the increased presence of California Highway Patrol (CHP) as part of the demonstration project. Over time, violation rates have fluctuated; current violation rates range from five to 20 percent on the existing I-15 HOT facility, which indicate that the current enforcement strategies have room for improvement. While SANDAG continues to maintain a contract with CHP for enforcement activities, adequate staffing is an issue at times, given other public-safety related demands on the assigned officers. For traditional toll facilities, in which all vehicles are required to possess some form of electronic eligibility, violation rates are typically less than five percent. A VES strategy that requires all

vehicles traveling in the ML facility to register as qualified HOVs (and be required to carry a transponder permitting them to operate in the ML) appears to enable a fully automated VES. Yet making this type of change in current I-15 HOT lanes operations may cause concerns with current HOV users and also would result in additional operating costs (to pay for the additional transponders and to register qualified HOVs).

CURRENT I-15 ML VALUE PRICING SYSTEM

Currently, HOVs are not required to carry and display toll transponders. Also, channelization of HOV and non-HOV traffic into segregated toll zones is not currently required. Enforcement is made through manual observation by the California Highway Patrol (CHP). The current practice is as follows: CHP officers randomly observe vehicles passing thru the tolling zone and note the number of occupants (count heads). A system-activated indicator located on the toll zone gantry indicates whether a toll has been paid. If a solo driver passes through the toll zone and the overhead light shows that a toll has not been paid, the officer will require the motorist to pull over and will determine if a violation has occurred. Current California law allows for a minimum \$341 fine to be imposed upon HOV/toll violators.

With plans to use a movable barrier to manage traffic on the future I-15 managed lanes and with multiple ingress/egress points, it is unlikely that channelization of HOVs from SOVs could be employed on the ML. Furthermore, due to the complexity of the expanded ML, routine enforcement even with the system-assisted overhead signals presents a significant challenge. If enforcement is to continue by observation only, viability of the ETC system may be jeopardized. A comprehensive evaluation of the current enforcement practices coupled with development of improved enforcement strategies are critical steps necessary to ensure the I-15 ML toll operations concept remains viable. In essence, there must be a viable enforcement capability.

The previous I-15 Managed Lanes Value Pricing Study identified the enforcement challenges related to I-15 ML operations and recommended potential solutions, such as portable hand-held tag reader for use by the CHP and an in-vehicle terminal and voice automated system with the capability of determining toll payment. These applications have not been evaluated in enough detail to determine their viability for large-scale HOT lanes applications.

In addition, as part of the original three-year demonstration project, entitled the I-15 Congestion Pricing Project, SANDAG conducted a limited evaluation of automated violation enforcement strategies, but elected to rely on traditional visual enforcement techniques, given the size and scope of the original HOT lanes demonstration.

II. PROBLEM STATEMENT

The proposed San Diego I-15 Value Pricing – Violation Enforcement System (VES) Pilot Project would evaluate the feasibility of applying various violation enforcement strategies to address expanded managed lanes (ML) operations on Interstate 15 in the San Diego region. Currently a combination of routine visual and special violation enforcement strategies are used on the existing eight-mile segment of two-lane, reversible high occupancy toll (HOT) lanes on Interstate 15. The existing ML system currently handles 22,000 ADT (75% HOV and 25% paying SOV), with violation rates estimated between 5 to 20%.

Existing enforcement is conducted to protect travel-time savings for eligible users (transit riders, high occupancy vehicle (HOV) users, and paying FasTrak™ solo drivers) and to ensure safety on the existing facility. However, the efficacy of the existing system for the expanded managed lanes on I-15 is not certain. The successful implementation of an accurate, reliable and equitable VES is challenged by operational requirements of the expanded managed lane

facilities, including a movable concrete center barrier; multiple ingress and egress points; and increased demand (including additional transit, HOV users, and paying SOV users).

Public acceptance of the ML concept currently runs high in the region, and regional transportation and land use plans are predicated upon the successful implementation of value pricing and the ML concept. Therefore, proper violation enforcement strategies, that are fully integrated with the planned electronic toll collection (ETC) system, are critical to preserving the travel-time savings and safety of the managed lane system and the continued public support for the HOT lanes system.

Violation enforcement policies, systems, and appropriate technologies that support the operational requirements of ML must be researched, developed, implemented and field tested prior to region-wide implementation of ML. The results of this study are expected to help agencies and toll operators improve toll operations accountability and safety by demonstrating effective violation enforcement policies and technologies for ML. The recommended VES and enforcement strategies that will result from the pilot project would be applicable not only to HOT lanes, but also to conventional HOV lanes included in SANDAG's 2030 Regional Transportation Plan, with potential for nationwide applicability.

III. PROJECT DESCRIPTION

1. Proposed Violation Enforcement System Pilot Project

SANDAG would conduct pre-project studies, preliminary engineering, and implementation of a ML VES that includes toll and HOV provisions. Strategies, underlying support policies and technologies would be examined and developed to address the complex operational requirements of the planned I-15 ML project (Stage 1).

The San Diego I-15 Value Pricing Program – VES Pilot Project proposes to evaluate the feasibility of applying various violation enforcement strategies, including development of an automated VES and corresponding policies for the I-15 ML, that would complement the planned value pricing ETC system and ensure the excess capacity of the I-15 ML facility in the north I-15 corridor is managed in an effective manner. The ML facility will consist of four HOV lanes with a movable barrier to accommodate peak directional traffic and multiple ingress and egress points midstream. The ML facility will allow solo drivers to pay a per-trip fee electronically to use the ML facility as is currently done on the existing 8-mile reversible HOT lanes on I-15. Enforcement of toll evasion on the I-15 ML will be highly complicated if current violation enforcement policies and practices are simply carried forward. The proposed pilot will establish an improved VES and maximize efficient, proper use of the system. Revenue that is raised through collection of toll and HOV fines and penalties would be used to augment funding for enhanced transit services, such as the planned I-15 BRT, that will operate in the I-15 ML facility and HOV improvements on the I-15 corridor.

2. Project Goals

The goals of the San Diego I-15 Value Pricing – Violation Enforcement System Pilot Project include:

- Leverage the ETC system and technologies being developed for the I-15 ML facility to support integration of an automated VES;
- Develop improved practices and sound policies for enforcement on the I-15 ML facility to ensure justice and fairness are upheld in administration of the ETC/VES;

- Effectively manage the capacity of the I-15 ML facility to preserve travel-time savings for eligible users of the I-15 ML and help relieve traffic congestion throughout the north I-15 corridor;
- Demonstrate the effectiveness of the automated VES and refined enforcement policies through a pilot test of the system/strategies on the existing I-15 HOT lanes;
- Lower the toll violation rate on the I-15 ML lanes to an acceptable level (less than five percent);
- Improve accountability of violation enforcement for the I-15 ML to ensure that toll evasion vs. enforcement of toll violations is revenue positive (i.e., process violators so that revenues pay for on-going enforcement costs as well as subsidy of transit/ridesharing in the corridor).

3. *Major Tasks*

The Pilot Project would be conducted in two phases and will include several tasks. Below are the seven major work packages (tasks) of the proposed pilot project:

Phase 1: Definition (Pre-Project Study)

This phase would incorporate pre-project planning activities and would include satisfying all federal, state and local approvals needed for the demonstration project.

1. User Needs and Concept of Operations

Needs assessment activities will be conducted with project stakeholders with a vested interest in the I-15 Managed Lanes (ML) project. Several outreach efforts for the I-15 ML project and Mobility 2030 Plan have already been conducted and the lessons learned from these outreach efforts is well documented. However, additional outreach effort is envisioned to help drive the underlying policy development and system requirements for the VES. User needs evaluations will be solicited from HOV, paying SOV users, and transit users of the Managed Lanes system, as well as SOV users of the I-15 general purpose lanes, either through workshop and/or interviews. The objective is to review the various operational scenarios and determine how the VES can be best implemented with the proposed Managed Lanes system. A Concept of Operations will then be developed to help stakeholders understand how the system would be used in daily operations and will be particularly useful for interactions with the CHP. The User Needs and Concept of Operations would be documented and become the basis for next steps in the process.

This task also includes baseline market research that would examine user and public acceptance (based upon the Concept of Operations). The work package also includes an assessment of social and environmental equity.

2. System Requirements

The Needs Assessment and Concept of Operations would be used to derive the requirements for the behavior of the VES. The development of system requirements will rely upon the methodology defined by Unified Modeling Language (UML) with "use-cases" related to the exchange and display of regional transportation data. Requirements statements would be generated as a sequence of user actions with sufficient detail to facilitate communication between project stakeholders during implementation and testing. Throughout the process, a requirements tracking tool would be used to manage system requirements. This allows

requirements to be established and tracked through their definition and phase assignments, traced to system design elements, and tracked through the integration and acceptance test process. The output of this step would be the System Requirements Document.

3. VES Strategy and Technology Trade Studies

During the System Engineering Process, a strategy analysis would be conducted that evaluates the impacts of implementing various violation enforcement strategies and systems on the proposed I-15 ML facility. This pre-project study would examine various enforcement policies and available technologies, evaluate a series of alternative strategies and systems, and recommend a preferred alternative with supporting policies and systems, including integration of the VES into the planned Electronic Toll Collection (ETC) system for the I-15 ML.

Also in this step, a trade analysis of technologies and vendor offerings that are available in the VES industry would be conducted. Comparisons of various VES strategies and applicable technologies would be conducted using evaluation criteria gathered from the System Requirements test to determine how well the strategy and technology addresses system objectives. Cost and maintenance requirements are also important criteria that would be considered during this activity. The recommendations that are developed here would be incorporated in the Phase 2 Design process.

The environmental approval for any elements of the VES not already covered in the approved I-15 ML Negative Declaration would also be included in this work package.

Phase 2: Design, Integration and Testing

4. System Design, Prototyping, and Proofs of Concept

System Design will culminate with the preparation of construction documents for the VES. During this step, the VES will be developed as an integrated element of the overall ETC that is defined in the Concept Plan for the I-15 ML Value Pricing Study. During this step the communication system will be specified, along with computer equipment, or Commercial Off-the-Shelf (COTS) software to be procured; or designing custom software such as a centralized VES management system. Prototyping would follow to ensure that whatever user interfaces are developed for the VES is compatible with and integrated with the planned ETC system on the Managed Lanes. This step would conclude with the implementation of a small-scale field test of the preferred VES on the existing eight-mile, reversible I-15 Managed lanes facility. This field test will ensure compatibility and full systems integration with the planned I-15 ML ETC system and conclude the Proofs of Concept activity.

5. Implementation and Testing

This step consists of software development, integration of subsystems, procurement of necessary hardware and COTS software, installation of equipment (including field elements on I-15 ML), and system integration testing. System integration is an iterative process. While integrating a particular subsystem into the overall system, the integration task consists of iteratively testing, identifying anomalous behavior, and fixing the subsystem or system elements responsible for the anomalous behavior. This activity continues until all unacceptable behavior of the integrated system is removed. This approach allows for an early operational capability with increased functionality over time. The Acceptance Testing will be conducted to verify that the system meets the requirements defined in Volume One of the I-15 ML Value Pricing Project Study. A test plan is prepared to outline the verification approach utilized for each implemented requirement. Testing will be conducted according

to procedures outlined in this document which will verify system installation, all major data interfaces and communication links. The activity concludes with system integration test to ensure full interoperability with the planned ETC and other CTOC toll agency systems, followed by final acceptance testing.

Implementation of the VES and enforcement strategies on the expanded ML facility in 2007 would also be included as a task. The overall task would include several sub-tasks as follows: public relations, marketing, full VES system installation including roadway improvements and VES equipment on the ML facility; acceptance testing of the VES; final approvals and all operational activities for the violation enforcement system as a component of the expanded I-15 ML Value Pricing Program.

In conjunction with the deployment of the VES, a new routine enforcement agreement with the California Highway Patrol (CHP) would also be completed and implemented. This agreement will augment automated enforcement and help to preserve travel-time savings for eligible users of the ML, ensure safe operations of the ML, and reduce access to the ML facility by unauthorized SOVs.

6. Commission System Operations Maintenance

Operational launch of the VES would follow the successful conclusion of acceptance testing and the VES system would transition into maintenance mode. During this step, the VES hardware and software systems and field equipment would be maintained and operated in accordance with the I-15 ML Implementation Plan. This activity continues until the pilot project is concluded; after which time the VES would conceivably be formally adopted and incorporated into SANDAG's standard I-15 ML operations.

7. Monitoring and Evaluation

An independent consultant would be hired to evaluate the effects of the VES operations and enforcement activities as well as attitudes of ML users and the general public. In this step, the VES would be evaluated compared to the criteria established during Task 2. An evaluation report will be prepared at the conclusion of this task which includes recommendations and issues to be considered for future ML/HOT lanes applications within the region. The lessons reported in this step would potentially have applications to any managed lanes implementation across the country. A preliminary monitoring and evaluation plan is attached.

a. Description of Facilities to be Included

There is an existing eight-mile, two-lane reversible HOT lanes facility located in the median of Interstate 15 that is the site of the I-15 Value Pricing Program. The I-15 Value Pricing Program is interoperable with other toll bridges and roads in California through a series of cooperative agreements governed by the California Toll Operators Committee (CTOC). The CTOC facilities are branded as FasTrak™ facilities.

Caltrans and SANDAG are currently constructing new lanes in the median of I-15 that would extend this existing HOT lane facility and create an expanded ML facility an additional 13 miles from its north end at the I-15/SR 56 junction to the junction of I-15 and SR 78.

In November 2003, Caltrans began construction of the first of three stages for the I-15 ML project that will ultimately extend the HOT lanes through the most heavily congested segments of the north I-15 corridor (SR 52 to SR 78).

A continuous 6.6-meter wide enforcement area is planned, consisting of the main lane inside shoulder and the ML shoulder. This configuration will allow CHP officers to position themselves on the main lane or ML shoulder while citing violators stopped on the HOT lanes.

The configuration of the expanded four-lane ML facility would operate either with two lanes operating in each direction (2+2), or with three lanes in the peak direction and one in the off-peak direction (3+1). Five direct access ramps to the facility are planned to provide priority access from local streets for eligible vehicles (BRT vehicles, HOVs, and paying SOVs). In addition, seven intermediate access areas would be incorporated along the full, 20-mile facility. The five direct access ramps would be located at Hillery Drive, Ted Williams Parkway, Bernardo Center Drive, Del Lago Blvd., and Hale Ave.

Support for the I-15 HOV/ML Project

Analysis of HOV usage and traffic demand has revealed a long-term need for a new four-lane facility. The four-lane ML facility was included in SANDAG's 2030 Regional Transportation Plan (RTP) that was approved by the SANDAG Board in March 2003. Extensive public outreach for the I-15 Value Pricing Program and recent region-wide surveys indicate strong support for the expansion of ML facilities throughout the San Diego region, with over 60% of respondents indicating that they approve of the FasTrak program administered by SANDAG. Further, nearly 70% of respondents indicate that they would likely use the expanded ML system when it becomes available. And more than 70% of respondents indicated that tolls are an effective way to keep the HOV/ML moving quickly.

In order to provide congestion relief for I-15 as soon as possible, and to meet expectations from surrounding communities, the four-lane ML facility is being constructed in phased segments: (1) the middle segment from SR 56 to Centre City Parkway (2) the northern segment from Centre City Parkway to SR 78 and (3) the southern segment from SR 163 to SR 56 (which would involve expanding the existing HOV facility from two to four lanes and adding intermediate access locations.)

Middle Segment (Stage 1)

Currently, construction work is being conducted by Caltrans for the middle segment of the HOV/ML, called Stage 1. The cost estimate for Stage 1 is to \$375 million. This initial I-15 ML project adds four ML from SR 56 to Centre City Parkway, three BRT stations, and direct access ramp facilities. Additional funding is being sought to complete the funding package required for Stages 2 and 3 which would complete the entire 20-mile ML facility. HOVs and BRT vehicles would have the first priority to use the ML facility. Any excess capacity not used by HOVs and buses would be made available to SOVs for a per-trip fee.

Timeline for Study and Possible Implementation of Violation Enforcement System Pilot Project

Stage 1 of the ML project will be constructed and open to operations by 2007. Concurrent with the Stage 1 construction, SANDAG would conduct Phase 1 and Phase 2 of the Pilot Project for implementation concurrent with the completion of the Stage 1 Managed Lanes construction. The Commission and Systems Operations Maintenance step, including monitoring and evaluation tasks would begin upon completion of the installation of the VES and would conclude approximately 12 to 18 months later with a final evaluation report.

The VES would be implemented concurrent with the opening of Stage 1 of the ML project in 2007.

b. Expected Pricing Schedules

This section is covered by the I-15 Managed Lanes Value Pricing Project Planning Study, May 2002.

c. Technologies to be Employed

From a systems perspective, the first question is if the existing enforcement strategy can provide the information required to support real-time value pricing violation enforcement systems. Despite all the alternative detection technologies now available to monitor and enforce HOT and HOV provisions, the use of radio frequency identification (RFID) transponders, coupled with visual validation, appear to be among the most trusted form of enforcement strategy employed today.

Existing Enforcement Approach

In the I-15 Managed Lanes Value Pricing Study, SANDAG's consultant recommended the ML employ the same enforcement approach as is currently practiced on the I-15 HOT lanes, which relies upon two strategies, Routine and Special enforcement. The Routine enforcement involves verifying vehicle occupancies by CHP officers visually counting heads of passengers within vehicles that pass through the single enforcement zone located near the south entrance/terminus of the ML/HOT lane system. Special enforcement is conducted through the system activated payment indicator (green light attached to the back of the toll gantry).

The CHP officer monitors vehicle occupancies of passing traffic on the ML/HOV facility and, when a SOV is noted, the officer monitors the payment indicator light to assess if the SOV is a valid paying customer. Upon determination of the status of the user as ineligible, the officer pursues the violator and issues a warning or a citation.

While this system has served the eight-mile, reversible lane system, with its single entry and exits points, the efficacy of this system applied to the multiple entry and exit points along the 20-mile managed lane system is uncertain. Therefore, this pilot project would conduct a detailed assessment of the completed I-15 ML Value Pricing study with a goal toward developing an integrated VES that leverages the planned ETC and that is appropriate for the more complex operational requirements presented by the expanded managed lane system on I-15. With this goal, other enforcement strategies and technology applications may be better suited and would be considered during the Phase 1 - Pre-Project Study; with the preferred enforcement strategies and underlying support technologies developed during Phase 2 - Design.

Discussion of Potential System Solutions

There have been a few reports and studies relating to the accuracy and reliability of various violation enforcement strategies, technologies and devices. The results of these studies vary significantly and lead readers to diverse conclusions. In the scope of the pilot project, a full analytical review would be appropriate. A number of factors would be considered in the technology review, including the ability of the technology to collect the required data in a reliable, accurate, and cost effective manner. The following technologies would be assessed for their ability to meet the system requirements and support the overall achievement of the goals of the project:

Entrance and exit read technologies

As already discussed, while these technologies provide actual travel times on individual vehicles, they include an inherent delay that would be problematic in a real-time congestion-pricing environment. This is especially true for freeway lanes where congestion could result in exit read delays in excess of 45 minutes. If toll tag reads were used, ramifications of additional tag reads on tag battery life also should be considered. Also, motorists would need to be educated on the reason for the additional tag beeps each time the tag is read. It should be noted that non-beeping tags are available but would require the costly replacement of all existing tags.

System-Assisted Indicator Signals

Enforcement is currently system-assisted in that overhead signals at the tolling zone are provided to identify vehicles paying the toll. Valid toll signals are displayed each time a transponder registers a valid read (toll transaction) at the lane controller/reader. The expanded ML could employ separate system-assisted indicator signals at each tolling point in the ML. However, due to the complexity associated with multiple ingress and egress points, routine enforcement using system indicators presents a challenge.

Video Detection

Video detectors can provide very accurate results in temperate weather conditions experienced in the San Diego region. However, the detectors do have limitation during severe adverse weather conditions such as fog, daylight-night transitions, occlusions, and reflections which also occur in the I-15 ML project vicinity. The technology study would assess the application of video detection, particularly as it has been deployed on the 91 Express lanes for license plate reader enforcement. The trade study would examine the differences in accuracy between the various brands available as well as the advantages and drawbacks of use.

Side-Radar / Microwave

Microwave technology uses non-intrusive, high performance sensors to detect the speed of vehicles traveling through the managed lanes facility. Multiple side-fire radar detectors would be stationed on the managed lanes at each toll zone and possibly along parallel segments of the facility.

The benefits of this approach include straightforward installation, wireless capability, and solar powering. Radar and laser detectors, such as those used by police departments, can be used as non-contact sensing devices to determine toll tag eligibility. SANDAG will soon have a network of roadside radar traffic sensors in the San Diego region. Originally planned as part of the federal Intelligent Transportation Infrastructure Program (ITIP) traffic data collection project, side-fire radar sensors, using wireless, high-speed communications and solar power systems may be used to collect traffic speed and density on the existing I-15 ML and the data may be incorporated into the toll schedules to augment in-road loop detectors. Side-fire radar detectors are proving to provide acceptable results for traffic management purposes if installed and calibrated appropriately. Radar units can be installed quickly and be operated relatively inexpensively and may hold value for use with a VES. The trade study would examine the differences in accuracy between the various brands available as well as the advantages and drawbacks of use.

RFID

Radio frequency identification (RFID), also referred to as transponder technology, identifies transponder-equipped vehicles and records the time they cross a set of antennas. The RFID technology would read the vehicle transponders at the entrance and exit of I-15 ML toll zones, recording the time the vehicle enters and exits the ML facility. A toll would then be assessed based upon the number of toll segments the paying SOV user utilizes. One scenario that would be studied is the use of transponders for all ML users, including HOVs, paying SOVs and transit vehicles. Vehicle eligibility could easily be determined in a completely automated fashion. The downside to this use-case is that all HOV users interested in traveling on the I-15 ML system must obtain a transponder prior to being eligible to traverse the system which could be considered an inconvenience.

Currently, transponder data is recorded on the I-15 FasTrak system at a single point in the toll zone. This technology is highly accurate in determining vehicle eligibility and is already a proven and reliable technology with an established vendor support record.

Infrared

Infrared detection systems recognize characters on vehicle license plates using infrared cameras and match them between two points. Infrared cameras could be stationed at the entrance of the multiple toll zones. Using infrared technology, the cameras would read license plate images for both the managed lanes. These images would then be optically scanned to identify the license plates, embedded with a timestamp and sent to the Central VES Server. Data would be encrypted or scrambled to address privacy issues. Vehicle eligibility (HOV or Paying SOV and transit) would be determined by matching the license plates observed at the ends of the defined routes and comparing the timestamp of corresponding license plates

Infrared detection is currently being used on the 91 Express Lanes as part of the violation enforcement system.

The advantage of this system is that it has been shown to be practical in gathering trip duration, trip speed, and volumes. Infrared systems have been successfully tested in Florida and planned to be extensively used in England as part of a travel time monitoring program. Moreover, the camera technology can be practically located, connected, and operated.

The main concern with this system is privacy, with respect to collecting license plate information, particularly for HOV users. However, the privacy issue would be mitigated with strict data control measures including substituting license plate numbers with record numbers and/or scrambling, encrypting, and discarding of the actual plate numbers.

Portable Transponder Readers

The technology and trade analysis would also consider the use of portable (handheld) scanners that read toll transponders away from the tolling zones to verify the recent payment of a toll. Portable readers of this type could be issued to the CHP officers patrolling the ML. Portable readers that can read vehicle-mounted tags from a distance are not currently available. A review of current and emerging portable reader technology should reveal how such a device could benefit the overall enforcement strategy for the ML.

Field Communications Terminal

An alternative to the use of portable transponder scanners is a field kit designed to query the central tolling system for recent toll transaction history. In this approach, a field 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 – would be integrated so as to provide the police officer with an in-patrol-car capability.

Other emerging technologies

There are other enforcement strategies technologies and devices that would be reviewed and screened for their viability for application to managed lanes VES. The accuracy and reliability of the data are critical to any advanced violation enforcement model. We would not suggest the use of any unproven technology to enforce toll and HOV provisions along the expanded I-15 ML.

d. Central VES Data Collection System

Regardless of the VES strategy solution selected, at the minimum, new central VES Data Collection System (Central System) must be developed and implemented to collect and process violations. The Central System software would be required to perform several data collection and analytical functions including but not limited to, license plate image processing and matching, transaction analysis, vehicle eligibility, violator identification and citation creation, and interoperability in conformance with Rev G of the CTOC specification.

IV. POTENTIAL EQUITY IMPACTS

The San Diego I-15 Value Pricing Program – Violation Enforcement System Pilot Project proposes to dedicate the revenue raised from collection of toll violation fines and penalties towards the operating expense of the BRTS being developed by SANDAG. The BRTS will operate on the expanded ML facility as a high-speed, bus system with similar service frequencies as light rail. Main line routes would consist of a limited number of stations at the direct access ramp. Secondary routes that would connect major residential areas and major employment centers to the main line BRTS would operate during peak periods. The planned BRTS will utilize electronic fare payment technologies to allow transit riders to pay fares before boarding the buses.

The I-15 Value Pricing Program – Violation Enforcement System Pilot Project would mitigate potential impacts to lower-income groups, because the violation program revenue would support improved transit service in the I-15 corridor, providing additional transportation options for lower-income groups. As part of Tasks 1 and 2 described above, the project would identify and evaluate any potential adverse effects of the VES pilot on low-income groups. Equity of value pricing projects was addressed as part of SANDAG's MOBILITY 2030 RTP, and the I-15 Value Pricing Study public involvement program. The input received was used to tailor this submittal. Further, this project scope also will include environmental justice activities to revisit and address any equity issues in an effort to minimize any adverse effects.

V. ROLE OF ALTERNATIVE TRANSPORTATION MODES IN THE PROJECT

As part of the previous Value Pricing project, MTDB developed a service plan for new I-15 Bus Rapid Transit (BRT) service for the I-15 corridor. The I-15 ML Stage 1 project completes the first segment of the expanded managed lanes facility and provides a premier level of service for the new, high-speed, BRT service. I-15 ML Stage 1 includes direct access ramps and BRT stations to provide a significant travel-time savings for transit, HOV and paying SOV users.

Funds generated from the I-15 ML Implementation will be used to fund BRT services in the I-15 corridor and enhancements to the HOV element. The high-speed BRT service on the I-15 ML system is a significant component of the region's 2030 Mobility Plan. Special emphasis will be placed on providing enhanced transit services that offer competitive point-to-point travel times to SOV users of the main lanes on I-15. Transit services operating in the ML facility will be given priority treatment as far as separate direct access facilities to the ML system from local streets.

VI. PROJECT SCHEDULE

Construction work is underway on Stage 1 of I-15 ML. SANDAG is currently preparing procurement documents to begin the process to form a project development team that will be responsible to prepare the design and implementation of the ETC. SANDAG is ready to begin work immediately upon notification to proceed from FHWA should funding from the Value Pricing Pilot Program be made available for the proposed VES Pilot Project. A detailed project workplan, with key work packages and tasks is included as Attachment C.

VII. SCOPE OF WORK

SANDAG would conduct pre-project studies, preliminary engineering, and implementation of a ML VES that includes toll and HOV provisions. The VES Pilot Project would be conducted in concert with the development and implementation of the I-15 ML ETC. While described in this proposal as a separate project, the VES Pilot Project is inextricably linked to the overall I-15 ML Implementation.

Strategies, underlying support policies and technologies would be examined and developed to address the complex operational requirements of the planned I-15 ML project (Stage 1). The Interstate-15 Value Pricing – VES Pilot Project would be developed following the two-phase, systems engineering process to maximize the quality of the developed VES and to ensure that the deployed system adequately meets the needs and objectives envisaged by FHWA, SANDAG and Caltrans (in accordance with US DOT Final Rule, Park 940-Intelligent Transportation System Architecture and Standards Section 940.11 Project Implementation). The following tasks make up the major work packages of the proposed VES pilot project:

1. Task Descriptions

Task Number	Task Description
0.1	<u>Organization</u> Establish policy and advisory committees; Project management
0.2	<u>Refine Work Plan</u> Refine implementation work plan, agency roles, and agreements

- 1.1 Outreach and Marketing Program
Establish baseline market data and market research plan; Conduct stakeholder workshops
- 1.2 Concept of Operations
Develop concept of VES operations
- 2.0 Systems Requirements
Develop VES system requirements
- 3.1 VES Strategy Analysis
Evaluate violation enforcement strategies; Establish violations enforcement policies
- 3.2 VES Technology Trade Studies
Trade analysis of available violation enforcement technologies and vendor offerings
- 3.3 Environmental/Transportation Clearance
Prepare and process environmental and transportation clearance
- 4.1 Design VES System and Prototypes
Develop vehicle eligibility and enforcement decision system
- 4.2 Detailed Component Design
Includes design documents and specifications
- 4.3 Develop Proofs of Concept
Verification testing and conduct small scale field test
- 4.4 Design Documentation
Prepare plans, specifications and detailed cost estimates (PS & E)
- 5.1 Purchase and Install VES Component and Software Systems
Procure and install VES subsystem equipment on Stage 1 Managed Lanes
- 5.2 - 5.4 Carry Out Pre-Implementation Activities
Conduct component, sub-system, and system verification and system validation
- 5.5 Design and Conduct Outreach Program
Identify and implement media and public participation strategies
- 6.0 Begin VES Operations
Commission VES operations maintenance
- 6.1 Administrative Oversight
SANDAG and Caltrans project management services
- 6.2 Violation Revenues Allocation
Allocation of violation revenues for ML improvements and enhanced transit services
- 7.1 Monitor Impacts
Monitor and collect operations, traffic, emissions, survey, and ridership data
- 7.2 Evaluation and Assessment of the Program
Evaluate effectiveness of program
- 7.3 Refinement and Modification of the Program Dimensions
Evaluate program operation and recommend changes for future operations

2. *Cost Estimates by Task*

A complete Pilot Project cost estimate, including pre-project studies, preliminary engineering and implementation is included on Attachment A.

VIII. MONITORING AND EVALUATION PLAN

A high level Monitoring and Evaluation Plan outline can be found on Attachment B.

IX. FINANCE AND REVENUE PLAN

1. *Budget and Funding Sources*

The proposed budget for the VES Pilot Project (See Attachment A) includes a total cost estimated at \$2,014,500, which includes the Phase 1: pre-project study and Phase 2: design, integration and testing of the proposed project. Of the total project cost, SANDAG is requesting \$1,268,400 from the Value Pricing Pilot 2004 FY Program. The matching funds would come from a combination of STP local and toll revenue which are already programmed.

The ETC and VES systems cost for the Stage 1 I-15 ML are estimated at \$7,179,500, as shown on Attachment A. Of that amount, SANDAG has \$2,125,000 programmed.

The remaining \$5,050,000 to complete Stage 1 ML Implementation would be funded by a combination of the FHWA Value Pricing Pilot Program, toll revenue, and any cost savings that may be derived from the I-15 Stage 1 highway project.

2. *Proposed Use of Revenues*

The collection of revenues from citations will continue to be the responsibility of the Superior Courts of San Diego County. Through existing agreements, HOV and toll violation revenue collected from the region's HOV and FasTrak system is shared with SANDAG. These revenues are used in the I-15 corridor to fund enhanced transit services and HOV system improvements. This arrangement will continue under the proposed I-15 ML VES Pilot Project.

3. *Future or Other Necessary Funding*

No future funding is expected as all VES support and administration will be funded through ongoing toll collection revenue and through violation fine revenue generated by the planned expanded I-15 Value Pricing program.

X. PUBLIC PARTICIPATION

In 2002, SANDAG conducted an outreach effort as a part of the development of its thirty year Regional Transportation Plan (RTP), MOBILITY 2030. A local public relations and marketing firm, Bailey-Gardiner, provided professional services in this effort to increase public awareness and understanding of growth issues in the region. The 2030 RTP helped to identify strong public support of value pricing concepts in the region.

In 2003 and 2004 an extensive a public outreach program to the region's decision-makers, residents, and civic, community, and special interest groups was conducted as a part of SANDAG's Regional Comprehensive Plan (RCP). The RCP provides a more comprehensive picture of growth management issues, and sought to better integrate land use and transportation planning. It focused attention on where and how we want to grow, providing a vital alternative to where we could end up if we continue with business as usual. The RCP contains several provisions supporting the expansion of ML throughout the region and is scheduled for adoption by SANDAG's Board of Directors on July 23, 2004.

Once the VES is implemented, future public participation will be available through monthly meetings of the I-15 FasTrak™ Project Management Team (PMT), for a committee that was created during the development of the I-15 Value Pricing Program. The PMT would continue to function as a joint-agency project oversight committee comprised of staff from SANDAG, Caltrans, FHWA, and the CHP, and may expand to include staff from the Federal Transit Administration (FTA), MTS, or other community, civic and special interest representatives appointed by SANDAG's Board of Directors.

XI. LEGAL AND ADMINISTRATIVE AUTHORITY

At a minimum, SANDAG as the Metropolitan Planning Organization (MPO) and transportation planning agency for the San Diego region, and Caltrans, the owner/operator of the freeway system, would be signatories to the cooperative agreement with FHWA for the San Diego I-15 Value Pricing Program - Violation Enforcement System Pilot Project. SANDAG already has agreements with both Caltrans and the CHP for operations and enforcement of the current I-15 FasTrak™ program.

SANDAG also would seek the individual support and participation of the I-15 corridor cities, including the Cities of San Diego, Poway, and Escondido. Other public agencies and private sector groups, such as Metropolitan Transit System (MTS), the North San Diego County Transit District (NCTD), and the Automobile Club also would be asked to support and participate in the project.

1. Federal Legal and Administrative Requirements

FHWA would need to approve the proposal and allow the proposed I-15 ML ETC and HOV violation provisions to be enforced in accordance with the requirements of the Value Pricing VES Pilot Project and with applicable provisions of the Value Pricing Program element of TEA-21. If approved by FHWA, cooperative agreements would be signed between FHWA, Caltrans, and SANDAG.

2. State Legal and Administrative Requirements

Existing California state law (Chapter 275, Statutes of 2001) authorizes SANDAG, in cooperation with Caltrans, to operate the current I-15 Value Pricing Project (I-15 FasTrak™ program). Additionally, SANDAG has secured state and federal approval to extend value

pricing to the expanded ML on I-15. Value pricing was included in the environmental impact report (EIR) that was prepared by Caltrans for the ML project. No other state approvals are needed.

3. *Local Legal and Administrative Requirements*

The SANDAG Board of Directors would need to approve any cooperative agreements that would be entered into between SANDAG and FHWA, Caltrans, or other party as a result of the San Diego I-15 Value Pricing Program – VES Pilot Project.

I-15 MANAGED LANES VALUE PRICING - VIOLATION ENFORCEMENT PILOT PROJECT
Work Program Summary

PRE-PROJECT STUDY ACTIVITIES - PHASE I

Task Number	Task Description	Hours	Task Costs		
			SANDAG	Agencies/Consultant	Total
0.1	<u>Organization</u> Establish Policy and Advisory Committees, Project Management	48	\$5,000	\$ -	\$5,000
0.2	<u>Refine Work Plan</u> Refine Implementation Work Plan, Agency Roles, and Agreements	114	\$12,000	\$ -	\$12,000
1.1	<u>Outreach and Marketing Program</u> Establish Baseline Market Data and Market Research Plan; Conduct stakeholder workshops	219	\$8,000	\$15,000	\$23,000
1.2	<u>Concept of Operations</u> Develop concept of VES operations	286	\$ -	\$30,000	\$30,000
2.0	<u>Systems Requirements</u> Develop VES system requirements	381	\$ -	\$40,000	\$40,000
3.1	<u>VES Strategy Analysis</u> Evaluate violation enforcement strategies, Establish violations enforcement policies	190	\$8,000	\$12,000	\$20,000
3.2	<u>VES Technology Trade Studies</u> Trade analysis of available violation enforcement technologies and vendor offerings	190	\$5,000	\$15,000	\$20,000
3.3	<u>Environmental/Transportation Clearance</u> Prepare and Process Environmental and Transportation Clearance	196	\$10,000	\$10,600	\$20,600
Sub-Total Phase I:		1,780	\$48,000	\$122,600	\$170,600

Sources of Phase I Funding	
Local Share (20%)	\$24,520
FHWA Share (80%)	\$98,080
Toll Revenues	\$48,000
	\$170,600

I-15 MANAGED LANES VALUE PRICING - VIOLATION ENFORCEMENT PILOT PROJECT
Work Program Summary

DESIGN, INTEGRATION, AND TESTING - PHASE II-a

Task Number	Task Description	Hours	Task Costs		
			SANDAG	Agencies/Consultant	Total
4.1	<u>Design VES System and Prototypes</u> Develop vehicle eligibility and enforcement decision system	589	\$5,000	\$56,800	\$61,800
4.2	<u>Detailed Component Design</u> Includes design documents and specifications	490	\$5,000	\$46,500	\$51,500
4.3	<u>Develop Proofs of Concept</u> Verification testing and conduct small scale field test	821	\$5,000	\$81,200	\$86,200
4.4	<u>Design Documentation</u> Prepare plans, specifications and detailed cost estimates (PS&E)	952	\$5,000	\$95,000	\$100,000
5.1	<u>Purchase and Install VES Component and Software Systems</u> Procure and install VES subsystem equipment on Stage 1 Managed Lanes	1,976	\$15,000	\$867,500	\$882,500
5.2 - 5.4	<u>Carry Out Pre-Implementation Activities</u> Conduct component, sub-system, and system verification and system validation	95	\$10,000	\$20,900	\$30,900
5.5	<u>Design and Conduct Outreach Program</u> Identify and implement media and public participation strategies.	< - - - Cost Allocation To Be Determined - - - >			\$200,000
Sub-Total Phase II-a:		2,895	\$45,000	\$1,167,900	\$1,412,900

Sources of Phase II Funding	
Local Share (20%)	\$273,580
FHWA Share (80%)	\$1,094,320
Toll Revenues	\$45,000
	\$1,412,900

I-15 MANAGED LANES VALUE PRICING - VIOLATION ENFORCEMENT PILOT PROJECT
Work Program Summary

OPERATION, MONITORING, AND EVALUATION - PHASE II-b

Task Number	Task Description	Hours	Task Costs		
			SANDAG	Agencies/Consultant	Total
6.0	<u>Begin VES Operations</u> Commission VES operations maintenance	1,095	\$115,000	\$15,000	\$130,000
6.1	<u>Administrative Oversight</u> SANDAG and Caltrans project management services.	1,800	\$189,000	\$ -	\$189,000
6.2	<u>Violation Revenues Allocation</u> Allocation of violation revenues for ML improvements and enhanced transit services.	190	\$20,000	\$ -	\$20,000
7.1	<u>Monitor Impacts</u> Monitor and collect operations, traffic, emissions, survey, and ridership data .	< --- Cost Allocation To Be Determined --- >			\$50,000
7.2	<u>Evaluation and Assessment of the Program</u> Evaluate effectiveness of program.	< --- Cost Allocation To Be Determined --- >			\$30,000
7.3	<u>Refinement and Modification of the Program Dimensions</u> Evaluate program operation and recommend changes for future operations.	114	\$12,000	\$ -	\$12,000
Sub-Total Phase II-b:		0	\$336,000	\$15,000	\$431,000

Sources of Phase II Funding	
Local Share (20%)	\$19,000
FHWA Share (80%)	\$76,000
Toll Revenues	\$336,000
	\$431,000

Total Project (Phases I and II):		2,895	\$221,000	\$0	\$1,583,500
---	--	--------------	------------------	------------	--------------------

Sources of Total Project Funding	
Local Share (20%)	\$317,100
FHWA Share (80%)	\$1,268,400
Toll Revenues	\$429,000
	\$2,014,500

I-15 Managed Lanes ETC and VES System Costs
I-15 MANAGED LANES VALUE PRICING PILOT PROJECT
 ETC & VES Subsystems - Preliminary Cost Estimates

DESIGN, ENGINEERING, INTEGRATION & INSTALLATION

ID	Description	Unit Price (\$)	ML Stage 1* System Quantity	ML Stage 1 System Cost (\$)	VES Subsystem Cost (\$)	ETC Subsystem Cost (\$)	FHWA Amount (\$) -- Requested --	Local Share Amount (\$) -- Funded --
1	Typical Main Lane Reader Gantry With Rate Sign	222,500	5	\$ 1,112,500		\$ 1,112,500		\$ 1,112,500
2	Typical BRTC Access Toll Zone With Rate Sign	170,000	2	\$ 340,000		\$ 340,000		\$ 340,000
3	Typical Managed Lanes Toll Zone - Gantry Type	95,000	1	\$ 95,000		\$ 95,000		\$ 95,000
4	Typical Managed Lanes Toll Zone - Bridge Mount	50,000	4	\$ 200,000		\$ 200,000		\$ 200,000
5	Typical Direct Entry/Exit Ramp Reader (2 Lane Cantilever)	47,500	4	\$ 190,000		\$ 190,000		\$ 190,000
6	Typical Direct Entry/Exit Ramp Reader (4 Lane Cantilever)	85,000	0	\$ -		\$ -		\$ -
7	Typical Pole or Gantry Mounted Infrared Video Capture System	16,000	16	\$ 256,000	\$ 256,000		\$ 204,800	\$ 51,200
8	Communications Interface (VES-ETC subsystem controller)	4000	16	\$ 64,000	\$ 64,000		\$ 51,200	\$ 12,800
9	Communications Equipment (Including fiber optic and end equipment)		1	\$ 50,000		\$ 50,000	\$ -	\$ 50,000
10	Central Computer Systems/Servers (ETC & VES)		1	\$ 200,000	\$ 50,000	\$ 150,000	\$ 40,000	\$ 160,000
11	ETC & VES Systems Software and Development		1	\$ 2,000,000	\$ 400,000	\$ 1,600,000	\$ 320,000	\$ 1,680,000
12	Documentation		1	\$ 500,000	\$ 100,000	\$ 400,000	\$ 80,000	\$ 420,000
13	Testing		1	\$ 225,000	\$ 45,000	\$ 180,000	\$ 36,000	\$ 189,000
14	Installation		1	\$ 750,000	\$ 112,500	\$ 637,500	\$ 90,000	\$ 660,000
15	Contingency And Engineering			\$ 1,197,000	\$ 206,000	\$ 991,000	\$ 165,000	\$ 1,032,000
	TOTAL			\$ 7,179,500	\$ 1,233,500	\$ 5,946,000	\$ 987,000	\$ 6,192,500

* I-15 ML Stage 1 is under construction and is part of 3-stage full project

Monitoring and Evaluation – Preliminary Plan

Evaluation Objectives

- Test ML VES
- Verify Vehicle Occupancies
- Verify toll payment
- Verify other eligible users
- Measure impact on users and non-users
- Test and validate automated strategies
- Measure impact of VES on toll revenue and congestion
- Fund BRT and corridor HOV improvements

Evaluation Approach

- Before and After Tiered evaluation
- Measurement of system impacts
- Measurement of Utilization
- Measurement of Acceptance
- Assessment of VES operations
- Assessment of ML operations

Performance Measures

- Level of Service (is it C or better?)
- Toll User volumes
- HOV User volume
- Transit user volume
- Changes in vehicle classification
- Number of citations issued
- Number of violations identified
- Toll revenue

Before / After Data Set

- Traffic counts
- Travel time
- Vehicle Occupancy
- Panel survey of FasTrak users
- Stakeholder interviews
- HOV violation rates
- SOV violation rates
- Ongoing traffic and accident data

Attachment C
VES Pilot Project Workplan

ID	Task Name	Duration	Start	2005				2006				2007				2008				2009			
				Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	
1	EXTERNAL: I-15 MANAGED LANES CONSTRUCTION - STAGE 1	1076 days	Mon 11/17/03	CALTRANS																			
2	I-15 ML Proj Mgr Procurement	141 days?	Mon 08/02/04	[Task Bar]																			
34	I-15 ML Implementation Procurement	150 days?	Tue 02/15/05	[Task Bar]																			
62	I-15 ML Implementation (ETC & VES)	1 day	Tue 09/13/05	[Task Bar]																			
63	Kick Off	1 day	Tue 09/13/05	[Task Bar]																			
64	Phase 1- Definition (Pre-Project Study)	172 days	Wed 09/14/05	[Task Bar]																			
65	1.0 User Needs and Concept of Operations	45 days	Wed 09/14/05	[Task Bar]																			
66	1.1 Market Research and Program	45 days	Wed 09/14/05	[Task Bar] SANDAG/Consultant																			
67	1.2 Develop Concept of Operations	40 days	Wed 09/14/05	[Task Bar] Consultant																			
68	2.0 Develop Systems Requirements	40 days	Wed 11/09/05	[Task Bar] Consultant																			
69	3.0 ETC Strategy and Technology Trade Studies	92 days	Wed 01/04/06	[Task Bar] Consultant																			
70	3.1 Strategy Analysis	22 days	Wed 01/04/06	[Task Bar] Consultant																			
71	3.2 Technology Trade Studies	35 days	Fri 02/03/06	[Task Bar] Consultant																			
72	3.3 Environmental Clearance (if req'd)	35 days	Fri 03/24/06	[Task Bar] SANDAG/Caltrans																			
73	PHASE II-a: DESIGN, INTEGRATION AND TESTING	440 days	Fri 05/12/06	[Task Bar]																			
74	4.0 System Design, Prototyping, and Proofs of Concept	225 days	Fri 05/12/06	[Task Bar]																			
75	4.1 Design System and Prototypes	90 days	Fri 05/12/06	[Task Bar] Vendors																			
76	4.2 Detailed Component Design	75 days	Fri 09/15/06	[Task Bar] Supplier																			
77	4.3 Develop Proofs of Concept	60 days	Fri 12/29/06	[Task Bar] Contractor																			
78	4.4 Design Documentation	60 days	Fri 12/29/06	[Task Bar] Consultant/Contractor																			
79	5.0 Implementation and Acceptance Testing	215 days	Fri 03/23/07	[Task Bar]																			
80	5.1 Purchase and Install Software System	30 days	Fri 03/23/07	[Task Bar] Contractor																			
81	5.2 Component and Sub-system Verification	60 days	Fri 05/04/07	[Task Bar] Consultant																			
82	5.3 System Verification	35 days	Fri 07/27/07	[Task Bar] Consultant																			
83	5.4 System Validation amd Acceptance Testing	90 days	Fri 09/14/07	[Task Bar] Consultant																			
84	5.5 Design and Conduct Outreach Program	90 days	Fri 09/14/07	[Task Bar] SANDAG																			
85	PHASE II-b: OPERATION, MONITORING, AND EVALUATION	254 days	Fri 01/18/08	[Task Bar]																			
86	6.0 Commission System Operations Maintenance	254 days	Fri 01/18/08	[Task Bar]																			
87	6.1 Administrative Oversight	254 days	Fri 01/18/08	[Task Bar] SANDAG																			
88	7.0 Evaluation and Monitoring	202 days	Fri 01/18/08	[Task Bar]																			
89	7.1 Monitor Impacts	120 days	Fri 01/18/08	[Task Bar] SANDAG																			
90	7.2 Evaluation and Assessment of the Program	30 days	Fri 07/04/08	[Task Bar] Consultant																			
91	7.3 Refinement and Modification of the Program Dimensions	30 days	Fri 08/15/08	[Task Bar] SANDAG																			
92	7.4 Close Out	22 days	Fri 09/26/08	[Task Bar] SANDAG																			

Project: VP_VES_Pilot project Sched
Date: Thu 07/15/04

Task: [Blue Box] Progress, [Black Bar] Summary, [Grey Bar] External Tasks, [Green Arrow] Deadline
 Split: [Dotted Line] Milestone, [Black Diamond] Project Summary, [Grey Diamond] External Milestone

DEPARTMENT OF TRANSPORTATION

District 11
2829 Juan Street
P. O. BOX 85406, M.S. 25
San Diego, CA 92110
PHONE (619) 688-6668
FAX (619) 688-3211
TTY (619) 688-3214



*Flex your power!
Be energy efficient!*

July 15, 2004

Susan Lee
Federal Highway Administration (FHWA)
Office of Transportation Policy Studies, HPTS
400 Seventh Street, SW, Room 3324
Washington, DC 20590

Dear Ms. Lee:

The California Department of Transportation (Department) District-11 San Diego Region office is pleased to support the Value Pricing Violation Enforcement Pilot Project proposal submitted by the San Diego Association of Governments (SANDAG) in response to the FHWA Solicitation of Proposals for FY 2004 Value Pricing Program.

The pilot project proposed by SANDAG, addresses a growing concern regarding the efficacy of traditional violation enforcement systems when applied to managed lanes, or high occupancy toll (HOT) lanes. The pilot project proposed by SANDAG would be developed in conjunction with the Department's Interstate-15 (I-15) Managed Lanes project, which began construction in November 2003 with expected completion in January 2007.

SANDAG's proposal would study various violation enforcement systems and would implement a pilot project that will field test the effectiveness of the recommended strategy. The results from the proposed pilot project will be particularly useful to the San Diego region which, in its adopted long-range regional transportation plan, has planned for the development of over 200 lane miles of HOT lanes. The successful implementation and operation of the HOT lanes system is crucial for the region to achieve its mobility goals.

We thank you for the opportunity to submit this letter of support for this exciting pilot project.

Sincerely,

A handwritten signature in black ink, appearing to read "Pedro Orso-Delgado".

PEDRO ORSO-DELGADO
District Director

c: Gary Gallegos, SANDAG



EMERALD PLAZA
402 West Broadway, Suite 1000
San Diego, California 92101-3585
Tel 619.544.1300
www.sdchamber.org

July 15, 2004

Ms. Susan Lee
Federal Highway Administration
Office of Transportation Policy Studies, HPTS
400 Seventh St. SW, Room 3324
Washington, DC 20590

Dear Ms. Lee:

The San Diego Regional Chamber of Commerce is pleased to support the Interstate-15 Managed Lanes Violation Enforcement Pilot Project proposal submitted by the San Diego Association of Governments (SANDAG). SANDAG's application responds to the Federal Highway Administration (FHWA) Solicitation of Proposals for FY 2004 Value Pricing Pilot Program (VPPP). The Chamber represents 3,000 businesses throughout the San Diego region and is actively working to alleviate regional traffic congestion.

The pilot project proposed by SANDAG addresses a growing concern over traditional violation enforcement systems on managed lanes, also referred to as high occupancy toll lanes. The pilot project proposed by SANDAG would be developed in conjunction with the I-15 Managed Lanes project which began construction in November 2003 and will be completed by 2007.

The proposed pilot project will address violation enforcement policies, systems and technologies, and will field-test the efficacy of an enforcement strategy. The results of the study are expected to help agencies and toll operators improve accountability and safety. Effective toll and HOV enforcement are critical to ensuring low vehicle travel-time and operational safety.

The results from the proposed pilot project will be particularly useful to the San Diego region, where there are plans for the development of more than 70 miles of managed lanes. Successful implementation and operation of the managed lanes tolling and enforcement systems are critical for the region to achieve its mobility goals. Paramount to the success of the managed lanes concept is the toll/HOV enforcement policies and supporting systems that enable SANDAG to accurately, reliably, and equitably enforce toll and HOV provisions.

The ability to enforce toll and high occupancy provisions is important to any region that contemplates a mobility management system. This project is important not only to San Diego, but also to other agencies that are contemplating or planning a managed lanes system, and this program could be viewed as a national model.

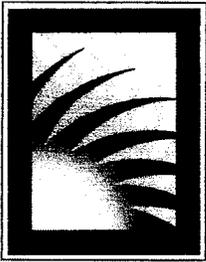
I ask you for your support for this important proposal.

Sincerely,

A handwritten signature in cursive script that reads "Eugene Mitchell".

Eugene "Mitch" Mitchell
Vice President, Public Policy & Communications
San Diego Regional Chamber of Commerce

EM/rjg



401 B Street
Suite 1100
San Diego
CA 92101
619.234.8484

619.234.1935 fax

Ms. Susan Lee
Federal Highway Administration
Office of Transportation Policy Studies, HPTS
400 Seventh St. SW, Room 3324
Washington, DC 20590

Dear Ms. Lee:

The San Diego Regional EDC is pleased to support the Value Pricing Violation Enforcement Pilot Project proposal submitted by the San Diego Association of Governments (SANDAG).

The pilot project proposed by SANDAG addresses a growing concern regarding the efficacy of traditional violation enforcement systems when applied to managed lanes (or high occupancy toll lanes). The pilot project proposed by SANDAG would be developed in conjunction with the I-15 Managed Lanes project which began construction in November 2003 (expected completion in 2007).

The proposed pilot project will address violation enforcement policies, systems, and technologies, and will implement a pilot project that will field test the efficacy of a recommended enforcement strategy. The results of the study are expected to help agencies and toll operators improve toll operations accountability and safety by demonstrating effective violation enforcement policies and technologies for managed lanes.

The results from the proposed pilot project will be particularly useful to the San Diego region that has planned for the development of over 70 miles of managed lanes. Successful implementation and operation of the managed lanes tolling and enforcement systems are critical for the region to achieve its mobility goals. Paramount to the success of the managed lanes concept is the toll/HOV enforcement policies and supporting systems that enable SANDAG to accurately, reliably and equitably enforce toll and HOV provisions, while moving a large volume of traffic at freeway speeds.

We thank you for the opportunity to submit this letter of support for this exciting pilot project.

Sincerely,

W. Erik Bruvold
Vice President, Public Policy