Interstate 15 Violation Enforcement System (VES) Study

Industry Forum
April 25, 2012
INDUSTRY FORUM
HANDOUT PACKAGE LIST

- 01 - Agenda
- 02 - Participants List (Stakeholders + Vendors)
- 03 - Copy of PPT Presentation
- Background Materials
  - San Diego Regional Transportation Network
    - 04 – 2050 Revenue Constrained Highway Network
    - 05 – 2050 Revenue Constrained Transit Network
  - I-15 Express Lanes Facility
    - 06 – I-15 Express Lanes Fact Sheet
    - 07 – I-15 FasTrak Fact Sheet
    - 08 – I-15 Corridor: Express Lanes Map
    - 09 – I-15 Corridor: Bus Rapid Transit Future Service Map
    - 10 – I-15 Strip Chart
MEETING NOTICE AND AGENDA

INTERSTATE 15 HOV/MANAGED LANES VIOLATION ENFORCEMENT STUDY

Industry Forum: Automated High-Occupancy Vehicle Enforcement Applications for HOT Lanes

Wednesday, April 25, 2012

8:00 AM – 4:00 PM

Caltrans District 11 Headquarters
Garcia Auditorium
4050 Taylor Street
San Diego, CA 92110

SANDAG Staff Contact:

Ellison Alegre
(619) 699-0729
eal@sandag.org

This event is open to stakeholders and industry vendors by invitation only.

Caltrans District 11 offices are accessible by public transit. Phone 1-800-COMMUTE or see www.sdcommute.com for route information.
I-15 HOV/ML VIOLATION ENFORCEMENT STUDY
Industry Forum: Automated High-Occupancy Vehicle Enforcement on HOT Lanes

FINAL AGENDA

1. REGISTERATION AND BREAKFAST  8:00 to 8:30 AM

2. WELCOME and INTRODUCTIONS  8:30 to 8:45 AM
   a. Welcome by SANDAG and other agencies
   b. Agenda Overview

3. PROJECT OVERVIEW AND UPDATE  8:45 to 9:30 AM
   a. HOT/HOV Enforcement in San Diego
   b. Project History
   c. Summary of Federal Value Pricing Program (VPP) Efforts
   d. Upcoming Caltrans-funded VES efforts
   e. RFI Process and Results

4. MORNING BREAK  9:30 to 9:45 AM

5. VENDOR ROUNDTABLE  9:45 to 11:15 AM
   a. Vendor Introductions
   b. Panel Discussion – Moderated by Susan Carlson, HNTB
   c. Vendor Perspective on HOV/HOT Lane Enforcement
   d. Q & A

6. VENDOR/STAKEHOLDER SESSIONS  11:15 AM to 12:15 PM
   a. Closed vendor sessions with SANDAG staff
   b. Informal vendor meetings in Garcia Auditorium or Breakout Rooms
      Session 1: 11:15 AM to 12:15 PM (Avego)
      Session 2: 12:15 to 12:45 PM (Axiom xCell)

7. LUNCH  12:15 AM to 12:45 PM

8. VENDOR/STAKEHOLDER MEETINGS (CONTINUED)  12:45 to 3:15 PM
   Session 3: 12:45 to 1:15 (FLIR)
   Session 4: 1:15 to 1:45 (Indra)
   Session 5: 1:45 to 2:15 (Tekasis)
   Session 6: 2:15 to 2:45 (Vehicle Occupancy Detection)
   Session 7: 2:45 to 3:15 (Xerox)

9. NEXT STEPS / RFP PROCESS  3:15 to 3:45 PM
   a. Proposed Request for Proposals (RFP)
   b. RFP Details and Procurement Parameters (M. Bowman, SANDAG)
   c. Q & A

10. CLOSING  3:45 to 4:00 PM
<table>
<thead>
<tr>
<th>Organization</th>
<th>Name</th>
<th>Mailing Address</th>
<th>Phone/Fax</th>
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</tr>
</thead>
<tbody>
<tr>
<td>California Department of Transportation (Caltrans) District 11 Traffic Operations Division</td>
<td>Shahin Sepassi, Senior Transportation Engineer</td>
<td>4050 Taylor Street, MS 230 San Diego, CA 92110</td>
<td>(619) 688-3288</td>
<td><a href="mailto:shahin.sepassi@dot.ca.gov">shahin.sepassi@dot.ca.gov</a></td>
</tr>
<tr>
<td>California Department of Transportation (Caltrans) District 11 TMC</td>
<td>Lima Kopitch, TMC Operations Engineer</td>
<td>7183 Opportunity Rd, MS 58 San Diego, CA 92111</td>
<td>858-467-3203/858-518-3763 Mobile</td>
<td><a href="mailto:lima_kopitch@dot.ca.gov">lima_kopitch@dot.ca.gov</a></td>
</tr>
<tr>
<td>California Department of Transportation (Caltrans) HQ -Division of Traffic Operations, HOV Systems</td>
<td>Joseph Rouse, Program Manager</td>
<td>1120 N Street, MS 36 Sacramento, CA 95814</td>
<td>(916) 654-6448/651-9053 Fax</td>
<td><a href="mailto:jrouse@dot.ca.gov">jrouse@dot.ca.gov</a></td>
</tr>
<tr>
<td>California Highway Patrol (CHP) Border Division San Diego Area</td>
<td>Hal Corbin, Officer</td>
<td>4902 Pacific Highway San Diego, CA 92110</td>
<td>(619) 220-5492</td>
<td><a href="mailto:hcorbin@chp.ca.gov">hcorbin@chp.ca.gov</a></td>
</tr>
<tr>
<td>California Highway Patrol (CHP) HQ Special Projects Section</td>
<td>Martha Vazquez</td>
<td>600 North 7th Street Sacramento, CA 95811</td>
<td></td>
<td></td>
</tr>
<tr>
<td>California Partners for Advanced Transit and Highways (PATH) UC Berkeley</td>
<td>Ching-Yao Chan, Ph.D., P.E. Program Leader Transportation Safety Research</td>
<td>Richmond Field Station 1357 S. 46th Street, Bldg. 452 Richmond, CA 94804-4658</td>
<td>(510) 665-3621/665-3537 Fax</td>
<td><a href="mailto:cychan@path.berkeley.edu">cychan@path.berkeley.edu</a></td>
</tr>
<tr>
<td>CHP HQ Special Projects Section</td>
<td>Megan Bucko, Associate Governmental Program Analyst</td>
<td>601 North 7th Street Sacramento, CA 95811</td>
<td>(916) 843-3365/843-3393 Fax</td>
<td><a href="mailto:mbucko@chp.ca.gov">mbucko@chp.ca.gov</a></td>
</tr>
<tr>
<td>Colorado DOT High-Performance Transportation Enterprise (HPTE)</td>
<td>Kari Grant, HPTE Specialist</td>
<td></td>
<td></td>
<td><a href="mailto:Kari.Grant@dot.state.co.us">Kari.Grant@dot.state.co.us</a></td>
</tr>
<tr>
<td>Colorado DOT High-Performance Transportation Enterprise (HPTE) - Jacobs Engg</td>
<td>Pamela Bailey-Campbell</td>
<td></td>
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<tr>
<td>Florida DOT Sunguide Transportation Management Center</td>
<td>Rory Santana, District ITS Manager</td>
<td>1001 NW 111 Avenue Miami, FL 33172</td>
<td>305 640-7375</td>
<td><a href="mailto:rory.santana@dot.state.fl.us">rory.santana@dot.state.fl.us</a></td>
</tr>
<tr>
<td>GADOT Office of Innovative Program Delivery</td>
<td>Darryl VanMeter, Administrator</td>
<td>600 West Peachtree NW, 27th Floor Atlanta, GA 30308</td>
<td>(404) 631-1703</td>
<td><a href="mailto:dvanmeter@dot.ga.gov">dvanmeter@dot.ga.gov</a></td>
</tr>
<tr>
<td>HNTB Corporation</td>
<td>Jose Mortero, Senior Transportation Planner</td>
<td>200 E. Sandpointe Ave, Suite 200 Santa Ana, CA 92707</td>
<td>(714) 460-1683/460-1610 Fax</td>
<td><a href="mailto:jmortero@hntb.com">jmortero@hntb.com</a></td>
</tr>
<tr>
<td>HNTB Corporation</td>
<td>Susan Carlson, Manager of Toll Facility Planning</td>
<td>Wayne Plaza I, Suite 400 145 Route 46 West Wayne, NJ 07470</td>
<td>(203) 259-6280/237-9185 Fax</td>
<td><a href="mailto:scarlison@hntb.com">scarlison@hntb.com</a></td>
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<tr>
<td>Illinois State Highway Toll Authority (ISTHA)</td>
<td>Michael Catolico</td>
<td>2700 Ogden Ave Downers Grove, IL 60515</td>
<td>(630) 241-6800 x2149</td>
<td><a href="mailto:mcatolico@getipass.com">mcatolico@getipass.com</a></td>
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<td>(630) 241-6109 Fax</td>
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<td>(630) 461-8877 Mobile</td>
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<tr>
<td>Los Angeles Metro</td>
<td>Elba Higueros</td>
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<tr>
<td>Los Angeles Metro</td>
<td>Kathleen McCune</td>
<td></td>
<td></td>
<td><a href="mailto:MCCUNEK@metro.net">MCCUNEK@metro.net</a></td>
</tr>
<tr>
<td>Los Angeles Metro</td>
<td>Megan Nangle</td>
<td></td>
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</tr>
<tr>
<td>METRO Department of Infrastructure and Service Development</td>
<td>Nader Mirjamali, P.E.</td>
<td>1900 Main P.O. Box 61429 Houston, TX 77208</td>
<td>(713) 652-4375</td>
<td><a href="mailto:Nader.Mirjamali@ridemetro.org">Nader.Mirjamali@ridemetro.org</a></td>
</tr>
<tr>
<td>Orange County Transportation Authority (OCTA)</td>
<td>Ellen Lee</td>
<td>550 S. Main St. P.O. Box 14184 Orange, CA 92863-1584</td>
<td>(714) 560-5988</td>
<td><a href="mailto:elee@octa.net">elee@octa.net</a></td>
</tr>
<tr>
<td>Orange County Transportation Authority (OCTA)</td>
<td>Gary Hausdorfer</td>
<td></td>
<td></td>
<td><a href="mailto:ghausdorfer@cofirouteusa.com">ghausdorfer@cofirouteusa.com</a></td>
</tr>
<tr>
<td>Orange County Transportation Authority (OCTA)</td>
<td>Ryan Young</td>
<td></td>
<td></td>
<td><a href="mailto:ryoung@cofirouteusa.com">ryoung@cofirouteusa.com</a></td>
</tr>
<tr>
<td>Riverside County Transportation Commission (RCTC)</td>
<td>Joel Haven</td>
<td>110 West &quot;A&quot; Street, Suite 1050 San Diego, California 92101</td>
<td></td>
<td><a href="mailto:joel.haven@parsons.com">joel.haven@parsons.com</a></td>
</tr>
<tr>
<td>SANDAG</td>
<td>Alexander Lukes</td>
<td></td>
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<tr>
<td>SANDAG</td>
<td>Marilyn Bowman</td>
<td>SANDAG 401 B Street, Suite 800, San Diego, California 92101</td>
<td></td>
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</tr>
<tr>
<td>SANDAG</td>
<td>Ingrid Weisenbach,</td>
<td>SANDAG 401 B Street, Suite 800, San Diego, California 92101</td>
<td>(619) 699-6920</td>
<td><a href="mailto:Ingrid.Weisenbach@sandag.org">Ingrid.Weisenbach@sandag.org</a></td>
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<tr>
<td>SANDAG</td>
<td>Associate Transportation Planner</td>
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<tr>
<td>SANDAG</td>
<td>Dan Martin,</td>
<td>SANDAG 401 B Street, Suite 800, San Diego, California 92101</td>
<td>(619) 699-6987</td>
<td><a href="mailto:Dan.Martin@sandag.org">Dan.Martin@sandag.org</a></td>
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<td>Mobility Management /iCommute</td>
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<tr>
<td>SANDAG Intelligent Transportation Systems (ITS)</td>
<td>James Dreisbach-Towle</td>
<td>SANDAG 401 B Street, Suite 800, San Diego, CA</td>
<td>(619) 699-6987</td>
<td><a href="mailto:iib@sandag.org">iib@sandag.org</a></td>
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<td>92101</td>
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<tr>
<td>SANDAG Intelligent Transportation Systems (ITS)</td>
<td>Samuel Johnson, ITS Chief Technology Officer</td>
<td>SANDAG 401 B Street, Suite 800, San Diego, CA 92101</td>
<td>(619) 699-6958 (619) 699-4865 Fax</td>
<td><a href="mailto:sjc@sandag.org">sjc@sandag.org</a></td>
</tr>
<tr>
<td>SANDAG Mobility Management &amp; Project Implementation</td>
<td>Ellison Alegre, Project Manager</td>
<td>SANDAG 401 B Street, Suite 800, San Diego, CA 92101</td>
<td>(619) 699-0729 (619) 699-4867 Fax</td>
<td><a href="mailto:eal@sandag.org">eal@sandag.org</a></td>
</tr>
<tr>
<td>Texas Transportation Institute (TTI)</td>
<td>Ginger Goodin, Senior Research Engineer</td>
<td>1106 Clayton Lane, Ste. 300E Austin, TX 78723</td>
<td>(512) 467-0946 (512) 467-8971 Fax</td>
<td><a href="mailto:j-goodin@tamu.edu">j-goodin@tamu.edu</a></td>
</tr>
<tr>
<td>Washington State Department of Transportation Urban Corridors Office</td>
<td>Patty Rubstello, P.E. Director, Toll Systems Engineering</td>
<td>310 Maple Park Avenue SE PO Box 47300 Olympia WA 98504-7300</td>
<td>(206) 464 1299</td>
<td><a href="mailto:rubstep@wsdot.wa.gov">rubstep@wsdot.wa.gov</a></td>
</tr>
<tr>
<td>Avego Corporation</td>
<td>Leon Wong, Solutions Engineer</td>
<td>5669 Snell Ave #250 San Jose, CA 95123</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avego Corporation</td>
<td>Paul Steinberg, Director of Americas</td>
<td>5669 Snell Ave #250 San Jose, CA 95123</td>
<td>408-540-9942</td>
<td><a href="mailto:paul.steinberg@avego.com">paul.steinberg@avego.com</a></td>
</tr>
<tr>
<td>AxiomCell</td>
<td>Ray Traynor</td>
<td>3944 Murphy Canyon Road, Suite C-107 San Diego, CA 92123</td>
<td>858-717-9431 858-876-1662 Fax</td>
<td><a href="mailto:ray@axiomxcell.com">ray@axiomxcell.com</a></td>
</tr>
<tr>
<td>FLIR Systems Inc. Traffic and ITS Markets</td>
<td>Art Stout</td>
<td>27700 SW Parkway Ave Wilsonville, OR 97070</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indra USA Inc. Traffic &amp; Transportation USA</td>
<td>Dan Dietrich, Business Development Manager</td>
<td>27700 SW Parkway Ave Wilsonville, OR 97070</td>
<td>775-815-8481</td>
<td><a href="mailto:dan.dietrich@flir.com">dan.dietrich@flir.com</a></td>
</tr>
<tr>
<td>Indra USA Inc. Traffic &amp; Transportation USA</td>
<td>Mark Rocky</td>
<td></td>
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</tr>
<tr>
<td>Indra USA Inc. Traffic &amp; Transportation USA</td>
<td>William Martinez, Director of Business Development</td>
<td>800 Brickell Avenue Suite 1270 Miami, FL 33131</td>
<td></td>
<td><a href="mailto:wmartinez@indrausa.com">wmartinez@indrausa.com</a></td>
</tr>
<tr>
<td>Tekasis Inc.</td>
<td>JD Margulici</td>
<td>2784 Homestead Road #160 Santa Clara, CA 95051</td>
<td>510-978-1150</td>
<td><a href="mailto:jd@tekasis.com">jd@tekasis.com</a></td>
</tr>
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<tr>
<td>Vehicle Occupancy Detection Company, LLC</td>
<td>Kenneth Brown</td>
<td>120 Sea View Drive San Rafael, CA 94901</td>
<td>415-258-9777</td>
<td><a href="mailto:KenBrown120@gmail.com">KenBrown120@gmail.com</a></td>
</tr>
<tr>
<td>Xerox Corporation</td>
<td>Abu Islam</td>
<td>12410 Milestone Center Drive, 4th Floor Germantown, MD 20876</td>
<td>714-672-9159</td>
<td></td>
</tr>
<tr>
<td>Xerox Corporation</td>
<td>Marc Delfin, Vice President, Sales</td>
<td>12410 Milestone Center Drive, 4th Floor Germantown, MD 20876</td>
<td>714-672-9159</td>
<td><a href="mailto:marc.delfin@acs-inc.com">marc.delfin@acs-inc.com</a></td>
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Legend:
- Video-conference
- Vendor
Interstate 15 Violation Enforcement System (VES) Study

Industry Forum
April 25, 2012
2050 RTP/SCS

- $214B Regional Transportation Plan & Sustainable Communities Strategy
- First RTP under state’s Greenhouse Gas legislation
- Highway Emphasis on Managed Lanes
- System/Demand Management
- Innovative Pricing Policies

Maximize Technology
I-15 Corridor Projects

- High-Occupancy Toll Lanes
- Bus Rapid Transit Service and Transit Centers
- Integrated Corridor Management (ICM)
- Electronic Toll Collection (ETC)
- Violation Enforcement System (VES)

I-15 Express Lanes

Key Features
- 20 miles/4 lanes
- HOV 2+ free
- Moveable barrier-up to 3X1 configuration
- Dynamic pricing
- Intermediate access points (IAPs) about every two miles
- Four direct access ramps (DARs)

Final Segment Opened to Traffic January 2012
I-15 Express Lanes Features

Typical Sign

Moveable Barrier in 2X2

I-15 Express Lane Features

Typical Mainline Gantry Configuration
I-15 Express Lane Features
Direct Access Ramp

- Part time enforcement by CHP
- 4 lanes of traffic over 20 miles
- Increased ingress/egress through IAPs and DARs
-Violation rates estimated at 5-15%
VES Project Overview

- Pilot study funded by U.S. DOT
- Research and test potential vehicle occupancy enforcement strategies and techniques
- Select appropriate technologies for the I-15 Express Lanes
- Project stakeholders nationwide

VES Project Tasks

- Enforcement Strategies (2006)
- Marketing and Outreach (2008)
- Technology Assessment I (2010-11)
- Enforcement Technologies & Strategies Update (2012)
- Technology Assessment II (2012-13)
Enforcement Concepts & Technologies

- Portable Enforcement Devices
- License Plate Enforcement
- HOV Transponders
- Occupancy Sensors
- Enforcement Gantry Light
- Infrared Image Occupancy Detection

Enforcement Strategies

Reliance On Manual Enforcement

MORE RELIANT  LESS RELIANT

- Routine Enforcement (CHP)
- Strategy 1: Technological Aids for Law Enforcement
- Strategy 2: Automated Toll & Manual Occupancy
- Strategy 3: Fully-Automated Enforcement
VES Outreach Program

- **Focus Groups**
  - Carpoolers, FasTrak customers, I-15 users
- **Stakeholder Interviews**
  - HOT Lane operators, State DOTs, MPOs
- **Telephone Survey**
  - Corridor residents, regular I-15 commuters
- **Intercept Surveys**
  - Express Bus Riders, Park & Ride users

Technical Assessment

- **2009 Request for Proposals**
- **Vendors invited to demonstrate enforcement technologies on I-15**
- **dtect system by Vehicle Occupancy Limited (UK) selected for testing**
- **Delcan served as system integrator**
- **Automated occupancy verification system**
Field Operational Testing

Controlled Test Results

- 552 data points collected
- \textit{dtect} system did not meet performance requirements
- 14\% to 20\% accuracy
- Higher accuracy…
  - during daytime hours
  - for SUVs
  - at speed ~40 mph
Post-FOT Efforts

- Reports by Delcan, SANDAG, and California PATH completed in June 2011
- Assess the current state of vehicle occupancy detection technology
- Conduct industry outreach
- Outreach to HOT lane stakeholders in California and beyond
- Request for Information & Industry Forum

Interstate 15 Violation Enforcement System (VES) Study

Industry Forum
April 25, 2012
Figure 1.1
2050 Revenue Constrained Transit Network
October 2011

- High Speed Rail *
- Commuter Rail
- Light Rail Transit (LRT)
- Express LRT
- Bus Rapid Transit (BRT)
- Peak Period BRT
- Streetcar
- Rapid Bus
- Local Bus

* High Speed Rail alignment based on the California High Speed Rail Authority’s 2005 Statewide Programmatic EIR/GIS preferred route.
I-15 EXPRESS LANES
FACT SHEET

The Project
The Interstate 15 (I-15) Express Lanes run for 20 miles, from State Route 163 (SR 163) in San Diego to State Route 78 (SR 78) in Escondido. This project features four lanes and replaces the previous eight-mile, two-lane Express Lanes, which opened in 1988.

The new improvements feature a movable barrier (similar to the ones on the San Diego-Coronado Bridge), which allows Caltrans to make up to three lanes available to drivers during rush hours in the peak direction; multiple access points to general purpose highway lanes; and direct access ramps for transit, carpools, vanpools, motorcycles, permitted clean air vehicles, and solo drivers in the FasTrak program who choose to pay a toll via a transponder to use the lanes.

A new high-frequency express bus system, known as Bus Rapid Transit (BRT), the first of its kind in San Diego, will operate in these lanes in early 2013.

The I-15 Express Lanes are free for carpools, vanpools, and buses. Solo drivers are charged a fee on a per mile basis, calculated based on traffic conditions.

The Need
The average daily traffic on I-15 ranges from 197,000 to 312,000 vehicles. Before work began on the Express Lanes project in 2003,

(Continued on reverse)
travelers on the I-15 experienced lengthy delays due to increased traffic. On average, those delays added 30 to 45 minutes to commute times. By 2020, projections showed commuting delays from 80 to 90 minutes if improvements were not made. The I-15 FasTrak program successfully demonstrates that value pricing can be an effective tool for increasing use of Express Lanes while maintaining free-flow conditions on them.

**Project Costs**
The total costs for the freeway improvements and the transit elements of the I-15 Express Lanes are about $1.3 billion.

**Project Status**
The Express Lanes, which were constructed in three segments (See map on the front page), are now open and fully operational.

The Middle Segment opened to traffic in two phases. The first phase, from State Route (SR 56) to Rancho Bernardo Road, opened in September 2008. The second phase, from Rancho Bernardo Road to Centre City Parkway, opened in early 2009. The South Segment, from SR 163 to SR 56, opened in June 2011. The North Segment, from Centre City Parkway to SR 78, opened in January 2012.

I-15 Express Lanes include:

» A movable barrier that allows up to three Express Lanes to be open between SR 163 and the Del Lago Transit Station. The additional lane is used to help ease traffic demand in peak directions, as well as to counter delays if an accident or emergency occurs on the freeway.

» Nine direct access points to and from the general purpose lanes in each direction, as well as four direct access ramps from transit stations along the I-15.

» Electronic tolling signs that provide information on FasTrak toll rates, as well as the estimated length of time it takes to get to various locations.

**Funding Status**
The project was built with funding from a variety of sources, including:

» $338 million in regional TransNet sales tax funds

» $327 million from the Corridor Mobility Improvement Account, created as part of Proposition 1B approved by California voters in November 7, 2006

» $269 million from the State Transportation Improvement Program

» $118 million from the federal Congestion Mitigation and Air Quality Improvement Program

» $4.7 million in Congressional appropriations from FY 2004, FY 2005, and FY 2006

» $5 million from SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users), administered by the Federal Highway Administration.
I-15 Express Lanes Fact Sheet

I-15 Express Lanes: The I-15 Express Lanes are an innovative “expressway within a freeway” that by 2012 will stretch 20 miles from SR 163 to SR 78 and will revolutionize the way our local highway system is utilized and operated. The Express Lanes are the first adaptable, high-tech transportation facility configured to meet the diverse needs of commuters and commerce throughout the San Diego region.

Developed by: San Diego Association of Governments (SANDAG) and California Department of Transportation (Caltrans)

Background: 1988: The Express Lanes opened originally as an 8-mile, reversible high-occupancy vehicle (HOV) expressway. 1998: The High Occupancy Toll (HOT) element of the lanes was added. 2009: A new 8-mile section of sophisticated Express Lanes was completed that includes four lanes situated in the middle of I-15.

Features: The new 8-mile section extension offers drivers who choose to use the Express Lanes:
• Multiple access points and direct access ramps for greater accessibility to the lanes
• Three transit centers open at Sabre Springs Parkway/Peñasquitos, Rancho Bernardo Road and Del Lago Boulevard (North County Fair). There will be a total of five stations when the facility is completed.
• Access for transit riders and carpoolers to Park and Ride lots conveniently located next to the transit centers which are served by five MTS Commuter Express bus routes (810, 820, 850, 860 and 880)
• Four new Express Lanes – two southbound and two northbound
• 24/7 operation

Who Can Use the Lanes: • Carpools, vanpools, motorcycles, transit, and approved clean air vehicles can use the lanes free of charge.
• Solo drivers with a FasTrak® prepaid toll account

Forward-Thinking Features: • The Express Lanes project not only goes beyond the HOV lanes concept, it is in a league of its own. Referred to by engineers as “managed lanes,” the I-15 Express Lanes were designed to provide a platform for new technology, including future traffic management technology and new communication technology being installed in vehicles that allows vehicles to communicate with roadside systems.
• The Express Lanes feature a sophisticated congestion pricing system that varies tolls for solo commuters based on distance traveled and the amount of congestion in the Express Lanes. FasTrak customers accessing the Express Lanes pay a toll based on the distance they travel in the lanes and a rate per mile for their entry location. Every few minutes, the system recalculates the per-mile toll rate based on the level of traffic in the I-15 corridor, ensuring traffic flows freely in the Express Lanes.
• The Express Lanes include a moveable barrier that allows for expansion or contraction of northbound and southbound lanes, thus providing maximum flexibility to meet both the region’s current needs and to accommodate future growth.
Project Completion
Timeline:
Opening 2011:
• 4 miles extending north from Centre City Parkway to SR 78.
Opening 2012:
• The original, 8-mile section of Express Lanes will reopen with two additional lanes, more access points and modern traffic management technology.
• Bus Rapid Transit will launch with new buses and high-speed transit connections along the I-15 corridor to downtown San Diego.

Other I-15 Enhancements:
The I-15 corridor has undergone a spectacular transformation during the last six years. The expansion and enhancements include:
• Auxiliary lanes and general purpose lanes on I-15 from Miramar to Escondido
• New bridges at SR 56/Ted Williams Parkway, Rancho Bernardo Road, Lake Hodges, Pomerado Road, and Carmel Mountain Road
• Widening of Camino del Norte, Rancho Bernardo Road, and the Peñasquitos Creek bridges

Express Lanes Funding:
• In part by TransNet, the local half-cent sales tax for transportation
• $350 million from the Corridor Mobility Improvement Account (funded by Proposition 1B)
• $50 million in State Transportation Improvement Program funds from the California Transportation Commission
• $280 million in federal funding

Project Cost:
The cost at completion is expected to be $1.3 billion.

About SANDAG:
The San Diego Association of Governments (SANDAG) is the San Diego region’s primary public planning, transportation, and research agency providing the public forum for regional policy decisions about growth, transportation planning and construction, environmental management, housing, open space, energy, public safety and national topics. SANDAG is governed by a board of directors composed of mayors, council members and supervisors from each of the region’s 18 cities and the county government.

About Caltrans District 11:
District 11 oversees approximately 1,000 miles of freeway and highway, both urban and rural. The district also is involved with local agencies to develop a diverse multimodal transportation system including light rail, transit, commuter rail and high-occupancy vehicle programs and facilities. The district staff includes some 1,400 employees in a variety of functions.
I-15 Corridor: Express Lanes

A Freeway within a Freeway. Four express lanes are located in the middle of the I-15 extending 20 miles from State Route 78 in Escondido to State Route 163 in San Diego. Every two to three miles, entrances and exits have been constructed for travelers to move on and off the main lanes to the Express Lanes. Carpool, vanpool, motorcycles, public transit vehicles, and certain permitted clean air vehicles can use the Express Lanes free of charge. Single-occupant vehicles can also use the Express Lanes when they have a FastRak® pass to electronically collect tolls.

Legend
- Interstate Highways
- State Route Highways
- Major Arterials
- I-15 Express Lanes
- SPRINTER Line and Stations
- Premium Express Bus Routes
- Park & Ride Lots
- Direct Access Ramps (DAR)
- Bus Rapid Transit Stations / Center
- Flyover Ramps
- Northbound Intermediate Access Points (IAP)
- Southbound Intermediate Access Points (IAP)
- Express Lanes Entrance Only
- Express Lanes Exit Only
- Future Construction

Date: 1.12.12
Bus Rapid Transit (BRT) Facts

In 2013, a Bus Rapid Transit (BRT) system will begin running on the I-15 Express Lanes. This new high-frequency express bus service, the first of its kind in San Diego, will be more reliable and convenient, similar to the services of a light rail system. Other regional freeways to undergo Express Lanes improvements will also support BRT systems, creating a vast network of quick and efficient public transit throughout the region. In the future, services may extend to Riverside County.

### BRT Service
- Beginning in 2013
- Offering 27 new buses for service start
- Providing higher frequency service and longer hours of service
- Linking North County communities via I-15 with key regional destinations

### Facilities
**I-15 Express Lanes Corridor:**
- 20-miles of Express Lanes on I-15 between SR 78 and SR 163
- 5 Direct Access Ramps (DARs) to BRT stations
- 5 freeway BRT stations:
  - Escondido Transit Center - Operational
  - Del Lago Transit Station - 2012
  - Rancho Bernardo Transit Station - 2012
  - Sabre Springs/Peñasquitos Transit Station - 2012
  - Miramar College Transit Station - 2013
  - (Mira Mesa Direct Access Ramp - 2014)

**Regional Destinations**
- **Mid City – BRT Freeway Stations:**
  - The Boulevard Transit Plaza on El Cajon Boulevard
  - City Heights Transit Plaza on University Avenue

- **Downtown San Diego Stops:**
  - All day, all stops, and peak period express
  - Along Broadway
  - Terminus at Santa Fe Depot

- **Sorrento Mesa, UTC and UCSD Stops:**
  - All day, all stops, and peak period express
  - Sorrento Mesa Area along Mira Mesa Boulevard
  - At La Jolla Village Drive/UTC
  - At SDSU Transit Station

**Kearny Mesa Stops:**
- Along Clairemont Mesa Boulevard

### Funding
- I-15 BRT operations are funded by the TransNet Extension Ordinance approved by San Diego County voters in 2004