



## THE SECRETARY OF TRANSPORTATION

WASHINGTON, DC 20590

October 14, 2014

The Honorable Bill Shuster  
Chairman  
Committee on Transportation and Infrastructure  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

I am pleased to send you the 2014 Report to Congress on the Value Pricing Pilot Program (VPPP). This report updates the VPPP activities, highlights some key projects and findings, discusses lessons learned on projects implemented over the last 2 fiscal years (FY), and presents some key programmatic activities that the Federal Highway Administration (FHWA) will support to help advance congestion pricing projects at the State and local levels.

The Moving Ahead for Progress in the 21st Century Act did not authorize additional funds after FY 2012 for the discretionary grant component of the VPPP. However, FHWA's ability to enter into cooperative agreements for projects that require tolling authority under this program for their implementation will continue. The statute continues the requirement that the Secretary monitor VPPP projects and report on the effects of the pilot programs.

According to the statutory requirements of VPPP, the FHWA may enter into cooperative agreements with up to 15 State or local governments or other public authorities to establish, maintain, and monitor value pricing pilot programs. Currently, there are 12 State-led programs and 2 city-led programs participating in the VPPP: California, Connecticut, Florida, Illinois, Maryland, Minnesota, New Jersey, North Carolina, Oregon, Texas, Virginia, Washington State, New York City, and the District of Columbia.

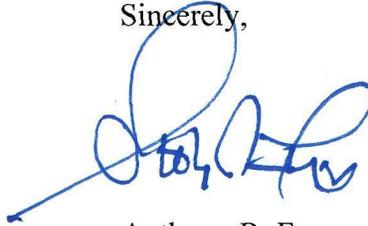
The U.S. Department of Transportation continues to focus extensive efforts on addressing traffic congestion problems. With outreach programs and technical assistance efforts of FHWA, the Department will provide many States with the information and resources needed to reduce traffic congestion through contemporary approaches to congestion pricing.

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The Honorable Bill Shuster

I have sent a similar letter to the Ranking Member of the House Committee on Transportation and Infrastructure and to the Chairman and Ranking Member of the Senate Committee on Environment and Public Works.

Sincerely,

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Anthony R. Foxx

Enclosure



## THE SECRETARY OF TRANSPORTATION

WASHINGTON, DC 20590

October 14, 2014

The Honorable Nick J. Rahall, II  
Ranking Member  
Committee on Transportation and Infrastructure  
U.S. House of Representatives  
Washington, DC 20515

Dear Congressman Rahall:

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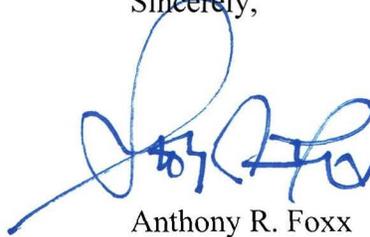
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Anthony R. Foxx

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## THE SECRETARY OF TRANSPORTATION

WASHINGTON, DC 20590

October 14, 2014

The Honorable David Vitter  
Ranking Member  
Committee on Environment and Public Works  
United States Senate  
Washington, DC 20510

Dear Senator Vitter:

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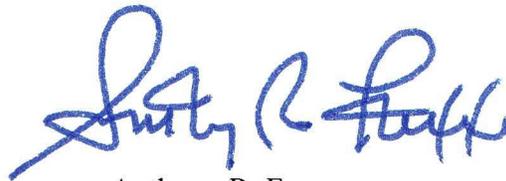
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Anthony R. Fox

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## THE SECRETARY OF TRANSPORTATION

WASHINGTON, DC 20590

October 14, 2014

The Honorable Barbara Boxer  
Chairman  
Committee on Environment and Public Works  
United States Senate  
Washington, DC 20510

Dear Chairman Boxer:

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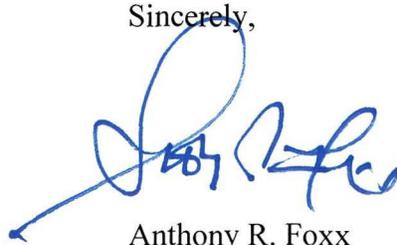
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Anthony R. Foxx

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**Report on the  
Value Pricing Pilot Program  
Through April 2014**

U.S. Department of Transportation  
Federal Highway Administration

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## List of Acronyms and Abbreviations

BTL	Bus Toll Lane
BRT	Bus Rapid Transit
CRD	Congestion Reduction Demonstration
DOT	U.S. Department of Transportation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GPS	Global Positioning System
HOT	High Occupancy Toll
HOV	High Occupancy Vehicle
ITS	Intelligent Transportation Systems
JPO	Joint Program Office
LA	Los Angeles
Marq2	Marquette and Second Avenue
MAP-21	Moving Ahead for Progress in the 21 <sup>st</sup> Century Act
MBUF	Mileage-Based User Fee
MnDOT	Minnesota DOT
MnPASS	Minnesota Electronic Toll Operation System
MPO	Metropolitan Planning Organization
NCHRP	National Cooperative Highway Research Program
NCTCOG	North Central Texas Council of Governments
NEF	National Evaluation Framework
NFC	Near Field Communications
OST	Office of the Secretary
ODOT	Oregon Department of Transportation
P2P	Peer-to-Peer
PAYDI	Pay As You Drive Insurance
PDSL	Priced Dynamic Shoulder Lane
PPP	Public-Private Partnership
PSRC	Puget Sound Regional Council
RTP	Regional Transportation Plan
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SANDAG	San Diego Association of Governments

SFMTC	San Francisco Metropolitan Transportation Coalition
SFMTA	San Francisco Municipal Transportation Agency
TxDOT	Texas Department of Transportation
TEA-21	Transportation Equity Act for the 21st Century
TRB	Transportation Research Board
UDOT	Utah Department of Transportation
UPA	Urban Partnership Agreement
VMT	Vehicle Miles Traveled
VPPP	Value Pricing Pilot Program
WSDOT	Washington State Department of Transportation

## Executive Summary

The U.S. Congress established the Congestion Pricing Pilot Program in 1991. It was subsequently renamed the Value Pricing Pilot Program (VPPP) under Section 1216 (a) of the Transportation Equity Act for the 21<sup>st</sup> Century in 1998, and continued through Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users. The Moving Ahead for Progress in the 21st Century Act (MAP-21 did not authorize additional funds after FY 2012 for the discretionary grant component of the VPPP.

A more commonly used term for "value pricing" is "congestion pricing." Congestion pricing can reduce peak period congestion by charging motorists new or higher fees for use of roads during peak times in order to encourage drivers to shift to other travel modes, routes or destinations; to travel at other times of the day; or to forgo making the trip altogether.

The purpose of the VPPP is to demonstrate whether, and to what extent, roadway congestion may be reduced through the application of congestion pricing strategies. The program seeks to measure the magnitude of the impact of such strategies on driver behavior, traffic volumes, transit ridership, air quality and availability of funds for transportation programs. Fiscal Year (FY) 2012 was the final year in which funding was available to solicit projects. Although MAP-21 did not authorize additional funds after FY 2012 for the discretionary grant component of the VPPP, the Federal Highway Administration (FHWA) may still enter into cooperative agreements for projects that require tolling authority under this program for their implementation. While the program no longer actively solicits projects, staff continues to provide technical assistance in project development, execution and evaluation, including implementation and pre-implementation. Staff also oversees the development and distribution of quarterly reports detailing how the objectives of the Value Pricing Pilot Program have been achieved.

Value Pricing projects continue to demonstrate the technical feasibility of pricing and have changed travel behavior. Priced lanes have also proven that many travelers are happy to have the option of paying for a guaranteed reliable trip. Furthermore, the VPPP's support of innovative congestion reduction strategies through the deployment of priced facilities has created more efficient use of the transportation network that offers citizens the opportunity to reach services and jobs.

### Key Findings

Projects and studies conducted as part of the VPPP have provided many valuable lessons, but six key findings demonstrate the significant progress made in the past few years toward successful deployment of comprehensive congestion pricing strategies and programs:

- The success of pilot-scale implementation of stand-alone managed lane facilities has led the industry to develop extensive managed lane networks in several major metro areas.

- Pricing of existing roadway facilities is being explored with careful planning and public involvement.
- Parking pricing and management strategies help balance parking supply and demand.
- Priced vehicle sharing and dynamic ridesharing strategies are helping to reduce auto ownership and usage.
- Distance-based pricing projects are encouraging drivers to be more efficient in trip making and reducing driving at congested times and places.
- States and regions are making pricing increasingly central to their long-range planning processes.

***The success of pilot-scale implementation of stand-alone managed lane facilities has led the industry to develop extensive managed lane networks in several major metro areas.***

The expansion of managed lanes from single facilities and corridors to networks, including new finance mechanisms to support network development is an important industry trend. It promises not only expansion of efficient pricing strategies for managing congestion but new revenue sources to supplant or supplement traditional sources that many States and regions are finding to be inadequate for meeting current and future transportation needs.

Managed Lane systems linking multiple facilities, some with hundreds of miles in the network, are in various stages of planning and development including:

- Miami/Fort Lauderdale
- Atlanta metro area
- Washington D.C. area, including Virginia and Maryland
- San Francisco Bay area
- Los Angeles metro area, including Riverside, Orange, San Bernardino, and Los Angeles Counties
- Dallas/Fort Worth region
- Houston metro area
- San Diego metro area
- Seattle/Puget Sound region

Accompanying several projects are innovative finance mechanisms. Three mechanisms are being used to procure and develop projects: (1) design-build (procuring agency assumes traffic, operations and maintenance cost and revenue risk), (2) toll concession (concession company assumes these risks), and (3) availability-pay concession (procuring agency bears traffic and revenue risk with the concession company assuming operations and maintenance cost risks).

***Pricing of existing roadway facilities is being explored with careful planning and public involvement.***

Many roads and bridges in the Nation, tolled or not, are in need of rehabilitation or replacement and new or revised tolling schemes for such facilities promise both aid in financing improvements and managing traffic flows to minimize future congestion. Furthermore, as

acceptability research in pricing suggests, decisionmakers and the public will support pricing of existing facilities where revenues are devoted to improvements on the facility and accompanying services such as improved transit. Support also hinges on public trust in the operating agency, good enforcement against violators and efficient, secure payment made possible with electronic systems and privacy safeguards.

New pricing on existing non-tolled facilities coupled with major improvements or rehabilitation has potential to help with these funding shortfalls. One early example of successfully applying this strategy is tolling of the SR 520 floating bridge in the Puget Sound region coupled with widening and replacing the facility. The Connecticut Department of Transportation may follow suit in the future, and the Department is studying pricing of an existing elevated section of I-84 in the city of Hartford, both to aid in financing major rehabilitation/replacement, and to manage traffic flow. Another category of pricing on existing facilities is variable tolls on fixed toll roads, including raising peak period tolls or discounting off-peak tolls. The following are examples of past projects supported by the VPPP: variable pricing on the Cape Coral Bridge and Midpoint Memorial toll bridges in Lee County, Florida; variable pricing on the New Jersey Turnpike, the Port Authority of NY and NJ's Interstate bridges and tunnels between New York City and New Jersey; and variable truck tolls on the Illinois Tollway.

***Parking pricing and management strategies help balance parking supply and demand.***

Extensive analyses of parking data, coupled with recent technological advances have allowed cities to apply market driven prices for on and off-street parking assets. As a result, they have succeeded in reducing urban traffic congestion caused by vehicles circling the block to find parking. Several examples of programs applying varying strategies are underway:

- Stanford University is varying pricing by location and demand coupled with off-peak commuting incentives to reduce excessive parking and travel demand.
- San Francisco is varying on and off street parking rates by demand to get best use of supplies, coupled with smartphone information on real time demand to help parkers find available parking. (Berkeley is beginning a similar program.)
- King County WA is reducing oversupply of parking at residential developments coupled with encouragements for non-auto modes.
- Seattle is encouraging better use of commercial parking through a combination of pricing, smartphone reservation and easy payment system.

***Priced vehicle sharing and dynamic ridesharing strategies are helping to reduce auto ownership and usage.***

Priced vehicle sharing and dynamic ridesharing programs, in combination with other congestion pricing, transit/high occupancy vehicle (HOV), and parking pricing strategies, are helping reduce auto ownership and usage. Many programs are based upon fixed pricing; however, some are exploring introducing market-driven variable pricing. The FHWA has the opportunity to continue to assist these programs to innovate and find optimal strategies to reduce traffic congestion.

Carsharing has become commercially viable in many U.S. cities. Innovation and competition among for-profit operators has driven significant progress in the industry in the past few years. Similarly, bikesharing programs have emerged in many U.S. cities, operating under a few different models including public agency operator, non-profit, and for-profit.

Dynamic ridesharing programs have flourished in many heavy commute corridors, as an alternative to driving alone and mass transit. The proliferation of smart phones has enabled real-time ride matching among potential drivers and riders where current traffic congestion and transit loads can influence participation by both parties. This can help to ease peak period usage of transit and roadways, delaying the need for the expense of major capacity improvements.

***Distance-based pricing projects are encouraging drivers to be more efficient in trip making and reducing driving at congested times and places.***

Distance-based insurance and leasing programs convert some of the fixed costs of owning and operating a vehicle to variable costs thereby altering vehicle use. In pilot projects, vehicle miles traveled programs have shown the potential to stabilize transportation revenue streams by charging by the mile instead of flat taxes and per gallon taxes. These programs are in line with national, State and local goals for reducing emissions and traffic congestion and respond to the growing interest in alternative transportation financing. Mileage fees are not only applicable locally or regionally, but have potential at the State and national levels.

The FHWA is supporting several distance-based pricing initiatives including:

- The Minnesota Department of Transportation has examined mileage-based user fees as an alternative to the fuel tax, including demonstration involving smart phone technology to collect fees.
- The Oregon Department of Transportation was the first State to evaluate pay as you drive insurance. Oregon is now considering making the mileage-based road user fee program into law in 2014.

***States and regions are making pricing increasingly central to their long-range planning processes.***

The road and non-tolling pricing strategies addressed in this document can combine to reduce single occupancy vehicle travel during peak periods (e.g., by encouraging shifts to carpools, transit, and other HOV options), provide reliable travel options (e.g., by offering a congestion-free priced option) and reduce emissions (e.g., by reducing traffic delay and sluggish traffic flows). As an integrated pricing program, the following positive impacts can occur in metropolitan areas:

- Optimize existing road capacity rather than needing to build new capacity.
- Improve transportation system reliability.
- Increase safety by reducing congestion and associated crashes and delays.
- Improve bus speeds.

- Reduce cruising for parking and volume of parking demand important for downtown business vitality and safety for pedestrians and cyclists.
- Support potential transit expansion (dependent upon net revenue allocation plans).

Some Metropolitan Planning Organizations (MPO) are incorporating comprehensive pricing plans into their Regional Transportation Plans, including road and network pricing coordinated with parking pricing, transit service and expansion, vehicle sharing and broad demand management strategies. This integration helps to optimize congestion management programs through the synergistic effects among these pricing strategies. Pricing can also be an important tool to aid MPOs in developing a fiscally constrained plan.

### **Moving Forward**

While the VPPP no longer solicits proposals for funding, the program still serves an important role by offering tools to encourage pricing innovations. The FHWA continues to support States' and regions' pricing initiatives by offering guidance and expertise in choosing the most promising and appropriate of the emerging strategies. For instance, where a pricing strategy has shown good success in limited settings but has yet to receive attention for possible replication elsewhere, FHWA develops and promotes Webinars, conference sessions, peer exchanges, guidance documents and other outreach actions to draw attention to the strategy.

### **Conclusion**

The VPPP has been critical for States and regions in exploring and initiating pricing projects to successfully manage congestion on State and regional facilities. These projects have played a central role in introducing transportation professionals, political leaders and citizens to pricing as a tool to address congestion problems and to manage the transportation system more effectively. The VPPP (along with the Urban Partnership Agreements and Congestion Reduction Demonstrations projects) has provided technical assistance, outreach, and research with respect to both tolling and non-tolling programs and projects. The FHWA will continue efforts such as the National Congestion Pricing Conference, development of primers, Webinars that describe lessons learned and successful practices in implementing congestion pricing projects, a comprehensive congestion pricing Web site, and other workshops and peer exchanges in order to ensure widespread awareness of pricing as a strategy to manage roadway congestion.

# Introduction

## Background

The U.S. Congress established the Congestion Pricing Pilot Program in 1991. It was subsequently renamed the Value Pricing Pilot Program (VPPP) under Section 1216 (a) of Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21) in 1998, and continued into Section 1604(a) Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), P.L. 109-59 signed on August 10, 2005. The Moving Ahead for Progress in the 21st Century Act (MAP-21) did not authorize additional funds after Fiscal Year (FY) 2012 for the discretionary grant component of the VPPP. However, the Federal Highway Administration's (FHWA) may still enter into cooperative agreements for projects that require tolling authority under this program for their implementation.

Congress established the VPPP to demonstrate whether and to what extent roadway congestion could be reduced through application of congestion pricing strategies, and to estimate the magnitude of the impact of such strategies on driver behavior, traffic volumes, transit ridership, air quality and availability of funds for transportation programs.<sup>1</sup> The program has provided tolling authority and discretionary grants to State or local governments to facilitate the demonstration of congestion pricing applications and report on their effects. There are 12 State-led programs and 2 city-led programs participating in the VPPP: California, Connecticut, Florida, Illinois, Maryland, Minnesota, New Jersey, New York City, North Carolina, Oregon, Texas, Virginia, Washington State, and the District of Columbia. Many of these programs have multiple projects.

There is a consensus among economists such as Paul Krugman of the New York Times that congestion pricing represents a viable and sustainable approach to reducing traffic congestion. Congestion pricing works by shifting some rush hour highway travel to other transportation modes or to off-peak periods. By removing a fraction (even as small as 5 percent) of the vehicles from a congested roadway, pricing enables the system to flow much more efficiently, allowing more vehicles to move through the same physical space.<sup>2</sup>

Although drivers unfamiliar with the concept initially have questions and concerns, based upon survey results described throughout this report, drivers who are more experienced with congestion pricing support it because it offers them a reliable trip time. Transit and ridesharing

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<sup>1</sup> Section 1012(b)(5) of the Intermodal Surface Transportation Efficiency Act of 1991, PL 102-240, as amended by section 1216(a) of the Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21), and section 1604(a) of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), PL109-59 (August 10, 2005).

<sup>2</sup> *Congestion Pricing – A Primer: Overview*, U.S. Department of Transportation, Federal Highway Administration, October 2008, [http://ops.fhwa.dot.gov/publications/fhwahop08039/cp\\_prim1\\_00.htm](http://ops.fhwa.dot.gov/publications/fhwahop08039/cp_prim1_00.htm).

advocates also appreciate the ability of congestion pricing to generate both funding and incentives to make transit and ridesharing more attractive. Through the VPPP, as well as follow-on initiatives such as the Congestion Reduction Demonstrations (CRD), Urban Partnership Agreements (UPA), and Express Lanes Demonstration programs, the FHWA provides key support to States to help them implement strategies to manage congestion problems. More importantly, findings from deployed projects continue to demonstrate that the application of innovative congestion pricing strategies can effectively manage demand on congested urban facilities.

## **The Value Pricing Pilot Program and Other U. S. Department of Transportation (DOT) Congestion Pricing Initiatives**

### ***Value Pricing Pilot Program***

The VPPP encourages implementation and evaluation of value pricing pilot projects to manage congestion on highways through tolling and other pricing mechanisms. Although there is no longer a discretionary grant component, many States have gained experience with pricing strategies with the help of the VPPP, and States now have the capacity to implement larger-scale value pricing projects. The FHWA continues to support States' and regions' pricing initiatives by offering guidance and expertise in choosing the most promising and appropriate of the emerging strategies. Congestion mitigation, environmental concerns, and limited funding for highway construction has led to increased interest by State, regional and local transportation agencies in congestion pricing as a strategy to manage congestion on oversubscribed roads. As a result, the DOT has made several other congestion pricing funding programs available to help agencies implement pricing strategies.

### ***Urban Partnership Agreements and Congestion Reduction Demonstrations***

In 2006, the DOT launched a Congestion Initiative to demonstrate a variety of innovative but proven strategies that could provide relief to traffic gridlock if more widely practiced. The UPA/CRD programs that resulted from the Congestion Initiative encouraged more aggressive, broad-scale, pricing approaches. During 2007 and 2008, DOT awarded UPA/CRD funds to Seattle, San Francisco, Minneapolis-St. Paul, Miami, Atlanta, and Los Angeles.

## **Report Organization**

This report provides an update on the various projects and studies that received funding through the VPPP and the UPA/CRD initiatives. All projects described in this report received funding and assistance from the VPPP or the UPA/CRD initiatives, and the level of assistance each project received from the VPPP is listed in Appendix A. The report then discusses FHWA's recent outreach and technical assistance efforts to advance congestion pricing beyond the VPPP and UPA/CRD project locations. Finally, the report provides an overview of emerging trends in congestion pricing and FHWA's plan for encouraging these trends and innovations across the country.

## The Value Pricing Pilot Program: Project Updates

In FY 2012, FHWA awarded approximately \$12 million in VPPP funds to 18 projects in 8 States and Washington, DC. The awards were for a variety of congestion mitigation studies or implementation projects. Table 1 lists the FY 2012 awards and locations.

For information on other VPPP projects, refer to the VPPP Quarterly Report at [http://www.ops.fhwa.dot.gov/tolling\\_pricing/value\\_pricing/projects/index.htm](http://www.ops.fhwa.dot.gov/tolling_pricing/value_pricing/projects/index.htm).

**Table 1. FY 2012 VPPP Awards**

State	Project	Award Amount
CA	Treasure Island Mobility Management study	\$480,000
CA	Contra Costa I-80 tolled-corridor real-time ridesharing	\$322,400
CA	San Diego pricing incentives for one-way electric car sharing	\$440,653
CA	San Francisco Metropolitan Transportation Commission Regional Parking Pricing Analysis Tool	\$560,000
CA	Parking Pricing Enhancement Study in San Francisco	\$420,000
CA	SR 237 Express Lanes Extension in San Jose	\$1,600,000
CA	Performance parking system implementation in Los Angeles	\$600,272
DC	Multimodal, dynamic parking pricing in downtown Washington, DC	\$1,090,000
FL	Integrated Congestion Pricing Planning--Phase Three	\$400,000
FL	Regional Congestion Pricing Study in Orlando	\$350,000
IL	Peer-to-Peer Car Sharing Pilot Project	\$715,118
MA	Kendall Square Employer Transportation Benefit Pricing Trail	\$743,872
MN	I-35E MnPass Managed Lane Extension Study	\$605,000
NY	DriveSmart New York City	\$1,000,000
NY	ParkSmart New York City	\$950,000
TX	Austin-area real-time carpooling automated toll discounts	\$764,008
WA	King County Park-and-Ride Pricing in Multi-Family Developments	\$543,900
WA	Express Toll lanes Continuous Access Demonstration	\$520,000

In addition to these projects, numerous other projects have received funding since FY 2008. Appendix A includes a listing of all awards. The following section describes project updates from the past year.

### Projects Involving Highway Tolls

#### *Updates from Recently Deployed Projects*

##### **SR 237/I-880 Express Connectors in Santa Clara, CA**

The Santa Clara Valley Transportation Authority (VTA) received \$3,200,000 in VPPP funds in 2009 to implement the SR 237/I-880 Express Connectors project, which opened in March 2012. This roadway pricing project is part of the Silicon Valley Express Lanes Program, which includes the conversion of existing carpool lanes on SR 85 and U.S. 101 into Express Lanes. The SR 237/I-880 Express Connectors project relieved an existing freeway bottleneck by variably pricing a carpool ramp that connects carpool lanes on two freeways. Results from this

project are providing valuable lessons from pricing applied to what is essentially a queue jump – a facility that allows vehicles to bypass points on the transportation network where congestion is particularly severe and occurs in a predictable pattern. In the first year of operation, the application of the toll led to a reduction in delays up to 20 minutes and net revenue was over \$500,000. The project’s one-millionth customer paid a toll in November 2013 and the project received 2013 “Project of the Year” from the California Transportation Foundation. The focus now is on delivering the Silicon Valley Express Lanes Program in segments based on sections that have carpool-to-carpool direct connectors similar to that of SR 237/I-880 Express Connectors.

### **I-680 Smart Carpool in Alameda County, CA**

Northern California’s first Priced Express Lane, covering 14 miles of I-680 Southbound, opened in September 2010. In 2004, the VPPP awarded Alameda County feasibility funds to explore pricing on I-680. In 2005, the VPPP awarded the project pre-implementation funds. The Priced Express Lane previously operated as a High Occupancy Vehicle (HOV) lane. Carpools, transit vehicles, and motorcycles can still use the lane free of charge. Between the hours of 5 a.m. and 8 p.m., the Express Lane is operated using dynamic pricing to ensure that traffic is always flowing smoothly. As of April 2014, over 1,700,000 toll-paying customers have used the facility with toll revenue exceeding \$4 million. Actual Express Lane usage and net revenue continue to exceed projections. During the peak commute hour, approximately 30 percent of the HOV/Express Lane users paid the toll and the remainder represents HOV and exempt vehicles (e.g., clean air vehicles, motorcycles, etc.) that travel free. The Express Lane continues to provide travel reliability while reducing congestion within the corridor by allowing the solo drivers from the general-purposes lanes to use the Express Lane for a fee. By opting to leave the general-purpose lanes and use the Express Lane, these solo drivers are also helping reduce congestion in the general-purpose lanes. The average speed in the Express Lane was observed at or above the posted speed limit of 65 mph during the morning commute while the average speed in the general-purpose lanes during the same peak period was observed up to 25 mph lower than the speed in the Express Lane.

### ***Projects Deployed Since 2012***

#### **I-15 Managed Lanes/Bus Rapid Transit in San Diego, CA**

The San Diego Association of Governments (SANDAG) opened its first high occupancy toll (HOT) lane conversion project on I-15 in 1998, utilizing grant funding and support from the VPPP. The original dynamically priced facility included two reversible lanes that went a distance of 8 miles. In January 2012, SANDAG opened the final segment of the now 20-mile managed lane system. The four new Express Lanes include a moveable barrier that allows up to a 3x1 configuration of the northbound and southbound lanes. The new lanes also feature a sophisticated pricing system that varies tolls for solo commuters based on distance traveled along with the amount of congestion in the Express Lanes. Light rail transit had been in the Long-Range Transportation Plan for decades for this same corridor, but a viable funding source did not

materialize. In 2014, a new Bus Rapid Transit (BRT) service, called Rapid, will begin service along the I-15 corridor. This high-frequency bus service will offer increased reliability and customer convenience, similar to the services of a light rail system. Rapid features include transit signal priority, digital displays announcing next vehicle arrival times, modern bus shelters, and fewer stops.

The SANDAG has a major managed lane network defined in its long-range plan and design and planning on key corridors is underway. According to SANDAG, adding four new Express Lanes to Interstate 15 has cut the average commute by 25 percent compared with a decade ago.

### **LBJ TEXpress Lanes in Dallas, TX**

When complete the LBJ Express Project will nearly double the capacity on the LBJ Freeway while providing commuters with more travel options. Under this project, 17 miles of eight existing general-purpose lanes on I-35E and I-635 will be reconstructed. In addition, 13 miles of new express toll lanes, called TEXpress Lanes, will be added to the route: two lanes each direction on I-35E, and up to three lanes in each direction on I-635. The Express Lanes will maintain a guaranteed speed of 50 mph. In addition, two- and three-lane continuous frontage roads will be added for better access to the roadway. Project construction began in early 2011. Phase 1, which includes 3 miles of Express Lanes on I-635 from Preston Road to Greeneville Avenue, opened in December 2013. For the first 6 months of operations, pricing on the Express Lanes will be fixed according to a pre-established pricing scheme. From that point forward, pricing will fluctuate in real-time based on demand. The Phase 2 lanes on I-35E are scheduled to open in spring 2014, and Phase 3, which will extend the I-635 lanes to connect them with I-35E, is scheduled to be completed in December 2015.

### **SR 167 Express Toll Lanes Continuous Access Demonstration in Seattle, WA**

The Washington State Department of Transportation (WSDOT) has developed a 230 lane-mile system of freeway HOV lanes in the Puget Sound region that have been a popular and well-used enhancement to the freeway system. In the past decade, most Puget Sound HOV lanes have become so well used that they have lost some of their speed and reliability advantage and fail to meet State and Federal performance goals. To remedy this, WSDOT is testing HOT lanes on a pilot basis in the SR 167 corridor, and is developing a dual-lane express toll lane facility on I-405. This project will re-stripe the SR 167 HOT lane system to allow near-continuous access, provide information and outreach to customers and the public, as well as perform a before and after evaluation of the system. As of March 2014, development efforts for this demonstration project are well underway. Development of contract documents for the civil construction is complete and the project has been advertised. The development of the education and outreach plan is also complete. The beginning of outreach efforts are planned to coincide with the award of the construction contract. The WSDOT has also contracted with the Washington State Transportation Research Center at the University of Washington, to perform before and after evaluations. The evaluation plan is complete and analysis of the “before” data has begun.

## *Updates from Studies Underway*

### **SR 237 Express Lanes Extension with Continuous Access in Santa Clara, CA**

The SR 237 Express Lanes (Phase 2) project is an extension of the existing first phase of the SR 237 Express Lanes project called SR 237/I-880 Express Connectors. The SR 237 Express Lanes (Phase 2) project is the conversion of the remaining 4 miles of HOV lanes on SR 237 to Express Lane operations. It will provide solo drivers the option of paying a toll to use the Express Lanes during commute hours. Carpools with two or more occupants, motorcycles, transit buses and eligible hybrids continue to use the Express Connectors free of charge. The tolls are collected electronically using the proven FasTrak transponder technology already in use throughout California. Tolls for solo drivers vary based on the level of congestion and are adjusted to maintain a free-flowing ride on the Express Lanes.

The Santa Clara VTA was awarded VPPP funds in 2012 to evaluate the potential of using different access approaches, such as continuous access with no painted buffer between the Express Lanes and general-purpose lanes. It is anticipated that the study will be completed in June 2015.

### **Interstate 35E MnPASS Managed Lanes Extension, in Minneapolis, MN**

The I-35E MnPASS Extension Study is a pre-implementation planning study that will develop and evaluate conceptual alternatives for extending MnPASS Express Lanes between Little Canada Road and CR 96 on I-35E. The study seeks to explore and test a number of managed lane scenarios to provide a higher level of service for all users. A key component is evaluation of additional transit enhancements that can increase transit and carpool use in the I-35E MnPASS Express Lanes. The goal for the Interstate 35E MnPASS Managed Lanes Extension Project is to achieve greater efficiency and performance in the corridor through better utilization of existing infrastructure, and to optimize highway system performance and customer service through transit enhancements and transit and bike/pedestrian supportive land use planning. The study is divided into three components: Concept Development, Outreach & Education, and Land Use & Transit Enhancement. Modeling work has been completed on all three alternatives (Continuous MnPASS through 35E/494 interchange, MnPASS not continued through interchange and implementing a Priced Dynamic Shoulder Lane through the interchange), including development of probable cost estimates and listing of pros and cons. In addition, a corridor simulation analysis on the Continuous and Non-Continuous alternatives has been conducted, and it was determined that the alternatives had counter-balancing benefits and costs. Three conceptual options were initially analyzed for extending the MnPASS lanes on 35E between Little Canada Rd and CR 96. Only two of the options could go through more detailed traffic analysis and modeling. The initial evaluation criteria determined that the Continuous and Discontinuous options should be modeled - the PDSL option was not modeled because it did not perform as well against several of the criteria.

The Land Use and Transit component continues to develop scenarios for improved land uses on its selected sites, although considerable effort has been expended in developing a more complete understanding of the study area. The Outreach and Education component has finalized plans to hold two community dialogues for each of three different groups: general users of the corridor, professional drivers and community leaders.

### **Feasibility of Pricing on I-84 in Hartford, CT**

The Connecticut Department of Transportation (CDOT) received VPPP funds to examine the feasibility of a variety of pricing strategies to address the deteriorating conditions on I-84 in the city of Hartford, one of the most highly traveled and congested highway segments in the region. A portion of the segment traverses an elevated structure, which is nearing its end of useful life. Replacement costs will be high, and this study will examine the potential of congestion pricing to both finance part of the replacement and better manage congestion. Data collection and evaluation activities were conducted in 2013, along with a stated preference survey to generate insights into the public's willingness to pay tolls in return for a more reliable trip. The project team completed base-year calibration of the micro-simulation model in early 2014 and is currently working on developing a future year travel demand model. The project is scheduled for completion in early 2015.

### **Variable Pricing in I-95 Corridor from New York to New Haven, CT**

The CDOT is currently evaluating the potential of congestion pricing strategies on the heavily congested I-95 corridor from New York to New Haven to better manage traffic and improve the efficiency of existing facilities. The study will also explore the ability of congestion pricing to generate revenues to finance transit improvements. Data collection activities to understand traffic patterns on the corridor are underway, including truck surveys, origin-destination surveys, and license plate surveys. The data will serve as inputs to a Travel Demand Model of the corridor, which in turn will be used to assess the likely impacts of various pricing strategies. The project team completed the draft existing conditions report in early 2014. In addition, initial calibration of the travel demand model has started. The project consultant obtained and tested the Regional Transit Forecasting Model and found that mode shift is sensitive to highway tolls. The model will be used once scenario evaluation begins in late summer 2014. A workshop will be scheduled in mid to late 2014 to go through the whole corridor and determine the extent of right of way impacts. The project is scheduled for completion in early 2015.

### **Influencing Travel Behavior, Sensitivity to Environmental Justice, and Use of Innovative Technology in Austin, TX**

The Texas Department of Transportation (TxDOT) and North Central Texas Council of Governments (NCTCOG) is conducting a study to determine which types of congestion pricing incentives and programs on IH-30/Tom Landry Highway will most encourage drivers to seek alternatives to driving alone or outside of peak periods. Smart card technology will track subscribers' managed lanes use, and they will be awarded incentives based on how they choose

to use the managed lanes. The study also includes an equity component to explore the potential impacts managed lanes have on low-income travelers. In 2014, the team completed the real-time casual carpooling mobile application for the region. The Texas Transportation Institute initiated work on the enhancements to “Traffic Thermostat Framework” including the development of goals and performance measures. The “Traffic Thermostat Framework” is a tool that can help make operating decisions for priced facilities and can guide changes in operational strategies for a facility over time.

### ***Studies Completed Since 2012***

#### **Charlotte, NC Region Managed Lanes Study**

The city of Charlotte was awarded VPPP funds in 2011 for the third phase of a series of studies to determine where “fast” lanes – HOV, HOT or truck-only toll facilities – should be implemented in the Charlotte region. The primary objectives of this study completed in June 2013 were to familiarize the public with

congestion pricing, their acceptance of managed lane projects, and define preferred managed lane projects for two specific corridors on US-74 East and I-485 South. Public assessment activities were conducted to determine the public’s understanding of and support for congestion pricing projects. Results showed that 56 percent of telephone respondents supported the fast lanes concept, and 85 percent of interviewed stakeholders preferred this approach to raising taxes. The team conducted technical analysis to generate recommendations for fast lane projects on the specified corridors and to estimate traffic and toll revenues associated with the projects. The North Carolina Department of Transportation is currently considering a public-private partnership (PPP) to implement the I-77 North HOV-to-HOT lanes conversion and extension project.

The Final Report from the Regional Bus Toll Lanes Study in Tampa, FL is available at [http://www.tampaxway.com/Portals/0/documents/Projects/Bus%20Toll%20Lanes/2\\_BTL%20Final%20Report.pdf](http://www.tampaxway.com/Portals/0/documents/Projects/Bus%20Toll%20Lanes/2_BTL%20Final%20Report.pdf)

#### **Regional Bus Toll Lanes in Tampa, FL**

The Tampa-Hillsboro Expressway Authority received \$800,000 in VPPP funds to evaluate the potential of advancing the first regional network of bus toll lanes (BTL) in the Tampa area through a BTL Concept Feasibility Study. The BTL is a price-managed lane with up to 10 percent of the capacity dedicated strictly to bus-transit.

While buses would travel without paying the toll, the BTL would be open to use by all light-duty, two-axle vehicles and would be price-managed to assure the desired level of service on the facility. The BTL would maximize passenger throughput by employing proven bus

technologies, all electronic open road tolling, and dynamic congestion pricing techniques. The final report for the study was completed in July 2013. It shows that even with a conservative estimate of 10-minute bus service headways (6 buses per hour); the BTL could raise the potential people-moving capacity by 187 percent over a congested highway lane. In addition, all three of

The Charlotte Region Managed Lanes Study Final Report is available at <http://www.charmeck.org/fastlanes/>

the hypothetical BTL networks studied would provide new fare box revenues that would cover 100 percent all of system operations and maintenance costs. Supplemental activities to identify and evaluate potential BTL projects in Hillsborough County are underway. This will include identification of 10 potential alternative routes and completion of the scope of services for the supplemental activities, involving traffic and revenue projections, cost projections, and financial feasibility analysis for each of the potential routes.

### **Integrating and Financing Transit with Managed Lanes on the I-90 Corridor in Chicago, IL**

This study modeled the impacts of operating the two new lanes (one in each direction) to be added to the I-90 Jane Addams Memorial Tollway as managed lanes. It also examined how transit could be integrated and financed through priced managed lanes and evaluated steps to mitigate equity concerns for potential low-income users. The final report for this project was completed in July 2013. The study found that managed lanes on the Tollway are not warranted for the immediate future. Results also showed that a separate project underway to complete the Elgin-O'Hare Western Access Expressway, combined with the planned lane additions to the Jane Addams Tollway, would relieve congestion on the corridor through 2030, and managed lanes would actually negatively impact corridor performance due to weaving at managed lane entrance and exit points. Ongoing design and construction for the Jane Addams Tollway includes an extra wide median and electrical infrastructure that could accommodate managed lanes in the future.

### **Trunk Highway 77 Managed Lanes in Minneapolis, MN**

The Trunk Highway 77 Managed Lanes project in Minnesota was awarded \$540,000 in VPPP funds in 2009 funding for a pre-implementation planning study that explored and tested a number of managed lane scenarios to provide a higher level of service for all users. The study also evaluated whether managed lanes concepts were compatible with long-term plans to develop Cedar Avenue BRT. The Minnesota Department of Transportation (MnDOT) completed the original study in early 2011. The new BRT service opened from the Apple Valley transit station to the Mall of America in June 2013. The remaining project funds financed Phase II, which includes preliminary engineering and evaluation work for three alternatives: 1) a contra-flow lane for northbound AM peak traffic; 2) a permanent MnPASS lane; and, 3) a hybrid design. The study also considered options to provide better direct access to the Cedar Grove park-and-ride lot. The MnDOT completed Phase II of the study in late 2013 and found that adding managed lane capacity on I-494 is necessary prior to MnPASS implementation on TH 77. The main concern is that creating MnPASS capacity on TH 77 prior to I-494 improvement will only serve to compound a bottleneck at the I-494 on-ramp westbound.

The Final Report for the Integrating and Financing Transit with Managed Lanes on the I-90 Corridor in Illinois study is available at <http://www.illinoistollway.com/construction-and-planning/community-outreach/i-90-corridor-planning-council>

## **Projects Not Involving Tolls**

The VPPP has awarded a portion of its funds to projects that did not involve highway tolls. The majority of these projects fall into one of three categories: parking pricing, priced vehicle sharing and dynamic ridesharing, or pay-as-you-drive-pricing initiatives.

### ***Parking Pricing***

Parking pricing encompasses parking policies that rely on market forces to influence the decision to drive. Strategies include variable pricing of curbside parking, commuter parking taxes, and parking "cash out" programs that require employers to provide their employees with the option to take the value of free or subsidized employee parking in cash in lieu of using the parking space provided by the employer.

### ***Parking Pricing Projects with Recent Results to Report***

#### **Priced Smart Parking Field Test at Commuter Rail Stations in San Diego, CA**

This VPPP project focused on developing pre-implementation products for smart, paid parking on North County Transit District's COASTER commuter rail service. In addition, stated preference surveys and other data were used to determine the relative impacts on parking and ridership of increasing transit fares by \$1 round-trip or beginning to charge \$1 for commuter parking, if revenues need to be raised from one of these sources. The results indicate that, where parking availability is not constrained, increasing fares would result in fewer losses in ridership and revenue than charging for parking among park-and-ride commuters. Only 20 percent of drivers believed that a change in parking fares would *not* influence how they used COASTER, as opposed to nearly 60 percent of non-drivers. In addition, 38 percent of drivers said they would *not* change the way they used COASTER in response to fare changes, versus 42 percent of non-drivers.

#### **goBerkeley Parking and Transportation Demand Management Pilot in Berkeley, CA**

This VPPP project involves a pilot program called goBerkeley, which seeks to reduce congestion in the city of Berkeley through parking pricing and transportation demand management strategies. The program promotes alternatives to driving, such as biking, walking, transit, and carsharing. It also includes variable parking rates to control the demand for parking spaces, along with signage directing drivers to available parking, more flexible parking time limits, and more methods to pay for parking. These elements are all designed to decrease the number of drivers "circling" for parking spaces, and thereby decrease congestion. The goBerkeley project launched in June 2013, and data collection activities to better understand parking demand, turnover, usage characteristics, and parker behavior will be conducted during the pilot. The project is halfway complete as of March 2014, with excellent results that demonstrate that demand-responsive parking pricing works in the City. Transit and carsharing incentives were distributed to participants in summer 2013, while demand-responsive parking rates were implemented in fall 2013 to encourage shifts in parking demand.

At the halfway point, the transit and carsharing incentive programs have attracted many participants – the exact mode shift and change in vehicular use will be collected and analyzed in June 2014. From data collected on the parking pilot, changes to parking rates and time limits have caused significant shifts in parking demand from congested blocks to blocks with available parking. Some areas have reached target occupancy of 1-2 available spaces per block. In general, the project has seen decreases in the percentage of blocks that are congested, or full, in the pilot areas. The Downtown area, which has 65 percent of the metered spaces in the pilot, saw a 9 percent decrease in the number of blocks that were full between June 2013 and January 2014. However, there are some pilot areas where there is room for improvement– a recommended increase to parking rates was presented to the City Council on April 29, 2014 and will be implemented June 2, 2014 if approved.

Findings have also indicated that most drivers do not purchase the full parking time available. For example, in the Downtown area, for the premium 2 hour time limit, the average time purchased is 0.97 hours and for the value 4 hour time limit, the average time purchased is 1.27 hours.

Staff will meet with stakeholders to discuss a potential extension of parking meter operating hours into the evening to manage high demand. In parallel, the City is ready to test the ability of enforcement technology to collect parking data so the City can make parking policy decisions in the future based on data collected during enforcement patrols. Though this data source would be less robust than parking sensors, it would also be much less expensive and accessible to many small to mid-sized cities for. The technology pilot will begin in summer 2014. All pilot activities above will conclude in December 2014.

*Right Size Parking Model Code is available at*  
<http://metro.kingcounty.gov/up/projects/right-size-parking/pdf/140110-rsp-model-code.pdf>

### **Incentives to Reduce Off-Street Parking Supply and Car Use in King County, WA**

King County Metro’s “Right Size Parking” project seeks to promote livability by reducing the supply of and demand for parking in new developments and by providing new residents with a range of transportation choices that are less costly than car ownership. This, in turn, facilitates the building of more compact, transit-oriented communities. The project includes a dynamic Web site where users can calculate parking use at developments in order to guide decisions on building and managing parking. Incentives are being offered to jurisdictions and developers to test pricing and right-sizing of parking supply, and engagement activities are being conducted with the development community to encourage use of parking demand information and implementation of parking pricing strategies. The surrounding jurisdictions established a local competitive grant program for localities and developers to take aggressive actions to reduce parking supply and to promote alternatives to car ownership and use.

Pilots to test parking pricing, parking management, and transportation demand management strategies were awarded to four partner King County cities: Seattle, Kent, Kirkland, and Tukwila

and began in 2014. The intent of the pilot projects is to apply the findings from the RSP research to better align jurisdiction parking regulations with regional goals, like increased transit ridership and affordable housing. Policy changes under consideration by the municipalities range from reductions in parking minimums to management strategies including shared parking and a residential parking program update.

In December 2013, King County Metro published *Right Size Parking Model Code*, aimed at municipalities looking to right-size their residential parking supply. The document provides a menu of options and explanation of each policy choice.

### **Off-Peak Commuting Incentives and Parking Pricing at Stanford University**

This project focuses on using behavioral economics to design transportation pricing schemes in order to optimize consumer responses in furtherance of public policy goals. The project partners include Caltrans, Santa Clara County, and Stanford University. Regular Stanford campus commuters can sign up for a program called Capri, through which they earn credits for driving on or off campus at off-peak hours or for biking or walking to and from campus. The project uses Radio Frequency Identification tags and a smartphone application to record vehicle entry and exit times. Credits can be used to earn cash rewards ranging from \$2 to \$50. Daily incentives will also be deployed to discourage parking in the most over-subscribed lots instead of in less desired, more peripheral facilities. As of January 28, 2014, 3837 Stanford affiliates have registered for Capri. These participants have conducted a total of 573,099 Radio Frequency Identification Device (RFID)-scanned trips and 54,960 app-based trips, and received a total of \$143,288 in incentives.

### ***Priced Vehicle Sharing and Dynamic Ridesharing***

Priced vehicle sharing involves the provision of vehicles, typically by a commercial vendor, for use by members in exchange for an hourly or daily charge. The periodic rates for use can vary in response to demand or be fixed. Customers have the advantage of using the vehicle only when needed and can avoid owning a car or need for a family to purchase additional vehicles. Priced vehicle sharing also includes peer-to-peer (P2P) carsharing, in which owners rent their vehicles out for use, and all vehicle ownership costs are converted to hourly rental costs that include insurance and gas. Human contact is not required for any part of the transaction. The P2P carsharing can be offered at a lower cost than vehicles leased exclusively for carsharing, enabling less dense and lower income areas to be served, and making shifting from car ownership to carsharing more attractive. Participating car owners will be able to maximize their revenue potential by using their own vehicles as infrequently as possible (and leaving them in the shared-vehicle fleet), further reducing congestion. Dynamic ridesharing involves matching of drivers and riders without preplanning a car pool. The ride matching process can be conducted in real time aided by smart phone technology or can occur at pre-designated pick-up locations. Priced dynamic ridesharing adds the element of cost sharing.

## ***Priced Vehicle Sharing and Dynamic Ridesharing Projects with Recent Results to Report***

### **Dynamic Ridesharing with Financial Incentives in Northern Virginia**

The Northern Virginia Regional Commission is implementing a pilot dynamic ridesharing program on the I-95/395/495 corridor from Fredericksburg, VA, to Washington, DC. The program includes a range of cash incentives to attract both drivers and riders to participate, focusing on Department of Defense employees and contractors who were impacted by base realignment and closure relocations. A private sector partner, Avego, is providing dynamic ridesharing software that will be coupled with global positioning system (GPS)-enabled smart phones to facilitate finding and executing ride matches, tracking and recording of journeys, and transferring money automatically (mostly from riders to drivers, although riders will be provided “credits” to spend before having to contribute their own funds). As of September 2013, nearly 900 users signed up for the program and 250 user trips were made, resulting in over 4,481 pounds of CO<sub>2</sub> emissions reduction and 5,050 total travel miles shared. The pilot program has found, based on the number of registrations and positive feedback that the most effective marketing tool has been on site events at targeted military installations.

### **Peer-to-Peer Carsharing in Portland, Oregon**

This project is a collaborative effort between FHWA, Getaround Inc., Ohio Department of Transportation (ODOT), Portland Bureau of Transportation and the Oregon Research and Education Consortium (OTREC) to evaluate the effects of P2P car sharing and other incentives on people’s travel behavior in the city of Portland, OR. The project will assess whether P2P car sharing reduces overall vehicle miles traveled by marginalizing the cost of driving for both car owners and renters, while both creating a revenue stream for car owners and increasing access to jobs and activities for those without cars. Additional factors such as usage-based insurance and peak usage pricing will also be studied.

In-vehicle technology is being installed to allow renters access to the vehicles at times the owners choose to make them available, and to collect data on mileage and time of driving. The project will have a peak-period surcharge default and will uniquely offer Pay-As-You-Drive-Insurance (PAYDI) priced by the hour to both vehicle owners and renters. Data will be collected from the GPS in-vehicle units, the reservation system, and participant surveys and will be analyzed by the Oregon National University Transportation Center.

By the end of March 2014, there were 193 active study participants and 36 percent or 122 owner participants had completed the 3 surveys that have been sent to date. The study has found that revenue follows a cyclical pattern, with peaks in summer and troughs in winter. Approximately 7 percent of the rental activity occurs among the top 20 percent of owners. Twenty-nine percent of owners have never completed a rental, while 45 percent have completed 1-9 rentals and just over one-quarter completed more than 10 rentals. Cars with rental activity completed on average of one rental per month and earned an average of \$45 per month gross income.

### **Real Time Carpooling Automated Toll Discounts in Austin, TX**

This innovative VPPP project deploys real-time ridesharing, facilitated by technology and incentives. The project will link dynamic ridesharing and tolling systems automatically providing participants sharing rides with a toll discount. Carpoolers who use the free app (CARMA) on the 183-A Tollway or the U.S. 290 East Tollway, known as the Manor Expressway, get half or their entire toll reimbursed, depending on how many people are in the car. Carma allows users to match up and message one another before sharing a ride. Users create a profile, input their commute and schedule, and register their TxTag and license plate information. Drivers using Carma get a 50 percent toll reimbursement through their TxTag account if they have one passenger and a 100 percent rebate if they have two or more passengers. As of March 2014, 582 Austin-area residents have downloaded Carma. The Carma could be the first system to verify carpoolers, which otherwise might take a police officer on the side of the road or cameras, and then provide them with toll reimbursements.

### **Dynamic Ridesharing Pilot with Pricing Incentives in Santa Barbara, CA**

Dynamic ridesharing is single-trip carpooling efficiently facilitated by telecommunications technologies and social networking structures, where participants need not bind themselves to travel arrangements until the last minute and make no long-term commitments. This VPPP project is implementing a technology-facilitated dynamic ridesharing program called SmartRide in the Santa Barbara region that includes a range of cash incentives to attract both drivers and riders to participate. The system is based on a GPS-enabled smartphone platform and involves commuters on two congested segments of U.S. Route 101. For a preliminary trial period, 20 drivers and 20 riders were recruited in each of the 2 corridors (80 participants in total) and were offered cash incentives and reimbursement for mileage and cell phone service. The pilot then expanded to include 360 total participants for a full pilot from January 2013 to March 2014. Data analysis and the final report will be completed in spring 2014. The SmartRide Program was officially launched on the Santa Barbara City College campus during the first quarter. The implementation team conducted significant marketing on campus, in classrooms, on the Metropolitan Transit District buses and in Isla Vista. A total of 439 SmartRide accounts were created during the initial outreach push. While this number is significant, the team had difficulty generating actual carpool trips using SmartRide. Only a few carpool trips were being made each week. During this quarter, the team offered \$5 or \$20 Amazon cards for participants to sign up and start carpooling. The team also raffled off two iPads to participants that were carpooling using SmartRide. The Hwy 101 commuter corridor will be the next target audience, which will begin in July and August.

### **Priced Electric-Assist Bicycle Sharing in San Francisco, CA**

This project is testing priced electric-assist bicycle sharing stations at 25 locations, with electric-powered bicycle trailers at up to 10 of the locations, in San Francisco and Berkeley. The bicycle stations will be located adjacent to carsharing stations, and study area will overlap with some areas where the federally funded SFpark parking pricing project is being deployed. The San Francisco Municipal Transportation Agency and San Francisco City CarShare will set an hourly

price for the electric bicycles at 50 to 70 percent less than the price for cars, and the same reservation, access, and billing systems will be available for both. The test will see how many carshare trips are replaced with electric bicycle/trailer trips. Travel behavior comparisons will be made between electric-assist bicycle sharing deployment neighborhoods and similar control neighborhoods, and between participants who are granted access to electric bicycles and a control group whose access will be temporarily restricted. University of California, Berkeley Transportation Research Sustainability Center (TSRC) is leading the data collection, surveying, focus groups, and analysis as the pilot progresses.

In 2013, City CarShare identified locations for the electric bicycle stations and conducted the environmental review process. In January and February 2014, TSRC completed two focus groups in San Francisco and Berkeley in relation to the designated areas of implementation of the electronic bicycles program. Following these focus groups observed by City Carshare staff, TSRC completed analysis of pre-focus group questionnaire data and wrote summaries of both groups. These data and summaries were compiled into an executive summary that will be delivered to City Carshare for review and consideration leading to implementation of their e-bikesharing program. Additionally, the summary will help inform the design of the 'before' survey questionnaire with City Carshare members to discern their willingness to participate in and pay for services associated with the e-bikeshare component of their City Carshare membership services.

### ***Distance Based or Pay as You Drive Pricing***

Fixed costs of vehicle ownership, such as insurance costs or registration fees, do not currently depend directly on the amount the vehicle is driven. Projects in this category are designed to convert those fixed costs into costs that vary according to the miles the vehicle is driven, thus giving the driver the incentive to recognize these costs when making the decision to drive. Strategies in this category include mileage-based user fees and pay as you drive insurance, and they are unique in providing drivers direct financial savings for reducing their driving. Studies indicate that PAYDI would save 64 percent of households an average of \$270 per year on each insured vehicle. Advanced projects relying on GPS may be able to make an even finer distinction for pricing of auto use according to time and location of travel.

### ***Distance Based or Pay as You Drive Pricing Projects with Recent Results to Report***

#### **Minnesota Mileage-Based User Fee (MBUF) Research and Outreach**

The MnDOT received VPPP funding in September 2006 to conduct Statewide outreach on application of MBUF in Minnesota. Subsequently, in May 2011, MnDOT began conducting technical research on using MBUF as an alternative to the fuel tax. This project developed into a statewide effort to investigate public understanding and opinions of mileage-based charges via interviews, focus groups, and qualitative surveys. A MBUF Policy Task Force was developed to evaluate issues related to a potential MBUF system. The Policy Task Force issued its Final Report in December 2011, in which they recommended that the MBUF approach could be a

potential supplement or alternative funding method to the fuel tax, but a full-scale implementation should not proceed due to unfamiliarity with MBUF among the public and policymakers and the technological and operational complexities of a potential MBUF system. However, the Task Force did recommend that exploration of a MBUF for Minnesota continue to advance. Accordingly, MnDOT conducted a technical demonstration with 500 participants to test the effectiveness of using smart phone technology to collect MBUFs. This research was completed in 2012, and the final report was published in February 2013. Some of the key findings from the research include that participants were accepting of modest monthly MBUF invoices, privacy was not a major concern to participants, and drivers value simplicity in the design of any alternative transportation funding program. The demonstration also provided insight into the types of planning, management, and customer interactions that would be required of a full-scale MBUF program.

### **Oregon Mileage-Based Road User Fee Evaluation**

The ODOT conducted a test designed to demonstrate the feasibility of area-wide, mileage-based road user fees as well as congestion pricing. The purpose of the pilot test was to demonstrate the technical and administrative feasibility of implementing an electronic collection system for MBUF and congestion tolls. The on-board technology was demonstrated in May of 2004. Twenty trial vehicles were equipped with the on-board devices in the fall of 2005. In the spring 2006, after verifying successful functionality, 260 trial participants in Portland, Oregon, had the on-board equipment added to their vehicles. For a period of 1 year, participants paid distance charges rather than the fuels tax (when they filled up at the fuel station, the fuels tax was deducted from the bill and the mileage charge was added). At the conclusion of the study, ODOT successfully demonstrated the feasibility of both MBUF and congestion pricing. The ODOT is now conducting additional pilots that give driver's options and address security concerns, using devices without GPS as well as devices that link to GPS already in drivers' smart phones. As a result of the success of the pilot programs, Oregon is now considering enacting the mileage-based road user fee program into law in 2014. The law would require vehicles made in 2015 or later and getting at least 55 miles a gallon to pay the road user charge.

King 5 News did a report on the Oregon Mileage-Based Road User Fee program in February 2013. This report is available at <http://www.king5.com/news/Will-drivers-someday-pay-for-every-mile-they-drive-190257121.html>

### ***Distance-Based or Pay as You Drive Pricing Projects with Results Not Yet Available***

#### **Pay-Per-Mile Insurance and Supporting Incentives in Texas**

The VPPP awarded funds to the TxDOT in 2010. The original partners to TxDOT included MileMeter Insurance and NuRide, which helps commuters find alternatives to driving alone in return for cash-based incentives such as gift cards. The NuRide system lists ride matches for requested times by the percentage of route overlap and allows users to limit searches by a host of factors, such as to a circle of personal friends and colleagues, to riders and drivers who other

participants have rated highly, or to people of the same gender. The Texas Transportation Institute was also a partner responsible for leading the evaluation of the project. The project intended to assess measures such as changes in VMT; changes in mode use; changes in cost of travel due to the PAYDI model; and other differences in traveler behavior (e.g., number of trips, trip timing, and trip chaining) among different socioeconomic demographics and in rural versus urban drivers.

In late 2013, the TxDOT decided it no longer wanted to lead this project after three unsuccessful attempts to secure an insurance company for the duration of the project. MileMeter Insurance decided that it was no longer in its interests to participate in this project. Two other insurance companies were subsequently invited to participate in this project, but they ultimately declined for similar reasons. The FHWA is presently reviewing the feasibility of continuing the project under the direction of the Texas Transportation Institute.

### **Pay-As-You-Drive Insurance in Washington State**

The VPPP awarded funds to the State WSDOT and its partner King County Metro in 2007. This pilot was designed to field-test telematics recording devices on a sample of approximately 5,000 vehicles, collect baseline data, select a PAYDI premium structure, and roll out and test it in the State of Washington. In addition to mileage, the telematics devices would have collected data on where driving occurs; total driving time; speed; time and day usage; routes; and aggressive stopping and acceleration, some of which may be incorporated into the premium structure. Study participants would have been recruited from Unigard Insurance Company policy holders. Half of the participants in each experimental group would have received free transit passes along with the PAYDI. Participant surveys before, during, and after the study phase would have addressed issues of customer satisfaction, changes in travel modes and travel behavior, use of transit passes, and participants' intentions to continue with their current insurance policy. A control group, whose mileage and claims rates would have measured just as for the experimental groups, would have received discounts based on traditional risk factors.

In late 2013, the WSDOT and the King County Metro decided to end this project because of the difficulty of finding a long term insurance company partner, after Unigard withdrew from the project. In addition, the WSDOT felt that since award of the VPPP grant in 2007, the insurance market has begun to adapt to delivering a product that meets the goals of the project, on its own, without the need for public support.

### **Pay-As-You-Drive Insurance Implementation in Massachusetts**

This VPPP project, awarded in 2012, is a cooperative undertaking by the Massachusetts Department of Transportation Division of Insurance and Executive Office of Energy and Environmental Affairs, along with Plymouth Rock Insurance, the Conservation Law Foundation Ventures, and the Massachusetts Institute of Technology (as the evaluator). Over 3,500 participants will enroll in a PAYDI program, and before-pricing driving data on all participants

will be collected. Different pricing protocols will be tested, varying the form of pricing (first using straight mileage pricing, then varying mileage rates by location and time of day); and the nature and frequency of communications to customers. There will also be monitoring of an additional 5,000 drivers who are never priced, to serve as a control group. Because insurance is very costly in Massachusetts, and also because the pilot will over-concentrate recruitment in congested urban areas where there are good transit and other alternatives to driving, it is expected that substantial changes in driving behavior will result, demonstrating the potential for significant reductions in congestion if deployment were to be further expanded beyond the pilot. A thorough study plan was included with the application that will ensure that the effects of PAYDI on both mileage and on driving during congested times and in congested conditions will be discerned.

## **The Urban Partnership Agreements and the Congestion Reduction Demonstration Programs**

Separate from the Value Pricing Project Program, in May 2006, the DOT announced the National Strategy to Reduce Congestion on America's Transportation Network, also known as the "Congestion Initiative." The intent of the initiative was to demonstrate a variety of innovative but proven strategies that could provide relief to traffic gridlock if more widely practiced. The UPA/CRD programs resulting from the Congestion Initiative encouraged more aggressive broad-scale pricing approaches. In each program, multiple sites around the U.S. were awarded funding for implementation of congestion reduction strategies. In total for these two competitive programs, DOT awarded over three-quarters of a billion dollars in grants to six cities: Miami, Minneapolis/St. Paul, San Francisco, Seattle, Atlanta, and Los Angeles.

The UPA/CRD programs focused on using four complementary and synergistic strategies to relieve urban congestion: tolling, transit, telecommuting, and technology. For example, the Minnesota I-35 W project combined congestion pricing and active travel demand management to implement priced dynamic shoulders.<sup>3</sup> As a result, the UPA/CRD programs represent successful collaboration between offices of several DOT agencies, including the FHWA Offices of Operations and Innovative Program Delivery, Federal Transit Administration, and the Office of the Secretary (OST) Intelligent Transportation Systems Joint Program Office (ITS JPO). The ITS JPO is responsible for the national evaluation that is assessing the impacts of the UPA/CRD projects in a comprehensive and systematic manner across all sites.

The following sections summarize some of the recent findings about the UPA/CRD projects. More information is available in the National Evaluation Reports, which will be available online soon.

### **CRD Project Deployed Since 2012**

#### **Express Lanes on I-10 and I-110 in Los Angeles, CA**

The Los Angeles (LA) CRD Express Lanes Program seeks to reduce congestion, promote throughput, and enhance mobility in the I-10 and I-110 corridors and in downtown Los Angeles. Prior to the Express Lanes Program, the HOV lanes on I-10 and I-110 were experiencing challenges with operational degradation of the facilities. The original LA CRD proposal for converting the HOV lanes into HOT lanes included a plan to increase the occupancy requirement

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<sup>3</sup> Priced dynamic shoulders on I-35 west allow transit and carpools use the shoulder for free and MnPASS customers can use the shoulder for a fee. The left shoulder is open to traffic, with overhead sign gantries indicating its operational status. When the general purpose lanes become congested, the shoulder is opened and the speed limit on the general purpose lanes is reduced.

in order to provide excess lane capacity to sell to ineligible drivers. However, existing policies did not allow for changes to the occupancy requirement. Therefore, existing occupancy requirements were used during the pilot period. The LA CRD grant also awarded funding to several complimentary strategies, which support enhanced transit, technology and travel demand measures. The centerpieces of the LA CRD are the Express Lanes along the I-10 and I-110 freeways. The Express Lanes were intended to improve overall system performance in the two corridors by permitting toll-paying vehicles that do not meet the carpool occupancy requirements to use remaining HOT lane capacity on the I-10 and I-110 freeways. The I-110 Express Lanes span 11 miles and include two lanes in each direction of travel from the I-105 to Exposition Blvd. The I-10 Express Lanes span 14 miles and as part of the demonstration program, a second lane, covering 9 miles, was added from I-605 to I-710. During the demonstration period, all vehicles were required to pay to use the Express Lanes with the exception of publicly or privately operated transit vehicles, motorcycles, and multiple-occupant private vehicles (three or more occupants on I-10 during peak hours, two or more all other times; two or more occupants on I-110). The demonstration period concluded on February 24, 2014. The other LA CRD strategies deployed include major transit improvements: increase frequency of Metro bus rapid transit service through the acquisition of new clean fuel expansion buses; increased service; security upgrades; construction improvements along stations; additional capacity along park-and-ride lots; and implementation of transit priority system technology to facilitate Express Lanes traffic movement where I-110 enters downtown Los Angeles. Additionally, the intelligent parking management (LA Express Park), a variable and demand-based parking pricing system was deployed to reduce traffic congestion, reduce air pollution, and improve transit efficiency by reducing parking search times. Lastly, ridesharing promotional efforts are underway to increase the number of registered vanpools (with a goal of 100 new registered vanpools on the I-10 and I-110 corridors).

Preliminary evaluation results suggest that the LA CRD projects are accomplishing many of their goals and objectives. Consistent with other new HOV/HOT conversion projects, the congestion data analysis shows degradation in travel times and travel speeds performance during the initial deployment period on some portions of the I-10 and I-110. However, consistent with other sites, the same facilities are showing an upward trend in travel time reductions and increases in speed in the later portions of the pilot period. The tolling analysis findings indicate that the number of trips on the Express Lanes (by all groups) continued to increase over the course of the demonstration period, partially demonstrated by the increase in gross revenue from toll-paying vehicles. The many incentive programs proved to be successful with almost \$13,000 in toll credits issued to Transit Rewards Program account holders and over \$100,000 in toll/transponder credits issued to over 4,000 LA County households enrolled in the Equity Plan. In addition, the Express Lanes program surpassed several of its goals including enrolling over 100 new Metro-registered vanpools and issuing over 253,000 transponders by the end of the demonstration period.

Transit analysis findings indicate that Silver Line bus rapid transit line ridership increased largely due to CRD-funded services. The entire line (both I-110 and I-10) showed a 27 percent increase in monthly boarding after the new service was added with an additional 15 percent increase post-tolling. When surveyed, a third of new riders said they drove alone prior to the increased services and 48 percent of riders agreed that tolling has improved their travel.

Analysis also shows that I-10 Express Lane users experienced a 2-minute reduction in travel times during both the morning and evening commute periods. Travel times in the general-purpose lanes also declined by approximately 2 minutes during the morning commute, but increased by over 4 minutes during the evening commute in the post deployment period.

## **Updates on Previously Deployed UPA/CRD Projects**

### **Variable Parking Pricing in San Francisco, CA**

This project officially deployed in April 2011. Unlike its UPA/CRD peers, the San Francisco SFpark project focuses on managing on- and off-street parking in the city. It comprises two key components: providing better, real-time parking information (such as through applications on smart phones) and implementing demand-responsive pricing. In the project's eight pilot areas, parking sensors and meters with a credit card payment option were installed for 7,000 spaces. Meter pricing varies by time of day (3-hour increments) and by block. Rates can go up or down by 25 cents an hour, down by 50 cents an hour if a block is particularly empty, or remain unchanged. Average hourly rates have actually gone down by about 14 cents overall, and 17 percent of the SFpark meters have hourly rates of less than \$1 – significantly less than rates at older meters in the city. In addition, there has been a 20 percent decrease in rates at San Francisco Municipal Transportation Agency (SFMTA)-run parking garages.

An initial revenue evaluation of SFpark showed that more parking revenue is coming from meter payments rather than ticket payments in the pilot areas. Previously, about 45 percent of SFMTA's parking revenue came from citations, versus 20 percent at SFpark meters. This may suggest that the new credit card option has made payment easier, so customers are more likely to pay and avoid a parking citation. In addition, although increased revenue is not the primary goal of the project, the new meters are generating approximately 11 percent more net revenue than meters that were not upgraded. The SFpark is entering the evaluation phase. The final report will be completed in the fall of 2014.

As of January 2013, all parking meters allow payment by phone. Customers with smartphones that have Near Field Communications (NFC) payment capability can “tap” the meter to initiate streamlined payment. With about 29,000 meters throughout the city, this NFC deployment is one of the largest single NFC deployments in the United States.

In January 2014, SFpark announced its ninth demand responsive garage rate adjustment, in which 3 percent of all garage hourly rates decreased, 86 percent of all garage hourly rates remained the same, and 11 percent of all garage hourly rates increased. In February 14, the 13<sup>th</sup> on-street meter rate adjustment was announced. This adjustment decreased the rate by 25 cents or 50 cents during 8 percent of metered hours, 73 percent of metered hours stayed the same, and increased the rate by 25 cents during 19 percent of metered hours.

### **Full Facility Tolling on SR 520 in Seattle, WA**

This UPA/CRD project is unique in that it comprises full facility pricing, which began December 29, 2011, on the existing four-lane SR 520 Bridge crossing Lake Washington. The facility is tolled by time of day, and toll revenue will generate funding to partially pay for the construction of the new SR 520 Floating Bridge. The project also includes electronic travel time signs on I-405, SR 520, and SR 522 directing drivers to the best route across Lake Washington; a “Smarter Highways” program on SR 520 and I-90 (a parallel route) that provides drivers with variable speed limits and real-time driver information; and more than 130 daily bus trips across the SR 520 Bridge.

Tolling on SR 520 is on track to generate the \$1 billion in revenue needed to construct a new bridge, with nearly 21 million toll transactions in FY 2013. Monthly tolled trips continue to grow between 2 and 5 percent when compared to the same month in the previous year. Daily toll traffic volume meets or exceeds projected levels, and travel times are faster on average during peak periods. Drivers on SR 520 save an average of 5 minutes on their trip. Weekday traffic volumes on I-90 are about 14 percent higher, and peak period travel times are on average about 1 minute longer. Transit ridership on SR 520 has also increased. Before tolling began, King County Metro Transit and Sound Transit added 140 daily bus trips across SR 520, bringing weekday service to nearly 750 bus trips on 19 routes. As a result, weekday ridership has increased 12 percent since 2012 and 41 percent since 2010. Vanpools have also increased 40 percent.

The project team anticipates that traffic and revenue will continue to meet projections. Toll rates will increase in July 2014 as the third of four planned 2.5 percent annual rate increases through 2015.

### **Express Lanes on I-85 in Atlanta, GA**

For this UPA/CRD project, an existing 16-miles of HOV2+ lanes on I-85, one in each direction, was converted to HOV3+ Express Lanes. The lanes operate 24/7, and carpools with three or more riders, buses, emergency vehicles, motorcycles, and vehicles with alternative-fuel vehicles license plates can use the lane for free, while single occupant drivers and two-person carpools pay a dynamically priced toll. In November 2013, weekday trips in the Express Lanes averaged 21,160, as opposed to 18,223 in November 2012. The number of registered “PeachPass” transponders has grown from approximately 75,000 before the lanes opened to over 268,000. With this growth in usage, the average daily toll has increased, from \$1.35 in August 2012 to

\$1.72 in August 2013, and hitting a record high of \$8 for the full trip during peak hour traffic in fall 2013. In addition, a 2013 survey showed 88 percent customer satisfaction with the Express Lanes after the first 12 months of operation.

Like the other UPA/CRD Express Lanes projects, the Atlanta project has a transit component, bringing online 36 new Xpress commuter coach buses and 2,200 new spaces in park-and-ride lots along I-85, as well as 45 new commuter coach buses and 5,000 spaces in park-and-ride lots in the remainder of the region. In May 2012, seven months after the start of tolling, riders were asked about the influence of the conversion of the HOV lane to an HOT lane on their decision to ride the bus. While only 13.5 percent of riders who had starting riding prior to tolling said they were influenced to take transit because of the conversion of the lane to tolling, 48.9 percent of riders who began transit after tolling said they were influenced.

### **Express Lanes on I-35W in Minneapolis/ St. Paul, MN**

Building on the success of the MnPASS lanes already implemented on I-394 (previously funded under the VPPP), MnDOT pursued a UPA project to add MnPASS facilities to I-35W as well. The existing HOV lanes on I-35W from Burnsville Parkway to I-494 were extended, converted to Express Lanes, and opened in September 2009, and a 2-mile MnPASS extension south beyond the I-35E split opened in November 2010. The dynamically priced HOT lanes are in operation from 6 a.m. to 10 a.m. in the northbound direction and from 2 p.m. to 7 p.m. in the southbound direction. Carpools with two or more people, vanpools, buses, and motorcycles continue to use the lanes toll free. The MnDOT has the distinction of being the first agency in the country to operate a priced dynamic shoulder lane (PDSL), which is open to the same user groups as the HOT lanes. The PDSL operates northbound on I-35W from 46th Street to downtown Minneapolis during the same hours as the Express Lanes and reverts to a shoulder at other times. The facility now has nearly 2 years of performance data. On the southern portion of the project (Burnsville Parkway to I-494), there are nearly 3,500 toll paying customers per day.

From 42<sup>nd</sup> Street to downtown Minneapolis, the number of toll paying customers has grown to 4,614 per week or about 923 per day on average. Demand and revenue continue to grow on the MnPASS portion of the project. The average toll paid on the PDSL is \$2.55. Drivers appear to understand messages when the shoulder is open or closed and violations have not been a significant problem. A detailed evaluation of the corridor has been completed as a component of the UPA.

The urban partners also initiated several transit-related improvements, including the addition of 27 new express buses on the Marquette and Second Avenue (Marq2) bus route, which features side-by-side bus-only lanes for faster trips through downtown, and traveler information technologies such as electronic messaging for bus arrival and park-and-ride space availability. A lane guidance system for shoulder-running buses was deployed on Cedar Avenue. The system includes lateral-guidance assistance, collision avoidance, and automatic vehicle location system technologies. There has been an 18 percent increase in ridership on the Marq2, and bus

operating speeds have increased, resulting in 5-10 minutes in time savings. In addition, 2,347 new parking spaces were added at park-and-ride facilities. Use of the park-and-ride lots along I-35W South and Cedar Avenue increased by 641 vehicles from September 2009 and October 2011, and use of the lots along I-35W North increased by 48 vehicles over the same time period.

Another unique aspect of this UPA/CRD project is eWorkPlace, a teleworking program that encourages employers to offer their employees the option of working remotely. Over 4,000 employees and 48 employers had signed up as of June 2011, eliminating over 1,260 solo car trips per week.

### **Express Lanes on I-95 in Miami, FL**

The Miami UPA/CRD project, also known as the “95 Express,” used a phased approach to convert a single HOV lane in each direction into dual Express Lanes on 21 miles of I-95 from Fort Lauderdale to downtown Miami. The project was implemented under two construction contracts in three phases. In December 2008, the northbound direction of the southern segment of the Express Lanes project (from downtown Miami to Golden Glades) opened to traffic, and the southbound direction of the same segment opened in early January 2010. The northern segment from Golden Glades to I-595 opened in 2012. The scope of the 95 Express project extends beyond the conversion of HOV to Express Lanes. It also includes improved ITS monitoring and incident management capabilities, ramp metering, and bottleneck elimination. There is a significant transit component to the project as well: 23 new express buses were added, and three new BRT routes were added in January 2010.

Since opening, the 95 Express has had a dramatic, positive effect on travel in South Florida. The tolling, transit, travel demand management and technology strategies have increased travel speeds by 200 percent in the local lanes and by 300 percent in the Express Lanes, while increasing transit usage by 286 percent since launch. Through March 31, 2014, 95 Express serviced 5.8 million trips in 2014, bringing the total since initial opening, December 5, 2008, to 94.1 million trips. Total revenue through March 31, 2014 was \$5.8 million for the year, bringing the total revenue to date to approximately \$77 million. The total number of registered toll exempt vehicles, e.g., carpool, vanpool, buses & hybrids was 9,109, resulting in approximately 137,000 toll exempt trips for 2014.

The most recent construction phase for 95 Express began in November 2011 and will last until spring 2015. This will extend the existing Express Lanes north from the Golden Glades Interchange, in Miami-Dade County, to Broward Boulevard, in Broward County, by converting existing HOV lanes into two Express Lanes in each direction.

### **The UPA/CRD Lessons Learned Since 2012**

The LA Metro deployed the final UPA/CRD project in February 2013. The LA partners then collected a year of post-deployment data. The evaluation team is in the process of preparing

final reports for the SFpark and LA Metro projects. Once these final reports are completed, the evaluation team will prepare a crosscutting report that represents lessons learned from the six UPA/CRD project sites. While that process will not be complete until next year, the evaluation team and project partners offered some initial lessons learned provided below:

- Outreach is important to shifting people's thinking.
- A variable toll can manage demand during the peak period.
- Investing in transit on a priced managed lane leads to significant growth in transit ridership.
- On-going construction can have an impact on data collected.
- The quality and quantity of data collected makes a difference. For example, 1 year of post deployment data may not be enough to draw long-term conclusions (one example is that typically, experts rely on 3-5 years of data to allow them to identify trends critical to determining safety performance on a facility).
- Successful operations can lead to public support of Express Lane projects in other corridors.
- Enforcement remains a challenge.

## **Advancing Pricing Initiatives: FHWA Outreach and Technical Assistance**

The Transportation Research Board's Congestion Pricing Committee established 2013 as the **"Year of Learning for Congestion Pricing."** Aside from authorizing, funding, monitoring, evaluating and documenting the various pricing projects and programs listed in the previous sections, FHWA has contributed to this "year of learning" by advancing the adoption and implementation of road, parking, mileage, rideshare and other pricing initiatives through a variety of other means. In particular, FHWA has sponsored and participated in numerous webinars and conferences on the latest and best pricing strategies to encourage widespread attention and adoption. The FHWA has also supported the development of primers, guidance documents and white papers to provide specifics on program development, successful ongoing implementation and issues pertinent to promising, emerging strategies. The DOT also continues to oversee the independent UPA/CRD National Evaluation conducted by Battelle. The evaluation report will focus on assessing the impacts of strategies, providing information and lessons learned to support deployments in other areas, and helping to inform Federal policy and program development.

### **Webinar Series on Overcoming the Challenges of Congestion Pricing**

The FHWA continued its successful Congestion Pricing Webinar series with Webinars focused on topics related to overcoming the challenges of congestion pricing. Webinar topics over the past year have included:

- Incident Management and Access for Managed Lanes
- The Impacts of Congestion Pricing - Lessons Learned from Recent Evaluations
- The Impacts of Congestion Pricing on Carpooling and Transit
- Managed Lanes Access Issues

The Webinars on the Impacts of Congestion Pricing were intended to provide information similar to what was heard at sessions during the National Congestion Pricing Conference, enabling those who were unable to attend the conference to participate in the discussion on these topics.

The Webinars had an average of 200 participants each, with the Managed Lanes Access Issues topic attracting over 300 participants. Participants represented State DOTs, local agencies, and private sector organizations. Recordings and presentations from all Webinars are available at [http://www.fhwa.dot.gov/ipd/revenue/road\\_pricing/resources/webinars/congestion\\_pricing\\_2011.htm](http://www.fhwa.dot.gov/ipd/revenue/road_pricing/resources/webinars/congestion_pricing_2011.htm), allowing the materials to be used as a resource at any time to help implement congestion pricing strategies.

## **The FHWA/Utah Department of Transportation (UDOT) I-15 Express Lanes Workshop**

This FHWA-sponsored workshop assisted the UDOT with advancing the I-15 Express Lanes program. Presenters from Miami and Los Angeles served as experts during the workshop and shared information about the strategies and key elements that lead to the successful operation and management of projects within their jurisdictions. The workshop included sessions on enforcement, outreach/communications, back office operations, changing toll rates, and degraded facilities. The workshop resulted in a series of action items to include quantifying the need for toll rate changes, developing an I-15 strategic plan, surveying existing express pass customers to determine their preferences and level of satisfaction, enhancing enforcement, and enhancing communications and outreach to encourage more motorists to use the Express Lanes.

## **Congestion Pricing: A Primer on Institutional Issues**

This primer was published in June 2013 as part of the Congestion Pricing Primer Series. It explores a range of institutional issues commonly encountered with priced roadway lanes and parking pricing programs. These include the up-front challenges of establishing leadership, meeting legislative requirements, and setting an organizational structure. Once these challenges are overcome, there are numerous institutional issues related to the planning process, public involvement and implementation procedures. These topics are considered based upon the insights offered during a peer exchange, and from case study applications around the United States and Europe. The primer is available at

<http://www.ops.fhwa.dot.gov/publications/fhwahop13034/index.htm>.

## **Guidebook for State, Regional, and Local Governments on Addressing Potential Equity Impacts of Road Pricing**

This guidebook was published in August 2013 and is designed to assist transportation agencies to better assess and mitigate perceived and potential equity impacts of road pricing projects on local communities, commuters, and system users. Addressing potential equity issues is often vital to obtaining support needed to implement road pricing projects. In order for road pricing projects to succeed, the implementing State, regional, and local agencies must understand equity issues, develop mitigating measures, and articulate the issues and mitigation strategies to both the decisionmakers and the public. This guidebook is intended to help agencies understand and communicate both the horizontal and vertical equities of their road pricing policies and projects.

The guidebook is available at

<http://www.ops.fhwa.dot.gov/publications/fhwahop13033/index.htm>.

## **The UPA/CRD National Evaluation**

A major objective of the UPA/CRD programs was to clearly and definitively evaluate the impacts of these multimodal projects on traffic congestion, safety, and transit use. The DOT established the National Evaluation as an independent process to assess those impacts.

Representatives from the modal agencies were actively involved in the evaluation. The Battelle

team was selected by the DOT to conduct the national evaluation through a competitive procurement process.

The national evaluation generated information and produced technology transfer materials to support deployment of the UPA/CRD strategies in other metropolitan areas. The national evaluation also generated findings for use in future Federal policy and program development related to mobility, congestion, and facility pricing. Project participants were required to provide extensive data in support of the performance measures established by the National Evaluation. This has proven to be the best opportunity that the managed lanes and congestion pricing community has had to develop data-driven performance measures producing statistically significant results and lessons learned. Many pricing projects over the past two decades have provided valuable lessons learned but were mostly anecdotal, lacking adequate data to draw statistically significant conclusions.

The results of the national evaluation for each UPA/CRD location have been summarized in a series of national evaluation reports. These reports are in the process of being finalized and will be posted online to the FHWA Congestion Pricing Web site.

### **National Congestion Pricing Conference**

The National Congestion Pricing Conference was the cornerstone of the “Year of Learning” effort. On July 9-10, 2013, 114 leaders in congestion pricing, managed lanes, and parking pricing convened in Seattle, WA to discuss recent successes in and challenges to advancing congestion pricing in the United States. The primary objective of the conference was raising the awareness, advancing the State-of-the-practice, and identifying the research and technology transfer needs in support of deploying congestion pricing strategies in the United States. Participants represented State, local and regional jurisdictions from across the United States and Ontario, Canada. Nearly half of the participants came from regional entities and State agencies; including MPOs, State DOTs, and tolling and transit agencies.

The workshop maximized participation by using a sequence of moderated panels followed by interactive discussion. Panelists represented the perspectives of different types of stakeholders involved in congestion pricing projects, including project managers, local elected officials, academics, State and local practitioners, and consultants. Key takeaways from the panels are summarized in Table 2.

Table 2. Key Takeaways from the National Congestion Pricing Conference

Panel Topic	Key Takeaways
<p><b>Innovations in Congestion Pricing over the Past 3 Years (Panel – Implementing Agency Project Managers)</b></p>	<ul style="list-style-type: none"> <li>• Clearly define pricing objectives early in the process, communicate them broadly, and use them to guide project decisions.</li> <li>• Transit benefits associated with congestion pricing projects have been substantial.</li> <li>• Identify relevant key performance indicators including traffic, safety, drivers’ time savings, and revenues.</li> <li>• Funding tied to aggressive deadlines established by DOT for implementation of the UPA/CRD projects helped to expedite consensus and focus project delivery.</li> </ul>
<p><b>Gaining Support and Buy-in from Elected Officials (Panel – Elected Officials from Regions with Implemented Pricing Projects)</b></p>	<ul style="list-style-type: none"> <li>• Perceptions of elected officials are often quite different from the agency view.</li> <li>• Sources and uses of funds are sensitive with pricing projects.</li> <li>• Broad coalitions are particularly useful in politically balanced cities. A center city, suburb, and exurb coalition is essential.</li> <li>• Look for partners and champions outside of the lead public agency.</li> </ul>
<p><b>Issues, Impacts, and Lessons Learned in Advancing Congestion Pricing Projects (Panel – Project Managers, Consultants, Planners)</b></p>	<ul style="list-style-type: none"> <li>• The public needs to see clear, direct benefits of pricing in their lives – a “Value Proposition.”</li> <li>• Back office functionality must align with policy goals through setting clear and manageable business rules.</li> <li>• Demonstrate that you are reinvesting excess revenues and back office cost savings into the corridor and local regions.</li> </ul>
<p><b>Parking Pricing – A Key Element of Regional Congestion Pricing Programs (Panel – Agency Project Managers)</b></p>	<ul style="list-style-type: none"> <li>• Effective parking management requires a balance between actual demand and supply. Current parking minimum policies are outdated.</li> <li>• Parking pricing with advanced technology allows for a shift from violation revenue to meter revenue, which is far more effective and popular.</li> </ul>
<p><b>Congestion Pricing Projects in Seattle (Agency Project Managers)</b></p>	<ul style="list-style-type: none"> <li>• Equity issues are not only related to income and environmental impact, but also jurisdictional impacts.</li> <li>• Domestic scans can be useful to share information. The scan demonstrated the value of practitioners viewing pricing projects first hand and sharing experiences with peers.</li> </ul>

Panel Topic	Key Takeaways
<b>Regional Approaches for Implementing Congestion Pricing Around the U.S. (Regional Planners Involved with Pricing Programs)</b>	<ul style="list-style-type: none"><li>• There is a need to develop a National Vision for transportation funding as Regional Long Range Plans are starting to effectively address funding shortfalls utilizing various pricing strategies.</li><li>• Policies, business rules, and finances will continue to be very different for each new project and must be flexible to accommodate regional networks.</li></ul>

## **Advancing Congestion Pricing Over the Next 3-5 Years**

### **Emerging Trends and Areas for Further Research**

State, regional and local governments are engaged in a host of pricing initiatives with potential to reduce congestion, reduce environmental problems and support the growing trend toward livable city and suburban centers. The initiatives span the full gamut of pricing categories and strategies including road, parking, mileage, rideshare and other pricing initiatives.

While the VPPP no longer solicits proposals for funding, the program still has an important role in encouraging pricing innovations. The FHWA continues to support states' and regions' pricing initiatives by offering guidance and expertise in choosing the most promising and appropriate of the emerging strategies.. For instance, where a pricing strategy has shown good success in limited settings but has yet to receive attention for possible replication elsewhere, FHWA can develop and promote Webinars, conference sessions, peer exchanges, guidance documents and other outreach actions to draw attention to the strategy.

The FHWA will continue to take into account the pertinent developments and trends in pricing strategies showing the most promise at the local, regional and State level. The six categories of pricing strategies below represent a summary of the most important recent trends and developments:

- Managed lane networks
- Pricing of existing facilities
- Parking pricing
- Priced vehicle sharing and dynamic ridesharing
- Pay as you drive pricing
- Integrating pricing into long range planning

### ***Managed Lane Networks***

State and regional governments have demonstrated in recent years numerous innovative pricing applications on highways and roadways in recent years. The types of strategies include pricing of carpool ramps; dynamic pricing of Express Lanes; managed lanes with moveable barriers and pricing based both on distance and congestion levels combined with enhanced transit; all electronic open road tolling; pricing strategies tied to finance of major corridor rehabilitation and transit expansion; and pricing strategies combined with programs to accommodate lower income groups.

Beyond these innovations, an important trend deserving attention is the expansion of managed lanes from single facilities and corridors to networks, including new finance mechanisms to support network development. This trend is especially important because it promises not only expansion of efficient pricing strategies for managing congestion but new revenue sources to

supplant or supplement traditional sources many States and regions are finding to be inadequate for meeting current and future transportation needs.

In particular, the following network developments exemplify this area of interest:

- The Miami area is expanding beyond the initial Express Lanes on I-95 to extend the lanes about 14 miles to Fort Lauderdale, and to add new Express Lanes to I-75 in Broward County and to the north-south portion of the Palmetto Expressway in Miami-Dade County. Future projects planned include extending the I-95 Express Lanes further north to Boca Raton and West Palm Beach and express toll lanes for the Dolphin Expressway. In support of the network, Florida DOT developed common design and operations parameters for future projects in Miami, Jacksonville, Orlando, and Tampa.
- The Atlanta area is adding reversible managed lanes to I-75 and I-575, and to a southern portion of I-75, beginning a network approach in the area.
- The Washington, DC metro area is building upon public support for a 500-mile network of priced managed lanes on all the major freeways, including express-bus/BRT service. The regional planning agency is advancing the express toll lanes network as one of two long-term strategies in its Regional Transportation Priorities Plan.
- The San Francisco area is beginning development of the first 90 miles of a projected 270-mile initial network. The initial projects will be 34 miles on I-880 and two bridge approaches in Alameda County, 12 miles on I-680 in Contra Costa County, and 11 miles on I-80 in Solano County. Initial projects are planned to be in operation by 2016 (I-680) and 2017 (I-880 and I-80).
- The Los Angeles area is beginning sections of what will be a managed lane network. Under construction is the widening of SR 91 in Riverside County, extending the existing Express Lanes from the Orange County line eastward beyond I-15. Riverside County plans a similar project on I-15 and San Bernardino County is planning to add managed lanes to I-10 and I-15. In Los Angeles County, projects include adding managed lanes to I-5 in the northern part of the county.
- Other managed lane network plans are in various stages in Dallas-Fort Worth, Houston, San Diego, and Seattle.

Accompanying several projects are innovative finance mechanisms. Projects are primarily being procured and developed with one of three mechanisms: (1) design-build (procuring agency assumes traffic, operations and maintenance cost and revenue risk), (2) toll concession (concession company assumes these risks), and (3) availability-pay concession (procuring agency bears traffic & revenue risk with the concession company assuming operations and maintenance cost risks). For example:

- In California, various entities are supporting project planning and development with one or more of the finance mechanisms. Examples include Riverside County extension of SR 91 Express Lanes east to I-15; LA Metro addition of priced managed lanes to I-5 in northern Los Angeles County; Orange County Transportation Authority plans for priced lanes to I-405 between John Wayne Airport and the LA County line.

- In Florida, the DOT is procuring an availability-pay concession for two express toll lanes on I-4 in Orlando. Other projects referenced above are planning to use one or more of the innovative finance mechanisms.
- In Georgia, the DOT is using design-build for I-75 in Henry County, south of Atlanta, and I-575 in Atlanta's northwestern suburbs.
- In North Carolina, the 26 miles of express toll lanes on I-77 in Charlotte will be procured as a 50-year toll concession.
- In Texas, various toll lane projects are financed by toll concession (I-35W, SH 288), and design-build-maintain contracts (I-35E).

### ***Pricing of Existing Facilities***

The majority of roadway and network pricing programs apply to existing facilities. Strategies typically include adding lanes or new road capacity, or conversion of HOV or shoulder lanes to priced lanes often called HOT lanes. One example from the projects in this report includes variably pricing of an existing carpool ramp connecting carpool lanes on two freeways, the SR 237/I-880 in the Santa Clara Valley of California. Other examples include new tolls on existing facilities coupled with major improvements or rehabilitation. The main operational example is tolling of the SR 520 Bridge in the Puget Sound region coupled with widening and rehabilitating the facility. The CDOT may follow suit in the future. As noted in the projects above, the Department is studying pricing of an existing elevated section of I-84 in the city of Hartford both to aid in financing major rehabilitation/replacement and to manage traffic flow.

Another category of pricing on existing facilities is variable tolls on fixed toll roads, including raising peak period tolls or discounting tolls off-peak. Examples supported by the VPPP in the past are variable pricing on the Cape Coral Bridge and Midpoint Memorial toll bridges in Lee County, Florida; variable pricing on the New Jersey Turnpike, the Port Authority of NY and NJ's Interstate bridges and tunnels between New York City and New Jersey; and variable truck tolls on the Illinois Tollway.

Though not as common as pricing coupled with new or converted use facilities, pricing of existing facilities is another strategy to be considered. Many roads and bridges in the Nation, tolled or not, are in need of rehabilitation or replacement and new or revised tolling schemes for such facilities promise both aid in financing improvements and managing traffic flows to minimize future congestion. Furthermore, as acceptability research in pricing suggests, decisionmakers and the public will support pricing of existing facilities where revenues are devoted to improvements on the facility and accompanying services such as improved transit. Support also hinges on public trust in the operating agency, good enforcement against violators and efficient, secure payment made possible with electronic systems and privacy safeguards. The FHWA will continue to disseminate evaluation results of ongoing and new evaluations of existing facility pricing through webinars and summary briefs, and encourage research on price effects and elasticities.

### ***Parking Pricing***

Parking pricing strategies have grown in recent years, spurred by several important developments. One emerging development is that research has shown that much downtown congestion is related to outmoded parking pricing rates and schedules, and also that the supply of parking is excessive and wasteful in many commercial and residential developments. As well, parking pricing technologies have advanced considerably allowing for implementation of variable pricing schedules and easier payment methods. Finally, many localities control parking through existing policy and regulations avoiding the need for new legislation and organizational development as sometimes is necessary for road pricing programs.

As shown in the parking pricing projects listed above, many promising parking programs are underway in localities aided by previous FHWA funding, technical assistance and evaluation. Stanford University is varying pricing by location and demand coupled with off-peak commuting incentives to reduce excessive parking and travel demand. San Francisco is varying on and off street parking rates by demand to get best use of parking supply, coupled with smartphone information on real time demand to help drivers find available parking. Berkeley is beginning a similar program. King County Metro is reducing oversupply of parking at residential developments coupled with encouragements for non-auto modes. Seattle is encouraging better use of commercial parking through a combination of pricing, smartphone reservation and easy payment system.

In addition to these developments already receiving FHWA attention and support, localities are studying or mounting other parking related efforts. Some include:

- New parking taxes to encourage more efficient private and commercial parking rates.
- Expanded preferential parking for car sharing.
- Revised pricing and management of residential parking zones.
- Revised public and commercial monthly permit policies and incentives.
- Refinement and targeting of parking cash out for broader implementation.
- Revised disabled pricing policies and enforcement to reduce abuse.
- New encouragements for unbundling parking in residential and commercial sectors.

Some of these initiatives are at a stage amenable to research, issue paper development and pilot programs. Others may have sufficient documented success in several settings to be candidates for broad dissemination via webinars and guidance documents. For example, preferential parking for carsharing may fit more into the latter category; new parking taxes into the former.

### ***Priced Vehicle Sharing and Dynamic Ridesharing***

Priced vehicle sharing and dynamic ridesharing have the potential to combine with other congestion pricing, transit/HOV, and parking pricing strategies to reduce auto ownership and usage. Many programs are based upon fixed pricing; however, an emerging trend is that some are exploring introducing market-driven variable pricing.

Carsharing typically involves a partnership between a commercial operator and city whereby the operator arranges to position vehicles in designated public or private parking spaces. Recently, systems have opened with agreements in place to allow shared vehicles to park in any legal on-street parking space within a specific geographic area. Another emerging trend is that carsharing has become commercially viable in many U.S. cities, having launched in the past several years with the assistance of the FHWA VPPP and other sources of seed funding. Innovation and competition among for-profit operators has driven significant progress in the industry in the past few years.

Similarly, bikesharing programs have emerged in many U.S. cities, having been popular overseas for decades. Programs operate under a few different models including public agency operator, non-profit, and for-profit, which can have an impact on objectives and deployment. All are focused on providing an alternative to other modes, including private vehicle, transit, and walking, to reduce vehicle trips and miles traveled. Revenue-generation also influences operations, as budgets must be met, regardless of operating model.

Dynamic ridesharing programs have flourished in many heavy commute corridors, as an alternative to driving alone and mass transit. The proliferation of smart phones has enabled real-time ride matching among potential drivers and riders where current traffic congestion and transit loads can influence participation by both parties. Fortunately, applications designed specifically for these projects include special features to prevent distracted driving while vehicles are in use. This can help to ease peak period usage of transit and roadways, delaying the need for the extreme expense of major capacity improvements.

### ***Distance Based or Pay as You Drive Pricing***

Another approach to altering vehicle use that has begun to emerge is the use of distance-based or pay-as-you-drive pricing to convert some of the fixed costs of owning and operating a vehicle to variable costs. One example is more variability in insurance and/or leasing costs based on mileage. Another approach includes travel prices based on VMT. Both approaches potentially encourage drivers to be more efficient in trip making and reduce driving at congested times and places depending on how prices are set. A mileage fee also can be varied by vehicle emission class and/or weight, serving the objectives of reducing emissions and accounting for added road wear from heavier vehicles. An added objective of VMT or mileage fees is to preserve or increase transportation revenues, a critical need in many localities and States.

Both categories of distance based pricing are in line with national, State and local goals for reducing emissions and traffic congestion and with growing interest in alternative transportation financing. Furthermore, unlike some other pricing concepts, mileage fees are not only applicable locally or regionally, but have potential at the State and national levels too.

As projects above demonstrate, FHWA has supported several distance based pricing initiatives. The MnDOT examined MBUF as an alternative to the fuel tax, including demonstration involving smart phone technology to collect fees.

There are several particular issues with distance-based fees that need additional attention. At the research level, it is important to track successful international implantation of broad mileage fee programs targeted to light-duty vehicles and/or trucks. Examples include programs in Germany, Switzerland, Austria, the Czech Republic, Hungary and Slovakia. Emerging specific issues deserving particular focus include:

- Price effects on vehicle use, ownership, and alternative mode use.
- Costs and savings across uses, the insurance industry and public sector implementing agencies where applicable.
- Comparison between mileage fees and traditional gas taxes as to effects on driving and revenue potential.
- Public reaction and acceptability particularly on data handling and privacy matters.
- Policy, regulatory and organizational implications associated with both insurance based and vehicle mileage fee systems.

### ***Integrating Pricing into Long Range Planning***

The pricing strategies addressed in this report fit with several major goals common to State and regional plans including reducing single occupancy vehicle travel during peak periods (e.g., by encouraging shifts to carpools, transit, and other HOV options). Appropriate application of these strategies can provide reliable travel options (e.g., by providing a congestion-free priced option) and reducing emissions (e.g., by reducing traffic delay and sluggish traffic flows). Furthermore, the various pricing strategies can optimize existing road capacity rather than build new capacity, important in times of fiscal constraint. Pricing strategies could also improve transportation system reliability, valuable to the freight and business communities; increase safety by reducing congestion and associated accidents and delays important to all travelers; improve bus speeds important to transit users. Parking pricing could reduce cruising for parking and volume of parking demand important for downtown business vitality and safety for pedestrians and cyclists; and support transit expansion depending on net revenue allocation plans.

An emerging trend is that several regional and State governments are making pricing increasingly central to their State and regional planning processes and documents. This centralizing trend entails comprehensive pricing plans including road and network pricing coordinated with parking pricing, transit service and expansion, vehicle sharing and broad demand management strategies. Examples include comprehensive pricing in the regional and State plans for Puget Sound area, San Francisco Bay area, Washington, D.C. and at both the regional and State level in Maryland, Virginia, Minnesota and Texas.

## **Current and Planned Outreach and Technical Assistance Activities**

As noted previously, while MAP-21 did not allocate funding to the VPPP program, FHWA will continue to provide support to regions and States in planning and implementing pricing projects through outreach and technical guidance. The expansion of congestion pricing across the U.S. depends heavily on educating States, MPOs, the public, and decision makers about congestion pricing and equipping them with informational resources and materials to help them develop and implement congestion pricing projects. The FHWA has several outreach initiatives planned over the next 3 years, including:

- Webinar Series on Overcoming the Challenges of Congestion Pricing
- Back Office Issues Peer Exchange and Primer
- Dynamic Ridesharing Primer
- Second Generation Congestion Pricing Projects Primer
- Parking Pricing Workshops
- Peer Exchange on the Impact of Congestion Pricing on Transit and Ridesharing
- Congestion Pricing Web site Updates
- Developing Analytical Methods to Measure Pricing Impacts

### ***Webinar Series on Overcoming the Challenges of Congestion Pricing***

The FHWA intends to continue this successful Webinar series, described earlier in the report, with Webinars held on a quarterly basis. Potential topics for upcoming Webinars include Shared Use Mobility, Interoperability, and Transit and Ridesharing.

### ***Publications and Information Products***

The FHWA has developed numerous primers and research reports to help guide State and local agencies and decisionmakers in implementing congestion pricing strategies. These include the Congestion Pricing Primer series, which covers topics such as non-toll pricing, technologies that enable and complement congestion pricing, transit and congestion pricing, economics of congestion pricing, and income-based equity impacts of congestion pricing. The FHWA is currently in the process of developing a primer on Back Office Issues, which will address administrative and back office technical aspects that are critical to the operation of a variably priced system. Issues to be addressed include the impact of business rules on back office operations, adjudication process for violators, efficient processing of video tolls, and interstate sharing of Department of Motor Vehicle records. A peer exchange, further described in the following section, was convened in May 2014 to gather input for the primer content. A primer on Dynamic Ridesharing is also planned, which will involve discussions with managers of the VPPP priced dynamic ridesharing projects and a policy peer exchange workshop to discuss issues and challenges related to integrating dynamic ridesharing and pricing. The FHWA also intends to develop a primer on the Evolution of Second Generation Congestion Pricing Projects. This primer will explore how the success of HOV to HOT conversions has led regions to develop networks of priced Express Lanes and regional congestion pricing strategies. It will also identify

challenges and opportunities facing agencies that are looking to expand the second generation pricing strategies.

### ***Workshops and Peer Exchanges***

The FHWA held a Back Office Issues peer exchange in May 2014 in Baltimore, Maryland. The peer exchange brought together 11 experts from around the country to discuss issues related to how policy decisions drive business rules, interoperability, back office efficiency, enforcement, data analysis and warehousing, transparency, privacy, and private sector involvement. The input from the peer exchange will be used to develop the Back Offices Issues primer previously described.

A series of Parking Pricing workshops is currently planned to start in June 2014, oriented toward agencies that are planning to or are already in progress of implementing parking pricing. The workshops will focus on the successes and lessons learned from *SFpark*. A representative from *SFpark* will be the primary presenter at these workshops and will discuss the specifications and details of the *SFpark* implementation. The FHWA intends to hold one pilot workshop and up to ten additional workshops in locations around the U.S.

The FHWA will also be sponsoring several peer exchanges, both in person and virtual, focusing on topics such as the impact of congestion pricing on transit and ridesharing, administrative technology aspects and issues associated with congestion pricing and dynamic ridesharing.

### ***Congestion Pricing Web Site***

The FHWA will be launching a newly designed and organized Congestion Pricing Web site in 2014. The Web site will provide comprehensive information on Congestion Pricing and related Federal programs. The site will provide links to publications, tools, and other resources to help agencies implement Congestion Pricing. In addition, the VPPP quarterly reports will continue to be posted to the Web site, providing updates on each VPPP project.

## **Conclusion**

The VPPP has helped States and regions explore and initiate pricing projects that have successfully managed congestion on State and regional facilities. These projects have played a central role in introducing transportation professionals, political leaders and citizens to pricing as a tool to address congestion problems and to manage the transportation system more effectively. The VPPP (along with the UPA and CRD projects) has provided technical assistance, outreach, and research with respect to both tolling and non-tolling programs and projects.

In order to further develop, advance, and enhance the tolling and pricing strategies and emerging trends that have progressed thus far as part of the VPPP, FHWA will continue to equip State and local agencies with resources and guidance to help understand and implement congestion pricing strategies. The outcomes, lessons learned, and success stories from the VPPP are often shared through these activities. These real world examples enable target audiences to understand that congestion pricing strategies can be successfully implemented in all different types of regions.

## Appendix A: VPPP Projects Funded Since 2008

FISCAL YEAR	FUNDING RECIPIENTS	STATE	PROJECT	AMOUNT
2008	Caltrans/San Francisco Municipal Transportation Agency	CA	SFPark Urban Partnership	\$10,000,000
2008	MNDOT	MN	MN Innovative Choices for Congestion Relief UPA	\$5,000,000
2008	WSDOT/King county/Puget Sound	WA	Seattle/Lake Washington corridor Tolling and Transit UPA	\$10,000,000
2009	Caltrans/Valley Transportation Authority	CA	Implement roadway pricing on SR 237 Express Connectors	\$3,200,000
2009	Twin Cities Area	MN	Feasibility study on pricing innovative lane additions on Trunk Highway 77	\$540,000
2009	Twin Cities Area	MN	Pre-implementation study of priced managed lane on I-94	\$400,000
2009	Greater Buffalo Niagara Regional Authority	NY	Pre-implementation of study of GPS-based truck pricing system	\$717,000
2009	Puget Sound/Seattle Area	WA	Express Lanes system concept study	\$1,280,000
2010	Caltrans / Santa Clara County	CA	Strategies to manage traffic and parking.	\$2,358,000
2010	Caltrans / City of Berkeley	CA	Strategies to manage on-street parking and reduce congestion from circling vehicles.	\$1,800,000
2010	Caltrans / Santa Barbara County	CA	Testing of carpooling system that uses participation incentives.	\$158,400
2010	Florida DOT	FL	Initiative for a regional priced managed lane network that can serve as a model for other regions.	\$900,000
2010	Tampa-Hillsboro Expressway Authority	FL	Advancement of first regional network of bus toll lanes in the Tampa area.	\$800,000
2010	NCDOT and Charlotte MPO	NC	Advancement of first regional network of priced lanes in the Charlotte area.	\$400,000
2010	MnDOT	MN	Expansion of project to test incentive alternatives to monthly parking passes and discourage daily driving.	\$24,800
2010	Texas DOT	TX	Usage-based insurance pricing and additional incentives for efficient travel choices.	\$1,948,000
2010	Virginia DOT and Washington Council Of Governments	VA	Public Acceptability of Road Use Pricing	\$320,000
2010	Washington DOT and King County	WA	Implementation of incentives as alternatives to parking.	\$1,024,000
2011	Caltrans/SCAG	CA	Express Travel Choices	\$1,080,000
2011	Caltrans/MTC	CA	Priced Electric-assist Bicycle Sharing in San Francisco	\$1,054,221
2011	Caltrans/SFCTA	CA	Parking Pricing and Regulations Study in San Francisco	\$480,000
2011	Connecticut DOT	CT	I-84 Viaduct, Hartford, CT	\$644,000
2011	Connecticut DOT	CT	I-95 Corridor Full Facility Pricing: New York to New Haven CT	\$1,120,000
2011	Florida DOT/Florida Transportation Enterprise	FL	Integrated Congestion Pricing Plan	\$600,000
2011	Illinois State Toll Highway Authority	IL	Integrate and Finance Transit w/ Priced Managed Lanes	\$528,840
2011	Massachusetts	MA	Pay-As-You-Drive Insurance in Massachusetts	\$2,144,000
2011	Oregon	OR	Peer-to-Peer Ridesharing in Portland, Oregon	\$1,725,000
2011	Texas	TX	Integrating Transit Related Pricing Incentives in Support of Managed Lanes	\$160,000
2011	Texas/NCTCOG	TX	Influencing Travel Behavior and Considering Environmental Justice	\$588,301
2011	Texas/CTRMA	TX	183A Turnpike Pilot Downstream Impacts	\$1,220,424
2011	Virginia	VA	Dynamic Ridesharing with Financial Incentives in Northern VA	\$447,200
2011	Washington	WA	Parking Pricing for Delivery trucks in Seattle	\$446,000
2012	Caltrans/SFCTA	CA	Treasure Island Mobility Management study	\$480,000
2012	Caltrans/Contra Costa Transportation Authority	CA	Contra Costa I-80 tolled-corridor real-time ridesharing	\$322,400
2012	Caltrans/San Diego Association of Governments	CA	San Diego pricing incentives for one-way electric car sharing	\$440,653
2012	Caltrans/SFMTA	CA	San Francisco Metropolitan Transportation Commission	\$560,000

			Regional Parking Pricing Analysis Tool	
2012	Caltrans/SFMTA	CA	Parking Pricing Enhancement Study in San Francisco	\$420,000
2012	Caltrans/VTA	CA	SR 237 Express Lanes Extension in San Jose	\$1,600,000
2012	Caltrans/LADOT	CA	Performance parking system implementation in Los Angeles	\$600,272
2012	DDOT	DC	Multimodal, dynamic parking pricing in downtown Washington, DC	\$1,090,000
2012	FDOT/FTE	FL	Integrated Congestion Pricing Planning--Phase Three	\$400,000
2012	FDOT/MetroPlan Orlando	FL	Regional Congestion Pricing Study in Orlando	\$350,000
2012	IDOT	IL	Peer-to-Peer Car Sharing Pilot Project	\$715,118
2012	MassDOT	MA	Kendall Square Employer Transportation Benefit Pricing Trail	\$743,872
2012	MNDOT	MN	I-35E MnPass Managed Lane Extension Study	\$605,000
2012	NYDOT	NY	DriveSmart New York City	\$1,000,000
2012	NYDOT	NY	ParkSmart New York City	\$950,000
2012	TXDOT/CTRMA	TX	Austin-area real-time carpooling automated toll discounts	\$764,008
2012	WSDOT/King County	WA	King County Park-and-Ride Pricing in Multi-Family Developments	\$543,900
2012	WSDOT	WA	Express Toll lanes Continuous Access Demonstration	\$520,000