Road Pricing: Public Perceptions and Program Development

DETAILS

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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

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FOREWORD

By Nanda Srinivasan
Staff Officer
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This report describes road pricing concepts and discusses their potential effectiveness and applicability. It also provides guidelines for project planning and integrating pricing into regional and state planning processes, and for communicating strategies and engaging affected parties. The report is structured to aid both readers familiar and unfamiliar with road pricing, providing both a brief overview of the concepts as well as in depth information on the latest applications, impacts, operations, costs, and policy and acceptability considerations.

The report is divided into two parts. Part 1 provides a review of six road pricing concepts and information for planners and decision makers to evaluate the potential of the concepts and understand the best engagement and communication strategies. Part 2 provides interview findings, literature reviews, and references to resource materials on planning, engagement, and communication related to road pricing strategies. The report will be of broad interest to state, regional, and local planners; project development staff; chief executives; and other decision makers.

Road pricing (RP) has advanced over the years, moving from the level of basic research and economic and policy analysis to effective and acceptable implemented projects. The most popular and widespread RP concept to date has been conversion of high-occupancy vehicle (HOV) lanes to high-occupancy toll (HOT) lanes and new-capacity HOT lane projects. These projects have shown initial success in managing traffic more effectively, raising revenue for system investment, advancing greater travel reliability for roadway users, and creating new travel options. The objective of this research project was to develop both easily digestible information and guidance as well as supporting detailed resource information to help planners; state, regional, and local decision makers; and stakeholders in transportation developments to (1) understand transportation needs and challenges which RP can effectively address; (2) identify opportunities and conditions for applying and integrating RP into local, regional, and state projects and programs; and (3) develop effective communication and public engagement actions to ensure best chances at acceptable and effective implementation of RP. A better understanding of how all these concepts apply to pressing problems of congestion, pollution, and lagging financial resources for transportation is needed to ensure that RP solutions are considered in projects and programs. Good articulation of the issues RP can address and of the best ways to advance acceptable and effective projects will boost attention to RP in the mix of solutions for the future.

The research was performed by ICF International and K.T. Analytics. Information was gathered via literature review and interviews with practitioners. Six road pricing concepts

for possible application based on experience to date are discussed: (1) conversion of existing HOV or other lanes to HOT lanes; (2) variable pricing on new or rehabilitated facilities; (3) variable pricing on existing tolling facilities; (4) areawide/cordon pricing; (5) distance-based pricing; and (6) variable pricing applied to parking.

CONTENTS

Note: Many of the photographs, figures, and tables in this report have been converted from color to grayscale for printing. The electronic version of the report (posted on the web at www.trb.org) retains the color versions.

PART 1

Decision-Making and Planning Guide

Introduction

The transportation system in the United States faces a number of significant challenges, including inadequate funding, persistent traffic congestion, and associated problems related to pollution, global climate change, sustainable energy, and neighborhood and community quality of life in an automobile-oriented society.

As governments attempt to cope with these pressing issues, the concept of road pricing has been receiving increased attention. Road pricing has gradually moved from economic and policy analysis to implemented projects both in the United States and overseas. It has proved effective in addressing the above challenges, while new electronic technologies have eased implementation without the need for manual toll connection. Also, the pilot testing and implementation of various road pricing approaches have spurred greater understanding of benefits, costs, operations, policy development, and acceptability.

Evidence regarding successful implementation of road pricing projects points to the importance of carefully designed and targeted information dissemination and outreach efforts. Without exception, early and continuing communication and engagement with the many stakeholders and potentially affected parties have been critical for public and political acceptance of pricing proposals. Several road pricing proposals are known to have failed where communication and engagement were inadequate, intermittent, or not in line with lessons about practices most likely to bring success. Successful applications of road pricing have required attentive, responsive, respectful, and tailored communication and engagement.

In addition to best practices in engagement and communication, successful road pricing plans and programs require sound planning practices. Planners need to analyze and present road pricing concepts that are most suitable and effective given local goals and high-priority problems that road pricing can address such as congestion, pollution, sustainability, and finance of transportation infrastructure. Plans must be financially feasible, address equity issues, be operationally feasible, and be sensitive to privacy concerns. Planned implementation must be in the hands of agencies trusted to carry them out and the planning process itself must be perceived as credible, responsive, and engaging of all affected parties.

Required state and regional transportation planning processes can also play a role in the implementation of road pricing. Thus far, road pricing has primarily emerged from planning involving individual corridors and areas but it is increasingly appearing in formal regional and state plans. In these plans, there are many analytic, policy, and institutional issues related to road pricing that must be attended to. For instance, long-range planning conducted by metropolitan planning organizations (MPOs) and state departments of transportation (DOTs) relies on travel demand forecasting models, which typically are not well suited to address road pricing. There are challenges not only in projecting travel impacts accurately, but also for meeting federal requirements of air quality conformity in non-attainment areas. Projecting revenue generation reliably is another

important issue, both for successful project implementation as well as for balancing costs and revenues as part of fiscal constraint requirements in regional transportation plans. Thus, the key challenge is to address all these issues in both project and long-range planning processes so as to increase the chances of success in the near term and leverage that success toward greater acceptance in the future.

In sum, road pricing is gaining favor as an effective way to cope with a number of issues that are now at the top of the agenda in state and local transportation agencies. Road pricing has strong potential to reduce congestion, address air quality issues, help raise transportation revenue, and address livability and sustainability issues. However, local and state planners need lessons and checkpoints based on the latest experience to evaluate and integrate a full array of road pricing strategies into transportation planning and project development. They also need approaches for addressing public and decision maker acceptability through effective communication if road pricing is to have the best prospects for successful adoption and implementation. The NCHRP Project 8-73 addresses these twin needs.

Purpose of the Project and This Report

The overarching goal of this project is to help state, regional, and local decision makers and planners to:

- Understand a range of road pricing concepts
- Determine which concepts may be most applicable, effective, and acceptable in light of the local environment and objectives
- Provide lessons on communicating pricing proposals and developing project plans for best chances of successful implementation
- Integrate pricing plans into regional and state planning processes to advance implementation

This report focuses on road pricing where the primary objective is the reduction of congestion and associated problems while potentially supplementing or replacing declining traditional sources of transportation finance. Flat rate tolling is not included. With the intent of encouraging attention to and implementation of road pricing beyond current programs, this report aims at the audience of planners who are not very familiar with the concept but interested in knowing more about its potential, status, and key planning considerations.

Structure and Use of This Report

This report is divided into two parts. Part 1 offers guide points for planners and decision makers needing an overview and introduction to pricing, as well as planning and acceptability lessons learned from a wide range of pricing projects. Section 1 of Part 1 describes the following six road pricing concepts for possible application to local goals and conditions:

- Conversion of existing high-occupancy vehicle (HOV) or other lanes to high-occupancy toll (HOT) lanes
- Variable pricing on new or rehabilitated facilities and regionwide networks
- Variable pricing on existing toll facilities
- Pricing of an area of existing roads and streets (“areawide” or “cordon” pricing)
- Distance-based pricing or mileage fees
- Variable pricing applied to parking

Each road pricing concept is briefly described in Section 1 and then arrayed in tabular form showing its applicability and considerations for project development. The overview and tables are

not only useful for planners interested in understanding the pricing options and possible application to congestion-related problems in their area, but also provide valuable information for decision makers on success considerations, policy and institutional requirements, and factors affecting acceptability. After reviewing Section 1, planners and decision makers can then decide which, if any, concepts are of interest for further and more in-depth consideration.

Part 1, Section 2, begins with more detail on engagement, communication, and achieving acceptability critical to the success of any of the six road pricing concepts. Next are pointers on planning road pricing at the project level and integrating pricing into formal regional and state planning processes. These processes include goal setting, evaluation of alternatives, conformity and environmental reviews, fiscal constraint planning, public and stakeholder engagement, and other key elements of the planning process as set out in federal law and guidance. The section ends with detailed descriptions and examples of the six pricing concepts and information on their impacts, costs and revenues, equity, and other particulars related to implementation. Section 2 also is useful for planners and analysts already familiar with road pricing who wish to review lessons and recommendations specific to one or more road pricing concepts.

Part 2 is a resource document for two audiences. It provides planning, engagement, and communication resource material along with findings supportive of the lessons and directions in the guide points. It aids all readers to understand the basis for the conclusions underlying the pointers and guidance provided in Part 1. It also provides detailed literature review and interview findings for readers already familiar with road pricing who want to review the latest pertinent information from research studies and local pricing programs. It includes references and links to many U.S. project websites, documents, and outreach materials.

SECTION 1

Decision-Making Guide: Evaluating Road Pricing Potential for Local Areas and Conditions

This section provides background on six road pricing concepts and provides diagnostic information to help planners and decision makers assess which specific road pricing concepts might be most applicable in their areas. It begins by briefly describing six road pricing concepts, followed by showing the applicability of the concepts through a series of three tables that (1) addresses how the pricing concepts match with many of today's important local and state transportation goals; (2) shows how the concepts best apply to roadway operating conditions, type and severity of congestion, availability of transportation alternatives, and the policy and institutional setting in a region; and (3) provides the main considerations related to acceptability, engagement, and communication that are important for the successful adoption and implementation of all the pricing concepts.

1.1 Road Pricing Concepts

The discussion in this section and the rest of the report focuses on the following six categories of road pricing:

- Conversion of existing HOV or other lanes to HOT lanes
- Variable pricing on new or rehabilitated facilities and regionwide networks
- Variable pricing on existing toll facilities
- Pricing of an area of existing roads and streets ("areawide" or "cordon" pricing)
- Distance-based pricing or mileage fees
- Variable pricing applied to parking

These six categories cover a full array of pricing strategies applied both within the United States and around the world. Descriptions of these concepts are provided in the following paragraphs.

1.1.1 Conversion of Existing HOV or Other Lanes to HOT Lanes

Conversions of existing HOV lanes to HOT lanes allow vehicles not meeting normal occupancy requirements to "buy-in" to the lane by paying a toll varying by time of day or level of congestion. In some cases, it is not HOV lanes but shoulder lanes that are converted to dynamically priced HOT lanes. Conversion of general purpose lanes to HOT lanes has also been studied, but is yet to be implemented. Of course, HOT lanes on new or rehabilitated facilities without conversion are another possibility, as addressed in the next category. HOT lanes allow drivers to use high-speed, uncongested HOV lanes either by meeting minimum occupancy requirements or by paying a toll. Where HOV lanes face peak-hour congestion, conversion to HOT lanes allows the use of variable pricing to control traffic demand, reduce peak-period congestion, and ensure that the lanes provide premium travel conditions to all users, both existing HOV users and new paying customers.

HOT lane projects are thus intended to make better use of existing capacity on HOV lanes, while creating a new travel option in the corridor being served. A side benefit may be that a shift of traffic to the HOT lane may reduce congestion on the general purpose lanes.

Some implemented projects include the I-15 FasTrak express lanes in San Diego, the QuickRide HOT lane projects on I-10 and US-290 in Houston, HOT lanes on I-25/US-36 in Denver, MnPASS lanes on I-394 in Minneapolis–St. Paul, and the SR-167 HOT lanes in the Puget Sound region.

1.1.2 Variable Pricing on New or Rehabilitated Facilities and Regionwide Networks

Like the conversions to HOT lanes discussed previously and variable pricing on existing toll facilities, pricing on new or rehabilitated facilities (termed "networks" in case of multiple facilities) uses variable pricing to control traffic, reduce peak-period congestion, and generate revenues supporting facility development or redevelopment and operations. However, instead of applying pricing to existing facilities, variable pricing is introduced with new or improved road capacity. The key goals are to increase capacity and throughput in one or more corridors while managing traffic demand and supporting improvements in part with funding generated on the facility, an approach users likely will perceive as equitable. Newly constructed expressways or lanes with variable tolls have been implemented on State Route 91 in Orange County, California, and on the Katy Freeway in Houston, Texas. Similar facilities are under development in several states where tolls are planned to vary by time-of-day and congestion levels using electronic toll collection technology.

State and local budget cuts and unsuccessful attempts to fund transportation improvements through taxation have increased the interest of states in financing capacity additions using toll revenues. For example, the planned SR-520 project in the Puget Sound region involves widening and rehabilitating a bridge, while supporting improvements with new variable tolls on the bridge. Planners in the region hope to extend the concept to other new facilities and existing facilities combined with improvements.

Also included in this category are regionwide networks of new express lanes or facilities at several potential locations within a region, including, in some cases, regionwide initiatives to promote carpooling or improve transit services. The overall purpose is to add highway capacity while managing new traffic levels and generating revenues through pricing. The lane management is aimed at creating new high-quality travel options for the users where the toll revenues can cover all or a significant proportion of the associated costs. Feasibility studies or long-range plans for regionwide networks of express lanes with inclusion of demand management and transit components have been completed in Maryland, Virginia, Minnesota, Texas, and the Washington, D.C., area. New express lanes that are expected to eventually become part of such a network are currently under construction in Virginia and Maryland.

1.1.3 Variable Pricing on Existing Toll Facilities

This category of pricing introduces variable tolls on highway facilities with existing fixed tolls to encourage some travelers to use the facility during less congested periods, to shift to another mode of transportation, or to change their travel route. Strategies include raising tolls during peak periods and/or discounting tolls off-peak, or introducing tolls that vary with the level of congestion on the facility. Implemented projects include variable pricing on two toll bridges in Lee County, Florida—the Cape Coral Bridge and Midpoint Memorial Bridge, variable pricing on the New Jersey Turnpike and on interstate bridges and tunnels of the Port Authority of New York and New Jersey between New York City and New Jersey, and variable truck tolls on the Illinois Tollway.

1.1.4 Areawide Pricing

While the U.S. pricing programs to date have focused largely on the introduction of variable pricing on single facilities, more of the urban road pricing efforts abroad have involved areawide or cordon-based congestion pricing. Areawide pricing involves charging a fee to travelers entering and sometimes driving within a congested zone or area, typically in city centers, as a measure to reduce traffic congestion and encourage a shift to modes other than the auto. Generating revenues to fund transit improvements has also been an objective in many cases. Some overseas pricing projects have focused on pricing traffic entering entire urban regions. Others have introduced congestion pricing on expressway networks. The charge may vary by time of day or vehicle characteristics, may be in effect all day or during peak hours only, or may vary dynamically with the level of congestion. Although congestion reduction is often the primary objective, cities also seek to reduce emissions, noise, and traffic accidents and to improve pedestrian access and enjoyment of public spaces and businesses. Areawide pricing, where fees are charged for entering and driving within a designated zone, is similar in concept to "cordon pricing," where drivers are charged when they cross the cordon surrounding a congested zone. Outside the United States, areawide pricing has existed in Singapore since 1975 and has been implemented in several cities, mostly in Europe over the past decade, notably in London in 2003 and Stockholm (cordon pricing) in 2006. Within the United States, areawide pricing was proposed in New York City in 2007 and in San Francisco in 2008. Neither plan has been implemented.

1.1.5 Distance-Based Pricing or Mileage Fees

The projects in this category 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 is a form of road pricing with travel prices based on vehicle miles traveled (VMT), a user-pay principle encouraging consumers to make cost-efficient travel decisions and to reduce driving at congested times and places. An added objective of VMT or mileage fees is to preserve or increase transportation revenues. Some states and research organizations are looking toward revenues from VMT fees to fully or partially replace existing gas taxes in the future. However, in line with the goal of targeting congestion, all the cases discussed here either vary charges based on congestion levels and traffic management objectives or are evaluating charges for this purpose.

Experience in the United States with distance-based pricing has been in two forms. One form is pay-as-you-drive (PAYD) insurance implemented by the private sector where the insurance premiums or the costs to the driver of insuring or leasing a vehicle vary by the distance driven. The other form is mileage fees implemented by the public sector for purposes of travel management and transportation finance. PAYD insurance is distinct from public sector mileage fees. PAYD involves voluntary participation by drivers and has so far been implemented only by private sector insurance companies with the goals of promoting safety and increasing cost-effectiveness for drivers. Reducing overall fuel consumption and VMT typically are not primary goals. Nevertheless, PAYD insurance rates can be designed to vary by time of day and location. For example, PAYD insurance tests in Atlanta and Houston varied per-mile insurance rates by a variety of risk factors including time of day, location of travel, and accident probability based on driver characteristics such as age, sex, and safety record.

Public sector mileage-fee programs can be found in the United States and overseas. Internationally, mileage fees have been implemented by governments on light-duty vehicles and/or trucks. The goal of the approach is a combination of traffic management and transportation finance. Germany, Switzerland, Austria, the Czech Republic, Hungary, and Slovakia are successfully operating such systems. In the United States, Portland, Seattle, the Twin Cities region, and Atlanta have conducted

tests of mileage fee systems with both traffic management and transportation finance purposes. The University of Iowa is in the process of conducting several more trials in urban areas around the country. 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. It also can be designed to vary by time of day with a higher rate during peak hours, as in a pilot program conducted in Portland, Oregon, thus helping to reduce peak-period congestion when some drivers choose to alter their time of travel to avoid a higher charge. Unlike some other pricing concepts, the concept of mileage fees is applicable not only locally or regionally; rather implementation has been discussed at the state and national levels too.

There is debate in the literature about whether PAYD insurance falls within the category of distance-based pricing. Although the insurance charges are based on the distance traveled by users, they are not intended primarily to address congestion but instead to account for accident risks. For this reason, detailed discussion under the category of distance-based pricing in the following sections of the report will focus primarily on public sector initiated or studied VMT/mileage fees.

1.1.6 Parking Pricing

Parking pricing strategies are applicable on and off street at spaces controlled by municipalities and can be of the following types:

- Revising or instituting rates to vary by times and/or locations of peak use, for example higher in congested zones and/or peak times of day
- Rates progressing by length of time parked, for example more costly rates for second or subsequent hours parked
- Charges applied by actual time parked versus by time blocks; examples include daily versus monthly parking charges and rates by minutes instead of by hours or all day rates

In San Francisco, the SF*park* program seeks to encourage drivers to park in garages and lots through new on- and off-street parking pricing that is more in line with demand. The on-street goal is to ensure that one parking space is available on every metered block to reduce cruising and associated congestion. An important anticipated benefit is improved transit speeds and reliability on the MUNI light rail system and reduced greenhouse gases. In New York, through the Park Smart program, the City aims to increase parking space availability and public safety and to reduce double parking, pollution, and congestion through new peak and off-peak meter rates. The City is holding a trial of this program in Greenwich Village, Park Slope, and Upper East Side neighborhoods.

The next section describes how these six road pricing concepts apply to a variety of planning goals, to local conditions, and to the local policy context. The section also provides planning and communication lessons geared towards achieving maximum acceptability and successful implementation.

1.2 Local Community Goals

Road pricing is effective in meeting many current community and state transportation planning goals. These include congestion management, reduction of VMT and emissions, more efficient utilization of highway capacity and parking spaces, generation of revenues supporting transportation, and encouragement of sustainability and livability. These goals can be met by one or more of the six road pricing concepts discussed in the previous section.

Exhibit 1 shows common planning goals and how the six pricing concepts compare in meeting them. The table is meant to guide readers to the most appropriate strategy or strategies to

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Exhibit 1. Community and regional goals achievable by road pricing concepts.

	Road Pricing Concepts					
COMMUNITY AND REGIONAL GOALS	Conversion of Existing HOV or Other Lanes to HOT Lanes	Variable Pricing on New or Revamped Facilities	Variable Pricing on Existing Toll Facilities	Areawide Pricing	Mileage or VMT Fees	Parking Pricing
Reduce or prevent congestion at peak hours or congested locations	+	+	++	++	+	+
Reduce auto use and encourage alternatives to reduce VMT to support sustainability goals	+	+	++	++	++	+
Encourage shift to other modes, time periods, or routes for efficient utilization of capacity	+	++	++	++	+	+
Delay or forgo capacity enhancements	+		++	+	+	
Raise revenues for transportation investment, provided surplus revenues are available	+	+	++	++	++	+
Ensure better utilization of HOV lanes	++					
Reduce emissions and improve safety	+	+	+	+	+	+
Improve transit speed and reliability	+		+	++		
Improve experience of using public spaces, shopping and doing business for visitors and residents				++	+	++
Reduce searching for parking and increase parking turnover to ensure better use of existing capacity						++

Note – +: supportive; **++**: very supportive

examine further in the following sections of this document, given the most important transportation problems and goals in their particular region and state.

The table shows some variation in the degree to which each of the pricing concepts support a particular goal by a + for supportive and ++ for especially supportive. For example, depending on the geographic extent of a new parking pricing program in a congested area and the volume of traffic bound for the priced parking, parking pricing can reduce searching for parking, a common source of congestion in some downtowns. However, areawide pricing can be expected to be more potent in a similar area and situation as it can apply to all traffic entering, exiting or circulating within a zone, if so structured, presuming a sufficient price and with no excessive exemptions. Likewise, variable pricing on existing toll facilities can be very effective in reducing congestion, again presuming sufficient pricing, as it can apply to all vehicles or those with significant traffic volumes on the subject facility. The reader should note that the goals achievable by different pricing con-

cepts outlined in Exhibit 1 offer broad guidance. Much depends on the specific features of projects considered and the particulars of the intended setting.

1.3 Existing Conditions and Policy Requirements

The applicability of specific road pricing concepts depends upon several transportation and policy conditions. Exhibit 2 lays out the conditions necessary for the maximum applicability and effectiveness of each road pricing concept. It outlines situations where pricing is applicable relative to

Exhibit 2. Applicability conditions and policy requirements for road pricing concepts.

	Road Pricing Concepts					
Maximum Applicability Conditions	Conversion of Existing HOV or Other Lanes to HOT Lanes	Variable Pricing on New or Revamped Facilities	Variable Pricing on Existing Toll Facilities	Area-wide Pricing	Mileage or VMT Fees	Parking Pricing
Roadway Situation						
Congestion due to capacity constraints	+	+	+	+		
Underused or overused HOV lanes	+					
Congestion/delays across zone of streets and highways				+	+	+
Peak-period congestion	+	+	+		+	+
Travel Options						
Availability of travel options (transit, HOV services, bike, walk, park and ride, TDM)	+	+	+	+	+	+
Off-peak travel options available (e.g., flexible work hours for commuters)	+	+	+		+	
Parking facilities available outside congested zone				+		+
Routes available for through traffic to bypass priced zone				+		
Policy/Institutional Conditions						
Enforcement and transponder/on-board unit verification technology	+	+	+		+	
Tolling authority and legislation allowing toll variation	+	+	+		+	
Interoperability policy across other toll systems	+	+	+		+	
Legislation enabling private sector role if anticipated	+	+		+	+	
Enforcement authorization, fines, appeal procedures, and associated staffing	+	+	+	+	+	+
Legislation and procedures in place to ensure data privacy	+	+	+	+	+	+
Sizeable portion of parking in congested zone controlled by municipality				+		+

(1) roadway operating conditions, including capacity constraints and type and severity of congestion; (2) availability of transportation alternatives; and (3) the main policy and institutional requirements necessary for successful implementation.

The first part of Exhibit 2 allows planners and decision makers to consider the most applicable road pricing strategy for highway and transportation conditions in the area of interest. For instance, for congested highways with capacity constraints, applicable road pricing concepts include conversion of existing HOV, shoulder, or other lanes to HOT lanes and variable pricing on existing facilities. Where new or rehabilitated capacity is an option, new lane pricing with or without HOT treatment is an option. However, when congestion is concentrated in an area of streets such as in downtowns or activity centers, the most applicable concepts are areawide pricing, mileage fees varying by time of travel in the congested area, and parking pricing. All of these concepts can reduce traffic congestion in a particular location, while encouraging a shift to alternative modes and travel times.

It is important to note that all the road pricing concepts in the table are most effective when coupled with alternative travel options set out in the second part of the table. These options include HOV services; transit; travel demand management (TDM) programs; and bike, pedestrian, and park-and-ride infrastructure. For HOT lanes, variable pricing based on time of travel on new or existing toll facilities, mileage fees, and flexible work hours for commuters will aid effectiveness and acceptability. For areawide pricing, alternative free routes for through traffic and park and ride options outside the priced zone to support a change in mode will boost effectiveness and acceptability.

Finally, in the last part of Exhibit 2, certain policy and institutional conditions are required or, if not required, are supportive and important to consider for implementation of the road pricing concepts. For instance, all the concepts require policy and institutional support not only to authorize their implementation but also to ensure proper enforcement, appeal processing, and data privacy. Other policy and institutional points are outlined by road pricing concept in Exhibit 2.

1.4 Planning, Acceptability, and Engagement

Bringing about successful road pricing plans and programs requires attention to many planning approaches as well as engagement and communication strategies aimed at the public, decision makers and stakeholders. Planners and decision makers should know that road pricing is not an easy concept to plan and bring to successful implementation. Road pricing has taken many years to gain its current successes and several major planned programs have failed to come about because of insufficient support from the public, stakeholders, and decision makers. Fortunately, documented experience to date and a substantial literature on engagement and acceptability (detailed in Part 2) have derived useful lessons for planners and decision makers about how to maximize the prospects for success. Exhibit 3 provides brief checkpoints of the main planning, engagement, and communication practices important for acceptance and successful implementation.

Exhibit 3 begins with pointers related to planning. To date, road pricing has emerged mostly from planning around single projects rather than from formal regional and state plans. As projects proved their success, they then appeared through amendments in regional and state plans required by federal law, along with other policies supporting road pricing. Regions and states having little or no experience with road pricing should anticipate that a road pricing plan may first emerge following this same path. However, regions with more experience in road pricing are now adopting transportation plans that include road pricing projects, networks, and broad, supporting policies. Some of these projects are underway or nearing final approval.

Exhibit 3. Success considerations for planning, communication, and engagement.

Planning

Plans for road pricing are most likely to succeed where:

Problem Focus, Project Experience, Link to Regional Planning

- *Pricing plans address severe congestion-related problems* or problems of "crisis" nature to decision makers, stakeholders, and affected parties.
- *Individual pricing projects already have taken place* or can take place before broad pricing policies, goals, and strategies are developed for adoption in regional and state plans.
- *Pricing can help meet requirements for fiscally constrained metropolitan plans* balancing revenues and costs, especially larger projects and/or networks versus small and first pricing projects.
- *Pricing is linked with conformity, environmental justice, and environmental impact review requirements,* especially in non-attainment regions.
- *Pricing has potential to generate capacity sooner* than traditional state and local funding sources, especially in light of ongoing and projected shortfalls in revenues from such sources.

Modeling and Analysis Expertise

- *Planners have experience and familiarity with one or more specialized microsimulation models*; familiarity with unique revenue and financial models for private sector involvement is also an important consideration.
- *Planning addresses investment and finance requirements* with attention to debt-backed proceeds for future tolls and investment grade analysis.

Policy and Institutional Situation

- *Agencies and authorities already exist to support, advocate for and implement pricing*, instead of planning for whole new organizations and policies.
- *Task forces, commissions, or committees are created and used to support and develop pricing plans,* especially to negotiate policy particulars such as price levels and the use and distribution of revenues.
- *Plans account for current restrictions on pricing federally aided facilities.*

Communication and Engagement

Communication and engagement encourages acceptance where:

Focus and Content

- *The focus is on the most resonant congestion-related problems and the degree to which they are characterized in terms and tones familiar to affected parties and stakeholders.* In some settings, the most resonant problems may be pollution or the need for revenues in a time of shrinking traditional revenue sources.
- *The problem to be addressed and the effect of pricing are clearly explained; pricing experienced to date is referenced to build familiarity and acceptance; content and tone are free of economic, planning, or engineering jargon;* and all information is available in multiple language versions representing the demographics of the area.
- *Program details are addressed*, including enhanced publicly acceptable alternatives to driving; enforcement to ensure equitable access and avoid "free riders"; simple rather than complex toll schedules; possible traffic and parking diversion in sensitive areas; and how data privacy and security will be ensured.
- *Fairness across income groups and communities in different locations is addressed*, as well as other fairness concerns: "paying twice" by traditional taxes and road pricing; hardship on certain population segments; availability of improved transit to some but not others; evasion of charges that is unfair to honest payers.

Engagement and Communication Process

- *The most important parties are involved* given congestion-related problems and the pricing options of potential interest, typically businesses, truckers, residents, and environmental organizations who have the ear of key decision makers; consensus and compromise take place toward policy clearance, authorization, and implementation.
- *Champions are encouraged and supported with timely analysis and information,* where champions are influential program advocates, potentially including public officials, stakeholders, and decision makers.
- *The appearance of "springing" proposals on the public is avoided,* questions are answered promptly, and concerns addressed with plan changes, and where revenue plans avoid the appearance of growing government and instead support preferred services and operations.

(continued on next page)

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Exhibit 3. (Continued).

Communication and Engagement

- *Program managers and public relations staff continue contact with decision makers and program "customers" after implementation,* and where newsletters, briefings and other communications feature continued input from stakeholders and evidence about program effectiveness regarding revenue distribution, services as promised, and positive experiences of program users.

Role and Image of Government

- *Government is not perceived as the culprit for congestion problems* and instead appears as an honest partner in implementing congestion-reduction programs to date; multiple levels of government support pricing plans; and agencies responsible for implementation are considered credible and competent.
- *Planners adapt to setbacks by developing and presenting altered or new concepts,* revising failed communication messages, or halting engagement and waiting for more opportune times.

Thus, Exhibit 3 provides pointers applicable to both project-level and regional planning. For instance, both project-level and formal transportation planning processes are advised to focus on the most severe congestion-related problems of "crisis" nature to decision makers, stakeholders, and affected parties. Likewise, all planning should reference U.S. and international experience to raise public and political awareness and enhance familiarity, acceptability and support. All planning is advised to use task forces, commissions, or committees to support and develop pricing plans, especially to negotiate policy particulars such as price levels and revenue distribution. However, where pricing is included in formal regional and state plans, unique considerations apply. Pricing should be linked with planning for air quality conformity, achieving environmental justice, and fulfilling environmental impact review requirements, especially in non-attainment regions. Planners also should consider how pricing might help meet the requirements for fiscally constrained metropolitan plans balancing revenues and costs. Larger projects and/or networks may well help meet fiscal constraint requirements.

The second part of Exhibit 3 highlights several chief considerations for successfully communicating road pricing and engaging stakeholders. Engagement and associated communications should be viewed as a multiway process that involves planners paying attention to the ebb and flow of influential actors, their interests, perceptions, and actions, while revising plans and working towards a sufficient consensus to bring about passage and implementation. In the process, planners should be fully aware that uncontrollable changes in economic, political, and policy variables still may sink even well-conceived and responsive road pricing plans. Thus, the guidance offered here is not a course guaranteed to gain acceptance or adoption of any road pricing proposal. Instead, it is a series of steps, cautions, and checkpoints on engagement and communications for local, regional, and state planners to take advantage of lessons to date, avoid pitfalls, and create the best prospects possible for bringing forth acceptable road pricing proposals.

Echoing a planning pointer, engagement and communications should identify and then emphasize the most resonant congestion-related problems. In some areas or corridors, those problems may include not only congestion but also pollution or the need for revenues in a time of shrinking traditional revenue sources. The lessons from studied projects also emphasize achieving consensus and compromise on revenue allocations, driving alternatives, good enforcement, toll schedules, privacy matters, and other program design elements. While these details may not arise in early discussions with decision makers and stakeholders while testing the waters about potential road pricing options, they are likely to arise once planning and engagement begins in earnest. Once surfaced, these issues demand much interaction with many actors and interests and the particulars of the road pricing program will require careful, respectful, and flexible fashioning and compromise. Other pointers are offered on government image, using economic and planning jargon in communications, and recovering from setbacks.

The importance of planning, engagement, and communication procedures taking account of success lessons to date cannot be overemphasized. For readers interested in further information on one or more of the six road pricing concepts, Section 2.3 offers more detailed pointers specific to each concept. In addition, Part 2 provides still more information on the road pricing acceptability literature, details from successful projects with examples of engagement and communication practices, and more detail on integrating road pricing into the formal regional and state planning process.

SECTION 2

Planning Guide: Developing Road Pricing Plans and Programs

Section 2 is for planners, analysts, communications and outreach personnel, and decision makers interested in moving forward with a road pricing plan or simply interested in more depth on planning and program development considerations for further evaluation of road pricing. The section provides considerations for successful planning and program development common to all the six pricing concepts introduced in Section 1.

In Section 2.1, readers will find expanded information on planning considerations from program startup to acceptance and implementation, as drawn from both an extensive literature review and case studies included as resources in Part 2. The same section provides checkpoints on the broad engagement process and communications important for successful development of any of the road pricing concepts.

Section 2.2 gives lessons and guidance on how road pricing can be integrated into the transportation planning process as structured under federal law and guidance. In areas where road pricing is expanding from individual projects to multiple projects with possible application across regions, it is important for planners and decision makers to dovetail project planning with required planning processes at the regional level. Regional planning processes are needed for authorizing and programming projects, pricing projects and complementary transit, HOV programs, parking, and land use policy. Some of the key planning steps discussed in relation to pricing include goal setting, evaluation of alternatives, air quality conformity and environmental reviews, planning with fiscal constraint, and public and stakeholder engagement.

Section 2.3 describes the six road pricing concepts in detail, including example programs followed by tables providing information on travel impacts, revenues and finance, equity, environment, policy and institutional requirements, popular reasons for attention to the concept, and promising recent developments bearing on acceptability and success considerations specific to each pricing concept. These tables are useful not only for planners and analysts evaluating the concepts with their potential impacts and implementation requirements, but also for decision makers interested in success considerations key to public and stakeholder acceptability, and the policy and institutional requirements particular to each concept.

2.1 Checkpoints for Planning, Engagement, and Communication

Section 2.1 has been developed based on a literature review and interviews at sites and agencies involved in developing road pricing projects and proposals. The literature reviews focused on (1) road pricing planning, including how planning has proceeded thus far in states and regions, and the nature of the formal transportation planning process as specified in federal guidance and

(2) the acceptability of road pricing as related to engaging affected parties, stakeholders, and decision makers, as well as outreach and communications in the development of projects. The interviews covered a range of planning activities and communications and engagement practices. Interviews were supplemented by collecting plans, studies, communications materials, press releases, and other documents. The interview sites are listed below with pricing plans and proposals subject to the interviews noted in parentheses:

- New York (areawide pricing, new variable parking pricing)
- San Francisco metro area (areawide pricing, HOT lane networks)
- Minnesota (HOT lanes)
- Washington State (research on VMT fees, proposed reconstructed bridge pricing)
- Oregon (VMT fees and gas tax replacement, HOT lane)
- Los Angeles metro area (emerging HOT lanes and downtown parking pricing)
- Virginia (HOT lanes and HOT lane network plans)
- Washington, D.C., metro area (HOT lanes and HOT lane networks)
- Dallas (HOT lanes and HOT lane networks)

Part 2 of this report contains the literature reviews and interview findings in a series of appendices. The literature review of planning documents and studies is contained in Appendix A. The literature review on acceptability, communication, and engagement is contained in Appendix B. The interview findings on planning issues are contained in Appendix E. The interview findings related to communication and engagement are in Appendix F. Appendix G includes a list of pertinent studies and links to websites showing examples of communication and engagement resources for planners and outreach personnel.

2.1.1 Overview of Planning for Road Pricing

As discussed in Section 1.4 that introduced the key planning, acceptability, and engagement considerations, road pricing programs to date have emerged mostly from planning around single projects rather than from formal regional and state plans. Regions and states having little or no experience with road pricing should anticipate that road pricing may well first emerge following this same path. However, areas with one or more successful road pricing projects now are adopting the initial pricing projects into the metropolitan regional transportation plans required by federal law and guidance. Some regions are also adopting plans and supportive policies and principles to lay the groundwork for multiple future projects and networks. Consequently, the pointers provided here emphasize planning and development for successful projects across all six road pricing categories. However, additional pointers are offered on integrating pricing into the planning process because such considerations are important as individual projects emerge and planning proceeds. Section 2.2 provides more detailed guidance for treating road pricing in formal regional and state plans.

2.1.2 Planning Phases of Project Development

Successful road pricing projects typically begin with strong interest among one or more key actors willing to initiate study, evaluation, and planning of one or more pricing concepts. Actors may include agency planners, officials, and possibly one or more decision makers. A strong and influential champion of pricing may or may not be present at this stage. One or more transportation agencies may take the lead in initiating discussion, whether city, county, congestion management agency, tolling authority, regional planning agency, air quality district, or state department of transportation. The initial phase can be characterized as testing the waters, both analytically and with an eye toward feasibility and acceptability.

Planners at the incubation stage should not initiate broad outreach involving significant public and traveler surveys, public meetings, media announcements, and informational or interactive websites. More appropriate is an informal working committee of the relevant agency actors and one or more decision makers key to passage of the plan ("gatekeepers") who guide and review preliminary studies. Planners and analysts now should match a pricing concept to a severe and resonant problem or set of problems to ensure potential effectiveness and support for continued assessment. Also, planners should explore potential support for more detailed study, planning, and eventual outreach as most pricing projects require considerable time and resources to be brought to fruition.

Presuming sufficient promise and interest in road pricing at this step, planners then enter a more formal and open process. At this step, planners should strongly consider setting up a broad working group composed of not only multiple agency representatives, but also stakeholders and staff to decision makers important to the passage of the program. The group first should focus on a study concept or concepts selected for assessment. The study group should define details of the study products and timeline and an engagement and outreach process. Now, planners and the working group will focus on impact and operational details, equity impacts, costs and revenues, driving alternatives including free routes and other options for drivers, simple but effective pricing schedules, enforcement, pricing technology, privacy assurances, required policy authorization, and potential implementing and operating agencies. The engagement and communication process aims at a broad group of stakeholders with clear and interactive messaging, to gain a critical mass of consensus and compromise required for needed authorizations, whether a new toll agency policy or enabling legislation and policy passed by city, county, or state decision makers.

As the more formal planning and engagement process proceeds, no single process template will guarantee successful passage and implementation. As pointed out in Section 1.4, there are many unpredictable or hard to control occurrences likely in planning for road pricing. Important agency and decision-maker champions may arise but unexpectedly disengage in an election change or other turn of events. A change in the economy may focus important attention elsewhere or affect the acceptability of an option. The nature of the congestion-related problem may change with a change in gasoline prices, economic conditions, or unemployment. Thus, the job of the planners and study overseers is to ensure that all important study, planning, engagement, and communication variables are tuned to the best prospects for success while remaining cognizant of the precarious nature of process outcomes.

The following subsections offer pointers on planning, stakeholder engagement, and public communications in line with both the preliminary phase of planning, where the potential and feasibility of road pricing are tested, as well as the formal phase of detailed planning with in-depth evaluation and an extensive engagement process. The points explained below are not surefire steps to implementing pricing projects but include lessons to date, cautions on pitfalls, and actions with the best possible prospects for bringing forth effective and acceptable road pricing plans and projects.

2.1.2.1 Target and Frame Problems Strategically

In both the preliminary and formal planning stages, it is important to focus discussion and effort on a problem or set of problems that are as pressing and compelling as possible. Road pricing often aims at the problem of congestion. As such, it is often called "congestion pricing." However, road pricing can address multiple problems, including congestion, pollution, underutilized or overutilized HOV facilities, and lack of revenues for roads and other desired transportation improvements. Planners need to choose which problem or problems to underscore in planning and communications to match with greatest public concern. Acceptability is enhanced where the prob-

lem is both clear and severe to affected parties. Planners need to show how pricing ties to those problems and does so effectively compared to other less effective, ineffective, or infeasible alternatives.

Again, congestion may or may not be the most resonant candidate problem in some areas. In some settings, it may be pollution or the need for revenues in a time of shrinking traditional revenue sources. Planners need to assess which problems are most pressing and their impact on affected parties, all of which will help fashion the kind of pricing proposed, how it is cast, and how its benefits are framed in communications and engagement.

Examples from Interview Sites: In the Washington D.C. region, planners stressed widespread congestion concerns, national congestion rankings, framing of outsiders as culprits for part of the congestion problem, and funding constraints in their painting of the problem to be addressed and how pricing could address it. Plan and communication materials portrayed a "system in crisis," highlighting the twin problems of "rapidly worsening congestion and funding shortfalls." Planners also stressed independent evidence about the ranking of the region on a congestion index as "number two" in the nation with the reminder of a significant number of commuters from "out of state." The approach has resonated with decision makers and local motorists sufficiently to aid the acceptability of several road pricing programs. While planners also made indirect reference to "sustainability" and a "green future" associated with tolling and pricing as options, such reference may not resonate as favorably as intended. Some in the environmental community view HOT lane development as a surreptitious way of adding highway capacity and therefore contrary to a green future.

The North Central Texas Council of Governments likewise emphasized funding issues and part of the problem as revolving around outside influences. Planners underscored inadequate roads and finance resources for improvements and expansion, and highlighted a congress and state legislature either not able to raise funds or diverting transportation funds to other uses. In this light, locally controlled toll roads and managed priced lanes become a solution to the perceived problem of lost local control. The agency also has stressed that gas taxes simply have not kept up with highway resource needs and that tolling and pricing are "the only" way forward since doing nothing is unacceptable. Thus, the problem addressed is not only an inadequate finance source but an unfixable one.

The Metropolitan Transportation Commission (MTC) in the San Francisco Bay Area gained acceptance of its HOT lane network in the regional plan in part by framing *content* around a pressing problem with strong public recognition (congestion and inadequate transportation facilities), which also was a top priority of key member agency actors and interests. MTC stressed not just managing traffic or reducing congestion and pollution via pricing, but financing planned highway improvements with HOT components faster and more credibly than under current lacking finance resources. That combination of issues resonated sufficiently with a sufficient number of key agency and stakeholder actors for passage of the plan, in spite of some opposition from an influential community group—the San Francisco Planning and Urban Research Association (SPUR). Other goals around carbon dioxide and nitrogen oxide emissions were also highlighted, but were not so pivotal and controversial with SPUR. Most pressing interactions around the plan centered on the highway development needs and finance, including revenue allocation back to where revenues originated. No doubt adoption of the plan was aided by some *contextual* elements of the proposal, for example, a neutral or somewhat positive MTC agency image and its referencing of experience of HOT lanes elsewhere ("tried and true" experience) showing income equity to be either not an issue or a manageable one. However, building upon a strong resonant problem for the traveling public and key stakeholders, then involving them in a special committee all the way appears to be the main combination behind successful adoption. Examples of policy and communication *vehicles* on these points are shown in Exhibits 4 and 5.

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Exhibit 4. San Francisco MTC HOT network implementation principles and objectives.

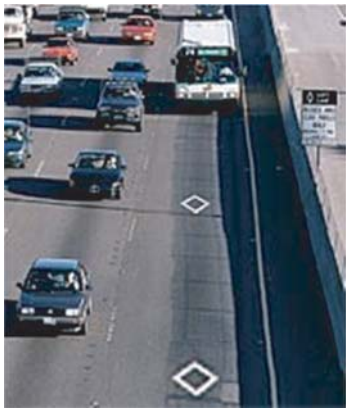
Development and implementation of a Bay Area Express/High-Occupancy Toll (HOT) Network has five primary objectives:

- More effectively manage the region's freeways in order to provide higher vehicle and passenger throughput and reduce delays for those traveling within each travel corridor;
- Provide an efficient, effective, consistent, and seamless system for users of the network;
- Provide benefits to travelers within each corridor commensurate with the revenues collected in that corridor, including expanded travel options and funding to support non-highway options that enhance effectiveness and throughput;
- Implement the Express/HOT Lane Network in the Bay Area … using a rapid delivery approach that takes advantage of the existing highway right of way to deliver the network in an expedited time frame; and
- Toll revenue collected from the HOT network will be used to operate the HOT network; to maintain HOT system equipment and software; to provide transit services and improvements in the corridors; to finance and construct the HOT network; and to provide other corridor improvements.

Source: MTC Resolution 3868, Attachment B, adopted July 2008.
http://www.mtc.ca.gov/planning/hov/Res3868_Att_B-HOT_Network_Principles.pdf

Exhibit 5. Excerpt from Frequently Asked Questions MTC website on need for express lanes and use of revenues.

Express (HOT) Lanes and Carpool Lanes



Frequently Asked Questions

Why consider express lanes?

The appeal of this concept is three-fold:

- It expands mobility options in congested urban areas by providing an opportunity for reliable travel times for express lane users;
- It generates a new source of revenue which can be used to pay for transportation improvements, including enhanced transit service; and
- It improves the efficiency of carpool facilities.

Why the need for an express lane network in the Bay Area?

There are several gaps in the region's current carpool lane system. Filling these gaps would create a seamless network of unobstructed lanes to provide a faster commute for travelers who use them. MTC's 25-year Regional Transportation Plan indicates that these gaps cannot be filled with traditional existing revenues.

What is the express lane revenue used for?

Express lane revenue can be used to help pay off bonds issued to finance construction, provide for maintenance, operations and enforcement of the lanes, and to fund new or enhanced transit service.

Source: http://www.mtc.ca.gov/planning/hov/faq.htm

2.1.2.2 Identify and Involve Relevant Decision Makers and Affected Parties; Understand Their Perceptions; and Fashion Program Options and Messages Accordingly

The literature on acceptability of road pricing shows travelers, voters, residents, and the public at large may well perceive congestion problems and pricing options differently. Especially once planning moves from testing the waters to a formal process, it becomes vital to identify which parties are most important to engage, given congestion-related problems and the pricing options of potential interest. It is also important to assess the relationship and influence of the parties with respect to specific decision makers who must pass program proposals. Important actors include active and influential interest groups such as businesses, truckers, residents, and environmental organizations who have the ear of key decision makers with the power and responsibility to clear or reject proposals. If a standing group of the relevant parties already exists, planners can use it as the engagement group for the study. If such a group does not exist, a new task force, working group, or commission may be useful for engagement purposes. Depending on the depth and complexity of the anticipated analysis, the group might be best served by technical, policy, and outreach subcommittees.

Cultivating champions at this stage is another way to enhance prospects for acceptable pricing proposals. Champions are influential policymakers, public officials, or stakeholders favoring a pricing concept, who are willing to take action in support of it. The literature and interview findings suggest that the presence or absence of champions can influence the course of road pricing proposals. The more influential a champion is in the decision-making process leading to the required policy approval, the more important their support and actions can be. Thus, the support of policymaker champions can be pivotal. While there are cases of road pricing programs arising without strong support from prominent policymakers and instead mostly from the actions of agency officials and active stakeholders, and examples of failed proposals with active decision makers and/or agency officials, the positive potential of champion support should not be ignored. In particular, planners should ensure that champions (or their close aides) are part of the planning process, have an opportunity to shape proposals, and receive timely information on points of concern and interest.

While assessing the perceptions of decision makers, stakeholders, and the general public about the nature and severity of congestion-related problems, planners should keep in mind that relevant parties may believe congestion is only one or even a lesser problem than other problems pricing can address. Planners should not ignore decision makers, especially their views on the best ways to allocate revenues, as their support or opposition often turns on this point. It is best to do interviews on such issues as the formal process begins and before a specific proposal is fleshed out, and to do so before any open and publicized outreach campaign as early adverse reactions can slow or reverse progress toward acceptability.

Only after planners gain a sense of perceptions about the problems to be addressed and account for stakeholder reactions should they begin fleshing out and analyzing more specific proposals. Proposals should combine pricing with other strategies including transit, traffic, and demand management to create an effective package. Reactions should be assessed in an open manner, prompting engagement on all likely issue areas suggested in the literature:

- Perceived nature and severity of congestion
- Probable effectiveness of pricing compared to non-pricing options
- Equity broadly defined and ways to mitigate potential fairness issues
- Revenue allocation and uses
- Transportation alternatives and improvements
- Broader issues such as the credibility of potential implementing agencies and the conduct of the planning and engagement process to come

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Examples from Interview Sites: Development of a successful parking pricing program in New York City (NYC) demonstrates the important assessment and engagement methods, as well as sensitivity to areas of concern. New York City, as part of developing Park Smart pilot programs in specific neighborhoods, focused on areas with high demand for on-street parking and attendant traffic and parking violation problems. Planners held numerous meetings with community boards and business associations to take the pulse of the communities and ensure that the Park Smart goals and design fit the perceived problem. Planners used sidewalk surveys to measure the proportion of shoppers who arrived by car to reassure businesses that most of their customers would not be affected by parking pricing. The program was based on community opt-in so that neighborhoods were not forced to participate. Planners fostered trust between NYCDOT and community stakeholders by repeated meetings and collaboration on data collection and program design. Communication *vehicles* highlighted the accepted goals of increasing parking availability and reducing double parking, the opt-in nature of the program, merchant involvement, and DOT credibility in delivering on transportation. Exhibit 6

Exhibit 6. Description and goals of NYC Park Smart program.

Motorists
PARK Smart NYC

What is PARK Smart NYC?

PARK Smart is a program to make parking easier while reducing congestion and improving safety. NYCDOT is conducting six month pilots in neighborhoods across the City to evaluate how the program works in different settings. The agency works closely with community boards, merchants, BIDs and other local stakeholders when developing the pilots.

PARK Smart aims to increase the number of available metered parking spaces by encouraging motorists to park no longer than necessary. The meter rate is higher when demand for parking is greatest and decreases when demand is lower.

Goals of PARK Smart NYC

- Increase the availability of parking spaces
- Increase safety
- Reduce double-parking
- Reduce pollution
- Reduce congestion from circling vehicles

PARK Smart NYC Pilots

Greenwich Village

A six-month trial of PARK Smart began on October 6, 2008 in Greenwich Village. Read the findings from the six-month pilot.

Due to the success of the pilot program, 71 Muni Meters in the West Village were permanently programmed to the Park Smart rate structure. The Park Smart rate operates as follows: $3 per hour from 12:00pm thru 4:00pm, $2 per hour for all other hours.

Park Slope, Brooklyn

On May 4, 2009 a second six-month pilot began in Park Slope, Brooklyn. Meter rates are $1.50/hr. from Noon to 4PM and $.75/hr. at all other times that meters are in effect. All other regulations remain the same.

Source: NYCDOT Park Smart Program website:
http://www.nyc.gov/html/dot/html//motorist/parksmart.shtml

shows an example of NYCDOT's communication content, highlighting the resonant goals of the Park Smart program and how the agency engages with community groups in implementing the pilot programs.

2.1.2.3 Develop Convincing Specific Plans, Plan in Depth, and Iterate Toward Acceptance

As the formal plan process proceeds and presuming sufficient support exists for detailed analysis and planning of a road pricing concept, planners must understand and communicate the details of their work and iterate plan particulars toward acceptability. The research on public acceptability suggests that one obstacle to specific pricing proposals at this stage may be skepticism on the part of the public or decision makers about the effectiveness of pricing in addressing the problems of concern (e.g., reducing congestion or pollution) and the potential for generating net revenues supporting operations and/or facility improvements. This is the time for communications and presentations in which the planners clearly reference experience elsewhere and as well as their own and independent studies for the proposed pricing area in order to convincingly demonstrate effectiveness.

Sometimes the root of suspicions rests in the tools of analysis. Actual experience with impacts from existing pricing projects may well be more convincing than model projections or results of cost–benefit analysis. Nevertheless, there is growing experience that simulation models are useful for projecting impacts on specific highways and street layouts in study areas, and can provide potent information about impacts to stakeholders and the public. Also, where there is interest in possible private sector participation in project development and operations, bonding agencies will require use of specialized models. Thus, modeling should not be avoided but done with full acknowledgment of potential weaknesses, and results should be given not as exact points but estimate ranges. Where local planners lack experience with such models, they should be guided by outside expertise and supporting resources such as those available from the federal Value Pricing Program and other U.S. DOT programs.

As analysis proceeds, it must go more in depth and stay responsive to the top priority issues, concerns, and preferences of stakeholders and decision makers. An initial detailed planning step is for planners to demonstrate how pricing affects traveler groups and eases congestion. Modeling and analysis should use a wide array of performance measures in synchronization with the problems addressed. Indicators may include changes in delay, traffic volumes, levels of service, speeds for both autos and transit, probability of accidents, and emission impacts. Planning and analysis also should focus on:

- Revenue generation and revenue/cost results from existing programs
- Potential role of pricing in the face of declining revenues from traditional sources
- User pay equity considerations including comparison to gas and sales taxes
- Enabling policy and legal requirements (e.g., pricing restrictions on federally aided facilities)
- Institutional requirements

For example, the literature suggests the importance of relying on existing policy authority and organizations to improve the prospects of acceptance and minimize the need to create whole new policies, authorities, and organizations. Equally important is attention to specific program design elements including those that the literature shows are key to acceptability, such as:

- Gearing revenue allocations and uses in line with stakeholder preferences, usually toward improvements of interest in the priced zone, though other options also may be preferred including potential tax reductions
- Providing not only enhanced alternatives to driving, but an acceptable free driving alternative
- Good enforcement strategies to ensure equitable access to priced facilities and avoid "free riders"
- Simple rather than complex toll schedules
- Handling possible traffic and parking diversion in sensitive areas
- Handling data and traveler information to maintain user privacy

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Certain pricing concepts at this stage may require developing pilot programs as a first step. Areawide pricing and VMT-based fees are two concepts where U.S. experience is limited and analytical tools may be lacking in precision and credibility. An examination of international experience for these concepts is a useful step to estimating impacts and illustrating operations. Additionally, small-scale pilot programs offer opportunities to test effectiveness, operational details, and user reactions through the involvement of volunteers. Pilot programs can build the familiarity and acceptance required for later expansion of programs. Some pilot programs may be supported by the federal Value Pricing Program, which offers technical assistance and funds to support planning, operations, and evaluation.

Examples from Interview Sites: Examples of accepted and adopted plans with transit and other travel options emphasized and communicated are numerous. The plan for HOT lanes in Los Angeles incorporates and underscores a strong "multimodal" approach (see Exhibit 7), in part to serve low-income groups, as do information websites for Minneapolis, the San Francisco Bay Area, and others where revenues go toward supporting project operations and transit. At the same time, numerous HOT lane projects in all these locations stress that the free driving option is always available. North Central Texas Council of Governments (NCTCOG), Metropolitan Planning Organization (MPO) for the Dallas region, goes a bit further by stating in policy that no current free lanes will ever be tolled.

Again, while transit expansion is a common and much touted element of pricing plans, easily communicated and generally well received, it is no guarantee of success for a pricing proposal. For example, both the areawide pricing plans in New York City and San Francisco stressed transit expansion and devoted some pricing revenues to transit, but neither project has come to fruition. As stated at the outset of this section, a number of variables bear on the success of pricing proposals; any one of these variables—whether equity, image of planning or implementing agencies, planned use of revenues, privacy, or other issues enumerated in the acceptability literature—can be paramount in determining the success or failure of project proposals. Nevertheless, most successful pricing projects have improved transit as a central element in the overall program.

Explanations of the workings of road pricing aimed at portraying its effectiveness and impacts are less common. One example of apparently effective communications is found in Texas. NCTCOG frames dynamic pricing as "guaranteeing" acceptable speeds. It also stresses that the traveler's value of time is a function of the opportunity cost of trips, as when one is hurrying to arrive at day care for a pickup where a late penalty might apply. The message attempts to counter the usual criticism that willingness to pay is a function of wage rate and that low-income people will suffer because of that. The workings and benefits of parking pricing probably are more easily explained and accepted. SFpark provides an example of very straightforward and easily digested information (see Exhibit 8) on how new variable rates following the peaks and valleys of parking demand will make finding parking easier, improve movement of transit and emergency vehicles, and attract more shoppers.

Exhibit 7. Multimodal approach of LA Metro ExpressLanes.

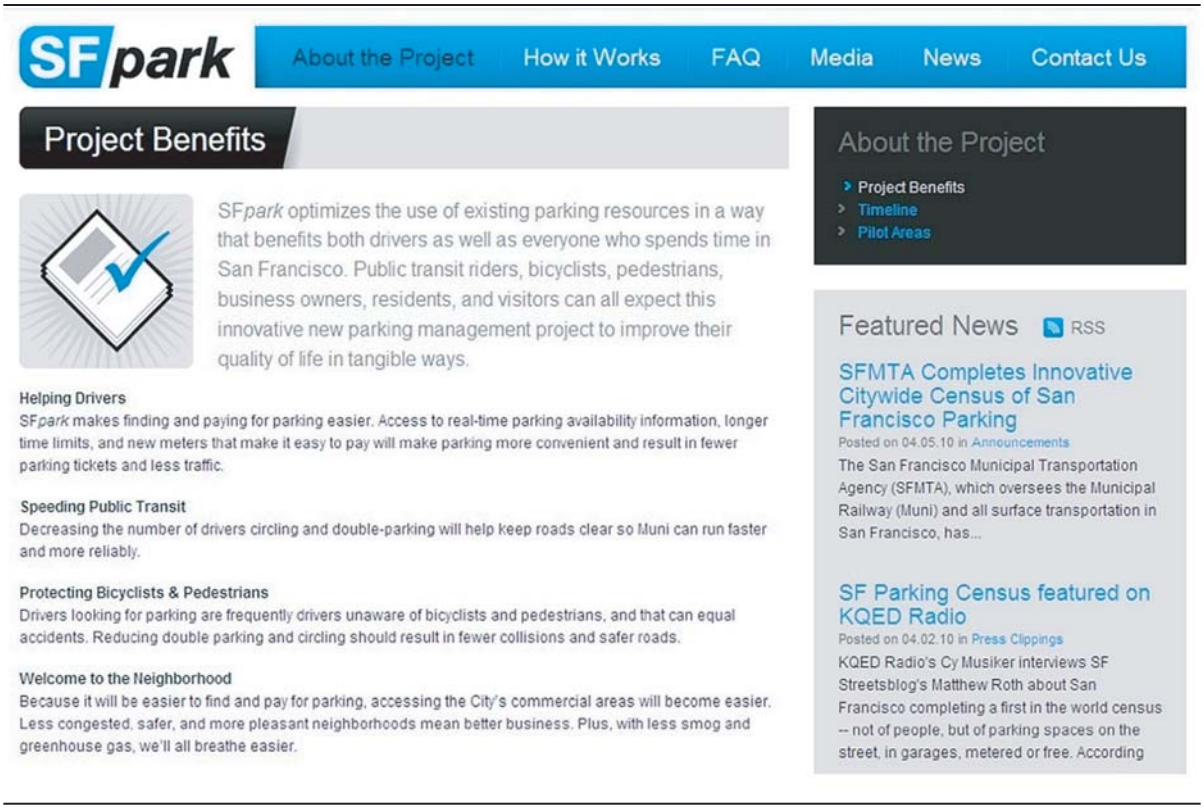
Project Benefits

Increased Transit Service and Expanded Vanpool Program

- Purchase 59 alternative fuel buses for increased feeder service and Silver Line service
- Provide an operating subsidy for the one-year demonstration period
- Promote vanpool program and create a minimum of 100 new vanpools that travel on the I-10 and I-110 Express Lanes

Source: http://www.metro.net/projects_studies/expresslanes/images/10-1683_ntc_ExpressLanes_condensed_web.pdf

Exhibit 8. Excerpt from website of SF*park* program highlighting project effects and benefits.



Source: Website of SF*park* program, http://www.sfpark.org

2.1.2.4 Address Fairness and Equity Issues Broadly

Equity issues are important to address both in preliminary discussions of road pricing and as planning proceeds. Equity across income groups who are subject to pricing often leads equity discussions among analysts of road pricing. However, research shows that acceptability of pricing programs does not vary greatly across income groups and equity defined more broadly may deserve more attention. Fairness concerns can revolve around concerns about "paying twice" necessitating clear demarcations between improvements and services supported by traditional taxes versus those supported by new pricing revenues. Other fairness concerns to address in planning and communications may center on possible evasion of pricing, the ease of participation in developing pricing plans (sometimes termed "procedural" fairness), and pricing effects perceived as a hardship on certain population segments. Finally, use equity (benefits in proportion to facility use) and spatial equity (benefits by location) are important, calling attention to program design issues related to providing transit as an alternative in undeserved locations, and setting upper limits on charges and the number of crossings priced in a given time period.

Examples from Interview Sites: The importance of income and other equity issues is illustrated by the interview sites. MTC addressed income equity along the way to successful adoption of its HOT lane network with not only the common approach of emphasizing transit improvements, but also the work of an independent expert suggesting no one is "forced" to pay as the free alternative always exists. Oregon DOT suggested a voluntary switch from the gas tax to mileage fee to counter perceptions that the mileage fee is unfair to rural versus urban drivers and the contentious issue of double payment. Planners with the SR-520 project in Seattle propose expanded transit, telework programs, and active traffic management to address potential inequities based on

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Exhibit 9. Excerpt from LA Metro ExpressLanes fact sheet.

Discounts for Low-Income Commuters *(proposed)*

- Residents of LA County with an annual income at or below $35,000 will qualify for a discount.
- A one-time $25 discount will be received when a new account is set up. It can then be applied towards the prepaid toll balance or transponder deposit.
- Monthly account non-user fee will be waived.

Source: http://www.metro.net/projects_studies/expresslanes/images/10-1683_ntc_ExpressLanes_condensed_web.pdf

income, work schedules, and traffic diversion into certain communities but not others. NCTCOG in Dallas carried out a special study on environmental justice showing no detriment to job access across areas affected by successfully adopted projects slated for implementation. See Exhibits 9 and 10 for how fairness concerns were targeted in communication content for express lanes in Los Angeles.

2.1.2.5 Keep Planning Open and Responsive; Make Government a Problem-Solving Partner, not Culprit

As planning moves from preliminary assessment to an open formal process, the conduct of the process itself may become an important acceptance issue. Numerous literature findings suggest that how planners, their governmental units, and communications are perceived can be as important to acceptance as the nature of their pricing proposal(s). Government itself may be perceived as a culprit for congestion problems, an issue which may be addressed by actions adjunct to pricing such as improving transit and traffic management. Suspicion of government motives in pricing for revenues underscores setting and communicating a clear-cut and committed revenue plan as important to acceptance. This is especially true when the implementing agency is not perceived to be competent, transparent, and attuned to impacts and potential improvements across all travel modes. It is worth cautioning that while presenting revenue options, planners also need to be

Exhibit 10. Excerpt from LA Metro ExpressLanes FAQ.

12. We all paid for the HOV lanes with our gas taxes, and now you want us to pay again for the right to use them? Shouldn't freeways remain free?

These are optional tolls, and the choice is yours. While it's true that the converted HOV lanes would become toll lanes, you only pay if you choose to use them – and in most cases, they will continue to be toll-free for many commuters. Either way, all general purpose lanes will remain free.

What's different under the ExpressLanes program is that commuters will have more options. For example, whereas HOV lanes are currently restricted to cars with two or more passengers, ExpressLanes will be open to solo drivers willing to pay a fee. And those drivers who choose to use the ExpressLanes provide a benefit to drivers who do not choose to pay a toll by creating more capacity in the other lanes.

As tolling experiments in other cities have shown, this extra capacity produces speedier trips for non-toll paying drivers as well.

13. Aren't low-income drivers being punished by being priced out of certain lanes?

No. The toll policy includes toll credits for low-income commuters. Carpools, vanpools, transit and motorcycles will not be charged a toll. The ExpressLanes project provides increased transit service and net toll revenues will be reinvested in transit and HOT lane improvements. The current proposal is to credit the accounts of qualifying LA County low-income households $25 for account set-up/establishment fees that can be applied to the transponder deposit or pre-paid toll balance.

Source: http://www.metro.net/projects_studies/expresslanes/images/10-1680_ntc_ExpressLanes_FAQ_web.pdf

sensitive to the possibility that some decision makers, their constituents, and influential stakeholders will be suspicious of revenue plans if the motive appears to be growing government agencies.

Also important may be matching funds from central governments and well-publicized agreements across levels of government demonstrating broad commitment. In terms of planning procedures, resistance can arise where pricing proposals appear "sprung" on people, suggesting the importance of clear and continuous communication and solicitations for input. Meaningful and sincere attempts at involving affected parties and answering questions are important to acceptance prospects, as well as clearly communicated program objectives, comparison of potential outcomes of road pricing to non-pricing options, supporting the results with credible analysis, and reference to successful projects elsewhere.

Examples from Interview Sites: Evolution of pricing proposals in the interview sites shows the role of a responsive planning process and capable, trustworthy agency image. Modifications to the original congestion pricing plan for New York City helped build support for the revised plan after intensive public discussion and a series of well-attended public hearings. Even after these changes, however, much of the public was skeptical that the promised transit improvements would materialize. At the same time, the New York State Metropolitan Transportation Authority (MTA) rolled back some promised service enhancements shortly before the failed state assembly vote. This action probably deepened skepticism that the MTA could deliver on service improvements if congestion pricing were adopted.

NCTCOG in Texas illustrates the effort necessary to build and maintain a credible planning and execution image. The agency has engaged state legislators, neighborhoods, chambers of commerce, and local officials over 15 years to build and maintain consensus and credibility around implemented and planned tolling projects and priced managed lanes. As a result, the 40 elected officials at NCTCOG have given unanimous support for tolling and pricing policies. Still, they are informed by monthly communications from staff on pricing rationales and program progress. The agency has adopted a policy of never ignoring opposition at community or agency meetings. All parties including opponents at relevant meetings always are invited to subsequent meetings. Minnesota DOT (MnDOT) takes a similar tack by "leaving no question unanswered" in its outreach and engagement processes.

The final example of open and credible outreach, planning, and analysis is the evaluation of tolling options and public outreach around the SR-520 bridge replacement project in Seattle. A 520 Tolling Implementation Committee was established by the state legislature in 2008 comprising senior officials from the state department of transportation, the state transportation commission, and the Puget Sound Regional Council (PSRC). The committee ran a year-long process of meetings with cities, counties, interest groups (over 40 meetings in 2008 alone) and maintained a media website and a Q&A website (input from over 2,700 people). They also engaged a panel of independent experts as a "peer review" group to give credibility to PSRC's modeling process (see Exhibit 11).

2.1.2.6 Coordinate with State and Regional Agencies and Planning Processes

As project planning proceeds, it is important to take into account the regional plan processes required by federal regulation and guidance. This is not to say successful projects have come about through the regional or state plan process. Typically, projects have begun outside such processes. However, especially for a project affecting a large area or corridor, involving regional and state planners is important for several reasons:

- Clearance of the project by the responsible regional and state agencies will be needed to receive potential federal funds supporting demonstration or implementation, and/or transit services expanded with the pricing program.

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Exhibit 11. Independent peer review recommendations to the 520 Tolling Implementation Committee.

Recommendations from Peer Review

- Conduct a more detailed review of results, including focus on target corridor
- Run the model under different assumptions, including:
  - fixed trip table
  - sensitivity analysis
- Improve model consistency, including:
  - values of time
  - operating costs in trip distribution
- Include strategic recommendations for future work
  - stated preference survey
  - corridor specific analysis
- State results in ranges to account for uncertainty

Source: Washington State DOT website for the SR-520 project: http://www.wsdot.wa.gov/Partners/Build520/documents/PeerReview_NextSteps_081208.pdf

- Regional and state planners and agency officials can be important and knowledgeable allies on developing new or revised regional and state policy and gaining necessary approvals. Regional planners also provide a regional perspective and regional analysis on such important matters as geographic equity, revenue distribution, and why pricing is considered for one corridor or area and not another.
- Regional and state planners assess the balance of revenues and costs as part of fiscally constrained metropolitan plans for significant projects. An important potential benefit of pricing projects for regional and state highway planners is how pricing may generate planned capacity sooner than traditional state and local funding sources allow. This effect is especially important in light of ongoing and projected shortfalls in revenues from such sources.
- Finally, regional planners attend to air quality conformity and environmental justice requirements for significant projects.

Section 2.2 addresses in detail how road pricing can fit into regional and state transportation planning processes as structured under federal law and guidance. The important point for planners carrying out project plans is to involve regional and state planners and be aware of how the formal federal plan process can bear on project development, especially for anticipated large projects.

2.1.2.7 Use Respectful, Clear, Non-Jargon Messages in Engagement and Communication Vehicles; Tailor Messages to Audience Segments

Throughout the entire planning process, communications should:

- Describe and underscore the nature of the problem(s) to be addressed
- Highlight key elements of proposed or implemented programs
- Be convincing about pricing effectiveness in addressing problems
- Convey experience with pricing to date to build familiarity
- Reiterate achievements of relevant agencies to boost credibility

For effective communication, the form, content, and tone of communication vehicles around these purposes should be as respectful, pithy, clear, and free of economic, planning, or engineering jargon as much as possible. Ensuring that the communication vehicles are available in multiple languages represented in the region and to minority communities, English speaking and otherwise, also helps ensure that all potentially affected parties are reached and have the information they need to participate in the planning process.

Examples from Interview Sites: While the areawide pricing plan in San Francisco has been put on hold, planners there have learned that jargon in road pricing discussions and communications can be off putting. Planners believe terms such as "marginal cost" pricing and even "congestion pricing" connote an overly technical slant. In fact, "congestion pricing" seems to imply a double burden: first, congestion itself, then pricing added on top. San Francisco planners found that organizing several working groups as part of planning (technical, business, policy, citizen, and agencies) and matching language accordingly reduced the risk of offending audience members.

Other interview sites also have chosen not to use the term "congestion pricing." For example, Texas uses "managed lanes" and Minnesota uses "express lanes" or simply "MnPASS lanes" after the well-received and widely recognized transponder used on the express lanes (see Exhibit 12). The term "express lanes" is intended to convey a premium service enabling customers to receive faster and more reliable service for the price they are paying. The message especially targets users versus taxpayers or citizens at large.

Texas provides another illustration of pithy, easily remembered, and catchy phrasing in its communications about the rationales for tolling and pricing. A phrase coined by the former Chair of the Texas DOT and adopted by planners and decision maker advocates is "no roads, slow roads, or toll roads" to underscore the need for pricing in the face of growth and declining gas taxes. Such digestible messages coupled with an open, continuous communications program referenced earlier for legislators and communities helps maintain a supportive constituency behind the ongoing program in Texas.

2.1.2.8 Learn from Glitches and Setbacks; Move on

Because road pricing has its roots in economic analysis and perceptions, it is not unusual for analysts and planners developing pricing options to focus on the most effective, efficient, or optimal solutions, often centered on congestion. As the above checkpoints indicate, such an avenue may be a mistake as such options may not be the most acceptable, or are entirely unacceptable. The planner's task is to identify the most resonant problems and find the mix of pricing options that work and are acceptable. For example, to attack downtown congestion, areawide pricing may be more effective than parking pricing, but far more perilous to plan, gain acceptance around, and move toward implementation. Planners should be aware that the acceptability research shows that HOT lanes, traditional toll facilities, and express lanes generally garner the most support, and less support is likely for cordon pricing, mileage-based fees, and private sector partnerships involving rights to revenues. General or hypothetical pricing concepts are less likely to meet with support than those applying to specific facilities.

However, all is not lost if a pricing plan runs into resistance, misunderstanding, or even rejection. As the literature suggests, some successful plans had long gestation and hiatus periods as well as early rejections, as in the Minneapolis–St. Paul Twin Cities area and in London. The planner's task is to learn from stumbling points and regroup, whether by altering the concept, engagement strategies, timing of plan efforts including waiting for a more auspicious time to begin again, or a combination of all of these. For example, planners with MnDOT turned to a "grasstops" approach of contacting, educating, and seeking support from elected officials and community leaders after

Exhibit 12. Logo for Minnesota's MnPASS lanes.

Source: MnPASS website: http://mnpass.org/

setbacks with an earlier "grassroots" approach aimed more toward travelers and the public at large. The "grasstops" approach eventually helped in gaining acceptance around the successful I-394 HOT lane project. London too eventually implemented an areawide scheme after many years of study and rejection by decision makers, due in large measure to the rise of a high-level advocate and forceful public official to mayor of the city, supported by strong analysis, worsening congestion, and a transit expansion plan appealing to a large segment of residents and commuters.

Examples from Interview Sites: The Oregon DOT (ODOT) mileage-fee pilot program illustrates the importance of recovering from a problematic public and media communication process to go forward with a proposed program, address concerns, and set the stage for potential further expansion of the pricing concept. To begin the mileage-fee program, planners engaged key stakeholders and decision makers in the state on the issue of replacing gas tax revenues to address the twin problems of insufficient revenues for current and foreseeable roadway needs and congestion varying by location. A 12-member task force of legislators, local decision makers, auto interests, and others supported a mileage-fee pilot program with price variation for congested areas and possible replacement of the state gas tax with a fee based on VMT on the state's roads.

However, the broad driving public never came "on board" with VMT fees as a possible replacement to the gas tax. While the pilot program went ahead with willing volunteers, the driving (and potentially voting) public was skeptical about the VMT fees because of uncertainty about possible double paying for road use, fairness to high- versus low-mileage drivers, and potential privacy breaches. These concerns about double billing and privacy were addressed in the pilot (e.g., operations changed from central to fuel station billing and changed from storing traveler coordinates to only counting mileage in tracking devices). In hindsight, planners believe a better job could have been done in developing the specifics of the mileage fee concept early on in light of broad public concerns. Instead, ODOT program administrators were forced to react with information on program specifics after the public and media made assumptions about how a general mileage fee system might work. Good explanation as in Exhibit 13 eventually quelled adverse press reaction and calmed some public fears, and keeps alive the potential of a future VMT fee system for the state.

2.1.2.9 Stay Engaged and Responsive as Implementation Proceeds

A consistent finding from the literature is that acceptance tends to grow the longer pricing programs are in existence, although the exact reasons for growing acceptance are not well explored. Some research suggests that proven effectiveness may be important and, where applicable, may minimize adverse reactions from influential parties such as local business. In other cases, it may be a proven link between revenues and promised transportation improvements. Whatever the case, research suggests that growing positive program experience is important for all parties including decision makers who must engage their constituents on the progress of the program.

An important implication is that concerns about acceptability should not end with program adoption. For best chances at avoiding termination, gaining continued acceptance, and setting the stage for expansion of pricing in a region or state, it is important to keep promises about program design elements generally, and revenue distribution commitments in particular, as implementation proceeds and operations commence. Continually highlighting successful program experience, detailing costs and revenues, and inviting stakeholder input after implementation via newsletters, briefings, and communications will enhance prospects for long-term success.

Examples from Interview Sites: MnDOT well illustrates how engagement and communication do not end with adoption and startup of a pricing program. After successful implementation of its first HOT or express lane project, I-394, MnDOT has operated not only an interactive website

Exhibit 13. ODOT's correction of inaccuracies in media reports about the road user fee pilot program.

Road User Fee Pilot Program

Corrections to news reports

The Wall Street Journal, Editorial Page by Brendan Miniter
May 10, 2005

Inaccuracy: "…it's clear the state is looking to influence behavior in addition to raising revenue by implementing a "vehicle mileage tax."

Fact: The Road User Fee Pilot Program is designed to measure behavior among motorists not influence driver behavior. With this pilot program, Oregon is not looking to raise revenue but looking at options for the inevitable future road revenue decline. While it is true that ODOT is obliged to test congestion pricing in the pilot program, this is a requirement of ODOT's FHWA Value Pricing Pilot Program grant and not an indication of a specific policy directive adopted by the Oregon DOT or the state legislature. Any future policy decision Oregon may make on the mileage fee does not necessarily translate into application of congestion pricing, as these two policy decisions are separate. The pilot program will simply test whether or not an electronically collected mileage fee could technologically include congestion pricing should policymakers ever decide to go in that direction.

Inaccuracy: "To administer this tax, a global positioning system would be mounted in each car."

Fact: The Oregon Road User Fee concept recommends that only new vehicles be equipped with the on-board technology. All of the technologies being used in the pilot program are already being manufactured in cars today. Some automobile manufacturers have already announced that key components will be standard equipment on all models within the next few years. The Federal Highway Administration and transportation standards organizations are working to adopt universal standards for the same technologies being used in the pilot. In the near future, therefore, it is very likely that a state adopting a GPS-based mileage fee would not need to require additional hardware be installed in vehicles. Some sort of software upgrade seems more likely.

Clarification: "As a driver fuels up, the device would relay mileage information to the gas pump, which would calculate the VMT."

Fact: The Oregon concept is that as the driver fuels up, the VMT is calculated **AND the gas tax is deducted**.

Inaccuracy: "What Oregon is showing us is that taxes can provide a government with the rationale to amass and act on all sorts of personal information, including when and where you've driven."

Fact: The GPS receiver in cars simply tells the electronic odometer whether to count the miles as "in state" or "out of state." This is necessary to prevent Oregonians from being charged for miles driven outside the state. No location data is transmitted anywhere or stored in the device or elsewhere; since vehicle location data is not collected, it cannot be accessed. The only data collected and transmitted is the mileage, which is sent to the gas pump reader through a radio frequency that can only travel about eight to ten feet.

Source: Website of Oregon DOT's Office of Innovative Partnerships and Alternative Funding: http://www.oregon.gov/ODOT/HWY/OIPP/mileage_newsroom.shtml

for users and prospective users of the facility, but also performed impact analyses and revenue/cost evaluations and publicized the results through press releases and information meetings with decision makers and stakeholder groups. MnDOT believes that ongoing engagement and communication are important not only to the future of I-394 but also to plans for future express lanes such as those recently implemented on I-35W. In the same vein as outreach for I-394, a user satisfaction survey and its results are made available to I-394 users through the MnDOT website (see Exhibit 14).

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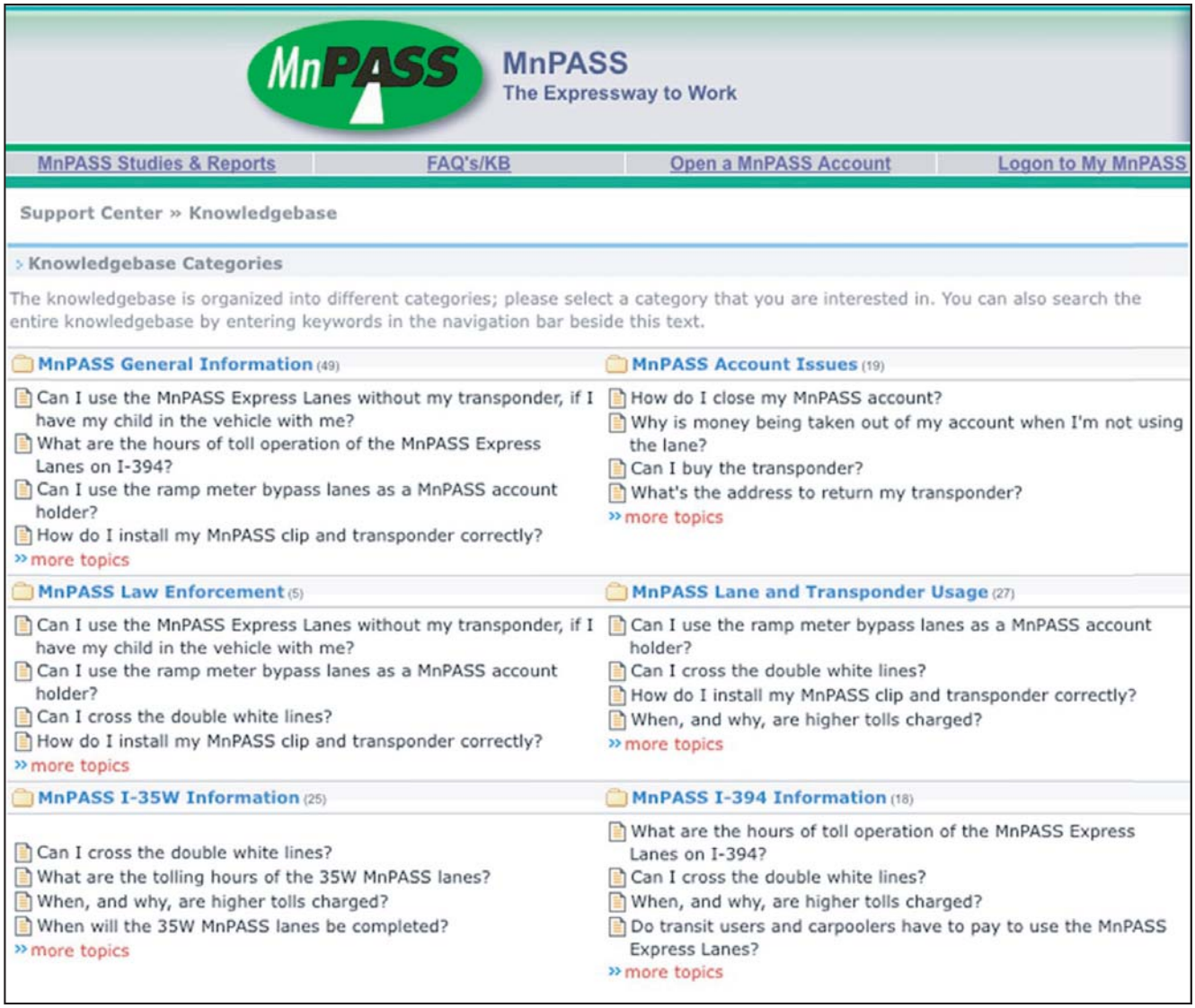
Exhibit 14. Interactive user website for MnPASS lanes providing detailed information.



Source: MnPASS website: https://support.mnpass.net/kayako/index.php?_m=knowledgebase&_a=view

2.2 Road Pricing in the Transportation Planning Process

Section 2.2 addresses how road pricing can fit into the transportation planning process as structured under federal law and guidance. Where road pricing is expanding from individual projects to multiple projects and possible application across regions, it should be treated in required formal planning, both for proper authorization and for programming in concert with complementary transit, HOV programs, parking, and land use policy. Also, road pricing has good potential to help meet many typical regional and state planning goals, air quality conformity, and fiscal constraint requirements.

The guidance in Section 2.2 has been developed based on a literature review and interviews at sites with agencies involved in developing road pricing projects. The interviews focused on planning for road pricing projects and the treatment of road pricing in regional and state plans. The

interview sites are those specified in Section 2.1. Interviews were supplemented by collecting plans and studies important to understanding the treatment of road pricing in planning, engagement, and communication. The literature review focused on road pricing planning in states and regions, and federal guidance and law underlying the transportation planning process.

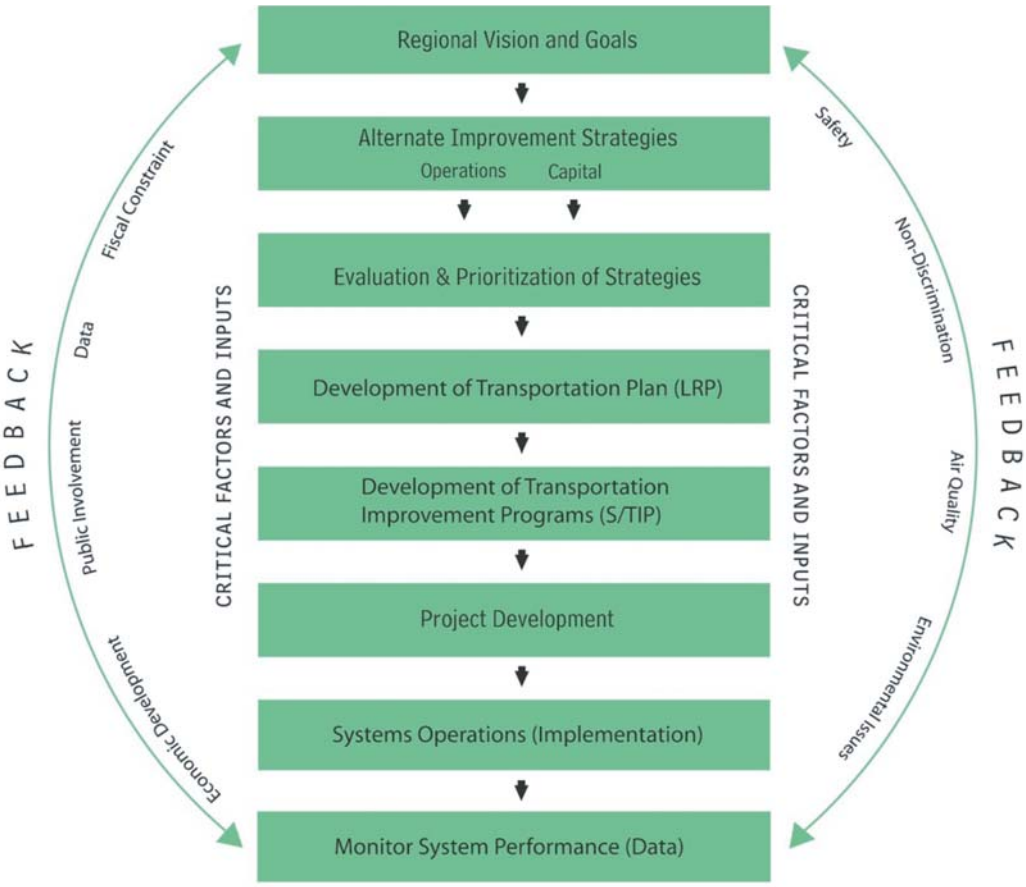
Part 2 contains the literature review and interview findings. The literature review of planning documents and studies is contained in Appendix A and the review of literature related to acceptability and communications is contained in Appendix B. The interview findings on planning, communication, and engagement issues are contained in Appendices E and F with links to supporting studies and reference materials contained in Appendix G.

2.2.1 Overview of the Transportation Planning Process

As shown in Exhibit 15 from FHWA and FTA, transportation planning involves a series of steps conducted by the MPO, state DOT(s), and transit operators:

- Developing a **regional vision and goals** for the transportation system
- Identifying **alternate improvement strategies**—Monitoring existing conditions; forecasting future population and employment growth, including assessing projected land uses in the region

Exhibit 15. Steps in the transportation planning process.



Source: FHWA and FTA, *The Transportation Planning Process: A Briefing Book for Transportation Decision Makers, Officials, and Staff.* A Publication of the Transportation Planning Capacity Building Program. FHWA-HEP-07-039, September 2007. Available at: http://www.planning.dot.gov/documents/briefingbook/bbook_07.pdf

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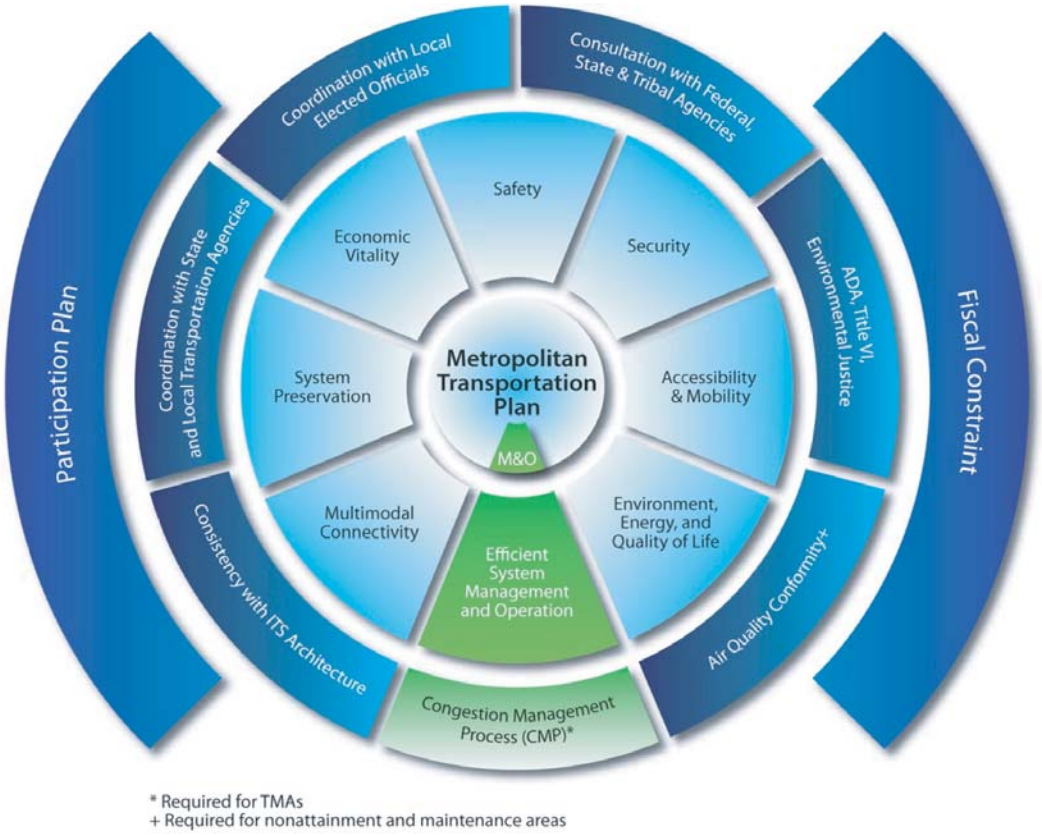
and identifying major growth corridors; identifying current and projected future transportation problems and needs; and identifying potential strategies

- The **evaluation and prioritization of strategies**—Analyzing, through detailed planning studies, various transportation improvement strategies to address needs
- Developing **long-range plans** (the long-range transportation plan, or metropolitan transportation plan) of alternative capital improvement and operational strategies for moving people and goods; estimating the impact of recommended future improvements to the transportation system on environmental features, including air quality; and developing a financial plan for securing sufficient revenues to cover the costs of implementing strategies
- Developing **short-range programs** (the Transportation Improvement Program) that identify funding and a schedule for implementation of projects
- Perform **project development,** including environmental review as part of the National Environmental Policy Act (NEPA) process, design, and construction
- Perform **system operation** and **monitoring** of system performance and effectiveness of implemented strategies

The metropolitan planning process also can be grouped by a set of broad important requirements. As shown in the center of Exhibit 16, MPOs must consider eight planning criteria in developing their long-range metropolitan transportation plans (MTPs, or LRPs as in Exhibit 15), including the highlighted efficient management and operations (M&O) of the transportation

Exhibit 16. Metropolitan transportation planning requirements, highlighting system management and operations.



Source: FHWA and FTA, *Advancing Planning for Operations: A Guidebook for an Objectives-Driven, Performance-Based Approach to Integrating Operations in Metropolitan Transportation Planning.* February, 2010. Available at http://ops.fhwa.dot.gov/publications/fhwahop10026/fhwa_hop_10_026.pdf

system where road pricing has strong potential applicability. Other planning criteria where road pricing may help achieve goals include improving accessibility and mobility; improving economic vitality; and maintaining the environment, energy, and quality of life. In addition to these eight planning criteria, the MPO planning framework addresses several other planning requirements:

- MPOs in transportation management areas—metropolitan areas with a population over 200,000—must develop a Congestion Management Process (CMP).
- MPOs in air quality non-attainment or maintenance areas must demonstrate conformity of the plan with the State Implementation Plan (SIP) for air quality.
- MPOs must develop a fiscally constrained plan—that is, the plan must be based on reasonable estimates of revenues that will be available to fund projects; the MTP is not intended to be a wish list of projects, but is implementable based on existing and projected funding sources.
- MPOs must develop an effective participation plan involving affected parties and stakeholders.

2.2.2 Bringing Road Pricing into the Transportation Planning Process

Plans for road pricing projects should be considered in conjunction with:

- Steps 1 through 3 leading to Step 4 in Exhibit 15, when the long-range plan is finally adopted
- Requirements in Exhibit 16 specifically, the CMP, air quality conformity through transportation strategies, participation plan, and fiscal constraint

Specifically, the following subsections indicate where in the formal planning process road pricing can and should fit and contain examples of how it has been done.

2.2.2.1 Regional Vision and Goals

Road pricing fits 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), providing 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). More specifically, depending on the pricing concept selected and the program structure, road pricing can support the following typical goals in formal regional and state plans:

- Timely development of improved and new transportation capacity. Compared to normal development and improvements to capacity, road pricing offers more timely development compared to reliance on traditional transportation finance methods.
- Management and reduction of congestion. Especially where congestion is severe and persistent, road pricing offers prospects for effective and lasting relief and management, improving speeds and reliability for autos, transit, and goods delivery. Also, because there are several types of pricing strategies available (areawide, corridor, parking), the strategy can be tailored to an array of congestion problems.
- Development of a sustainable and environmental friendly transportation system. Because of revenue-generating capacity, road pricing has the potential to aid in the finance of the transportation system, especially as expanded into sizeable regional or state projects. Also, because road pricing can support and help finance multimodal auto alternatives as it tames congestion, it can aid in meeting long-standing and newly emerging greenhouse gas emission conformity requirements.

There are a host of other typical goals found in regional and state plans [and arrayed in the center of Exhibit 16 (as planning factors)] where road pricing can be supportive. Depending on the specific pricing project or projects being considered for inclusion in formal plans and the particulars of the supporting studies and projections, road pricing can:

- Support economic vitality—improve transportation system reliability, which is valued by the freight and business communities

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- Increase safety—reduce congestion and associated accidents and delays
- Enhance livability and quality of life—encourage more walkable and transit-oriented centers by reducing auto use; by improving bus speeds and deliveries to businesses; and, for parking pricing, by reducing cruising for parking and the volume of parking demand
- Enhance system connectivity—reduce congestion areawide or in corridors and corridor networks and support transit expansion depending on net revenue allocation plans
- Emphasize preservation of the existing transportation system—optimize existing road capacity rather than build new capacity

2.2.2.2 Performance Measures

An important part of establishing broad goals in the first step of the process provided in Exhibit 15 is developing associated specific objectives and performance measures around the goals. As parts of recent guidance documents, FHWA and FTA are promoting use of an objectives-driven, performance-based approach in the metropolitan transportation planning process. The approach defines specific, measurable, agreed-upon objectives for system performance tracked at the regional level and used to inform investment decisions.

Formal regional and state plans must incorporate specific performance measures as they are developed. Planners involved in these processes should be aware of several specific performance measures appropriate to the assessment of road pricing both for the assessment of specific proposed project plans and for the ongoing evaluation of projects as they move toward implementation and operations. Exhibit 17 provides some example measures.

Other performance measures applicable to pricing relate to:

- Revenue generation and net revenues
- Equity, as measured by demographic categories of facility users overall and by frequency of use
- Air pollutant emissions

2.2.2.3 Alternatives Analysis

An important part of the transportation planning process is analyzing alternatives. Offered here are checkpoints for analysis of pricing with a focus on its benefits, thereby enhancing prospects of adopting worthwhile projects and supporting policies. The points are in line with both interview findings and literature on developing acceptable and successful plans and projects.

Road pricing proposals should include options for the use of revenues and potential for speeding transportation capacity enhancements and supporting transit services. The analysis of road pricing as a solution should involve a package of investments and specific policies for planned rev-

Exhibit 17. Examples of performance measures related to road pricing.

Type of Measure	Examples of Performance Measures
Traffic Congestion	▪ Lane miles congested (defined based on volume/capacity ratio of speed during peak periods) ▪ Average hours of congestion per day ▪ Travel time index ▪ Lost time due to travel delay ▪ Wasted fuel due to travel delay ▪ Average speeds by corridor
Reliability	▪ Buffer time index ▪ Planning time index
Multimodal Choices	▪ Percentage of travel by transit or carpooling ▪ Availability of alternatives to congestion

enue allocation. An example is pending legislation in the San Francisco Bay Area specifying that network HOT lane revenues will be returned to corridor developments in proportion to the revenue generation from specific corridors.

Specific studies of road pricing will be needed to identify the potential impacts on traffic on the priced facility and adjoining roadways, transit ridership, air quality, and revenue generation, which is especially critical to pricing projects relying on bond market finance. The credibility of model projection also may be an issue in such analysis. Ways to handle these challenges include the use of an add-on microsimulation traffic assignment tool, or the HERS economic benefit–cost analysis model, which produces a revenue estimate associated with road pricing. These and other such models are available from specialized consultants or government or university sources. Another helpful approach is the use of model peer review groups to enhance credibility during planning (e.g., as used by the PSRC).

Alternatives involving road pricing should also be analyzed for legal compliance on federally aided facilities because tolling may not be permitted on such facilities, e.g., on Interstate highways. However, states approved for the Federal Value Pricing or Urban Partnership programs (a limited number) are not held to the federally aided restriction. Under these programs, federal aid may be available to support road pricing options for enhanced analysis and implementation. To date, support has spanned HOT lanes, pricing on existing facilities, areawide pricing, VMT fees geared to congested locations, and parking pricing (such support may or may not continue under forthcoming reauthorization of federal transportation programs).

2.2.2.4 Fiscal Constraint

The metropolitan long-range transportation plan must be fiscally constrained and include a financial plan that estimates how much funding will be needed to implement recommended improvements, as well as operate and maintain the system as a whole, over the life of the plan. This plan includes information on how the MPO reasonably expects to fund the projects included in the plan, including anticipated revenues from FHWA and FTA, state government, regional or local sources, the private sector, and user charges.

Road pricing offers potential as a funding source for highway infrastructure improvements associated with the project (e.g., to help pay for additional lanes) and for ongoing highway maintenance and operations, transit services, or other related investments. Depending on the area, road pricing projects evaluated as part of formal regional and state plans may not be so extensive as to help meet fiscal constraint requirements. However, road pricing can help where multiple projects or networks of priced facilities are planned or emerging, as in the San Francisco Bay Area, Washington D.C. area, and Puget Sound, or in Texas where private investment in the Dallas managed lanes helps reduce public sector costs in the overall plan.

An example for planners to consider on how road pricing can be applicable in transportation finance planning is the PSRC in the Seattle, Washington, region. PSRC has included road pricing as a key element of its Draft Transportation 2040 Plan. This financing plan suggests a long-term shift in how transportation improvements are funded, with more reliance on road pricing as a means to pay for transportation improvements, while also contributing to other goals, such as reducing contribution to climate change and air pollution. Similarly, recognizing that potential shortfalls in the gas tax will lead to limited funding in future years, planners in Dallas have been including managed lanes in its regional plans since the 1990s when the fiscal constraint requirement was first introduced. Exhibit 18 shows how NCTCOG expects to meet the Dallas–Fort Worth region's transportation funding needs through "innovative" finance sources, including revenues from managed lanes proposed on multiple facilities in the region. These priced facilities have been adopted in the current regional plan and are expected to fund about 30% of NCTCOG's 2030 Metropolitan Transportation Plan costs for the roadway system.

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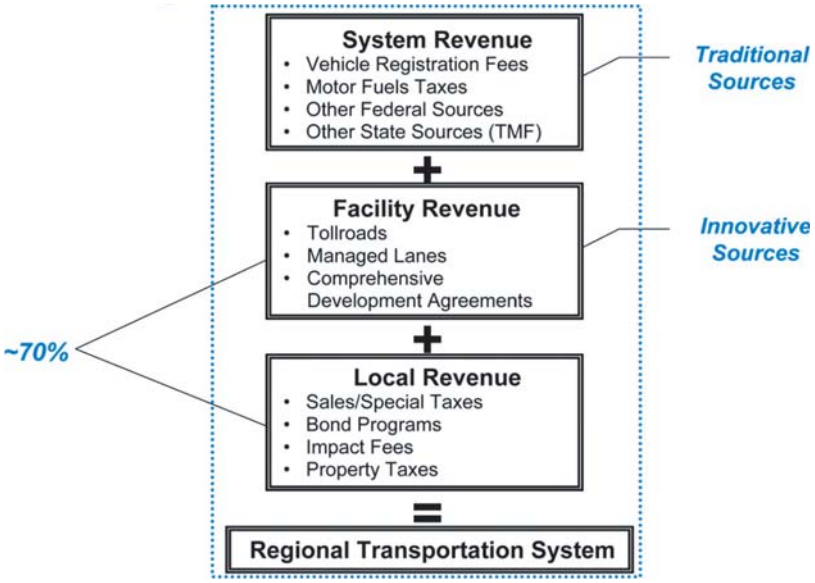
Exhibit 18. Use of innovative finance sources to fund the regional transportation system in the Dallas–Fort Worth region.



Source: "A Guide to Understanding Current Transportation Funding", a funding presentation by NCTCOG at the request of Texas State Senator John Corona, August 12, 2008; available at htpp://www.nctcog.org/trans/presentations/TransportationFundingPrimerIrving8-13-08.pdf

2.2.2.5 Public and Stakeholder Participation

Formal regional and state plans must be developed with public involvement. Usually, regional and state planning agencies maintain standing technical, policy, and advisory groups for developing and adopting plan updates. Because road pricing is still a new and potentially controversial concept, planners need to augment the usual established process for public involvement in developing regional plan updates. Experience with road pricing suggests the importance of involving organized affected parties, stakeholders, and decision makers specific to pricing proposals rather than relying on standing committees with more general interests and charges. A significant engagement effort will be necessary following the recommended nine pointers in Section 2.1.

State DOTs are important actors in the engagement process, as the document review and interviews suggest, because they either directly control potential priced facilities or are vital to the development of necessary enabling policies and legislation for pricing in regions. They also have strong interests in uniform, safe operations and enforcement of new priced facilities such as HOT lanes. Regional planning agencies involved in areawide or corridor pricing plans must engage state DOT planners, especially around needed state legislation, enforcement and operations on state roads, and financial issues of toll revenue allocation and use of multiple revenue sources for project development.

As part of effective engagement, communications particular to pricing must be continuous, responsive, and tailored to issues of specific resonance to affected parties in a region or state. Standard agency newsletters and websites devoted to general regional or state plan development may not be adequate to communicate and engage on pricing proposals. Nor will generic descriptions of pricing benefits make for effective messaging, such as general references to congestion relief, environmental benefits, and a new revenue source. Messages must be tailored to specific audiences depending on their perceptions of the issues road pricing can address, and communications must be structured as two-way to ensure that parties feel they can influence plan development. Model involvement and engagement processes involving specialized organized groups focusing

on pricing are found in the PSRC region, Minnesota, and Oregon, where planners have engaged task forces and commissions and developed successful plans in the process.

Beyond paying heed to the recommended planning, engagement, and communication pointers in Section 2.1, regional and state planners are encouraged to review Part 2 for sample message content used for public and stakeholder outreach, which includes links to websites at the above-referenced sites. Finally, "success considerations" in the exhibits within Section 2.3 for each of the six pricing concepts give points important to acceptance and adoption once planners are ready to focus on one or more specific pricing concepts.

2.2.2.6 Congestion Management

In the Congestion Management Process (CMP), a region must define what it means to have unacceptable congestion and include specific congestion management objectives and performance measures, along with methods to monitor and evaluate the performance of the multimodal transportation system. It also must identify strategies to manage congestion, evaluate the anticipated performance of these strategies, and assess the effectiveness of implemented strategies.

An important step in the CMP is establishing congestion management objectives and principles. As noted previously in the discussion of goals, objectives, and associated performance measures, road pricing supports several congestion-related objectives and associated performance measures. Depending on varying congestion management objectives, strategies to be considered can include stand-alone road pricing projects or areawide pricing approaches or incorporate elements of pricing into the existing system. Some metropolitan areas have congestion management principles that prioritize demand management and operational strategies before infrastructure development. Road pricing can support these objectives and focus more attention to optimizing system performance and providing options to avoid congestion.

In transportation management areas (TMAs) that have air quality issues, the CMP takes on a higher level of importance and should focus attention on road pricing especially for consideration of all new highway capacity projects. According to federal regulations, in a TMA designated as non-attainment for ozone or carbon monoxide (CO), federal funds may not be programmed for any project that results in a significant increase in single-occupancy vehicle (SOV) capacity unless the progress is monitored through the CMP. Road pricing offers the promise of managing SOV demand "safely and effectively" and is therefore a "reasonable travel demand reduction strategy," in the language of federal regulations. In particular, regulation for non-attainment areas states,

> "the congestion management process shall provide an appropriate analysis of reasonable (including multimodal) travel demand reduction and operational management strategies for the corridor in which a project that will result in a significant increase in capacity for SOVs . . . is proposed to be advanced with Federal funds. If the analysis demonstrates that . . . additional SOV capacity is warranted, then the congestion management process shall identify all reasonable strategies to manage the SOV facility safely and effectively (or to facilitate its management in the future)." (23 USC 450.320)

Consequently, in these regions, road pricing should be considered as part of any capacity expansion project included in the metropolitan transportation plan.

2.2.2.7 Air Quality Conformity

In air quality non-attainment and maintenance areas, the MTP must demonstrate "conformity" with the State Implementation Plan (SIP) for air quality. That is, a regional emissions analysis must be conducted to demonstrate that the emissions associated with implementation of the MTP do not exceed the emissions budget for the region's on-road mobile sources. (In certain circumstances, emissions tests, such as build–no build test, are used. For a more complete discussion of conformity, see FHWA, "Transportation Conformity Reference Guide." Available at http://www.fhwa.dot.gov/environment/conformity/con_bas.htm.)

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To include road pricing projects in the MTP therefore requires that such projects be analyzed as part of the regional emissions analysis. Consequently, travel modeling and emissions analysis tools are needed to examine the impacts of road pricing projects on emissions. In many cases, as previously discussed, traditional transportation models may require supplemental model analysis to assess travel and associated emission impacts for such pricing projects as conversions of HOV lanes to HOT lanes. Where planned or programmed road pricing projects are few and relatively small in a region or state, pricing impacts on emissions may not be significant in the conformity analysis. However, where several corridors or an entire network is anticipated, as with planned HOT lane networks in some regions, there will be important consequences for conformity analysis. For instance, an emissions analysis for the San Francisco Bay Area HOT lane network showed reduced emissions compared to the existing HOV network; this type of analysis was necessary for inclusion of road pricing into the transportation plan (see Exhibit 19).

In some cases, road pricing may function as an emissions reduction measure. Whether the project reduces emissions will depend on many factors, including the type of pricing strategy employed (e.g., peak period pricing, round-the-clock pricing, corridor, network, areawide, or VMT-based pricing), the availability and inclusion of driving alternatives as part of the project (e.g., new or more efficient transit services), and the extent to which travelers shift to alternative modes or other routes. Certain types of road pricing—such as parking pricing—may be considered a transportation control measure (TCM) and appear as such in Environmental Protection Agency (EPA) guidance documents. Justifying inclusion of such measures as a direct emission control strategy and analyzing their emission reduction potential will be aided by EPA guidance.

Air quality analysis related to road pricing is not only a function of conformity analysis. Projects developing in regions and states, whether derived from formal planning processes or arising in a more ad hoc fashion, may require an environmental review under the NEPA. The exact extent of the review is variable depending on the nature of the pricing strategy, application to new or existing facilities and the extent of the project. Large projects involving significant new capacity probably will require a full Environmental Impact Statement (EIS). Small projects and those applying to existing facilities may not require the same treatment. Exemption or a less demanding environmental assessment without detailed analysis might be possible for pricing projects on existing facilities stressing vehicle trip reduction and support of transit. Parking pricing projects explicitly defined as TCMs may be exempt. Finally, major environmental analyses will involve not only air quality analysis but also analyses of indirect and cumulative impacts, economic impacts, and social

Exhibit 19. Emissions associated with San Francisco Bay Area HOT network compared to HOV network in year 2030[1]

	Reactive Organic Gases (ROG) (tons)	Nitrogen Oxides (NO_x) (tons)	Particulate Matter (PM10) (tons)[2]	Carbon Dioxide (CO_2) (thousands of tons)
AM Peak Period Emissions—Two peak hours from 7 to 9 AM				
HOV network	2.10	2.18	0.20	4.65
HOT network	2.06	2.11	0.18	4.32
Percentage change	–2%	–3%	–10%	–7%

[1] Figures are for emissions on freeways with HOV or HOT lanes only and reflect results of analysis assuming existing HOV occupancy requirements for HOV and HOT lanes.
[2] PM10 emissions reflect exhaust only and do not include tire and brake wear emissions.

Source: Bay Area High Occupancy Toll (HOT) Network Study, December 2008 Update, Metropolitan Transportation Commission, available at http://www.mtc.ca.gov/planning/hov/12-08/HOT_Network_Report_12-08.pdf

impacts including environmental justice issues along with a public participation process in selecting preferred alternatives. Environmental justice sometimes is the only substantive issue evaluated in environmental documents involving pricing projects. It involves conducting thorough analysis to show that disadvantaged populations, including low-income and minority communities, will not be disproportionately burdened by a road pricing scheme and that the project is the least discriminatory alternative. Experience has shown that it is important for state and local actors, including state DOTs, local leaders, MPOs, and congestion management agencies (CMAs), to collaborate in moving road pricing projects forward through the complex stages of project development and environmental review.

2.3 Analytic, Policy, and Success Considerations for Each Road Pricing Concept

This section presents examples for all six road pricing concepts. Each example is followed by a table with information on:

- Travel impacts
- Revenues and finance
- Equity
- Environment
- Policy and institutional requirements
- Popular reasons for attention to the concept
- Promising recent developments bearing on acceptability and success

Exhibits in the rest of this section have been developed through interviews with regional and state actors active in road pricing development, a review of plans and studies collected as part of the interviews, and a review of literature related to each of the road pricing concepts. The interview sites are listed at the beginning of Section 2.1. The exhibits incorporate not only findings from completed studies but also the latest projections of travel and other impacts from ongoing studies gathered from respondents and agency sources. Part 2 contains the interview summaries with reference reports and website links for those interested in site sources.

2.3.1 Conversion of Existing HOV and Other Lanes to HOT Lanes

This category of pricing introduces a new, more reliable travel option on congested corridors that have existing HOV lanes by converting the HOV lanes to HOT lanes. It also includes cases where shoulder lanes are converted to HOT lanes. HOV lanes are converted to HOT lanes usually to make better use of underused capacity or to alleviate HOV lane congestion. Either way, the objective is to gain more precise control over lane volumes than is possible using occupancy eligibility alone. In the case of congested HOV lanes, it may be necessary to reduce or eliminate free access to two-person carpools.

Vehicles with single occupancy (or lower than required occupancy) can use the HOT lanes by paying a toll that varies with the level of congestion on the corridor and/or the time of day. Vehicles meeting the HOV occupancy requirements of the lane (typically 2+ or 3+ passenger occupancy) travel free of charge or at a discounted rate in most applications. The goal is to achieve optimum utilization of an existing HOV lane (whether under- or overused) or new HOT lane. HOT lanes ensure good level of service for HOV drivers, while allowing single-occupancy vehicles or vehicles with lower than required occupancy to enjoy the same level of service by paying a charge. HOT lanes can be developed with new or existing road capacity. Most early HOT lanes converted existing HOV lanes to HOT lanes and mostly on underused rather than overused HOV facilities. More recently, new HOT lanes and networks of lanes are receiving attention. Where developing

additional roadway is not desirable or feasible, especially in highly developed and congested corridors, planners are giving new attention to converting shoulder lanes to HOT lanes providing a more reliable travel option compared to the general purpose lanes.

Planners should be sensitive to occupancy requirements in cases of converting HOV lanes to HOT lanes, as well as whether the HOT will include general purpose lanes. For instance, the following options can be expected to have differing usage and diversion potential, as well as acceptability implications:

- Conversion of HOV2+ lanes to HOT lanes
- Conversion of HOT2+ to HOT3+ lanes
- Conversion of an HOV2+ lane and a general purpose lane into a combined two-lane HOT facility

The following projects have been implemented under this category:

- I-15 "FasTrak" project in San Diego implemented in 1991, the earliest of all projects, with goals of better utilizing the HOV lanes and raising funds for expanded transit service. Initially 8 miles of reversible lanes were priced with tolls varying dynamically with the level of congestion (as often as every 6 minutes) in order to maintain free-flow traffic conditions. The charges were managed electronically and deducted from prepaid driver accounts recognized via in-vehicle transponders. The normal toll varies between 50 cents and $4, but during very congested periods it can be as high as $8. The average price paid per trip typically has been under $3 and seldom goes above $4. The project's success has spurred an expansion project to add 20 additional miles in the I-15 corridor.
- "QuickRide" HOT lane projects on I-10 (Katy Freeway) and US-290 (Northwest Freeway) in Houston, begun in 2000 and created to reduce heavy congestion on HOV lanes, in contrast to the San Diego project. Free access is restricted to vehicles with three or more people during peak periods. Two-person carpools can use the Katy Freeway lanes by paying a $2 per trip toll during peak hours, while single-occupant vehicles are prohibited. All transactions are completely automated.
- HOT lanes on I-25 in Denver, begun in 2006 with preset pricing by time of day, with goals of increasing HOV lane utilization and generating revenues for general corridor improvements.
- I-394 HOT lanes in Minneapolis (also known as MnPASS lanes), implemented in 2005 with objectives of increasing corridor capacity and throughput, improving utilization of HOV lanes, reducing congestion, creating a new travel option for solo drivers willing to pay a toll, and using excess revenues for improving highway facilities and transit service in the corridor. The project uses dynamic pricing on an 8-mile and 3-mile segment of I-394, with tolls varying as often as every 3 minutes depending on the levels of congestion. A HOT lane conversion project on I-35W is also currently under development in Minneapolis and southern suburbs, involving dynamic pricing on shoulder lanes on a 3-mile section near downtown Minneapolis. The pricing policy on that facility will mirror the policy on I-394 with a toll range of 25 cents per segment to a maximum of $8.
- SR-167 HOT lanes in the Puget Sound region became operational in May 2008. The project includes 9 miles of non-barrier-separated express lanes in both directions. The toll varies with demand to ensure smooth traffic flow, with rates between 50 cents to $9. Carpools of two or more people, vanpools, buses, and motorcycles use the HOT lane toll free.
- HOT lanes on I-95 in Miami–Dade County, also called "95 Express Lanes," opened in 2008 in the northbound direction as part of Phase 1. Southbound lanes opened for tolling in 2010. The project involves a variable-priced toll starting from 25 cents upwards, depending on the level of congestion, to encourage travel in less heavily traveled periods. It also offers a toll-free option for registered carpools (HOV3+), vanpools, transit and emergency vehicles, and registered hybrid vehicles.

- I-15 express lanes in Utah, implemented in 2006 initially as a permit system where a limited number of solo drivers pay a monthly fee of $50 to use the lanes; however, a full electronic tolling system with charges varying by time of day based on actual traffic volumes is expected to be implemented by late 2010.

Exhibit 20 provides more information on conversion of existing HOV and other lanes to HOT lanes.

2.3.2 Variable Pricing on New or Rehabilitated Facilities and Regionwide Networks

The distinguishing feature of these projects is that instead of applying pricing to existing facilities, congestion pricing is introduced with new road capacity or along with major rehabilitation. The overall goal is to improve the facility and enhance traffic flow in the corridor while managing traffic demand through pricing, thereby creating a new high-quality travel option for the users. Like HOT lane conversions, new and revamped express lanes or other facilities use variable pricing to control traffic, reduce peak period congestion, and generate new revenues. Some projects may also give preference to HOV travelers.

State and local budget cuts and unsuccessful attempts to fund transportation improvements through taxation have increased the interest of states in financing lane additions using toll revenues. For example, the planned SR-520 project in the Puget Sound region involves widening and rehabilitating a bridge, while supporting improvements with new variable tolls on the bride. Planners in the region hope to extend the concept to other new facilities and existing facilities combined with improvements.

Projects include:

- Newly constructed express lanes with variable tolls on SR-91 in Orange County, California, opened in 1995 to reduce congestion on one of the most heavily congested highways in the United States. The project added two new lanes in each direction, with tolls varying by direction, day of the week, and time of the day according to a pre-set schedule. Unlike many HOT lane conversions, the toll schedule on SR-91 does not vary automatically with level of traffic ("dynamic pricing") but is set by management and is updated periodically to reflect trends in traffic conditions and to maintain free-flowing traffic. In 2007, the peak toll in the busiest half hour was 95 cents per mile. In-vehicle transponders are used to assess and deduct tolls from a pre-paid account.
- Managed lanes on the 15-mile I-30 corridor in Dallas; the first 6 miles opened in 2007 with two reversible express lanes operating during the peak periods, allowing single-occupant vehicles for a fee and HOVs for a fee that was up to 50% off the SOV rate at peak periods. A fixed fee was applied during the first 6 months (75 cents per mile maximum) and pricing varying by traffic levels ("dynamic") thereafter.

New express lane projects currently under development include the I-15 managed lanes in San Diego arising as an extension of I-15 HOT lanes, the I-10 (Katy Freeway) reconstruction in Houston, and managed lanes on I-30 and I-635 and the North Tarrant Expressway in Dallas.

Also included in this category are regionwide networks of new express lanes or facilities at several potential locations within a region and, in some cases, including regionwide initiatives to promote carpooling or improve transit services. The overall purpose is to add highway capacity while managing new traffic levels and generating revenues through pricing. The lane management is aimed at creating new high-quality travel options for the users where the toll revenues can cover all or a significant proportion of the associated costs. Feasibility studies or long-range plans for regionwide networks of express lanes with inclusion of demand management and

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Exhibit 20. Conversion to HOT lanes.

Planning Considerations	
Travel/Traffic	▪ *Impact:* Evaluations of I-15 in San Diego and US-290 and Katy Freeway in Houston show 21% to 24% increase in lane use across projects with no decrease in travel speeds and 11- to 20-minute travel time savings for HOT lane users; impacts on traffic in general purpose lanes were positive in Houston and Minneapolis (speeds were up 15% in peak period with up to 1,000 fewer vehicles), but not conclusive in San Diego. ▪ *SOV violations:* I-15 showed fewer SOV violators in the HOT lanes, probably due to more enforcement and some previous violators buying into the lanes.
Revenue/Finance	▪ *Revenues and program costs:* Revenues typically used to cover operating costs of operations and enforcement in full or part; where available, additional revenues sometimes recommended for transit, transportation improvements in the corridor, and/or implementation of ridesharing and other TDM programs (e.g., San Diego, Minneapolis, Los Angeles). ▪ Revenues may cover all improvements and operating costs for projects with sufficient volumes and low capital costs, but may not for small, low-volume or highly capital-intensive projects; revenue/finance balance also influenced by competing facilities, as with I-15 upon opening of SR-56.
Equity	▪ Experience shows that income equity has not been a major issue; usage surveys of I-15 lanes in San Diego and I-394 lanes in Minneapolis showed high support for HOT lanes across all income groups, with lowest and highest income groups expressing about equal support. ▪ Experience shows that HOT lanes are likely to be used by all income groups, although higher-income drivers are more likely to have transponders (I-394 Minneapolis); transit usage has improved in the case of Minneapolis I-394 HOT lanes benefiting low-income commuters; no disadvantages caused to transit and carpool users. ▪ Equity concerns may center more on those with inflexible work schedules, with peak-hour tolling in effect on HOT lanes; however, optional nature of HOT lanes reduces concerns about some travelers being worse off than before. ▪ Requirement of an electronic tolling account (e.g., need to purchase a transponder, maintain a pre-paid account balance) can be a concern for low-income or other groups without credit cards or access to checking accounts.
Environment	▪ Assessments limited: Evaluations of HOT lanes focus primarily on traffic impacts and traveler reactions; limited evaluations show no increase in noise or corridor emissions (I-394). ▪ Possible reduction of congestion on general purpose lanes due to shift of traffic to HOT lanes may reduce overall emissions in corridor in the short term.
Policy/Institutional	▪ *Authorization:* State authorization required for toll collection and for any private sector role in development and operations. ▪ *Revenue allocation*: How much allocated to HOT lane operations, to improvements in the corridor, to transit, or to other programs, in the same corridor or across the transportation network. ▪ *Freight*: Applicability to freight vehicles must be decided, i.e. whether or not they can use the lane for time-sensitive trips; in Minneapolis, free passage for freight vehicles in off-peak hours is being considered. ▪ *Discounts*: Discount policy for HOVs, buses, and hybrid vehicles are decision points for revenue generation and demand management. ▪ *Agreements*: Agreements between HOT lane operating agency, transit operators, enforcement agencies and highway department needed to specify transit, enforcement, and maintenance services. ▪ *Local planning and federal programs*: Congestion management process and fiscally constrained long-range plan may bear on HOT lane development and cost/revenue plans and require specification in or amendments to long-range regional transportation plan.
Emerging Directions	
Motivators	▪ Underutilized or overutilized HOV lanes; perceptions of severe congestion in general purpose lanes; and willingness to pay for time savings, enhanced safety, and reliability. ▪ Violation rates in HOV lanes perceived as an issue with credible promise of improved enforcement via HOT conversion.

Exhibit 20. (Continued).

Emerging Directions	
	▪ Higher emissions in part related to stop-and-go congestion on general purpose lanes. ▪ Revenue generation supporting HOT operations and development.
Promising Developments	▪ Electronic tolling technologies make variable pricing by time of day, level of congestion, and vehicle occupancy easier to implement and customer friendly with ability to accept various payment types. ▪ Generally promising cost/revenue balance with support for new transit service and no delays to HOV users in operations to date. ▪ Technologies offer improved data collection on HOV use, toll payment, travel behavior, equity impacts, and vehicle mix for evaluation and planning. ▪ Emerging technology for vehicle occupancy detection and enforcement; new technology for license plate recognition (LPR) and optical character recognition (OCR). ▪ Plans for linking individual HOT lane projects into larger regional HOT networks likely to scale up benefits. ▪ Experience from San Diego (I-15), Denver (I-25), Minneapolis (I-394), Houston (Katy Freeway), and Puget Sound region (SR-167) provide recent, concrete impacts to reference in planning. ▪ Priced dynamic shoulder lanes are increasingly receiving more attention (e.g., I-35W in Minneapolis–St. Paul).
Success Considerations	▪ Combine HOT pricing project with complementary congestion reduction strategies like telecommuting, transit enhancements (e.g., bus rapid transit proposed on HOT corridor shoulder lanes), transit incentives, and active traffic management strategies. ▪ If HOV lane conversion to HOT is combined with change in carpool exemption/discount from 2+ to 3+, emphasize, document, and report congestion reduction benefit to lane users. ▪ Develop explicit plan for revenue allocations to support transit, telecommuting, etc., taking into account discounts/exemptions for low-income groups, to counter potential “Lexus lanes” criticisms. ▪ Consider construction of park-and-ride lots near HOT lanes to encourage ridesharing. ▪ Plan transit access and egress requirements carefully where applicable to allow for buses moving across traffic into and out of HOT lanes. ▪ Collaborate across agencies on operations, enforcement, planning, and communication (highway patrol, transit operators, local transport authority, and regional planning and congestion management agencies). ▪ Evaluate trade-offs between toll level required for good level of service, break-even revenues, and political acceptability; ensure toll flexibility in enabling policies. ▪ Enforce against non-paying solo drivers; monitor effects on transit access and speeds; plan for customer service and relations program upon implementation, including newsletter and feedback vehicles. ▪ Plan for effective marketing of transponders; readable, understandable toll, occupancy, and ingress/egress signage.

transit components have been completed in Maryland, Virginia, Minnesota, Texas, and the Washington, D.C. area. New express lanes that are expected to eventually become part of such a network are currently under construction in Virginia and Maryland.

Exhibit 21 provides more information on variable pricing on new or rehabilitated facilities and regionwide networks.

2.3.3 Variable Pricing on Existing Toll Facilities

This category of pricing introduces variable tolls on highway facilities, bridges, and tunnels having existing fixed tolls.

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Exhibit 21. Variable pricing on new or rehabilitated facilities.

Planning Considerations	
Travel/Traffic	▪ *Impact:* SR-91 added two new lanes in each direction to an existing highway with variable tolls by time of day and day of week, resulting in free-flowing express lanes carrying over 40% of peak traffic versus stop and go in general purpose lanes; forecasts for new priced lanes projects in the National Capital Region estimate an increase in transit use, some decrease in HOV, slight increase in VMT, and some increase in speeds on mixed use lanes; forecasting suggests that a network of variable priced lanes can be more effective than the simple sum of individual projects. ▪ *Mode effect:* 40% increase in HOV3+ on SR-91 probably due to initial free-use policy, though charging HOV3+ 50% did not change overall HOV use; overall, more SR-91 commuters shifted from solo to high occupancy than vice versa; no significant effect on transit use (1%) in the corridor. ▪ *Effect duration:* Initially, the new SR-91 capacity dramatically reduced traffic and congestion on the general purpose lanes, but traffic has increased on these lanes with growth in travel.
Revenue/Finance	▪ *Construction:* Four-lane, 10-mile-long SR-91 toll facility was constructed for approximately $134 million with private funds and toll revenues covered construction and operating costs; costs did not involve new right-of-way, interchange modifications, or intermediate access/egress points resulting in a cost of about $3 million per lane mile versus $10 million or more per lane mile for typical major urban freeway construction. ▪ *Cost/revenues:* SR-91 income (revenue less expenses) was $733,000 in 1996 rising to $13.7 million in 2001, according to private owner/operator audits; National Capital Region forecasts of revenues versus costs showed revenues may not offset capital and operating costs for major investments in segments of a new network. ▪ *Economic, finance issues:* State of California saved construction and operating/enforcement costs and Orange County gained property taxes from SR-91 private owner/operator of $6.8 million in first 6 years; positive benefit/cost for the expressway compared to carpool lanes as an alternative; combination of new and HOT conversions in SF Bay Area projected to generate revenues to finance capacity 30 to 40 years faster than traditional state and local tax funding; plans for SR-520 (Washington) estimates toll revenues need to be combined with traditional federal and state funds (e.g., gas tax) for financial feasibility.
Equity	▪ Experience to date shows the income equity issue has not blocked programs, nor has it been critical in focus groups and surveys, e.g., for planned expansion of I-15, survey of facility users found 71% consider the extension fair with few differences based on ethnicity or income; equity assessments are limited but for SR-91, use of the express lanes increased over time for all modes across all incomes, with percentage of trips for the lowest and highest incomes (20% and 50%) stable over time.
Environment	▪ Assessments limited; projections for network in SF Bay Area indicate that CO emissions reduced 10 million tons over 40 years compared to regular HOV network, in part because of better use of transit due to uncongested speeds.
Policy/Institutional	▪ *Authorization:* Legislation required for new authority to finance, build, and operate and required for public–private venture (e.g., AB680 California), as well as carefully crafted agreement with private sector.
Emerging Directions	
Motivators	▪ Delays, accidents, travel time unreliability. ▪ Inadequacy of traditional finance for new capacity. ▪ Possible allies in traveling public, businesses concerned with aging roads, inadequate capacity and taxpayers wanting user pay equity. ▪ Possible emission reductions compared to do nothing or regular highway expansion.
Promising Developments	▪ Electronic technologies make variable pricing by location, time of day, and vehicle class easier to implement and customer friendly by accepting various payment types; new information signs add value for real-time status of traffic conditions, accidents, speeds, and travel times. ▪ New payment cards and other pay technologies enabling toll and transit fare payment via a single account may enhance toll customer relations and encourage more attention to transit options.

Exhibit 21. (Continued).

Emerging Directions	
	▪ Lane reconfigurations to add capacity for pricing, e.g., dynamic use of shoulder lanes as travel lanes, and re-striping. ▪ SR-91 and ongoing studies provide increased familiarity and credibility for planning and stakeholder engagement, including I-15 managed lane extension for San Diego; plans for Houston I-10 (Katy) reconstruction; Dallas I-30; SR-520 in Seattle; and network studies for I-95/JFK Expressway in Baltimore; I-270 and I-495, National Capital Region (Beltway and I-95/395); and San Francisco Bay Area (800-mile network).
Success Considerations	▪ Attend to phasing stages, potential diversion, and ingress/egress from pay to free lanes for ease and safety of transition. ▪ Develop explicit benefit plan for new revenues dovetailing with goals and mitigation concerns (e.g., need for new facility, guaranteed free flow, revenues dedicated to source, easy payment technology, and improved transit for broad appeal). ▪ Consider a mix of fund sources other than tolls for financial feasibility. ▪ If public–private partnership is involved, heed cautions about public concerns over private build–operate monopoly position and non-compete clauses prohibiting construction of competing facilities.

As with other pricing strategies highlighted in this section, the purpose is to use electronic collection to vary prices by day of the week and time of day to reduce congestion. The variable prices are intended to encourage some travelers to use the roadway facility during less congested periods, to shift to another mode of transportation, or to change their route. Toll authorities have introduced variable tolls to reduce peak-period congestion, gain more efficient use of facilities, delay capacity enhancements, encourage mass transit, and/or to raise revenues for facility improvements (often by using off-peak toll discounts to make an overall toll increase program more acceptable).

Projects include:

- Variable pricing on two toll bridges—the Cape Coral Bridge and Midpoint Memorial Bridge in Lee County, Florida—implemented in 1998 with the goal of spreading traffic from peak to shoulder times and thereby postponing expensive bridge enhancements required to accommodate growing peak traffic.
- Variable pricing on the New Jersey Turnpike implemented in 2000 and on interstate bridges and tunnels of the Port Authority of New York and New Jersey (PANYNJ) implemented in 2001 in the New York City region, intended primarily to gain better use of capacity by spreading peak-period traffic, while preserving revenue levels. The PANYNJ pricing also encouraged mode shift and increased use of electronic toll collection as objectives.
- Variable pricing on the Illinois Tollway implemented in 2005. Tolls apply to both cars and trucks; however, the truck tolls vary by time of day, with the aim of reducing peak-hour congestion on the facility.

Exhibit 22 provides more information on variable pricing on existing toll facilities.

2.3.4 Areawide Pricing

While the U.S. pricing programs to date have focused largely on introduction of variable pricing on single facilities, most of the road pricing efforts abroad have involved areawide or cordon-based congestion pricing. Many of these overseas pricing projects charge for entering or traveling within a congested zone (such as downtown). Some have focused on pricing traffic entering entire urban regions. Others have introduced congestion pricing on expressway networks.

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Exhibit 22. Variable pricing on existing toll facilities.

Planning Considerations	
Travel/Traffic	▪ *Impact:* A survey taken the year after the Lee County, Florida, toll discount program showed that 71% of eligible drivers shifted their time of travel at least once a week under 25 cents off-peak toll discount (elasticity estimates range between –0.36 and –0.03 depending on the time of day); travel time savings up to 20 minutes at certain locations observed under PANYNJ tolls with 7.4% of passenger trips and 20.2% of truck trips changing behavior (travel time, mode). ▪ *Effect duration:* May depend on periodic toll adjustments as motorists change their peak/off-peak travel in response to congestion and price. ▪ *Traffic growth:* General traffic growth can make off-peak shift less attractive over time, as in New Jersey Turnpike experience. ▪ *Combined effects:* Peak pricing and new electronic payment introduced together may boost travel time savings by reducing payment queues. ▪ *Trucks*: Smaller, independent trucks would be more likely to shift to alternative routes or travel times due to limited ability to pass along costs (e.g., Illinois Tollway); some truckers may not be able to shift travel times because of inflexible delivery schedules (PANYNJ experience).
Revenue/Finance	▪ *Revenues and costs*: If much of the pricing infrastructure already in place, revenues likely to exceed operating costs (e.g., New Jersey, PANYNJ), unless designed to be revenue-neutral. ▪ *Postpone capacity enhancements:* May postpone bridge or road capacity enhancements by years (e.g., Lee County).
Equity	▪ Experience to date shows income equity has not blocked programs and not a paramount issue in planning or focus groups and surveys; equity assessments are limited but a study of changes in electronic pass ownership before/after price changes in Illinois shows ownership rates increased across all income groups; equity concern may center more on those with inflexible work schedules.
Environment	▪ Assessments limited, but after the introduction of variable pricing and electronic toll collection in New Jersey, vehicle emissions at toll plazas declined, probably due mostly to electronic payment.
Policy/Institutional	▪ *Authorization:* Little or no required new policy or institutional formation with tolling authority and operations already in place. ▪ *Cross state:* Toll authorities across states may need to coordinate operational and pricing policies for electronic tolling (e.g., Indiana, Illinois). ▪ Coordination of programs with other toll and transportation agencies.
Emerging Directions	
Motivators	▪ Potentially improved revenues, since peak travel demand is often relatively inelastic. ▪ Driver familiarity and acceptance of existing tolls. ▪ Congestion and travel time unreliability, delays, and accidents. ▪ Possible allies in businesses concerned with on-time delivery. ▪ Extra emissions from stop-and-go traffic.
Promising Developments	▪ Electronic technologies make variable pricing by time of day and vehicle class easier to implement and customer friendly by accepting various payment types. ▪ New payment methods and channels may support possible integration of toll payment with payment for transit and parking. ▪ Technologies offer improved data collection on time of travel, frequency of travel, and vehicle mix for evaluation and planning. ▪ Lee County, Florida, PANYNJ, and Illinois Tollway provide recent, concrete examples to reference in planning.
Success Considerations	▪ Keep the toll schedule simple and easily communicated; monitor off-peak congestion. ▪ Encourage receivers of goods to adopt flexible delivery practices. ▪ Mount adjunct campaign focused in part on large employers to encourage flextime. ▪ Consider timing off-peak discount with regularly scheduled general toll increase.

Areawide pricing involves charging a fee to travelers entering and sometimes driving within a congested zone or area, typically in city centers, as a measure to reduce traffic congestion and encourage a shift to modes other than the auto. The charge may vary by time of day or vehicle characteristics. Although congestion reduction is often the primary objective, cities also seek to reduce emissions, noise, and traffic accidents and to improve pedestrian access and enjoyment of public spaces and businesses. Areawide pricing refers to pricing of vehicles entering and/or traveling into a zone, typically a congested downtown. Cordon pricing is similar in concept to areawide pricing in which drivers are charged fees each time they cross the cordon but not for travel within the cordoned zone.

Outside of the United States, areawide pricing has existed in Singapore since 1975 and has been implemented in several cities, mostly in Europe over the past decade, notably in London in 2003 and Stockholm in 2006. Within the United States, areawide pricing was proposed in New York City in 2007 and has been recently studied for San Francisco. The plan for New York City proposed a daily charge of $8 for cars entering lower Manhattan south of 60th Street to improve travel times and reliability in the city. The revenues from the congestion charge were proposed to be used for transit improvements and investment. This plan was not approved by the state assembly and is therefore not likely to be implemented soon. In San Francisco, planners are studying areawide pricing involving a $3 fee to enter, leave, or pass through certain parts of the city during peak hours, generating revenues in support of transit, cycling, and possibly more regional transit parking.

Exhibit 23 provides more information on areawide pricing.

Exhibit 23. Areawide pricing.

Planning Considerations	
Travel/Traffic	▪ *Traffic impact:* Number of vehicles entering the charging zone dropped by 24% in Singapore (after 1998 conversion to electronic pricing), 14% in London (2007, after implementation of western extension), and 18% in Stockholm; 60,000–65,000 fewer vehicles entered the zone per day and average travel speeds increased by 28% to 30% in both Singapore and London; higher traffic levels apparently have returned to London probably due to continued growth in auto use, increased bus traffic, construction and limited changes to the toll level to manage increased traffic levels. ▪ *Travel time/speeds:* Travel time reliability increased (journey times decreased by 14% in London); reduced speeds observed on bypass route around zone in Singapore and increased traffic observed on boundary route in London; in London, 20% to 30% of reduction in vehicles entering zone was due to travel during non-charging hours or diversion to bypass routes. ▪ *Elasticity:* Car trip to price elasticity found to be –0.4 to –0.5 in London; i.e., each 10% increase in user costs of auto travel (excluding parking) resulted in a 4% to 5% reduction in auto trips. ▪ *Mode effect:* Peak transit (bus) use in morning peak increased by 40% in London and over 30% in Singapore (helped by significant transit investment), with 4+ carpools increasing significantly; in Stockholm, transit use up 6% to 9%; increase in use of motorbikes and bicycles observed in London; no significant change in these mode shares in Stockholm. ▪ *Duration:* The traffic reductions in priced zones have been sustained over 30 years in Singapore and 5 years in London.
Revenue/Finance	▪ Pricing revenues have been used in part for funding transit in London and Stockholm. ▪ Revenues have generally exceeded operating (administration, maintenance, and enforcement) and capital costs, though initial operations have been made more cost effective after implementation in London and Stockholm; in Singapore, revenues were nearly 10 times the operating costs of the pricing scheme; if capital costs are included, the revenues are still 2.5 times the costs; Singapore returns net revenues in excess of programmed transport needs back to motorists in the form of reduced taxes; for London, the revenues exceed twice the operating costs, and inclusion of capital costs brings this ratio down only marginally.

(continued on next page)

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Exhibit 23. (Continued).

Planning Considerations	
	▪ Initial capital costs have ranged from $110 million in Singapore in 1998 to $410 million in Stockholm in 2006 and depend on technology and method of enforcement used.
Equity	▪ *Income inequity:* Findings from Singapore attitudinal surveys show pedestrians, taxi riders, and residents outside the priced zone found the impact as neutral or negative while cyclists, bus passengers, and residents within the zone judged pricing as favorable; car drivers and passengers judged the program as mildly unfavorable; increases in transit were fairly uniform for low-, medium-, and high-income peak-period travelers; generally, the perception that congestion pricing is "unfair" to low-income drivers has not been a major concern in Singapore, London, and Stockholm after implementation. ▪ *Geographic/spatial equity:* Residents of neighborhoods outside the zone who work in the zone may perceive negative impacts, as in New York City and Singapore; residents of the charging zone receive significant discounts in London to meet concerns; residents of the island Lidingö in Stockholm are allowed free passage through the central charging zone as it is their only north–south roadway option in Sweden. ▪ *Business inequity:* In Singapore, pricing did not change business conditions or location patterns and overall, the business community responded positively to the program; pricing in London has had broadly neutral regional economic impacts in the central zone and a majority of businesses continue to support the charging scheme, provided investment in public transportation is continued; there is evidence of some negative business impacts in the western extension of the London congestion charging zone which has a higher number of smaller businesses and retailers where they could not pass along costs to customers compared to larger business which could do so; in Stockholm no negative impacts identified on retail or household purchasing; after implementation of pricing. ▪ *Economic impacts:* After implementation of pricing, property values just inside zone found to be higher than those just outside zone in London.
Environment	▪ Significant difference in emissions seen in London before and after implementation (between 2002 and 2003) and in Singapore. ▪ NO_x 7% to 13% lower, PM10 7% to 9% lower, and CO_2 10% to 15% lower; effects attributable to both vehicle technology changes and traffic impacts. ▪ Road safety improvements reported in Singapore. ▪ *Land development impacts:* Downtown-based areawide pricing may cause some businesses to move to suburban locations, though other businesses may find advantages to locating in an area with less traffic and improved transit and pedestrian access.
Policy/Institutional	▪ *Authorization:* State legislation will be required for local authority to impose charges, monitor and identify vehicles for pricing and enforcement, and enforce charges and to allow contracting for any private sector role in operation of pricing system (charge collection and technology infrastructure operations). ▪ *Operational policies:* Enforcement authorization, fines, adjudication and appeal/processing procedures, and new organizational and staffing arrangements may be necessary. ▪ *Agreements:* Agreements must be made between agencies operating transit and pricing authority to ensure agreed-to transit service improvements and supporting revenues; in London and Singapore, a unified agency operates the pricing system, road network, and transit. ▪ *Program procedure policy*: Exemptions/discounts must be specified for any specific user groups, e.g., vehicle fleets, residents of charging zone, and drivers of two-wheelers and environmentally friendly vehicles (as in London).
Emerging Directions	
Motivators	▪ Perceptions of severe congestion in charging zone and willingness to pay for time savings, enhanced safety and reliability, and improved transit access to zone. ▪ Possible allies in businesses concerned with travel delays for patrons and customers, shopper/commuter competition for parking, slow deliveries. ▪ Slow surface transit speeds, excessive noise, and tight funds for transit, pedestrian, and cycling investments.

Exhibit 23. (Continued).

Emerging Directions	
	▪ Increasing emphasis on improving air quality and reducing urban carbon emissions, particularly in large cities. ▪ Revenue constraints for transportation system investment.
Promising Developments	▪ Transponder, GPS, cell phone beacon, and license plate recognition technologies applicable to areawide pricing and enforcement; also technologies offer improved traffic data collection and evaluation and possible enhanced crime security (e.g., London). ▪ Promising cost/revenue balance in experience to date, with support for new transit service, improved/higher speeds, and reduced delays to vehicle drivers; more safety and travel alternatives for non-drivers. ▪ Possible integration of pricing technology with payment for transit, parking, and existing tolls (e.g., use of EZ Pass in New York City). ▪ *U.S. Examples:* Proposed in the United States for the first time in New York City in 2007 and San Francisco in 2008.
Success Considerations	▪ *Auto options:* Implement adequate transportation improvements as part of pricing program to improve transit capacity, frequency, and reliability; construct park-and-ride lots; provide express bus services in neighborhoods where majority of auto trips to charging zone originate; accommodate truck delivery considerations; improve conditions for pedestrians and cyclists; institute neighborhood preferential parking where spillover parking is a risk. ▪ *Program design:* Evaluate discounts and exemptions (e.g., residents, emergency vehicles, taxis, zero emission vehicles) for enhanced acceptability but balance against reduced effectiveness; tailor pricing to peaks (versus all day) with possible limits on the number of charges per zone crossing and reduced business or other taxes as offsets to pricing revenues; where air quality is a paramount objective, alternative fuel vehicles may be exempted, as in London. ▪ *Politics:* Identify/be cognizant of proportion of auto versus other mode users affected by pricing; accordingly, attend to key interest groups and tailor communications (resident associations, large and small businesses, auto drivers, transit riders, shoppers, media, environmental interest groups, and low-income advocacy groups); identify influential group positions and seek acceptable compromises; identify and nurture champions; run open, credible, responsive planning and outreach processes. ▪ *State–local:* State clearance very likely necessary, requiring interaction, clearance, and legislation. ▪ *Goals:* Identify appropriate multiple goals of interest to affected parties (e.g., reduced travel time, better transit, reliable deliveries, neighborhood protections); tailor strategy for different travel markets. ▪ *Revenues:* Develop explicit benefit plan for increased revenues dovetailing with goals and mitigation concerns (e.g., enhanced transit, spillover protections, better enforcement). ▪ *Enforcement:* Mount effective enforcement upon implementation of new pricing to ensure acceptability and long-term implementation; pay heed to privacy concerns in data collection and processing. ▪ *Payment:* Design convenient payment channels and options, e.g., easy-to-understand price structures. ▪ *Examples:* Extensive public outreach and stakeholder consultations in London began 18 months prior to start of congestion pricing; London mayor's leadership was a strong supporting factor; transit was expanded and improved in Stockholm, London, and Singapore before charging began.

2.3.5 Mileage Fees

Road pricing where the charges paid are based on the number of vehicle-miles traveled has largely been applied to light-duty vehicles and/or trucks to date. A key goal of many VMT-based fee programs has been to preserve or increase transportation revenues, compared to declining gas tax revenues. However, traffic management also is a target of VMT fees where they vary by most congested times and places. Another potential goal is to vary the fee by vehicle emissions and/or

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weight to reduce emissions and account for added road wear from heavier vehicles. Unlike some other pricing concepts, implementation of VMT-based fees has been discussed at all levels of government—national, state, and metropolitan.

Regional trials for mileage or VMT fees have been conducted in Portland by ODOT, in the Seattle area by the PSRC, in the Twin Cities region by the MnDOT, in Atlanta by the Georgia Institute of Technology, and in multiple locations around the country by the University of Iowa. Abroad, distance-based pricing has been implemented for heavy trucks in Switzerland, Austria, Germany, and Eastern European countries including Hungary and Slovakia.

Exhibit 24 focuses on VMT fees that vary based on location and time of day and thus have the same objectives as other road pricing strategies, as opposed to flat rate VMT fees as a potential replacement for the fuel tax. The matrix discusses VMT fees with variable rates to address problems of peak-period congestion delays, pollutant emissions, and the need to capture costs and apportion revenues based on location, jurisdiction, or user group.

The regional trials of VMT charges have evaluated driver responses in experimental groups rather than in developed, ongoing, fully operational programs. The following projects have examined the effects of particular variable road use pricing strategies on travel behavior and seek insights

Exhibit 24. Mileage fees.

Planning Considerations	
Travel/Traffic	▪ *Overall travel impact:* 8% to 16% reduction in VMT has been recorded across trial programs, as a combined effect of mode shift and change in travel times or routes. ▪ *Results from VMT fee trials:* In Oregon, fees of 0.43 cents per mile in off-peak periods and up to 10 cents in peak periods in congested zones led to 11% to 16% reduction in VMT; in Puget Sound, peak tolls of 40 to 50 cents per mile on freeways (10 to 15 cents off-peak) and 20 to 25 cents per mile on non-freeways (5 to 7.5 cents off-peak) led to about 10% reduction in VMT during peak periods and more on specific roadways. ▪ *Results from truck tolling in Europe*: Differential tolls by number of axles and emission standard for heavy vehicles (> 12 tons) on all major roads in Germany was followed by increased purchase of lower emission trucks; higher load factors have been observed in Switzerland under a similar pricing scheme.
Revenue/Finance	▪ *Construction:* Preliminary cost estimates for a distance tolling system in the Puget Sound region include initialization costs of approximately $0.75 billion to $1.5 billion and operations could equal 5% to 10% of proceeds; includes costs for in-vehicle technology, supporting infrastructure, fee collection, and enforcement. ▪ *Cost/revenues:* A recent AASHTO study (June 2009) shows a revenue-neutral switch to a flat VMT fee of 1.1 cents per mile applicable to all vehicles would yield $35.7 billion of revenues in 2015—the same as would result from current fuel tax rates—but switching to VMT fees would result in about $7 billion to $9 billion of additional revenue by 2030—an increase of at least 20% compared to fuel tax revenues at current rates. ▪ *Economic and finance issues:* If implemented at a nationwide-scale with central billing, there is a possibility to apportion revenues more in line with travel volume within boundaries of states, counties, and regions.
Equity	▪ Research shows that the distribution impacts across income groups of a flat mileage fee are not significant; however, geographic equity may be an issue as some rural residents drive longer distances than urban residents, which may be moderated by lower rural road fees; equity issues for congestion pricing component same as with other road pricing concepts—see exhibits in this section. ▪ Owners of fuel-efficient vehicles would be advantaged if charges vary by emissions as opposed to those driving typically less fuel-efficient farm and business vehicles.

Exhibit 24. (Continued).

Planning Considerations	
Environment	▪ Reduced trips and travel distance can reduce emissions following travel impacts noted above. ▪ Available results show that higher VMT fee rates for vehicles with higher emissions encourage adoption of less polluting vehicles; e.g., in Germany, a relatively high VMT fee of 12.4 Eurocent (20 US-cents) per vehicle-kilometer for trucks resulted in an increase in the number of new trucks with higher emissions standards.
Policy/Institutional	▪ *Authorizations*: Enabling legislation, policy, and procedures needed to encourage adoption of tried and tested open, flexible and cost-effective technology interoperable across states; enabling legislation also needed to allow state/regional governments to levy congestion pricing element of distance-based pricing systems. ▪ Policy for apportioning revenues across jurisdictions and agencies established prior to implementation. ▪ Selection of technology and protocol (open versus closed) that allows interoperability across states/countries and allows states to opt in or opt out. ▪ *Transition*: Policies to allow motorist adoption of technology over time.
Emerging Directions	
Motivators	▪ More stable and sustainable revenue source as compared to fuel tax supporting road development and maintenance costs. ▪ Potential to reduce congestion and emissions compared to “do nothing” scenario or regular highway expansion. ▪ Possible allies in state and regional governments struggling to meet revenue needs and traveling public, businesses concerned with aging roads and inadequate capacity, and road users who believe the strategy offers greater equity due to “user pays” principle.
Promising Developments	▪ *Technologies:* Oregon piloted mileage fees at vehicle refuels; the Puget Sound pilot used in-vehicle meters charging by location (type of roadway) and time of travel; GPS units tested well in Oregon, although privacy concerns remain; relatively low-cost RFID technology allows equipping all vehicles with mileage-metering capabilities; use of cell phone and Bluetooth applications. ▪ *Trial programs:* Information on potential impacts and actual operations available from trials in Oregon, Puget Sound, Georgia Institute of Technology, and Minnesota, and nationwide trials by the University of Iowa. ▪ Increasing recognition during 2009 economic downturn that new sources of infrastructure finance must be explored. ▪ Oregon legislature expected to pass HB 2001A making the mileage-fee-based road pricing pilot program permanent, and authorizing a congestion pricing pilot in Portland.
Success Considerations	▪ Communicate with public about how transportation is financed and the problem of declining gas tax revenues due to inflation; evaluate indexing of VMT fees with inflation. ▪ Gain legislative support early on; pilot project in Oregon would not have been possible without legislative support; engage all affected and influential parties including city and community representatives, auto owners associations, environmental groups and media; gain agreement on revenue allocation. ▪ For best chance at acceptance, consider starting with a voluntary approach. ▪ Use tried and tested, reliable, and familiar technology; address driver privacy concerns through technology or data storage mechanism (in Oregon, only mileage counts were transferred to billing system). ▪ Ensure that all vehicle types are accounted for in system planning, including potential future growth in electric vehicles. ▪ Design system with minimal burden on users for payment method, purchase of equipment, or regular inspections of odometers. ▪ Develop detailed program design including billing and collection technology, rate structure, enforcement, spillover guards, revenues and gas tax replacement strategy, and mitigation for perceived geographic inequity before communicating with public.

into some of the institutional and technological challenges facing large-scale implementation of these concepts:

- *Road User Fee Program* is a pilot implemented in Portland, Oregon, and assesses the technical feasibility of replacing the state gas tax with mileage fees in order to fund transportation, as well as the potential of using variable fees in congested areas at peak travel times to influence traffic levels. ODOT is also conducting a demonstration of a weight–distance tax for trucks in partnership with a Portland-based trucking company.
- *Traffic Choice Study* in the Puget Sound Region was implemented over 8 months to test the practicality and travel behavior implications of charging tolls based on distance, time of day, and road location.
- Mileage-Based User Fee (*Pay-as-You-Drive*) demonstration project in Minnesota evaluated the impact on travel of charging auto lease costs or insurance premiums by the mile. The project aimed at better understanding the sensitivity of drivers to alterations in vehicle ownership/lease costs and how results varied by income, location, and annual mileage driven. Planners also wanted to gauge the potential of VMT fees to reduce travel, acceptance of VMT fees, and requisite institutional arrangements for eventual wide-scale implementation.

All the above studies involved relatively small sample sizes and were conducted in metropolitan areas. Cooperating gas stations in the area and participant vehicles were equipped with hardware needed to charge fees based on mileage. All programs established mileage budgets based on baseline driving records from which mileage-based charges were debited.

2.3.6 Parking Pricing

Parking pricing strategies are applicable on and off street at spaces controlled by municipalities and can be of the following types:

- Revising or instituting rates to vary by times and/or locations of peak use, for example higher in congested zones and/or peak times of day
- Rates progressing by length of time parked, for example more costly rates for second or subsequent hours parked
- Charges applied by actual time parked versus by time blocks; examples include daily versus monthly parking charges and rates by minutes instead of by hours or all day rates

Recent examples of these parking pricing strategies include the SFpark program in San Francisco, the Park Smart pilot program in New York City, and a pilot program in Austin.

Exhibit 25 provides more information on parking pricing.

Exhibit 25. Parking pricing.

Planning Considerations	
Travel/Traffic	▪ *Elasticity:* General price-demand elasticity "rule of thumb" is –0.1 to –0.3, meaning a 10% increase in price reduces demand about 1% to 3%, including shifts to other available parking on and off street, alternative modes, or forgone trips. ▪ *Through-traffic proportion*: New York City finds 39% of central business district traffic is through, unaffected by parking policy. ▪ *The role of subsidized parking*: Subsidized parking by employers affects the price elasticity of parking demand (New York City experience). ▪ *Municipal rate hike:* The City of Eugene raised monthly parking rates at two municipal garages from $16 to $30 per month, and at several surface lots from $6 to $16 per month, reducing number of monthly parkers from 560 to 360 (about half changing parking locations, the rest shifting modes).

Exhibit 25. (Continued).

Planning Considerations	
	▪ *Variable on-street meter rates:* Port of San Francisco adopted "progressive rates" at meters (low first 2 hours, higher third and fourth hours) with "minimal change" in parking demand or turnover due to minimal enforcement in contrast to same strategy in New York City with good enforcement bringing "significant decrease" in occupancy and duration.
Revenue/Finance	▪ Generally parking demand has low elasticity, meaning an increase in price usually brings an increase in revenues to operators, though results depend on the availability and price of alternative parking supply; where such supply is very competitive, parking demand may prove to be more elastic. ▪ Revenue sharing may enhance acceptability, as with some increased revenues going to a parking district for priced zone improvements in sidewalks, lighting, landscape, and security.
Equity	▪ Little empirical research on parking pricing impacts across income groups. ▪ Perceived or actual income inequity may be mitigated by some revenues devoted to increased transit, as in Boulder, Colorado.
Environment	▪ Revised on-street variable pricing projected to reduce VMT 14,000/day in non-attainment areas of California (San Francisco, Los Angeles, Sacramento, San Joaquin Valley).
Policy/Institutional	▪ Little or no required new policy or institutional formation if parking authority and operations already in place. ▪ New residential preferential parking programs require legislation, permit sales, and enforcement.
Emerging Directions	
Motivators	▪ Driver familiarity and acceptance of parking pricing. ▪ Possible allies in businesses concerned with commuters "poaching" shopper parking, where there are no time limits for parking and/or low meter rates encouraging feeding. ▪ General excess parking demand relative to availability of spaces. ▪ Inconvenience to many interest groups in long search times for parking.
Promising Developments	▪ New electronic technologies make variable pricing easier to implement and customer friendly by accepting various payment types. ▪ Possible integration of parking pricing technology with payment for transit and toll roads. ▪ Technologies offer improved data collection on parking use and turnover for evaluation and planning. ▪ New York City and San Francisco implementing pricing pilots on street, with comprehensive evaluations.
Success Considerations	▪ Identify and engage affected parties early in planning, including residents, businesses, commuters, shoppers, and environmental interest groups (downtown and residential associations may provide starting points). ▪ Identify appropriate multiple goals of interest to affected parties (e.g., reduced cruising, more shopper parking, neighborhood protections); tailor strategy to particular commuter market (especially cash out). ▪ Develop explicit benefit plan for increased revenues dovetailing with goals and mitigation concerns (e.g., enhanced transit, spillover protections, better enforcement). ▪ Ensure effective enforcement upon implementation of new pricing. ▪ Ensure that revenue increase and allocation plan is within the bounds of public and business acceptability. ▪ *Examples:* New York City employs neighborhood and business champions, walking surveys to evaluate and communicate impacts, regular neighborhood seminars to 59 community boards, voluntary participation in pilot; Redwood City, Pasadena, and Austin return portion of fee revenues to improvement districts for zone.

PART 2

Resources and References

SECTION 3

Summary of Literature Review on Planning for Road Pricing

Certain literature on local, regional, and state transportation planning processes is helpful to devising recommendations for treating road pricing in the formal planning process as undertaken by regional and state agencies in line with federal law and regulation. The background information reviewed in this section on transportation planning carried on by metropolitan planning organizations (MPOs), congestion management agencies, and state departments of transportation (DOTs) offer consistent and pertinent findings for how the formal planning process proceeds and how planning for road pricing can and should fit with the process.

Appendix A provides detailed findings and references from the literature on planning. Overall findings from background information pertaining to planning for road pricing are as follows.

3.1 Domestic Scan of Congestion Pricing and Managed Lanes

A recent survey by DKS Associates of selected MPOs and state DOTs in 10 metropolitan areas examined how they are planning for congestion pricing and managed lanes (DKS Associates, February 2009). Important findings include the following:

- The study found congestion pricing in eight metropolitan areas "started with individual projects," versus deriving from within regional plans.
- As interest has moved from individual projects to regional approaches, "integration into the metropolitan planning process has also increased."
- Policy specifying the use of road pricing revenues has evolved in metropolitan transportation plans (MTPs), most often to cover cost of implementation and maintenance, often with excess revenues going to fund transit improvements. However, given the size and extent of typical high-occupancy toll (HOT) lane pricing projects, revenues have not been sufficiently large yet to be significant in meeting MTP financial constraint.
- All HOT land projects reviewed involved assessing air quality impacts and mitigation to meet National Environmental Policy Act (NEPA) and/or California Environmental Quality Act (CEQA) requirements.
- Analysis of congestion pricing among the metropolitan areas surveyed relied on the regional travel model for analysis, often supplemented by other tools with added sensitivity to pricing and/or for analysis of costs and benefits.

3.2 GAO Report on MPOs

A report by the Government Accountability Office (GAO, September 2009) surveyed all 381 MPOs (with an 86% response rate) and conducted case studies of eight metropolitan areas to determine the status of planning and how the U.S. DOT provides oversight for MPOs. Important findings include the following:

- A large proportion of MPO respondents to surveys believe their agencies lack resources and/or expertise to carry out transportation planning. Given that road pricing is a relatively new concept, it is likely many MPO planners may feel challenged analyzing and incorporating pricing into regional plans.
- While MPOs representing more than 200,000 in population are subject to federal certification reviews, the reviews are viewed as "pro forma in nature." MPO respondents place a greater value on informal assistance provided by both federal and state governments.
- Making the planning process more performance based might enable the FTA and FHWA to improve assessment of MPO planning progress and outcomes. And, more federal investment in modeling and data gathering should give greater reliability and consistency to MPO travel demand forecasting.

3.3 MPO Review on Congestion Policies by Anthony Downs

Anthony Downs at the Center on Urban and Metropolitan Policy (Downs, 2004) reviewed the history of MPO development and action to assess whether regional planning can be improved for combating congestion and considers various organizational options for changing MPO authority and effectiveness. Important findings include the following:

- Some regional agencies already have authority to implement pricing broadly and are important to implementation prospects. Downs cites the Metropolitan Transportation Commission (MTC) in the San Francisco Bay Area, where a "sister" organization sets tolls for the state-owned bridges in the area. He also indicates some air quality agencies, such as the California Air Resources Board, may be agencies capable of implementing congestion pricing.
- An important impetus for gaining public support for pricing is the time when congestion rises to the top of the agenda in a metropolitan area whether due to a booming economy and associated growth or unusual strictures in road development or other causes.

3.4 MPO Review for TEA-21 Reauthorization by Bruce Katz et al.

As with Anthony Downs, Katz et al. (2003) at the Center on Urban and Metropolitan Policy reviewed MPO authority and roles. Important findings include the following:

- States are vital to any transportation planning. Katz indicates states receive and manage large shares of federal and state transportation money, and their "political leverage" is far greater than that of the MPOs.
- Many MPOs, particularly in smaller areas, lack adequate staff and financial resources, with a recent study finding 58% of small MPOs (those representing populations of less than 200,000) have limited or no formal transportation models or forecasting tools. Such entities will struggle to analyze pricing adequately.
- Specific and publicly available performance measures and feedback systems around all candidate strategies in plans, including road pricing, will boost implementation prospects.

- Local and state planning for road pricing should be augmented by federal program implementation assistance, not simply left to develop with only federal planning guidance.

3.5 Decision-Making Framework for Pricing Decisions

In a review of planning for road pricing projects, Parsons Brinckerhoff, Inc. (July 2008) recommends four phases in the planning of road pricing projects: exploration, option development, feasibility assessment, and investment or finance study. Important findings include the following:

- Financial planning for road pricing entails unique steps. For projects financed by debt-backed proceeds from future tolls, an "Investment Grade Study" is needed to finalize funding arrangements and detail project cost estimates, revenue structure, and financial resources.
- Two broad approaches are used to initiate road pricing: (1) comprehensive regional or state planning or (2) specific corridor- or area-focused planning. Parsons Brinckerhoff (PB) notes, both approaches "are valid."
- Road pricing planning should match up types of pricing options with appropriate goals and contexts, as HOT conversions, existing tollways, new facilities, and other concepts are best suited to varying goals and conditions.
- Environmental reviews as part of road pricing planning vary with state law and custom. In some cases, the consideration of pricing may come while the environmental process is under way. The level of environmental review depends on the circumstances surrounding the particular project; where the introduction of tolling and pricing is determined to be "significant," a supplemental environmental impact statement may be required.
- Planning for road pricing requires both tolled and non-tolled alternatives, as well as multiple tolling scenarios. Modeling standards can be particularly high when private sector investment is involved (to meet bonding requirements).
- State and local jurisdictions have the greatest flexibility to implement tolling and pricing on local roads and highways that have been, or will be, built without federal funding. Greater restrictions apply when tolling and pricing are used on the Federal Aid Highway System, or on HOV lanes or busways funded with transit monies. Local legal requirements are dictated by state and local statutes and regulations.

Several planning screening criteria important to consider in planning road pricing include:

- Congestion relief potential
- Consistency with state and regional plan goals
- Ability to improve the efficiency of the regional transportation network
- Public acceptance
- Institutional feasibility
- Safety impacts
- Order-of-magnitude construction cost
- Revenue generation potential
- Financial viability

3.6 Federal Interim Guidebooks and Briefing Book

Federal planning regulations and guidance is important to devising any planning framework and directly bears on how regional and state planners conduct transportation planning. FHWA and FTA have developed a briefing book that summarizes the transportation planning process and two interim guidebooks addressing the integration of management and operations and the congestion management process in metropolitan transportation planning. These guidebooks and resources

are intended to help provide assistance in effectively carrying out federal planning requirements. Key items from the interim guidebooks (FHWA and FTA, February 2008) and briefing book (FHWA and FTA, September 2007) include the following:

- Road pricing (RP) planning will be constrained by planning cycles. For example, the Metropolitan Transportation Plan has 5-year updates (every 4 years in non-attainment areas). The Transportation Improvement Program or TIP is done every 4 years. Only the Unified Planning Work Program (UPWP) is done annually. Thus, if an RP proposal arises through the formal regional planning process, it will be bound by these timelines or, if it comes from outside the planning process, it may be "adopted" into the plan, which may constrain project timing.
- States may legislate their own provisions for congestion management planning, as in California where an entirely separate agency from the MPO can be formed to carry out congestion management planning. In such cases, the Secretary of Transportation must "find" that the processes are consistent with federal congestion management requirements.
- The congestion management process (CMP) as described in guidance provides an opportunity to consider road pricing. MPOs [or Congestion Management Agency (CMA) in places like California] in transportation management areas (TMAs)—those metropolitan areas with over 200,000 population—must have a congestion management process that includes congestion management objectives and identifies "travel demand" and "operational strategies"; road pricing is a logical candidate for consideration as a strategy. The CMP is intended to be fully integrated into the metropolitan transportation planning process.
- Planners seeking attention to road pricing in federal guidance will not find it featured strongly. The documents provide reference to the strategy, but more attention to road pricing within federal guidance documents may aid in consideration of road pricing in metropolitan and statewide transportation planning.
- Conformity requirements in planning provide an opportunity for attention to road pricing. The briefing book points to transportation control measures (TCMs) as a means to help attain conformity; road pricing could qualify as an emissions reduction strategy.
- Road pricing may aid in meeting the metropolitan planning process requirement to be "fiscally constrained," meaning expected revenues and costs balance. The MPO must demonstrate how it expects to fund projects included in the plan, and that there is a balance between the expected revenue sources for transportation investments and the estimated costs. Revenues may include those from "user charges," which would include road pricing revenues.

3.7 Strategic Highway Research Program 2 Project C01

The keystone project under the Strategic Highway Research Program 2 (SHRP 2) capacity focus area is the development of a Collaborative Decision-Making Framework (CDMF) for decision points in various phases of the transportation decision-making process (Project C01). The work by ICF is useful for identifying possible points for road pricing to enter planning and decision making. The framework is derived from about 25 detailed case studies of transportation projects and the decision-making processes that led to their adoption. Important findings include the following:

- Road pricing may be considered at several steps in the long-range planning process. Early steps setting out regional objectives such as sustainability, improving system efficiency, improving air quality, and managing congestion provide opportunities for attention to road pricing. The CMP provides another opportunity where transportation deficiencies in the region are acknowledged and where alternatives such as pricing and demand management strategies are considered and prioritized. The CMP also can spur corridor studies or major investment studies in areas where

congestion is greatest, and bring attention to potential congestion-relief solutions such as road pricing.

- Corridor planning offers good potential for attention to road pricing because it is specific by area and by level of analysis. Corridor planning is the level of planning detail required for environmental review, suggesting both planning and environmental analysis for road pricing might be done simultaneously, thereby shortening development and implementation time.
- According to the C01 project, there are two paths for road pricing under environmental review. When a road pricing project involves significant new capacity, an extensive environmental review process may be required via an Environmental Impact Statement (EIS). The review may be necessary either for compliance with NEPA at the federal level or for a state-level environmental review required by law in some states. Another path may be lesser reviews or an exemption, particularly for pricing projects on existing facilities, where trip reduction and air quality benefits are clear cut and where revenues support auto use alternatives.

SECTION 4

Interview Findings

The interview guide (included in Appendix C) explored several points pertaining to how road pricing is treated in local, regional, and state planning and the process of engaging the public, stakeholders, and decision makers and fashioning communications on road pricing. Interview summaries were compiled on these points and all others in the guide. From the summaries, responses on each specific planning point were synthesized and compiled in Appendices E and F. Provided here are findings derived from a cross-cutting examination of the tables. From the findings, conclusions and implications are derived regarding the treatment of RP in the planning process.

4.1 Road Pricing Emergence Factors

This section discusses the factors that caused road pricing to emerge as a policy option and to be included in the planning process in the studied regions, even if it did not lead to final implementation as a project. The factors discussed below were found to be responsible for emergence of RP at multiple locations.

Prior experience: Familiarity with proven examples or prior local experience aids in explaining and bringing forth RP concepts and plans. In the San Francisco Bay Area, acceptable project proposals for HOT lanes to be implemented in the near term in Santa Clara paved the way for a regional HOT network plan. Pricing has been part of the philosophy at the Metropolitan Planning Commission for two decades and this familiarity with the policy has been vital. In D.C., studies had been done dating back to the 1970s with legal scrutiny of RP plans over two decades before adoption of a vision plan supporting RP and final implementation of the first project. Regions having experience with prior failed attempts at RP have also seen successful re-emergence of the concept. In the Los Angeles area, prior failed experience with designing RP programs began debate and awareness about it among public and decision makers. In the Twin Cities region of Minneapolis–St. Paul, pricing was first proposed in 1997 without political support, but increasing familiarity with the concept over a decade helped in implementation of the I-394 MnPass HOT lanes.

Constraints of traditional funding: RP emergence is aided by its potential to generate capacity sooner than traditional state and local funding cycles. For instance, a key motivator for the regional HOT lane network in San Francisco is that new capacity could be created 30 to 40 years sooner. Expected shortfalls in transportation revenues under traditional funding sources also aid emergence. This was the case in Dallas where indications of potential shortfalls in gas tax revenues were seen in the early 1990s, the Washington D.C. metropolitan region, New York City where the transit system required new sources of funding, and the Seattle region where the gas tax has already been raised multiple times, leaving pricing as the only option to raise additional funds.

Federal funding: Funding support for RP available through focused federal initiatives like the Value Pricing Pilot Program (VPPP), Congestion Reduction Demonstration Initiative (CRDI), or Urban Partnerships Agreements (UPA) aids emergence. This aid was seen in Los Angeles, which successfully applied for the CRDI after failed attempts at a UPA grant; Minneapolis–St. Paul, Seattle, and New York City's areawide pricing program where emergence was sparked by applications to the UPA grant; and Portland, D.C., and New York City's parking pricing pilot that were funded by the FHWA VPPP. In some cases, funding from public–private partnerships also aids emergence, seen typically in the case of HOT lanes with examples in Dallas and the D.C. area.

Quality and strength of technical analysis: Sound and compelling technical analysis on RP impacts can aid emergence; weak or unconvincing analysis can retard emergence. Whether done within the formal regional planning processes or at project level, the character of analysis on relieving congestion, improving operations, providing revenues, or increasing economic productivity is important to emergence, as seen in San Francisco, D.C., and the Twin Cities region.

Legislative and policy support: Adoption of policy framework or specific legislation can be an impetus to RP emergence, and pivots off of revenue needs, environmental goals, or congestion. For instance, in the early nineties, the MPO for the Dallas region adopted a policy framework stipulating that all facilities on new right-of-way and existing freeways that were being reconstructed should be tested for toll road feasibility and built as such, if warranted, because of the limited availability of funding to meet the region's capacity needs. In Portland too, House Bill 2120 was passed, directing the Oregon Department of Transportation (ODOT) to develop pilot programs for congestion pricing and to test alternatives to the fuel tax; House Bill 2001A was passed in 2009 that allowed the Oregon Department of Transportation to make the mileage-fee based road pricing program permanent and implement a congestion pricing pilot program within 3 years. Similar legislation was passed in Los Angeles in 2006 allowing implementation of HOT lane projects.

Presence of responsible planning entity and local tolling authority: RP emergence is often accompanied by creation of a specific commission or task force at the state or local level charged with planning to relieve traffic congestion and to vet options. In New York, the governor created a Traffic Congestion Mitigation Commission in 2007, the same year a Congestion Pricing Committee was created in Los Angeles. RP emergence is also eased when additional state authority is not needed for pricing due to the presence of a local toll authority as in Dallas or a state-authorized commission as in Seattle. In Seattle, a commission with authority to charge tolls for revenue and traffic management purposes was set up through legislative action.

Pricing proposed on new facilities: RP emergence is facilitated when planned on new facilities or lanes rather than existing ones, as public and stakeholder acceptability is enhanced. This was seen in the case of new HOT lane projects constructed in Dallas and the Intercounty Connector in Maryland.

Traffic conditions: The nature and severity of traffic conditions is important to emergence, whether severe, persistent congestion as recognized in Los Angeles, the D.C. metropolitan region, and New York City or the underutilization of HOV lanes as was the case in the Twin Cities region.

Influence of key actors: Engagement, support, and persuasiveness of influential actors and stakeholders—such as a federal administrator, governor, senator, or other champion and the positions and actions of business, environmental, and equity interest groups—is important to RP emergence. The influence of such actors had an important bearing on the course of road pricing developments in Los Angeles, Portland, New York, and other cities.

4.2 Relationship of RP with Regional Transportation Planning Requirements

Moving onward from the factors that aid emergence of road pricing, the focus of this section is on the relationship of pricing with the regional transportation plan. RP may either be part of the regional transportation plan or find a place in other plans such as statewide or corridor plans. The planning requirements that help or hinder implementation of RP are discussed below.

Treatment in regional plan: Where RP is included in adopted long-range transportation plans, it enters by varying rationales and supports, sometimes by planning integral to the regional plan—as in Dallas, San Francisco, Minneapolis–St. Paul, and Seattle—and sometimes by amendments and updates based on ongoing projects—as in Los Angeles and the D.C. metropolitan area. Once road pricing is included within the regional plan, RP strategies aim at reduced congestion, delays, and emissions and improved highway performance. Additionally, they sometimes aim to bring forth transportation improvements more quickly than with traditional finance sources. Also, inclusion of RP even in general terms during a prior planning cycle can facilitate inclusion in future plans.

Federal requirement of fiscal constraint: RP in regional plans plays a supportive role in meeting the regional plan requirements of fiscal constraint as revenue generation can be an important objective. The fiscal constraint requirement was cited as a key impetus to the implementation of road pricing in Dallas, Minneapolis, and Los Angeles.

Technical analysis and environmental review: Analysis of RP in determining preferred scenarios for long-range plans often involves the application of detailed regional models, sometimes requiring modification. In Dallas, detailed analysis showing performance measures about the real costs of the transportation system and how much people are underpaying was an important part of public communication, while in Seattle, sophisticated toll optimization and integrated land use–transportation models were used along with benefit–cost analysis with updated values of time. Analysis also included assessment of environmental and equity impacts as part of full environmental reviews for projects nearing implementation. Such impacts were analyzed in Dallas, Los Angeles, and New York City.

Treatment of RP outside regional planning process: In some cases, RP may have an "after-the-fact" relationship with the long-range transportation plan or other state planning processes, as when developed under federal grant programs as was the case in New York City, Portland, the D.C. area, and the Twin Cities. In other cases, such as San Francisco and the I-270 corridor in Maryland, RP is being developed via corridor studies. However, once funding is assured and development is forthcoming, projects are formally included in applicable state and regional transportation plans as seen in the case of projects in the D.C. area.

RP is sometimes also included in plans outside of regional transportation plans, e.g., the 2009 Revised Transportation Policy Plan for Minneapolis that forecasts the needs and capabilities of the highway system 50 years on and the Moving Washington (Seattle) 10-year state plan that supports funding projects using non-traditional sources.

4.3 Relationship of RP with Specific Planning Actions and Required Planning Processes

This section discusses how required planning processes support or hinder planning for RP. Processes include air quality conformity, congestion management, environmental review, integration with specific plans (such as for greenhouse gas reduction), and parking management.

Air quality conformity process: Documentation of potential air quality impacts of RP can support conformity requirements in long-range transportation plans and transportation improvement plans. Air quality impacts projected for the San Francisco Bay Area HOT lane network showed reduced emissions compared to existing HOV network. In Dallas, all road pricing projects have undergone emissions analysis and are included in conformity assessments, including contributions to mobile source emissions inventories as part of the long-range planning process.

Congestion management process: RP has been successfully integrated into the congestion management process in some cases, though the fit depends on the specific type of pricing program proposed and the scale of application. For instance, in New York City, the congestion management process was considered applicable at a much more aggregated scale than that to which the areawide pricing scheme applied. Still, the example of New York City indicates the CMP can play the role of establishing regional consensus between the MPO and the state or city department of transportation on the locations of congestion and the major problems to address. In Dallas, Los Angeles, and Minneapolis, the RP programs have been named in regional plans and are assessed as part of CMP planning and analysis.

NEPA environmental review process: RP planning sometimes does not entail any significant environmental review. Pilot projects implemented under the VPPP have often received exemptions and proceeded without environmental review; however, as projects get closer to full-fledged implementation, environmental reviews are considered necessary. Where assessed, RP has cleared environmental justice reviews, but sometimes requires considerable communication effort using data from established RP projects as was done in Minneapolis and Maryland (for the Intercounty Connector). Mitigation actions have also been undertaken in some cases to ensure environmental justice, such as the building of a transit line in Dallas and addition of a transit component to the RP plan in Los Angeles.

Greenhouse gas emissions reduction: RP is sometimes linked with the objective to reduce greenhouse gas emissions, given the documented evidence from some completed projects and recent emphasis on climate change mitigation in regional plans. New York City, Seattle, and San Francisco had this as a specific objective in the regional plan that was supported by the RP proposals.

Parking management: RP may be proposed as part of a parking pricing plan that may be separate as in the case of the Park Smart pilot program in New York City and San Francisco or integrated with a larger regional RP package as in Los Angeles. Parking pricing may not require significant environmental reviews.

4.4 Role of State and State Department of Transportation in Planning for RP

The multiple ways in which states are involved in RP efforts are discussed in this section, using examples from the interview sites.

Support for RP planning and policy: The state DOTs can play a vital role in planning and developing performance standards and principles for RP projects, e.g., by stipulating a mandatory minimum level of service as in the case of HOT lanes in the San Francisco Bay Area and through laws regarding reinvestment of revenues as in the case of Los Angeles. In Portland, the state DOT was the primary implementing agency for the mileage-fee pilot program and, in Seattle, the agency supported the MPO in planning efforts for pricing on SR-520.

The state can also be involved in an important way by helping to pass legislation that permits implementation of RP programs as seen in several cases, e.g., legislation supporting use of

public–private partnerships for toll roads in Dallas and legislation authorizing tolling in Los Angeles, Minneapolis, Portland, and Seattle.

State DOT support, advocacy, and involvement of key actors and high-level staff are important for moving RP projects forward. In the case of the San Francisco Bay Area toll network, the state DOT was one of the key actors agreeing to and developing the network; in Dallas, the former chair of the Texas DOT was a key advocate for supportive legislation; in Los Angeles, the California Department of Transportation (Caltrans) Director was essential in moving forward the RP plans and analysis; in the D.C. metropolitan area, three DOTs on the Transportation Planning Board bring project proposals for consideration, supported by sophisticated analysis; in the Twin Cities, Minnesota DOT (MnDOT) planning and policy groups nurtured the idea and brought the governor on board. In New York City, the New York State DOT (NYSDOT) helped in conducting analysis of regional impacts of RP. The involvement of the NYSDOT and the Metropolitan Transportation Authority (MTA) was important to the New York governor's support of the New York City congestion pricing proposal.

Technical support: State DOTs typically provide support with technical analysis and studies as seen in almost all interview sites. In addition, state DOTs provide guidance on public outreach and can encourage involvement of the MPOs and others as was the case in the D.C. metropolitan area (Maryland DOT), Minneapolis, Portland, and Seattle.

Funding support: The state may provide funds to match the federal government's pilot program grants, as in the case of Portland, or other funding sources to support RP. In Minnesota, the legislature authorized use of state funds to accelerate HOT lane conversions.

Role in implementation: The state role in implementation varies by type of RP policy—in New York City where most roads are owned by the city, the state DOT had no key role. However, City officials sought support from state tolling agencies (MTA and the Port Authority of New York and New Jersey) for use of certain tolling facilities and operations for the proposed congestion pricing program. In Portland, for the mileage-fee pilot program, ODOT was the key implementing agency. States are typically not involved or minimally involved in parking pricing, e.g., in the case of New York City, Los Angeles, and San Francisco, city agencies have been taking the lead.

4.5 Role of Federal Government in Planning for RP

This section discusses the ways in which the federal government has played a role in supporting RP programs and proposals.

Support through funding and pilot programs: The federal government has been providing important funding for infrastructure and pilot support through the Value Pricing Pilot Program, Urban Partnership Agreements, and similar grants. This was a prime impetus to the RP programs in almost all interview sites.

Experiences in Los Angeles, New York City, Minneapolis, Portland, and the D.C. region show that the role of federally supported pilot and demonstration programs is important in initiating technical studies, raising awareness, bringing RP into the public debate, catalyzing exploration of RP by states and local governments, and fostering collaboration among agencies. Federal encouragement of a "learning process" has been important in advancing RP. Overall, federal RP pilot programs and project support, technical assistance via project evaluations and RP reviews, and involvement of key actors and advocacy is evident in RP development.

Federal planning guidance: Planning guidance from the federal government was not believed to have much influence on RP planning, as experience in San Francisco and Dallas shows; however federal research studies, support for technical analysis, conferences, and best practice documents are valuable in RP planning; e.g., in Los Angeles, a federally supported symposium helped gain

support from the state legislature, and in the D.C. region, funding and implementation of a federal pricing workshop played a significant role.

Fiscal constraint legislation: Federal legislation mandating fiscal constraint in regional planning can bring attention to RP as an innovative source of local funds. This helped bring RP into the planning process in Dallas and Seattle.

Air quality standards: Experience from Dallas showed that federal air quality standards such as the ozone standard may encourage attention to RP in planning since RP goals can be related to air quality improvement in non-attainment areas.

4.6 Public/Stakeholder Involvement in RP Plans

Key aspects regarding the involvement of multiple stakeholder groups are discussed in this section.

Organized stakeholder involvement: RP implementation is generally accompanied by involvement of one or more organized multiple-stakeholder groups as seen in San Francisco, Dallas, Los Angeles, Minneapolis, and Portland. Negotiations among stakeholders who are part of the key RP committee or task force can help arrive at consensus and arrive at acceptable plans. Examples of discussion and consensus building points include how to allocate revenues for transit and HOT corridor improvements as seen in San Francisco, Los Angeles, Minneapolis, New York City, and Seattle; how to address equity concerns seen in Dallas, Los Angeles, Minneapolis, and New York City, and how to address issues of privacy and double payment as seen in Portland. The following paragraphs contain additional examples.

In the San Francisco Bay Area, the MTC HOT Executive Committee was established to oversee the overall network plan, with further plans for specific corridors. Los Angeles uses the South Bay Council of Governments to reach out to local elected officials and seeks support of grassroots organizations in specific corridors to generate support. The D.C. area attends to the chambers of commerce, trucking interests, and environmental community and involves the Transit Advisory Committee. In the Minneapolis–St. Paul region, a community task force was formed representing city councils, trucking, automobile associations, and state legislators.

In Dallas, all elected officials of the MPO supported the RP plans, and planners worked closely with state legislators to build understanding and consensus. Neighborhoods, businesses, and other groups in opposition initially were assessed and planners worked to assess concerns and address them in emerging plans. In Los Angeles, the Metro Board worked closely with influential state legislators to ensure acceptance. The New York mayor's office led widespread communications directed to community boards and specific interest groups. The ODOT used a 12-member task force with a mix of decision makers and key interest groups, set up presentations by high-level federal officials, and met with transportation advocacy groups. In Washington State, an independent group called the Committee for 520 interceded with elected officials, civic groups, and elected officials.

Constant outreach and communication: Attention to acceptance and resistance from various stakeholder groups via constant communication is part of RP development. Outreach is aided by reference to experience from other RP projects as was the case in D.C., Minneapolis, and New York City. Outreach and communication are often supported by detailed analysis and technical studies. For instance, in Texas, key aspects were strong, focused monthly communication; constant use of media; framing of equity issues around opportunity costs of time; and emphasis on sustainability of revenue source. In Los Angeles, outreach involves numerous meetings and presentations along affected corridors. In the D.C. area, the three states conducted multiple public hearings to disseminate information, launched websites and marketing campaigns, tailored messages to

stress benefits of choice and congestion relief in mixed flow lanes, and referenced projects elsewhere for effects and equity. Minneapolis uses public roundtables, legislative seminars, and stakeholder workshops twice per year and emphasized the benefit to transit as this was a key concern.

In New York City, communication was tailored to specific stakeholders and constant meetings were conducted with community boards, businesses, and environmental justice groups, using "every communication tool in the book," with reference to the London pricing scheme and transit improvements to increase familiarity and address transit concerns. The New York City parking programs conducted sidewalk surveys to address the issue of access to businesses, conducted outreach to neighborhoods and businesses to build credibility and acceptance, fashioned a pilot program with voluntary buy-in as an acceptance strategy, and communicated with neighborhood individuals to generate supportive parties as allies. Oregon used a reactive approach in communications, answering questions and objections as they arose, working with the media to allay concerns and clarify issues, and designed a pilot to attend to privacy issues. Finally, in Seattle, planners working on pricing for SR-520 targeted low-income groups and countered specific concerns such as paying twice, undertook a scoping process as part of the regional plan to get comments from more than 1,000 people, and pitched and attended to the revenue concern by ensuring that pricing revenues would be returned to the source corridor.

Local champions: Interviews reveal RP development is sometimes supported by a local champion. Specifically, the former chair of the Texas DOT (TxDOT) supported key legislation, and the 40 elected officials of the COG Board have been supportive of pricing policy in the region. The director of the MTC in San Francisco and Mayor Michael Bloomberg in New York City were visible champions behind the pricing proposals reviewed and the governor in Minnesota was active in supporting the first successful pricing project in the state. However, champions do not necessarily bring successful implementation. Specifically, the active support of New York City's mayor was not enough to bring about a program in the face of rejection by the state legislature. Nor was the support of the MTC director sufficient to bring about early unsuccessful Bay Bridge pricing proposals. Also, the governor of Minnesota was supportive of not only its successful initial pricing proposal but also earlier failed attempts.

4.7 Maximizing Attention to RP in Planning—Barriers and Opportunities

Experience from the interview sites revealed specific common barriers and opportunities to integrating RP programs into the various planning processes and in planning for RP in general. These are discussed below with examples.

Opportunities

- ***Transportation bill reauthorization:*** The upcoming reauthorization of federal transportation legislation provides a good opportunity to continually support RP planning and development by continued encouragement of pilot RP programs and funding support for implementation; agency officials in San Francisco, Los Angeles, Dallas, and Minneapolis believe that it provides incentive for change and for pushing pricing projects forward.
- ***Limited transportation revenues:*** Federal underscoring of revenue shortfalls for transportation may bring more attention to RP in planning. Just like the federal fiscal constraint requirement, a federal policy that is explicit about the lack of revenues for transportation needs in urban areas will help MPOs gain support and approval for RP from the state.
- ***Successful pilot programs:*** Implementation of successful pilots for RP projects increase familiarity with the concept, attracts national interest, and paves the way for further RP planning as seen in Dallas, Minneapolis, Portland, and Seattle. Stronger federal support to technical research

and an oversight role are important in this regard. Prospects for successful RP plans are enhanced by packaging with transit development as in the case of Minneapolis, Los Angeles, and Dallas.

- ***Federal financial and advocacy support:*** Federal funding and support for transit and supporting pricing infrastructure aids development of pricing projects, e.g., purchase of transit buses to increase operations before the start of pricing, a strategy proposed in Los Angeles and New York City, and transit infrastructure construction in Seattle. Additionally, involvement of key federal and/or state actors who are strong communicators and supporters of RP can advance RP plans, as seen in Los Angeles.
- ***Congestion and fiscal constraint references in regional plans:*** State or regional plans with emphasis on severe congestion and need for transportation revenues and/or specific reference to pricing may provide opportunities for RP, e.g., the governor's Strategic Plan in the case of Los Angeles; PlaNYC, the mayor's sustainability plan in New York City; and the 2010 Revised Transportation Policy Plan in Minneapolis–St. Paul.
- ***Travel options to increase acceptability:*** Acceptance of RP in planning may be helped by innovative ways to add capacity in concert with pricing. For example, using shoulders or restriping, without taking away free lanes, was reportedly instrumental to the acceptability of recent project proposals in Minneapolis.
- ***Economic context and timing:*** Timing RP plans in relation to the economy is important to advancing RP. In Dallas, San Francisco, and Seattle, interviewed officials believe that the current state of the economy can lead to support for revenue reasons. However, the economic context can also be a barrier in the short term due to greater public scrutiny of how dollars are spent—this was believed to be the case in New York City and Portland—and concerns that future pricing revenues may fall short of expectations due to the continuing effects of a recession, a concern in the D.C. region.
- ***Voluntary participation option:*** Voluntary participation in pricing programs, at least initially, helps gain acceptance, as shown by the Park Smart parking pricing program in New York City and the mileage-fee pilot program in Portland.
- ***Use of a tolling agency:*** The presence of a tolling agency authorized by law and operating for some time may facilitate implementation of pricing compared to the need to create such an agency or authority. For example, plans for pricing in Dallas probably were expedited by the presence of a tolling authority. Likewise, the presence of the Bay Area Tolling Authority in the San Francisco Bay Area may well have eased planning for how all pricing options for the region are to be implemented. New York City sought to use tolling facilities at the river crossings and their back office capabilities to ease operations of the congestion pricing proposal.

Barriers

- ***Limited modeling capability:*** Modeling and analysis tools can act as a barrier to RP assessment if models and tools used are not adequately geared toward pricing or based on good survey data in some cases—a finding from New York City, Seattle, and San Francisco.
- ***Private sector involvement:*** Involving the private sector requires caution in RP plans. It could bring much-needed funding but could create a barrier due to public perceptions and opposition to private entity, particularly if international, e.g., public–private partnerships formed to implement the HOT lane projects in Dallas.
- ***Pricing restrictions on federally aided highways:*** Limitations regarding what can and cannot be done on Interstate highways funded by the federal government is a barrier to RP expansion—e.g., whether tolling can be introduced and under what conditions was an issue in Dallas and the amount that can be charged on facilities/lanes that are not currently priced was a concern in Los Angeles, in the proposal for New York City, and in the regional HOT lane network in San Francisco. The city or local government needs legal authority from the state to implement pricing on previously free roads and waivers from the federal government to allow tolling on facilities that

received federal funding; this can be a barrier because local governments are less likely to propose a project that may face a future roadblock. As experience from New York City's Park Smart program shows, parking pricing could be an exception because it is implemented in local areas and may not need multiple clearances from higher level agencies.

- ***Public and political acceptance issues:*** Several well-documented acceptance issues continue to be potential barriers in RP planning and development. The public's lack of familiarity with pricing projects, perceptions of paying twice, privacy concerns and income equity arguments are referenced, e.g., Los Angeles, Portland, early efforts in Minneapolis, New York City, and Seattle.

APPENDIX A

Literature Review on Planning for Road Pricing

This appendix provides the findings from a literature review of sources addressing road pricing and the transportation planning process. Each key source is described below.

Domestic Scan of Congestion Pricing and Managed Lanes

A Domestic Scan of Congestion Pricing and Managed Lanes. Prepared for the Federal Highway Administration, U.S. Department of Transportation, DKS Associates, with PBSJ and Jack Faucett Associates, February 2009.

This recent survey by DKS Associates of selected Metropolitan Planning Organizations (MPOs) and state departments of transportation (state DOTs) in 10 metropolitan areas examined how they are planning for congestion pricing and managed lanes. Important findings for consideration of a road pricing planning framework include:

Evolution of road pricing from projects to plans: The study found initiation of congestion pricing in eight metropolitan areas with pricing projects "started with individual projects," versus deriving from within regional plans themselves. Specifically, "In most cases, the desirability of a congestion pricing or managed lanes project did not emerge directly from a CMP assessment of options" and "most congestion pricing or managed lanes projects are . . . initiated and advocated for by agencies within the metropolitan area and are incorporated into the MTP and the Transportation Improvement Plan (TIP) by the MPO as updates of these documents occur." One example is how HOT lanes gradually developed into the regional plan as a network approach within the San Francisco Bay Area. There, "the initiative for the HOT lane projects came first from the Alameda County CMA and the Santa Clara County CMA (the Santa Clara Valley Transportation Authority)." Thereafter, "The MPO (MTC) took the lead to develop the regional plan for a HOT lane network." Nor did state agencies generally derive congestion pricing projects from within broad or systematic planning efforts but instead derived them from site-specific studies. Specifically, "The state DOT was often the initiator but survey respondents generally did not indicate that the projects proposed were part of the state-wide planning effort."

However, the report also finds as interest has moved from individual projects to regional approaches, "integration into the metropolitan planning process has also increased." Specifically, MPOs are making "a greater effort to provide an appropriate interagency collaborative process for identifying the need for the projects, identifying the options and alternatives to be considered, formulating an appropriate evaluation process, seeking public and stakeholder input and identifying a preferred approach." To spur continued attention to road pricing, regional approaches and more comprehensive planning, the report recommends the federal government provide

"additional encouragement through guidance documents and descriptions of exemplary practices and also in the form of recommendations as part of the MPO certification reviews. Support should also be in the form of federal grants to support regional planning for congestion pricing and managed lane projects."

Exemplary planning approaches: The report identifies some "exemplary approaches" to planning that are useful for consideration in devising the recommended framework. The report points to the Seattle area where the Puget Sound Regional Council (PSRC) has updated its CMP to:

- Identify the location where congestion is greatest and potential future locations for possible application of congestion pricing
- Specify pricing, demand management, and system management strategies as specific options
- Establish a specific evaluation method (in this case, benefit–cost analysis model) as well as other more traditional performance measures such as safety, reliability, access, and delay
- Coordinate with Washington DOT long-range transportation plan, to ensure it incorporates outcomes of the MTP update

Policy and plans addressing road pricing revenues: Another important finding relevant to any regional and state planning framework attending to road pricing has to do with revenues. The report finds that in Minnesota a policy position has evolved in the MTP pertaining to road pricing revenues. Policy indicates "revenue generated from the managed lanes will be used for the cost of implementation and maintenance. The net revenue from the I-394 MnPASS project has not been sufficiently large to warrant consideration of it in the MTP financial constraint." Likewise in Virginia with the adoption of the I-95/I-395 HOT lane project into the 2007 MTP, policy sets out how revenue obtained will be used to cover the costs of each project and excess revenue will be used to fund transit improvements.

Accounting for air quality requirements: The report notes the importance of road pricing plans meeting air quality requirements, suggesting any planning framework for road pricing must take into account air quality requirements and assessment processes. The study found all HOT lane projects reviewed involved assessing air quality impacts and attending to mitigation to meet NEPA and/or CEQA requirements. One MPO in Kansas City, MARC, is attempting to make environmental review and analysis integral to regional planning rather than having analysis done after projects are identified. The initiative is entitled "Linking Environmental and Transportation Planning."

Models/analysis procedures: The analysis of congestion pricing among the metropolitan areas surveyed relied on the regional travel model for analysis. The model often is supplemented by other tools with added sensitivity to pricing and/or for analysis of costs and benefits. Microsimulation models have been used to assess the travel time and level of service associated with alternative pricing scenarios, level of service, traffic impacts on local streets and general purpose lanes, as well as the impacts to lower income travelers. Other common performance measures include vehicle miles traveled, emission volumes, vehicle hours traveled, and individual and network delays savings. Proprietary toll revenue models have been used for analyses in some areas.

GAO Report on MPOs

"Metropolitan Planning Organizations: Options Exist to Enhance Transportation Planning Capacity and Federal Oversight," Government Accountability Office, a report to the Ranking Member, Committee on Environment and Public Works, U.S. Senate, GAO-09-868, September 2009.

This report by GAO surveyed all 381 MPOs (with an 86% response rate) and conducted case studies of eight metropolitan areas. This congressionally requested report aimed to determine how the U.S. DOT provides oversight for MPOs in transportation planning and how the over-

sight might enhance transportation planning. Some findings important to developing a road pricing planning framework include the following:

MPOs cite lack of resources and/or expertise for comprehensive planning: A large proportion of MPO respondents to surveys believe their agencies lack resources and/or expertise to carry out transportation planning. Given road pricing is a relatively new concept compared to, for example, traditional transit or road improvement strategies, it is likely many MPO planners may feel challenged analyzing and incorporating pricing into regional plans. GAO found about 85% of all MPOs responding "cited the lack of transportation planning funding as a challenge to transportation planning" and "about half of [the] survey respondents stated that the lack of flexibility for using federal planning funds inhibits them from conducting comprehensive transportation planning." Also, "staffing constraints, such as limited number of staff and lack of trained staff, also impact MPOs' ability to conduct transportation planning." Finally, "some MPOs lack the technical capacity and data necessary to conduct the type of complex transportation modeling required to meet their planning needs."

MPOs view federal planning requirements as pro forma and more value technical assistance: GAO found MPO oversight from the Federal Transit Administration (FTA) and Federal Highway Administration (FHWA) is "process-oriented" and difficult to assess for improving transportation planning. While MPOs representing more than 200,000 in population are subject to federal certification reviews, the certification reviews and planning requirements are viewed as "pro forma in nature" and MPO respondents place a greater value on "informal assistance provided by both federal and state governments."

Improved planning may come from performance rather than process requirements, and more support for modeling and data gathering: GAO recommends "making the planning process more performance-based could allow FTA and FHWA to better assess MPOs' progress in achieving specific results." GAO also recommends "increasing federal investment in modeling and data gathering to encourage more reliability and consistency across MPOs to travel demand forecasting."

MPO Review on Congestion Policies by Anthony Downs

"The Need for Regional Anti-Congestion Policies," Anthony Downs, Center on Urban and Metropolitan Policy, February 2004.

Anthony Downs at the Center on Urban and Metropolitan Policy has reviewed the history of MPO development and action to assess whether regional planning can be improved for combating congestion, and considers various organizational options for changing MPO authority and effectiveness. He concludes MPOs as currently structured have a near impossible task assigned to them by Congress. On the one hand, they are charged with developing long- and short-range transportation plans across multiple modes, establishing widespread regional consensus, coordinating with multiple agencies, taking into account air quality considerations and numerous federal and state regulations bearing on their operations, carrying out the latest and best modeling techniques, and doing all this "without any direct powers to implement the plans it creates, since implementation is left to other agencies." He calls the MPO mission "Herculean."

While he supports efforts to build capacity at MPOs for all these functions and references the U.S. DOT 2001 Metropolitan Capacity Building Program (MCB) as one such effort, he is sanguine about how effective such help can be. Instead, he suggests serious attention to institutional reform, in particular,

> "persons promoting regional anti-congestion strategies should seriously consider developing some type of regional transportation entity with responsibilities that go beyond those currently afforded to MPOs

> and become the regional infrastructure agencies. Creating such an agency would require action by the state government—or governments—concerned. The agency's jurisdiction should ideally include the planning, construction, and operation of the metropolitan area's principal roads, bridges, tunnels, and mass transit systems. It would be able to review and coordinate local land use policies and be able to set pricing schemes for parking and tolls. This could be a newly-created regional authority or it could be a fully-evolved MPO."

After reviewing various possible models for a new or revised agency, Downs concludes there is little hope for strong regional governance given current distribution of city, county, state, and special district institutional arrangements. However, he points to an opportunistic approach for advancing "anti-congestion" strategies, which has implications for a planning framework for encouraging attention to road pricing:

Take advantage of unique and relevant authority and powers: Downs cites some regional agencies already having authority to implement pricing broadly and urges planners and managers to look for ways to implement road pricing under such authority. He notes, for example, ". . . in San Francisco, the Metropolitan Transportation Commission (MTC) is responsible for setting tolls for the state-owned bridges in the area. Conceivably and with sufficient political courage, the MTC could employ peak-hour tolls on these bridges to dissuade many auto commuters from using the bridges." Downs also points to authority, law, and organizational entities associated with air quality in non-attainment areas as another opportunity for regional action in pricing and other congestion reduction strategies. He cites the California Air Resources Board and its wide authority, reach, and proactive actions as an example, noting "it (ARB) has proposed that a significant fraction of all automotive vehicles be powered by fuels other than gasoline by the year 2010. Achieving that goal would require enormous changes both in the automobile and petroleum industries and in household behavior. There are 36 air districts in California charged with carrying out these regulations in collaboration with their local MPOs." He suggests ARB-like agencies anywhere working with MPOs could (in theory) implement many of the potentially most effective anti-congestion tactics at regional levels. For example, they could impose peak-hour road pricing and parking charges throughout a metropolitan area. He concludes, "federally rooted anti-pollution agencies represent one of the potentially strongest instruments for carrying out regional anti-congestion tactics."

Take advantage of crises: Referring to the unique authority MTC has as a regional agency, Downs notes using such authority for pricing bridges will take "widespread public support." He notes an important impetus for gaining such support is a time of crises where congestion rises to the top of the agenda in a metropolitan area whether due to a booming economy and associated growth or unusual strictures in road development or other causes. Downs says such issues "must pose serious, obvious, and immediate threats to the welfare of a large percentage of the population." Probably the reverse also applies—in times of waning congestion and a poor economy, no matter what authority is available, the impetus for effective action is diminished.

MPO Review for TEA-21 Reauthorization by Bruce Katz et al.

"TEA-21 Reauthorization: Getting Transportation Right for Metropolitan America," Bruce Katz, Robert Puentes, and Scott Bernstein, Center on Urban and Metropolitan Policy, March 2003.

As with Anthony Downs, Katz et al. at the Center on Urban and Metropolitan Policy are not optimistic about the capabilities of MPOs to execute effective regional planning. While acknowledging federal statutes have "required transportation planning to move beyond simple mobility concerns and take into account social, economic, and environmental outcomes," he suggests much

room for improvement and daunting barriers. Some findings of importance to a road pricing planning framework include:

States wield considerable power in planning for congested regions: Katz et al. find, "Although ISTEA and TEA-21 were designed to move transportation decision making out of the back rooms and board rooms of the highway establishment, many state DOTs still wield considerable formal and informal power, and retain authority over substantial state transportation funds." And, "the reality is that the state receives and manages all the federal transportation money, as well as large amounts of state transportation money and the state political leverage is far greater than the MPO's." Katz et al. urge, "Congress should require that financially constrained state transportation plans incorporate locally defined metropolitan priorities." Whatever the balance or imbalance of power between state and regional entities, the Katz et al. conclusion points to the importance of state roles in envisioning, planning, and implementing road pricing in state plans and collaborative plans with regions and localities.

Planning capacity is uneven across MPOs: As with Downs, Katz et al. find capacity needed to evaluate complex and relatively new concepts such as road pricing may be limited at many MPOs. Katz et al. conclude, "MPOs in places as diverse as Albany, Dallas, Hartford, Minneapolis, San Francisco, and Seattle are strong players in their regions and maximize their responsibilities in an effective way. These entities have built up the expertise of their staff to carry out the responsibilities of the new federal law. Yet other MPOs, particularly in smaller areas, struggle. . . . Many lack adequate staff and financial resources. A recent analysis, for example, found that 58 percent of small MPOs (those representing populations of less than 200,000) cannot perform basic transportation modeling or forecasting." Planning guidance and support needs to be tailored to such uneven capacity.

Planning progress indicators needed: Katz et al. recommend requiring both regional and state planning agencies "maintain information systems that annually measure progress on indicators of national significance. These indicators might include mitigating congestion, improving public health, improving air quality, lowering transportation costs, and expanding transportation options for target groups (such as the elderly or low income workers). The law should also require transportation agencies to set annual performance objectives in each of these critical areas. As with disclosure of spending decisions, agency performance objectives (and progress towards meeting those goals) should be shared with the general public in an accessible manner." The recommendation is general but implies incorporating specific and publicly available performance measures and feedback systems around planning and implementing road pricing.

Continue and enhance support for road pricing planning and implementation: Katz et al. recommend much increased funding for the Value Pricing Program which includes both demonstration support and technical assistance. Apparently the authors believe local and state planning for road pricing should be augmented by federal assistance not simply left to develop with only federal guidance.

Decision-Making Framework for Pricing Decisions

"Improved Framework and Tools for Highway Pricing Decisions, Draft Final Report Volume I: Decision-Making Framework for Highway Pricing Decisions," NCHRP Project 08-57, Prepared by Parsons Brinckerhoff, Inc., July 2008.

In a review of planning for road pricing projects, Parsons Brinckerhoff, Inc. (PB) recommends four phases in the planning of road pricing projects: (1) exploration, (2) option development, (3) feasibility assessment, and (4) investment or finance study. PB indicates the phases follow

traditional transportation planning. However, some findings and recommendations of relevance to a road pricing planning framework are:

Finance phase of planning deserves special attention: PB indicates the investment and finance phase of study for road pricing while common to many transportation planning activities entails unique tasks. For projects financed by debt-backed proceeds for future tolls, an "Investment Grade Study" is needed to finalize funding arrangements in a "Financial Plan," the formal document that details a project's cost estimate, revenue structure and financial resources. Projects not relying upon debt finance based on future tolls do not require this step but still require detailed finance analysis.

Planning can and should proceed either by project or comprehensively: Echoing the opportunistic approach to planning offered by Downs, PB suggests "two broad approaches may be used to initiate and assess tolling and pricing," including a comprehensive approach going through the four phases identified or a project approach focusing on a specific corridor or area. As PB notes, both approaches "are valid" and, "this research effort demonstrates that a flexible decision-making framework is likely to incorporate both approaches, capitalizing on their respective strengths" and tailored to reflect "regional transportation needs, institutional arrangements, and politics." Examples of comprehensive approaches are cited in the San Francisco Bay Area, Washington State, Colorado, Atlanta, and Texas.

Road pricing planning tends to evolve from projects to regional assessments with two main agencies leading the way: PB finds, "Many regions begin their experience with pricing as a result of low hanging fruit situations where there is a clear logic behind the use of tolls on a new or existing facility. If pricing is implemented successfully . . . a region may consider embarking on a comprehensive assessment of pricing in other settings, with subsequent projects moving forward for further assessment as a result." Furthermore, PB finds road pricing planning may be led by a single agency or more, with state DOTs and the MPOs the main players.

Planning for pricing should match types of pricing to goals and contexts: PB proposes road pricing planning should match up types of pricing options with appropriate goals and contexts. PB suggests HOT conversions, existing tollways, new facilities, and other concepts are best suited to varying goals and conditions and a planning approach needs to select concepts accordingly. Likewise the exact form of pricing needs to match the congestion problem.

Environmental review procedures and timing may vary by location and "significance": PB notes environmental reviews as part of road pricing planning vary with state law and custom, suggesting planning guidance needs to be flexible on the subject. It notes, "In certain cases, the consideration of tolling and pricing may be introduced while the environmental process is underway or even after it has been completed. At a minimum, this change would require a reevaluation of the analyses completed. The level of detail of the reevaluation depends on the circumstances surrounding the particular project. In situations where the introduction of tolling and pricing is determined to be 'significant,' a supplemental environmental impact statement must be prepared."

Modeling is an important and demanding task in pricing planning: PB finds planning for road pricing is an "intense endeavor" given "behavioral models must consider both tolled and non-tolled alternatives, as well as multiple tolling scenarios. Standards can be particularly high when private sector investment is involved (to meet bonding requirements)."

Planning must account for legal and legislative matters: PB notes an important stepping stone in the planning process is assessing legal and legislative requirements. Planning will vary depending in large measure on federal aid to facilities. PB notes, "State and local jurisdictions have the greatest flexibility to implement tolling and pricing on local roads and highways that have been, or will be built without federal funding. Greater restrictions apply when tolling and pricing are used on the Federal Aid Highway System, or on HOV lanes or busways funded with transit monies. As a

result of these restrictions, the vast majority of tolling and pricing projects implemented over the past 50 years have involved either new state or county toll roads or the expansion of pre-existing toll facilities that have been incorporated into the Interstate Highway System." Likewise, "Various state and local authorities are also needed to implement tolling and pricing projects. Local legal requirements are dictated by state and local statutes and regulations, as well as pricing and toll collection policies and mechanisms used to raise financing. Policy makers interested in pursuing tolling and pricing projects should consult with legal experts to identify the specific requirements that would apply in their regions."

Key screening criteria in planning: PB enumerates several planning screening criteria important to consider in planning road pricing including:

- Congestion relief potential
- Consistency with state and regional plan goals
- Ability to improve the efficiency of the regional transportation network
- Public acceptance
- Institutional feasibility
- Safety impacts
- Order-of-magnitude construction cost
- Revenue generation potential
- Financial viability

Federal Interim Guidebooks and Briefing Book

"An Interim Guidebook on the Congestion Management Process in Metropolitan Transportation Planning," FHWA and FTA, FHWA-HOP-08-008, February 2008.

"Management & Operations in the Metropolitan Transportation Plan: A Guidebook for Creating an Objectives-Driven, Performance-Based Approach," FHWA and FTA, FHWA-HOP-08-007, February 2008.

"The Transportation Planning Process: Key Issues, A Briefing Book for Transportation Decision Makers, Officials and Staff," FHWA and FTA, FHWA-HEP-07-039, Updated September 2007.

Federal planning regulations and guidance are important to devising any planning framework and directly bear on how regional and state planners conduct transportation planning. FHWA and FTA have developed a briefing book that summarizes the transportation planning process and two interim guidebooks that address the integration of management & operations and the congestion management process in metropolitan transportation planning. FHWA and FTA are currently in the process of developing final guidebooks on advancing planning for operations and the CMP. These guidebooks and resources are intended to help provide assistance in effectively carrying out federal planning requirements. Some key items from existing published materials relevant to a road pricing planning framework are:

Planning timelines and agency roles are specified: As the briefing book shows, MPOs handle three plans with specified update terms:

- The MTP or Metropolitan Transportation Plan has 5-year updates except in non-attainment areas where it is every 4 years.
- The Transportation Improvement Program or TIP (approved capital or "investment" projects—all projects with federal funds must be in here) is done every 4 years. Likewise, for states, the STIP is updated every 4 years.

- Only the Unified Planning Work Program or UPWP is done annually and it focuses on planning studies, not goals, strategies or investments as the other two plans do.

Thus, if a RP proposal arises through the planning process, it will be bound by these timelines to come to fruition. Or if it comes from outside the planning process, say from a demonstration or pilot program application, it may have to get "adopted" into the appropriate plan, which may or may not cause delay in the anticipated project development timing.

However, pricing projects as with all projects can enter into regional plans outside these cycles via amendments. The briefing book acknowledges the issue of constant changes in projects getting incorporated into the TIP: "Amendments to the TIP can be common given the frequent changes in engineering practices, environmental issues, contracting issues, project readiness, and other factors that can require adjustments to project schedules and budgets."

What is required versus advised: Knowing what is required versus advised in regional and state planning is vital to developing any new planning framework recommendations. One key requirement is for the MPOs (or CMA in places like California) in TMAs (areas over 200,000 in population or designated same by a governor) to have a congestion management process involving "travel demand" and "operational strategies." The Secretary of Transportation has authority to hold up 20% of "funds attributable to the MPO" if the metropolitan planning process of an MPO serving as a TMA is not certified. Moreover, MPOs in TMAs classified as non-attainment for ozone and carbon monoxide may not receive funds for any highway project that will result in a significant increase in single-occupant vehicles unless the project was addressed as part of the congestion management process.

States have latitude in defining some of MPO congestion management planning: States and MPOs are encouraged under federal law to cooperate in planning especially for state facilities within MPO planning areas. States also may legislate their own provisions for congestion management planning, as in California where an entirely separate agency from the MPO can be formed to carry out congestion management planning and perform other functions such as allocate local and state funds to projects. Unique state processes are allowed if there is a "finding" by the Secretary of Transportation that the processes are consistent with federal congestion management requirements.

Emphasis on process versus system: Under SAFETEA-LU, there is a change in emphasis from a congestion management "system" to a congestion management "process" that is intended to be fully integrated into the metropolitan transportation planning process, rather than a stand-alone data collection and analysis system. As the CMP guidebook states, "The change in name (and acronym) is intended to be a substantive change in perspective and practice, to address congestion management through a process that provides for effective management and operations, an enhanced linkage to the planning process, and to the environmental review process, based on cooperatively developed travel demand reduction and operational management strategies as well as capacity increases." The emphasis is on performance-based planning to tackle congestion, with specific goals and performance measures, and an emphasis on management and operations of the system and demand management where road pricing may apply, as opposed to simply capital facility planning. Another goal is to ensure planning dovetails with air quality planning to avoid duplication. All such emphasis should support attention to road pricing.

Federal guidance updates are ongoing: The CMP guidebook says, "It is also important to recognize the connections between the development of this guidebook and other, concurrent efforts. FHWA/FTA is also currently undertaking the development of a guidebook for management and operations in the planning process; documenting and assessing various analysis tools with applications to transportation systems management and operations; and cataloguing resources available for statewide transportation planning."

Road pricing mention in guidance: In the CMP guidebook (page 2-3), when "operational strategies" are mentioned, they are called "management and operations" and road pricing is not mentioned as one of them in the upfront discussion. While language appears relevant to road pricing such as "mode shift" and change in "travel time," there is no specific mention of road pricing as there is with "ramp metering" and "traffic signal coordination" and "travel info." However, pricing is mentioned in the guidebook on page 3-2: "demand management measures, including growth management and congestion pricing." Road pricing also appears on page 3-8: "congestion pricing strategies, including high occupancy toll (HOT) lanes"; "pricing fees for the use of travel lanes by the number of persons in the vehicle and the time-of-day"; and "pricing fees for parking spaces by the number of persons in the vehicle, the time-of-day or location." While more explicit mention of pricing would aid in attention to it, road pricing certainly fits with example "performance measures" named such as "delay," "person throughput," and "transit on time performance." Likewise, the briefing book mentions "systems management and operations," and road pricing might be deduced from the language "pricing of transportation services" (page 47) under that heading. However, much more play is given to ITS, signal coordination, incident management and other classic "TSM" strategies. Attention to pricing might be boosted by explicit reference here and elsewhere in the document.

Guidance on non-attainment strategies related to road pricing: An obvious nexus between road pricing and air quality planning requirements occurs when new capacity is added in non-attainment areas. As mentioned above, non-attainment areas require special CMP planning, as specified in the guidebook:

> "SAFETEA-LU requires that 'for transportation management areas classified as nonattainment for ozone or carbon monoxide pursuant to the Clean Air Act, Federal funds may not be advanced in such area for any highway project that will result in a significant increase in the carrying capacity for single-occupant vehicles unless the project is addressed through a congestion management process.' While capacity-expanding projects are not prohibited, the CMP requirement means that the MPO must consider alternatives to capacity increases. . . ."

Guidance on conformity: The briefing book also makes evident the importance of air quality "conformity" in regional planning, with mention of transportation control measures (TCMs) as a means to attain conformity. Road pricing planning certainly has a potential in TCM planning. The regulatory process underlying conformity is set out: "Transportation conformity on transportation plans and TIPs is demonstrated when projected regional emissions for the plan and TIP do not exceed the region's motor vehicle emissions budgets. A conformity determination is a finding by the MPO policy board, and subsequently by FHWA and FTA, that the transportation plan and TIP meet the conformity requirements." The conformity finding must be made every 4 years.

NEPA guidance and road pricing: The CMP guidebook suggests a linkage between NEPA and CMP strategies, with road pricing potentially included, might occur at the regional level voluntarily. The guidebook points to MARC in Kansas City where the agency has developed policy ensuring NEPA studies incorporate a CMS "Toolbox" developed by the agency. The guidebook states on page 4-7, "MARC adopted a policy that its CMS Toolbox of strategies would be considered when the purpose and need for an environmental study includes congestion management." While the MARC toolbox does not mention road pricing as a distinct strategy, it could be considered under TDM, and parking pricing could appear under parking strategies. Another important consideration in NEPA analysis of road pricing is the level of scrutiny required, which depends on the level of impact of a project. A project does not need to have an Environmental Impact Statement prepared if it receives a Categorical Exclusion (CE)—which applies to projects that have no significant environmental impacts—or a Finding of No Significant Impact (FONSI) from an environmental assessment. Exemption from conducting a full environmental impact review might be possible for pricing projects on existing facilities with limited impacts on travel patterns or where air quality benefits are very likely.

Financial planning fit with road pricing: The briefing book makes evident the role of financial planning in the MTP and points to the importance of any planning framework linking road pricing to financial planning requirements and processes. Road pricing could be considered as "user charges" and used as a revenue source to develop the fiscally constrained MTP:

> "The metropolitan transportation plan, which has a 20-year planning horizon, must include a financial plan that estimates how much funding will be needed to implement recommended improvements, as well as operate and maintain the system as a whole, over the life of the plan. This includes information on how the MPO reasonably expects to fund the projects included in the plan, including anticipated revenues from FHWA and FTA, state government, regional or local sources, the private sector, and user charges. The metropolitan transportation plan must demonstrate that there is a balance between the expected revenue sources for transportation investments and the estimated costs of the projects and programs described in the plan. In other words, a metropolitan plan must be fiscally (or financially) constrained."

The appendix of regulations (page C-2) reiterates the balance point: "The metropolitan transportation plan, TIP, and STIP include sufficient financial information for demonstrating that projects in the metropolitan transportation plan, TIP, and STIP can be implemented using committed, available, or reasonably available revenue sources, with reasonable assurance that the Federally supported transportation system is being adequately operated and maintained."

Strategic Highway Research Program 2 Project C01

Project C01 under the SHRP 2 "capacity" focus area, being undertaken by ICF International, is devising a collaborative decision-making framework for key decision points in various phases of the transportation decision-making process. The CDMF is useful for identifying possible points for road pricing to enter planning and project-level decision making. The framework is derived from about 25 detailed case studies of transportation projects and the decision-making processes that led to their adoption. For each decision point, detailed information is available regarding the stakeholders involved, roles of government agencies, interactions between actors, issues typically considered, and analytical methods and data used to make decisions. The C01 framework covers four phases of transportation decision making:

- Long-range transportation planning—with inputs from CMP
- Programming
- Corridor planning
- Environmental review and permitting

For purposes of considering a planning framework for this project, some key findings include:

Long-range planning points for road pricing: Road pricing may be considered at several steps in the long-range planning process. Early steps lay out the scope of the metropolitan transportation plan including regional objectives such as sustainability, improving system efficiency, air quality, and so on. The congestion management process may be considered a sub-process that feeds into the MTP at steps where transportation deficiencies in the region are acknowledged and where alternatives such as pricing and demand management strategies are considered and prioritized. The CMP can also be the impetus for initiating corridor studies or major investment studies in areas where congestion is greatest, and for identifying potential congestion-relief solutions such as road pricing. Road pricing can be brought into the MTP at steps where strategies are proposed and approved either directly or via the CMP. If road pricing comes up as an opportunity outside of the planning process after an approved MTP is in place, there are two ways to integrate it: (1) hold it until the next plan update, test the strategy, and get approval or (2) issue an amendment to the MTP.

Programming points for road pricing: Programming involves the commitment of funding to particular projects from the MTP over a period of several years. Road pricing has potential for balancing project needs with funding requirements not only in the development phase but ongoing.

Corridor planning points for road pricing: Corridor planning offers good potential for attention to road pricing because it is specific by area and by level of analysis. However, any planning framework incorporating points for road pricing needs to take into account that corridor planning is not a legally required process and therefore is less susceptible to required procedures and strong guidance. Another important point for corridor planning is that the level of planning detail is at the level required for environmental review, so that both planning and environmental analysis for a road pricing might be done simultaneously, thereby shortening development and implementation time.

Environmental review points for road pricing: The C01 project suggests at least two potential paths for road pricing under environmental review. When a road pricing project involves significant new capacity and thereby the potential for causing significant environmental impacts, an extensive environmental review process may be required via an EIS. The environmental review process could be necessary either for compliance with NEPA at the federal level or for a state-level environmental review required by law in some states. Another path, as the review of federal guidance above suggests, may be lesser reviews or an exemption, particularly for pricing projects on existing facilities, where trip reduction and air quality benefits are clear cut and where revenues support auto use alternatives.

APPENDIX B

Literature Review on Road Pricing Acceptability, Communication, and Engagement

Overview

Communicating with various affected parties and stakeholders in planning for road pricing (RP) is vital to acceptable, effective, and lasting programs. Certainly, decision makers authorizing proposals need to understand the objectives, the efficacy of pricing, equity considerations, overall costs and benefits, operations, revenue distribution, or other particulars for them to give their support. Likewise, affected parties such as travelers, residents, businesses, and other stakeholders likely to influence decision makers also must understand pricing strategies and their expected impacts for acceptable projects to develop.

However, communication should not be viewed simply as a matter of conveying pricing concepts to maximize understanding or counter misconceptions. For maximizing chances of successful road pricing proposals and projects, communication needs to be seen as only one part of a broader engagement process between planners, public officials, decision makers, affected parties, and stakeholders active in the development of RP proposals. Rather than simply putting out information, communication seen as part of engagement aims to uncover most resonant problems pricing can address, assess concerns and objections, and modify pricing proposals accordingly. Communication in this context is hardly short term. It becomes part of an ongoing and open, responsive, and committed process and posture through planning, clearances, and adoption and on to implementation and operations. In short, communication involves much more than understandable messages and the specific content of typical communication and information vehicles such as websites, newsletters, press releases, or talking points.

The important role of the communication process at all stages of engagement and development of pricing proposals and projects has been the subject of considerable study under the general heading of acceptability research. Relevant research can be divided into the *content* and *context* of road pricing communication and engagement. Whether communication *vehicles* are press releases, public forums, newsletters, websites, charrettes, community forums, or other means, acceptability of pricing proposals and successful implementation hinges on how the numerous *content* and *context* issues are addressed:

Content of Communication:

- The pricing concept put forth (e.g., HOT lanes, areawide pricing, VMT pricing, or other solutions)
- Program design particulars selected and presented including travel options for various traveler groups and revenue distribution
- The framing of fairness and plans for revenue distribution as part of the program design
- The severity of congestion addressed and potential effects of pricing on congestion, traffic, and air quality

Context of Communication:

- Mix of affected parties and interest groups, how their positions are assessed and addressed in planning and communication
- Familiarity with proven programs; if and how such programs are referenced in planning
- Image of planning agencies regarding responsibility for congestion and ability to carry out plans

Content of Road Pricing Communication

Type of Pricing

The importance of content is addressed in probably the most comprehensive and current research on road pricing acceptability: *NCHRP Synthesis of Highway Practice 377: Compilation of Public Opinion Data on Tolls and Road Pricing* (Zmud and Arce, 2008)—hereafter referred to as the Synthesis report. Focusing primarily on the United States, the study is based on public polls and surveys conducted since 2000. Additionally, the study references focus group information and literature. The poll sampling was arrived at from literature searches as well as a survey of 42 agencies (17 responding) in the United States. A key finding is that the specific pricing concept can make or break support. Aggregate public support was 73% for HOT lanes (variable-priced HOV lanes), 71% for traditional toll roads (usually flat or distance-based fee), and 62% for express toll lanes (lanes separated from main lanes and variably priced). For cordon pricing, support was only 32% and there was no support for the private sector to construct or rehabilitate a public toll facility in exchange for rights to the future toll revenues (pricing usually variable). Some of the newest pricing concepts also did not fare well, such as a per-household highway access fee and a mileage fee. Focus group participants in Washington State were apprehensive about a mileage-based system using global positioning systems and cell phone technology. Clearly, much depends on the specific pricing concept communicated.

The importance of the kind of pricing planned and communicated is buttressed in a review of road pricing public polls prior to those assessed in the Synthesis report. A 1997 research article reviewing 13 years of U.S. and London public opinion polls (Higgins, 1997) found majority support for HOT lanes and priced new lanes, but less than majority support for pricing existing lanes. Naming specific facilities versus a generalized approach (e.g., "charging drivers to enter busy city centers") also increased acceptability, just as found in the Synthesis report where "general issue polls" rendered mixed support or majority opposition versus the majority support received for specific projects (e.g., SR-91, I-15 and I-394).

Program Design and Revenues

Both the Synthesis report and 1997 review underscore not only the importance of the pricing concept but also how it dovetails with a total program including revenue expenditures. The 1997 review of polls shows adding preferential treatment for carpoolers and removing an unpopular policy (ramp meters in one instance) contributed to increased acceptability, as did revenues devoted to transit expansion, maintenance of the priced facility, discounts for low-income drivers or offsets to tax cuts. The Synthesis report also indicates higher support when revenues support highways, speed construction, or improve public transit. Focus groups in Washington State favored revenues devoted to transportation as opposed to general government purposes. A proposal for New York City received higher support when revenues helped dampen increased transit fares and tunnel tolls.

An important program design element is not only alternatives to driving but non-priced driving alternatives. A review contrasting successful pricing programs in California to an ill-fated San Francisco Bay Bridge proposal concludes no "comparable alternative free routes" for

drivers was crucial to the demise of the proposal (Evans et al., 2007). More generally, research shows the acceptability of various "green" initiatives such as cap-and-trade emissions schemes or variable pricing in home energy meters depends on giving companies and consumers a choice between the pricing system and other options (Thaler and Sunstein, 2009).

Overseas research confirms the importance of specific program design elements in RP proposals. Studies by Ittner et al. (2003) of 369 respondents in Trier, Germany, and of 313 respondents nationwide find strong sensitivity to compliance and fear of "free riders" with implications for emphasis on enforcement strategies. Ison (1993) in interviews with decision makers around a proposed Cambridge scheme, finds simplicity in technology preferred to the more complex. Burris et al. (2007) hit upon simplicity too in reviewing early California HOT lane projects. They find, for SR-91, "a fixed toll schedule was more acceptable because people tend to 'fear the unknown.' " Likewise, Jaensirisak et al. (2005) did assessments in London and Leeds and found acceptability hinges on limited rather than expansive areawide schemes, fixed rather than dynamic pricing, and fees under certain limits. In a survey of German residents, Holzer (2003) finds the importance of pricing designed as a means to investment is not an end in itself. Jones (2002) emphasizes selective exceptions, targeted pricing to groups and trips least likely to raise hardship concerns, upfront improvements in alternative modes, and attention to boundary effects (traffic and parking diversion).

The pivotal role of revenues in RP programs is affirmed in much overseas research. Tretvik et al. (2003) examined city resident reactions after implementation of pricing in Oslo through an annual telephone survey. They find the most important reason for support was revenues devoted to road construction and observe the same support in Trondheim is largely due to funds for transportation improvements. Jones (2002) shows support for road pricing in early London surveys hinges on support for better public transport. He echoes the findings by Tretvik et al. in concluding that the emphasis on revenue for improved transportation versus traffic reduction was vital in Norway. Not all research points to the use of revenues for transit or road improvements. Vrtic et al. (2007) find a return of revenues to all Swiss residents competes with transit investment for high preference. Link's work (2003a, b) across European countries shows policymakers preferring revenues for general tax reductions, and car users preferring revenues for roads and transit, but closely followed by reductions in income taxes. Confirming the importance of revenue distribution, Link finds acceptability to be "largely determined" by use of revenues in the two countries among his sample.

Clearly, developing elements of an RP plan around acceptability concerns is important for eventual adoption and implementation. But equally important is ensuring that the key elements are underscored and understood. Researchers (Ungemah and Tighe, 2005) assessing opinions about a proposed HOT lane on I-25 in Denver found that simply reminding respondents about transit and carpool services as toll alternatives boosted support by 12%. Even where programs are up and running, the public may need repeated information to ensure understanding of program elements. For example, in a survey about Houston's I-10 HOT lanes, researchers found half of all non-users were not aware of pricing program elements ("QuickRide") or were misinformed about how they worked (Burris et al., 2007).

Fairness and Equity

While income equity is the focus in much road pricing literature, the literature treats income equity as one of many fairness issues bearing on the acceptability of road pricing. The literature suggests just as road pricing may be perceived as unfair to lower income travelers, it also may be perceived as unfair in other ways to other groups of affected parties. Thus, from the standpoint of the literature and the importance of how RP is communicated and received, income equity is a subset of many important fairness perceptions.

The broad set of fairness issues important to acceptability includes how RP is perceived to affect travelers, taxpayers, urban versus rural residents, as well as how the planning and execution of road pricing takes place. The Synthesis report referenced above indicates focus groups in the New York and New Jersey area and in Miami believed peak pricing is unfair to commuters versus other travelers. In the 1997 review of polls mentioned above, fairness issues arose around workers requiring day use of vehicles, those working fixed work schedules, and those making long versus short trips. With respect to taxpayers, the Synthesis report referenced San Diego focus groups concerned with having to "pay twice" for using a facility constructed using traditional taxes. The authors surmise that the double pay issue is why public polls generally find more support for tolling new facilities rather than existing ones. Vrtic et al. (2007) find variation in the acceptability of pricing options by rural versus city residence and by city size. Such "spatial" equity issues arose in development of the London areawide program, and in plans or a similar scheme in New York. In New York, concerns were raised about how some commuters in the region would pay little or nothing in congestion fees due to a toll offset provision while others would pay the full fee (Schaller, 2010). About the fairness of planning and execution, Schade (2004) discusses the importance of whether or not people feel full opportunity to participate in developing pricing plans, what might be termed "procedural" fairness. Already mentioned is the finding by Ittner et al. (2003) on the importance of perceptions about the degree of potential or actual evasion of tolls, seen as unfair to honest payers.

Where the literature addresses income equity, it is found to be secondary to other fairness concerns. The Synthesis report review of polls in San Diego, Los Angeles, and Minneapolis shows support for pricing proposals was either higher among low-income respondents or unrelated to income; nor did tax credits or toll discounts for low-income people meet with much support. Schade (2004) for OECD reviews several European studies to find income is not strongly related to acceptance of road pricing proposals. In a four-city review, Schade and Schlag (2002) find the acceptance of potential pricing schemes varied, but not by income. Vrtic et al. (2007) come to the same conclusion. Reviewing findings from the Netherlands, Jaensirisak et al. (2005) find no relation between acceptance and income.

While the preponderance of acceptability literature indicates income equity generally is secondary in importance to other equity issues, income equity issues often do arise around pricing plans. Pricing plans have encountered criticism as potential "Lexus lanes" catering to the rich and unfair burdens on the poor who may not have credit card accounts needed for transponder purchase (FHWA, 2008). Still, to the extent acceptability of pricing on income equity grounds is informed by research, analysis indicates income equity impacts depend entirely on how pricing programs are structured. For example, a recent comprehensive Rand report (Ecola and Light, 2009) on pricing equity finds progressive schemes can be constructed depending on how revenues are distributed and the presence of non-toll options (as with HOT lanes). The authors also point out road pricing compares favorably to traditional transportation taxation such as regressive gasoline and sales taxes.

The literature also addresses how various fairness concerns may be moderated. The Synthesis report finds concerns about fairness to commuters are moderated by available alternative highway and transit facilities, echoing Downs (2004) who suggests providing "tolling and non-tolling options" in the same corridor to moderate equity concerns. Jones (2002) suggests several ways to enhance perceptions of fairness in road pricing plans and projects. He suggests exempting the handicapped or emergency workers. He also urges attention to "use inequity" where occasional payers reap the same benefit from new roads and transit as frequent users; and "spatial inequity" depending on travel within or to/from a cordon pricing scheme. He points to Norway policies defining a period in which only one charge is made irrespective of the crossings; limits on the number of charged crossings per month; season tickets and allowances for unlimited use in certain periods.

Nature, Severity of Congestion and Pricing Effectiveness

Another issue integral to the content of RP proposals is how the proposal addresses and communicates the nature and severity of the problems underlying the proposal. Some research suggests travelers may not understand causes of congestion which may disadvantage pricing as a solution option. Survey and focus group research across Texas (Kockelman et al., 2006) found, "Several fundamental sources of traffic congestion (such as population growth and inadequacy of gas tax revenues) do not appear to be common knowledge." Jones (2002) in a review of "typical UK findings" finds the problem (traffic, air quality, etc.) must be seen as clear and severe before the pricing solution can be entertained. He puts the point well saying the "pain" must be worth the gain.

A corollary finding is congestion may or may not be the most critical candidate problem for pricing. In some settings, the more resonant problem for pricing to address may be pollution. As Schade (2004) for OECD finds in a review of several European studies, as well as Bamberg and Rolle (2003) and Ison (1993), groups sensitive to environmental problems may be more accepting of pricing than groups more sensitive to congestion. In a review of both overseas and recent polling in several U.S. cities (Atlanta, Washington D.C., and New York City), Odioso and Smith (2009) also conclude acceptance may be boosted by ties to environmental concerns: "The research results suggest that officials should focus on the environmental benefits of congestion charging because of increased advocacy for environmental protection measures."

Just as the problem communicated must resonate, so must the promise of pricing to address it. In a review of acceptability studies for OECD, Schade (2004) finds acceptance is dependent on perceptions about how effective pricing may be, and such perceptions vary considerably. Vrtic et al. (2007) in their study of Swiss residents find acceptance strongly correlated with increasing effectiveness of proposed plans, in this case increased speeds. Bamberg and Rolle (2003) in mail-back surveys of 5,000 people in two medium-sized German towns and two villages concluded perceived effectiveness "central" to acceptability. Jaensirisak et al. (2003) find the same result from reviewing experience in the Netherlands as does Link (2003a) in a broad sample. His study included 104 stakeholder interviews among planners, including interest groups and decision makers in nine European countries, focus groups with the general public in three European countries, a Delphi survey in five European countries, as well as an extensive quantitative survey of public attitudes in six European countries (1,300 individuals).

Of course, while effectiveness of pricing is important to acceptability, convincingly conveying traffic impact information may not be easy. A review of successful and failed pricing projects in California (Evans et al., 2007) shows various affected parties consider travel time savings from reduced traffic to be a believable potential benefit of pricing. However, few believe pricing also may offer better throughput compared to free parallel alternatives. The researchers do not assess how beliefs about throughput bear on acceptability, but given the above findings about the importance to acceptability of beliefs about effects of pricing on traffic, clear and credible explanations about such effects must be important. While conveying information about traffic and pricing effectiveness may not be easy, there is some evidence that detailed and concise information about both can move opinion. Focus groups in Texas found detailed messages about pricing impacts on traffic and comparisons to gas taxes on grounds of equity and revenue to be persuasive (Kockelman et al., 2006).

Context of Road Pricing Communication

Affected Parties, Decision Makers, and Interest Groups

Perhaps the most important context for RP plans is the mix of potentially affected parties associated with a proposed plan. Because decision makers, travelers, voters, residents, and the public

at large are likely to perceive road pricing plans differently, assessing their positions, fashioning plans accordingly, and reaching out to these parties with tailored communications are important to successful plans.

Relevant affected parties may be a broad or narrow set. Where a plan requires an initiative or legislation and affects an entire city, region, or state, the voting public within a jurisdiction are relevant affected parties. Where a plan is more narrow and requires no public vote, the most relevant parties for clearance may be a smaller set of residents and businesses within the planned priced zone; travelers to, from, and within it; and decision makers for the jurisdiction. To date, research on engaging and assessing positions of affected parties has focused mostly on public and travelers. Less attention has been paid to decision makers or specific interest groups such as businesses and truckers.

While research on decision-maker positions is thin, results show they can be important to the fate of RP proposals and plans. Ison (1993) in a study of a proposed scheme for Cambridge, England, interviewed 21 officials in city, county, and district councils and found the retirement of a single political champion was a major—or perhaps even *the* major—detriment to a planned program. A review of road pricing developments in England convincingly details how strong or weak advocates among politicians and agency officials can speed or retard pricing plans (Richards, 2008). For the I-394 HOT lane program in Minnesota, researchers concluded, "It is difficult to maximize public outreach efforts without the support of higher-level officials who share their advocacy with the public. Minnesota's governor participated in conversations with value pricing advocates." Researchers go on to advocate for a "grasstops" approach emphasizing communication with community leaders and decision makers (Burris et al., 2007). However, decision-maker champions and opponents are not always so paramount in the development of road pricing projects. A review of successful and failed pricing projects in California concludes decision makers played strong and visible roles in two of the four cases reviewed. In the case of I-15, a policymaker was the key champion; in the demise of the Bay Bridge project, a few powerful legislators were instrumental. However, in two other cases (SR-91 and I-680), policymakers did not play such crucial roles in support or opposition (Evans et al., 2007). Successful proposals emerged mostly from agency actors working with stakeholder groups, with decision makers in much less visible or active roles.

To the extent decision makers are important, their perspectives on pricing need to be understood. The above research on California programs concludes, "Most of those who were interviewed believed the advantage elected officials see in road pricing is its revenue raising potential." The researchers conclude decision makers may "find returning revenues to nearby transportation most palatable." Likewise, an important point for the governor, lieutenant governor, and legislators supporting and eventually passing enabling legislation for the I-394 HOT lane project in Minnesota was a revenue stream sufficient to match the development and operating costs of converting an HOV lane to HOT. The favorable cost–revenue picture apparently was especially important to decision makers due to tight revenues for any highway modifications or expansions combined with the government promise of no new taxes (Buckeye and Munnich, 2007b).

Of course travelers are a paramount affected party, and each segment of this group is likely to hold different perspectives bearing on development and communication of plans. For example, statewide surveys and focus groups across Texas (Kockelman et al., 2006) drew this conclusion about traveler market segments: "Logit models indicated that those who commute more than 25 miles (one-way) to work, and/or live in Austin were less likely to support conversion (tolling existing free roads). In contrast, frequent toll road users tended to be more supportive. Therefore, it may be beneficial to direct informational campaigns to those who commute long-distances, and toward Austinites, in order to increase support, since these two groups appear to be the least supportive."

Because truckers are influential parties in road and port transport policy and often concerned about toll changes (Urban Transportation Monitor, 2006), research on this segment of travelers has mounted. One notable assessment carried out telephone interviews with 1,200 California-based and national carriers (Golob and Regan, 1999). It found opposition to pricing, with about 60% judging the concept "ineffective," though no reasons were stated. The research did find either neutral reactions or some support from carriers who provide just-in-time pickups and deliveries, those with short hauls and average loads, and household goods movers. However, private fleets (typically under control of large companies and accounting for a large share of the industry) did not favor road pricing (Regan, 2000). Again, segmenting trucker groups is important—reactions to pricing hinge in good part on type of carrier.

Given the variation in perceptions and positions of affected parties, plans and communications need to be tailored accordingly to enhance acceptability and feasibility. However, negative positions do not necessarily translate to doomed or ineffective programs. Taking truckers again as an example, an assessment after implementation of road pricing suggests truckers sometimes can and do adapt to pricing aimed at shifting travel to the off-peak hours, in spite of the oft-expressed opinion that peak pricing is ineffective for truckers. For example, in the 2005 assessment by the Illinois State Highway Authority of trucker reactions to increased tolls combined with off-peak discounts, respondents indicated the inflexibility of delivery times and ability to pass on toll costs to customers as a limiting factor in making travel time shifts (K.T. Analytics, Inc. and Cambridge Systematics, Inc., 2008). The same opinion about ineffectiveness was found by the Port Authority of New York and New Jersey assessing truck dispatcher reactions to a time-of-day pricing program implemented in 2001. Truck dispatchers claimed toll increases could be passed on to customers (Zmud and Arce, 2008) with no impact on time of travel. Yet, a program at Long Beach and Los Angeles marine terminals imposing a charge of $50 per loaded container moved during peak hours resulted in a considerable shift to night deliveries (Herr, 2008). While no documented interview reactions are reported, presumably truckers have accepted the program judging by its continuance since 2005.

Success and Familiarity with Proven Programs

Successful RP programs gain in acceptance and approval with time. While public polling after implementation of road pricing programs is not as common as before, evidence shows acceptability grows and concerns diminish as successful implementation proceeds. As perception research shows (Odioso and Smith, 2009), while only 40% of Londoners supported congestion charging when it was announced, "support rose to 57% just one month after charging started. In Stockholm, only 43% were initially in favor of congestion charging, but after a six-month trial period, voters passed a referendum to continue the charging scheme." In reviewing surveys around three HOT lane projects (SR-91, I-15, and I-394), the above-referenced Synthesis report finds, "support remained high and even increased slightly" with time. Another recent review of FHWA Value Pricing programs by K.T. Analytics, Inc. and Cambridge Systematics, Inc. (2008) echoes the finding for HOT lanes, indicating, "HOT Lane conversions have encountered concerns in planning about catering to the rich, but usually these have not been sufficient to halt projects. Such concerns tend to diminish among users and the public as operations get underway." The report draws the same conclusion about tests of VMT fees, saying, "Results from variable cost experiments, as with HOT lane conversions, suggest initial concern about security and technology can change to a favorable response after sufficient time and experience."

The exact reasons for growing acceptance as road pricing programs mature are not well explored. Surveys from London (Streetsblog, 2007) suggest proven effectiveness may be central and, in the case of business support, researchers surmise businesses perceived no harm to commerce. Other research (Transport for London, 2008a; 2008b) suggests some businesses

did perceive harm in the western extension of the congestion charging zone, perhaps sufficient to cause withdrawal of the program there, though the original core program remains. Tretvik et al. (2003) speculate that not only is effectiveness at work in the growing acceptance of Norway programs, but also the absence of queues at tollgates and the visible, proven link between revenues and transportation improvements.

Once successful programs take place, then familiarity with them in and beyond the program area can aid planners in bringing forth similar pricing proposals and generating support for them. Schade (2004) finds acceptance and preference for well-known versus new pricing measures, and Ison (1993) notes that the "snowball effect" of growing program experience is important to decision makers. Reviewing a broad array of road pricing programs, Burris et al. (2007) conclude, "familiarity with congestion pricing or managed lanes increases the likelihood that the user will support congestion pricing." A survey of California residents found more support for HOT conversions in southern California outside of the Los Angeles region than elsewhere, concluding "This likely reflects that region's experience with HOT lanes" (Weinstein and Dill, 2007). Planners in Minnesota concluded that familiarity is important to acceptance and produced and distributed a videotape of successful HOT lanes to TV reporters and stakeholders (Munnich and Loveland, 2005). They also concluded study task force members visiting "other HOT lane and express lane projects played a critical role in increasing the task force understanding of how value pricing works" (Buckeye and Munnich, 2007a). Researchers there conclude, "People will strongly support value pricing if they see it work" (Buckeye and Munnich, 2004). Thus, growing familiarity with programs living up to promises may be key to increased acceptance over time; and, presumably, familiarity with such programs may be helpful in the planning stages of new programs, assuming planners reference them.

Perception of Government

How government and the planning process are perceived are other important contextual issues bearing on the chances of acceptance and formulation of communications. Researchers in Texas (Kockelman et al., 2006) found "clear distrust of government officials" in statewide focus groups, as well as "reservations about the planning competency of TxDOT, distrust with politicians or tax usage, and distrust with the quality of construction materials or maintenance procedures." The researchers suggest "messengers/spokespeople should come from the community at large" as opposed to politicians. Researchers analyzing the long and rocky development of I-394 HOT lanes in Minnesota suggest perhaps shifting away from a government lead in planning may have helped move the project forward. They say, "Recognizing that there is more public trust for an initiative led by an academic institution rather than a governmental agency, the Humphrey Institute at the University of Minnesota organized a Value Pricing Advisory Task Force of community stakeholders" (Ross et al., 2009). Schade (2004) finds when government, rather than individuals, is perceived as the main reason for the congestion problem acceptability suffers. Thus, presumably, if government has and can communicate a favorable image in coping with bottlenecks, improving transit, and traffic management, acceptability of pricing proposals is enhanced—and vice versa.

Suspicion about government motives in raising revenues is another image issue. A review of politics around the London areawide pricing scheme observes, "the popular press saw charging as another of Brown's stealth taxes," a reference to the familiar complaint of government as money hungry and money grabbing (Richards, 2008). Jaensirisak et al. (2005) point out that suspicion of government motives in pricing for revenue-raising purposes can block proposals and suggest a Swiss referendum process as a way to counteract suspicions. Tretvik et al. (2003) echo findings about government revenue raising. They find the main objection among opponents of the Oslo scheme was "already pay enough tax/duty," pointing to the importance of governmental image as a taxing entity with already sufficient resources to deal with congestion. Link (2003a) also found

suspicion of government motives in public surveys across nine European countries, in particular the belief that money raising may be the unstated and fundamental motive.

Link (2003a) and Ison (1993) find government transparency in planning is important. Link (2003a) cites as important the clarity of program objectives, the degree to which non-pricing options have been examined, and the extent of reference to pricing experience elsewhere (as above). Another transparency issue is how quickly and well government reveals its rationales and findings when asked hard questions. Researchers of HOT lane development in Minnesota concluded, "An unanswered question (or accusation) can become an accusation believed. Minnesota formed a public outreach team to quickly answer any questions from the public. Common public concerns included technical feasibility, equity, impact on HOV use, and public acceptance" (Burris et al., 2007). Minnesota also relied upon a task force of elected officials, citizens, and transportation leaders to ensure questions and concerns were aired and to keep planning "in tune with community concerns," avoid an unresponsive image, and help "Mn/DOT make sound decisions at key points in the process" (Buckeye and Munnich, 2007b). An observer of the rocky history behind the eventual adoption of the London scheme comes to a similar conclusion. He suggests that not mounting a constant response to criticism can create "a vacuum within which those opposed to the principle can disseminate their own interpretations," and that the chief political champion (Mayor Livingstone) was right to "keep the media and the public well-informed," and be "subject to regular and public scrutiny by the London Assembly" (Richards, 2008).

Finally, governments acting "fairly" in planning and ensuring participation in the proposed program is important to acceptability. For example, governments at various levels acting to put in their "fair share" may be important. Harsman's (2003) review of Norway's experience describes how local, state, and national governmental agreements and matching funds were an important step. Jones (2003) agrees in his review of programs in Norway. Another fairness issue for government is how procedurally "fair" the planning process appears to affected parties, as referenced above (Schade, 2004).

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APPENDIX C

Interview Guide

Topic Areas for Discussion

A. Background and Emerging Directions

The interviewer will be familiar with certain published information about Road Pricing (RP) background and history in your area. However, please anticipate discussing:

- Latest developments in road pricing (including parking pricing) plans and projects
- Emerging directions for road pricing (RP), including involved agencies and relevant stakeholders
- Recent studies for impact projections, program design, cost/revenue estimates, and attitudinal survey and focus group results
- Relationship of emerging directions in RP to current important economic and political trends
- Role of federal programs: Urban Partnerships (UPA), Express Lanes Demonstration (ELD), Congestion Reduction Demonstration (CRD); interstate tolling restrictions
- References to other contacts for information on these issues

B. Relationship of RP Developments to Planning Processes

- Is RP considered in the Metropolitan Transportation Plan (MTP), constrained long-range plan, or the air quality conformity plans for the region? If so, how?
- What prompted the emergence of RP in the region?
- The extent to which RP emerged from regional planning process via vision, goals, criteria, deficiencies, finance assumptions, versus coming from outside the planning process and incorporated via plan updates or amendments.
- What in the MTP process or other state/federal compliance processes would maximize attention to RP? Barriers and opportunities in maximizing attention to RP.
- The role of conformity or other air quality planning; the congestion management process; and federal, state or local regulations and guidelines in spurring or hindering RP development.
- Use of in-house planning guidelines or toolboxes for RP planning.
- Role of state DOT in planning of RP and relative role compared to MPO and CMA agencies.
- Nature and extent of public, stakeholder and decision-maker involvement in RP plans and proposals

C. Communication Strategies

Content

- Variations in communications content by: (1) type of pricing proposed and (2) stakeholder group targeted

- How RP was framed, objectives communicated; if/how packaged with transit; contingencies for potential negative impacts; revenue distribution plan
- Ties, if any, to environmental and funding issues for transportation and climate change action
- Treatment of equity, including broader than income terms, e.g., spatial (in/out zone), sector (business), "paying twice," occupations requiring daytime use of vehicles, those on fixed work schedules

Context

- If/how government is pitched as a resource partner working on congestion.
- If/how RP programs elsewhere were referenced and what specific cases were used.
- If/how views of stakeholders, interest groups, key decision makers for and against were assessed and taken into account toward acceptable compromises; if/how nurturing of champions and allies was done.

Vehicles

- Specific communication vehicles used to target voters, residents, businesses, other interest groups, and decision makers vital to the final passage of pricing proposals.
- Samples of perceived successful or problematic vehicles (flyers, newsletters, press releases, public hearing materials, brochures, web information, opinion/attitudinal surveys).
- For ongoing programs, customer information materials (e.g., newsletters, mailings and web information). Pros/cons of each.
- Reference to (1) active and likely responsive decision maker for follow up and (2) personnel in public relations or elsewhere directly responsible for relevant communications.

APPENDIX D

List of Interview Sites and Interviewees

Interview sites (range of programs in parentheses) and list of interview respondents:

- New York (areawide, variable pricing, new parking pricing)
- San Francisco metro area (areawide, bridge toll proposals, emerging parking pricing)
- Minnesota (HOT lane, recent and ongoing VMT fee studies)
- Washington State (VMT fees, proposed reconstructed bridge pricing)
- Oregon (VMT fees and gas tax replacement, HOT lane)
- Los Angeles metro area (emerging HOT lanes and parking pricing)
- Virginia (HOT lanes and network HOT plans)
- Washington, DC metro area (HOT lanes and HOT networks)
- Dallas (HOT lanes and HOT networks)

Table 1. Interview sites and interviewees.

Region	Respondent(s) at each site	Agency
Dallas–Fort Worth	Director of Transportation	North Central Texas Council of Governments
Los Angeles	Transportation Planning Manager	Los Angeles County Metropolitan Transportation Authority
	Project Manager and Executive Officer for the Congestion Reduction Demonstration Initiative	
	Deputy Executive Officer for Regional Communications	
Minneapolis–St. Paul	Principal Planner	Metropolitan Transportation Services, Metropolitan Council
	Senior Fellow and Director, State and Local Policy Program	Hubert Humphrey Institute of Public Affairs, University of Minnesota
San Francisco	Manager of Transportation Planning	Metropolitan Transportation Commission
	Director	San Francisco County Transportation Authority
Seattle	Transportation Manager	Puget Sound Regional Council
Washington, D.C.	Transportation Director	Metropolitan Washington Council of Governments
Maryland	Director	Maryland State Highway Administration
Oregon	Manager	Office of Innovative Partnerships and Alternative Funding, ODOT
New York	Director	Congestion Mitigation, NYCDOT
	Director of Long-Term Planning and Sustainability	Mayor's Office of Operations City of New York
	Director of Planning Studies	NYCDOT Office of Planning and Sustainability

APPENDIX E

Interview Summaries Related to Planning for Road Pricing

Table 2. San Francisco Bay Area HOT lanes—planning.

Location and Project	San Francisco Bay Area, Metropolitan Transportation Commission, Regional HOT Network
RP Emergence Factors	▪ HOT concept gaining in acceptance in Bay Area by virtue of acceptable HOT project proposals (relatively near term in 4 corridors authorized under current state law: 580 Tri Valley, 680 Sunol, 85 & 101 in Santa Clara); work of Alameda County CMA especially vital; 680 important stepping stone, deriving in large part from Alameda County CMA work and 1990 VP grant; interest emerging in some other corridors (I-80 in Solano County) but not currently authorized under state law ▪ HOT network pivots off acceptance and familiarity from individual HOTs to stitch together what was becoming piecemeal approach; also projected to bring on line new capacity 20–30 years faster than traditional state and local tax funding would allow ▪ State of economy not deterrent for near-term projects listed above, which are mostly funded through traditional sources, but may affect financing prospects for the larger network; stimulus package not playing role; greenhouse gas emissions weighs more in emergence discussions; some fear from environmental community "new highways in sheep's clothing" surrounds network; enabling legislation AB744 is still pending with discussions ongoing about the amount and timing of net revenue that may be committed to transit
RP Relation to Planning Processes	▪ MTC groundwork in studies since 2006 on operations, finance, revenues and air quality impacts helps get "ducks in order" prior to adoption into LRP, April '09, all aided by general "philosophy" at MTC dating back 20 years to encourage congestion pricing, whenever possible, and land use oriented toward transit ▪ The previous plan (adopted 2005) had network at conceptual level (last two RTPs attended to network); the network is a central focus of the current plan (adopted April 2009), with foundation set by "targets" in them for delay, CO_2; Performance Measurement report supplemental to MTP sets out measures key to pricing justification ▪ Important part of plan are "principals" adopted with plan for corridor investment focus, revenue back to source, maximum use of existing right of way, best technology, common system of marketing and branding to encourage uniformity ▪ Corridor studies now next step to specify exact configurations, cost/revenue picture, operations
Role of Air Quality, CMP, Planning Regulation and Guidance for RP Plan	▪ "Air quality planning" refers to general work behind the regional plan where pricing generally supports air quality goals; "conformity analysis" refers to specific analysis prescribed by Fed for region as non-attainment area showing funded projects getting into TIP are not increasing pollutants beyond "emission budget"; HOTs as they are funded become part of conformity analysis; air quality planning is not a difficult process, but conformity is much more demanding and time consuming

Table 2. (Continued).

Location and Project	San Francisco Bay Area, Metropolitan Transportation Commission, Regional HOT Network
	▪ Air quality planning not a problem thus far for getting planned HOT network into RTP; projected air quality impacts for network: CO emissions estimated reduced 10 million tons over 40 years compared to regular HOV network; HOT gives better speeds with CO_2 and NO_X benefits, also better because transit can move without congestion ▪ As new HOTs are developed corridor by corridor, they will require environmental analysis; so far, for 680 HOT (under construction) and I-580 HOT (entering advanced planning and environmental review), environmental review not a problem (CMAs taking lead)
Role of State DOT vs. MPOs in RP	▪ Caltrans one of the key actors on HOT Executive Committee vital to formulation and agreement on principles for HOT network (others include CMA Directors, BATA—toll authority collecting bridge tolls in Bay Area, and CHP) ▪ Caltrans major concern and point of influence has been on design issues of merging, ingress, and egress issues and still has operational (mostly weaving) concerns; currently wants to separate acceleration and deceleration lanes with no mixing in general purpose lanes, increasing freeway footprint, costs and development time which MTC does not favor ▪ Caltrans may have a HOT "business plan" mandating level of service C as minimum for HOTs in state
Role of Federal Government in RP	▪ No barriers via tolling interstate restrictions for network development ▪ Planning guidance from Fed less helpful than best practices studies and documents, and "excellent" pilot program ▪ Federal certification process has not been issue for developing pricing plans, either pro or con; process is "big sleeper"
Public, Stakeholder Involvement in RP Plans	▪ HOT Executive Committee of stakeholders vital to formulation and agreement on terms: CMA Directors, BATA (toll authority collecting bridge tolls in Bay Area), Caltrans and CHP. ▪ No other stakeholders on Executive Committee, for example auto, truck, environmental interests, cities; anticipate these will be involved for each corridor as specific plans emerge ▪ Steve Heminger as Director of MTC has been key champion on pricing for years ▪ Main negotiating issue and stick point among Executive Working Group stakeholders included CMAs taking lead role in allocating revenue returns to HOT corridor improvements and added transit to provide good auto alternative; key elected officials from Alameda and Santa Clara counties initially were skeptical of MTC "stealing" net revenues from early HOT and more profitable HOT lanes in those counties and diverting revenues to regionwide network—negotiated, pending legislation (AB744) now provides 95% of net revenues will go to source, 5% as "backstop" for areas where net revenues are not enough; latest revenue issue in AB744 negotiations is building in specific proportion for transit
Maximizing Attention to RP in Planning—Barriers and Opportunities	*Opportunities:* ▪ Certification process is not opportunity to press pricing or other specific strategies and should be kept that way ▪ Believes more research on enforcement technology automation (like Cyclops) is needed to advance pricing planning as current reliance on CHP and standard enforcement methods is plan weak point ▪ Re-authorization to continue UPA type programs with encouragement for more attention to pricing in planning is key opportunity to seize *Barriers:* ▪ Does not see modeling or analysis barriers to assessing pricing, though air quality analysis and projections always stick point ▪ Believes lack of funding flexibility ("stovepipe" approach) is barrier which, if removed, might bring more attention to pricing in planning at regional and state levels

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Table 3. Dallas–Fort Worth area managed lanes—planning.

Location and Project	Dallas, SH 121 (in operation), SH 161, I-635, Dallas–Fort Worth Connector, and North Tarrant Expressway (planned), I-30, I-35E, Southwest Parkway
RP Emergence Factors	▪ Upfront funding from local toll authority, North Texas Tollway Authority; provided upfront payment of $3.2 billion for SH 121, first toll project and will provide $200 million for SH 161 in 2010 for new right-of-way ▪ Major 3-step policy adopted by MPO North Central Texas Council of Governments (NCTCOG) in early nineties: (1) all facilities on new ROW must be tested for toll road feasibility and built as such if warranted because of limited funds to meet region's capacity needs; (2) for existing freeways being reconstructed, test if trip length justifies express lane and if tolls are warranted on express lane; (3) free lanes already paid for by gas tax revenues will not be tolled. Bottom line: if additional capacity is necessary and it can be tolled, it will be tolled due to anticipated revenue needs for maintenance and reconstruction ▪ Presence of local toll authority meant that no further authority was needed from the state to start tolling, so MPO was free to plan ▪ Fiscal constraint provision added to ISTEA in 1991 led to realization that gas tax funds would fall short in the future ▪ I-635, Dallas-Fort Worth Connector, and North Tarrant expressway are existing freeways being expanded to include central tolled/managed lanes, often with more free lanes than before expansion ▪ In 2009, economic trends have led to media support from sources earlier opposed to pricing, given the state's lack of revenues
RP Relation to Planning Processes	▪ The MPO, NCTCOG has successfully integrated tolling/pricing into the planning process since 1991 ▪ MPO has been using detailed simulation models to include new toll roads, toll road conversions, and express lanes in their plan ▪ Do not use the term HOT lanes, but managed lanes or tolled express lanes because their facilities are dynamically priced, with guaranteed speeds, flexible operations, and incident management capabilities; therefore they are more comprehensive while HOT lanes imply only two key features—high occupancy and tolls ▪ Have gone through full Environmental Impact Review process for managed lanes, including special Environmental Justice component not just for overall plan but for each toll road; addressed equity impacts, e.g., by building 20-mile new passenger rail line on the SH 121 project, being built by public sector from revenues obtained from an upfront toll road payment ▪ For most toll road projects, revenues will go to roadway improvements, a significant share of revenues will go to air quality improvements, and another for a 20-mile passenger rail system ▪ Only one increase in gas tax in the 1990s in Texas and the money was diverted to other purposes; no current push to increase it, therefore MPO is working in public-private partnerships in design-build or design-build finance arrangements ▪ For the PPP projects, tolls will be used to pay back operating costs and to pay the upfront payment to construct the road; 30-40% of total construction cost is being paid by public sector through gas tax money and 60-70% by private sector through revenues obtained from the managed lane
Role of Air Quality, CMP, Planning Regulation and Guidance for RP Plan	▪ All above toll facilities were included in the long-range MTP in the mid-90s ▪ Once fiscal constraint provision was added, any new freeways went into the plan as toll roads; because the region is large, trip lengths typically justify express lanes ▪ Dallas is in an air-quality non-attainment region, so all air quality conformity plans and mobile source emissions inventories are totally integrated into RP/managed lane planning

Table 3. (Continued).

Location and Project	Dallas, SH 121 (in operation), SH 161, I-635, Dallas–Fort Worth Connector, and North Tarrant Expressway (planned), I-30, I-35E, Southwest Parkway
	▪ Congestion Management Process (CMP) is used well and aggressively followed through because dynamic pricing is considered good for managing congestion and for air quality/ozone attainment ▪ RP is policy principle in Dallas CMP (see mobility plan & CMP on NCTCOG website)—completely internalized since mid-1990s
Role of State DOT vs. MPOs in RP	▪ State DOT got involved in a major way 5 years ago; credit goes to late Rick Williamson, former Chairman of TxDOT, who listened to NCTCOG planners, agreed that funding was not sufficient, and helped pass legislation to create public–private partnerships for toll roads or Comprehensive Development Agreements (CDAs); he coined the phrase, "Slow Roads, No Roads, or Toll Roads" that is now becoming more widely understood ▪ State's biggest concern is institutional—i.e. using private sector for constructing toll roads; SH 121 and 161 are being built by public sector toll authority, but 635, DFW connector and North Tarrant Express are through PPPs—mainly an issue in rural areas ▪ State has some opposition to toll roads and managed lanes, but also realizes that it has not come up with funding on its own, especially for fast-growing regions like Dallas ▪ State is now backing away from some commitments to inter-city toll roads because of opposition from rural parts of Texas (not because of tolls but because of impact on land owners owning large tracts of land that would need to be fragmented)
Role of Federal Government in RP	▪ Federal support is important; federal ISTEA legislation that introduced financial constraint requirement in 1991 considered most important ▪ Believes that all MPOs would come up with innovative funding means of transportation investment if they followed the procedures of this requirement and did due diligence ▪ Federal programs such as Value Pricing Pilot Program and Express Lanes Demonstration Program have been important—NCTCOG pursued every such innovative federal program, winning some bids and losing some ▪ NCTCOG won an innovative FHWA grant to get funding for I-30 that will be used as a permanent managed lane test corridor comprising 8-lane freeway and 4-lane tolled expressway in the middle, with plans to test any policy first in this corridor before applying it to all others—e.g., providing frequent flier miles to travelers as incentive to car pool and use express lanes ▪ Federal air quality standards (conformity with ozone requirement) support managed lane innovations and increasing auto occupancy—idea of converting HOV to managed lanes "would not have got its wings if we couldn't pin it back to ozone problem." ▪ On relationship of RP to federal planning requirements and CMP, "felt that feds were late to the game and we were plowing ground by ourselves for a long time before that"
Public, Stakeholder Involvement in RP Plans	▪ All of NCTCOG's 40 elected officials are unanimous in supporting pricing, given the absence of leadership and revenues at federal or state level—most likely the result of strong, focused monthly communication on rationale and purpose of pricing from NCTCOG targeted at these officials ▪ Initial opposition (in 1995) was from all stakeholder groups—neighborhood groups, conservative tax people, libertarians, state legislators, local elected officials, Chambers of Commerce. NCTCOG was involved in constant communication on merits of RP ▪ Constantly use radios and talk shows to clear misconceptions about managed lanes, explaining benefits to all types of users

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Table 3. (Continued).

Location and Project	Dallas, SH 121 (in operation), SH 161, I-635, Dallas–Fort Worth Connector, and North Tarrant Expressway (planned), I-30, I-35E, Southwest Parkway
	▪ Most important group to involve is state legislators who do not necessarily have answers when the public is critical, but must defend their position, especially because lack of money from fed or state is why toll roads are being built anyway ▪ Framed equity discussion around value of time being function of out-of-pocket opportunity costs (late arrival at work, daycare for blue collar workers), not wage rate as typically considered—idea has received support because people understand these situations ▪ "Well-orchestrated bottom-up approach" that uses a very strong analytical/modeling and planning process showing performance measures about real costs of the transportation system and how much people are under-paying—sustainability is a key message, before the need for revenues
Maximizing Attention to RP in Planning—Barriers and Opportunities	*Opportunities:* ▪ New transportation bill should continue to support and lay framework for alternative funding mechanisms—just as fed fiscal constraint requirement provided an opportunity ▪ A federal policy that is explicit about the lack of revenues to solve problems in urban regions will help MPOs when they approach state legislature for approval to implement pricing and other ways to raise funds ▪ Believes it is harder to build toll roads and managed lanes without an integrated plan that is communicated well and constantly ▪ Because toll roads have existed in the region, people are familiar with the concept and the critics don't have much of an argument because the toll roads are successful *Barriers:* ▪ State opposition to PPPs likely due to involvement of international firms as concessionaires ("some sort of xenophobia") ▪ What can and cannot be done on Interstate highways is an issue: e.g., can managed lanes be introduced and under what conditions? ▪ Federal planning requirements are considered behind the curve with respect to current MPO needs, planning approaches, and strategies

Table 4. Los Angeles metropolitan area HOT lanes—planning.

Location and Project	Los Angeles, I-10 and I-110 Express Lanes Demonstration Projects (1-year long)
RP Emergence Factors	▪ Severe, persistent Los Angeles congestion ▪ RP experience elsewhere proving workability ▪ Engagement and persuasiveness of specific federal actor (Tyler). Also, LACMTA project management to first get approval of immediate supervisors and then the LACMTA Board of Directors. Inviting Tyler to present to the LACMTA Board part of the logistics/strategies set by MTA project management. ▪ Persuaded board buy-in and direction to staff ▪ Availability of federal pilot money and use by other cities ▪ Short time frame for pilot grant and available proven RP concept—HOT ▪ Failed application (freight-focused) for U.S.DOT UPA grant (December 2006) started debate and awareness; successful application for U.S.DOT Congestion Reduction Demonstration Initiative (2008) resulted from greater attention to RP as desired by feds

Table 4. (Continued).

Location and Project	Los Angeles, I-10 and I-110 Express Lanes Demonstration Projects (1-year long)
RP Relation to Planning Processes	▪ Adopted 2001 Long-Range Transportation Plan (LRTP) analyzed pricing and concluded it was the best alternative. However, pricing alternative was limited to increasing gas prices ▪ Current 2009 draft LRTP mentions RP; politicians and executive management no longer afraid to discuss RP ▪ Downtown parking pricing plan was already included under TDM in the 2001 LRTP ▪ SAFETEA-LU gives 5 states authority to approve exemptions to the environmental process, but Caltrans (project partner) did not use this to avoid criticism later, so projects are going through the normal EIR process
Role of Air Quality, CMP, Planning Regulation and Guidance for RP Plan	▪ To access funding, projects must be included in LRTP, the Regional Plan, and TIP; so adopted 2001 plan was amended to include I-10 and I-110 projects, and I-210 project contingent on availability of financing ▪ No challenges to 2001 amendment that introduced RP into the plan ▪ LACMTA is the Congestion Management Agency, so it included pricing in LRTP
Role of State DOT vs. MPOs in RP	▪ State tolling authority required by U.S.DOT to be approved within 6 months of U.S.DOT award ▪ State limited the number of HOT lanes that could be implemented ▪ Per state law, net revenue must be reinvested in the corridor where revenues are generated. The use of excess toll revenue includes transit or carpool lane improvements ▪ New state legislation passed in 2006 allowed implementation of HOT lane projects and required approval from the California Transportation Commission (CTC) prior to approval from state legislature ▪ Parking pricing program for downtown is led by LA city ▪ State DOT director supported RP from the start and this was essential for moving the project forward. ▪ State DOT helped with technical analysis
Role of Federal Government in RP	▪ Federal UPA grant initiated the process, then U.S.DOT grant required increased focus on pricing, leading to consideration of RP ▪ Feds funded value pricing study in 1995, determining that HOT lanes were the most feasible RP project, but no funding available ▪ Fed role enhanced at Oct 2007 LACMTA regular Board Meeting where Asst. Director of Policy (Tyler) spoke and helped gain support ▪ As part of the strategies set by LACMTA project management, Fed supported LACMTA request to organize a symposium for professionals, decision makers, and politicians in June 2008, inviting speakers from successful RP locations (Stockholm, Seattle, Texas) whose presentations helped gain support from state legislature ▪ No objection to U.S.DOT grant application from LACMTA Board and minor opposition in state legislature, partly because of strong fed role in helping gain local and state support ▪ Role of federal demo application: an application “raises debate”/brings focus, once LA application didn’t make it, LACMTA formed the Ad-Hoc Congestion Pricing Committee to manage future opportunities
Public, Stakeholder Involvement in RP Plans	▪ LACMTA Board representatives supported RP and influenced state legislature ▪ Creation of Ad-Hoc Congestion Pricing Committee after first failed grant was helpful and has ongoing involvement ▪ Transit operators are partners because of the inclusion of transit in project

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Table 4. (Continued).

Location and Project	Los Angeles, I-10 and I-110 Express Lanes Demonstration Projects (1-year long)
	▪ No organized opposition ▪ Original concern from congressional reps and legislators about environmental justice issues were addressed in the implementation plan; transit component included to benefit lower-income commuters ▪ Support of major facilities along the corridors and community grassroots organizations was sought by providing opportunity for revenues to be returned to the corridors along with transit improvements ▪ LACMTA project management staff gave presentations to representatives of elected officials, South Bay Council of Governments, San Gabriel Valley of Governments, and agencies to explain the project. This helped because all COG member cities have representative decision makers in the LACMTA Board of Directors ▪ Formed Corridor Advisory Groups with stakeholders in the 2 corridors (residents, businesses, employees at facilities along the corridors), elected officials, and other agencies like Highways Patrol. Also formed Technical Advisory Group with representatives from partner agencies and other stakeholders
Maximizing Attention to RP in Planning—Barriers and Opportunities	*Opportunities:* ▪ U.S.DOT grant opportunity provided incentive for change ▪ Short timeline for implementation led to choice of practical, focused strategies ▪ Part of grant funds used to purchase transit buses to begin operation before tolling began ▪ Planning and pilot implementation, role of key federal actor who was a good communicator, role of LACMTA project management staff who recommended to the Board to support congestion pricing ▪ Project was consistent with the Governor's Strategic Plan for implementation of HOT lanes ▪ HOT lanes were not approached as individual projects, but included transit and parking pricing in an integrated approach for managing congestion in LA ▪ HOT lanes controversial by themselves; so transit component was built into project to encourage mode shift and gain public support. Also, it was emphasized that the aim of the project was congestion mitigation, not revenue generation *Barriers:* ▪ Public perception of "double taxation" and attitudinal barriers because of no existing models of HOT concept in LA. Only nearby HOT lane is SR-91 in Orange County ▪ There are limited options to charge tolls on Interstates—cannot charge on a lane that is not currently priced or that is not an HOT lane, though conversion of existing HOV lanes into HOT lanes is legal

Table 5. Washington, D.C. metropolitan area HOT lanes—planning.

Location and Project	Washington D.C. Region, Maryland Intercounty Connector (ICC—under construction), Virginia I-495 Beltway HOT Lanes (under construction) and I-395/95 HOT Lanes (proposed)
RP Emergence Factors	▪ Highly congested major state highways in the metropolitan Washington region; region ranked high nationally in congestion (TTI rank is #2); significant revenue shortfalls under traditional "gas tax" funding mechanisms ▪ Past, recent, and ongoing studies of road and parking pricing initiatives and future prospects; past successes and failures with attempts to implement RP on state highways ▪ Trend of multiple RP projects currently underway—new variably priced ICC expressway (has been on the agenda and facing legal scrutiny for 2 decades), HOT lane on I-55, inclusion of HOT lane alternatives on I-270 corridor; 3 other flat-tolled bridges and tunnels in Maryland ▪ Numerous think tank studies of road and parking pricing applications since 1970s (aimed at congestion reduction, revenues, and emissions), but these never moved forward toward implementation ▪ In 2004, Maryland DOT and State Highway Administration (SHA) developed a vision program for express toll lanes for all of the major MD highways. The ICC was the first such facility to be given a firm go ahead and the project was adopted ▪ In response to rapidly worsening congestion and funding shortfalls to address it, in mid-2000s, Virginia DOT opted to pursue private–public partnership route for the two most congested corridors in the region, I-495 beltway and I-395/I-95; VDOT is now implementing these 2 PPP projects
RP Relation to Planning Processes	▪ While not initially considered in the plan, now all three projects have been adopted in the region's long-range plan ▪ In early 2000s, Metropolitan Washington Council of Governments/National Capital Region Transportation Planning Board (MWCOG/TPB) modified their regional travel/traffic forecasting models to enable assessment of impacts of HOT lane projects in the region; updated model system is now being used for assessing numerous regional pricing studies ▪ Maryland DOT is currently conducting a corridor planning study in the I-270 corridor in which pricing options are under consideration ▪ Use of well-developed and highly respected land use and transportation and air quality modeling tools with ability to input different values of time saved; models have been updated to address HOT lane issues
Role of Air Quality, CMP, Planning Regulation and Guidance for RP Plan	▪ RP was not directly considered in regional transportation or long-range plan or air quality plan, though there are vague references to it under discussion of future tools needed for addressing endemic and worsening congestion, perennial funding shortfalls, and increasing facility needs; role of planning processes has been peripheral and marginal overall ▪ All 3 RP projects were later adopted in MTP via plan updates (MD/ICC in 2004, VA/I-495 in 2005 and VA/I-395, I-95 in 2007) ▪ Long-range "vision plans," documents addressing "A system in crisis," "Maryland's Statewide Express Toll Lanes Network Initiative," and Washington metropolitan region's brochures on "sustainability" and "green future" all make indirect references to "tolling" and "pricing" as options that need to be more visible in the transportation "tool box"
Role of State DOT vs. MPOs in RP	▪ Three state DOTs were involved in planning and developing the 3 pricing projects; the TPB comprises the 3 DOTs and several local jurisdictions; states come to the TPB with project proposals and decisions are made together on whether project meets federal, state, and other requirements (funding, AQ, CMP, etc.) and how the project fits in with shared regional goals and priorities

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Table 5. (Continued).

Location and Project	Washington D.C. Region, Maryland Intercounty Connector (ICC—under construction), Virginia I-495 Beltway HOT Lanes (under construction) and I-395/95 HOT Lanes (proposed)
	▪ State provides guidance with established outreach procedures and technical support through high-quality modeling tools ▪ Maryland DOT involves other state agencies like the MD Toll Authority and relevant MPOs in planning and outreach
Role of Federal Government in RP	▪ The ICC in suburban Maryland evolved outside of the federal VPPP ▪ In 2000s, FHWA VPPP grant funded preliminary exploration of the potential for pricing in the region and a workshop highlighting key pricing issues and U.S. experience; this was meant to inform stakeholders and is believed to have opened the door for further exploratory studies and discussions by VDOT, eventually leading to the PPP agreement for Beltway/I-495 HOT lane project ▪ VDOT received another FHWA VPPP grant to further develop project design and impact estimates. ▪ The federal programs that fund feasibility studies (VPPP, climate change initiatives, clean air initiatives, planning requirements, etc.) are seen by the states as major catalysts for in-depth exploration of pricing strategies in the region; states “follow the money” ▪ The VPPP also supported a regional evaluation of alternative scenarios for a network of variably priced highway lanes in the MWCOG region
Public, Stakeholder Involvement in RP Plans	▪ Public has been involved from the start of deliberations with continued involvement throughout, key stakeholders have been listened to carefully and continuously, and elected officials and decision makers have been kept fully informed ▪ Maryland ICC project has been supported by the SHA, businesses (chambers of commerce, etc.), trucking interests and a majority of the region’s planners; opposed by many, but not all, of the environmental community and corridor residents; environmental community sees these projects as a surreptitious way of adding highway capacity ▪ Stakeholder reaction to the two Northern VA HOT lane projects has been quite similar to that in MD in the context of ICC ▪ States conducted extensive (multiple) public information meetings and public hearings; established project information website and means of responding to individual queries, held stakeholder meetings, the TPB held public hearings and workshops, consulted with TPB Transit Advisory Committee, conducted citizens meetings during EIR process, held marketing campaigns, disseminated information at retail kiosks, and engaged the press; used well-established state and TPB practices and procedures for outreach ▪ HOT lanes were framed as allowing choice to pay and avoid congestion, producing some congestion relief on mixed traffic lanes, and making more congestion free lanes available to transit; priced new ICC lanes were presented as providing a fast by-pass shortcut between two heavily congested freeways ▪ Evidence based on surveys of perceptions of users and actual travel patterns by different population segments from other RP projects like San Diego I-15 and Orange County SR-91 was cited often to dispel public concerns regarding “equity” ▪ Feasibility studies were also carefully carried out and modeling results were shown to support the case for projects ▪ Environmental community sees these projects as a surreptitious way of adding highway capacity ▪ Each state and jurisdiction has its well-established community outreach and consultation strategies: community meetings, websites, newspaper ads, public hearings, etc; for RP, the states also carried out focus groups and surveys

Table 5. (Continued).

Location and Project	Washington D.C. Region, Maryland Intercounty Connector (ICC—under construction), Virginia I-495 Beltway HOT Lanes (under construction) and I-395/95 HOT Lanes (proposed)
Maximizing Attention to RP in Planning—Barriers and Opportunities	*Opportunities:* ▪ Believes federal planning regulations could ask for consideration of RP alternatives in all plan developments with adequate funding made available to analyze the impacts of and issues surrounding RP alternatives ▪ The context is ripe for consideration of RP because congestion continues to spread and intensify ▪ In recent years, as congestion has worsened and the promise of "largely self-financing" new highway capacity has surfaced, level of support for RP has increased as both a potential funding source and as a means of congestion relief *Barriers:* ▪ VA I-395/95 HOT lane construction postponed because of concerns about revenues falling short of planning projections (perhaps due to future effects of the current economic downturn); additional concerns relate to likely requirement of HOV-2 being tolled ▪ Current economic downturn probably makes it more difficult to generate support for road pricing in the short term ▪ Need more planning funds and grants to nurture political support and pursue outreach with media and stakeholder groups ▪ In MD, they believe that a financial or operational calamity is needed to pursue RP vigorously and they are not there yet

Table 6. Minneapolis–St. Paul HOT lanes—planning.

Location and Project	Minneapolis, I-394 MnPASS Lanes and New I-35W Project
RP Emergence Factors	▪ HOT lanes first proposed as demonstration project on I-394 in 1997, but there was no political support so proposal was withdrawn by governor; idea that "it could be implemented and people would support it afterwards" led to failure of earlier proposals ▪ In early 2000s, despite lack of political support, MnDOT was in favor of implementing RP and contracted with Univ. of Minnesota's Humphrey Institute to get it implemented ▪ Value Pricing Advisory Task Force comprising political figures (state legislators, city officials) was set up in 2000/2001 with goal of seeking and identifying an appropriate demonstration project; Humphrey Institute was tasked with public education and outreach geared towards implementation. ▪ MnDOT received value pricing grant to implement the recommendation of the task force; thus in 2003 the idea of converting underutilized HOV lane to HOT lane on 11-mile corridor on I-394 was presented to state legislature ▪ Because of public acceptance of I-394, MnDOT applied for and won $133 million UPA grant for HOV-HOT conversion on I-35W, which will also include bus rapid transit (BRT) on shoulder lanes and promotion of teleworking as part of overall plan; project will be completed in 2010 ▪ Twin cities region has high technological expertise in ramp metering and use of cameras for managing and improving operations

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Table 6. (Continued).

Location and Project	Minneapolis, I-394 MnPASS Lanes and New I-35W Project
RP Relation to Planning Processes	▪ Pricing ideas were first introduced in 1993 long-range plan and there has been a policy position supporting RP in the regional plan since then; while primary driver was improving mobility, pricing is consistent with other goals of supporting transit and improving air quality ▪ RP first emerged from outside the planning process in the twin cities region; VPPP provided opportunity for I-394 MnPASS lanes which emerged from a corridor study; this then led to preparation of MnPASS System Plan that included the new I-35W project ▪ In Phase 2 of I-394 MnPASS lanes, MnDOT is considering improvements and has been trying to integrate pricing into the region's Comprehensive Land Use Plan; but the realization is that this is a disruptive process; planners do not know how to deal with the institutional/political issues and are not familiar with how RP will work in a community ▪ Planning processes are not "in-sync" and trying to integrate the different processes for transit, land use, highways gets complicated ▪ Ongoing relationship between local MPO and state DOT with regard to other projects is important for planning purposes
Role of Air Quality, CMP, Planning Regulation and Guidance for RP Plan	▪ Having a fiscally constrained plan forced a closer look at regional resources and at the aging transportation system, enabling pricing to come up in discussions ▪ New 2009 Revised Transportation Policy Plan projects needs and capabilities of highway system 50 years on; resulted from policymaker workshops and debates on future of transportation; has pricing and managed lanes as important component ▪ Plan recommends 4–5 priced corridors, similar to the UPA project of managed lanes combined with transit improvements, BRT investments; since Metro runs the region's bus system, it was more sensitive to having HOV/transit lanes with RP as a policy ▪ Metropolitan Council (MPO) is justifying and planning for pricing/demand management through Congestion Management Plan ▪ RP revenues are not and should not be the main focus in planning; rather efficiency, mobility, and congestion reduction should be
Role of State DOT vs. MPOs in RP	▪ MnDOT has had a sustained interest in congestion pricing and always had staff working on it; group of people working on ITS introduced the idea of RP, conducted studies, and worked with the Humphrey Institute; had been waiting for the right opportunity ▪ State passed legislation in 2003 that allowed charging tolls on I-394; interest from state legislators brought governor on board and allowed MnDOT to quickly identify and implement project
Role of Federal Government in RP	▪ Strong role—federal Value Pricing Program provided support for I-394 and UPA grant is driving work on the new I-35W highway ▪ New federal UPA grant is also imposing collaboration between state and local agencies (MnDOT and Metro Transit) as a condition of the grant, which is a positive thing going into the future, even in the absence of federal incentives ▪ Overall, federal engagement (FHWA), funding, and encouragement of a learning process have been important
Public, Stakeholder Involvement in RP Plans	▪ MnDOT and project team set up a Community Task Force that operated over 2004–2005 until opening of MnPASS Lanes in 2005. Task force involved key leaders—representatives from 6 city councils, citizen representatives, AAA, trucking association, transit-oriented groups, and state legislators, met monthly and visited California's SR-91 and I-15 projects to guide project design ▪ Diverse project team—partnership was established between the local team, MnDOT, and Humphrey Institute that presented a neutral face to get community support for implementation

Table 6. (Continued).

Location and Project	Minneapolis, I-394 MnPASS Lanes and New I-35W Project
	▪ Community Task Force influenced project features—e.g., minimum toll was lowered from $0.50 to $0.25 for political acceptability ▪ Key feature of strategy involved "grasstops approach" (reaching out to elected officials and community leaders who can then communicate with their constituents) to first get support of elected officials before the general public; communicated with media ▪ Recent survey work to evaluate I-394 showed broad-based support from 75% of the population ▪ Univ. of Minnesota and MnDOT sponsored public roundtables on "Rethinking Transportation Finance," organized legislative seminars on RP, held stakeholder workshops twice a year with presentations from MnDOT; tried to leave no question unanswered ▪ Effect of HOT lanes on transit was a key public concern—allayed by communicating research and findings after project was built; evaluation surveys for I-394 found that lanes were benefitting transit and there was not much effect in HOVs/carpools. ▪ For new I-35W project, focused on individual components of project for different interest groups, rather than on whole package ▪ No "organized" opposition, but trucking association has been an opponent and has sought state legislation prohibiting tolling projects except for HOV conversions and shoulder projects ▪ Very little public involvement in the regional plan because it is difficult to include them in a 20-year plan
Maximizing Attention to RP in Planning—Barriers and Opportunities	*Opportunities:* ▪ Believes that without federal financial incentive offered through VPPP, RP would not have reached this level of implementation anywhere in the country ▪ Federal position on long-range plans is important and next role of feds should be to give incentives to projects that include RP ▪ Believes even with pricing project, more impact will be seen when people change behavior and shift to transit; therefore transit projects must include incentives for congestion pricing as a next step and institutions should work together ▪ Success of I-394 has been a major driver in moving the I-35W project forward at a fast pace; also because it is an add-on lane that does not take away free lanes ▪ More encouragement of pricing should be built into federal planning guidance ▪ 2010 Revised Transportation Policy Plan will include a more significant role for RP with a 50-year vision *Barriers* ▪ Early issues: no toll roads in Minnesota when the MnPASS lanes were proposed, so no experience; funding for a series of pilot projects failed to come through; a public–private partnership proposal similar to SR-91 failed because the community vetoed it ▪ Not much public communication or education prior to I-394 proposal which faced major political opposition; so MnDOT and project team realized need to improve communication strategies and hired a communications consultant ▪ Lack of funding; Metro has done studies to show where DOT can implement low-medium cost improvements to region's highway systems using pricing and demand management, but these cannot be funded because of the need to fund other high-cost projects

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Table 7. New York City areawide pricing—planning.

Location and Project	New York City, Areawide Pricing (proposed pilot program)
RP Emergence Factors	▪ Discussion on effects of congestion in NYC began in 2000 with several studies including the Growth or Gridlock study by Partnership for NYC (a business organization); study estimated congestion to cost $13 billion in terms of lost economic productivity ▪ Mayor Bloomberg proposed congestion pricing in 2007 as part of sustainability plan for 2030, PlaNYC; State Legislature set up Traffic Congestion Mitigation Commission with members appointed by the governor, legislature, mayor, and city council ▪ MTA was awarded a $354 million Urban Partnerships Agreement (UPA) grant, conditional upon city adopting congestion pricing to address short-term transit needs; UPA set a deadline for legislative action; UPA application proposed a 3-year pilot program for congestion pricing with an interim evaluation after 18 months ▪ Commission issued recommendations in 2007; city council passed resolution in favor of the proposal but state legislature did not act ▪ In 2009, with MTA still in fiscal trouble, need for revenues was raised again; Ravitch Commission set up to ensure long-term fiscal health of MTA considering Manhattan-wide Mobility Tax (0.34% of payroll) and tolls on city-owned East River and Harlem River bridges; legislature adopted payroll tax but not the tolls
RP Relation to Planning Processes	▪ In 2007, Mayor Bloomberg unveiled a sustainability plan for NYC for 2030 that took land use, transportation, and climate change into account; this plan PlaNYC included the congestion pricing policy (London-style areawide charge, south of 86th street) ▪ PlaNYC is more than a transportation plan; it is a policy framework for infrastructure initiatives with a set of interlocking policies aimed at sustainability; pricing was included, recognizing other levels of government would need to approve ▪ No direct link between MPO's regional transportation plan and city's PlaNYC; the two entities coordinate on large transportation investments but MPO does not guide what the city implements ▪ MPO's RTP has general language supporting pricing in principle; 2006 plan called for closer look at using pricing for transportation improvements, including solving congestion and expanding transit ▪ Overall, congestion pricing emerged from outside the MPO's long-range planning process
Role of Air Quality, CMP, Planning Regulation and Guidance for RP Plan	▪ Transportation and environmental goals were the major drivers for the project; plan addressed congestion and population and economic growth ▪ Since UPA funds were involved, the city had to satisfy NEPA requirements; project got stalled at state assembly when preparatory/scoping work for EIS had already begun ▪ EIS requirements and NEPA process can be burdensome ▪ Formal air quality conformity process had no role in RP, though GHG emissions reduction was a broad goal of the plan ▪ Congestion Management Process played no role in this pricing project; CMP is updated every 2 years and represents regional consensus on problems that MPO and DOT need to address, but congestion locations and facility needs are not very accurate at local city level because MPO's regional model was designed for highway travel ▪ Addressing climate change is a goal in PlaNYC; RP was one part of larger set of plans addressing climate issues
Role of State DOT vs. MPOs in RP	▪ The city (NYCDOT and the Mayor's Office) led all planning for the project, not the state ▪ State DOT provided staff support to NYCDOT and was a very supportive partner in the implementation of the plan in an engineering/technical role

Table 7. (Continued).

Location and Project	New York City, Areawide Pricing (proposed pilot program)
	▪ State DOT worked with MPO on planning and with city on impact analysis; involvement of high-level policy staff at state DOT was helpful; state assessed regional impacts beyond city's borders and found overall improvement in mobility on arterial system ▪ State had minimal implementation role because very few roads in NYC are state owned; most are city/locally owned
Role of Federal Government in RP	▪ UPA grant did not drive consideration of RP; analysis of the feasibility of congestion pricing started before UPA grant was on the table but was helped forward by prospect of UPA funds. UPA grant paid for consulting work and early implementation studies (about $2–3 million) and also would have funded BRT routes ▪ UPA grant set deadline that kept the project moving
Public, Stakeholder Involvement in RP Plans	▪ NYCDOT and Mayor's Office framed issues and tailored communication for specific stakeholders—separate meetings were organized with transit and traffic communities, with general public, constant community meetings with community boards, small and large businesses, and outreach to environmental organizations and environmental justice constituencies—used "every communication tool in the book" for public outreach ▪ Major concern was that congestion pricing would hurt outer borough commuters, so transit improvement was a key message of the project; low-income groups heavily depend on transit, do not typically drive into Manhattan, and some low-income neighborhoods need better transit access and options; therefore RP revenues were proposed to fund a special Transit Capital Improvements account ▪ London areawide pricing example and quantitative results were referenced a great deal; used to show air quality improvements and neutral impacts on business ▪ Large businesses were generally supportive of project, but some small businesses were concerned about impacts on delivery/wholesale businesses; many residents of "auto-dependent" areas of Queens and Brooklyn were opposed to the project
Maximizing Attention to RP in Planning—Barriers and Opportunities	*Opportunities:* ▪ The lack of capital funding could be instrumental in bringing back congestion pricing—to solve the problem of funding MTA Capital Plan. *Barriers:* ▪ City needs legal authority from state to implement congestion pricing or tolls on previously untolled roads ▪ Tolling could be allowed on Interstate highways and waivers guaranteed to local governments to implement tolls on facilities that received federal funding; local governments are less likely to propose a project that may face a future roadblock ▪ Political upheavals—resignation of supportive governor at critical time, one month before bill came up for vote in state assembly ▪ Powerful opponents in state assembly—issues were skepticism about MTA's use of funds, potential parking impacts outside the pricing zone, drivers not wanting to pay, privacy concerns due to installation of cameras, and impacts on occasional trips to hospitals and medical facilities; UPA deadline pushed the project forward; no such deadline now and focus has shifted to current fiscal situation ▪ Federal environmental review process made prospective environmental review more demanding but not a major obstacle; the additional rules can be a barrier ▪ Equity arguments hard to refute since "equity" means different things to different people—often meant why do "I" have to pay but not someone else

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Table 7. (Continued).

Location and Project	New York City, Areawide Pricing (proposed pilot program)
	▪ With current economic recession, capital funding for MTA is a huge issue to solve but after two major battles, there is little appetite to revisit congestion pricing or bridge tolls; additionally, in an economic downturn data shows that traffic and transit ridership both go down, making congestion and crowding on transit less acute problems ▪ Congestion pricing cannot be formalized in the planning process unless it is politically accepted as a legitimate transportation option; political barrier must be passed for planners to be able to effectively analyze the policy ▪ No champion exists for the project because supporting RP is still perceived as a risky political position

Table 8. New York City parking pricing—planning.

Location and Project	New York City, Park Smart Parking Pricing (under implementation)
RP Emergence Factors	▪ NYCDOT Division of Planning and Sustainability has received funding for six pilot Park Smart programs through the Value Pricing Pilot Program
RP Relation to Planning Processes	▪ Periodic studies on parking pricing, justification, and synchronization with goals of PlaNYC was done to keep parking pricing on the radar ▪ NYCDOT's Sustainable Streets Strategic Plan to improve curb management was an important impetus for Park Smart program ▪ No relationship of parking pricing with the regional plan
Role of Air Quality, CMP, Planning Regulation and Guidance for RP Plan	▪ The NYCDOT Sustainable Streets plan includes curb management in one of its goals and Parking Pricing as a strategy ▪ No role of NEPA process or air quality assessments in the parking pricing program, but required for the congestion pricing plan
Role of State DOT vs. MPOs in RP	▪ State DOT not directly involved
Role of Federal Government in RP	▪ Federal funding through the VPPP for pilot program evaluation
Public, Stakeholder Involvement in RP Plans	▪ Agency worked with delivery businesses to understand how their businesses work (which ones depend on peak vs. off-peak deliveries) and show that the program would not negatively impact their finances; face-to-face interactions with businesses ▪ NYCDOT conducted a sidewalk survey in response to business concerns that parking fees would discourage clientele arriving at stores by motor vehicles; instead survey found that most customers were arriving at stores by foot or subway or bus or bikes and thus relatively few of their customers would be impacted by parking fees ▪ NYCDOT worked closely with neighborhoods, community boards, and business districts; sought inputs, and responded by including strategies in program design that addressed community issues; agency developed credibility and buy-in by doing this ▪ All evaluations of parking, traffic, etc. were shared with affected parties ▪ 6-month pilot programs were only implemented in neighborhoods that were open to a pilot project; agency emphasized that continuation of the program at the end of 6 months would be based on evaluations and further consultation ▪ NYCDOT gained allies in each neighborhood who helped build support and generate more interest early in the outreach effort ▪ The agency also set up an informative Park Smart website to communicate details about the program ▪ In conjunction with program, NYCDOT worked with merchants to create AM "delivery windows" to better accommodate goods deliveries.

Table 8. (Continued).

Location and Project	New York City, Park Smart Parking Pricing (under implementation)
Maximizing Attention to RP in Planning—Barriers and Opportunities	*Opportunities:* ▪ Park Smart is a voluntary program with no regulation or obligation to participate; areas can opt in or stay out and this helps acceptance ▪ NYCDOT plans to use a combination of pricing strategies and incorporate emerging technology into program logistics *Barriers:* ▪ Businesses must be convinced that customers will face minimal negative impacts from peak-period parking fees

Table 9. Portland, Oregon, Road User Fee Pilot Program—planning.

Location and Project	Portland, Oregon, Road User Fee Pilot Program (2006–2007)
RP Emergence Factors	▪ The direction for starting a pilot and creation of a Road User Fee (RUF) Task Force came through the legislature in 2001 ▪ Pilot project would not have emerged if the bill had not passed—Senator Bruce Starr played a visionary role and sponsored the initial bill; Oregon governor has championed RP in the state ▪ RUF Task Force decided on an integrated mileage-fee and congestion pricing program
RP Relation to Planning Processes	▪ Initial legislative direction for the pilot program (2001) did not reference any state planning processes ▪ The ideas of mileage fees, congestion pricing, and tolling new capacity entered the planning process in 2002 and the legislature influenced ODOT's planning work through vision statements, etc.
Role of Air Quality, CMP, Planning Regulation and Guidance for RP Plan	▪ Planning process less relevant in implementing pilot program, but for the next pilot project or an implementation of RP, it may become more relevant because state planners now want to be involved, given the new legislative direction for implementing RP
Role of State DOT vs. MPOs in RP	▪ Passed HB 2001A (2009) with two key provisions—(1) allow ODOT to make the mileage-fee–based RP pilot program permanent, and (2) direct ODOT to implement a congestion pricing pilot within 3 years ▪ ODOT worked with the RUF Task Force to design the program; ODOT was the key implementing agency through Office of Innovative Partnerships and Alternative Funding and worked with Portland State University to survey traveler reactions and Oregon State University to design technology for the system ▪ State contributed $771,000 in matching funds to supplement FHWA's grant from the Value Pricing Pilot Program (VPPP)
Role of Federal Government in RP	▪ The bulk of the funding for the pilot program came from the FHWA's VPPP through three targeted grants, totaling $2.1 million over 6 years; the congestion pricing component was incorporated into the pilot program as a requirement of this funding grant ▪ Setting technical standards, supporting technical research, and providing national funding and oversight to state-level mileage fee programs is important
Public, Stakeholder Involvement in RP Plans	▪ 12-member Task Force was independent and structured to include different interest groups—was set up by the governor and comprised 4 legislators, 2 from state, 6 others representing cities and communities, highway user groups and academics; AAA and local petroleum industry were brought in as advisers

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Table 9. (Continued).

Location and Project	Portland, Oregon, Road User Fee Pilot Program (2006–2007)
	▪ Three public hearings were held in first year of project planning; formal presentations made to U.S.DOT, legislative committees of several states, two national transportation commissions, and U.S. Secretary of Transportation Mary Peters. ODOT also presented to citizen groups, state DOTs, MPOs, and transportation advocacy groups inside and outside Oregon ▪ A reactive approach of "learn and modify" was used; in future, plan to conduct focus groups first to see how the public would react to the marketing messages ▪ Media support or criticism depended on how well they were informed about the key issues such as privacy; turned from critic to proponent of the pilot program as ODOT responded to each one of the media and public comments ▪ The public was concerned about privacy and double paying; the original plan called for a central billing system which was changed to billing at the gas pump because of public fear of double paying ▪ To deal with privacy issue (raised in the media), alterations were made such that only mileage counts would be recorded and not actual coordinates of travelers (these would be erased from the tracking devices and not transferred to billing system). For a future implementation, motorists will receive the opportunity to choose the mileage counting device they prefer rather than have a government agency choose for them. ▪ Equity concerns came up with respect to urban vs. rural populations—people typically do not perceive how much they pay for the gas tax and that can be a significant amount ▪ Learned that all project design details must be worked out and nothing should be unknown before public communication begins
Maximizing Attention to RP in Planning—Barriers and Opportunities	*Opportunities:* ▪ Believes that a national mileage-fee system could be designed and implemented by volunteer states, with a policy oversight body to direct pilot projects ▪ Limited gas tax resources at state level are driving interest in Oregon's experiment from all around the country; structural problems with gas tax are similar in most states ▪ Believes the initial implementations should be small and partial, starting with electric vehicles and conditional voluntary adoptions where people can elect to be in a mileage-fee system. Over time, the system should become mandatory ▪ ODOT has talked with U.S.DOT (RITA) about future pilot programs ▪ Believes feds should play a stronger role in technical research, federal funding of state pilot programs and implementations, and setting up a national policy oversight body ▪ Additional development and testing is on for flexible open platform technology for future pilots, so that technologies or devices are not specified; instead, standards are set for type of device that must be used and how data must be transferred ▪ ODOT's strong engagement with national policymaking bodies and actors will help in future implementation plans as several major implementation issues and policy questions have been addressed *Barriers:* ▪ State resources are typically limited, so charging systems should not emerge state by state; instead system design should be at the national scale

Table 9. (Continued).

Location and Project	Portland, Oregon, Road User Fee Pilot Program (2006–2007)
	▪ Public perceptions of ODOT are mixed because it is a government agency; it made strong efforts to not politicize the mileage-fee experiment and enter the tangle of right vs. left ▪ GPS-based mileage counting devices were given by ODOT to people who participated in the pilot program; public perception of and familiarity with GPS tracking technology required much more explanation; public opinion is negative on the idea of imposing a mileage counter that also acts as a transponder for congestion ▪ Timing and state of the economy is important and affects how public will respond; currently there is much more public scrutiny of how government dollars are spent

Table 10. Puget Sound Region HOT lanes—planning.

Location and Project	Puget Sound Region (Seattle), SR-167 HOT Lanes (opened in 2008) and SR-520 (planned)
RP Emergence Factors	▪ Washington State Transportation Commission (appointed by governor) authorized 7 potential tolling corridors; the legislation set up commission with authority to set rates and charge tolls for revenue and traffic management purposes, which would be implemented by state DOT ▪ Urban Partnerships Agreement (UPA) and legislation authorizing tolling; severe gap in funding for new SR-520 bridge led to decision to implement tolls on existing bridge while new bridge is built ▪ SR-520 tolls partly driven by slow revenues in economy and uncertain trust fund; state gas tax has been raised multiple times, so tolling appears to be the only way to raise funds
RP Relation to Planning Processes	▪ PSRC has its own pricing task force that came into existence in late 1990s when previous transportation plan was being developed; task force was reinvigorated for the current round of planning and it introduced pricing options into the latest plan ▪ Region has a Vision 2040 plan that focuses on mobility and demand management to reduce need for capital improvements ▪ 2001 regional transportation plan included some discussion on tolling and direction to explore potential but was not pursued further; currently with Tacoma Narrows project running successfully, decline in gas tax revenues, deterioration of infrastructure, and sustainability of transportation being a key issue in 2040 plan, there is more support for tolling ▪ Important criteria/"attention-getters" in regional plan that support tolling: (1) sustainable funding, (2) environmental issues, specifically climate change, (3) congestion and mobility; plan sets out pricing and other non-pricing options
Role of Air Quality, CMP, Planning Regulation and Guidance for RP Plan	▪ Current Moving Washington 10-year state plan includes SR-520 bridge toll project to provide revenue for "strategic capacity" and for traffic management; also includes language about funding projects using non-traditional sources ▪ As part of environmental review process, several pricing options for SR-520 have been analyzed using integrated land use and transportation models and benefit–cost analysis with updated values of time, and toll optimization models; revenues, air quality impacts, and traffic diversion impacts were considered. ▪ Key criteria in Moving Washington plan include reliability, travel time savings, accident reduction, commuter choice, and emissions control; both state and region have goals to reduce greenhouse gas emissions and drive-alone VMT ▪ Draft Environmental Impact Statement (DEIS) for SR-520 released and receiving public comment; no preferred alternative yet

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Table 10. (Continued).

Location and Project	Puget Sound Region (Seattle), SR-167 HOT Lanes (opened in 2008) and SR-520 (planned)
Role of State DOT vs. MPOs in RP	▪ For SR-520, legislature created Toll Implementation Committee (including MPO head, secretary of transportation, chair of transportation commission) and gave authority to proceed with variable pricing schemes (peak-period tolling) ▪ Legislature has asked DOT to do tolling analysis similar to study done for SR-520 to assess impacts on 4 additional tolling projects; along with public outreach and engagement ▪ State and PSRC (MPO) cooperated in planning for SR-520
Role of Federal Government in RP	▪ Federal UPA grant has been important and will support tolling infrastructure (active traffic management, toll collection system on existing bridge, transit); no other federal role or barriers. ▪ All options in regional plan have different costs and are tied to adopted revenue sources; PSRC is responsive to federal guidance for financial constraint in the regional plan (while "unconstrained" projects can exist outside the plan)
Public, Stakeholder Involvement in RP Plans	▪ SR-520 Tolling Implementation Committee has presented information to more than 40 elected officials, jurisdictions, and stakeholder groups during 2008, including meetings with community and civic groups, local city councils and elected representatives; heavy media coverage; public opinion generally in favor of tolling to fund new SR-520 bridge ▪ Meetings targeted at low-income, minority, and "special needs" groups to address environmental justice issues ▪ Issue of "paying twice" has come up, raising questions about replacing sales tax with user fees ▪ "Scoping Process" on regional plan involved asking public and interest groups for reactions to alternatives; over 1,000 comments were received ▪ SR-520 outreach also involved and pitched a model peer review group to bolster the credibility of the planning process model ▪ Issue of revenues has arisen—i.e., spending revenues where they are raised (corridor) or across general transportation system, including transit
Maximizing Attention to RP in Planning—Barriers and Opportunities	*Opportunities:* ▪ Public familiarity and success of new Tacoma Narrows bridge that opened in 2007 with flat tolls was helpful for discussions on tolling on SR-520 and elsewhere in state ▪ Current economic climate has drawn attention to critical funding needs and increased support for tolling *Barriers:* ▪ Concerns about "paying twice" and model credibility

APPENDIX F

Interview Summaries Related to Communication and Engagement

New York City: Variable Parking Charges

In New York, through the Park Smart program, the New York City Department of Transportation (NYCDOT) aims to increase parking space availability, reduce pedestrian and vehicle accidents associated with double parking, and reduce pollution and congestion through new peak and off-peak meter rates. A 6-month trial of Park Smart began in 2008 in Greenwich Village. Thereafter, 71 Muni Meters in the West Village were permanently programmed to the Park Smart rate structure. The rates are $3.75 per hour from 12:00 pm through 4:00 pm, $2.50 per hour for all other hours. In 2009, a second 6-month pilot began in Park Slope, Brooklyn. Meter rates are $1.50 per hour from 12:00 pm through 4:00 pm and $0.75 per hour at all other times that meters are in effect. All other regulations remain the same. Table 11 summarizes the interview findings.

City of San Francisco: Areawide Pricing Proposal and Variable Parking Pricing

In San Francisco, planners at the San Francisco County Transportation Authority are studying areawide road pricing involving a $3 fee to enter, leave, or pass through certain parts of the city during peak hours, generating revenues in support of transit, cycling, and possibly more regional transit parking. Additionally, a proposal for pricing Doyle Drive leading to the Golden Gate Bridge was studied but rejected. At this writing, variable pricing of on- and off-street parking in certain downtown areas termed SFPark is planned for implementation in the summer of 2010. It will vary pricing for parking by demand and encourage drivers to park in underused areas and garages. It also will provide real-time information to parkers on availability. The planned test is at 6,000 metered spaces and 12,250 spaces in city-owned parking garages. Table 12 summarizes the interview findings.

San Francisco Bay Area: Regional High-Occupancy Toll Lane Network

In the San Francisco Bay Area region, several road pricing projects are planned and nearing implementation. High-occupancy toll (HOT) lanes are authorized by state law in 4 corridors: 580 Tri Valley, 680 Sunol, 85 & 101 in Santa Clara. Other potential HOT lanes are receiving attention, e.g., I-80 in Solano County. Bay Bridge peak pricing was recently adopted by the Bridge Tolling Authority. In light of growing development and acceptance of HOT lanes, the Metropolitan Transportation Commission (MTC) recently adopted a network of HOT lanes in its regional plan to manage traffic and bring on line new priced capacity 20–30 years faster than traditional state and local tax funding would allow. Table 13 summarizes the interview findings.

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Table 11. New York City parking pricing—communication and engagement.

Agency and Project	NYCDOT Office of Planning and Sustainability: Park Smart On-Street Pricing Program
Content	*Framing of pricing:* Frame peak pricing of parking as ▪ Way to reduce cruising and associated traffic, improve safety, reduce violations, and reduce cost of violations to delivery trucks passed through to businesses and customers; not as way to drive commuters to off-street parking as there are few commuters on-street, surveys find ▪ Voluntary program where neighborhoods can opt in or stay out of parking pricing; also frame as pilot with 6-month evaluation followed by possibility of termination after that *Audience targeting:* Used ▪ Business and neighborhood association allies ("advanced troops") used to "drum up interest" among various affected parties in the area ▪ Several one-to-one meetings with community boards and businesses districts *Environmental/funding issues:* ▪ One listed goal in the Sustainable Streets plan is reduced pollution, and is fitting with many efforts to reduce "miles driven" in DOT strategic plan, Sustainable Streets ▪ An advantage to parking pricing program is it did not require the same level of environmental scrutiny as compared to congestion pricing studied for NY, so no need to communicate NEPA requirements and processes *Equity:* ▪ Fairness across businesses more important than income equity ▪ "Sidewalk surveys" important to demonstrate how and when shoppers arrive, to counter concern about inequitable adverse impacts on some retail businesses and those highly dependent on timely deliveries
Context	*Respondent's view of government image:* Bolstered by ▪ City council and planners pitched as facilitators of a voluntary program, not as those imposing a program decided upon outside the community; "big bad DOT" image countered by fashioning programs for each area according to preferences ▪ Fostered responsiveness and "transparency" by holding transportation "seminars" for all 59 city community boards ▪ Listed specific transportation and parking project accomplishments on agency website and in Sustainable Streets, 2009 Progress Report *Reference to programs elsewhere:* ▪ No reference to programs elsewhere in communications, though planners have been watching and talking to San Francisco program for latest developments *Attention to stakeholder views:* ▪ Special attention to delivery business stakeholders to ensure that the program does not affect their delivery, and retailers to ensure that customer traffic would not be affected ▪ Also addressed residential stakeholders' concerns by monitoring spillover from commercial corridor into residential streets
Vehicles	*Content:* ▪ Park Smart website lists range of goals from increasing parking availability to improved safety, reduced cruising congestion, and less associated pollution ▪ Also lists trial sites and prices and highlights "merchant involvement" and support via sale of parking cards and displaying Park Smart logo ▪ 311 info website also lists similar information; "user feedback" encouraged via public forums and websites ▪ Sustainable Streets offers a Q and A section on parking programs, rates, use instructions, operation hours, etc.

Table 12. San Francisco areawide and parking pricing—communication and engagement.

Agency and Project	San Francisco County Transportation Authority: Mobility, Access and Pricing Study (MAPS) and SFPark
Content	*Framing of pricing:* ▪ Doyle Drive pricing plan framed as congestion relief and financing for major improvements ▪ MAPS framed as congestion relief, finance for transportation improvements including BRT, support of "economic vitality" and environmental benefit ▪ SFPark framed as improving parking availability, reducing cruising, pricing changing with demand *Audience targeting:* ▪ Doyle Drive showed importance of targeting Marin County decision makers who objected to and halted pricing plan as unfair to Marin County commuters (see "Equity") ▪ MAPS and SFPark show importance of targeting business community; e.g., a special economic impact study of MAPS aimed at business concerns is underway *Environmental/funding issues:* ▪ MAPS references climate change, potential alternative finance to potentially "bankrupt" federal Trust Fund ▪ SFPark emphasizes revenues to support transit *Equity:* Handle equity concerns by ▪ Potential discounts to special needs groups is under consideration for MAPS ▪ Dropping Doyle Drive pricing plan because of strong objection of an influential Marin county supervisor believing county commuters would bear large bulk of pricing charges; supervisor believed downtown areawide pricing was not objectionable because commuters from all counties would pay
Context	*Respondent's view of government image:* ▪ Image of government as slow to deliver on projects is hard to counter even with plans for transit expansion in concert with pricing *Reference to programs elsewhere:* ▪ Pricing in London and Singapore referenced in study and outreach materials, but downtown businesses see London as very "different" ▪ SFPark references Manhattan parking pricing program as a success *Attention to stakeholder views:* ▪ Single Task Force for Doyle Drive less beneficial than several working groups (technical, business, policy, citizen, and agencies), so issues and expertise match up ▪ important not to be seen as "talking down" to people or confusing them, a risk of the Task Force model
Vehicles	*Content:* ▪ Website, meeting materials, newsletters, press releases—all were employed ▪ Language important to conveying content, especially avoiding jargon and off-putting terms such as "marginal cost" pricing and even "congestion pricing"

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Table 13. San Francisco Bay Area HOT lanes—communication and engagement.

Agency and Project	San Francisco Bay Area MTC: Regional HOT Network
Content	*Framing of pricing:* ▪ Framed as expediting development of HOV network over and above what regular funding would allow, with HOT element as key to financing system and returning revenue to the same corridors where it is generated *Audience targeting:* ▪ Key actors included CMA directors, BATA (Bay Area Toll Authority—toll authority for bridge tolls), Caltrans, and CHP, all part of HOT Executive Committee concerned with finance, operations, and enforcement ▪ No specific targeting to environmental or auto interests [they do have input via standing Planning Committee and SPUR (SF Planning and Urban Research—an SF group concerned with HOT air quality impacts)], but will be targeted more as individual corridor studies start *Environmental/funding issues:* ▪ CO_2 emissions an explicit element, as well as NO_X, all touted as improved over regular HOV network ▪ "Return to source" finance important for CMA, city, county acceptance (legislation now specifies this)—more relevant where emerging HOT lanes are coming on line, versus general pot for region *Equity:* ▪ Some concern about HOT benefiting the rich, especially in 680 planning so far, but directing new revenue to transit blunts the issue ▪ Analysis by professor at SJ State was referenced as finding that no one is "forced" to pay—it is "all about choice"
Context	*Respondent's view of government image:* ▪ MTC and CMA image not an obstacle, with planning process generally seen as fair *Reference to programs elsewhere:* ▪ Helpful to reference HOT programs elsewhere, and helpful that some Commission decision makers have had tours of S. California programs ▪ Makes concept less foreign; website references FHWA VPPP and Reason Foundation paper on HOT networks *Attention to stakeholder views:* ▪ HOT Executive Committee views (see framing above) vital to acceptance in regional plan, with some operational issues still to be resolved with Caltrans (safety, weaving)
Vehicles	*Content:* ▪ Plan itself stresses "collaborative effort," quotes from MTC Commission chair and Alameda County Supervisor, indicating "worked closely over many months with thousands of …" agencies, business groups, ABAG (Association of Bay Area Governments; also points to benefits for economy (via congestion management), health and safety, equitable mobility options; pitches HOT as "expansion" of HOV concept, not a negation of it; promises "sooner funding" for "express lanes" and transit ▪ Plan pitches biggest revenue share is for transit, less for highways; HOT "principles" indicate more "throughput" and reduced "delays," benefits "commensurate" with revenues collected in specific corridor, use of "existing" highway right-of-way, design tailoring to each corridor, but "consistent" overall geometrics and signage ▪ FAQ explains HOT concept, rationale, and timeline; emphasizes "tried and true" concept, operations, cost, revenue use, attraction to HOV and transit; says "Lexus lane" is flawed criticism; and gives links to other HOT lanes in the United States

Portland, Oregon: Mileage-Fee Test Program

Portland, Oregon, assessed the feasibility of replacing the state gas tax with mileage fees in order to fund transportation and improve traffic in congested areas at peak travel times through variable distance-based pricing. The Oregon Department of Transportation operated a 1-year test of the mileage fee in the Portland area in March 2006 with the use of volunteers. The pilot program charged a per-mile fee at participating gas station pumps in lieu of paying the state gas tax. The charge was $0.012 per mile, discounted to $0.0043 during non-peak hours in certain zones and adjusted upwards to $0.10 for peak travel in congested zones and times. Table 14 summarizes the interview findings.

Table 14. Portland, Oregon, Road User Fee Pilot Program—communication and engagement.

Agency and Project	Oregon Department of Transportation: Mileage-Fee Program
Content	*Framing of pricing:* ▪ VMT better than gas tax with decline in revenues for future finance of highway infrastructure and operations; can be tuned to relieve congestion and to address greenhouse gas reduction strategies ▪ Application to plug-in electric vehicles or voluntary pilot as starters, and perhaps voluntary switch over from gas tax to VMT fee for the future ▪ Privacy concerns addressed by offering motorists choice of their mileage counting mechanism with various privacy protection options, but not wise to indicate "yes, people should be concerned" about privacy, as was done; some effort required to explain how much people now pay for gas tax *Audience targeting:* ▪ Twelve-member task force involved legislators, localities, agency interests and academics; auto makers not involved or electric vehicle manufactures and interests (a mistake in hindsight, they say), but AAA involved; also attempted to reach out to petroleum companies but they resisted "controversial" concept ▪ Public targeted via 3 public hearings to begin pilot, continuously involved via website and community meetings as go for "permanent pilot;" since "public" still not "on board" (key legislators are supportive, including important Senator as champion); in hindsight perhaps should have used focus groups to develop most effective messages rather than just instructional materials for pilot ▪ Should have been less in "reactive" and "trial and error" mode ▪ Also should have started with more fixed variables in concept—emphasis on "flexibility" scared some members of the public due to uncertainty about what future pricing would bring ▪ Media not targeted at first, only after their negative response; they eventually "came around" but no "media plan" to target them was a mistake *Environmental/funding issues:* ▪ Environmental groups wanted variations in pricing more attuned to emissions, although this viewpoint was not specified or accommodated in the program *Equity:* ▪ Urban versus rural important as equity issue since rural travelers generate more VMT; it is also difficult for rural public to estimate whether better off under gas tax or VMT fees; try to counter by making fee system simple ▪ Double paying another perceived fairness issue, as public perceives gas tax and mileage-fee system in combination—voluntary switch over may counter this concern
Context	*Respondent's view of government image:* ▪ General suspicion of government always an issue—government seen as inefficient and money grabbing ▪ DOT image is "pretty good" in terms of getting things done, maybe in top 10 nationwide, so not a big point of contention

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Table 14. (Continued).

Agency and Project	Oregon Department of Transportation: Mileage-Fee Program
	Reference to programs elsewhere: No references indicated *Attention to stakeholder views:* ▪ Task force designed to pitch concept to key decision makers and stakeholders, and at the outset tailored program design via focus group for designing instructional materials for pilot ▪ Changed from central to fuel station billing to reduce public (driver) concern for double billing, and changed from transmitting coordinates to counting only mileage via on-vehicle devices to address privacy issue ▪ Should have heeded public concern for more specific pricing plan as public dislikes uncertainty
Vehicles	*Content:* ▪ Relied quite heavily initially on individual explanations of rationales via e-mails in response to comments and criticisms ▪ Used newsletters and press communications stressing themes of sustainable support for transportation, flexibility by location and congestion ▪ Used website for FAQ, radio, TV and print media (national and local) ▪ ODOT communications people did not want involvement during concept development stage but assisted enthusiastically once pilot began

Puget Sound Region: HOT Lanes, Variable Bridge Tolls, and Pricing in Regional Plan

In the Puget Sound area, the SR-167 HOT lane project is operating and is slated for extension and possible merging with a planned I-405 HOT lane. Variable pricing of a bridge replacement is planned on SR-520 to fund the bridge reconstruction. Other candidates for pricing projects include the SR 509 extension and Alaskan Way Viaduct replacement. Road pricing options appear in the long-range plan but will require state legislation that has not yet been passed. Table 15 summarizes the interview findings.

City of Los Angeles: HOT Lanes and Parking Pricing Program

In Los Angeles, LACMTA and the California Department of Transportation (Caltrans) are planning for the conversion of high-occupancy vehicle (HOV) lanes to high-occupancy toll (HOT) lanes on the I-10 and I-110 corridors. (Conversion of the I-210 corridor is subject to funding availability and requires state legislation). The pilot pricing program is to be combined with improved transit service and an intelligent parking management system in downtown Los Angeles with variable pricing based on parking demand. Table 16 summarizes the interview findings.

Twin Cities of Minneapolis and St. Paul: I-394, I-35W, and Future HOT Lane Projects

In the Twin Cities area, the I-394 express lanes started in May 2005 via conversion of an existing HOV lane from Highway 101 to I-94 in the Minneapolis area. The express lanes are dynamically priced and remain free to buses, HOVs, and motorcyclists during peak hours. They also remain free to all users during off-peak periods (and in off peak direction during peak hours). In September 2009, the I-35W express lane opened, with 2+ carpools free and dynamic pricing during peak periods. A portion of the 16-mile long facility uses a converted shoulder lane available at most congested times. Potential express lanes are being investigated on other corridors. Table 17 summarizes the interview findings.

Table 15. Puget Sound Region HOT lanes—communication and engagement.

Agency and Project	Puget Sound Regional Council, Seattle: Regional Transportation Plan and Various Projects
Content	*Framing of pricing:* ▪ Unifying theme behind implementation of SR-167, SR-520 current plan and recent authorization by WA State Commission for 7 potential toll corridors is the need for revenues for development and traffic management—"Tolls are considered due to intractable funding gap for a must-do project" (from webinar slide) ▪ Moving Washington (state 10-year plan) stresses revenues for "strategic capacity" and traffic management ▪ Also pivoted off of past experience and success of Tacoma Narrows and SR-167 HOT; PSRC RTP on pricing (see Transportation 2040) includes broad environmental, prosperity, mobility, and quality-of-life goals *Audience targeting:* ▪ RTP scoping process goes to public at large and interest groups ▪ Key targets are Transportation Policy Board, Pricing Task Force, and several working groups ▪ Doing targeted meetings with special needs, low-income, and minority groups ▪ SR-520 planning involves city councils, businesses, public at large, and stakeholder groups *Environmental/funding issues:* RTP discussion ▪ Emphasizes vehicle emissions reduction, open space retainment, less runoff from impervious surfaces, "quality of life" benefits including reduced accidents ▪ Notes statewide GHG reduction goals (1990 levels by 2020) as "legislative direction" ▪ References lack of sustainable funding under current gas tax system, indicating that no tolling means "traditional" sources will need rate adjustment, indexing, more reliance on general fund, taxes on sales ▪ Indicates federal revenues in 2009 will be inadequate to meet SAFETEA-LU "spending guarantees" ▪ Big unresolved finance issue now is whether to dedicate toll revenue to toll facilities or broader uses ▪ Regional plan discussion also indicates must-have "financially constrained" component, with balanced costs and revenues, supportive of pricing *Equity:* RTP discussion framed and discussed around ▪ Income differences ▪ How toll revenues may link with fairness issue of "paying twice" if supporting transit via tolls and sales tax (may roll back or "rebase" if toll revenues grow)
Context	*Respondent's view of government image:* ▪ No particular negative image presently for PSRC in plan development; agency generally respected ▪ Effort to get lots of public and decision-maker input which may keep image as "responsive" ▪ Used "model peer review" group for SR-520 work to bolster credibility of planning model *Reference to programs elsewhere:* ▪ Tacoma Narrows referenced in toll discussions, including SR-520 FAQ documents, especially focusing on operations with "non-stop" toll collection ▪ Emphasized that "experiences in other cities in the U.S. and around the world have shown that these fees can help reduce congestion" ▪ Also referenced SR-167 as "pay for quicker trip" to counter image of tolls as necessitating toll booths

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Table 15. (Continued).

Agency and Project	Puget Sound Regional Council, Seattle: Regional Transportation Plan and Various Projects
	Attention to stakeholder views: ▪ Regular interaction with key stakeholder decision-maker groups, including WA State Commission for overall tolling in state, Transportation Policy Board, Pricing Task Force at regional level, and specific groups associated with project planning, for example SR-520 ▪ SR-520 project committee (MPO head, secretary of transportation, chair of transportation commission) received technical and outreach results (from city mayors, city councils, chambers, public meetings) to help fashion acceptable project (see vehicles used, below)
Vehicles	*Content:* ▪ Regional plan references "reliability," time savings and emissions control; also pitches gas tax as "toll"-like road pricing in town halls, i.e., another user fee drivers may not calculate on per mile basis ▪ SR-520 public information stresses "variable tolls can help relieve congestion" giving people "incentive to change travel times, reduce optional trips, take an alternate route, or choose transit as an alternative to driving alone," also emphasizes transit expansion and electronic signs for real-time traffic information ▪ SR-520 examples of vehicles for soliciting wide range of input include meetings with cities, town halls, open houses, decision-maker and press interactions ▪ SR-520 information presented "to more than 40 elected officials, jurisdictions, and stakeholder groups during the spring and summer of 2008 … these included meetings with community and civic groups such as the Bellevue Downtown Association and Transportation Choices Coalition, along with many local city councils and elected representatives" ▪ SR-520 also has special project website that summarizes media and public reactions in a report (input from 2,770 people, many from letter-writing campaigns sponsored by Sierra Club and Mercer island residents)

Table 16. Los Angeles metropolitan area HOT lanes—communication and engagement.

Agency and Project	Los Angeles Metro: I-10, I-110, I-210 HOT Lanes and Downtown Parking Pricing Plan
Content	*Framing of pricing:* ▪ It all started as a grant application. ▪ Increase capacity through proven concept of HOTs as opposed to more controversial areawide pricing, with encouragement for more transit use, while staying within limits and directions of state enabling legislation governing HOTs ▪ Downtown parking pricing plan framed as building toward a comprehensive approach to congestion reduction and providing connectivity to the E-W I-10 corridor and the N-S I-110 corridor. ▪ Pricing presented as adding choice, as opposed to coercion *Audience targeting:* ▪ Involved major facilities along the corridors (e.g., Dodger Stadium, music center, medical facilities, LA Trade Tech educational facility) and grassroots groups in corridors ("corridor advisory groups") and media ▪ Did not have "different messages for different groups" ▪ Tried to make HOT real and tangible by showing how it works for different commuter groups. LACMTA project management envisioned the need for the use of visual aids to explain a difficult concept in a very simple way. LACMTA project management worked with the Communications Department to develop a DVD that was presented at meetings and distributed. The HOT lanes project also resulted in improved communications and coordination internally among LACMTA's different departments. ▪ Outreach plan says "identify target audiences (commuters, transit providers, residents, businesses, employers, employees, labor, environmental, policy leaders, government agencies, etc.) and develop corollary key messages"

Table 16. (Continued).

Agency and Project	Los Angeles Metro: I-10, I-110, I-210 HOT Lanes and Downtown Parking Pricing Plan
	Environmental/funding issues: ▪ Political and public acceptability improved by ensuring return of revenues to the corridor for improvements and transit support, consistent with state and federal legislation. Support was also gained because existing carpool users would not be charged tolls if they continued to meet the minimum passenger occupancy requirements. Thus, the project was presented as improving the travel choices available to them, as well as to solo drivers *Equity:* ▪ "Double taxation" is fairness issue among public ▪ Legislators initially concerned about environmental justice, but parallel study conducted by LACMTA and project experience has amassed to "debunk" the idea that road pricing is unfair to lower-income people ▪ Plans give strong attention to "multi-modal" aspect to advantage lower-income groups
Context	*Respondent's view of government image:* ▪ People do distrust government; tried to counter by being "forthright" and responsive in all matters *Reference to programs elsewhere:* ▪ Early federal-supported symposium showcasing successful projects in Stockholm, Seattle, Texas, etc. (Gunnar Söderholm from Stockholm particularly effective for local stakeholders to hear) ▪ Metro website FAQ references projects elsewhere, including live chat with LACMTA Board Chair *Attention to stakeholder views:* ▪ Attentive to stakeholder views and positions in application to Feds, mustered necessary support locally and at state level (needed legislative support for HOTs in early 2008), including AAA which held neutral position ▪ Fashioned proposed state legislation in simple, short terms and referenced existing legislation [AB1467, 2006 allowed implementation of 2 HOT lane projects in S. Cal, with approval of California Transportation Commission (CTC)] so RP was cast as falling within current law and policy directions ▪ Attentive to CTC's task charged by state legislature and LACMTA project management staff's interpretation of state legislation that was accepted by CTC staff, all these helped merging four HOT corridors into one HOT project for federal approval, with support and encouragement of federal VP actors ▪ Worked with regional planning agency to amend 2001 plan to include I-10 and I-110 projects, and I-210 if funding became available, though there was little challenge or concern by regional planning agency actors ▪ Outreach by LACMTA staff to several Council of Government (COG) agencies, including the South Bay COG and the San Gabriel Valley COG, which lobbied elected officials and public attendees at meetings
Vehicles	*Content:* ▪ Stressed congestion as high if not highest public quality-of-life concern in LA, choice not coercion in HOT concept, gas tax as declining revenue source for supporting even highway operations. Message provided was that project's objective was congestion relief, not revenue generation. ▪ Stressed RP was not a "double tax" issue as public was getting something new and more than before, including support for more transit ▪ Vehicles include "Express Lane Experience" materials with different "profiles" for different commuters via animated PowerPoint presentations ▪ Did media briefings to inform and persuade media of merit of the project, which was successful judging by positive editorials ▪ Used press releases ▪ Website has FAQ, "discovery workshop" with links to projects elsewhere, and live chat allowing direct communication on project topics

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Table 17. Minneapolis–St. Paul HOT lanes—communication and engagement.

Agency and Project	Minnesota Department of Transportation, Minnesota: I-394 and I-35W HOT Lanes
Content	*Framing of pricing:* ▪ HOT lanes framed overall as getting better use from underutilized HOV lanes while preserving and enhancing transit use on the HOT facilities ▪ Emphasized as "congestion free choice" with no one worse off, and a fixable or reversible project if conditions worsened in unexpected ways ▪ De-emphasized revenue generation and emphasized congestion management and improved travel options ▪ Did not explore pricing of existing lanes for future, but now exploring the use of shoulders (e.g., I-94); areawide not proffered as downtown congestion is not severe *Audience targeting:* ▪ Marketing focused on individual components with different interest groups, e.g., Metro Transit conveyed the transit benefits in workshops for transit riders and stressed reliability and free flow for drivers on I-35W ▪ Tailored to purpose, e.g., certain communications just tell people that the I-35W project is opening and remind people to buy a transponder, others promote the telecommute initiative or transit benefits *Environmental/funding issues:* ▪ Environmental issues tended to center on noise and possible spillover around the proposed corridor, handled by monitoring and evaluation ▪ Revenues tied to operating costs and if there are excess revenues, law requires 50% go to transit, 50% to other transportation improvements (current revenues do not render surplus) ▪ "Green" aspects of the project now being evaluated *Equity:* ▪ Some concern that transit and HOV users may lose out in HOT lane, so project managers showed transit impacts elsewhere and shaped plan to support transit and HOV ▪ Other possible losers were workers on fixed schedules unable to modify time of travel very much, and this concern was met in I-35W planning by emphasizing telework as an option ▪ Income equity has not been paramount issue, but reference to I-15 used to show that all income groups use HOTs
Context	*Respondent's view of government image:* ▪ "Sometimes" better to have University of Minnesota present to project ideas at the outset versus DOT, since sometimes "there is suspicion of government" and "complex systems" ▪ University of Minnesota is considered neutral—adds credibility and objective tone *Reference to programs elsewhere:* ▪ Community Task Force (see below) met monthly and visited California's SR-91 and I-15 projects for information and application to MN; data from both often referenced *Attention to stakeholder views:* ▪ Under "grasstops" approach, strategy was to get decision-maker support first; Community Task Force operated over 2004 and 2005 with representatives from 6 city councils, citizen representatives, AAA, trucking association, transit-oriented groups, and state legislators ▪ Task Force targeted by Humphrey Institute (Univ. of Minnesota) and DOT to receive continuous information on HOT concept, all leading to implementation of I-394 HOT

Table 17. (Continued).

Agency and Project	Minnesota Department of Transportation, Minnesota: I-394 and I-35W HOT Lanes
	▪ For newest HOT plan I-35W, local mayors were targeted and are now engaged; planner responsiveness to Task Force shown by initial proposal for $8 max and $0.50 min charge, but Task Force thought minimum value was too high and proposed $0.25, which was accepted as "politically palatable" even though it results in reduced revenues; media targeted to make sure they had "all information"
Vehicles	*Content:* ▪ "No question unanswered" approach in content of meetings and workshops important element ▪ Vehicles include University of Minnesota and MnDOT use of public roundtables on "Rethinking Transportation Finance" for key leaders ▪ Legislative seminars on transportation issues ▪ Hired consultant to help develop vehicles and content of presentation materials, feed media; also used publicity video

Dallas Region: Various Tolling and Managed Lane Projects

In the Dallas metropolitan region, there are several toll roads that will include variable pricing, following adopted regional policy. Currently, committed HOT lanes (termed "managed lanes") include I-30, I-635, I-35E, the North Tarrant Expressway, and the Dallas–Fort Worth Connector. North Central Texas Council of Governments (NCTCOG; MPO for the Dallas region) and Texas Department of Transportation (TxDOT) have planned several other priced expressways with variable pricing and traditional toll roads slated for the near or long term. The North Texas Tollway Authority is the toll provider and is constructing SH 121, SH 161, and the Southwest Parkway. Table 18 summarizes the interview findings.

New York City: Areawide Pricing Proposal

Areawide pricing was proposed in New York City in 2008. The plan proposed a daily charge of $8 for cars entering lower Manhattan south of 60th Street to improve travel times and reliability in the city. Trucks would pay $21. Autos traveling only within the priced zone would pay half the price. The charge would apply to all vehicles, except emergency vehicles, those with handicapped license plates, taxis, and for-hire vehicles (radio cars). Fees would be assessed through an existing EZ Pass transponder system used for collecting bridge tolls. For drivers without EZ Pass, the charge would be assessed through cameras mounted on traffic light poles, with payment options available through the Internet, telephone, and participating retail outlets. The revenues from the congestion charge were proposed to be used for transit improvements and investment in the city's subway system. This plan was not approved by the state assembly and was not initiated. Table 19 summarizes the interview findings.

Washington D.C. Region, Maryland, and Virginia: High-Occupancy Toll Lanes

Virginia Department of Transportation (VDOT) is planning two new HOT lanes in each direction on the I-495 Capital Beltway from the Springfield Interchange to just north of the Dulles Toll Road (14 miles) and introduction of HOV and new transit service on the Beltway

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Table 18. Dallas–Fort Worth area managed lanes—communication and engagement.

Agency and Project	NCTCOG, NTTA and TxDOT: SH 121 (in operation), SH 161, I-635, DFW Connector, and North Tarrant Expressway (planned), I-30, I-35E, Southwest Parkway
Content	*Framing of pricing:* ▪ Supporting MPO policy from 15 years ago provides key framework: region does not have sufficient gas tax to meet "capacity needs"; any freeway reconstruction will test for "express lane" feasibility; but existing free lanes will not be tolled ▪ Also pitched that there is plenty of capacity but not at all times of day, so pricing can shift and reduce peak demand and speeds can be "guaranteed" because of dynamic pricing, where applied to tolled managed facilities ▪ Framed in terms of how much we really "pay" for transportation and how old and inadequate infrastructure will be burden on "children and grandchildren," so if we won't tax selves via legislature or congress, we need to pay the right amount now to get at sustainability, especially if external costs of safety, congestion, air quality, climate change, and energy are accounted for *Audience targeting:* ▪ Forty elected officials at NCTCOG gave unanimous support for tolls; support is continually nurtured by "monthly communications" from staff on rationale and purposes of tolls to "keep in the fold" ▪ Generally used same messages across groups ▪ Tried to maintain support with locals in part by alluding to congress and state legislature as either not up to the job or diverting funds, compared to user fees where "we" more local powers can ensure that funds are spent on local roads and transit *Environmental/funding issues:* ▪ As non-attainment area, very important to tie road pricing to emissions inventories for mobile sources, whole concept of managed lanes would not have "its wings" if not tied to the ozone problem ▪ Relied on reality of diminished federal funding for roads in urban areas as central to tolling rationale; toll revenues also enable transit support not otherwise possible (see next); for PPP projects, revenues pay back operating costs and upfront construction costs *Equity:* ▪ Environmental justice analysis shows equity is not a problem in terms of accessibility to jobs, i.e., geographic/spatial equity for road pricing projects is acceptable ▪ Stressed toll revenues as enabling transit support, e.g., (121 project) a passenger rail project supported exclusively by tolls ▪ Rural versus urban equity is an issue, not so much because of tolls per se, but new toll roads cutting up large tracts of privately owned rural land (especially inter-city) ▪ Also some concern about private sector involvement in several projects (I-635, DFW Connector and N. Tarrant Expressway), so concern is profit motive and preference in private land acquisition and development ▪ Another effort is to show that value of time (e.g., getting to daycare pickup on time) is not a function of wage rate, so then blue versus white collar doesn't matter—"opportunity cost" of time does, and express lanes allow choice "when you are in a hurry"; compelling argument to say that all people will pay to not be late, sometimes
Context	*Respondent's view of government image:* ▪ TxDOT is perceived to have a somewhat negative image in rural but not urban areas, where residents seem to buy the idea of "no roads, slow roads or toll roads" in the face of growth and declining gas tax ▪ NCTCOG has extensive meeting and communication agenda shows that they are not "hiding anything and always out there taking the message," fostered also by inviting any meeting participants to subsequent meetings ▪ Believes image and acceptability trouble can be avoided by common trap of "preaching to friends and avoiding critics"

Table 18. (Continued).

Agency and Project	NCTCOG, NTTA and TxDOT: SH 121 (in operation), SH 161, I-635, DFW Connector, and North Tarrant Expressway (planned), I-30, I-35E, Southwest Parkway
	Reference to programs elsewhere: ▪ Some familiarity in the region with toll roads didn't require reference to programs elsewhere for operational explanations *Attention to stakeholder views:* ▪ Important to pay attention to all groups and at all times ▪ Need "constant communication" to keep support of all groups including neighborhoods, conservative tax people, libertarians, state legislators, local officials, chambers of commerce; have stayed course for "15 years" ▪ Key group to "keep" is the state legislators, to whom it was pitched that gas taxes are not sufficient to meet region's needs, so tolls are the only or forced option; doing "nothing" is unacceptable in the face of growth ▪ Many decision makers at MPO are anti-tax and generally conservative, but were "won over" by stressing not behavior change or social engineering, but sustaining a system of roads and transit for growth in a fiscally responsible way—given that the region is adding a "million people every seven years"
Vehicles	*Content:* ▪ Strong Internet presence was used as a vehicle, also held "40 public meetings a year" with presentations to city councils, editorial boards, talk shows, town hall meetings, one-to-one meetings with congressional and legislative delegations, speeches at events (250/year), use of newsletter ▪ Entirely open process so all can "give their 2 cents worth"; sent out 8,000 notices every time they did public meetings, so no complaints about lack of information about meetings ▪ Did public surveys including a panel over time on toll road attitudes ▪ Key actor (former chair of TxDOT) coined vital supporting phrase, "slow roads, no roads or toll roads" in support of PPP legislation ▪ Cleared misconceptions and clarified communications content on managed lanes about all lanes versus just express lanes being tolled ▪ Stressed new capacity with pricing (e.g., LBJ freeway adds capacity via frontage roads) and payment coming from managed lane's users (see framing for content emphasis above) ▪ Also used the message of inadequacy of gas tax, and ensuring that revenues go to specific improvements, preventing "children and grandchildren" from the burden ▪ Stressed "guarantee" of free flow on managed lanes; also tried to counter concerns about private sector involvement discussing the roles of risk taking and distribution of revenues

and Tysons Corner. The HOT lanes will allow the Beltway to offer HOV-3 connections with I-95/395, I-66, and the Dulles Toll Road. When completed, buses, carpools, and vanpools with three or more persons, and motorcycles will travel for free; vehicles carrying one or two persons will pay a toll or use free lanes. Also planned are HOT lanes on I-395. The 56-mile project would add a third lane to the existing 28 miles of HOV lanes between Arlington and Dumfries and would include building two new HOV lanes for an additional 28 miles south to Spotsylvania County. Lastly, the Maryland Intercounty Connector (ICC) planned by the Maryland State Highway Administration (SHA) will link existing and proposed development areas between the I-270/I-370 and I-95/US 1 corridors within central and eastern Montgomery County and northwestern Prince George's County. It will be operated as a new toll facility by the Maryland Transportation Authority (MDTA). The connector will be Maryland's eighth toll facility. Table 20 summarizes the interview findings.

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Table 19. New York City areawide pricing—communication and engagement.

Agency and Project	New York City Department of Transportation and NYC Mayor's Office: Proposed Areawide Pricing Plan
Content	*Framing of pricing:* ▪ Framed in terms of transportation needs in light of growing population, need for managing congestion and shifting more to transit, not air quality or climate change ▪ Emphasized that transit service would be increased before the start of charging or at the same time as revenue stream starts flowing ▪ Frame impact has been weakened by current economic recession where major capital funding for MTA looms larger, and congestion has diminished in case of traffic and transit ridership; therefore impetus for PlaNYC diminished *Audience targeting:* ▪ NYCDOT and Mayor's Office tailored communication for specific stakeholders ▪ Separate meetings were organized with transit and traffic communities, with general public, constant community meetings with community boards, small and large businesses, and outreach to environmental organizations and environmental justice constituencies ▪ There were different messages to different groups: ○ Drivers—Reduced travel time ○ Transit riders—Transit funding ○ Big business—Street efficiency ○ Small business—Ease of compliance, since most small businesses rely heavily on driving ○ Labor—Jobs created because of construction of new subway lines *Environmental/funding issues:* ▪ Environmental issues were not a big driver, although always referenced as one of three prime goals (congestion reduction, transit support, air quality improvement) ▪ Climate change is not an obvious plus for RP, e.g., if the problem was idling, the competing solution is encouraging hybrids ownership and transit fleet conversion, not clearly linked to RP ▪ RP revenues were proposed to fund a special Transit Capital Improvements account for transit enhancements *Equity:* ▪ The "thorniest groups" were the organizations advocating for outerborough commuters, who felt pricing was inequitable for drivers without a viable transit alternative to driving. Organizations representing lower-income communities supported pricing because revenues would go toward transit; low-income groups are heavily dependent on transit, do not typically drive into Manhattan, and some low-income neighborhoods need better transit access and options ▪ Another equity issue was directing revenues back to source, some not wanting to pay so that neighborhoods other than their own get more transit service
Context	*Respondent's view of government image:* ▪ There is some distrust among the public about MTA delivering on program promises; "didn't help" that shortly before the failed state assembly vote, the MTA rolled back promised service improvements because of funding shortfalls *Reference to programs elsewhere:* ▪ London areawide pricing example and quantitative results were referenced a great deal; especially used to show air quality improvements and neutral impacts on business ▪ London also showed the wisdom of adding more buses before road pricing took place to boost acceptability; problem with London was people believed it was a good model but then rumors of some bad experiences clouded the results ▪ PSRC plans and model analysis were also referenced *Attention to stakeholder views:* ▪ A large coalition of environmental advocacy organizations (including campaign for New York's Future) supported the project; large businesses were generally supportive

Table 19. (Continued).

Agency and Project	New York City Department of Transportation and NYC Mayor's Office: Proposed Areawide Pricing Plan
	▪ Many "auto-oriented" residents of Queens and Brooklyn were opposed to the project and could not be convinced of the benefits ▪ Key actor (speaker of state assembly) did not come forward to support due to installation of cameras as privacy issue, potential traffic and pollution impacts on neighborhoods surrounding congestion zone, and congestion reduction only in Manhattan and not other neighborhoods ▪ The state eventually rejected the proposal due to insufficient convincing or compromises
Vehicles	*Content:* ▪ Used "every vehicle in the book" for outreach; used response content in answer to questions as they arose through Mayor's Office, e.g., on the point of who benefits, "the majority of New Yorkers don't own a car so the majority would benefit," "the average transit user makes $22,000/year and the average driver $34,000/year" ▪ Stressed pilot nature of program, "best way to predict whether it will work is to try it" in Plan2020; also mentioned that most would pay less than the "cost of commuting by bus" ▪ Stressed benefit not just in Manhattan but in other boroughs as well since much traffic bound for Manhattan passes through them ▪ Emphasized potential economy benefit, saying "Manhattan would be more productive" for businesses there; stressed transit improvements "prior to implementation of congestion pricing" ▪ A clear website table outlines "features" of the pilot; possible problem of parking spillover outside the zone addressed by "possible solutions including parking permits for residents"

Table 20. Washington, D.C. metropolitan area HOT lanes—communication and engagement.

Agency and Project	VDOT, MD SHA: Maryland ICC and in Virginia, I-495 HOT Lanes and I-395/95 HOT Lanes (proposed)
Content	*Framing of pricing:* ▪ Framed in terms of "rapidly worsening congestion and funding shortfalls," beginning in mid 2000s; metropolitan transportation plan updates and long-range vision plans documenting "a system in crises" ▪ Underscored that D.C. region ranked high on congestion (TTI rank #2) and also pointed out significant number of commuters are from "out of state" so some appeal for outsiders paying their fair share ▪ HOT lanes were framed as allowing choice to pay (no forcing) and avoid congestion, producing some congestion relief on mixed traffic lanes, and making more congestion free lanes available to transit ▪ Priced new ICC lanes were presented as providing a fast by-pass shortcut between two heavily congested freeways; managed lanes promise of "largely self-financing" new highway capacity was part of the frame *Audience targeting:* ▪ Although three consultations with MD secretary of transportation garnered support for HOV conversion along US-50, the previous governor was swayed by opposition to "Lexus lanes" ▪ Still interacting with opponents of I-395/95 HOT lanes to be operated as a PPP ▪ For northern VA HOT lanes, VDOT and private sector partner "have done careful nurturing through well crafted outreach activities to generate and sustain the supporting constituency," and thus far the two projects received "close scrutiny" by the entire Transportation Planning Board and were adopted in the region's long-range plan

(continued on next page)

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Table 20. (Continued).

Agency and Project	VDOT, MD SHA: Maryland ICC and in Virginia, I-495 HOT Lanes and I-395/95 HOT Lanes (proposed)
	▪ Audience targeting is ongoing and tied to objections about added capacity and growth inducements *Environmental/funding issues:* ▪ Maryland's Statewide Express Toll Lanes Network Initiative and Washington metropolitan region's brochures on "sustainability" and "green future" all make indirect references to "tolling" and "pricing" as options ▪ MD/ICC pitches pricing as reducing VMT by resulting in shorter trips and associated air quality benefits ▪ However, environmental community sees new HOTs as a surreptitious way of adding highway capacity ▪ Revenues planned to be returned to corridors that generate them ▪ Some uncertainty arising about I-395/95 HOT revenues falling below projections, possibly due to effect of overall economic and traffic downturn, so construction postponed until further analysis *Equity:* ▪ On income equity issue, referred to evidence based on surveys of user perceptions and actual travel patterns by different population segments from other RP projects like San Diego I-15 and Orange County SR-91 to dispel public concerns regarding "equity"
Context	*Respondent's view of government image:* ▪ Importantly for D.C. region, good travel and air quality modeling tools are respected by stakeholders and governing board *Reference to programs elsewhere:* ▪ Referenced I-15 and SR-91 on equity issue *Attention to stakeholder views:* ▪ New 2009 Revised Transportation Policy Plan resulted from policymaker workshops and debates on future of transportation and has pricing and managed lanes as important components ▪ Key stakeholder group to target and attend to views is the Transportation Planning Board (TPB) composed of the three DOTs and several local jurisdictions ▪ States come to the TPB for project proposal approval based on whether project meets federal, state, and other requirements (funding, AQ, CMP, etc.) and how the project fits in with shared regional goals and priorities ▪ Maryland DOT as one key actor involves other state agencies like the MD Toll Authority and relevant MPOs in planning and outreach ▪ In 2000s, FHWA VPPP grant funded workshop to inform key stakeholders and "opened the door" for further exploratory studies and discussions by VDOT, eventually leading to the PPP agreement for Beltway/I-495 HOT lane project ▪ Maryland ICC project has been supported by businesses (chambers of commerce, etc.), trucking interests, and a majority of the region's planners; it has been opposed by many, but not all, of the environmental community and corridor residents
Vehicles	*Content:* ▪ Three involved states conducted multiple public information meetings and public hearings ▪ Established a website and means of responding to individual queries, held stakeholder meetings ▪ TPB held public hearings and workshops, consulted with TPB Transit Advisory Committee, conducted citizens meetings during environmental review process, held marketing campaigns, disseminated information at retail kiosks, and engaged the press ▪ Each state and jurisdiction relied upon established community outreach and consultation strategies: community meetings, websites, newspaper ads, public hearings, focus groups and surveys

APPENDIX G

Planning Resources for the Road Pricing Concepts

Conversion of Existing High-Occupancy Vehicle (HOV) and Other Lanes to High-Occupancy Toll (HOT) Lanes

Federal Government Resources and Research

K.T. Analytics, Inc. and Cambridge Systematics, Inc., *Final Report,* Federal Highway Administration (August 2008). See for discussion of conversions of HOV lanes to priced HOT lanes in Section 2-1, including case studies on impacts, equity, environment, operations, outreach and marketing with project details in Appendix B, part 1.0.

Evans, J. E., K. U. Bhatt and K. F. Turnbull, *TCRP Report 95: Traveler Response to Transportation System Changes, Chapter 14: Road Value Pricing,* Transportation Research Board of the National Academies, Washington, D.C. (2003). See for discussion of impacts, analytic considerations, elasticities, case studies, and planning considerations.

State and Local Government Resources

See the following documents/reports for discussion of each HOT lane conversion program with detailed description of impacts, cost and revenue implications, outreach, and affected party reactions.

Minneapolis (I-394)

Website of Minneapolis MnPASS lanes: http://www.mnpass.org (As of July 28, 2010).

San Diego (I-15)

Website of San Diego I-15 FasTrak lanes: http://fastrak.sandag.org (As of July 28, 2010).

Denver (I-25)

Colorado Department of Transportation, *I-25 HOV/Express Lanes: Monthly Progress Report.*

Colorado Department of Transportation, I-25 HOV/Tolled Express Lanes Website: http://www.coloradodot.info/travel/tolling/i-25-hov-express-lanes (As of July 28, 2010).

Houston (Katy Freeway and US 290)

Website of Houston Value Pricing Quick Ride program: http://houstonvaluepricing.tamu.edu/quickride/ (As of July 28, 2010).

The Effect of Operational Changes on the US 290 HOV/HOT Lane—available at http://houstonvaluepricing.tamu.edu/reports/documents/us_290.pdf (As of July 28, 2010).

Academic and Other Resources

Buckeye, K. R. and L. W. Munnich, Jr., "I-394 MnPASS High-Occupancy Toll Lanes: Planning and Operational Issues and Outcomes (Lessons Learned in Year 1)." *Transportation Research Record: Journal of the Transportation Research Board,* No. 1996, Transportation Research Board of the National Academies, Washington, D.C. (2007), pp. 49–57.

Buckeye, K. R. and L. W. Munnich, Jr., "Value Pricing Outreach and Education: Key Steps in Reaching High-Occupancy Toll Lane Consensus in Minnesota." *Transportation Research Record: Journal of the Transportation*

Research Board, No. 1864, Transportation Research Board of the National Academies, Washington, D.C. (2004), pp. 16–21.

Supernak et al., *I-15 Congestion Pricing Project, Monitoring and Evaluation Services, Task 13, Phase II Year Three Overall Report* (September 24, 2001).

Burris, M. W. and J. Appiah, "Examination of Houston's QuickRide Participants by Frequency of QuickRide Usage." *Transportation Research Record: Journal of the Transportation Research Board,* No. 1864, Transportation Research Board of the National Academies, Washington, D.C. (2004), pp. 22–30.

Burris, M. W. and B. R. Stockton, "Hot Lanes in Houston—Six Years of Experience," *Journal of Public Transportation,* Vol. 7, No. 3 (2004).

Variable Pricing on New or Rehabilitated Facilities

Federal Government Resources and Research

K.T. Analytics, Inc. and Cambridge Systematics, Inc., *Final Report,* Federal Highway Administration (August 2008). See for discussion of variable pricing on new expressways and networks, Sections 2-11 and 2-23, including case studies on impacts, equity, environment, operations, outreach, and marketing with project details in Appendix B.

Evans, J. E., K. U. Bhatt and K. F. Turnbull, *TCRP Report 95: Traveler Response to Transportation System Changes, Chapter 14: Road Value Pricing,* Transportation Research Board of the National Academies, Washington, D.C. (2003). See for discussion of impacts, analytic considerations, elasticities, case studies, and planning considerations.

U.S. Federal Highway Administration, *Technologies That Enable Congestion Pricing, A Primer* (2009). See for discussion of tolling technologies from manual to advanced, including relevant enforcement and operations technologies. See: http://www.ops.fhwa.dot.gov/publications/fhwahop08042/fhwahop08042.pdf

U.S. Federal Highway Administration, *Congestion Pricing, A Primer: Overview* (2009). See for discussion of a range of pricing options, U.S. and overseas experience to date, nature of congestion, impacts and benefits of pricing, relevant supporting U.S. DOT programs and FAQs. See: http://www.ops.fhwa.dot.gov/publications/fhwahop08039/fhwahop08039.pdf

State and Local Government Resources

See the following links for reports for specific express lane facilities and plans, both single facility and network, including project descriptions, study reports, and public information pieces.

San Francisco Bay Area Network Plan

http://www.mtc.ca.gov/planning/hov/HOT_Phase_3_report/2_HOT_Lanes_Final_Report.pdf (As of July 28, 2010).

Also see public information: http://www.mtc.ca.gov/planning/hov/faq.htm (As of July 28, 2010).

Seattle, WA—State Route 520

http://www.build520.org (As of July 28, 2010).

Also see public involvement: http://www.wsdot.wa.gov/Partners/Build520/choices.htm and funding plan: http://www.wsdot.wa.gov/Partners/Build520/funding.htm (As of July 28, 2010).

San Diego, CA—Interstate 15

http://fastrak.511sd.com/ (As of July 28, 2010).

Orange County, CA—State Route 91

http://www.91expresslanes.com/ (As of July 28, 2010).

Washington, D.C., National Capital Region—the Intercounty Connector, the Northern Virginia Capital Beltway HOT Lanes Project, and the I-95/395

http://www.mwcog.org/uploads/committee-documents/bl5fWV5X20080310120945.pdf (As of July 28, 2010).

Academic and Other Resources

HOT Networks: A Plan for Congestion Relief and Better Transit (Reason Foundation), available at http://www.rppi.org/ps305.pdf (As of July 28, 2010)—provides an overview of rationales for priced lane networks, some experience to date, and planning considerations.

Variable Pricing on Existing Toll Facilities

Federal Government Resources and Research

K.T. Analytics, Inc. and Cambridge Systematics, Inc., *Final Report,* Federal Highway Administration, (August 2008). See for discussion of variable pricing on existing tollways Section 2-16, including case studies on impacts, equity, environment, operations, outreach and marketing with project details in Appendix B, part 3.0.

Evans, J. E., K. U. Bhatt and K. F. Turnbull, *TCRP Report 95: Traveler Response to Transportation System Changes, Chapter 14: Road Value Pricing,* Transportation Research Board of the National Academies, Washington D.C. (2003). See for discussion of impacts, analytic considerations, elasticities, case studies, and planning considerations.

U.S. Federal Highway Administration, *Technologies That Enable Congestion Pricing, A Primer* (2009). See for discussion of tolling technologies from manual to advanced, including relevant enforcement and operations technologies. See: http://www.ops.fhwa.dot.gov/publications/fhwahop08042/fhwahop08042.pdf

U.S. Federal Highway Administration, *Congestion Pricing, A Primer: Overview* (2009). See for discussion of a range of pricing options, U.S. and overseas experience to date, nature of congestion, impacts and benefits of pricing, relevant supporting U.S. DOT programs and FAQs. See: http://www.ops.fhwa.dot.gov/publications/fhwahop08039/fhwahop08039.pdf

State and Local Government Resources

See the following reports for discussion of each peak pricing program with detailed description of toll changes, impacts, cost and revenue implications, outreach, and affected party reactions.

Wilbur Smith Associates, *Summary Report: Pennsylvania Turnpike Value Pricing Study.* Pennsylvania Turnpike Commission (March 2004).

Evaluation Study of New Jersey Turnpike Authority's Time of Day Pricing Initiative, Final Report, FHWA/NJ-2005-012 (May 31, 2005).

Wilbur Smith Associates, *Illinois Tollway Value Pricing Pilot Study,* Final Report (January 2007).

CRSPE, Inc. and Cella Assoc., *Expansion of Variable Pricing to Heavy Vehicles,* Final Report, Lee County, Florida Department of Transportation (February 2005).

Academic and Other Resources

Muriello, M. F. and D. Jiji, "The Value Pricing Toll Program at the Port Authority of New York and New Jersey: Revenue for Transportation Investment and Incentives for Traffic Management." *Transportation Research Record: Journal of the Transportation Research Board,* No. 1864, Transportation Research Board of the National Academies, Washington, D.C. (2004), pp. 9–15.

Areawide Pricing

Federal Government Resources and Research

K.T. Analytics, Inc., *Lessons Learned from International Experience in Congestion Pricing,* Final Report, Federal Highway Administration (August 2008). See for detailed discussion of congestion pricing in Singapore, London, and Stockholm, including travel impacts and issues related to revenues, operations, equity, environment, outreach, and acceptability.

Evans, J. E., K. U. Bhatt and K. F. Turnbull, *TCRP Report 95: Traveler Response to Transportation System Changes, Chapter 14: Road Value Pricing,* Transportation Research Board of the National Academies, Washington, D.C. (2003). See for discussion of impacts, analytic considerations, elasticities, case studies, and planning considerations.

State and Local Government Resources

See the following reports for discussion of each areawide pricing program with descriptions of features, impacts, cost and revenue implications, outreach, and affected party reactions.

Singapore

Land Transport Authority (2008), description of Electronic Road Pricing and other details, available on http://www.lta.gov.sg/motoring_matters/index_motoring_erp.htm (As of July 28, 2010)

London

Website of Transport for London (TfL) annual impact monitoring publications, reports, and outreach materials: http://www.tfl.gov.uk/roadusers/congestioncharging/6722.aspx#2 (As of July 28, 2010).

Quddus et al., *The Impact of the Congestion Charge on Retail: the London Experience,* Centre for Transport Studies, Imperial College, London, U.K. (2006)

"Central London Congestion Charging Impact Monitoring," *Transport for London,* Sixth Annual Report, London, U.K. (July 2008) Available at: http://www.tfl.gov.uk/assets/downloads/sixth-annual-impacts-monitoring-report-2008-07.pdf (As of July 28, 2010).

"Western Extension: Londoners have spoken and the Mayor has listened," *Transport for London* press release. Available at: http://www.tfl.gov.uk/static/corporate/media/newscentre/archive/10590.html (As of October 22, 2010).

"Demand Elasticities for Car Trips to Central London as revealed by the Central London Congestion Charge." *Transport for London,* London, U.K. (September 2008).

Stockholm

Website of Congestion Charge Secretariat, Stockholm, Sweden: http://www.stockholmsforsoket.se/templates/page.aspx?id=183 (As of July 28, 2010).

New York

NYCDOT, *Report to the Traffic Congestion Mitigation Commission and the Recommended Implementation Plan* (January 2008).

City of New York, Mayor's Office, *New York City Mobility Needs Assessment: 2007–2030,* part of PlaNYC.

Regional Plan Association, *An Evaluation of Alternatives to the New York City Congestion Pricing Plan* (2007).

Academic and Other Resources

University of Leeds, *Coordination of Urban Road User Charging and Organizational Issues,* State of the Art Report, Work Package II, Version 4.0, U.K. (2008).

Prud'homme R. and J. P. Bocajero, "The London Congestion Charge: A Tentative Economic Appraisal." *Transport Policy* 12 (3), (2005) pp. 279–287.

Callaway, Ewen, "Frank Kelly: London Congestion Charges Did Not Improve Air Quality," *New Scientist.com News Service* (30 April 2008) http://technology.newscientist.com/channel/tech/motoring-tech/dn13809-londoncongestion-charge-did-not-improve-air-quality.html (As of July 28, 2010).

Mackie, P., "The London Congestion Charge: A Tentative Economic Appraisal. A Comment on the Paper by Prud'homme and Bocajero." *Transport Policy,* 12 (3), (2005) pp. 288–290.

Mahendra, Anjali, *The Impacts of Road Pricing on Businesses: An Institutional Analysis Across Economic Sectors,* Delft University Press, The Netherlands (2010).

Wikipedia (2008), *London Congestion Charge,* http://en.wikipedia.org/wiki/London_congestion_charge (As of July 28, 2010).

Armenius, H. and L. Hultkrantz, "The Politico-Economic Link Between Public Transport and Road Pricing: An ex-ante study of the Stockholm road-pricing trial." *Transport Policy,* 13 (2), (2006) pp. 162–172.

Olszewski P. and L. Xie, "Modeling the effects of road pricing on traffic in Singapore." *Transportation Research,* 39A (7/9), (2003) pp. 755–772.

Mileage or VMT Fees

Federal Government Resources and Research

K.T. Analytics, Inc. and Cambridge Systematics, Inc., *Final Report,* Federal Highway Administration, (August 2008). See for discussion of variable driver costs, pages 2-26 to 2-30, including case studies on impacts, equity, environment, operations, outreach, and marketing with project details in Appendix B (Section 5).

Evans, J. E., K. U. Bhatt and K. F. Turnbull, *TCRP Report 95: Traveler Response to Transportation System Changes, Chapter 14: Road Value Pricing,* Transportation Research Board of the National Academies, Washington, D.C. (2003). See for discussion of impacts, analytic considerations, elasticities, case studies, and planning considerations.

Sorensen, P., *Implementable Strategies for Shifting to Direct Usage-Based Charges for Transportation Funding,* Draft Final Report for AASHTO, RAND Corporation (June 2009). Provides an overview of technologies, institutional issues at state and federal level, and evaluation of various VMT-fee options, recommendations for most promising options, and strategies and steps to prepare for implementation by 2015.

Whitty, J. M. and J. R. Svadlenak, *Discerning the Pathway to Implementation of a National Mileage-Based Charging System,* Draft Report to TRB Executive Committee (March 2009). See for discussion of how a distance-based fee system might be instituted stepwise from the state to national level.

State and Local Government Resources

See the following links for details about specific trial programs and impacts, including project descriptions, study reports, and public information pieces.

GA 400 Variable Pricing Institutional Study in Atlanta

Commute Atlanta Study website, available at http://commuteatlanta.ce.gatech.edu/ (As of July 28, 2010).

Mileage-Based User Fee Demonstration Project/PAYD Pilot in Minnesota

Cambridge Systematics, Inc. et al., *Mileage-Based User Fee Demonstration Project: Pay-As-You-Drive Experimental Findings,* Final Report MN/RC—2006-39A, Minnesota Department of Transportation (March 2006). http://www.lrrb.org/PDF/200639A.pdf (As of July 28, 2010).

Cambridge Systematics, Inc. et al., *Mileage-Based User Fee Demonstration Project: Potential Public Policy Implications of Pay-As-You-Drive Leasing and Insurance Products,* Final Report MN/RC—2006-39C, Minnesota Department of Transportation (March 2006). http://www.lrrb.org/PDF/200639C.pdf (As of July 28, 2010).

Mileage-Based Road User Fee Evaluation in Oregon

Oregon's Mileage Fee Concept and Road User Fee Pilot Program: Final Report. Oregon Department of Transportation, Office of Innovative Partnerships and Alternative Funding (November 2007) http://www.oregon.gov/ODOT/HWY/RUFPP/docs/RUFPP_finalreport.pdf (As of July 28, 2010).

Global Positioning System (GPS)-Based Pricing in the Puget Sound Region, Washington

Puget Sound Regional Council, Traffic Choices Study, details available at http://www.psrc.org/transportation/traffic (As of July 28, 2010).

Puget Sound Regional Council, Traffic Choices Study: Summary Report, April 2008. http://www.psrc.org/assets/37/summaryreport.pdf (As of July 28, 2010).

Academic and Other Resources

Zhang, Lei, B. Starr McMullen, Divya Valluri and Kyle Nakahara, "The Short- and Long-Run Impact of a Vehicle Mileage Fee on Income and Spatial Equity," paper presented at TRB 88th Annual Meeting, 2009. See for analysis showing spatial equity may be more an issue than income equity for a VMT fee system.

National Evaluation of a Mileage-Based Road User Charge, ongoing study by the University of Iowa; details available on http://www.roaduserstudy.org

Distance-Based Tolling for Trucks in Europe

Kossak, Andreas, "Germany's Truck Tolling: Road Pricing for High Performance Transportation" presentation at Urban Partnerships Workshop, Washington, D.C. (January 25, 2007).

McKinnon, Alan C., "A Review of European Truck Tolling Schemes and Assessment of Their Possible Impact on Logistics Systems." *International Journal of Logistics Research and Applications,* 9:3, pp. 191–205.

Parking Pricing

Federal Government Resources and Research

Vaca, E. J. and R. Kuzmyak, *TCRP Report 95: Traveler Response to Transportation System Changes, Chapter 13: Pricing and Fees.* Transportation Research Board of the National Academies, Washington, D.C. (2005). See for state of the art and exhaustive discussion of parking pricing strategies as to elasticities, effects by market segment, case study findings, and analytic considerations.

K.T. Analytics, Inc. and Cambridge Systematics, Inc., *Final Report,* Federal Highway Administration, (August 2008). See for discussion of cash-out pilot program with implementation and marketing cautions from Seattle case study, page 2-30 and Appendix B.

State and Local Government Resources

San Francisco

Overview:
http://www.sfmta.com/cms/psfpark/sfparkhist.htm (As of July 28, 2010).
http://www.sfmta.com/cms/psfpark/sfparkindx.htm (As of July 28, 2010).

How pricing works:
http://www.sfmta.com/cms/psfpark/sfparkprcng.htm (As of July 28, 2010).

Results of an on-street parking pricing program with "progressive rates" run by Port of SF: *San Francisco On-Street Parking Management and Pricing Study,* Final Report—Draft, San Francisco County Transportation Authority (June 2009) available at: http://www.sfcta.org/images/stories/Executive/Meetings/cac/2009/06jun/On-StreetParkingStudyAttachment_All-withAppendices.pdf (As of July 28, 2010).

Relative effectiveness and applicability of parking pricing versus congestion pricing for addressing specific congestion and traffic problems: http://www.sfcta.org/images/stories/Executive/Meetings/cac/2009/06jun/On-StreetParkingStudyFinalReportMemo_Final.pdf (As of July 28, 2010).

New York

Cambridge Systematics, Inc., *Congestion Mitigation Commission Technical Analysis—Increased Cost of Parking in the Manhattan Central Business District (CBD): Technical Memorandum,* New York City Economic Development Corporation and New York City Department of Transportation (December 2007); available at: https://www.nysdot.gov/programs/repository/Tech%20Memo%20on_Parking.pdf (As of July 28, 2010).

Free parking, congested streets:
http://transalt.org/files/newsroom/reports/freeparking_traffictrouble.pdf (As of July 28, 2010).

Sustainable Streets plan (strategic plan):
http://www.nyc.gov/html/dot/html/about/stratplan.shtml (As of July 28, 2010).

Park Smart website:
http://www.nyc.gov/html/dot/html/motorist/parksmart.shtml (As of July 28, 2010).

Austin

City of Austin Neighborhood Parking Benefit District Pilot program (2009) with revenues from on-street parking meters returned to neighborhood improvements:
https://www.ci.austin.tx.us/parkingdistrict/default.htm (As of July 28, 2010).

Seattle, Washington—Parking Cash Out Demonstration

The Downtown Seattle Access Project Parking Cash Out Experience: Results and Recommendations, King County Metro, Seattle, Washington (July 2003). Report available at: http://knowledge.fhwa.dot.gov/cops/hcx.nsf/All+Documents/A19C77018189D09F85256DBA0063D8F4/$FILE/ParkingCashOutFinalJuly03.pdf (As of July 28, 2010).

Academic and Other Resources

Shoup, Donald, *Parking Cash Out,* American Planning Association, Report Number 532 (March 2005). Includes discussion of the concept, rationale, California cash out law, tax implications, eight case studies of impacts, implementation and distribution effect considerations.

Schaller Consulting, "Free Parking, Congested Streets: The Skewed Economic Incentives to Drive in Manhattan," *Transportation Alternatives* (March 1, 2007). Shows the type of data gathering and analysis needed to determine potential of parking pricing strategies on and off street; reportedly an important foundation document allowing City of New York to go forward with parking pricing innovations.

Litman, Todd, *Parking Management Strategies, Evaluation and Planning,* Victoria Transport Policy Institute (April 3, 2006). See for comprehensive overview of all parking pricing strategies including impacts and implementation considerations

Bianco, M. J., *Effective Transportation Demand Management: The Results of Combining Parking Pricing, Transit Incentives—Portland, Oregon.* Portland, Oregon: Portland State University (2000). See for example of effective parking pricing aimed at downtown commuters.

Abbreviations and acronyms used without definitions in TRB publications:

AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI–NA	Airports Council International–North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	Air Transport Association
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation