BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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TECHNICAL MEMORANDUM

DATE: **December 21, 2023**
TO: **Boston Region Metropolitan Planning Organization (MPO)**
FROM: **Seth Asante and Ryan Hicks, MPO Staff**
RE: **Learning from Roadway-Pricing Experiences**

1 INTRODUCTION

According to INRIX (a transportation analytics firm), Boston was ranked the second most congested city in the United States and the fourth most congested city in the world in 2022.[1] Based on INRIX data, an average driver spent 134 hours stuck in congestion over the year and the estimated cost of congestion per driver was reported to be $2,270, making it even more pressing to explore congestion mitigation options, such as roadway pricing. Roadway-pricing strategies have been implemented throughout the United States with three primary goals: reducing congestion and greenhouse gas emissions, generating funds to maintain highway and public transportation infrastructure, and managing travel demand by encouraging single-occupancy private automobile drivers to shift their trips to active transportation modes or travel routes, or to high-occupancy vehicles, or to travel during off-peak periods.

Through the Boston Region Metropolitan Planning Organization's (MPO) Unified Planning Work Program discrete projects program, the Boston Region MPO elected to fund the "Learning from Roadway-Pricing Experiences" study with its federally allocated metropolitan planning funds during federal fiscal year (FFY) 2023.[2] The purpose of this study is to identify the political, institutional, and technological challenges and opportunities that arise from implementing roadway-pricing strategies, so that MPO staff can learn from them and provide the MPO Board with keys to successful implementation, potential MPO goals for roadway pricing, and ideas for exploring roadway pricing in the MPO planning process. The study also identifies the essential principles that should be followed for implementing successful roadway-pricing programs based on existing roadway-pricing programs around the country.

[1] INRIX Global Traffic Scorecard, accessed September 25, 2023. https://inrix.com/scorecard/#city-ranking-list

[2] Learning from Roadway-Pricing Experiences, Work Program to the Boston Region MPO, January 26, 2023.

Civil Rights, nondiscrimination, and accessibility information is on the last page.

To accomplish the goal and objectives of the study, MPO staff completed a series of tasks for this study. First, staff identified and selected existing roadway-pricing programs that would be suitable for stakeholder interviews. Interviews were then conducted with key personnel, which either created or helped manage the selected roadway-pricing programs. In addition, staff, with the help of the Congestion Management Process (CMP) Committee, identified MPO goals for roadway pricing and explored roadway pricing in relation to the MPO planning process. Lastly, this memorandum was written to document and summarize the results of this study as well as the various roadway-pricing strategies and lessons learned.

2 ROADWAY-PRICING STRATEGIES

Roadway-pricing strategies fall into two broad categories: road toll and usage charges and congestion pricing. Figure 1 shows strategies related to both categories. Road tolls are a common way to maximize revenue to pay for highway and bridge improvement costs. Road tolls rarely vary by time of day and are not intended to reduce congestion. A road usage charge (RUC) allows all users of a transportation system to help pay for that system in a fair manner and in proportion to how much it is used, and it is often referred to as a mileage-based user fee, vehicle miles traveled tax, or distance-based fee. Congestion pricing typically varies by time of day and focuses on adjusting user fees during peak periods to mitigate congestion. In most cases, the primary goal of a congestion pricing program is to relieve congestion, not raise revenue. Other goals of congestion pricing include shifting demand to other modes of transportation, spreading trips to off-peak times, and reducing air pollution. An existing toll facility may be updated so that it meets the criteria of congestion pricing by increasing prices under congested conditions.

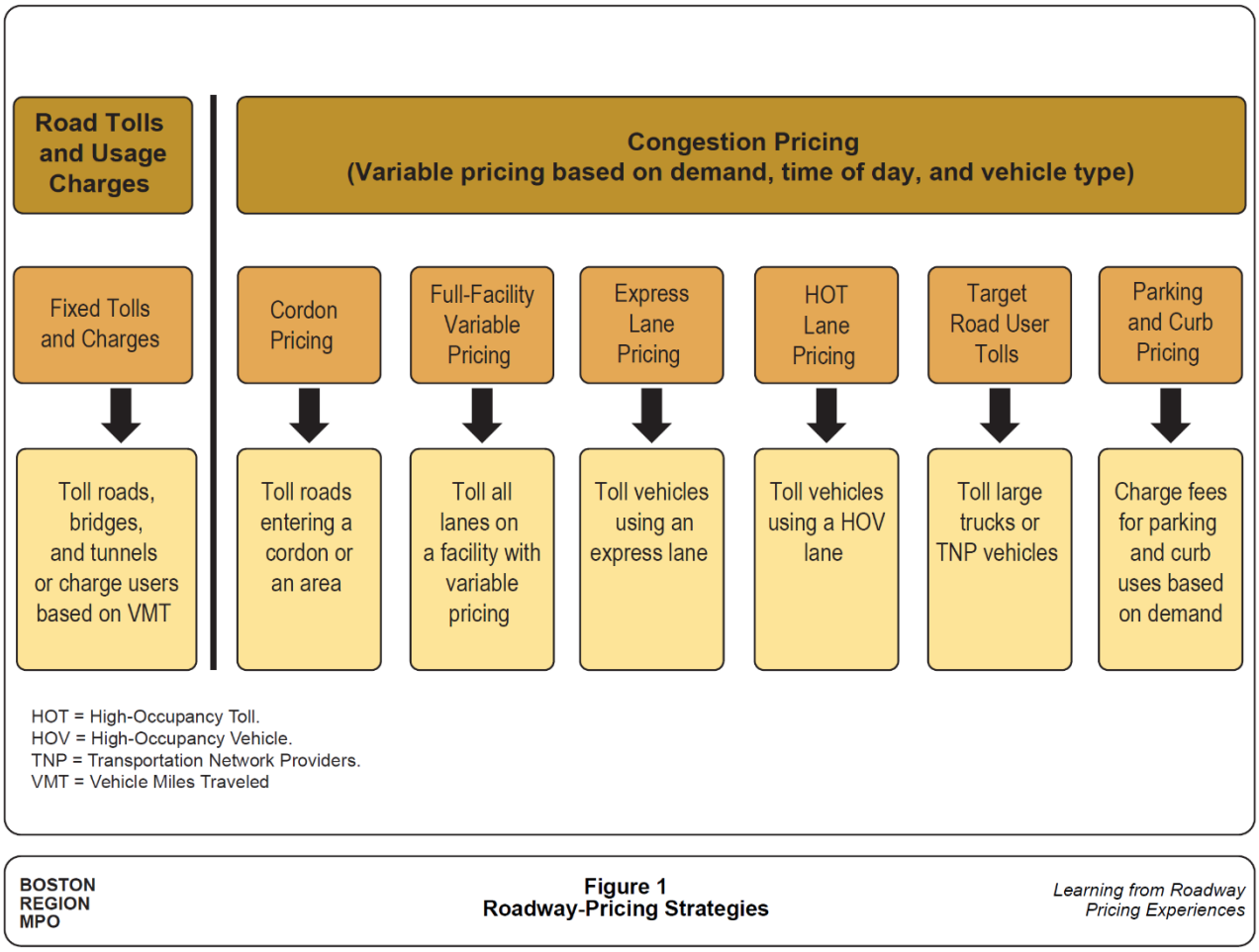
The following are the different forms of roadway-pricing strategies:

- *Cordon (Area) Tolls.* Cordon tolls are variable by time of day and paid by users to drive in a designated area, usually a city center. On the edge of the cordon, entry points are created, and drivers pay a toll to enter the designated zone.
- *High-Occupancy Toll (HOT) Lanes.* HOT lanes are high-occupancy vehicle (HOV) lanes that also allow use by a limited number of low-occupancy vehicles that pay a variable toll.
- *Express Lanes.* Express Lanes are adjacent to existing general-purpose lanes to provide users the choice of a less congested trip by paying a variable toll.

- *Variable Price Tolling (By Facility).* Variable-price tolling is a technique to use a monetary cost to shift travel demand to off-peak times, less congested facilities, or other travel modes. Variable pricing can apply to any existing or new facility, including toll roads, managed lanes, cordon areas, parking pricing, or curb pricing.
- *Targeted Road User Tolls (TRUT).* TRUT charges specific vehicles, such as large trucks or transportation network providers (TNP), to enter a cordon or roadway segment. Other vehicles are exempt from tolling.
- *Parking-Pricing Policies.* Parking-pricing policies incorporate strategies and incentives, other than tolls, for people to consider alternatives to driving. This can include, but is not limited to, variably priced parking, or policies promoting subsidies for alternative modes of transportation in lieu of driving and parking at a certain location.
- *Curb-Management Pricing.* Curb-management pricing is a policy that charges vehicles for accessing curb spaces for loading or egressing goods or people.

Roadway-pricing strategies typically provide subsidies to address equity issues and reduce pollution. Free or discounted usage of congestion-pricing facilities is permitted for certain vehicle types, depending on their role in society and their impact on the environment, such as clean-fuel and electric vehicles, emergency and transit vehicles, and carpools. In addition, subsidies are considered for low-income populations and other groups who may be adversely burdened by the costs on certain congestion-pricing facilities.

Figure 1
Roadway-Pricing Strategies



3 SELECTION OF ROADWAY-PRICING PROGRAMS FOR INTERVIEWS

MPO staff identified 13 roadway-pricing programs in the United States that were reviewed as part of this study, which were presented to the CMP Committee on March 23, 2023, for discussion. Figure 2 maps the locations of the 13 programs. Table 1 in Appendix A presents information on each program including the program description, purpose or goals, roadway-pricing policy, challenges, and considerations for incorporating congestion pricing in the planning process. The CMP Committee provided feedback on which roadway-pricing programs to explore further through interviews with key personnel associated with the programs.

The CMP Committee expressed interest in roadway-pricing programs that

- do not require costly expansion or widening of roadways;

- avoid disproportional geographical impacts on suburban versus urban communities, for example, due to traffic diversions;
- address equity concerns;
- improve public and active transportation options; and
- incorporate pricing in the regional transportation planning process.

The CMP Committee also expressed interest in a selection of programs to study that

- provide an opportunity to learn from the challenges and understand how the programs were implemented;
- provide insights into how program goals align with the MPO planning process;
- allow for the ease of implementing a similar program in the Boston region;
- were implemented after an environmental assessment was completed before the program implementation; and
- directly addressed equity concerns over how it would affect disadvantaged populations.

Table 2 in Appendix A shows the 13 programs, the selection criteria, and the five highlighted programs that were selected for interviews.

Figure 2
Locations of the 13 Roadway-Pricing Programs

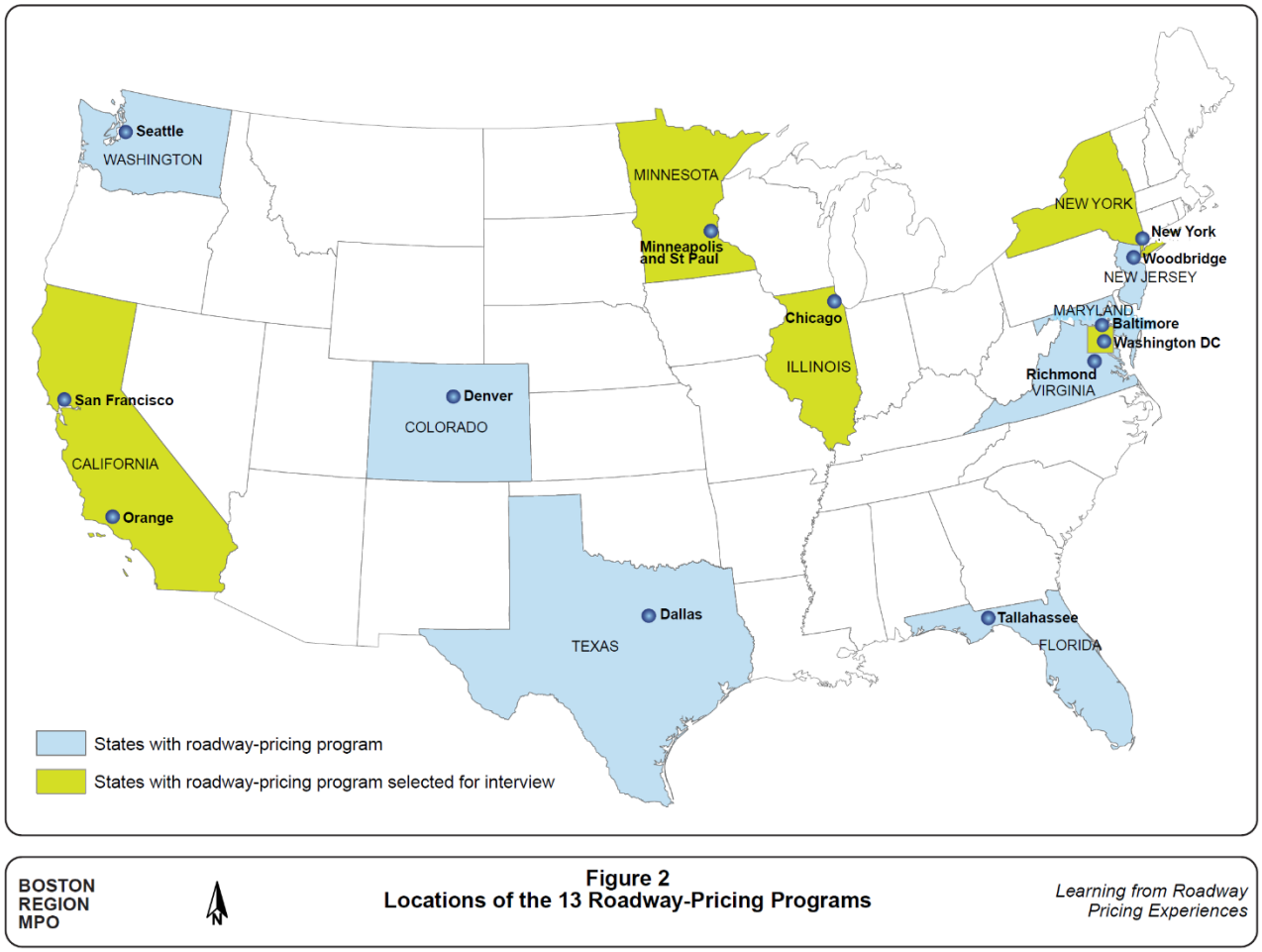


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Figure 2
Locations of the 13 Roadway-Pricing Programs

Learning from Roadway Pricing Experiences

4 INTERVIEW KEY PERSONNEL OF CANDIDATE ROADWAY-PRICING PROGRAMS

As a result of the discussion at the CMP Committee meeting, the following programs were selected for further exploration:

- Transportation Network Provider (TNP) Surcharge—Chicago, Illinois
- Minnesota Department of Transportation HOT Lanes—Minneapolis, Minnesota
- Central Business District Tolling Program—New York City, New York
- Bay Area Express Lanes—Northern California/San Francisco
- Chinatown/Penn Plaza Pilot Parking Program—Washington, District of Columbia

In June and July of 2023, Boston Region MPO staff interviewed managers and designers of the five roadway-pricing programs listed above. The objective of these meetings was to explore how the programs were created, how they were implemented, and what lessons were learned. To obtain this information, questions were asked about program initiation, stakeholder engagement, program implementation, revenue allocation, and planning goals and process about how the program addressed the equity concerns of disadvantaged populations. The five interviews are briefly described below with detailed excerpts available in Appendix B.

4.1 TNP Surcharge—Chicago, Illinois

Between 2015 and 2023, TNP location data has showed an increase of TNP trips in Chicago, particularly in the Chicago downtown area.[3] Between March 2018 and February 2019, one-half of all TNP trips in Chicago began and/or ended in the downtown area and nearly one-third of those trips began and ended in the downtown area. In 2018, there were more than 100 million TNP trips in Chicago, and that number has grown significantly since. This rapid increase in TNP trips has resulted in more congestion and emissions and contributed to a decrease in transit ridership in the downtown area.[4]

Lori Lightfoot, the Mayor of Chicago from 2019 to 2023, proposed that a surcharge of $1.75 ($5.00 for special zones)[5] be imposed on TNP trips that either drop-off or pick up in designated neighborhoods in Chicago.[6] The pricing structure was determined by the City of Chicago staff in coordination with local politicians. The cordon-style roadway-pricing program was passed by the Chicago City Council in 2019. That year, this program produced $200 million in revenue, $16 million of which went towards the Chicago Transit Authority (CTA). The remaining revenue was allocated towards the general funds for the City of Chicago. Although TNP companies lobbied to drop the surcharge after the COVID-19 pandemic, they were not successful. TNP location data still shows rapid expansion of TNP trips, and the program has not reduced congestion

[3] By law, TNP companies operating in the City of Chicago are required to register with the City and share trip location data.

[4] City of Chicago, *Transportation Network Providers and Congestion in the City of Chicago,* accessed September 25, 2023. www.chicago.gov/content/dam/city/depts/bacp/Outreach%20and%20Education/MLL_10-18-19_PR-TNP_Congestion_Report.pdf

[5] Business Affairs and Consumer Protection, City of Chicago Congestion Pricing, accessed September 25, 2023. https://www.chicago.gov/city/en/depts/bacp/supp_info/city_of_chicago_congestion_pricing.html

[6] The TNP surcharges applies to two zones: the downtown zone and special zones (airports, Navy Pier, and McCormick Place).

significantly. TNP data shows that a higher surcharge would be required to significantly reduce congestion based on this policy. The City of Chicago is interested in raising the surcharge, but this action would require significant political support.

Goals of the program

- Reduce congestion caused by TNP companies, which has not yet been reached.
- Raise revenue for the city of Chicago and the CTA
- Incentivize ridesharing when TNPs are used rather than single rides[7]

4.2 Minnesota Department of Transportation (MnDOT) HOT Lanes—Minneapolis, Minnesota

In the early 2000s, the I-394 Express Lane Community Task Force was formed and tasked with understanding how pricing programs work and communicating their benefits to the public and elected officials. This task force displayed a grasstops advocacy approach by assembling high-level legislators, city officials, MPO staff, public county officials, Federal Highway Administration (FHWA) officials, MnDOT staff, and other stakeholders. Through detailed technical work and communication of the findings by the task force, the state legislature introduced legislation authorizing MnDOT and the Metropolitan Council, which serves as the MPO for the Minneapolis-Saint Paul metropolitan region, to study and implement congestion pricing and the conversion of an underutilized HOV lane on I-394 into a HOT lane.

The cost of the first phase of the I-394 HOT lane in 2005 was $10 million. Subsequent phases of the program consisted of conversions of HOV lanes to HOT lanes and the addition of new lanes as HOT lanes to manage congestion, which cost $130 million and was financed through an Urban Partnership Agreement grant from the FHWA.

By statute, excess revenues (after capital, operations, and maintenance costs) must be used for the corridor (50 percent of excess revenue) and for transit enhancements (remaining 50 percent). After implementation, 60 percent of the public supported this program, according to the Minnesota Department of Transportation. An after-study by the University of Minnesota showed that commuters on these corridors come from diverse income levels and racial backgrounds.

[7] The surcharge is dependent on the number riders (single or shared) and the origin and destination of the rider on the trip. Shared trips can have discounts of between 25 and 50 percent depending on the trip origin or destination.

Goals

- Manage congestion
- Provide faster and reliable travel times (including for buses)
- Support economic growth through faster delivery of goods and services

4.3 Central Business District Tolling Program—New York City, New York

In 2017, the idea of congestion pricing in Manhattan was revived after previous consideration due to budget shortfalls and the need to generate revenue for transportation improvements. In 2019, the congestion-pricing program was approved by the State of New York through the state budget and has since been approved by the FHWA in 2023. The current target year for implementation of this program is 2024.

The three sponsors for the program are the Metropolitan Transportation Authority (MTA, the lead agency), New York State Department of Transportation, and New York City Department of Transportation. The FHWA was a key collaborator in the development of this program. The Environmental Assessment mentioned several equity concessions, including discounts and scenarios for various toll rates, however, the toll rates have not yet been determined.

In the current proposed version of this congestion-pricing program, motor vehicles that travel south of 60th Street in Manhattan will be charged a toll. The toll rate has not been finalized but is expected to be between $9 and $23 during weekday peak times. A Traffic Mobility Review Board (TMRB), which includes the Director of Planning for New York City and various business leaders in the New York metropolitan region, will recommend toll rates and discounts to the MTA Board. The MTA Board will have the final say on the tolling policy. State tax credits will be available for households making less than $60,000. Tolls will not be required from vehicles with qualifying disabled plates or qualifying transit and emergency vehicles, and passenger vehicles will only be tolled once each day. The TMRB also recommends credits, discounts, and/or exemptions for tolls paid the same day on bridges and tunnels and for some types of for-hire vehicles. The program is designed and projected to raise $1 billion annually and a portion of the revenue will be allocated towards MTA transit infrastructure (capital projects). A key challenge is determining the toll rate, as more discounts will require a higher toll, which would make it more difficult to obtain political buy-in. The implementation of this program has come with resistance from New Jersey, which is currently suing New York to prevent this program from beginning.

Goals of the Program

- Raise revenue to fund MTA projects
- Reduce congestion and travel times in Manhattan's central business district
- Improve air quality
- Promote equity by funding transit improvements at the MTA

4.4 Bay Area Express Lanes—Northern California/San Francisco

The Bay Area Express Lanes concept was driven by environmental concerns in the 1990s. These concerns led to state legislation allowing regional transportation agencies, in cooperation with the California Department of Transportation (Caltrans), to apply to the California Transportation Commission to develop and operate HOT lanes, including the administration and operation of a value-pricing program and exclusive or preferential lane facilities for public transit. The Bay Area Express Lanes were constructed under this bill beginning in 2010.

The Bay Area Express Lanes program was included in the regional transportation plan that was published in 2009. In the following years, the Metropolitan Transportation Commission (MTC), San Francisco area's MPO, converted several existing HOV lane facilities to express toll lanes. Caltrans owns the freeways, but the MTC is responsible for collecting tolls and maintaining the express lanes. Although toll revenue can be used for transportation improvement projects, generating revenue to fund public transportation improvements was not an explicit goal of the program.

Goals of the Program

- Increase person throughput
- Reduce congestion
- Provide reliable and faster trips
- Improve air quality

4.5 Chinatown/Penn Quarter Pilot Parking Program—Washington, District of Columbia

The Chinatown/Penn Quarter Parking program began in 2014 as a pilot program in the Chinatown/Penn Quarter Neighborhood of Washington, DC. In this program, fixed-rate, on-street parking was converted to variable-rate parking, depending on parking demand. In 2019 the pilot program became permanent.

The District Council approved city-wide legislation that permitted the demand-parking pricing in 2012. The legislation allowed flexible parking-pricing policies to

consider smart technologies, growing availability of travel and parking data, and socioeconomic factors to effectively transform curbside spaces and control demand. In addition, the FHWA Value Pricing Pilot Program provided funding for the program that allowed district officials to kick off the program in 2014.

This program was asset-light and monitored parking demand on a block-by-block basis, rather than individual spaces. This information is accessible in real time through the ParkDC application, which allows people searching for parking to get a general idea of parking demand in an area, helping them to decide whether to search for on street parking or a private parking garage. This program proved to be successful at reducing the time needed to find a parking space and reducing congestion.[8] In addition to helping reduce congestion, the program reduced double parking, provided more efficient curbside uses, and improved safety. Revenue generated from this program is allocated to the Washington Metropolitan Area Transit Authority, which operates the DC Metro as well as program operations.

Goals of the Program

- Reduce time needed to find a parking space
- Reduce congestion and pollution, improve safety (reduce double parking), and increase use of other modes
- Develop parking management solutions through a cost-effective, asset-light approach

4.6 International Programs

Although the scope of this study was to focus on roadway pricing examples in the United States, it is important to acknowledge two important congestion pricing programs that are currently in operation internationally: London and Singapore. Both programs are pioneers of roadway pricing and offer important insights that can be applied to potential future roadway-pricing programs.

London

Roadway pricing in central London began with concerns about worsening congestion, air pollution, and livability problems in the 1990s. It sparked a debate about a roadway-pricing program in central London, which enabled the Greater London Authority Act in 1999, authorizing the mayor and the city transportation department to implement roadway pricing strategies.

[8] Congestion in the Chinatown/Penn Quarter neighborhood decreased at a faster rate than the rest of Washington, DC.

On February 17, 2003, a roadway-pricing program began in central London. There was initial opposition to the program from politicians, businesses, trade unions, local media, and the public. However, the public eventually accepted the program, which has significantly reduced traffic congestion, improved air quality, and led to sustainable transportation and a healthier environment.[9] Public acceptance has increased over time because environmental and climate issues have become more prominent in recent decades.

The program runs from 7:00 AM to 6:00 PM on weekdays and from 12:00 PM to 6:00 PM on weekends, and the charge is currently £15.00 (approximately $19.00 as of December 2023). Residents in the charging zone receive a 90 percent discount while buses, taxis, and electric cars, and drivers with disabilities are exempted.

Keys to the successful implementation of the program included

- good involvement from stakeholders such as policy makers, business owners and Transit operators;
- clear objectives of the program in the beginning—reduce traffic congestion in central London, provide more alternative travel options, improve safety and the environment, while raising substantial revenues;
- incorporating the program into the City's long-range transportation plan, which presented the benefits to the stakeholders and the public;
- extensive public information campaign;
- provision of high-quality, practical travel alternatives to driving to work in central London;
- availability of day-one travel alternatives enabling travelers to shift trips to other modes; and
- transparent uses of revenue raised from the program. Revenues have been allocated to help Londoners move around the city in more environmentally friendly ways.

In a recent *New York Times* article about congestion pricing in three cities, London, Singapore, and Stockholm, the authors pointed out that the early successes in the London congestion pricing program have been declining in recent years and congestion has increased to prepandemic levels, resulting in

[9] Intelligent Transport, "London's Congestion Charge Celebrates 20 years of Success," accessed September 25, 2023. https://www.intelligenttransport.com/transport-news/143883/londons-congestion-charge-celebrates-20-years-of-success/

gridlock and air pollution.[10] They attributed this congestion not only to the rise in trips involving taxis, Ubers and other ride-hailing vehicles, and delivery trucks, but also to the installation of bus lanes and bike lanes, which took road space from automobiles. Since inception, the London congestion charges have risen from $6.30 to $19.00 today and public support has reduced slightly, but the program reduced traffic and delays and created favorable conditions to attract drivers back. The authors concluded that to realize long-term reduction in congestion, there would need to be a significantly high charge, and this may not lead to public and political support.

Singapore

Area Licensing Scheme (ALS) is the name of the congestion pricing program that has operated in Singapore since 1975.[11,12] ALS began as a basic program where drivers were charged a fee to enter a district each day in the AM peak period. For the first 20 years of ALS, vehicles displayed a sticker on their windshield, which indicated that the fee to enter the cordon was paid. Currently, an electronic tolling collection (ETC) with gantries that communicate with transponders is used. The tolls range from $0 to $6.71, depending on the time of day. Global Navigation Satellite System (GNSS) technology is being considered for the ALS program in the future. This program was successful, as it reduced congestion by 20 percent initially. Over the years, this success has been maintained through adjustments such as changes to the restricted zone and accounting for vehicles that enter the zone multiple times.

Keys to the successful implementation of the program included

- strong political will to implement congestion pricing strategy;
- taking the initiative to adjust the program periodically based on car ownership growth data, public input and technical trials;
- desire to stay ahead of the curve technically. (ETC, GPS, GNSS); and
- desire to shift fees to vehicle usage rather than vehicle ownership.

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[10] Winnie Hu, Ana Ley, Stephen Castle, and Christina Anderson, “Congestion Pricing’s Impact on New York? These 3 Cities Offer a Glimpse,” *The New York Times*, December 2, 2023, accessed December 2, 2023. https://www.nytimes.com/2023/12/02/nyregion/new-york-congestion-pricing-london-stockholm-singapore.html

[11] Chicago Metropolitan Agency for Planning, “How Singapore improved traffic with congestion pricing,” accessed September 25, 2023. https://www.cmap.illinois.gov/updates/all/-/asset_publisher/UIMfSLnFfMB6/content/singapore-congestion-pricing

[12] Walter Theseira, Singapore University of Social Sciences, International Transport Forum “Congestion Control in Singapore Discussion Paper,” accessed September 25, 2023. https://www.itf-oecd.org/sites/default/files/docs/congestion-control-singapore.pdf

4.7 Key Findings

Challenges

The following challenges of roadway pricing were identified through interviews with the five peer agencies:

- Ensuring that disadvantaged populations, especially people with lower incomes, are not disproportionally burdened by increased tolls should be a priority for roadway-pricing programs. However, a challenge is finding a balance between doing so and collecting revenue, as more subsidies and credits result in higher tolls for other users to achieve financial goals. Early engagement with disadvantaged populations were mentioned in the Minneapolis/St. Paul HOT Lane Program, Central Business District Tolling Program, and Bay Area Express Lanes Programs.
- Congestion fees need to be high enough to change commuter behavior on a widespread scale. However, obtaining political buy-in for higher congestion fees is a challenge. This was emphasized in the Chicago TNP Program; however, the program did not reduce congestion significantly, because the charges were low. In order to realize long-term congestion reduction benefits congestion charges need to be high.
- Roadway pricing sometimes results in some communities bearing a larger share of its impacts, such as the increase in traffic in some neighborhoods by drivers seeking alternative routes. Mitigating geographical inequities can be difficult. In the Minneapolis/St. Paul HOT Lane program, congestion at the ends of the HOT lanes was causing diversion of traffic into neighborhoods that was addressed.
- Stakeholders, advocacy groups, or business groups who directly oppose the roadway-pricing program must be engaged. Engagement with some stakeholders can be challenging and time consuming. All 13 programs identified involved the stakeholders in the programs.
- Interagency collaboration can be difficult but is a requirement for an efficient roadway-pricing program. It is important to have cohesion with the MPOs, the state department of transportation, the municipalities, and transit agencies. All five programs interviewed had interagency collaboration involving state agencies, MPOs, transit authorities, and federal agencies.
- Roadway-pricing programs require before-and-after monitoring to assess performance, benefits, and necessary changes. The before-and-after results of the roadway-pricing program must be properly monitored and evaluated. This can be challenging in some instances due to the monitoring costs and staffing needs.

- State statutes often specify how revenue should be distributed and for what purposes. Statutes or other restrictions that limit the allocation of revenue for desirable transportation uses could affect support for the program. All five programs interviewed had statutes in place on how to distribute revenue.
- Several of these programs were negatively affected by the COVID-19 pandemic. It will be important to evaluate the resiliency of these roadway-pricing programs. The COVID-19 pandemic affected travel demand and reduced the number of peak period trips on many roadway-pricing facilities, resulting in loss of revenue for funding transportation improvements. COVID-19 affected the Bay Area Express Lane Program, the Chinatown/Penn Quarter Pilot Parking Program, and the TNP Surcharge Program.

Figure 3 presents the challenges of roadway-pricing programs gathered through interviews with the five peer agencies.

Figure 3
Challenges of Roadway-Pricing Programs Identified through Interviews

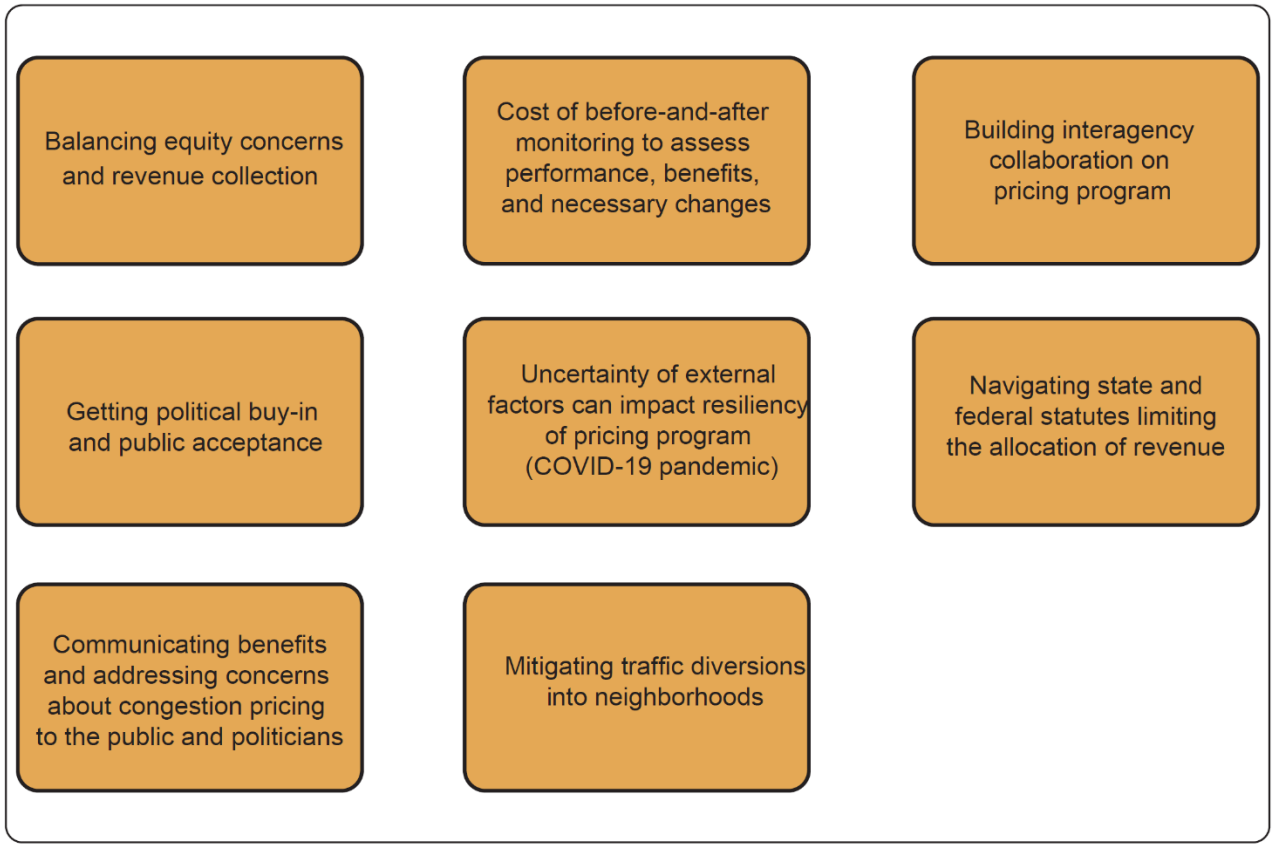

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Figure 3
Challenges of Roadway Pricing Programs Identified through Interviews

Learning from Roadway Pricing Experiences

Opportunities

The following opportunities of roadway pricing were identified through interviews with the five peer agencies:

- Use revenue from roadway pricing to fund public transportation investments, thereby addressing equity concerns by increasing access and mobility for transportation-disadvantaged populations. The Central Business District Tolling Program, the Chinatown/Penn Quarter Pilot Parking Program, and the TNP Surcharge Program use revenue to fund public transportation.
- Link roadway pricing to regional goals to reduce congestion and vehicle-miles traveled, improve air quality, and reduce energy use. The regional goals for the Central Business District Tolling, the Bay Area Express Lanes, the Minneapolis/St. Paul HOT Lanes are described above.
- Change driver behavior and encourage mode shift to non-auto transportation modes. The two programs with this focus are the Central Business District Tolling and the Bay Area Express Lanes.
- Take advantage of smart technologies to manage parking and congestion effectively while generating revenues that exceed capital and operating costs. All programs that we interviewed are using available smart technologies to manage their programs, including all-electronic tolling, parking sensors, and TNP data reporting systems.
- Provide data to augment existing data collection efforts. Some data gathered from the programs are useful for monitoring the performance of the facility.
- Use roadway pricing to support economic vitality. Many of the 13 programs identified in the research support economic vitality by reducing congestion so that people and goods can get to their destination as fast as possible.
- Support sustainable multimodal transportation and increase transportation options for residents. In tandem with supporting public transportation, the TNP Surcharge and the Bay Area Express Lanes programs fund active transportation modes such as installing sidewalks and bike lanes.

Smaller programs, such as parking pricing, TNP surcharge, or HOV- to HOT-lane conversion programs, can help raise revenue for transit projects. For example, a transportation project such as a new rapid transit line or a bicycle path give commuters a day-one travel alternative to a congested location if a cordon-pricing program is planned in the future. The City of Chicago allocates a portion of the revenue from the TNP surcharge program to the Chicago Transit Authority for transit improvements and some of the remaining revenue

for improving active transportation improvements (sidewalks, bike lanes, and pedestrian safety). In addition, the District of Columbia allocates a part of the revenue from its parking program to the Washington Metropolitan Area Transit Authority. Also, early equity studies can be conducted that will provide new data about the potential impacts of a proposed program, which can be used to make decisions about roadway pricing, which can potentially show the before and after impacts of roadway pricing to equity communities.

Figure 4 shows the key opportunities identified during the five interviews.

Figure 4
Opportunities of Roadway-Pricing Program Identified through Interviews

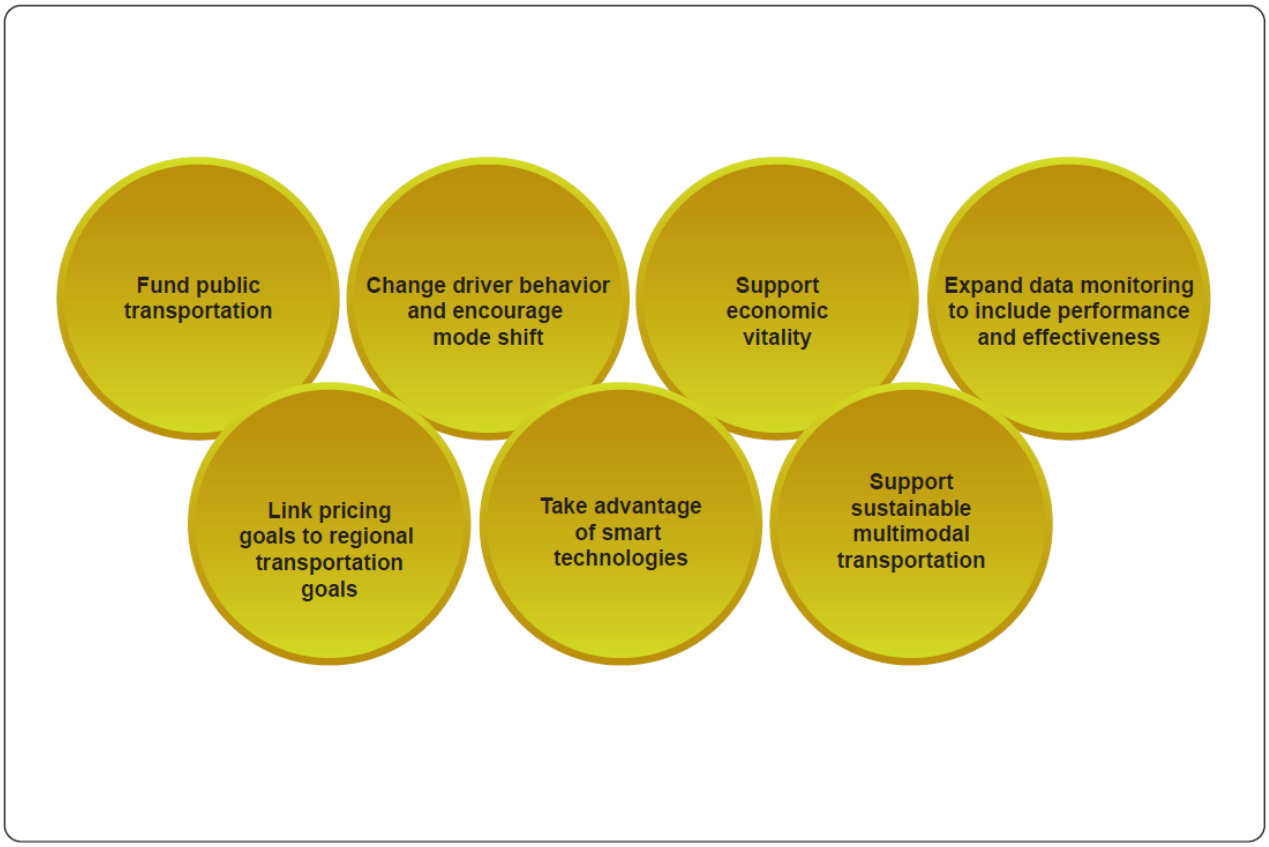

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Figure 4
Opportunities from Roadway-Pricing Programs Identified through Interviews

Learning from Roadway Pricing Experiences

Lessons Learned/Essential Components of a Successful Roadway-Pricing Program

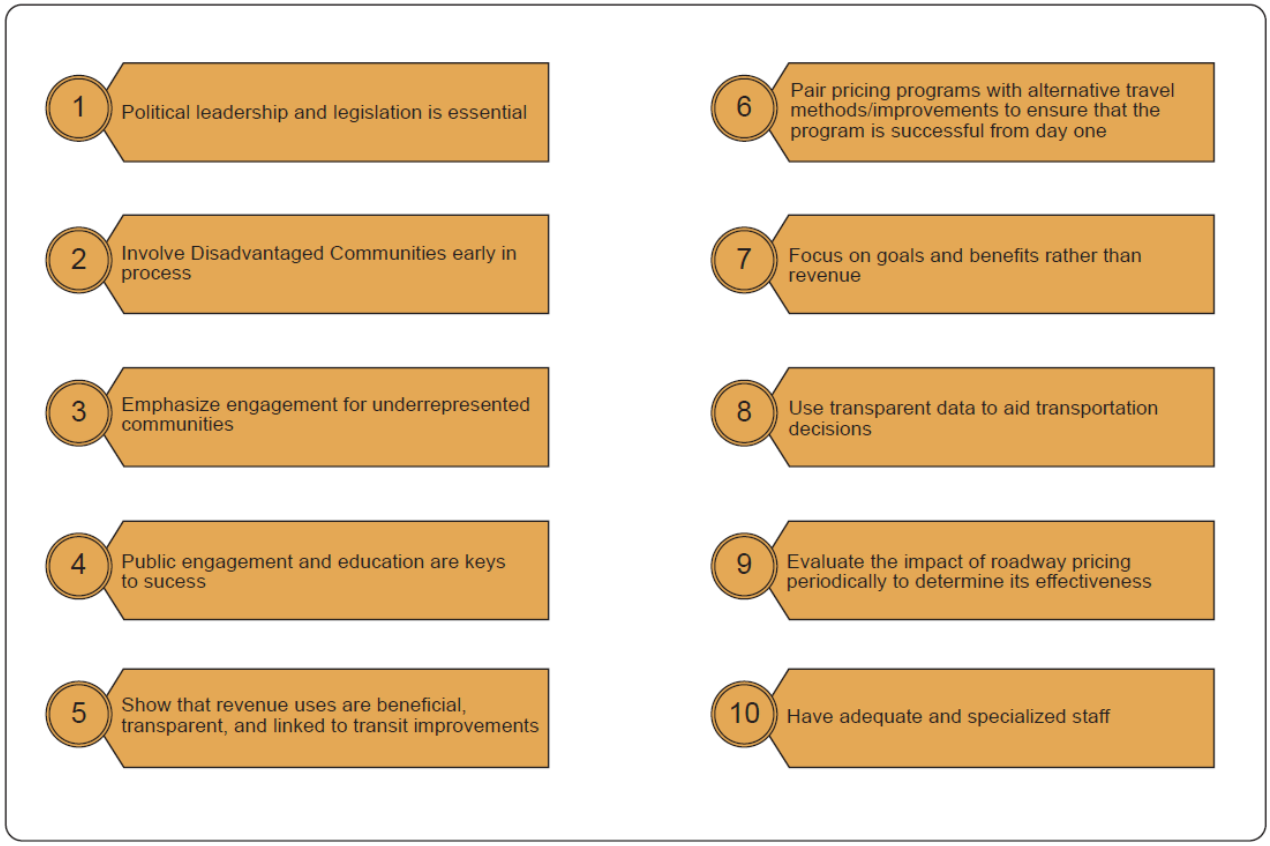
- Ensure that disadvantaged communities are involved in program design from the beginning. Subsidies and support can be offered to populations that will be most affected by the program to mitigate the impact on them. Be cognizant of and address potential congestion diversion into these communities and establish mitigation strategies.
- Emphasize the need for communication and engagement with underrepresented communities.
- Provide alternative travel methods when implementing roadway pricing. If alternatives are not available, it is best to pair a roadway-pricing proposal with a transit project. A day-one alternative for commuters is ideal when implementing a roadway-pricing program.
- Focus on the goals of reducing congestion, increasing mobility for all commuters, or reducing vehicle emissions, rather than focusing on raising revenue. Reducing congestion, increasing mobility, and reducing emissions directly benefits commuters, while there is no guarantee that revenue will be used to directly benefit commuters.
- Get decision-makers, the business community, and other stakeholders involved early in the process.
- Use data to back up transportation decisions. Make sure the data are transparent to the public.
- State where revenue from the program will be allocated if the program is projected to produce revenue. In many cases, public support will increase if the allocation of revenue is transparent. The Central Business District Tolling Program explicitly stated that revenue from the program will go toward funding MTA transit projects. The Minneapolis/St. Paul HOT Lane Program explicitly stated that excess revenues (after capital, operations, and maintenance costs) must be used for the corridor (50 percent of excess revenue) and for transit enhancements (remaining 50 percent).
- Adequately plan for additional staffing needs. Specialty staffing, such as lawyers, economists, or data scientists, might be required to effectively implement and evaluate a roadway-pricing program. Larger programs such as the Central Business District Tolling Program, Bay Area Express Lanes Program, and Minneapolis/St. Paul HOT Lanes used multidisciplinary teams to implement the programs.
- Evaluate the impact of roadway pricing. Periodic evaluations for congestion, equity, air quality, and revenue can help determine whether

the program is effective. These evaluations can also indicate what kinds of adjustments may be needed for the program.

- Ensure that there is significant engagement for the proposed program. This should include online and in-person meetings, workshops, and other events to reach as many stakeholders as possible. Be prepared to lose support at certain times in the implementation process. The best way to mitigate loss of support is early engagement, transparency, and communicating benefits of the program.

Figure 5 shows the takeaways and lessons learned from peer agency interviews.

Figure 5
Takeaways and Lessons Learned from Roadway-Pricing Programs Based on Interviews



BOSTON REGION MPO
Figure 5
Takeaways and Lessons Learned from Roadway-Pricing Programs Based on Interviews
Learning from Roadway Pricing Experiences

5 DISCUSSION OF CMP COMMITTEE GOALS AND ROADWAY PRICING

The CMP Committee meeting on August 17, 2023, provided a forum to discuss the MPO's goals and potential roadway-pricing program in the Boston region. Six of the eight members of the CMP Committee attended the workshop. Two questions were used to guide the discussion:

- *What is the most important goal for roadway pricing? (Prompted with options)*
- *What Long-Range Transportation Plan (LRTP) goals does roadway pricing relate to? (Discuss all that apply)*

Below is a synopsis of the discussion in response to these two questions.

The committee felt that all goals proposed at the meeting related to roadway pricing—supporting economic growth, supporting mobility and reliability, supporting transportation-disadvantaged communities, supporting congestion reduction and mode shifts, and supporting transit and other modes—were interrelated and important objectives for a roadway-pricing policy in the Boston region. The committee agreed that economic growth is strongly related to relieving congestion and the other goals identified. For example, if investments are made to provide more transportation options for disadvantaged communities as part of the roadway-pricing strategy, then it increases the potential for human productivity and assists the economy.

The committee recommended that any roadway-pricing strategy should provide disadvantaged communities with more transportation options to help the economy and improve the quality of life of people living in these communities by increasing access to important destinations. In addition, if traffic decreases in these communities because of roadway pricing, they would benefit from reduced congestion and air quality.

The committee suggested that roadway pricing should be implemented to reduce congestion through changes in travel behavior and shifts in travel modes to transit and active transportation.

According to the committee, roadway pricing fits most of the LRTP goals and produces revenue to invest in other modes. Roadway pricing revenues can support improvements in transit services, bicycle and pedestrian infrastructure, and other options. Such improvements could lead to mode shifts, reduce congestion, and improve air quality.

6 EXPLORING ROADWAY PRICING IN THE PLANNING PROCESS

At the CMP Committee workshop on August 17, 2023, MPO staff sought feedback from the committee on what kinds of efforts staff can explore in a future planning process. The discussion was framed around three questions included in the sections below.

6.1 Early Communication and Engagement Efforts

What would your priorities be on early communication and engagement with the public about roadway pricing? What forms of communication channels would be appropriate?

The committee recommended that staff start early communications and engagement about roadway pricing with the Regional Transportation Advisory Council, the eight MPO subregional committees, and the MPO-Metropolitan Area Planning Council forums. In addition, the committee suggested that staff engage with equity communities early in the research process to understand priorities and concerns, especially given the recommendations of other regions. The committee also raised the importance of engaging politicians early, even before a potential bill is drafted, in a setting that is comfortable for them. Once these stakeholders are engaged, staff could expand these efforts to include other focus groups.

6.2 Exploring Effects on Equity Populations

What would your priorities be on exploring the effects of roadway pricing on equity populations in the Boston region?

The committee stated that critics of roadway-pricing programs often say that it is inequitable because it makes it harder for low-income populations to travel to work and perform basic services. Another possible negative effect of roadway pricing on disadvantaged communities could include traffic diversions through neighborhoods. The committee noted that if the Massachusetts Bay Transportation Authority (MBTA) is operating at capacity and cannot support additional travelers shifting to transit, then a roadway-pricing strategy is just raising revenue and reducing commuting options for people who want to shift to transit. The committee suggested that there must be expanded and reliable transit services to accommodate mode shift, as well as other travel options or people cannot choose to shift to transit. Ideally, roadway pricing should occur either in coordination or after improvements to the other travel options to absorb mode shifts. They suggested evaluating

- how roadway pricing might disrupt mobility for disadvantaged populations and communities;
- what traffic diversions into disadvantaged communities could occur if a roadway-pricing program is implemented and how these diversions can be prevented or mitigated; and
- what improvements in transit and other travel options will be needed so travelers have a day-one alternative to driving.

6.3 Regional Transportation Plans

How would you like roadway pricing to be incorporated into future long-range transportation plans?

The committee recommended that MPO staff should first evaluate roadway pricing with the regional travel demand model to evaluate the benefits and impacts that arise from implementing roadway pricing strategies. The San Francisco Express Lanes and the New York City Central Business District Tolling Programs have used regional planning models to do various environmental assessments. Early assessments should ensure that a roadway-pricing strategy evaluates the potential to

- shift trips to other travel times such as off-peak periods, less-congested routes, combined trips, or even to eliminate some trips altogether;
- shift trips to alternate travel modes (transit, walking, biking, carpools, and telecommuting);
- reduce vehicle-miles traveled;
- reduce greenhouse gas emissions;
- create balanced multimodal transportation networks;
- identify effects on disadvantaged populations;
- analyze alternatives, benefits, and costs; and
- analyze impacts from working remotely on travel behavior.

The Boston Region MPO's travel demand model (TDM 23) has the capability to conduct these kinds of evaluations. Additional tools may be needed to use model outputs to perform benefit/cost analysis. These assessments, including others not listed above, may provide useful information about using pricing strategies to support LRTP goals and to answer questions that may arise from decision-makers.

7 CONCLUSIONS AND NEXT STEPS

This study identified several roadway pricing strategies that could be suitable for the Boston region, pending additional analysis. An initial analysis of 15 roadway-pricing programs (including two international programs), with detailed interviews about five projects, has informed MPO staff and the CMP committee and provided information on the challenges, opportunities, and lessons learned from these programs. The five interviews and the two workshops have provided information on elements needed to implement a successful roadway-pricing program, potential MPO goals for roadway-pricing strategies, and steps to be taken to begin exploring roadway pricing in the MPO planning process.

7.1 Next Steps

The following sections describe steps that could be taken to advance the idea of roadway pricing in the Boston region to help relieve congestion. These next steps include activities that could be taken by the MPO and other regional partners. The final presentation of this memorandum to the Boston Region MPO provides the opportunity for a forum to discuss the next steps for this research and advancing potential roadway pricing policies.

The Boston region MPO's role in implementing the 3C process (continuing, cooperative, and comprehensive) in the region, developing the LRTP (and Transportation Improvement Program [TIP]), and making decisions about where federal funds are spent is important and could influence roadway-pricing programs in the region. The MPO board could direct staff to develop potential policy frameworks and action plans to advance their goals for congestion pricing in the context of other statewide roadway pricing proposals and proposed bills. This would set the stage to incorporate roadway pricing into MPO planning processes such as the early communication and engagement process, follow-up studies on transportation equity issues, linking the LRTP and roadway pricing, and using TDM 23 to explore potential roadway pricing strategies and help answer strategies on travel behavior. In addition, it will be imperative for the MPO to fulfill the 3C process in the Boston region, while executing decisions about where federal funds are spent through the TIP.

Recommended follow-up studies that could be funded through the Boston Region MPO's existing programs or as discrete projects include

- discussing the MPO board's role in congestion pricing throughout the region;
- exploring equity concerns with roadway pricing;
- linking roadway pricing to the current and future LRTP and TIP;

- exploring modeling strategies for roadway pricing;
- conducting a stakeholders' analysis (in collaboration with outside agencies) to identify who is supportive and who is against roadway pricing; and
- preparing a location suitability analysis (in collaboration with outside agencies).

Engagement of Disadvantaged Populations

It will be imperative that disadvantaged communities are involved from the beginning. Surveys and meetings should occur to make sure opinions are heard. Careful attention should be given to equity, to prevent a roadway pricing project from being a burden on disadvantaged populations. An extensive framework will need to be mapped including a plan to protect disadvantaged populations as part of the roadway pricing implementation.

Stakeholder Analysis

Cohesion will need to occur with efforts conducted by several entities being completed around Massachusetts pertaining to roadway pricing. For the implementation of roadway pricing to be successful, there should be an inventory of potential stakeholders in the region who will determine what this program will entail. Once listed, these stakeholders can either be interviewed or surveyed to seek their position and knowledge on roadway pricing. This will indicate who is supportive and who is against roadway pricing as well as who has power and influence. Then, establish a stakeholder working group to help direct how to proceed with further study of roadway pricing, the type of pricing program, what facilities to include/exclude, how to study the equity impacts, etc. Other topics MPO staff could study would include identification of revenue sources to provide transportation alternatives to the priced facilities, and assessment of the implementation costs. Potential regional stakeholders include state departments of transportation, transit operators, local communities, and organizations representing disadvantaged communities.

Selection of Alternative Roadway Pricing Schemes

There are several possible options for roadway pricing in the Boston region. Roadway pricing strategies that fit the Boston region context will need to be explored and plans for implementation will need to be determined. An example of a long-term implementation plan could include creating a small roadway-pricing program, such as a parking-pricing program or TNP surcharge program to raise revenue to fund a bigger roadway-pricing program later, which will include the need to fund a day-one transportation alternative for a final program. Another alternative example would be to seek bonds or other funding to implement a

roadway-pricing program, with the promise that the tolls and revenue will eventually pay the bonds over time.

Roadway-Pricing Scenario Analysis

Analysis will need to be done that will specifically pertain to the Boston region. Modeling will need to be completed on the agreed upon alternatives. The Boston Region MPOs TDM 23 model can be used to help understand the impacts of an implemented roadway-pricing program. Both physical attributes such as a cordon-pricing scheme and policies such as taxation or surcharges should be modeled.

Location Selection

It will be important to identify the areas or corridors that would most benefit from roadway pricing in the region. An analysis of congested locations can be done across the region to see where roadway pricing might be able to help. TDM23, in tandem with other tools, could be used to perform the analysis and information from the analysis could guide the MPO board to make informed decisions about future roadway pricing in the Boston region. In addition, strategies will need to be related to the presence and type of congestion as well as transportation equity and available alternatives to driving in the region.

Appendix A

Appendix A, Table 1
Identifying Roadway-Pricing Programs for Interviews

Implementing Agency	Program Description	Purpose/Goals						Roadway-Pricing Policy	Challenges	Considerations for Incorporating Congestion Pricing in the Planning Process
		Reduce Congestion/ Increase Person Flow	Improve Air Quality/Reduce GHG/Improve Quality of Life	Improve Safety	Improve Reliability / Predictability of Travel	Generate Revenue[1]	Support Economic Growth			
	Cordon Pricing									

Tri-borough Bridge and Tunnel Authority, Metropolitan Transportation Authority, New York City, New York	**The Central Business District (CBD) Tolling Program** would toll vehicles that enter Manhattan CBD and would include a zone that would cover 60th Street in Manhattan and all the roadways south of 60th Street.
	
	https://new.mta.info/project/CBDTP
	
	Status: Environmental Assessments completed in August 2022, and it is anticipated to go into operation in 2024.
		X	X			X		• Cordon tolls
								• Charge users once per day
								• Variable tolling
								• New York State tax credits for residents of the CBD making less than $60,000
								• Free for emergency vehicles and vehicles transporting people with disabilities
									• Opposition from elected officials, trade and civic associations, and the public.
									• Concerns about
									  ○ disproportionate harm to working and low-income people
									  ○ negative environmental and financial impacts
									  ○ increased traffic in outer borough communities
									  ○ increased cost of business
										Analysis of
										• potential shift to other travel times and modes of transportation,
										• how roadway pricing will impact equity populations,
										• how it will help support climate goals and target, and
										• potential congestion reduction from roadway pricing.
										
										Lessons to be learned from this program include
										• environmental impact assessments,
										• engagement with business chambers and residents,
										• concerns related to equity populations, and
										• establishment of tolling policies.

	Cordon Pricing/Targeted Road User Tolls (TRUT)									
City of Chicago, Chicago, Illinois	**The City of Chicago** operates the Transportation Network Providers (TNP) Congestion Pricing. TNPs such as Uber or Lyft, which operate within the designated downtown cordon during peak-period pay surcharges. The designated downtown cordon includes the Chicago Loop, West Loop, South Loop, and the neighborhoods of River North, Streeterville, Near North, Gold Coast, Old Town, and Goose Island. https://www.chicago.gov/city/en/depts/mayor/press_room/press_releases/2019/october/NewRegulationsEaseTraffic.html Status: In operation since 2020.	X	X			X		• Cordon pricing style with tax • Designated peak period is weekdays between 6 AM and 10 PM. • $1.75 downtown zone surcharge for any single TNP trip that has an origin-destination in the downtown zone during peak period. • $0.60 surcharge for any shared TNP trip that has an origin-destination in downtown zone during peak period. • $5.00 surcharge for any trip that begins or ends in a special zone citywide (includes Airports, Navy Pier, and McCormick Place Convention Center).	• Opposition from TNP companies persists. There is also some opposition from the public.	• Chicago Department of Transportation continues to work with all stakeholders from ride-hailing companies to transportation advocates on long-term congestion policies that will further support goals ensuring affordable, accessible and reliable transportation options serving all areas of the city. • The TNP congestion pricing presents an opportunity for Chicago to both reverse the inequities embedded in its existing transportation system and to improve access to opportunities. • There have been discussions about expanding this program to additional neighborhoods. Lessons to be learned include • targeted pricing strategies focusing on specific problems and areas, and • engagement with stakeholders on policy changes.

[1] Uses of the revenue generated varied and included funding transportation improvements and providing travel choices; maintaining and preserving infrastructure; promoting transportation equity; promoting sustainable modes of transportation; supporting public transit; and making shared rides affordable in transportation equity neighborhoods.

Implementing Agency	Program Description	Purpose/Goals						Roadway-Pricing Policy	Challenges	Considerations for Incorporating Congestion Pricing in the Planning Process
		Reduce Congestion/ Increase Person Flow	Improve Air Quality/Reduce GHG/Improve Quality of Life	Improve Safety	Improve Reliability / Predictability of Travel	Generate Revenue[1]	Support Economic Growth			
	Express Lanes									
Colorado Transportation Investment Office, Colorado Department of Transportation, Denver, Colorado	Colorado Department of Transportation (CDOT) operates and maintains a network of **CDOT's Express Lanes** within the Denver-Boulder metropolitan area. https://www.codot.gov/programs/expresslanes https://www.codot.gov/programs/ctio Status: In operation since 2006, some express lanes are currently in development or construction.	X		X	X	X		• Variably priced express lanes • Variable tolling (tolls will vary at set times and days) • Free for HOV 3+, motorcycles, buses, and transit vehicles • General-purpose lanes are free	• Achieving interagency collaboration • Ensuring that transportation equity communities receive an equitable distribution of the benefits of transportation activities without suffering disproportionately high and adverse effects	Stakeholder engagement was a key facet in developing recommendations for a future network of express lanes. The main communication goals were to educate and engage stakeholders and the public on • the purpose and benefits from the use of express lanes, • how the results from the express lanes may benefit their local communities, and • how to build a network of informed decision-makers to support the development and implementation of the projects. Lessons to be learned include • innovative financing schemes, • program benefits and accomplishments, • federal and state oversight, and • public engagement and acceptance of the program.
Bay Area Infrastructure Finance Authority (BAIFA), a unit of the Metropolitan Transportation Commission (MTC), San Francisco, California	**The Bay Area Infrastructure Finance Authority (BAIFA), a unit of the Metropolitan Transportation Commission (MTC),** operates and maintains the MTC Bay Area express lanes. The growing Bay Area express lanes network is made up of more than 155 lane-miles, including I-580, I-680 southbound, I-880, State Route 237, US 101, State Route 237, and State Route 85. https://mtc.ca.gov/planning/transportation/driving-congestion-environment/mtc-express-lanes Status: In operation since 2010, developing vision and scope for future express lanes network.	X	X	X	X	X		• Variably priced express lanes • Free for carpools, vanpools, commute buses, motorcycles, and clean air vehicles • General-purpose lanes are free	• Required consensus among many stakeholders. • Environmental groups raised concerns about the HOT network as contributing to more travel and emissions. • Income equity issues were brought up early in the planning process and were addressed by devoting significant revenues to transit patronized by low-income groups.	The MTC Transportation 2035 plan evaluated the HOT lane network with express bus enhancements, regional freeway operational improvements, and regional rail expansion. The evaluation included • congestion and vehicle-miles traveled reductions, • greenhouse gas emissions, and • crash reduction. MTC also developed a legislative framework for the express lane network that addresses issues such as • the roles and responsibilities of the key players, • use of revenue, and • project development processes. MTC carefully framed its public engagement materials (web site, press releases, etc.) on the topic of HOT lanes for the public Lessons to be learned include • MTC experiences from existing express lanes, and • Renewed scope and vision for future express lane network.

Implementing Agency	Program Description	Purpose/Goals						Roadway-Pricing Policy	Challenges	Considerations for Incorporating Congestion Pricing in the Planning Process
		Reduce Congestion/ Increase Person Flow	Improve Air Quality/Reduce GHG/Improve Quality of Life	Improve Safety	Improve Reliability / Predictability of Travel	Generate Revenue[1]	Support Economic Growth			
Texas Department of Transportation, Dallas, Texas	**The Texas Department of Transportation (TxDOT)** operates and maintains express lanes in the Dallas-Fort Worth area called TEXPRESS lanes. The TEXPRESS network is made up of more than 100 miles on eight roadways including I-35E, I-30, SH 114, I-635E, SH 183, and LOOP 12. TxDOT has several public-private partnerships (P3) with the LBJ Infrastructure Group, NTE Mobility Partners, and NTE Mobility Partners Segments 3. https://www.txdot.gov/discover/express-toll-hov-lanes/managed-lanes/texpress-lanes.html Status: In operation since 2015, some projects are currently in construction or development.	X	X	X	X	X		• Variably priced express lanes • Discounts for HOV 2+ and motorcycles • General-purpose lanes are free	• Environmental Justice has been a significant regional issue for decision-makers and the North Central Texas Council of Governments (NCTCOG) worked extensively with the Federal Highway Administration, TxDOT, and others to address this. • More work was needed on communication and consensus building as the public and policymakers had difficulty understanding all nuances of the concept. • Complaints about “double taxation” as many feel that federal, state, and local taxes already pay for building and maintaining the transportation system.	• NCTCOG staff’s strong analytical foundation through improving modeling tools facilitated analyzing a wide range of managed lanes options for consideration. • NCTCOG considered innovative financial strategies including setting toll rates, use of comprehensive development agreements, use of revenue, and disposition of excess revenue. • NCTCOG’s consistent messaging with respect to the benefits of pricing and policy coordination with elected officials facilitated the planning process. Lessons to be learned include the benefit of building • a strong analytical foundation through modeling tools, • consistent message with respect to benefits, and • a sustainable transportation system.
Virginia Department of Transportation, Richmond, Virginia	The **Virginia Department of Transportation (VDOT)** partnered with Transurban to create faster travel options including the express lanes on I-495, I-95 and I-395. VDOT operates the express lanes on I-66 inside the Beltway. The I-66 Express Mobility Partners operates and maintains the I-66 express lanes outside of the Beltway in a public-private partnership with VDOT. https://www.virginiadot.org/info/congestion_pricing.asp Status: In operation since 2012, some projects are in development.	X	X		X	X	X	• Variably priced express lanes • Free for buses, motorcycles, carpools, vanpools, and HOV 3+ • General-purpose lanes are free	• Drivers unfamiliar with congestion pricing may initially have questions and concerns. • More work was needed to establish early communications and engagement with state and local agencies, elected officials, stakeholders (roadway or transit users), and the public.	• The Metropolitan Washington Council of Governments’ (MWCOG) travel demand model and regionally adopted land use forecasts were used to project travel demand for the near-term and long-term timeframes in the corridor and on major arterials. Lessons to be learned include • how VDOT's congestion-pricing strategies are working to achieve the objectives for the program, and • how to structure early engagement efforts.
The Orange County Transportation Authority, Orange, California	The **Orange County Transportation Authority (OCTA) and Riverside County Transportation Commission (RCTC)** operate and maintain the California State Route 91 (SR 91) express and I-405 express lanes. https://www.octa.net/91-Express-Lanes/About-the-91-Express-Lanes/ Status: In operation since 1995, some express lanes are in construction or development.	X			X			• Variably priced express lanes • Free for HOV 3+, zero emission vehicles and motorcycles, and vehicles with disabled and disabled veterans’ plates • General-purpose lanes are free	• Public has little familiarity with roadway pricing to understand all nuances of the concepts • Negative initial reactions to road charges	• Using roadway-pricing strategies to develop targeted capacity improvements enabled the State and regions to fund more mobility options within these targeted corridors and recognize social equity issues. • “Fairness and Equity” themes resonated with the public • Transportation choice was important to the public. • Potential impacts on urban versus rural residents • Building required consensus among many stakeholders. Lessons to be learned from OCTA Express Lanes include • how to plan, operate, and finance express lanes, • development of toll policies, and • public engagement process.

Implementing Agency	Program Description	Purpose/Goals						Roadway-Pricing Policy	Challenges	Considerations for Incorporating Congestion Pricing in the Planning Process
		Reduce Congestion/ Increase Person Flow	Improve Air Quality/Reduce GHG/Improve Quality of Life	Improve Safety	Improve Reliability / Predictability of Travel	Generate Revenue[1]	Support Economic Growth			
Washington State Department of Transportation, Seattle, Washington	Washington State Department of Transportation (WSDOT) operates and maintains toll roads and bridges in the state. **WSDOT's toll facilities** include I-405 express lanes, SR 167 HOT lane, SR 520 Bridge tolling, SR 99 Tunnel tolling, and the Tacoma Narrows Bridge tolling. https://wstc.wa.gov/programs/tolling/ Status: In operation since 2011, some express lanes are in development.	X		X		X		• Variably priced express lanes • Free for motorcycle, carpools, vanpools, and HOV 3+ • Free for transit and emergency vehicles • General-purpose lanes are free	• Assessing equity impacts of distribution of benefits and revenue allocation policies • Communicating how pricing will reduce congestion because the public and policymakers did not understand it	A comprehensive tolling study that • considered a broad range of policy motivations and applications, • evaluated institutional and technical considerations, and • considered a variety of case studies and resulted in eight policy recommendations. A traffic choices study that examined how travelers change their travel behavior (number, mode, route, and time of vehicle trips) in response to time-of-day variable charges in a congestion pricing program. Using behavioral information to feed travel demand models for better analysis of road pricing. Treating pricing as an integral part of regional transportation plan development was important to the success of the Puget Sound Regional Council process. Lessons to be learned include • how WSDOT plans, selects, and builds toll facilities, especially the evaluation process and public engagement, • incorporating pricing in MPO plans, • public engagement, • environmental impact studies, • building consensus, and • financing schemes.
Florida Department of Transportation, Tallahassee, Florida	The **Florida Department of Transportation (FDOT)** operates and maintains express lanes on several high-traffic areas throughout the state, such as on I-295 in Jacksonville, I-595 in Broward county, I-75 and I-95 in Miami-Dade and Broward counties, I-4 Ultimate and Beachline Expressway in Orlando, and Veterans Expressway in Tampa. https://www.fdot.gov/traffic/teo-divisions.shtm/cav-ml-stamp/managedlanes.shtm Status: In operation since 2014, some express lanes are in development.	X	X	X		X	X	• Variably priced managed lanes • Free for vanpools, carpools, hybrid and electric vehicles, buses, transit buses, school buses, motorcycles, and emergency vehicles • General-purpose lanes are free	• Achieving interagency collaboration	• Several regional planning models from MPOs and Council of Governments were used to forecasts traffic and analyze a wide range of managed lanes options for consideration. • Many of the FDOT express lanes were envisioned in long-range transportation plans. Lessons to be learned include • community engagement and stakeholder/industry participation and workshops, • planning and analyzing managed lane facilities, and • tolling policies and operations.
Maryland Transportation Authority, Baltimore, Maryland	**Maryland Transportation Authority** operates and maintains the **I-95 Express Toll Lanes (I-95 ETL)**. There are currently two express toll lanes in addition to three to four toll-free general-purpose lanes in both directions. I-95 ETL Northbound Extension is a planned extension of the existing express toll lanes. There will be transit connections at the proposed park-and-ride facilities. https://mdta.maryland.gov/I95ETLNB/home.html https://mdta.maryland.gov/ETL/I-95_ExpressTollLanes.html Status: In operation since 2015. The full extension of this project is under construction and will be completed in 2027.	X	X	X	X	X		• Variably priced express lanes • General-purpose lanes are free	• Building agency partnerships to facilitate communications and consensus building. • Obtaining and incorporating public feedback into express lanes development and tolling policies	Roadway pricing is incorporated into Baltimore Metropolitan Council's Long-Range Transportation Plans and Transportation Improvement Program (TIP). The MPO holds public meetings to take comments on the TIP amendments for new Express Toll Lane program. Lessons to be learned include • public engagement, • environmental impact studies, and • how to incorporate into MPO plans.

Implementing Agency	Program Description	Purpose/Goals						Roadway-Pricing Policy	Challenges	Considerations for Incorporating Congestion Pricing in the Planning Process
		Reduce Congestion/ Increase Person Flow	Improve Air Quality/Reduce GHG/Improve Quality of Life	Improve Safety	Improve Reliability / Predictability of Travel	Generate Revenue[1]	Support Economic Growth			
	Variable Pricing									
The New Jersey Turnpike Authority, Woodbridge, New Jersey	**The New Jersey Turnpike** opened in 1951. The current length of the New Jersey Turnpike mainline expressway is 117 miles. Variable pricing began in the fall of 2000. This enabled a discount to travelers who use the facility during off-peak hours and use an EZ-Pass. https://www.njta.com/toll-calculator https://www.fhwa.dot.gov/policy/otps/vpqrrt/sec5.cfm Status: Variable rate pricing has been in operation since 2000.	X	X		X	X		• Variably priced tolling • Discounts are available for senior citizens, and electric and hybrid vehicles with 45 miles per gallon (mpg) or better • The discount is not applicable if a user pays by cash	• Addressing safety, customer satisfaction, resilience and sustainability, and connectivity issues • Addressing potential environmental issues • Building agency coordination to facilitate project development.	• The introduction of variable tolls has improved traffic flow and provided associated air pollution and energy consumption benefits. • Preliminary data show that value pricing is working to shift traffic out of the peak period to off-peak period. Lessons to be learned include • collaboration with other organizations (many tolled bridges and tunnels are operated by the Port Authority of New York and New Jersey), and • revenue sharing for transit projects.
	HOT Lanes									
Minnesota Department of Transportation, St. Paul, Minnesota	**The Minnesota Department of Transportation** operates and maintains the **E-ZPass HOT Lanes.** Minnesota's HOT lane system includes I-35E, I-35W South Metro, I-35W North Metro, and I-394. https://www.dot.state.mn.us/ezpassmn/howezpassworks.html Status: In operation since 2005.	X			X			• Variably priced HOT lanes • Free for buses, motorcycles, and HOV 2+ • General-purpose lanes are free	• Potential public acceptance hurdles associated with roadway pricing • Lack of sufficient consensus, especially among legislative and local decision-makers, combined with lack of public support, led to failure of early proposals • Identifying key target audience for specific roadway-pricing projects • Building agency partnerships to facilitate communication and consensus building	Pricing is one of the five "key components" of the Twin Cities' Long-Range Plan to cope with "limited resources" and is cast as fully consistent with stated transit and HOV strategies. Lessons to be learned include • partnerships and agency roles, • policy development, • general consensus building and public engagement, • how to incorporate into MPO plans.
	Parking and Curb Management Pricing									
District Department of Transportation, Washington, District of Columbia	**The District Department of Transportation operates the Penn Quarter/Chinatown Parking Pricing Pilot** program. The program was implemented to better connect parking availability with demand by providing real-time parking information to motorists. https://dc.gov/release/dc-prepares-launch-new-parking-program-downtown Status: In Operation since 2016, expansion under consideration.	X	X				X	• Demand-based parking pricing • Variably priced parking (peak vs. off-peak) • Parking price adjustments occur every three months • By the end of the pilot program, the parking prices varied from $1.00 to $5.50 per hour depending on the time of day and demand. • Longer parking time limits were permitted on evenings and weekends when parking demand was lower.	None	The nature of curbside use is changing considerably and the demand for that use is changing considerably. Demand-based parking could lead to important safety outcomes by reducing double parking and blocking bike lanes and crosswalks. Lessons to be learned include • planning, • public engagement, and • parking strategies to address congestion.

GHG = greenhouse gas. HOT = high-occupancy toll lane. HOV = high-occupancy vehicle lane. HOV 2+/3+ = vehicles with 2/3 persons in high-occupancy vehicle lane.

Appendix A, Table 2
Identifying Roadway-Pricing Programs for Interviews

Implementing Agency/Location	Program Name	Roadway Pricing Type	Purpose/Goals						Criteria for Selecting Program for Interviews						
			Reduce Congestion/ Increase Person Flow	Improve Air Quality/ Improve Quality of Life	Improve Safety	Improve Reliability/ Predictability of Travel	Generate Revenue[2]	Support Economic Growth	Opportunity to Learn from Challenges	Program Goals Align with the Boston MPO Planning Process	Ease of Implementing in the Boston Region[3]	Program was Recommended by Workshop Participants	Environmental Assessment Completed before Implementation	Program Directly Addresses Equity Concerns	**Total Points**
Tri-Borough Bridge and Tunnel Authority, Metropolitan Transportation Authority, New York City, New York	Central Business District Tolling Program	Cordon Pricing	X	X			X		X	X	X	X	X	X	**6**
City of Chicago, Chicago, Illinois	Chicago's Transportation Network Provider Congestion Pricing	Cordon Pricing/Targeted Road User Tolls (TRUT)	X	X			X		X	X	X	X			**4**
Colorado Department of Transportation (CDOT), Denver, Colorado	FDOT's Express-Lanes Program	Express Lanes	X		X	X	X		X	X			X		**3**
Bay Area Infrastructure Finance Authority (BAIFA) / Metropolitan Transportation Commission, San Francisco Bay Area, California	Metropolitan Transportation Commission's Express-Lanes Program	Express Lanes	X	X	X	X	X		X	X		X	X		**4**
Texas Department of Transportation (TxDOT), Dallas, Texas	TxDOT's Express-Lanes Program	Express Lanes	X	X	X	X	X		X	X		X	X		**4**
Virginia Department of Transportation (VDOT), Northern Virginia/Washington DC Suburbs	VDOT's Express-Lanes Program	Express Lanes	X	X		X	X	X	X	X			X		**3**
The Orange County Transportation Authority, Orange County, California	Orange County Transportation Authority's Express-Lanes Program	Express Lanes	X			X			X	X					**3**
Washington State Department of Transportation (WSDOT), Seattle, Washington	WSDOT's Express-Lanes Program	Express Lanes	X		X		X		X	X			X		**3**
Florida Department of Transportation (FDOT), Tallahassee, Florida	FDOT's Express-Lanes Program	Express Lanes	X	X	X		X	X	X	X			X		**3**
Maryland Transportation Authority, Baltimore, Maryland	Maryland Transportation Authority's Express-Lanes Program	Express Lanes	X	X	X	X	X		X	X			X		**3**
The New Jersey Turnpike Authority, New Jersey	New Jersey Turnpike Variable Rate Pricing	Variable Pricing	X	X		X	X		X	X	X	X			**4**
Minnesota Department of Transportation (MnDOT), St. Paul/Minneapolis, Minnesota	MnDOT's E-ZPass Express Lanes Program	HOT Lanes	X			X			X	X	X		X		**4**
District Department of Transportation, Washington, District of Columbia	Penn Quarter/Chinatown Parking Pricing Program, Washington, DC	Parking and Curb Management Pricing	X	X				X	X	X	X	X			**4**

GHG = greenhouse gas. HOT = high-occupancy toll lane. HOV = high-occupancy vehicle lane. HOV 2+/3+ = vehicles with 2/3 persons in high-occupancy vehicle lane

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The light green highlighted rows are the programs selected for interviews.

[2] Uses of the revenue generated varied and included funding transportation improvements and providing travel choices; maintaining and preserving infrastructure; promoting transportation equity; promoting sustainable modes of transportation; supporting public transit; and making shared rides affordable in transportation equity neighborhoods.

[3] Ease of implementation include pricing programs that are low cost, does not involve widening or add lane miles or major changes to the highway system.

APPENDIX B

NOTES FROM THE INTERVIEWS

- Transportation Network Provider (TNP) Surcharge—Chicago, Illinois
- Minnesota Department of Transportation (MnDOT) High Occupancy Toll (HOT) Lanes—Minneapolis, Minnesota
- Central Business District Tolling Program—New York City, New York
- Bay Area Express Lanes—Northern California/San Francisco
- Chinatown/Penn Quarter Pilot Parking Program—Washington, District of Columbia

Chicago Transportation Network Provider Surcharge—July 5, 2023

Background

In 2019, Lori Lightfoot, who was the Chicago mayor at the time, proposed that a surcharge of $1.75 ($5.00 for special zones) be imposed on Transportation Network Provider (TNP) trips that either drop-off or pick up in designated neighborhoods in Chicago. This cordon style roadway pricing program was passed by the Chicago city council in 2019.

Federal and State Support

There wasn't much federal and state involvement with the implementation of this program.

Program Goals

- To reduce congestion caused by TNP companies.
- To raise revenue for Chicago and the Chicago Transit Authority (CTA).
- To maximize vehicle occupancies.

Revenue and Operating Costs

Revenue Background

- In 2019, this program produced $200 million in revenue. $16 million went towards the CTA. The remaining revenue was allocated towards the general funds for the City of Chicago.
- There is a Memorandum of Understanding (MOU) between Chicago and the CTA which details how the funding can be used. No MOU exists with Metra or Pace as they currently don't receive revenue from this program.

Fee Structure Goals

- Incentivize sharing rides when using TNPs. As a result, surcharges were reduced to 60 cents for shared TNP trips.

- Traveling through the downtown zone in a TNP without stopping won't result in the TNP surcharge. (Trip must start or end in the downtown area for a charge to occur)
- Chicago receives the TNP data monthly through an open portal. They know the number of surcharges that should be charged based on the ridership level.

Costs and Operations

- In-house staff time was mostly used to design the policy. Staff had a variety of roles, including a policy analyst, a data analyst and tax law specialist.
- It took around 20 staff members for the program to be implemented. Five staff members are working on this continuously.
- The Business Affairs and Consumer Protection department manages the TNP program. One staff member is a lawyer. Two to three staff members oversee analyzing the data. If this was a bigger program, such as the TNP surcharge program in New York City, there could be many more staff working on this.

Challenges

- TNPs have opposed the surcharge throughout the entire duration of this program.
- Chicago city council approval was difficult due to the council's size, which is over 50 people.
- The coronavirus pandemic occurred after implementation, so they don't know how effective this program would be at reducing congestion.
- Commuters are concerned about being over monitored while traveling in Chicago.
- This program was successful as far as being implemented, however it has not significantly reduced congestion.
- The surcharge would need to be $10 to make an impact and affect travel behavior. Chicago proposed a lower surcharge fee to ensure that it would pass.
- Chicago did not have much time to implement this program, so they were not able to do a detailed analysis before implementation.

Opportunities

Using Data to Manage TNP's

As of 2019, TNP data was collected at the census block level. Since then, Chicago has been able to receive even more detailed data. At first, Chicago couldn't obtain the through points, just the beginning and end points of a trip. Now Chicago is receiving more frequent pings to make the routes visible.

Planning Process
Chicago staff sat down with transportation and civil organizations to inform them that they want to implement this program and warned about the challenges ahead.

Equity
Reducing the cost of shared rides that did not go downtown is a big priority. An objective is to shift congestion to neighborhoods that have roadways that are underutilized. Revenue from this program goes to support public transit investments at the CTA which helps address equity concerns. Chicago also uses revenue to invest in shared bicycles.

Keys to a Successful Program

- Robust data and make data readily available.
- Have a data scientist on your staff—Chicago's data scientist can write code to do quick in-house analyses.
- Transparency to the public. Communication is the key to having the public on board.
- Ensure documents are written so that the public can read them. It helps when reports and presentations are non-technical.

Communication and Messaging

- Chicago has an open data portal. Advocates can obtain data and conduct their own analysis.
- The public loved these TNP policies. In addition, riders have become accustomed to the surcharge. It's a modest fare for a TNP ride.

Expanding the TNP Surcharge

- Companies asked if the fee would go away during the pandemic but did not suspend this program during the pandemic.
- Chicago is using some of the revenue to complete a longer-term congestion study that will analyze the impacts of TNPs in different neighborhoods.
- Chicago desires to research how the surcharge, or any congestion pricing policies are impacting TNP drivers. Chicago wants to help TNP drivers whenever they can.

E-ZPass Minnesota Express Lanes—June 29, 2023

Background

Interest in congestion pricing started in the early 1990s when MnDOT and the Metropolitan Council began to study and implement congestion pricing.

Federal and State Support

Enabling State Legislature

Public and political work in the early 1990s led to a state enabling legislature allowing the MnDOT and the Metropolitan Council to study and implement congestion pricing. In early 2000, a Value Pricing Advisory Task Force comprising state legislators and city officials and the I-394 Express Lane Community Task Force were formed and tasked with communicating benefits and understanding of the pricing project to the public. The task force visited SR 91 Express Lanes in California, which is using pricing to maximize capacity and maintained advantage for buses and carpools. The efforts led to the introduction of state legislation authorizing the conversion of underutilized High Occupancy Lane (HOV) lane into HOT Toll Lane.

Federal Support

The Federal Value Pricing Pilot Program supported the I-394 HOV to HOT conversion in 2005. The project received $10 million federal demonstration grants and regular MnDOT funds. This low-cost conversion project involved installing tolling equipment for the contraflow lane.

Program Goals

- Manage congestion.
- Improve air quality.
- Support economic growth.

Revenue

- The main purpose of the E-ZPass Minnesota express lane program is to manage congestion, not revenue generation.
- Revenue from the pricing program is used to pay for operations and routine maintenance. Additional support for the program comes from MnDOT maintenance fund and state and federal funds.
- The state legislature specifies that excess revenues (after capital, operations, and maintenance costs) are to be used in the corridor and to transit enhancements on a 50/50 basis.

Challenges

- Opposition and support from the legislature and public.

- Equity concerns such as financial burdens or diversions.
- Environmental concerns and opposition to building new express lanes.
- Advocacy on climate change goals to reduce vehicles miles traveled.
- Operational challenges include traffic diversion where the managed lanes end up causing congestion at the terminals.
- Challenges for expanding highway projects that are not safety projects and funding for new express lanes.

Opportunities

- New projects emphasize engagement with underrepresented communities.
- E-ZPass express lane is evaluated as part of all new projects.
- Extensive public engagement now than in the past.
- Transit improvements to take pressure of local street.
- The University of Minnesota completed a study on equity enhancement in the systems and found that:
    - Income levels are balanced throughout the transportation network under the program.
    - Diversity, ethnicity, and race—The users of the express lanes are more racially diverse than the users of the general purpose lanes.
    - Excess revenue was used to target Central Business Districts in low-income communities to fund transit improvements.

Communication and Messaging

- Grasstops approach not a grassroots approach—assembling at task force comprising legislators, city officials, MPO, public, county officials, Federal Highway Administration (FHWA), MnDOT, and stakeholders.
- Detailed technical work evaluating different pricing strategies and the benefits to the public.
- Scanning trips: A visit to California SR 91 Express Lanes made the difference and convinced the task force to draft and champion legislation to implement congestion pricing.
- After study showed 60 percent of the public supported it.

Expanding the Express Lanes

- Since the I-394 HOT lane project, MnDOT has expanded express lanes on I-35W and I-35E. The expansions are a combination of conversion of existing HOV lanes into HOT lanes and new construction. Expansion of the Express Lanes on I-35 system also benefited from UPA grant of $130 million.

New York City Central Business District Tolling Program—notes from meeting—July 21, 2023

Background

In 2006, the city of New York proposed to implement congestion pricing in Manhattan Central Business District (CBD). This congestion pricing program was approved by the City but was rejected by New York State. Since the congestion pricing bill failed to pass in 2008, this program was shelved until 2017.

In 2017, the idea of congestion pricing in Manhattan was revived due to budget shortfalls and revenue needed for transportation repairs. In 2019, the congestion pricing program was approved by New York State through the state budget and has since been approved by the FHWA, in 2023. The current target year for implementation of this program is 2024.

In the current version of this congestion pricing program, motor vehicles that travel south of 60th Street will be charged a toll. The toll rate hasn't been determined yet, but the final set rate will be between $9 and $23.

Federal and State Support

- The Environmental Assessment (EA) on the program was federally approved in the spring of 2023.
- The tolls were not finalized at the time of the EA so hypothetical scenarios were created to conduct the EA analysis.
- The three sponsors for the program are the Metropolitan Transportation Authority (MTA), State Department of Transportation, and the New York City Department of Transportation. There was a lot of collaboration with the FHWA.
- Several mitigations and discounts that the MTA offered to commuters helped this program receive FHWA approval.

Program Goals

- To raise revenue
- To reduce congestion
- To improve air quality
- To improve quality of life for residents of Manhattan CBD

Revenue and Operating Costs

Revenue Background

- The MTA will have to raise at least $1.1 billion annually to meet their $15 billion for the bonding for the capital plan. It is estimated that it will take 30 years to repay the bonds. This is why the tolls are projected to be so high.

Costs and Operations

- Upfront cost includes new poles and transmitters.
- Operating costs will be over $100 million annually.
- EZ pass will be fully integrated to this project.
- No flashers can be used with the tolling equipment.
- The management of this program will be in house, but they would need to add more staff in existing operations to manage the new congestion pricing program.
- The MTA will collaborate with NYDOT.
- The FDR and Westside Highway will be exempt from the tolls.
- The toll algorithm will distinguish where all commuters are traveling to within the cordon.

Challenges

- $23 congestion fee is too high for politicians. The MTA was hoping for a $10 to $15 congestion fee, but giving commuters discounts is driving the fee upwards.
- The MTA must give cross credit for people who already paid tolls in other nearby entry points (example: bridge tolls).
- There were a lot of required mitigation projects required to obtain the bonds for this project. This includes asthma centers, air filtration in schools, pollution eating vegetation, and improvements to parks.
- This program will cause some traffic diversions by commuters. More traffic will be pushed to the outer boroughs.
- There is an ongoing conflict between New York and New Jersey over congestion pricing. New Jersey sued New York in July 2023.

Opportunities

- The reason that cordon pricing was the chosen pricing method is because Manhattan is an island. This makes the location ideal for cordon pricing because entry points onto the island are limited and it would be easier to set up checkpoints.

Planning Process

Traffic Mobility Review Board (TMRB)—this is a six-member panel that will implement the tolling structure. The MTA and FHWA must also approve of the tolling structure.

The MTA did not consider adding a new transit project to be implemented before the congestion pricing program begins, because the pandemic caused the drop in ridership on the subway and extra capacity was not needed. Additionally, the model projects that transit ridership will only increase two percent with congestion pricing. However, there are discussions about possibly adding some

additional bus rapid transit routes to the system before or shortly after implementation.

Equity

- There are extensive equity analyses in the EA.
- The congestion pricing EA requires TNC drivers to be tolled only once a day
- Some of the revenue will be going toward updating the subway system and improving stations to ADA accessible standards.

Discounts

- Households under $60,000 will receive a discount. This was negotiated by the FHWA when creating the EA.
- Out of zone discount—25 percent discount on the toll after the tenth trip in the cordon zone during a calendar month. This will apply to a frequent commuter. This discount was recommended by the FHWA.
- Fifty percent overnight discount from the hours of 12:00–4:00 AM. This was required by the FHWA.
- Emergency vehicles will get a discount. The definition of an emergency vehicle is still being determined.
- Individuals with disabilities will have a discount. This will require special plates.
- Public transport buses will have a discount.
- These discounts also apply to New Jersey and upstate New York residents.

Planned Assessments

When implemented, these assessments will be done:

- Environmental Monitoring from day one
- Before and after traffic studies
- EJ monitoring assessments

Communication and Messaging

- Communication with Politicians are very important.
- Expect the U-curve result of support. Support bottoms out right before implementation. Once implemented, support of the program will spike.
- The MTA had 19 public meetings hearings in 2021. In 2022, six more public meetings were held. The length of meetings grew over time. The last few meetings were 10 hours long. The comments were three to one negative to positive at these meetings.

Background of Other Similar Program

New York City TNC surcharge

- This program commenced in 2019. The surcharge is $2.75 for Uber and Lyft.
- The first $300 million in revenue goes into the subway action account. Then, $50 million goes into the Outer Borough Transit Improvement account. 2022 is the first year that there was enough revenue that the Outer Borough Transit Improvement account received money.
- The fee has not decreased demand at its current price.

Bay Area Express Lanes—Metropolitan Transportation Commission (MTC) notes from meeting—June 30, 2023

Federal and State Support
Relevant Assembly Bills

- Assembly Bill 1467 – The bill in 2012 allowed regional transportation agencies (RTA), in cooperation with California Department of Transportation (Caltrans), to apply to the California Transportation Commission (CTC) to develop and operate high-occupancy toll lanes, including the administration and operation of a value pricing program and exclusive or preferential lane facilities for public transit. The Bay Area Express Lanes were completed under this bill.
- Assembly Bill 194 – New bill in 2015 -California Transportation Commission (CTC) – Value pricing program (Toll facilities program), gave the CTC responsibility to approve the tolling of an unlimited number of facilities. This new authority allowed regional transportation agencies (RTA) and Caltrans to apply to the commission to implement and operate HOT lanes, and other tolling schemes including a value pricing program or exclusive lanes program for transit or freight. Additionally, this legislation gives RTA and the state to consider alternative means to finance transportation infrastructure improvements. Before 2016, special legislation was required to grant an entity to implement a tolled facility.
- 23 U.S.C. 301 and 23 U.S.C. 129—This is a federal bill that allowed states to give authority for operators to build and operate tolled expressways. This passed in 2012. The bill allows the conversion of a HOV lane to a toll facility. However, there are restrictions on how revenue can be used (transit is allowed) and requirements for implementing tolling on interstate and non-interstate highways.
- California Senate Bill 743—This bill was implemented in 2018. The legislation prompted a change in the way the state measures the impacts of new development and transportation projects. It promotes reductions in vehicle miles traveled (VMT) as a measure of the impacts of transportation projects and developments. The goal of this bill is to reduce greenhouse

gas emissions, discourage sprawl and promote active transportation. Change in VMT would be compared to the project's cost.

Background

The MTC began implementing the Bay Area Express Lanes network after seeing the California SR 91 express lanes being implemented in Orange County, California, in the late 1990s. The Bay Area Express Lanes network concept was also driven by environmental concerns back in the 1990s. The goal of this program is to increase person throughput and reduce vehicle emissions. The objective was to increase carpooling and manage travel demand of single-occupant vehicles (SOV).

Program Goals

- Reduce congestion by rewarding use of high-occupancy vehicles.
- Provide reliable and faster trips.
- Provide a choice for drivers to pay for faster trips.
- Improve air quality.

Challenges

Equity Concerns

- Users thought it was a choice to use the express lanes. Now, stakeholders understand the purpose of an express lane is more nuanced than this.
- Riders on buses on express lanes tended to be higher income and the buses are emptier than on typical routes.
- Express Lanes Starts pilot program offers low-income drivers living in the San Francisco Bay Area at least 50 percent discounts on tolls in the I-880 Express Lanes. MTC is evaluating the 18-month pilot program and looking to implement it across the Bay Area Express Lanes.

Operations

- Operations are very complex and setting up high-tech systems was a challenge.
- Unanticipated costs such as replacing the toll systems every 10 years can be very expensive over time.
- Public perception that express lanes are difficult to use.
- Lack of customer service workers to help users.

Revenue

- Can use toll revenue for other projects. However, generating revenue to fund public transportation improvements was not the goal of the program.
- COVID-19 impacted the program. Traffic volumes are still below the pre-COVID-19 level. Revenues and operating/obligation costs are about equal.

- Loss of revenue due to toll violations and drivers cheating.
- Enforcement has been an issue as well. Existing technologies do not detect vehicle occupancies to determine if drivers have the appropriate occupancies or if they need to pay the toll.
- Tracking emerging technologies that can be used to increase enforcement and revenue.

Environmental Concerns
Environmental advocates express concerns about capacity expansion by adding more lanes for express lanes. MTC is looking at federal rules about converting general purpose lanes to toll lanes than building new toll lanes.

Opportunities

- Public engagement centered on how express lanes function and program benefits. This was done in a non-technical format that was easily understood by the public and focused the most on boards and communities, more than the public directly.
- The MTC considered express lanes pricing because the Assembly Bills 1467 and 194 authorized the Caltrans and regional planning agencies to implement managed lanes.
- The MTC decided that a three-person carpool was best for the region and were allowed to travel free on all express lanes to reduce congestion and VMT. A two-person carpool pays half-price toll or travel free on express lanes based on the level congestion.
- The Express Lanes program was originally included in the Long-Range Transportation Plan that was published in 2009. Agency and county partners participate in the process and each cycle has a performance assessment where the evaluation of the effectiveness of the roadway pricing facility occurs.
- Caltrans owns the freeways, but a memorandum of understanding gave MTC the responsibility for operating and collecting tolls on the system and maintenance on the express lanes.

Funding

The Bay Area Express Lanes program did not use public private partnerships, mainly because of federal funding and state propositions to fund transportation improvements.

Keys to Implementation

- Stakeholder partnership
- Communication
- Realistic cost

Takeaways and Lessons Learned

The MTC seeks to implement cost-effective, sustainable, and self-supporting managed lanes that help achieve regional goals.

- Reduce congestion so people and goods get where they need to go reliably.
- Support and promote the use of transit and high occupancy modes.
- Advance equity by improving equitable and affordable access to mobility options and in underinvested communities.
- Clean the air to support public health and fight climate change.
- Deliver Bay Area Express Lanes Network in a timely manner.
- Be responsible in the use of public funds.

District of Columbia (DC) Penn Quarter/Chinatown Parking Demand Program—notes from meeting—July 6, 2023

Background

The DC Penn Quarter Parking program is a pilot program that converted fixed rate, on-street parking to variable rate on-street parking depending on parking demand. This program was implemented in the Chinatown/Penn Quarter Neighborhood. The pilot program began in 2014 and concluded in 2019, at which time the pricing adjustments in the neighborhood became permanent.

Federal and State Support

This program was funded from a grant though the FHWA Value Pricing Pilot Program

Program Goals and Outcomes

- Reduce time to find a space. This program was successful at reducing time to find a parking space. Circling for parking also decreased with this program.
- Reduce congestion and improve safety and use of other modes. Congestion was reduced two percent in the neighborhood when the program was implemented. There was a bigger congestion reduction in the Chinatown/Penn Quarter neighborhood than what was experienced citywide. The program did not have an impact on businesses.
- Develop parking management solutions through a cost-effective, asset light approach. This was achieved by using data fusion to determine a system which didn't require much additional equipment.

Implementation

There were three steps for implementation:

1. On street configuration, which involved converting to a pay by space system.
2. System design, which involved data monitoring at a block level instead of individual spaces. Sensors are expensive and pay by space monitoring doesn't work well with sensors, so it was not recommended to install sensors on every space.
3. Data fusion, which involved adjusting prices based on real-time demand.

Revenue and Operations

- Revenue from this program is allocated to the Washington Metropolitan Area Transit Authority, which operates the DC Metro. Some of the revenue is also allocated towards program operations.
- This program is not to generate revenue and parking pricing is reduced at underutilized parking spaces.
- Between 2014 and 2019 there were seven rounds of parking price increases or decreases, depending on the time of day. This resulted in 12 different parking prices by 2019. The most utilized parking spaces reached level 12 in 2019, which means parking will be $7.00 per hour at the space during peak periods.
- There are four parking periods: weekday mornings 7:00–11:00 AM, weekday midday 11:00 AM–4:00 PM, weekday evening 4:00–10:00 PM, and all-day Saturday. Sundays are free.
- There are substantial operating costs for this program, but the asset-light approach reduced capital costs.
- Real time information is sent to the DC Park application. This shows block level parking availability to commuters that are looking for parking. If all blocks are displayed in red, it is best to utilize a parking garage.
- Seventy percent of revenue is through the DC Park application. Some commuters pay by coins but it's less than 10 percent of revenue. The District Department of Transportation (DDOT) is looking into implementing a coin free pilot soon.
- The district does not have any off-street parking. The 26,000 parking spaces that are operated by DDOT are all on-street parking.
- DDOT is working on cleaning up parking signs. The parking signs are currently confusing to commuters that are searching for parking.
- It's important to communicate to the commuters that it's best to view the app before they heading to the neighborhood. DDOT is working on possibly integrating the application to the vehicle GPS units.

Challenges

- Illegal/double parking increased when the program was implemented. There was also an increase in people parking in loading zones. As a

result, DDOT reduced prices in some locations to discourage this behavior.
- After the COVID-19 pandemic, parking is at 85–90 percent of its 2019 use. Employees in the offices in the neighborhood now work from home several days a week. Overall, there are fewer general activities downtown than in the period before the COVID-19 pandemic.

Opportunities
- Better real-time information on demand based on parking can help reduce the troubles of parking downtown.
- 2023 is the first year that vibrancy is returning to the DC neighborhood. DDOT is monitoring the data to determine if this trend will continue.
- If the parking is too expensive, commuters know that they have transit options. Because of this, DDOT can discourage commuters from driving to the neighborhood altogether.
- It is recommended that a smaller program such as this parking pricing program funds start-up transit options to provide a day one alternative for driving in a congestion pricing cordon.

Communication and Messaging
- DDOT expected political push back but didn't get much. Local politicians were already dealing with several parking bills, so they had a familiar background on the parking pilot.
- Most of the commuters are short term visitors and tourists, not residents and daily workers. Short term visitors often are from out of town and are not politically interested in this program, so they rarely opposed this program.
- Once parking rates reached $7.00 per hour in some locations, some push back occurred. DDOT met with the local Advisory Neighborhood Commission to resolve the push back.
- DDOT stated that their biggest mistake was not engaging with the small business community sooner.
- DDOT regularly communicates with WTOP, which is a local news outlet.

Background of Other Similar Programs
- SF Park implemented variable parking in San Francisco before this program. They elected to install a sensor on every space that they monitored.
- Other programs include Park Indy (Indianapolis), Seattle and LA express park (Los Angeles). LA Express Park started at the same time but doesn't change prices as often. Some of these programs monitor off-street parking too.

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