



LEARNING FROM ROADWAY-PRICING EXPERIENCES

December 2023

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.

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

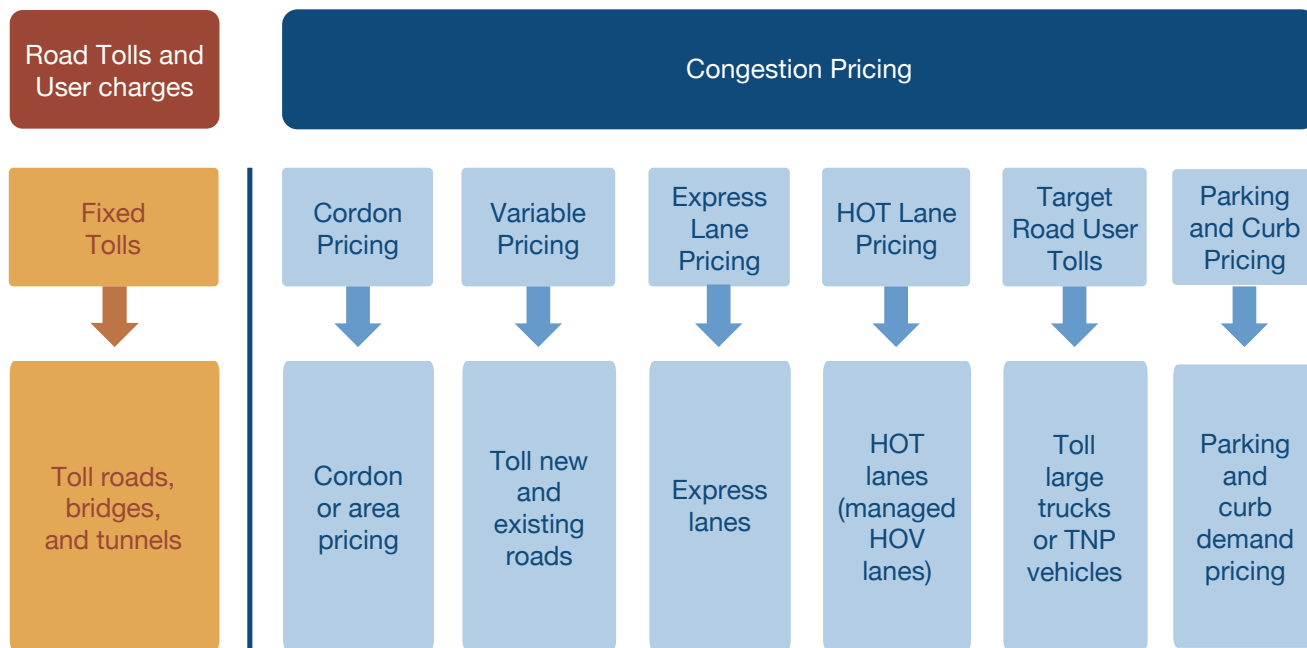
Roadway-pricing strategies fall into two broad categories: road toll and usage charges and congestion pricing. Figure 1 shows strategies related to both categories. Road tolls are a common way to maximize revenue to pay for highway and bridge improvement costs. Road tolls rarely vary by time of day and 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



HOT = High-Occupancy Toll.
HOV = High-Occupancy Vehicle.
TNP = Transportation Network Providers.

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

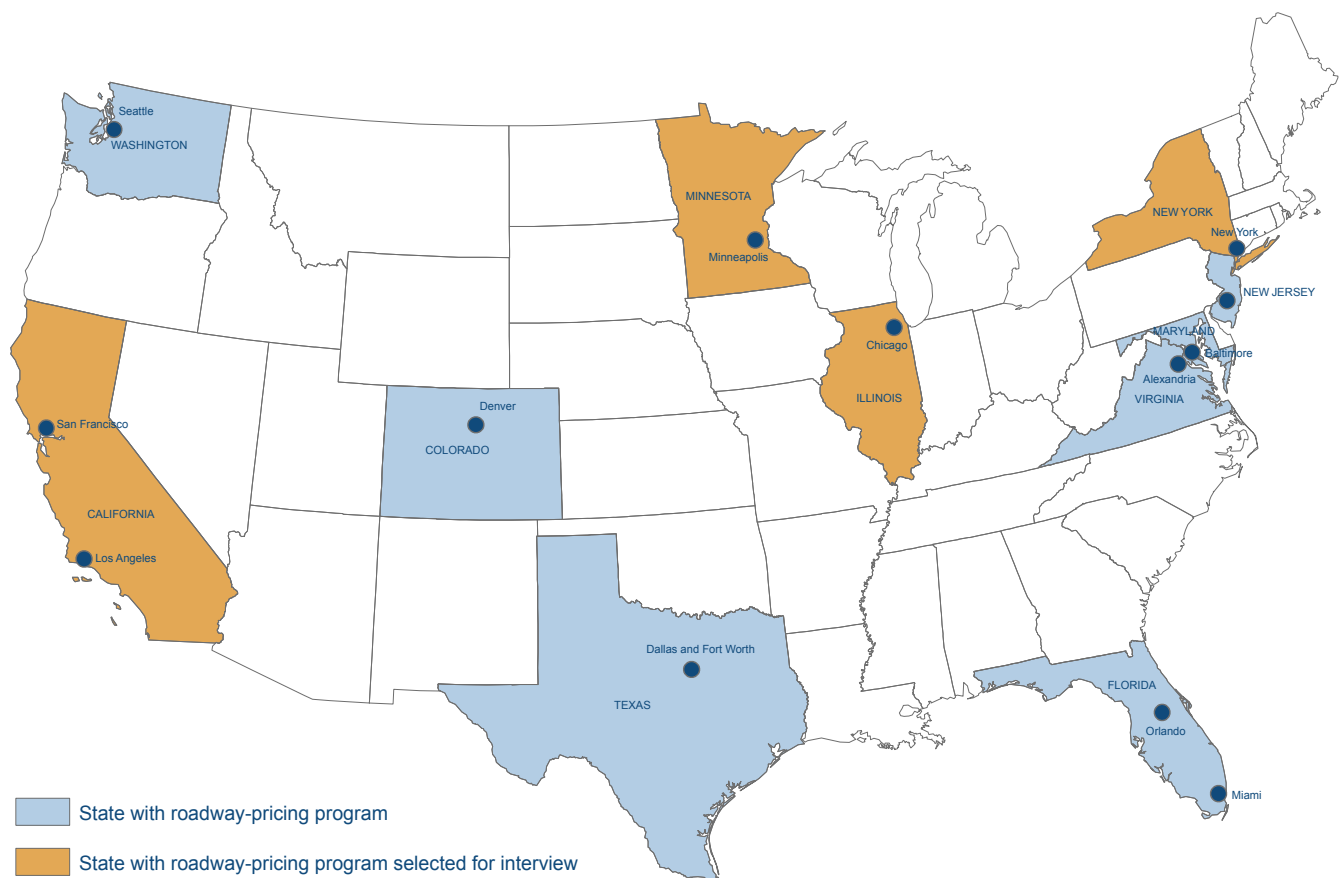
- do not require costly expansion or widening of roadways;
- avoid disproportional geographical impacts on suburban versus urban communities, for example, due to traffic diversions;
- address equity concerns;
- improve public and active transportation options; and
- incorporate pricing in the regional 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



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 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 rides⁷

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 grassroots 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.

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.

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 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.

4.7 Key Findings

Challenges

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

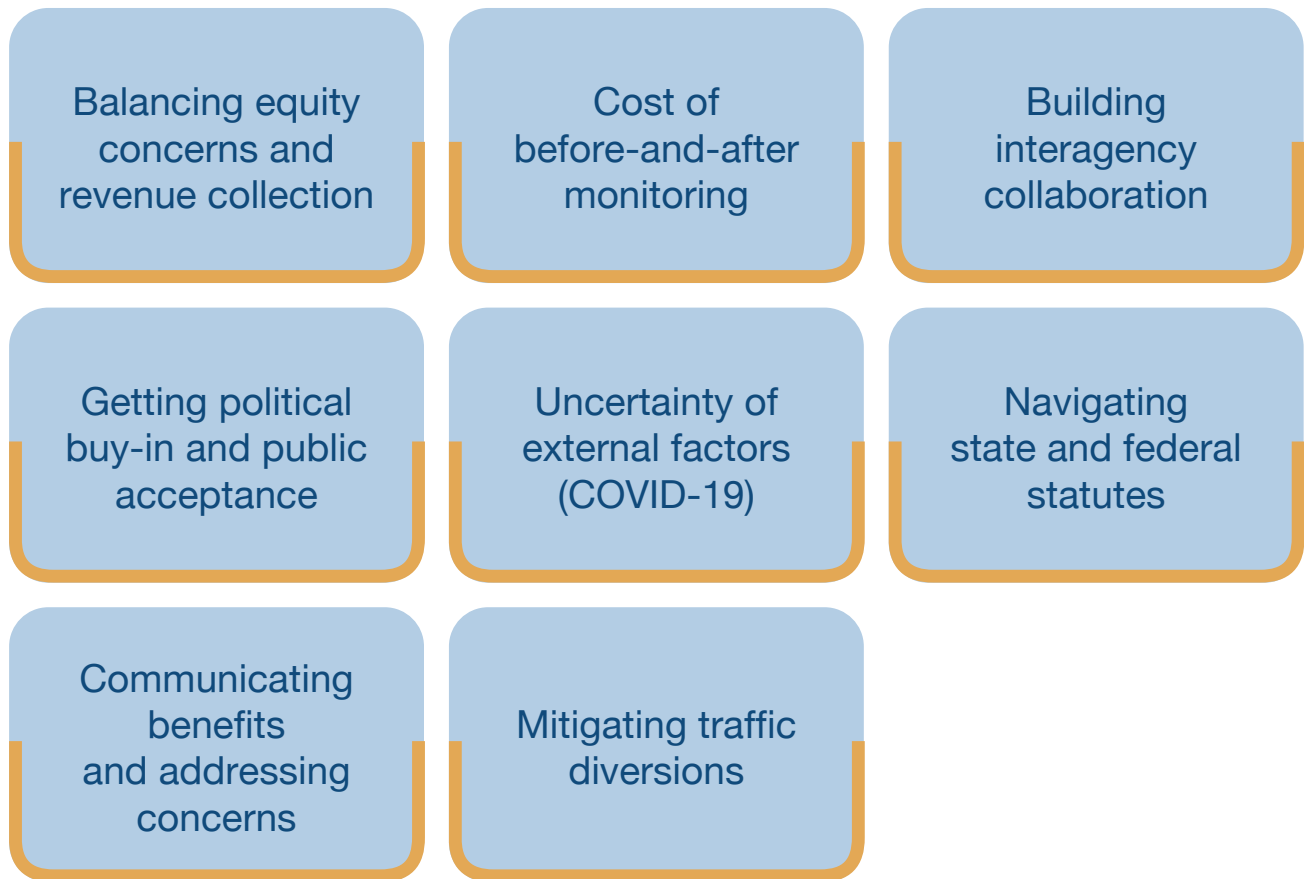
- Ensuring that disadvantaged populations, especially people with lower incomes, are not disproportionately burdened by increased tolls should be a priority for roadway-pricing programs. However, a challenge is finding a balance between doing so and collecting revenue, as more subsidies and credits result 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



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

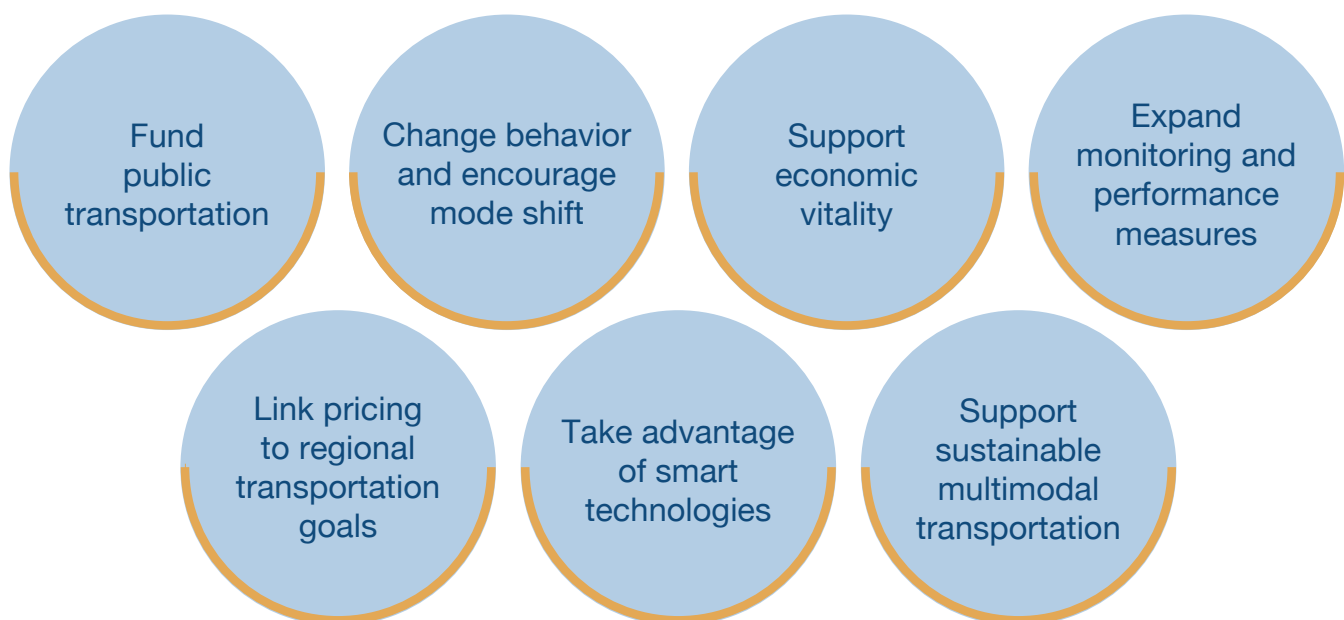
interviewed are using available smart technologies to manage their programs, including all-electronic tolling, parking sensors, and TNP data reporting systems.

- 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



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

Political leadership and legislation is essential

Involve Environmental Justice (EJ) communities early in process

Emphasize engagement for underrepresented communities

Public engagement and education are keys to success

Show that revenue uses are beneficial, transparent, and linked to transit improvements

Pair pricing programs with alternative travel methods

Focus on goals and benefits rather than revenue

Use transparent data to aid transportation decisions

Evaluations are key to maintaining the effectiveness of a pricing project

Have adequate and specialized staff

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.

The Boston Region Metropolitan Planning Organization is a public agency responsible for conducting the federally required transportation planning process for the Boston metropolitan region, which includes 97 cities and towns with 3.4 million residents. The agency develops a vision for transportation in the region and allocates federal and state transportation funds to research and projects that improve pedestrian, transit, bicycle, and roadway infrastructure.

The contents of this publication were originally presented as a technical memorandum written by Seth Asante and Ryan Hicks at the January 18, 2024, board meeting of the Boston Region Metropolitan Planning Organization.

ENDNOTES

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.

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).

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.

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

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/>

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>