



**Eno**

Center for  
Transportation

# CONGESTION PRICING IN THE UNITED STATES

Principles for Developing  
a Viable Program to  
Advance Sustainability  
and Equity Goals

MAY 2020

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# Acknowledgements

For their contributions to this paper, we wish to thank Alice Grossman, Paul Lewis, Charles Komanoff, Amanda Eaken, Kate Laing, Joshua Schank, Michael Manville, and Jonas Eliasson, who provided excellent comments on earlier drafts of this report.

The Eno Center for Transportation thanks the Summit Foundation and the Barr Foundation for their support of this work.

# About the Eno Center for Transportation

The Eno Center for Transportation is an independent, nonpartisan think tank whose vision is for a transportation system that fosters economic vitality and improves the quality of life for all. The mission of Eno is to shape public debate on critical multimodal transportation issues and build an innovative network of transportation professionals.

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# Introduction

## About This Report

There is no silver bullet to fix the woes of urban mobility and access, but congestion pricing is a proven, viable, and effective tool. Charging a fee for the parts of the roadway network used the most during the busiest times of day reduces demand. The charges incentivize travelers to switch to other modes of transportation, seek alternative routes, or travel at other times. The charges can help to reduce negative effects of traffic such as air pollution, carbon emissions, road damage, and traffic crashes.

Though revenue generation has not been the primary objective of most congestion pricing programs, congestion pricing can yield revenues for investments in other modes and other community priorities. When based on thoughtful data and analysis, programs can help address systemic inequities.

This report seeks to accelerate the development of congestion pricing programs in the U.S. that advance sustainability and equity goals. The report is intended for elected officials, civic leaders, advocates, and agency professionals in cities and metropolitan regions. The principles outlined in this report illustrate key concepts, discuss challenges, and share examples and emerging best practices.

This report does not replicate the extensive literature and analysis that already exist.<sup>1</sup> Rather, it addresses the most significant barriers to congestion pricing today: the political, institutional, and communication hurdles. While congestion pricing can benefit from sophisticated technology, the primary impediments are not technical. Congestion pricing strategies require bold leadership and vision and these principles are intended to outline an approach for getting there.

**This report does not delve into specifics about implementation but is intended to inform the three stages in the policy development process.**



**One is the idea phase when the initial concept is conceived in order to address a specific problem or opportunity.**



**Another is the planning phase when more specific details are formulated, such as how revenue would be spent.**



**The other is the proposal phase when the final strategy is developed.**

**These stages are not necessarily linear, however, and the principles overlap and relate to one another and inform more than one phase.**

The development of the principles was informed by interviews with dozens of experts and stakeholders as well as review of literature and research. The principles also benefited from a study tour of congestion pricing programs in London and Stockholm and discussions with officials in those cities.<sup>2</sup>

The COVID-19 pandemic upended transportation in cities and metropolitan areas in the United States and around the world. While congestion has all but disappeared, the reasons for pursuing congestion pricing will not disappear once the crisis abates. Cleaner air, better access, and a more efficient transportation network will remain top priorities in metropolitan areas. Pursuing these goals may become even more important, as it will certainly take time for transit agencies to rebound to pre-outbreak service levels after losing considerable passenger fare and sales tax revenues due to the crisis. A post-outbreak world may see increased traffic congestion if previous transit customers become frustrated with service that is slow to return or fearful of contact with other passengers and turn to private automobiles instead. In light of this, COVID-19 should strengthen reasons for pursuing congestion pricing.

### **About Congestion Pricing**

Congestion pricing takes several forms but is usually deployed in two main ways.<sup>3</sup> Cordon (or area-wide) congestion pricing charges a fee for any vehicle that enters a defined geographic area, usually a city center, during peak hours. Dense city centers work most efficiently when public road space is allocated in a manner that moves the most people safely and efficiently. These effects are evident in Singapore, Stockholm, Milan, and London, which all adopted cordon pricing schemes. No U.S. cities have yet adopted cordon congestion pricing, although New York City is preparing to initiate one in 2021.<sup>4</sup>

The other common form of congestion pricing is fees or tolls on discrete corridors or on parts of roads. In the case of high-occupancy toll lanes, motorists are charged if the number of passengers in a vehicle is below a threshold, usually two or three people. Such fees are in place today in U.S. cities including San Diego, Denver, and Houston. They mainly manage congestion on the lanes themselves, rather than on the broader transportation network. However, a new project in northern Virginia charges solo drivers to use the express lanes, with prices varying based on demand. The project provides significant resources to directly support improved public transit and non-motorized transportation projects.<sup>5</sup>

The international examples described throughout this paper, in particular London, Stockholm, Milan, and Gothenburg, provide examples of how congestion charging was introduced as a means to reduce traffic in the city's core. The programs in these cities also saw related benefits such as emissions reductions, fewer crashes, and better access to public services, jobs, and schools.

There is no single path to success. London's congestion pricing plan needed the unwavering support of the new mayor in order to keep it from unraveling before it even began. Stockholm benefitted from a unique governing coalition in the national legislature, then had to survive a public referendum. Governance and institutional structures vary between Europe and the United States, but congestion pricing is a major political lift in both.<sup>6</sup>

### **About Building More Equitable Systems**

While congestion pricing is strongly supported by transportation practitioners and economists, the concept is often met with skepticism by the general public and elected officials.<sup>7</sup> The primary worries are that the charges constitute another tax on drivers and that it will be unfair to low income populations.

The issues of equity are complex. Congestion pricing is a regressive fee, as are most other transportation charges, including gas taxes, sales taxes, and parking fees.<sup>8</sup> Revenues can be used to improve transit services, which are disproportionately used by lower-income populations. However, in many U.S. cities, rising housing costs have pushed low income households farther from city centers, making transit a less viable option. Discounts can be strategically deployed to minimize impacts on communities of concern.

While congestion pricing programs can be carefully crafted to minimize impacts and bring benefits to communities, the long-standing systemic inequities in our transportation system are pervasive and remedying them requires a much more comprehensive approach.

# Congestion Pricing

## SUMMARY OF PRINCIPLES



Idea Stage



Planning Stage



Proposal Stage

### PRINCIPLE 1



#### **Situate the policy within a clear vision and purpose**

A bold vision and rationale for addressing traffic congestion should be defined prior to pursuing congestion pricing. Clear and compelling goals with broad buy-in will build a base of support and guide discussion on trade-offs. Stakeholders will be more engaged if they know that a pricing strategy addresses locally-specific problems. The vision should transcend transportation to emphasize social, environmental, and economic outcomes by addressing a crisis or embracing an opportunity.

### PRINCIPLE 2



#### **Ensure a rational nexus between revenue and spending**

Local officials may be tempted to consider congestion pricing as a way to address general revenue shortfalls. But successfully introducing a program will require a specific and direct connection between how the revenue is raised and how it is spent. Managing transportation demand and using revenue to improve multimodal transportation can boost public support. Deciding how to spend revenue should happen early in the planning, though revenue allocation should adapt to changing needs and conditions.

### PRINCIPLE 3



#### **Improve mobility options to provide choices**

Transportation options provide alternatives to paying the congestion charge for those who want to avoid it. Revenue can be used to improve transit service as well as bicycle and pedestrian connections so commuters can easily choose something other than a single occupancy vehicle trip. Robust transit service with capacity for more riders should be in place when a congestion pricing program is rolled out.

### PRINCIPLE 4



#### **Create fair programs**

Equity should be at the heart of the process of developing congestion pricing strategies and of the policy itself. Stakeholders from diverse perspectives must be brought on during the initial stages of planning. Careful and thoughtful data-driven analysis can help to identify if vulnerable populations will be disproportionately affected by congestion pricing and should ground discussions on addressing those concerns.

### PRINCIPLE 5



#### **Build strong cross-sector partnerships**

Broad civic, corporate, and political support is essential to advancing congestion pricing programs, especially since various levels of government have authority over pricing proposals. Elected officials will need strong backing in order to lead on the issue. Robust community outreach and coalition building will help to normalize the concept while building the necessary support. Both agency-initiated processes and organizing by non-profits and other community groups have roles to play.



## PRINCIPLE 6



### **Communicate transparently and strategically**

Communicating congestion pricing requires clear, concise messaging to indicate its potential and counterbalance what is complex and unfamiliar. Messaging should factor in the vast array of traveler and stakeholder needs and perspectives. Outreach must begin before the concept is unveiled to the public and continue through implementation. Effective communication will both generate support for and provide details of the program.

## PRINCIPLE 7



### **Build a strong foundation first**

Congestion pricing requires a certain set of circumstances, preparation, and pre-conditions before it becomes an appropriate approach. Any city can start to lay the groundwork for considering pricing by gathering stakeholders to develop a deeper understanding of the problems to be addressed. Dynamic charges for parking and curbside uses and pilot projects can help lay a foundation for congestion pricing discussions.

## PRINCIPLE 8



### **Commit to transparency with performance targets**

Performance monitoring will measure progress in meeting policy goals and can indicate when policy changes are needed. Full transparency of information about intended outcomes facilitates engagement and support from the public and key stakeholders. Transparent reporting on the intended purpose of a charge, the effects of the charge, and strategies to improve or change the program can help to build trust in the agencies that will execute the program.

## PRINCIPLE 9



### **Limit exemptions to essential services**

There are good public policy reasons to exempt emergency vehicles from paying a congestion charge. However, exemptions that go beyond essential services may counteract the program's effectiveness at reducing congestion. Discounts for special categories of drivers—like electric vehicle owners—may be considered as a potential means to mitigate undue burden, but only if these discounts are accompanied by sunset clauses. Robust technical analysis should accompany any consideration of exemptions.

## PRINCIPLE 10



### **Be nimble**

The technology and policy landscapes are likely to change over the course of time needed to design and implement a region's congestion pricing program. Program designers can still work within existing parameters to design an effective program while embracing a nimble approach that allows decision-makers to adapt the system to changing conditions. Decision-makers should understand the problems they are trying to solve before embracing a specific technology, fee structure, or policy approach.



## Principle 1: Situate the policy within a clear vision and purpose

Stage in the Process: Idea

### Overview

From the start, cities and metropolitan areas need to communicate a vision for congestion pricing with a rationale that mitigating automobile-induced traffic congestion will catalyze downstream effects on policy issues like climate change, air quality, and social equity. For each of these, congestion pricing should be one intervention in a suite of transformative policy measures.

Congestion pricing may gain momentum in a specific city or region when it is aimed at addressing a crisis or embracing an opportunity. The purpose and goals should be clear, compelling, and data-driven, and should reinforce the vision of reducing congestion to achieve other social, environmental, or economic outcomes. Doing so will help garner the broad base of support needed for successful implementation. Stakeholders will be more engaged if they know that the purpose of a congestion pricing strategy is to address a set of locally specific problems caused by traffic congestion.

### Examples

In London, the key rationale for pursuing congestion pricing was decongesting the urban core to maintain economic competitiveness. In the late 1990s, a consensus emerged that London's traffic congestion was hindering the economy of both London and the nation as a whole. Congestion pricing was seen by some as a way to improve a system that was not working effectively.<sup>9</sup> Sir Rod Eddington, a former CEO of British Airways, called it "an economic no-brainer" in a report that evaluated the United Kingdom's transportation infrastructure as a factor in achieving economic competitiveness.<sup>10</sup> In the immediate months following implementation of the charge, more businesses expressed that they thought the charge was working than thought it was failing.<sup>11</sup>

In the U.S., some cities focus on congestion pricing as a tool to facilitate mobility and accessibility for all segments of society, particularly low income and minority residents. In San Francisco, the rising cost of living has made social equity and inclusion a top concern in discussions about urban growth and mobility.<sup>12</sup> While the city is in the early stages of discussing what a congestion pricing program would

look like, its Treasure Island Mobility Management Program has equity as one of the elements of its pricing strategy. Revenue generated by tolls to enter Treasure Island, an artificial island off the northeast coast of San Francisco slated for the development of 8,000 new homes, will be allocated toward providing low income residents discounts on multimodal options.<sup>13</sup>

Conducting a data-driven assessment of existing conditions can help places understand their precise local conditions before determining how congestion pricing can be targeted to meet goals related to traffic congestion. In its plans for a study, the District of Columbia listed a number of goals for a potential congestion pricing program, including equity, mobility, emissions reduction, and household transportation spending, among other indicators.<sup>14</sup> All of these goals have supporting metrics that can be assessed prior to and after implementation of a congestion pricing program. The study will also include an analysis of baseline challenges and equity in order to assess how well the current transportation system serves the population and who would be affected by a pricing program.

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**It is important to note that broad societal goals and transportation outcomes are not mutually exclusive.**

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It is important to note that broad societal goals and transportation outcomes are not mutually exclusive. The transportation network plays a vital role in the economic, social, and environmental health of cities and metropolitan areas, and congestion pricing can serve more than one of these goals at once. Conventional wisdom holds that revenue generation alone is not a compelling rationale for a major initiative like congestion pricing, given that many citizens already feel overtaxed. However, New York City's success in advancing congestion pricing suggests that revenue generation for a related purpose may be effective.

The New York congestion pricing program is specifically and intentionally intended to address the crisis of the city's deteriorating subway system. Five million people use the system each day, creating strong public awareness of the need for revenues directed to repair [see Principle 2]. Los Angeles's transportation agency has a study underway that is motivated by the city's need to address their infamous traffic congestion.<sup>15</sup> At the same time, Chicago's mayor suggested congestion pricing to help address a multi-million hole in the city's budget.<sup>16</sup> Experience suggests it may

be ineffective to focus on revenue without a compelling transportation-related rationale for using the revenue.

In 2019, protests erupted in Oslo and other cities in Norway over road charges, where the revenues are funneled into city general coffers.<sup>17</sup> Gothenburg, Sweden's program struggled to gain support in part because the main objective for congestion charges was to finance a large infrastructure package including a rail tunnel seen as mainly benefitting residents outside the cordon. In a 2014 advisory referendum, voters in Gothenburg rejected the charge (although policymakers decided to keep it in place).<sup>18</sup>

## **Implications**

Establishing a clear vision is crucial to the idea formation stage of a congestion pricing program, but it can also inform the implementation process and the ultimate design of the program. Agencies should determine their data needs early on and start collecting data as soon as possible in order to demonstrate the scale of the challenge, identify the particular areas where the proposed intervention could be especially effective, and provide comparative data to assess progress in the future. If a city or region cannot devise a compelling reason for congestion pricing beyond revenue generation, or there is not civic buy-in on the problem and the need for a solution, that place is not ready to pursue the policy.



## Principle 2: Ensure a rational nexus between revenue and spending

Stage in the Process: Idea

### Overview

If a place has congestion, pricing should be considered a good option. But as noted in Principle 1, because of its potential to generate funding it may be tempting for officials to consider congestion pricing as a way to shore up local budgets or be spent for general purposes. Congestion pricing can and will generate revenue, which should be used in a way that supports the benefits of the program, like mobility alternatives. The revenue's end-use should not be the main reason for implementing a program, but it is a powerful and politically motivated part of the conversation.



Public distrust that the real motivation for implementing a new road charge is to boost general revenue can be mitigated if elected officials champion the use of revenue for specific, transportation-related purposes.



A useful analogy for local governments is "impact fees" for new real estate developments. Such fees are imposed by localities on developers and the revenue generated must legally be spent on something that has a rational nexus with the needs created by the new project.<sup>19</sup> While congestion pricing lives outside of this legal construct, the guidelines are useful and, in fact, the U.S. Government Accountability Office used this test to determine whether the U.S. Department of Transportation had the discretion to use congestion pricing as a selection factor for awarding certain programs.<sup>20</sup>

Ensuring that any revenue generated is used to expand multimodal transportation choices will also likely help build public and political support for the strategy. Public distrust that the real motivation for implementing a new road charge is to boost general revenue can be mitigated if elected officials champion the use of revenue for specific, transportation-related purposes. A spokesperson for London's then-Mayor Ken Livingstone stated that, "the scheme was always

designed to reduce congestion and not raise revenue", and Los Angeles Mayor Eric Garcetti recently noted that congestion pricing "has to be about congestion relief, not revenue."<sup>21</sup>

## Examples

Pricing is an economically important policy for New York to pursue given the delays caused by chronic congestion in Manhattan.<sup>22</sup> Advocates in New York were successful in winning legislative approval of a congestion pricing strategy because they insisted that the revenue raised would be invested in public transportation. It is expected to generate \$1 billion annually and while the strategy's ability to raise revenue was the prime mover to getting it in motion, there is a rational nexus between the revenue raised (from the charge) and how the money is spent (on the transit system, to provide commuters with reliable non-tolled transportation options). This is also particularly resonant because of the systemic underinvestment in the MTA capital program in the past leading to extremely poor-quality services in the minds of the general public.

The evolution of the congestion pricing discussion in Los Angeles also provides a helpful framework. In 2018, the Los Angeles County Metropolitan Transportation Authority (LA Metro) Board of Directors charged the agency staff with devising ways to accelerate project delivery for over \$25 billion in investments in advance of the 2028 Olympic Games to be held there. While congestion pricing was found to be a feasible option for doing so, officials recognized the political challenge of approving congestion pricing as a way to accelerate their projects.<sup>23</sup> The congestion pricing study underway in Los Angeles is now squarely focused on reducing congestion to promote mobility, equity, and environmental goals—like zero-fare transit—rather than project acceleration.

Some criticize the allocation of revenue from congestion pricing to transit based on the idea that charging suburban drivers for transit they may not use is an unfair redistribution of income. While some localities may wish instead to spend revenue as they see fit, this approach may not directly work to improve shared or low-emission options that benefit all commuters in a region. A robust public transportation network can result in a reduction of vehicles on roads by encouraging those who may otherwise be inclined to drive alone—thus contributing to congestion—to instead use shared transportation. In addition, increased use of public transit, reduced vehicle trips overall, and incentives for cleaner vehicles are all measures to address region-wide air pollution caused by drivers and borne disproportionately by lower income households.<sup>24</sup>

Like in other places, the key decision point for Stockholm's congestion charge was how the money would be spent. Per Swedish law, the charge is actually considered a national tax and the revenue is deposited in the national general fund. Engendering political support for the congestion pricing scheme is obviously challenging when

the revenue could theoretically be spent elsewhere and with no direct connection to the region. Recognizing this, political leaders developed a plan for a large-scale transportation package supported by the national government for projects in and around Stockholm including a major roadway bypass.<sup>25</sup> The inclusion of the roads was controversial but important in ultimately building the political coalition needed to implement the plan.<sup>26</sup>

Part of the revenues generated by a congestion pricing program also need to go back into operating the system, and those costs can be substantial. About half of the funds generated by the London program are used for its capital and operating costs.<sup>27</sup> In Singapore, those costs are about 20 percent of the annual revenues, though next-generation satellite technology to be implemented in 2020 may change the operating costs.<sup>28</sup>

## Implications

Negotiations over the allocation of revenue from congestion pricing schemes can be politically fraught but may also be the grease that smooths the process. Deciding how revenue is spent should occur in the planning phase. It must be early in order to build stakeholder support by indicating that investments in a reliable transportation system will benefit the entire community.



## Principle 3: Improve mobility options to provide choices

Stage in the Process: Idea, Planning

### Overview

Travelers need viable options and alternatives to paying the congestion charge. The revenue generated can be used to increase investments in transit, bike, and pedestrian infrastructure so that commuters can easily choose something other than a single occupancy vehicle trip [Principle 2]. Even in places where extensive and reliable public transportation does not already exist to absorb the influx of riders at the onset of congestion pricing, congestion pricing can succeed. Mobility systems are constantly changing, and trip decisions are not static.

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Regardless of whether reliable public transportation already exists or must be augmented, it must be clear to the public that the provision of mobility options is a critical goal of congestion pricing. However, people need ample warning about changes, time to prepare, and a clear understanding of what will happen so they can adjust [Principle 6]. In some American cities, there is excess capacity on existing public transit services so those who shift away from driving will have viable alternatives, but they may need tools to know how to use other modes.

### Examples

Stockholm added 16 new bus lines plus additional capacity and frequency on existing public transit services, resulting in seven percent additional transit service.<sup>29</sup> London added 300 new buses to the city network, and Transport for London (TfL) froze transit fares, provided better travel information for transit users, improved transit frequency, and



conducted better traffic management in order to make public transit and other shared and active options "easier, cheaper, faster, and more reliable."<sup>30</sup>

The 18 percent reduction in traffic volumes in downtown London after congestion pricing began made it easier to implement pedestrian plazas and re-allocate travel lanes for buses and cyclists.<sup>31</sup> Mayor Sadik Khan promised to invest about \$990 million (equivalent to five percent of the city's transportation budget) in improving the city's bike network during his first term in office. This includes the completion of two more cycle superhighways, which are wide and comfortable protected bike lanes separated by curbs from the roadway.<sup>32</sup> The improvements so far have resulted in an eight percent increase in bike ridership since 2015.<sup>33</sup>

As U.S. leaders explore congestion pricing for their regions, these lessons from abroad should inform their strategies. Specifically, in order for a congestion pricing program to be effective, reliable transportation options must first be in place. While most of the country is heavily reliant on single occupant vehicles, the American cities at the vanguard of congestion pricing have the most robust transit systems and the highest levels of use in the country. For example, nearly 80 percent of travelers into New York City's central business district arrive by transit.<sup>34</sup> In Seattle and Portland, Oregon, that figure is lower but still robust at 48 and 45 percent, respectively.<sup>35</sup> Continued investment in these services can help to make the case that drivers will have other options available with the onset of a congestion charge.

In 2017, the I-66 Commuter Choice program in Northern Virginia began as a part of the dynamic tolling program along that corridor. This multimodal grant program provides funding to transit and transportation demand management services, such as additional bus routes and improvements to existing routes, and expanded bikeshare capacity around metro stations.<sup>36</sup> New York's congestion pricing proposal is projected to raise \$1 billion annually, and the revenue will be used to secure bonds up to \$15 billion to fund MTA capital projects – like improvements to train signaling, elevator installations to improve wheelchair access, new subway cars, track and subway car repair, and expanded bus service to outer boroughs – through 2024.

Many American cities already have far-reaching plans to expand and improve bus networks, accelerate the buildout of light rail and other fixed transit systems, carve out space on streets to improve bus operations, and provide safer places for people on bikes. San Francisco has established transit priority lanes, realigned service, and improved reliability.<sup>37</sup> Sound Transit in Seattle has one of the most ambitious transit expansions underway in the country, bolstered by voter approvals in recent years.<sup>38</sup> While these efforts are not directly in service of congestion pricing, they are building the foundation that makes possible mode shift incentivized by pricing strategies. Both resources and political will are necessary. Mayors and city councils

have important roles to play as they can prioritize the projects and stand firm in the face of opposition [Principle 5].

## **Implications**

Quick build techniques that use temporary materials to quickly re-allocate street space can be followed by more permanent installations. Pilot projects can speed the implementation process by allowing people to see and experience the proposed changes. Cities across the country are accelerating the build-out of their networks by first piloting new approaches [Principle 7].<sup>39</sup>

Building a robust multimodal system during the idea and planning phases will improve public perception of agency commitment and will help to achieve broader city goals centered on mobility, equity, economic vitality, and sustainability.



## Principle 4: Create fair programs

Stage in the Process: Idea, Planning, Proposal

### Overview

Compared to other countries with strong social safety nets, the United States suffers from high levels of inequity with respect to income and health.<sup>40</sup> It also has a history of inadequate access to opportunity with respect to transportation.<sup>41</sup>

Concerns that congestion pricing programs will exacerbate existing social problems are common and understandable. Pricing strategies are routinely criticized based on the perception that their proportionate impact is greater for low income households than for those with higher incomes.<sup>42</sup> Others worry about geographic unfairness for residents in suburban jurisdictions, especially those with poor transit access.<sup>43</sup> On

the other hand, congestion pricing can reduce pollution in historically disadvantaged communities that are more likely to have highways run through them.<sup>44</sup> Prices that do not account for people's ability to pay or their ability to access alternative modes can be problematic.

Arguments that assume congestion pricing is unfair mistakenly assume that the status quo is fair.

The definition of social equity can vary depending on what is important for any given place. Emphasis might be placed on income, geographic displacement, or on neighborhoods disproportionately affected by highways. Ultimately, regardless of the specific elements that a city or region wants to focus on when addressing equitable outcomes, a standard working definition is "the correction of broken systems in order to eliminate disparate outcomes based on identity."<sup>45</sup> In this way, if designed carefully and with specific intent, congestion pricing is a progressive, not regressive, policy if it improves equity by correcting for systemic inequities in transportation.

Arguments that assert congestion pricing is unfair mistakenly assume the status quo is fair.<sup>46</sup> Most current transportation funding streams are regressive, including gas taxes, sales taxes, and parking charges. Transportation is now the second largest expense for most American households, consuming on average 20 cents out of every dollar. While poorer workers commute by transit, carpooling, biking, and walking more frequently than higher income workers, when faced with limited transit options, many low income families purchase cars out of necessity, which may further exacerbate their financial challenges.<sup>47</sup> Indeed, low income households that drive to work spend a higher share of their income on commuting than those that take public transit.<sup>48</sup>

## Examples

To help ensure a fair congestion pricing program, equity needs to be at the heart of the process and there must be deliberate inclusion of a diverse network of stakeholders during the initial stages of planning.<sup>49</sup> This includes vulnerable populations more likely to suffer disproportionately because of their existing social circumstances.<sup>50</sup> Identifying these groups in cities and regions means having experts on staff focused intentionally on equity goals as well as training other staff. Vancouver, British Columbia established an independent commission that reflected the demographic and geographic diversity of the region to consider new pricing strategies.<sup>51</sup> Portland, Oregon established a "Pricing for Equitable Mobility Task Force" in order to center the concept of addressing inequities in its exploration of pricing strategies.<sup>52</sup>

A range of exemptions, discounts and subsidies to offset the impact of the charges on low income drivers will likely be proposed in many U.S. cities. In some areas, the suburbanization of poverty due to displacement has resulted in poor transit service, long distance travel, and limited options for people with low incomes. Careful and thoughtful data-driven analysis can help to identify if particular vulnerable populations will be disproportionately impacted by congestion pricing. That information should ground the discussions on how to address those particular concerns, with the caveat that discounts should be used with great care [see Principle 9].

One way to ensure equity in congestion pricing is to make sure the policy gives careful consideration to how those who have been historically marginalized can benefit from any policies pursued. This can be addressed, in part, by providing robust alternatives to paying the charge in the first place [see Principle 3]. In 2006, about 83 percent of the revenue expended from London's congestion charge went into making "radical improvements to bus services."<sup>53</sup> Los Angeles is studying a congestion pricing plan that would, among other things, provide free fares to all transit riders.<sup>54</sup> Cities also need to work with their regions and metropolitan transit authorities to use congestion pricing revenue to expand transit in suburban communities. In the 100 largest metropolitan areas, more poor people live in the

suburbs than in cities. However, they can only access only about 22 percent of jobs throughout their metropolitan area by public transit.<sup>55</sup>

A reduction in automobile emissions can have disproportionately positive benefits on low income households in areas with the worst air quality. In Southern California, over 1.2 million residents live within 500 feet of a highway, and these residents are disproportionately people of color and have higher rates of poverty.<sup>56</sup> One recent study found that minorities are exposed to 38 percent higher levels of pollution from nitrogen dioxide.<sup>57</sup> That pollutant is caused mainly by motor vehicle exhaust and can have significant impacts on human health. Singapore, London, and Stockholm each saw drops in vehicle emissions after congestion pricing was introduced.<sup>58</sup>

If the policies focus directly on improving public transportation and other shared or active transportation options, they have the potential to be progressive rather than regressive in nature. An analysis of congestion pricing in New York found that for every outer-borough commuter that would pay the tolls, 18 would benefit from upgrades to public transit.<sup>59</sup> However, as part of the legislation for the city's congestion charge, households in the congestion pricing zone that earn less than \$60 thousand a year in annual income will receive a tax credit equal to the toll amount.<sup>60</sup>

## Implications

Better transit service may not be sufficient to allay concerns about the impacts of pricing on low income individuals, especially in places where gentrification has pushed them to the suburbs. Transportation modeling can identify which communities can be helped with expanded services and where approaches such as toll discounts for certain groups may be appropriate [see Principle 9].

Achieving equitable outcomes by improving the overall transportation system should be at the center of an effective congestion pricing program. Designing a system that meets the needs of all travelers must be considered at all points of the planning and implementation process, irrespective of the ultimate road pricing policy that is chosen. Actively incorporating disadvantaged groups into the planning process and designing the system with their needs in mind will result in a more equitable program with far better outcomes, and one that has widespread support.



## Principle 5: Build strong cross-sector partnerships

Stage in the Process: Planning, Proposal

### Overview

Without question, broad civic, corporate, and political support is essential to advancing congestion pricing programs. Various levels of government have authority over roadway pricing proposals. Elected officials will need strong backing in order to lead on the issue. Robust community outreach and coalition building will help to normalize the concept while building the necessary support. Both agency-initiated processes and outside organizing have roles to play.



A political champion  
is key to success.

While transit agencies and other local governments may not always have authority to regulate the schemes independently, they are certainly interested in the outcomes and uses of revenue. They can wield significant power in negotiations and may have data, information, and access points that are important to developing an effective program. There may also be several agencies with different directives such as departments of transportation, planning, and law enforcement, involved in execution of a congestion charge. Establishing communication among the various entities involved is thus important for maintaining consistency.

### Examples

A political champion is critical to success. In 2000, Ken Livingstone's slogan "Getting London Moving" was a key part of his mayoral campaign to introduce congestion pricing in order address the crippling traffic congestion that was hurting the broader economy [Principle 1].<sup>61</sup> Once elected, Livingstone's

team developed a full plan for the strategy. In the process, the mayor had to overcome a court case to block the program as well as an initial poor public perception of the policy with local papers predicting “traffic chaos” and “tube fears.”<sup>62</sup> His commitment to congestion pricing is widely considered the key to its ultimate success.

Unlike Livingstone, during her campaign for Stockholm mayor in 2002, Annika Billström promised to not introduce any kind of congestion tax in the subsequent four years. However, once elected, her administration implemented a seven-month pilot congestion pricing program.<sup>63</sup> From the outset, there was considerable reticence to the plan. Initial public support was below 40 percent, but after the trial period a referendum was held and a majority voted in favor of keeping the plan. Similar to Livingstone, Billström's support and political action enabled the ultimate adoption of the strategy.<sup>64</sup>

Political leadership is important in the United States, as well. In early 2019, Governor Andrew Cuomo reignited the push for congestion pricing which had been stalled in New York City for years.<sup>65</sup> However, the different governance and institutional structures in this country present significant challenges to congestion pricing. While local agencies are leading efforts to develop area-based programs, they may need authorization or cooperation from county, regional, state, and federal agencies, as well as other municipalities. Regional and metropolitan approaches need to coordinate across local boundaries. Different agencies may be operators, owners of the infrastructure such as streets, and/or have funding and finance responsibilities.

The City of New York is helping to plan, design, install, and maintain its congestion pricing program, but revenues will fund the MTA, which is a state-designated public authority. The program, which was codified in the New York Constitution, gives the state broad powers over local governments.<sup>66</sup> In California, a law to allow the creation of a pilot program for areas in which to deploy congestion pricing (called "Go Zones") has been introduced in the state legislature, but have not passed to date.<sup>67</sup>

San Francisco recently revived the idea of congestion pricing after building off a regional analysis a decade ago.<sup>68</sup> In setting up the new study, staff at the agency leading the work (the San Francisco County Transportation Authority) interviewed individuals from the previous effort to learn what the new initiative should do differently. One of the most consistent responses was the call to focus less on technical modeling of proposals and outcomes and more on stakeholder engagement and outreach.<sup>69</sup> Experts in New York expressed a similar sentiment with regard to the importance of grassroots coalitions in their current initiative.<sup>70</sup>

Coalition building by private groups (independent of public agency work) is also a vital piece of the puzzle. A broad coalition representing a variety of interests is essential at every phase of the process, from introducing the idea into the public dialogue to providing additional analysis, communicating effectively about the plans, and mobilizing supporters at key junctures. Stakeholder groups can respond to proposals by agencies or introduce proposals of their own. For example, the Seattle-based Sightline Institute is developing concepts for an equitable and effective program that fits the unique local context.<sup>71</sup>

Civic leaders in the Washington region have also been discussing congestion pricing through a roundtable called DC Sustainable Transportation (DCST). Coordinated by a local non-profit, DCST is partnering with the District of Columbia on a preliminary study to analyze potential roadway pricing policies and will explore possible uses of revenue and how equity issues can be addressed.<sup>72</sup> This partnership approach helps ensure that stakeholders are deeply involved in crafting any proposals that move forward, and merges technical analysis with coalition-building. Business coalitions and advocacy groups have also contributed to early discussions.

A New York City-based coalition of business, labor, environmental, transportation, and justice organizations called Fix Our Transit similarly promoted congestion pricing, alongside the grassroots coalition Fix the Subways. The coalition focuses on the outcomes that congestion pricing can help deliver rather than the mechanism itself.<sup>73</sup> Members of the coalition, while joined in a common effort, each speak with their unique voices to their particular interests. In this way, leadership in New York City simultaneously received input from policy-focused business groups and diverse grassroots voices.

However, stakeholder groups must also find a balance between full-throated support of public agency proposals and the need to push for improvements to those proposals. A strong outside voice will help to ensure that the sustainability and equity elements are not diluted excessively in the process of negotiations with those who seek to curtail or compromise the programs.

In those states and cities where ballot initiatives or voter referenda are required in order to move forward with congestion pricing programs, organizing and mobilizing supporters is a prerequisite. Some cities will need to put the measure before the public for a vote at a general or special election. Seattle, for example, will be required to put the tolls to a public vote at a general or special election.<sup>74</sup> For the most part, public agencies are prohibited from actively campaigning once a proposal is approved for the ballot.

## Implications

Official public engagement processes must be early and often, involve a broad set of stakeholders, and should prioritize information sharing on policy proposals and



program designs [Principle 4]. For example, concerns about whether congestion pricing programs are fair to low income travelers means that social justice groups must be engaged. The business community will want to understand whether the charges will make an area less or more economically competitive. Logistics firms need assurances that the financial benefits of improved and more consistent travel times offset the additional charge to deliveries. Parent-based and environmental justice organizations groups are increasingly interested in the air quality improvements. Regular communication by public agency staff and elected officials with these community leaders is essential to help keep projects on track and raise awareness.

A primary challenge for outside coalition building and organizing is resources. The lack of funding to support the work of community groups for congestion pricing came up repeatedly in interviews for these principles. Potential sources are grants from private foundations, philanthropies, and other private sector actors who see the value of the proposals. Some cities and public agencies have also found productive ways to partner with non-profits (like DCST).

The basics of building a coalition for congestion pricing are the same as with any issue. According to the national advocacy organization Community Catalyst, "coalition members must identify their common interests, articulate their shared goals, and work together to take advantage of the benefits that result from being part of a larger collective."<sup>75</sup> This building should start at the planning stage and continue through when the proposal is in place.



## Principle 6: Communicate transparently and strategically

Stage in the Process: Idea, Planning, Proposal

### Overview

Congestion pricing is a difficult and complex proposition and should always be situated within a broader vision and purpose [Principle 1]. Unlike other utilities that consumers use and pay for on a regular basis like water or electricity, the concept of paying more to use a road during times of higher demand is new to drivers. Many Americans believe gas taxes and other fees pay the full costs of roads and the value of time saved by moving more efficiently is also not well internalized and incorporated into daily decisions about travel.<sup>76</sup>

Communicating about congestion pricing requires clear, concise messaging to indicate its potential as a tool to achieve shared goals for a better community.

Communicating about congestion pricing requires clear, concise messaging to indicate its potential as a tool to achieve shared goals for a better community. Simple messaging can counterbalance what is complex and unfamiliar. Instead of merely reporting on complicated analyses of traffic or financial models, communicators should focus on why the congestion charge is happening, the benefits it will bring, and how travelers can prepare for changes. Especially in the period of time leading up to the first day of charging when motorists receive information about the location, rates, and time of day for the charge, information that conveys only the necessary details can help drivers know what to expect.

### Examples

The information can be used to tailor messaging to the unique concerns that resonate most with stakeholders and the general public. Advertising and outreach should represent diverse constituents and the

communities in which it is placed, as was the case in a campaign featuring people of color riding bikes as part of a Citi Bike partnership with Bedford Stuyvesant Restoration Corporation to improve equity in bikeshare in New York City.<sup>77</sup> Public education campaigns should be delivered in multiple languages and media publications, as appropriate, based on the community.

Messaging should emphasize the beneficial aspects of a congestion charge. Among the takeaways from a recent successful push in Oregon to re-legalize multi-family housing was that framing the message around what the public was gaining, rather than what it would lose, was a marker of success.<sup>78</sup> This strategy can also apply to road pricing: drivers should understand that a road charge will benefit them with less congestion, cleaner air, and more productivity.

Public polling tends to be mixed with concerns ranging from fears that congestion pricing represents another user fee without guarantee of improvement, to concerns that tolls penalize those who cannot afford to pay.<sup>79</sup> In some cases, the policy is also initially unpopular due to concerns about adverse effects like increased demand for parking just outside of the pricing zone or a reduction in commercial activity in the zone. Yet in both London and Stockholm the initial fears were overcome. Once residents and businesses witnessed the overall reduction in vehicle traffic with no adverse effects on economic activity, the charges became highly popular.<sup>80</sup>

For travelers directly affected by a congestion charge—as well as those who will not be—there must be clear indication of what to expect the first day a program is introduced. Before initiating its program, TfL assembled a media relations team of outside experts and embedded it in the agency. The team helped TfL compose a strategy to stay on message and select markets to target. TfL delivered messages on key elements of the pricing scheme in three phases so as not to overwhelm the public. This method allowed people to absorb and act on specific information at designated times.<sup>81</sup> In addition, the agency diligently called out misinformation spread in the popular media about the program's logistics. This "rebuttal system" allowed TfL to minimize confusion and maintain control of the narrative.<sup>82</sup>

## Implications

Outreach must begin before the concept is unveiled to the public and should continue through implementation. In this way, effective communication is about understanding needs and perceptions, generating support, providing information, and measuring efficacy of whatever policy is implemented. Communications should also focus on the collective benefits and how the policy serves the broader vision and purpose [Principle 1]. Discussions of revenue generation should clearly portray how revenues will be used to further the broader vision and collective benefits.

A variety of media can be used to disseminate information. Social media, pre-planned community events (e.g. farmers markets or festivals), and interactive web

tools are all potential outlets, in addition to the traditional methods of open houses, public meetings, and local news coverage.

Messaging should be delivered in a way that considers the vast array of travelers' and stakeholders' needs and perspectives, including different sociodemographic backgrounds [Principle 4]. Preliminary consultations with the public can help decision-makers understand different citizens' and stakeholders' concerns and how they believe they will be affected by price or travel route changes.<sup>83</sup> This insight can be used to design and communicate a program that achieves a balance of mitigating these effects and improving other services, like public transportation, based on demand.

Before any outreach is done, decision-makers should compose a list of who will be affected by road pricing and devise a plan to include these perspectives in all planning and outreach. At a minimum, the following perspectives should be sought: low income individuals and advocates; individuals with physical disabilities or specific medical needs; the elderly and advocates; representation from all wards or districts within a city; representation from surrounding jurisdictions; business owners and Chambers of Commerce; public transportation providers and advocates; other transportation providers, such as private ride hailing companies [Principle 5].



## Principle 7: Build a strong foundation first

Stage in the Process: Idea, Planning, Proposal

### Overview

Interest in the policy has grown in cities and regions across the country as leaders began to take notice and understand its potential to reduce traffic, improve air quality, and advance other public policy goals. Congestion pricing is a flexible and powerful tool, but a certain set of circumstances, preparation, and pre-conditions are required before it is decided as the most appropriate approach. Nevertheless, any city can start to lay the groundwork for progress.

“  
Agencies should consider pilot programs and let the results speak for themselves.”

Cities, states, and metropolitan areas must have a clear vision and purpose when considering a congestion pricing program [Principle 1]. If such a compelling rationale cannot be articulated, a more long-term and multi-faceted approach is needed, and a broad coalition of stakeholders can help build an effective strategy [Principle 5]. But these coalitions take time to build, and support may hinge on robust analyses that help local leaders understand the underlying causes and impacts of congestion, including how it affects different populations and interests. Traffic is an outcome of land use decisions, including housing supply and affordability, so a broad view from diverse stakeholders is needed before deploying specific tools.

A pricing portfolio can be built incrementally. Early analysis, with robust data collection and outreach can help generate widespread understanding of the rationale and outcomes [Principle 6]. Expanding existing parking pricing programs is a logical step, including broadening the areas of paid parking.”

Introducing dynamic pricing, which charges different rates at different times of day or locations depending upon demand, can help familiarize people with the concept of demand-based pricing.

## Examples

Another approach in the United States is to build off of existing tolling programs. With a few key exceptions, in most American metropolitan areas, highway traffic bottlenecks are more pervasive than European-style center-city congestion. Partly for this reason, a number of places have already installed sophisticated toll lanes on highways and other facilities with corridor-based congestion pricing applications including variable and dynamic charges based on levels of traffic or time of day. Drivers in New York are famously accustomed to paying tolls on bridges and tunnels, so a full cordon-based charge is a potentially more palatable leap than in a place without such fees. In metropolitan Washington an independent for-profit private company (Transurban) now operates over 50 miles of dynamically-priced high occupancy toll (HOT) lanes in northern Virginia. This corridor-based approach is likely to expand to other roads in northern Virginia and southern Maryland as part of an interconnected system with revenues committed to supporting multimodal options.<sup>84</sup>

Cities have also begun to realize that curb space is valuable, so they are getting better at mapping it and pricing it appropriately for a variety of uses beyond traditional parking charges, such as delivery zones and ride-share pick-up spots.<sup>85</sup> Some are instituting fees or taxes on for-hire vehicle trips, including New York City, Seattle, and Chicago, which is calibrating the tax to encourage more shared rides.<sup>86</sup> Recently, the District of Columbia ran a pilot of demand-based parking pricing as a trial of congestion management. Results from the pilot pointed to an increase of on-street parking availability and a decrease in illegal parking, and one of the takeaways based on the program's success was to "employ an incremental but intentional expansion plan."<sup>87</sup> In this way, parking pricing can achieve some of the desired outcomes of congestion pricing, as both provide economic signals that will incentivize switching to other modes of travel, other times or day, or other destinations.

Low or zero-emission zones in downtowns can also encourage cleaner vehicles through fees or prohibitions on some vehicles. A number of places in Europe, including cities in Denmark, Germany, the Netherlands, Italy, Portugal, Spain, and the United Kingdom have such zones.<sup>88</sup> Car-free centers can demonstrate the benefits of dedicating space to people rather than vehicles. A number of places already ban cars from historic areas and other tourist and pedestrian-heavy areas.<sup>89</sup>

Pilot projects have proven remarkably effective for testing protected bike lanes, bus-only lanes, and public spaces. Temporary materials are inexpensive and easily adjustable as designs are tested on the streets. Conducting congestion pricing pilots

may be more of a challenge but are worth considering in order to test the viability of this approach. One of the challenges of piloting a congestion pricing program is the equipment and technology requirements, though this is less of an issue in places where transponder-based toll systems already exist. Stockholm installed a full system of cameras on gantries, put up signage, and collected revenue in order to implement the pilot. The ubiquity of cell phones and other technological innovations may make pilots cheaper and easier to implement. Pilots could be implemented for areas of the region as Los Angeles is considering, on particular roadways, or in conjunction with large special events.<sup>90</sup> Pilots should be given sufficient time to fully realize changes in travel behavior before final decisions are made.

## Implications

Agencies should consider pilot programs and allow the results to speak for themselves. It is important for the public to experience improvements before rolling out the policy, as public support is often lowest right before the full deployment, as was the case in London. In Stockholm, a seven-month pilot installation spurred a dramatic increase in public support when people experienced the benefits of less congested roadways in real time.<sup>91</sup> Agencies then need to be ready to iterate, learn lessons, and make changes based on the trials.

Prior to New York's successful passage of a congestion pricing program in 2019, the city twice previously attempted to pass the policy. The initiatives were unsuccessful because a range of political, technical, and social considerations were not fully addressed. Drivers and key stakeholders alike are unfamiliar with the concept of demand-based pricing, so leaders should consider making the potential benefits apparent with clear information and small-scale demonstrations. A deliberate, iterative approach should permeate the entire policy development process.



## Principle 8: Commit to transparency with performance targets

Stage in the Process: Planning, Proposal

### Overview

Quantitatively assessing progress toward meeting target indicators of program success can serve several purposes for a congestion pricing program. For one, such performance monitoring can measure progress in meeting policy goals and if those goals are not met, it can indicate that policy changes are needed. It can also help quantify the benefits of congestion pricing and document success.<sup>92</sup> Full transparency of information about intended outcomes and progress in meeting those outcomes facilitates engagement and support from the public and key stakeholders.

By collecting robust data on a range of performance metrics, and tying these metrics to stated policy objectives, programs can be consistently monitored and modified based on whether designated performance targets are met.

The primary metric of interest should be delays attributed to congestion. However, a number of metrics that are indirectly related to congestion can also provide indication of the system's performance. For example, metrics like improved transit reliability or increased transit ridership after introduction of a congestion charge can indicate that these services are benefiting from the charge. Decreased pollution can demonstrate that air quality has improved. Metrics can also demonstrate whether a program advances equity by measuring public participation in the planning process (i.e. process equity) as well as how the program affects vulnerable populations (i.e. outcome equity) [Principle 4].

### Examples

After the rollout of its congestion charge, TfL published five years of impact monitoring reports to understand the direct and indirect effects of its program. These reports provide objective data on traffic, congestion, public transport, travel behavior, business and the economy, and society and environment.



It tracks conditions before and after the charge was put in place for a range of key indicators, including bus speeds and reliability, traffic volume, vehicle-kilometers driven within the zone, and trends in air quality. Among the key takeaways from these reports were a notable decrease in average daily car traffic entering the zone during charging hours, a broadly neutral impact overall on London's economy, a reduction in emissions (including a 16 percent reduction in carbon dioxide emissions), and fewer personal injury road accidents in the central zone.<sup>93</sup>

By collecting robust data on a range of performance metrics, and tying these metrics to stated policy objectives, programs can be consistently monitored and modified based on whether designated performance targets are met. If not, appropriate changes should be made. In London's case, the boundaries of the congestion charge were expanded due to the program's success, but performance monitoring can also be used to modify a program if it does not meet the stated goals. These metrics can be used to make decisions about adjusting the charges, for example on an annual basis.<sup>94</sup>

Data should also be transparent. New tools, like New York's Balanced Transportation Analyzer—a spreadsheet containing multiple pages corresponding to different variables relevant to calculating the effects of a congestion charge—are aimed at enabling comprehensive and transparent forecasting.<sup>95</sup> This tool is openly available to anyone, though it requires some baseline knowledge of what the different variables in the spreadsheet mean. Residents in Milan are kept informed via a dedicated website that provides data on traffic counts, emissions, and projects funded by congestion pricing revenue.<sup>96</sup>

In Stockholm, the results of the trial were measured and summarized by many different independent researchers and consultants and reported by the Congestion Charging Secretariat in an easy to read format. The report, printed as a brochure and distributed to households in Stockholm, was intended to "serve as a basis for discussion by everyone, both those who are in favor of a continuation of the congestion tax and those who are against."<sup>97</sup>

## Implications

There is often concern that a congestion charge is just a government strategy to generate revenue. In the United States, there is also notable concern among citizens that the government is not transparent in its decision-making.<sup>98</sup> Transparent reporting on the intended purpose of a charge, the effects of a charge based on performance metrics, and strategies to improve or change the program can help to build trust in agencies. The development of metrics and commitment to transparency should occur primarily in the planning and proposal phases. However, officials should be careful to ensure messages focus not as much on the technical aspects of the models and data, but rather on sharing simple stories and effectively communicating and engaging with stakeholders [Principles 5 and 6].



## Principle 9: Limit exemptions to essential services

Stage in the Process: Planning, Proposal

### Overview

Early discussions of congestion pricing in the U.S. have, in some cases, incorporated exemptions to the charges for certain groups with the intention of mitigating adverse effects on vulnerable populations. This is a risky approach, because as these exemptions accumulate, they will counteract the revenue-generating ability of a congestion charge, which limits the amount of funding that can go toward improving transportation options and reducing roadway congestion.

While a singular focus on raising revenue may be at odds with goals like congestion relief or lowering emissions, officials need to develop revenue targets in order to more effectively plan for the right congestion pricing system and to be able to track

it as a performance metric [Principle 8]. A charge that is set too low may lead too many drivers to choose to pay the toll, undercutting the goals of the program. However, a charge can start low and increase over time, giving people time to adjust. Cities may fall short of revenue targets by offering too many exemptions to certain segments of the population, vehicle types, or other concerns.

Cities may fall short of revenue targets by offering too many exemptions to certain segments of the population, vehicle types, or other concerns.

### City Examples

An important distinction should be made between exemptions and discounts. Whereas exemptions for essential services like ambulances and firetrucks are common in international examples of congestion pricing, discounts for special classes of drivers have been applied differently (see Table 1). In many cases, these discounts also sunset after a period of time.

For example, discounts may be given to electric vehicle drivers to encourage the adoption of cleaner vehicles. But as was the case with Stockholm’s clean vehicle discount, the benefit was removed when it became *too* successful, resulting in an increase in congestion. There are often good public policy reasons to provide discounts.

**Table 1: Types of Congestion Pricing Exemptions and Discounts**

Place	Exemptions
<b>London</b>	Exempt: Emergency vehicles, vehicles used by the disabled, vehicles with nine or more seats, taxis <sup>99</sup>
	Discounted: Motorcycles, ultra-low emission vehicles (EVs, hydrogen vehicles, and hybrids), residents that live within the congestion zone.
<b>Stockholm</b>	Exempt: Motorcycles, emergency vehicles, and vehicles used by the disabled, public buses. Taxis were exempt until 2007. Alternative fuel vehicles were exempt until 2012. Residents of an island only accessible through the zone.
<b>Gothenburg</b>	Exempt: Motorcycles, emergency vehicles, and vehicles used by the disabled, public buses.
<b>Oslo, Trondheim and Bergen, Norway</b>	Exempt: Motorcycles, service vehicles, hearses, public transport, emergency vehicles, electric and hydrogen vehicles, vehicles used by the disabled.
	Discounted: 20 percent for vehicles less than 3.5 tons; 10 percent for vehicles greater than 3.5 tons.
<b>Singapore</b>	Exempt: Buses, emergency and military vehicles.
<b>Milan</b>	Exempt: Motorcycles, emergency vehicles, and vehicles used by the disabled, public transit vehicles, electric vehicles, public utility vehicles, taxis.
	Discounted: 20 percent for residents that live within the zone.

The desire to provide financial relief to low income households is understandable. Yet if a congestion pricing policy fails due to too many exemptions, everyone loses. Local leaders will be interested in minimizing impacts on vulnerable communities and perhaps even using the system to make transportation more equitable. A report from nonprofit TransForm points out that while exemptions may benefit low income drivers in the short-term, it may work at cross-purposes to "other program goals such as moving traffic more efficiently or reducing greenhouse gas emissions."<sup>100</sup> In addition, while equity is a major concern in the United States, one study in New York found that only two percent of the working poor in outer areas would even be subject to the fee since most take mass transit to work.<sup>101</sup>

Robust technical analysis should ground any consideration of discounts for certain populations or vehicles, including the impacts on program effectiveness and performance targets, and whether the desired outcomes can be achieved in other ways. Other programs could address equity goals such as the provision of a so-called "mobility wallet" that offers subsidies to certain populations for modes of transportation other than single occupancy vehicles.<sup>102</sup> San Francisco's plan to charge all vehicles that enter Treasure Island will specifically provide low income residents of a new development on the island with discounts on multimodal options such as transit and car sharing. Structured this way, the program is expected to provide greater benefits to low income households than a credit or toll subsidy would.<sup>103</sup>

Exemptions for categories of drivers beyond emergency vehicles can also lead to logistical challenges and unintended consequences. Technology that can detect different types of exemptions may be expensive to build. Enforcing exemptions for different types of vehicles or users can be difficult. Communicating the different exemptions and whether they apply to various groups can also pose challenges. In Gothenburg, because company cars do not pay the congestion charges, high income groups disproportionately benefited from the exemption and made the system there regressive.<sup>104</sup> Stockholm's exemption for drivers to Lidingö Island—which is only accessible through the congestion zone—added significant cost and complexity to the system due to the challenges of tracking vehicles and verifying their legitimacy.<sup>105</sup>

Logically, if fewer drivers are paying the congestion charge due to exemptions, less money will be generated from initial revenue projections unless overall fees are raised on nonexempt drivers. One analysis in New York found that if just 10 percent of potential trips into the congestion zone were exempt, the city would see a revenue reduction of over \$100 million annually.<sup>106</sup> The failure to meet revenue targets would potentially be politically damaging to the long-term viability of a congestion pricing strategy.

In broad terms, every vehicle has the same impact on congestion regardless of the driver, purpose, or type of vehicle. Exempting certain groups of motor vehicles from the charge puts those vehicles in the congestion zone and hinders efforts to reduce travel times. More vehicles in the zone likely also means an increase in emissions. For example, the benefit in Stockholm for energy efficient vehicles boosted their sales by 11 percent.<sup>107</sup> But the proliferation of these exempt vehicles in Stockholm increased traffic and directly led to the reduction of speeds in the congestion zone.<sup>108</sup> Milan saw a reduction in emissions from cleaner vehicles but not in traffic.<sup>109</sup> One study found that when all exemptions were in effect in Stockholm, about 30 percent of vehicles in the charging zone were exempted from paying.<sup>110</sup>

## Implications

The bottom line is that congestion pricing architects want to avoid what some have termed "death by a thousand exemptions."<sup>111</sup> The more carve-outs a congestion pricing strategy awards, the weaker the effect of the strategy overall.

Robust analysis of the socioeconomics of a place, technical analyses of discount administration, and travel demand modeling of a discount's effects should be used to inform the decision to provide discounts. In addition, having political leaders and other stakeholders involved in the design of a congestion pricing system and the discounts is one way to address concerns and garner support.<sup>112</sup>



## Principle 10: Be nimble

Stage in the Process: Idea, Planning, Proposal

### Overview

A congestion pricing program designed today may look quite different in tomorrow's landscape. Technologies evolve, and policy priorities shift to meet the demands of external factors like population growth, climate change, and shifting economic forces. In light of these unpredictable factors, embracing a nimble approach can still ensure that the program meets designated performance targets. Embracing an uncertain future can happen concurrently with designing a program that will thrive under existing conditions.

Embracing an uncertain future can happen concurrently with designing a program that will thrive under existing conditions.

Maintaining flexibility in technology and scope can allow the designers of a congestion pricing system to adapt to changing future conditions. Ultimately, a nimble approach will be more well thought-out and will garner more robust public and political support.

### Examples

A nimble approach allows decision-makers to adapt the program to meet changing local dynamics. In London, whereas the initial system was initially effective at achieving targeted goals, the program's effects have diminished over time due to population growth and changing travel patterns. Local experts have suggested a program that varies significantly from the original design, including its use of a distance-based charge, operations that are supplied through a single transport platform, and a "delay repay" guarantee, where drivers receive a refund when a journey takes significantly longer than

expected. Such elements reflect the need to consistently monitor and change a program to meet new opportunities.<sup>113</sup>

The revenue generated from a congestion fee need not be allocated to one source in perpetuity. While this is the case in New York, where revenue is to be put toward improving MTA, other jurisdictions might choose to distribute the funds across a variety of projects, and to change recipients over time. For example, revenue from the toll lanes in northern Virginia is partly distributed to projects that enhance multimodal options. Each year, different projects such as new and improved bus service, improved access to park and rides, or bike share expansion are selected to receive a distribution of the program's funds.<sup>114</sup>

A number of technologies exist to administer a congestion charging program. Today, many of the cities that have adopted the policy use gantries or road signage with cameras to detect license plate numbers. Drivers are then mailed a bill, or they can pay the charge online. New and emerging technologies such as cell phone-based technologies or other artificial intelligence solutions (e.g. automated vehicle occupancy detection) may mature into new solutions for collecting fees, but programs can nevertheless be implemented with existing automatic number-plate recognition (ANPR) technology. Researchers in London recently proposed a fee system based on vehicle miles travelled, vehicle emissions, traffic on the roads and the availability of other transportation options.<sup>115</sup> Given the rapid evolution of technology, new advances may bolster congestion pricing programs by allowing for more nuance in the future, but decision-makers should not wait for silver bullet technologies.

## Implications

A number of approaches should be considered, including area cordons, corridor tolls, vehicle miles travelled fees, parking pricing, or other approaches. To some extent, the program style that is chosen will depend on geographic feasibility. For example, if an area is surrounded by bridges, bridge tolling may make most sense [Principle 7].

Fees and charging times are both details that can be discrete or dynamic. If discrete, drivers know exactly how much they can expect to be charged, and they can also know when those charges apply. If dynamic, the fees will vary based on demand, with higher charges resulting during times when there are more cars on the road.

Many of these elements of variability that decision-makers should take into consideration are also being assessed in the context of the potential future introduction of automated vehicles (AVs). For example, applying a vehicle miles travelled fee to AVs has been listed as a unique opportunity to address growing infrastructure funding needs.<sup>116</sup> Other issues relevant to the adoption of AVs, such

as funding, privacy, and coordinating between state and local regulations may also apply to a congestion charge, and suggest that plans should be as nimble as possible.

Decision-makers should seek to understand the problems they are trying to solve before embracing a specific technology or policy approach [Principle 1]. Having clearly defined program goals is important, and program designers can subsequently propose a variety of solutions to meet those goals.





## Conclusion

Increasingly, U.S. cities are exploring congestion pricing as an important tool to address transportation challenges and meet sustainability and equity goals. However, it does not take the same form in all places, and it is not the only tool in the toolbox. The principles outlined in this report may signify many potential paths or answers, and they apply at different stages. The key takeaway for all readers in places that are considering congestion pricing is the lesson from Principle 1: outline a clear vision and purpose.

Absent a clear motivating purpose or comprehensive vision for implementing congestion pricing, congestion pricing will not succeed. Going through the process of articulating the existing needs of a place's transportation system—what works well, what does not, and what needs to change—can elucidate whether congestion pricing is the appropriate tool to help achieve transportation goals. This process may lead decision-makers to decide that congestion pricing is not the right tool. One thing is certain, answering these questions begins with the exercise of asking what a place's ultimate goals are.

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The key takeaway for all readers in places that are considering congestion pricing is the lesson from Principle 1: outline a clear vision and purpose.

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## End Notes

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- <sup>1</sup> See e.g., Benjamin G. Perez, Reno Giordano, and Heidi Stamm, "Evaluation and Performance Measurement of Congestion Pricing Projects," Transportation Research Board National Cooperative Highway Research Program Report 694, 2011; and Federal Highway Administration, "Lessons Learned from International Experience in Congestion Pricing," 2008
- <sup>2</sup> The study tour was a broad partnership effort. The Bloomberg American Cities Climate Challenge, supported by Bloomberg Philanthropies and led by the Natural Resources Defense Council and Delivery Associates, hosted delegations from seven American cities. The Summit and Barr Foundations supported the Eno Center for Transportation to organize the tour.
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