

Seattle Department of Transportation  
Phase 1 Summary Report

# SEATTLE CONGESTION PRICING STUDY



Source: Oran Virayinyay

MAY 2019



Seattle  
Department of  
Transportation



**Seattle**  
Department of  
Transportation

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# 1

# INTRO

At the City of Seattle, we are exploring congestion pricing as a way to address traffic congestion, reduce greenhouse gas emissions, and create a more equitable transportation system.

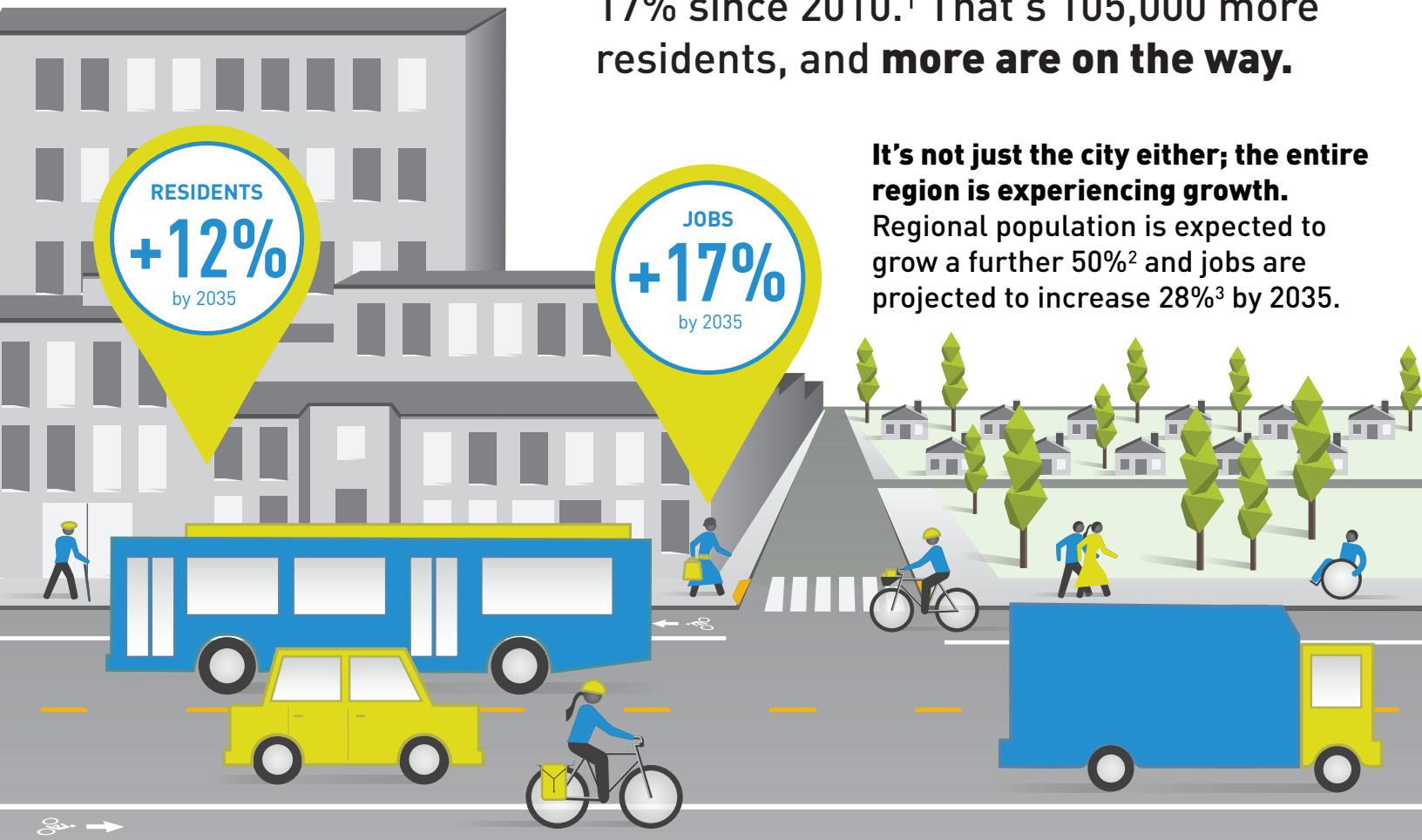
Congestion pricing is based on the idea that traffic congestion comes with high costs to society and to individuals in the form of air and climate pollution, traffic collisions, and slower commutes for everyone. When tolls are charged—especially when based on demand so that the more congested a road becomes, the higher the fee to use it—some people make changes to some of their trips. To avoid tolls, they may choose to drive during off-peak times, shift to carpools or transit, or combine trips.

As we consider congestion pricing in Seattle, we are committed to prioritizing racial and social equity, and to exploring how a pricing program might improve access to opportunities and reduce current inequities.

**Seattle's** population has grown by 17% since 2010.<sup>1</sup> That's 105,000 more residents, and **more are on the way.**

**It's not just the city either; the entire region is experiencing growth.**

Regional population is expected to grow a further 50%<sup>2</sup> and jobs are projected to increase 28%<sup>3</sup> by 2035.



## SEATTLE TODAY

Among major U.S. cities, we have ranked among the top four in growth for five consecutive years. We are also ranked as the fourth most congested U.S. city.<sup>4</sup> With the additional growth in residents and jobs expected in Seattle and the region by 2035, our commutes will get only longer, and the miles we travel will only increase.

We are faced with the fundamental challenge of moving more people and more goods in the same amount of space. By lowering the share of people driving alone to and through Center City, and shifting trips to other times of day, we can free road space for other uses.

This Summary Report includes highlights of our work to date. It focuses on the lessons other cities have learned, the pricing tools that appear most promising for Seattle, potential equity impacts, best practices in communications, and next steps for future phases of work.



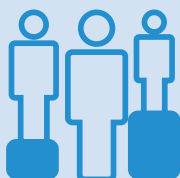
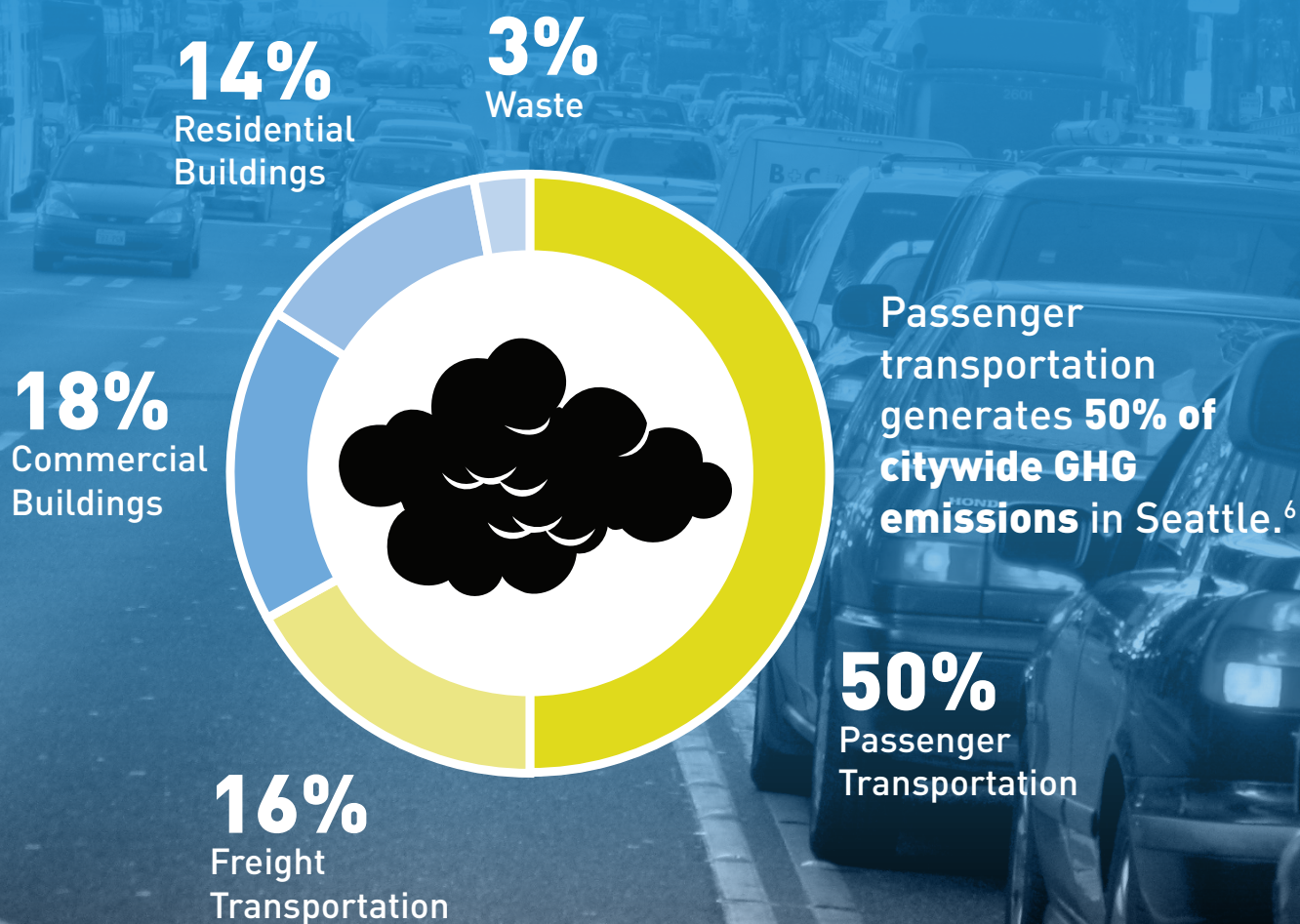
We also know that our transportation system is the greatest contributor to greenhouse gas emissions: 66% of emissions citywide come from road transportation.<sup>5</sup>

We must act now to curb emissions and reduce vehicle miles traveled to meet our goal of becoming carbon neutral by 2050, and supporting the Paris Agreement's commitment to limit global warming to 1.5 degrees Celsius. More efficient travel options, such as transit and shuttles, are part of the solution, and decisive action is needed to reduce congestion and protect our environment.

We cannot meet our climate goals without taking a range of bold steps. Our most disadvantaged neighbors bear the greatest burden of environmental damage, and we must address this inequity.



**66% of emissions citywide come from road transportation.”**



## EQUITY

Seattle's worst air quality areas are also in communities of color, and King County households with annual incomes less than \$15K experience rates of asthma nearly two times those of households with incomes above \$50K.<sup>7</sup>

## People and goods spend **55 hours** per year in Seattle traffic.<sup>8</sup>



Congestion pricing is one potential tool for addressing the challenges of congestion, emissions, and equity, but we must gather broad feedback, carefully study, and thoughtfully design a potential program to ensure that it is equitable, transparent, and responsive to our city's needs.

This first phase of the Seattle Congestion Pricing Study answers key questions about how we might design a congestion pricing program for Seattle. These efforts build on lessons learned from other cities that have either implemented or studied congestion pricing. We use existing data—which is limited at this time—to screen potential pricing tools and to begin exploring ways that congestion pricing can improve mobility for Seattle residents, employees, visitors, and students of all backgrounds and incomes.

We have summarized the initial findings in this report, and details are available in these technical papers:

- Pricing Tools: Review and Preliminary Screening
- Best Practices in Engagement and Communications
- Creating a More Equitable Pricing Program
- Preliminary Impacts and Benefits Analysis

These documents offer guidance for the next phase of study. They focus on engaging with city and regional residents, businesses, and visitors, and deepening our analysis to gain a better understanding of the impacts and benefits of a pricing program.



## EQUITY

With Seattle's growth comes pressures on housing and overall affordability. Some people are being priced out of the city and forced to move further from jobs and services. People who can't afford to live near their jobs or who don't have access to transit may have few options other than to drive, and often when traffic is heaviest.



# PRODUCTIVITY



## CHALLENGE

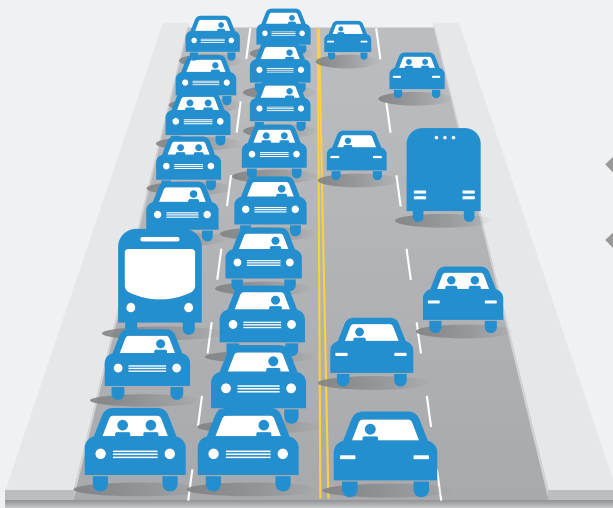
There is a significant economic cost associated with people and freight spending time stuck in traffic in Seattle.



## OPPORTUNITY

Pricing is one tool that can help businesses prosper and ensure we get to the places we are going and to the people we love on time.

In 2017, the time spent in Seattle traffic is estimated to have cost **\$5 billion in lost productivity.**<sup>9</sup> That is **nearly as much as the entire City of Seattle budget** for 2019-2020.

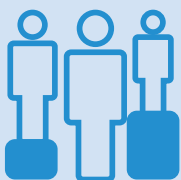


**\$5 billion**  
in lost productivity



**\$5.9 billion**

The 2019-2020  
City budget



## EQUITY

People with hourly wage jobs or more than one job experience disproportionate impacts from unreliable traffic patterns. Additionally, their work schedules or job requirements may not be well served by transit.<sup>10</sup>









# 2

# PRICING TODAY

More than a dozen cities have implemented, seriously considered, or are actively studying congestion pricing, which is sometimes referred to as mobility pricing, decongestion charging, or road pricing.

# PRICING PROGRAM OUTCOMES

In this section, we explore lessons we can learn from other cities and highlight the results of successful congestion pricing programs. Lessons learned regarding communications and engagement can be found in Section 3.4.

- All cities that have implemented congestion pricing have built on aggressive transportation demand management programs.
- All implemented congestion pricing programs have explicitly aimed to reduce congestion and/or emissions.
- Most programs provide a revenue stream that funds transportation options and services.
- Public and business acceptance typically rises dramatically post-implementation.



One of 300 buses added to London's fleet after the start of congestion pricing

## Cities Pricing Mobility





**“In every case, congestion pricing has reduced vehicle trips, reduced CO<sub>2</sub> emissions, and lowered travel times.”**



Congestion pricing tools that other cities have implemented include low-emissions zones (LEZ), congestion charges (CC), area licensing schemes (ALS), electronic road pricing (ERP), and GPS-based road pricing (GPS ERP). These tools and others are described in more detail in Section 3.2. In every case, congestion pricing has reduced vehicle trips (by 10% to 44%), reduced CO<sub>2</sub> emissions (by 2.5% to 22%), and lowered travel times (by 10% to 33%). Congestion pricing has also had positive economic benefits; for example, business sales within Stockholm’s and London’s charged areas increased after implementation. Revenues generated are almost exclusively reinvested into transit or other mobility options. The table below summarizes five implemented congestion pricing programs and their results.

#### Major Cities with Congestion Pricing Programs

	Stockholm	London	Singapore	Milan	Gothenburg
<b>Mechanism</b>	LEZ – 1996 CC – 2007	CC – 2003 LEZ – 2008	ALS – 1975 ERP – 1998 GPS ERP – 2017	LEZ – 2008 CC – 2012	CC – 2013
<b>Time to Prepare</b>	4 years	3 years for CC	13 years for ERP	2 years for LEZ	9 years
<b>Motor Vehicle Trip Reduction</b>	22%	16% all 30% charged	44% initially (in 1975); additional 15% with new technology in 1998	34%	12%
<b>GHG Reduction</b>	14% CO <sub>2</sub>	17% CO <sub>2</sub>	15% CO <sub>2</sub>	22% CO <sub>2</sub>	2.5% CO <sub>2</sub>
<b>Travel Time</b>	33% reduction in delays	30% reduction in delays	Price adjustments manage speeds to targets	30% reduction in delays	10% to 20% faster travel time in corridors
<b>Net Annual Revenue</b>	\$150M	\$230M	\$100M	\$20M	\$90M

## NORTH AMERICAN STUDIES UNDERWAY

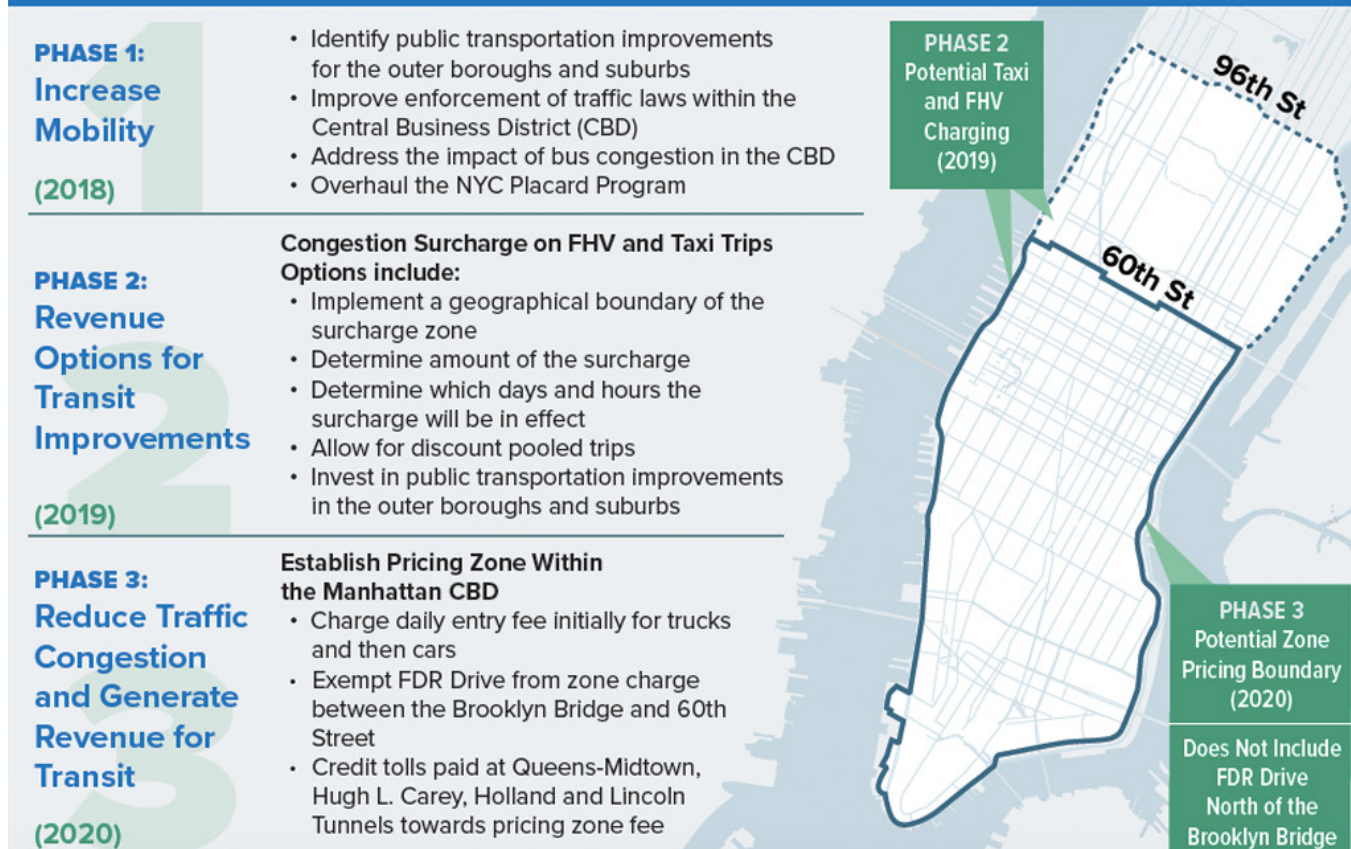
Congestion pricing's success abroad has encouraged many North American cities to explore its potential. New York, San Francisco, Vancouver (British Columbia), Oregon State, Portland (Oregon), and Los Angeles are also studying various forms of congestion pricing, and Washington State recently piloted road user charging. Work in New York City, Vancouver, B.C., and Washington State is described on the following pages, followed by a case study from Stockholm's successful pilot program, which led to their existing system.

## New York City

New York City has studied congestion pricing for decades. In early 2019 the City implemented a congestion zone surcharge on for-hire vehicles in high-traffic areas in Manhattan as part of its phased approach to pricing. Through its pricing plan, New York intends to address traffic congestion while simultaneously raising revenues to support upgrades for the Metropolitan Transportation Authority (MTA). In Phase 1, the City took steps to increase overall mobility, including overhauling the parking program (NYC Placard Program). Phase 2 introduces a surcharge on For Hire Vehicles (FHV), such as Uber and Lyft, and taxis to help fund transit improvements. The planned Phase 3 would establish a pricing zone around Manhattan's Central Business District (CBD).

### New York City's Phased Approach to Congestion Pricing

Solutions are required to get our streets moving again and bring the subway back to a state of reliability New Yorkers deserve and expect.

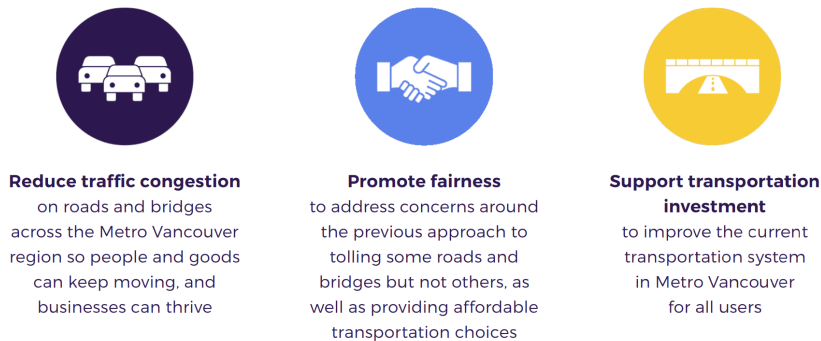




## Vancouver B.C.

In Vancouver, B.C., an independent commission began studying congestion pricing in 2017. The Mobility Pricing Independent Commission was tasked with exploring how mobility pricing could address existing congestion and help realize opportunities for density and improved connectivity associated with the region's anticipated growth. The goals and objectives of the pricing initiative were clearly defined: reduce traffic congestion, promote fairness, and support transportation investment. The initial findings and recommendations were released in May 2018, and called for further study to develop an actionable plan in the year ahead.

### Vancouver's Mobility Pricing Initiative Objectives

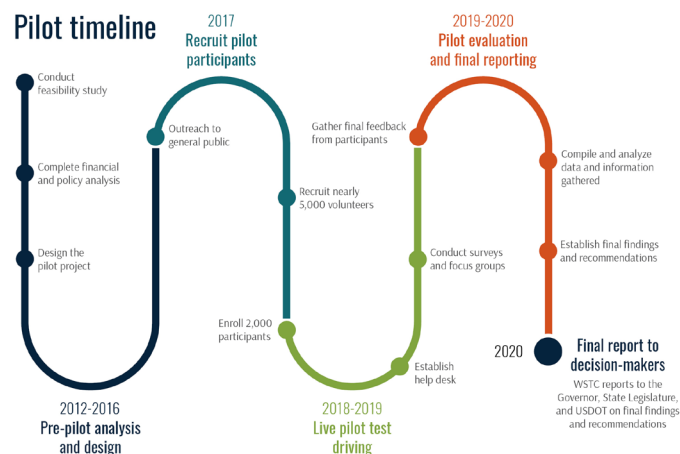


Source: Metro Vancouver Mobility Pricing Independent Commission

## Washington State

In January 2019, Washington State concluded a year-long Road User Charge (RUC) pilot project with roughly 2,000 participating drivers. While the purpose of the Washington State RUC is to explore potential revenue replacements for the gas tax, it is a tool that some states have used to help address congestion and greenhouse gas emissions by charging for the miles a person drives. The Washington State Transportation Commission is now analyzing the pilot data to develop a report of findings and recommendations. That report will be submitted to the Governor, the State Legislature, and the United States Department of Transportation in early 2020.

### Timeline of Washington State RUC Pilot Project



Source: [https://waroadusagecharge.org/wp-content/uploads/2019/01/2019\\_0131\\_WARUC\\_Pilot\\_timeline.jpg](https://waroadusagecharge.org/wp-content/uploads/2019/01/2019_0131_WARUC_Pilot_timeline.jpg)

# STOCKHOLM'S CONGESTION PRICING PILOT

Stockholm conceived its congestion pricing program long before it ultimately implemented it. In the 1990s, a road tolling proposal to fund infrastructure failed due to lack of public and political support. In 2002, the Social Democratic party considered road tolls to fund infrastructure, but likewise lacked public support. The Social Democrats eventually agreed to a congestion pricing trial to obtain the support of the Green Party to form a political majority.

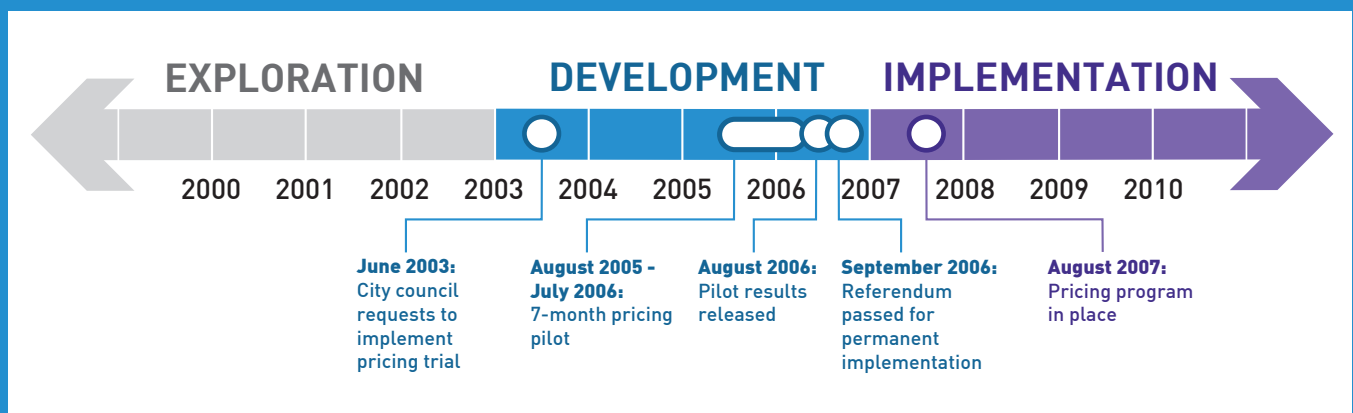
The public and the media initially had a strong negative response to pricing. Opponents proposed a referendum after the pilot in 2006 to determine if the charges would be implemented permanently.

## A Phased Approach

The pilot program began in January 2006 and lasted seven months. The goals were to “reduce congestion, enhance accessibility, and improve the environment.” Key milestones in the development of the pilot and permanent implementation are shown below.

The program employed a cordon design featuring 18 charging points aligned with the city’s geography. The city installed transponders to collect vehicle data and automatic vehicle identification cameras in case transponders failed. The charging system was designed to be simple and easily understood. The charges varied, with a maximum daily charge of €6 (about \$7). Charges were highest at peak times and identical for both morning and afternoon peak hours. Evenings, weekends, and holidays were exempt from charges.

The pilot also improved transit service to offer better alternatives to driving. Stockholm Transit purchased 197 additional buses and added 16 new bus routes, expanded service on existing bus routes, and added some limited new capacity on rail. Park-and-ride service was also expanded with 2,800 new parking spaces (for 18,800 total spaces). During the pilot, park-and-ride lots were free for anyone with a Stockholm Transit card.



Key Milestones for the Stockholm Pricing Pilot



## Pilot Evaluation

To ensure broad understanding of the pilot, Stockholm carefully evaluated the trial and shared the results with the public.<sup>11</sup> The evaluation included over 30 individual reports exploring the impacts of the pilot on a range of stakeholders, including taxis, public transit, and retail.

The Stockholm pilot allowed the public to develop a thorough understanding of the charging program through both personal experience and the city's comprehensive evaluation reports. Following the pilot, public opinion shifted dramatically to support permanent implementation. The program resulted in improvements throughout the transportation network, including:

- 22% decrease in traffic volumes from 6:30 AM to 6:30 PM
- 4% increase in transit ridership
- 23% increase in park-and-ride lot use
- Up to 10% decrease in traffic collisions involving personal injuries
- Up to 14% reduction in emissions from road traffic

Some expected impacts never occurred. Although there was a 4% increase in transit use, only 0.1% of people driving before the project switched to public buses. Drivers adapted in other ways, including combining trips, switching routes, and driving at different times of day. There was almost no measurable difference in noise levels, car-sharing didn't increase, and people didn't work from home more often. One percent of vehicle trips used a modified route to cross into the city via the Essingeleden Bypass to avoid the cordon charge, resulting in a minor increase in congestion along the bypass.

## Lessons Learned

The 2006 post-pilot referendum passed with 53% support. Upon implementation of a permanent program, the list of exemptions changed. The city and national government negotiated a 10-year infrastructure deal, including revenues from the congestion charge, that funded a roadway bypass around the city.

The Stockholm pilot provides Seattle a number of important lessons. The initial emphasis on congestion reduction failed to motivate the public, but the later emphasis on the environment rallied some public and political support. However, the environmental argument created tension, as it negatively portrayed people driving cars. The infrastructure investment deal helped to quell some of the emotional response by providing infrastructure for vehicles. This shifted the conversation around congestion charging away from an emotional environmental argument toward a more technical approach to provide communal benefits. Support has continued to grow and was above 70% by 2013.



Source: Tage Olsson





Five day treatment  
for prostate cancer

CyberKnife treatment  
is 80% effective at treating prostate cancer

SWEDISH  
Cancer Institute  
swedishcancerinstitute.org







# 3

## KEY FINDINGS

In this phase of the Seattle Congestion Pricing Study, we have explored ways to ensure a pricing program is equitably implemented and have identified and evaluated the universe of available pricing tools, screening them for applicability to Seattle. We have completed a high-level analysis of the impacts and benefits of an area pricing system. And we have reviewed peer cities' experiences and lessons learned about communicating with the public to inform development of a possible approach for Seattle. Introductions to these findings are presented in the four sections of this chapter, and much more detail is available in the companion technical papers on each topic.

## 3.1 CREATING AN EQUITABLE PRICING PROGRAM

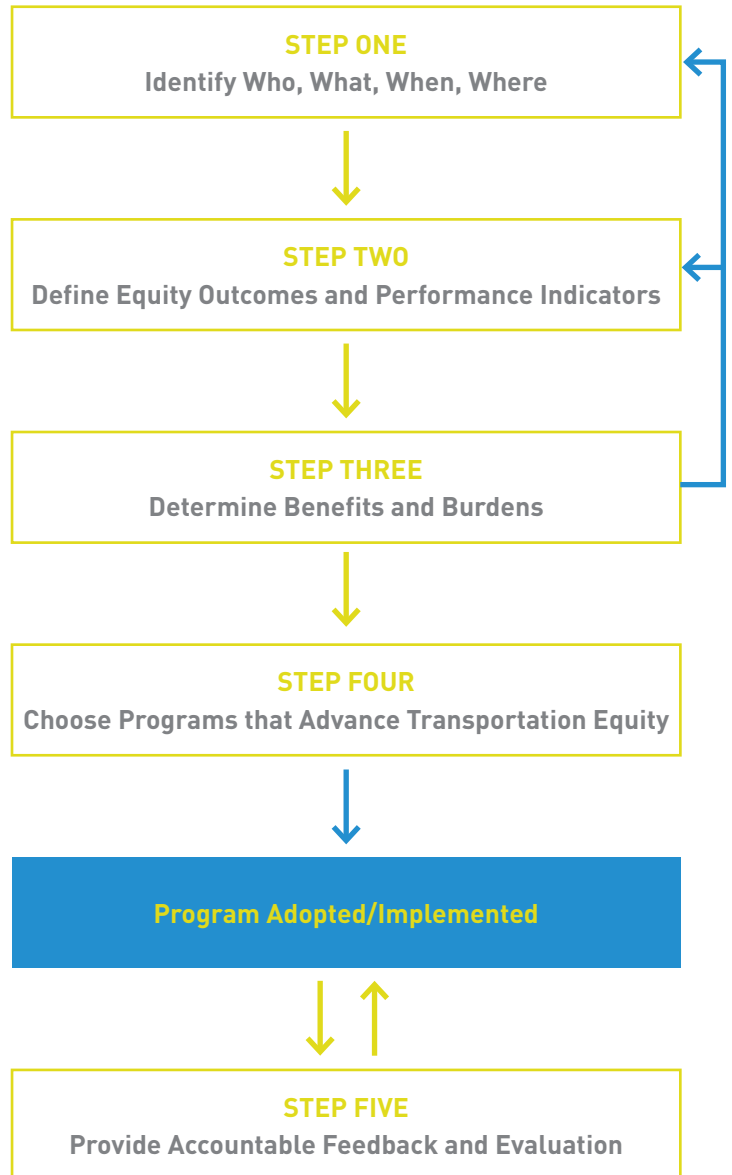
As we consider congestion pricing in Seattle, we are committed to prioritizing racial and social equity, and to exploring how such a program might benefit communities that currently confront inadequate access to opportunities (and for those who drive, high relative costs). Other cities' experiences have demonstrated that there can be unintended consequences to congestion pricing. Without a clear focus on social and racial equity, pricing can burden low-income people with new costs, just when skyrocketing housing costs are forcing many to move to the suburbs where driving may be the only option for most trips.

Our intent is to address these potential impacts from the start, in part through community engagement that will guide development of a fair pricing program and identify strategies for advancing equitable outcomes. The steps for this are shown in the graphic to the right and described below.

### STEP ONE Identify Who, What, and Where

We will identify the populations to be considered from an equity perspective, the proposed tools for further study and evaluation, and the geographic boundaries of the study area. Vulnerable populations may include people of color, low-income populations, people with disabilities, people experiencing homelessness, LGBTQ people, youth, and seniors. Each phase of our study will further define the geographic area based on factors such as the existing transportation network, the location of vulnerable populations, and key destinations. Initial geographies may help to identify who should be the focus of the public engagement plan and partnerships for developing an equitable program.

### Key Steps in Developing an Equitable Pricing Program





**STEP TWO****Define Equity Outcomes and Performance Indicators**

An important part of project planning is defining our primary goals and matching those goals with indicators—the measures used to gauge success or failure. Certain indicators can illustrate whether the policy or program advances equity, both in the process of policy development and implementation, and in its outcomes.

- **Process Equity** measures the participation of vulnerable communities in planning, implementation, and project evaluation. Public participation can vary tremendously, from simply informing people about a policy to including them at the decision-making table.
- **Outcome Equity** focuses on the actual impact of a program and is typically described in three dimensions: affordability, accessibility, and community health.

A comparative analysis at both the population and individual level can project benefits and impacts for immediate implementation and for one or more points in the future (e.g., 10 and 25 years). Two types of comparative analysis are useful: a comparison of impacts from the congestion pricing proposal with what may be expected if pricing is not adopted; and comparison of impacts on vulnerable populations with the impacts on the general population.

**STEP THREE****Determine Benefits and Burdens**

Once we adopt a set of performance indicators, we will study the impacts of the proposed alternatives, as well as the status quo. The analyses that will go into determining benefits and burdens should be tailored to the scale of impacts, community interest in those impacts, and the potential of those impacts to help or hurt vulnerable populations.

There will likely be an iterative process between Step 3 and Steps 1 and 2. Results of the analysis will both inform further development of the proposal and illuminate new perspectives in the understanding of the equity impacts, requiring new or amended indicators.

**STEP FOUR****Choose Programs to Advance Transportation Equity**

We will identify the policies and measures that best maximize equity and increase opportunity, in addition to those that minimize harm to vulnerable populations. Some of the most relevant strategies may already have been identified or implemented (in part or in full) in local or regional plans or in community transportation recommendations for other projects; others may be new.

**STEP FIVE****Provide Accountable Feedback and Evaluation**





Congestion pricing strategies will inevitably lead to changes in travel behavior, traffic volumes, and public revenues. Some aspects of pricing lend themselves to adjustments, such as fees, time periods, discounts, and geographies. Ongoing monitoring and evaluation can help quantify positive or negative changes, as well as identify the need to adjust program features. To develop an equitable pricing program, we will need to ensure that:

- Monitoring and evaluation occur within a reasonable timeframe;
- We identify agreed-upon mechanisms for providing feedback to the community and decision-makers regarding both the successes and shortcomings of any potential program, as well as emerging opportunities and technologies; and
- The results of monitoring and evaluation are communicated clearly and consistently with affected communities.

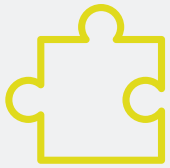
The table below identifies some basic strategies that can address affordability and meet other important goals. A deep analysis of affordability for those who currently drive—as well as for people who use other modes—will be an important part of the next phase of this study. Future public engagement will provide

opportunities to identify priority strategies from this list and others that should be added. Some strategies may have been identified in previous plans but still need to be funded. Other strategies may look beyond making transportation more affordable to also consider whether there are ways to stem displacement.

### Sample Strategies to Advance an Equity Agenda

Strategy	Examples
 <b>Affordability and Driver Assistance</b>	<b>Driver Discounts, Caps, and Exemptions</b> , such as: <ul style="list-style-type: none"> <li>• Free or discounted transponders</li> <li>• Toll discounts or credits for low-income households</li> <li>• Exemptions for people with disabilities</li> <li>• No tolls during off-peak hours</li> </ul>
	<b>Cash Payments</b> for those without credit cards or bank accounts
	<b>Transit Discounts</b> , such as: <ul style="list-style-type: none"> <li>• ORCA LIFT transit discounts</li> <li>• Subsidized bike and car share memberships or rides</li> </ul>
 <b>Greater Mobility Options and Safer Active Transportation Networks</b>	<b>Improved Transit Service</b> , including: <ul style="list-style-type: none"> <li>• New routes to more destinations</li> <li>• Faster, more reliable service</li> <li>• Improved stations/stops</li> </ul>
	<b>Carpool and Vanpool Programs</b> , such as: <ul style="list-style-type: none"> <li>• Carpool matching services</li> <li>• New vanpool routes</li> </ul>
	<b>Pedestrian/Bike Improvements</b> , including: <ul style="list-style-type: none"> <li>• Improved pedestrian network</li> <li>• Improved bicycle network</li> <li>• Pedestrian-scale lighting</li> </ul>
	<b>Emerging Mobility Options</b> , such as: <ul style="list-style-type: none"> <li>• Bike share</li> <li>• Car share</li> <li>• Creative use of rideshare services to connect to transit</li> <li>• Shuttles</li> <li>• Carpool apps and programs</li> </ul>
 <b>Programs for Seniors and People with Disabilities</b>	<b>Accessible Information</b> , such as senior help lines and materials
	<b>Targeted Transit/Shuttle Routes</b>
 <b>Healthier Communities</b>	<b>Encourage Clean Air Vehicles</b> , through strategies such as: <ul style="list-style-type: none"> <li>• Credits for drivers</li> <li>• Purchase clean transit vehicles</li> </ul>

# AFFORDABILITY



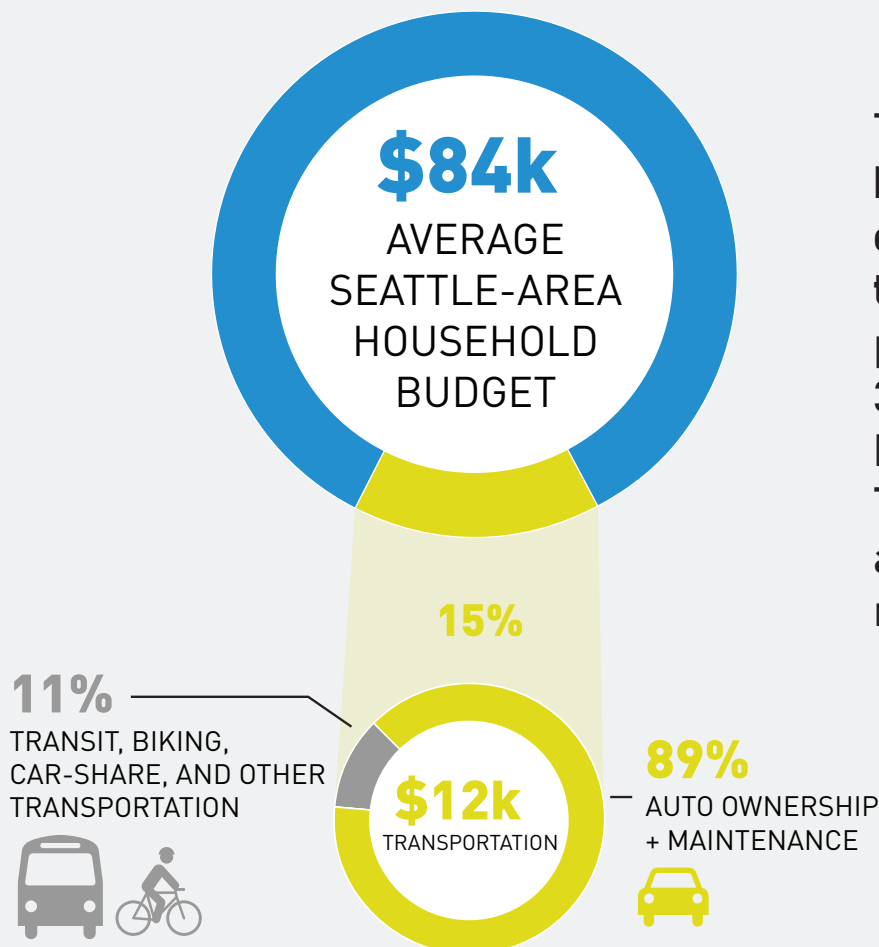
## CHALLENGE

Our city is becoming increasingly unaffordable for many. The high cost of living has caused displacement, meaning more people are moving further from Center City jobs to find more affordable housing, and now face long, slow commutes.

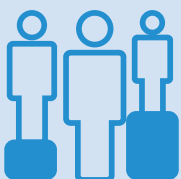


## OPPORTUNITY

With good travel options, car ownership can become a choice rather than a necessity. Investing in transit, street safety, and infrastructure that supports more efficient and sustainable travel options can reduce the amount of income people spend on transportation.



The average **Seattle household spends 15% of its budget on transportation.**<sup>12</sup> That percentage can be up to 30% for low income households.<sup>13</sup> Transportation is less of a financial burden for residents without cars.



## EQUITY

Households with lower incomes spend a greater proportion of their budget on transportation, especially if they require a car.



## 3.2 PRICING TOOLS: REVIEW AND PRELIMINARY SCREENING

Our comprehensive review of pricing tools identified 11 options that have been used in other cities (see table below), their potential applicability to Seattle, and associated technologies, privacy considerations, and legal matters.

### Potential Pricing Tools

Pricing Tool	Description	Example
<b>Cordon Pricing</b>	Charge vehicles for crossing a boundary into pricing zone	Stockholm (implemented): <ul style="list-style-type: none"> <li>Implemented in 2006.</li> <li>Congestion pricing charge is levied on vehicles entering city center, using license-plate recognition technology.</li> </ul>
<b>Area Pricing</b>	Charge vehicles for crossing a boundary and for driving inside a pricing zone	London (implemented): <ul style="list-style-type: none"> <li>Implemented in 2003.</li> <li>Prior to adoption, funding for public transport was unreliable and congestion levels in central London were extremely high.</li> </ul>
<b>Fleet/Vehicle Class Pricing</b>	Charge specific vehicle types entering a zone, such as ride-hailing or commercial vehicles	New York City (moving to implementation): <ul style="list-style-type: none"> <li>Fleet/Vehicle Class Pricing is phase two of a three-phase congestion pricing approach.</li> <li>Fleet pricing applies to taxis and other ride-hailing services.</li> </ul>
<b>Connected/Autonomous Vehicle (C/AV) Zone</b>	Create a zone that allows only licensed connected and/or autonomous vehicles	<i>This approach has not yet been implemented, as C/AVs are in their infancy.</i>
<b>Fossil Fuel Free Zone (FFFZ)</b>	Create a zone that allows only licensed non-fossil fuel vehicles; can also allow all types of vehicles and charge those that are not low-emissions vehicles (called a Low-Emissions Zone program)	Milan (implemented): <ul style="list-style-type: none"> <li>Cordon pricing was implemented in 2012, including a low-emissions zone.</li> <li>In addition to applying a charge for all vehicles entering the zone:               <ul style="list-style-type: none"> <li>» Vehicles using gasoline Euro 0 or diesel Euro 3 or below are prohibited from entering.</li> <li>» Private vehicles longer than 7.5 meters (24.6 feet) are also prohibited.</li> <li>» Electric vehicles, motorcycles, scooters, public transit vehicles, public utility vehicles, emergency vehicles, taxis, and vehicles for people with disabilities are exempt from the charge.</li> </ul> </li> </ul>
<b>License Plate-Based Restriction Zone (LPRZ)</b>	Restrict access to a zone based on license plate numbers; functions as a management tool that has a similar effect to a pricing tool	Mexico City (implemented): <ul style="list-style-type: none"> <li>Launched in 1989, with expansions in 1990 and 2016.</li> <li>Cars are prohibited from driving in the city on certain days based on the last digit of their license plate (e.g., license plates ending in a 3 or 4 cannot drive on Wednesdays).</li> </ul>

Pricing Tool	Description	Example
<b>Road Usage Charge (RUC)</b>	Restrict access to a zone to vehicles enrolled in a RUC program that levies a per-mile charge, potentially by time of day and/or location	Washington State (piloted): <ul style="list-style-type: none"> <li>Completed a 2,000-driver pilot of a road user charge program in January 2019.</li> <li>Participants chose one of four options for reporting their mileage: pre-selected mileage block, quarterly odometer readings, plug-in mileage meter, or smartphone app.</li> </ul>
<b>Arterial Toll Roads</b>	Toll all lanes of an arterial road	Singapore (implemented): <ul style="list-style-type: none"> <li>Implemented electronic road pricing technology in 1998.</li> <li>Vehicles are charged while passing under overhead gantries.</li> <li>The fee varies based on vehicle type, time, and location.</li> </ul>
<b>Arterial Express Lanes</b>	Convert or add lanes on arterial roads as tolled facilities; some lanes remain unpriced	Tampa (study): <ul style="list-style-type: none"> <li>Conducted a proof of concept study of a Bus Toll Lane (BTL) focused on limited access corridors as a partnership between transit and toll agencies with a revenue-sharing model.</li> <li>Tolling equipment, similar to that used on freeway express lanes, would be required for implementation.</li> </ul>
<b>On-Street Parking Pricing</b>	Vary street parking prices to control demand	San Francisco (implemented): <ul style="list-style-type: none"> <li>Launched in 2011, with expansion citywide in 2018.</li> <li>Smart parking meters update pricing within a \$0.75 range per hour.</li> <li>Pricing is adjusted per block, based on time, location, and day of the week.</li> </ul>
<b>Off-Street Parking Pricing</b>	Apply a variable fee/tax to off-street parking facilities	San Francisco (implemented): <ul style="list-style-type: none"> <li>Citywide smart parking meter program is also used in operation of SFMTA-owned off-street garages and lots.</li> <li>Rates at SFpark off-street facilities vary by time of day, and are updated quarterly based on demand.</li> </ul>

**Play Like a Parking Pro.**

**THERE'S A NEW PLAYER IN TOWN**

- Leading Edge Technology.
- Rates Vary by Time of Day
- Easier to Use

**Go Ahead. Park Now.**

Seattle introduces new high-tech IPS parking pay stations!  
Delivering faster, more reliable service. Rates based on data.

**Know the Rules. Win the Game.**  
[seattle.gov/parking](http://seattle.gov/parking)

**SDOT**  
Seattle Department of Transportation

PRELIMINARY PRICING TOOL SCREENING

To identify the most promising tools for further study, we screened the 11 tools listed on the previous pages based on four preliminary areas of focus that align with larger City goals. This initial qualitative screening may be updated as we learn more about community goals and desired outcomes. Based on this screening, we identified four tools for further study.

Preliminary Screening Criteria

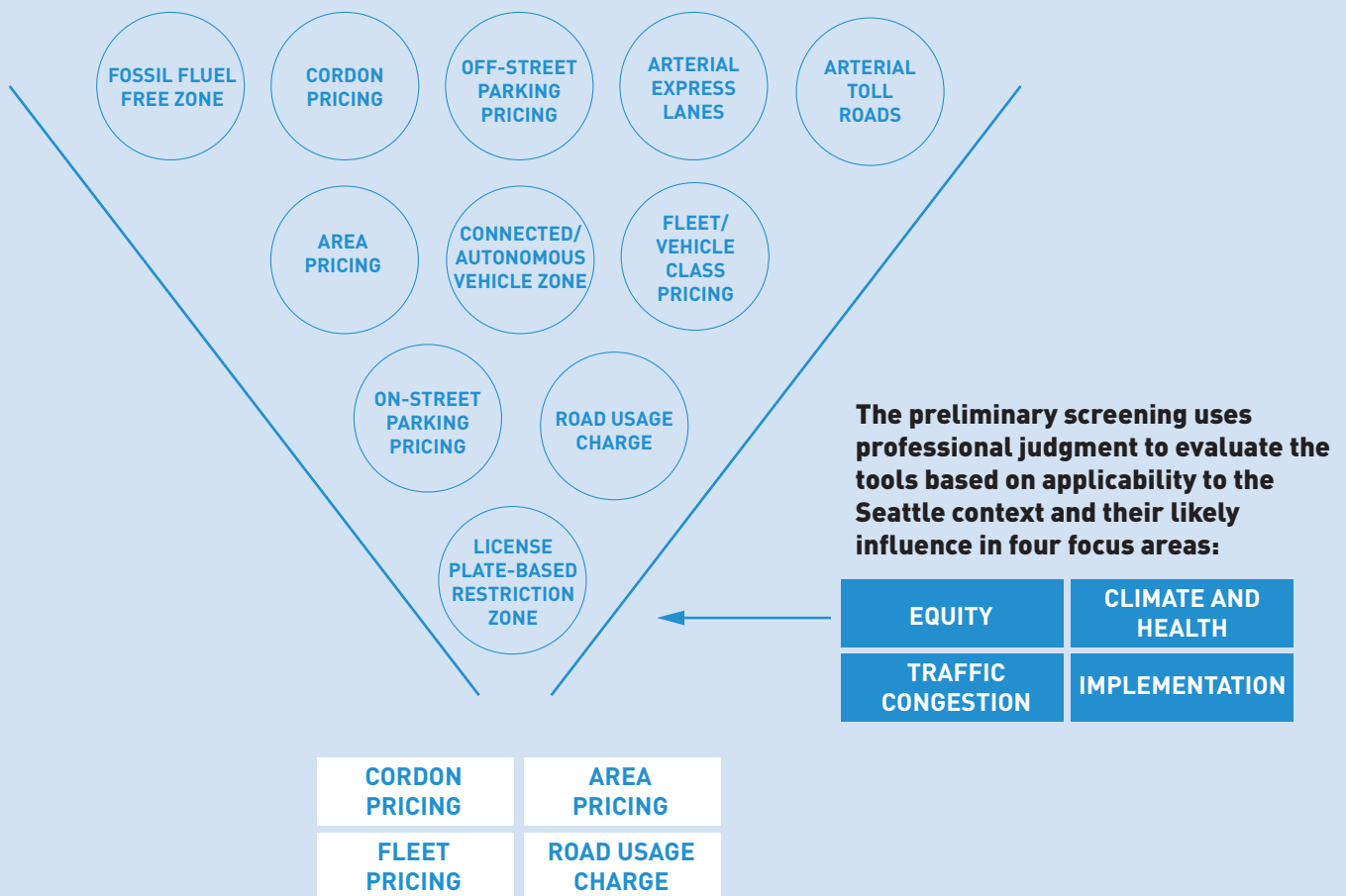
Focus Areas	Initial Desired Outcomes
Equity	<ul style="list-style-type: none"><li>• Potential to reinvest resources to enhance equity and affordability</li><li>• Opportunity to increase and improve transportation options for low-income populations</li><li>• Opportunities for inclusive decision-making around mobility options</li></ul>
Climate and Health	<ul style="list-style-type: none"><li>• Potential to change travel behavior to support active and sustainable modes</li><li>• Likelihood of decreasing peak-period congestion and reducing particulate matter</li><li>• Opportunity to encourage more fuel-efficient and fossil-fuel-free travel</li></ul>
Traffic Congestion	<ul style="list-style-type: none"><li>• Increase predictability and reliability of travel in Seattle for people and goods</li></ul>
Implementation	<ul style="list-style-type: none"><li>• Feasibility, technologies, legal frameworks, and potential efficiencies</li></ul>



Source: SounderBruce



We screened the tools using a simple low-medium-high scale for each of focus areas listed on the previous page. Based on the screening, the 4 tools called out below have a greater potential to meaningfully influence those focus areas and their desired outcomes.



All of the tools considered are valuable and could be used (or used more extensively, in the case of parking pricing) by the City of Seattle to meet related goals. As we work closely with the community in the next phase of this study to develop refined goals and desired outcomes, we may re-evaluate the larger set of tools or prioritize others for additional study.

## Cordon Pricing

### *Traveling to or from a zone*

Cordon pricing charges vehicles for crossing the boundary into a zone. It is likely to reduce trips into the tolled area. The concept is relatively simple to explain and requires less infrastructure than area pricing. It may deter people from traveling to or through the priced zone, potentially presenting equity concerns. Additional transit service and/or targeted discounts could provide travel options for lower-income travelers.



Congestion charge billboard in London, showing charging area

## Area Pricing

### *Traveling to, from, and within a priced zone*

Area pricing is a type of cordon pricing that includes trips both into and within a defined area. Area pricing captures more and additional types of trips (such as ride-share trips within the zone). It encourages both fewer and shorter trips. It requires more infrastructure than cordon pricing but is likely to offer greater transportation benefits and generate more revenue for reinvestment in our transportation system. As with cordon pricing, it may deter people from traveling to, from, or within the priced area, presenting potential equity concerns. Additional transit service and/or targeted discounts could help to reduce impacts.



Charging area camera in London

Source: David Lisbona

Source: Guipietish

## Fleet Pricing

### Targeted approach

Fleet pricing targets specific vehicle types, such as ride-hailing or commercial vehicles, which could limit both congestion reduction and revenue generation. It is relatively easy to implement, as many fleet vehicles are already permitted or registered. A mitigation program could be highly-targeted, although the types of vehicles charged should be carefully considered. Fleet pricing could be used in combination with cordon or area pricing, potentially as an interim step.

## Road Usage Charge

### Vehicle miles traveled

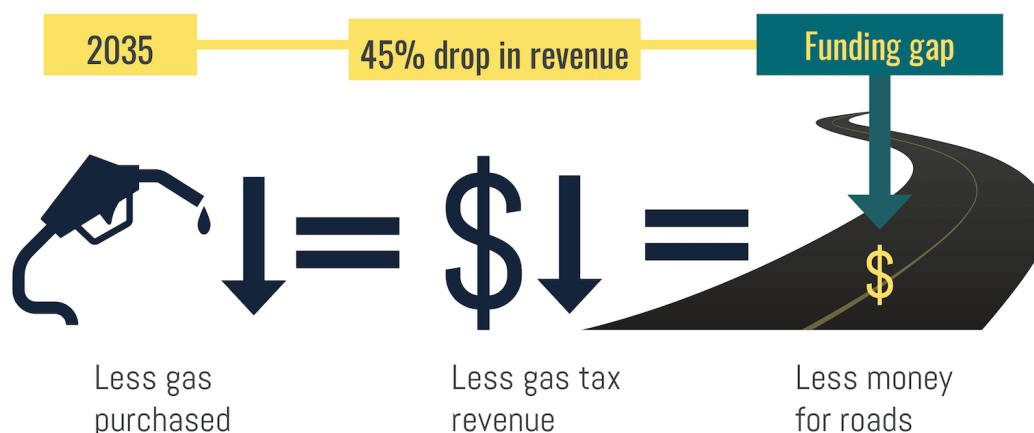
A road usage charge is directly tied to road use and has a high potential for congestion reduction. The recent Washington State pilot program was designed to test the viability of a road usage charge as a replacement to the gas tax rather than as a tool for reducing congestion. However, it would be relatively easy to tailor a road usage charge to achieve specific outcomes (and avoid impacting certain populations). However, the technology is not yet mature enough to support rapid, full-scale implementation, and enforcement may be challenging.



Source: Flickr user joiseyshowaa

New York City is implementing fleet pricing on for-hire vehicles

## HOW DOES WASHINGTON ADDRESS THIS FUNDING GAP TO MEET FUTURE NEEDS?



Washington State's road usage charge pilot was designed to test revenue generation rather than congestion reduction

Source: WSDOT Road Usage Charge Pilot





Source: Toll Collect

## CONSIDERATIONS FOR FURTHER STUDY

Example of tolling equipment used for truck tolling in Germany

### Technology

A number of technologies exist—and are used in other cities—to implement a variety of pricing tools. Depending on the specifics of a program, a congestion pricing system may require onboard vehicle identifiers, roadside or overhead detectors, and back-office equipment. For example, tolling typically uses automatic vehicle identification and automatic license plate readers that identify vehicles without impacting traffic movement. New and emerging technologies are likely to augment or replace existing ones, such as cell phone apps, dedicated short range communications, 5G Long-Term Evolution (LTE) wireless, mobile license plate readers, and automated vehicle occupancy detection.

We will continue to study issues such as technology maturity, physical footprint, interoperability, scalability, and flexibility. This will help us identify the most feasible and cost-efficient options for our city. Deployment of existing, well-established technologies is likely cheaper in the near-term, although they may become obsolete in the future or be vulnerable to future market disruptors.

Urban environments also pose spatial constraints for equipment placement, system performance, and public acceptance. This is especially true in a city like Seattle, which has many competing demands on the public right-of-way. It is also important that we evaluate initial capital costs and ongoing maintenance costs. These costs can vary depending on technology lifecycle, market penetration, and other factors.

## Privacy

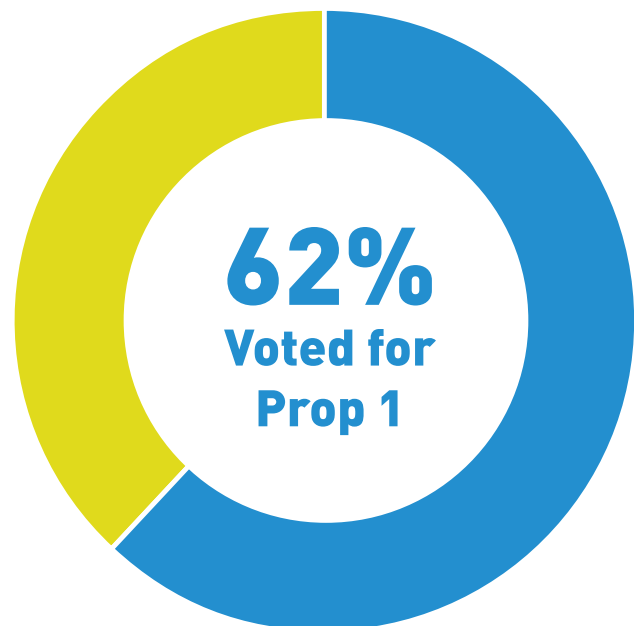
Protecting privacy is an important consideration in congestion pricing policy discussions, as pricing typically requires identifying vehicles to enforce a charge. Concerns are generally related to access and storage of personally-identifiable information, such as unique vehicle and owner data. Technologies can be designed and regulated to safeguard personal information using methods such as proprietary internal identifiers, encryption, and anonymized/aggregated geodata. Credit card industry regulations can further ensure anonymity, and customer education and transparent privacy agreements are important for raising awareness of privacy protections. An existing City of Seattle surveillance ordinance addresses some of these concerns by mandating public transparency when the City considers the acquisition of technology that may be considered surveillance.



Example of AVI antennas to read transponders and cameras to capture license plates

## Authority to Implement Tolls

The Seattle Transportation Benefit District was established in 2010, and the state authorizing legislation for transportation benefit districts provides the authority to charge vehicle tolls within the boundaries of the district. Tolls may not be imposed without the approval of a majority of the votes in the district voting on a proposition at a general or special election. As we continue to explore congestion pricing options, we will evaluate the relevant codes and regulations.



In 2014, Seattle voters approved Proposition 1, increasing the charges associated with the Seattle Transportation Benefit District; Proposition 1 did not address tolling

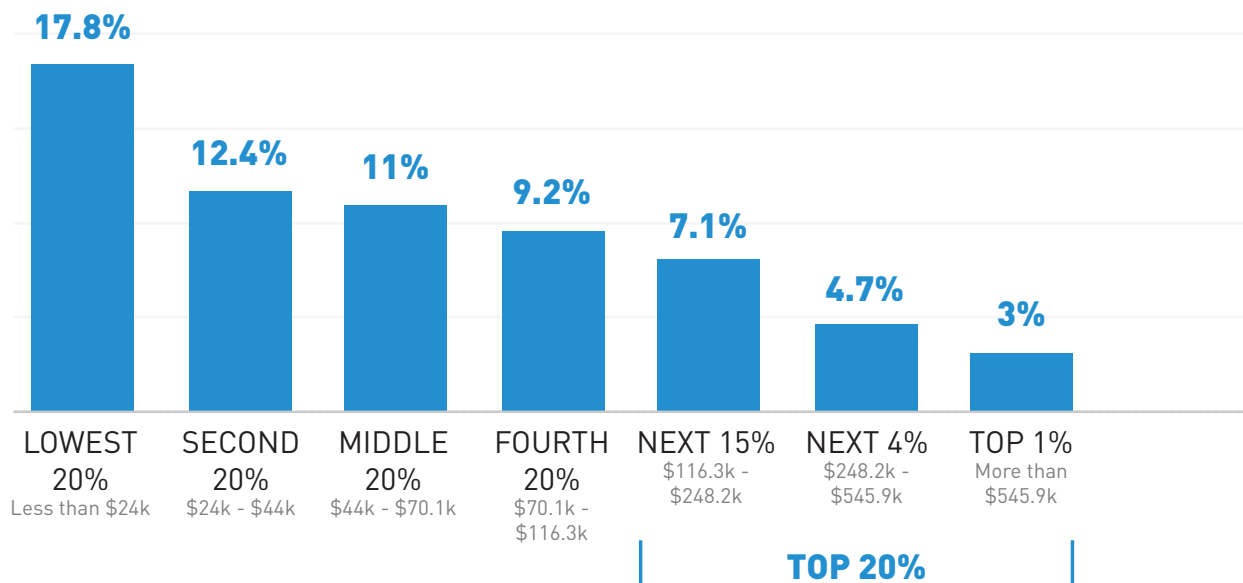
### 3.3 INITIAL EQUITY IMPACTS AND BENEFITS ANALYSIS

Our preliminary impacts and benefits analysis begins from a baseline understanding of regional transportation equity and considers the four pricing tools identified through the high-level screening discussed above. This allows us to benchmark potential congestion pricing to the current distribution of transportation costs and benefits.

#### CURRENT STATE OF EQUITY

Seattle and Washington State's revenue collection methods—including those for transportation—are highly regressive, collecting a far greater percentage of income from low-income households than from wealthy ones. This reality strengthens the case for a congestion pricing system that is sensitive to equity issues.

Total State and Local Taxes in Washington (Share of Family Income)



Source: Institute on Taxation and Economic Policy, 2018. "Washington: Who Pays? 6th Edition." <https://itep.org/washington/>



#### EQUITY

Sales and property taxes to pay for streets and roadways disproportionately burden people with lower incomes.





## POTENTIAL EQUITY IMPACTS AND BENEFITS

The existing inequities outlined above, informed by an understanding of historic discrimination in transportation and land-use planning against racial and ethnic minorities, are foundational elements of our analysis. We used existing datasets to identify potential impacts on travelers by income and race. Data is limited and largely regional in scale, meaning fine-grained results are not yet possible. (More precise data collection and analysis can be conducted when more specific pricing tools, methods, and geographies have been identified for further study.) Therefore, our analysis should be considered high-level and generally informative. It is not meant to predict actual outcomes.

Based on the results of the screening and the limitations of the existing data, we conducted a preliminary analysis of one type of pricing: a potential area pricing program. An area pricing program would charge people driving into or within downtown Seattle. Because area pricing captures more trips than cordon pricing, analysis of area pricing is compatible with the best data currently available. Note that we are not proposing specific boundaries as part of this initial work, but selected the general downtown area for analysis purposes.

The equity impacts and benefits of congestion pricing will depend largely on how we design our program. Any pricing program can be structured in a way that is more or less equitable. Structuring pricing to reduce the impacts on specific communities of concern, such as low-income households, can make a pricing program more equitable. Likewise, investing revenues generated by pricing into carefully-chosen programs, such as public transit and traffic safety, can provide benefits to historically disadvantaged communities.

To understand the potential equity implications of an area pricing system, we analyzed data from the U.S. Census, which includes only commute trips. The Census-based analysis suggests that approximately 13% of workers who drive in the region would be affected by a downtown pricing program.

## INITIAL FINDINGS

To reflect our focus on equity and concern for priority populations, we used the existing data on workers who drive in the region to analyze the percent of drivers that might be affected by a potential downtown area pricing program in two categories: income and race.

Because the details of a potential pricing program are not yet defined—meaning both a pricing structure and exemptions—we are not able to estimate the magnitude of the impact that a particular driver or group of drivers might face. Rather, this initial analysis tells us only about the relative numbers of people in different categories who might experience a pricing program.

In the next phase of study, we will build a pricing model that allows us to take this high-level analysis and estimate the magnitude of impacts and benefits on specific populations.

As noted on the previous page, the drivers represented in this analysis make up approximately 13% of workers who drive in the region.

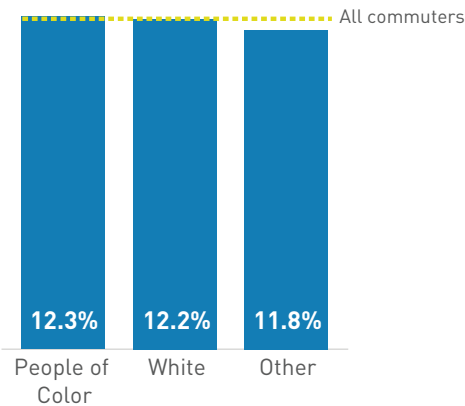
### Race

Within the 13% of people who drive that would be impacted by a potential program, we looked at the percentage of people in various demographic groups. Although these 13% of commuters include many fewer people of color than white people, we normalized the data by total regional demographic population to most accurately reflect the likely impact on each group. The analysis shows that approximately the same percentage of people of color and white people would be impacted by a potential downtown area pricing program. The percentages for both groups are similar to the overall percent of the population that would be impacted. People who identified as more than one race or didn't select their race (shown as "Other") would also be affected at approximately the same rate.

### Income

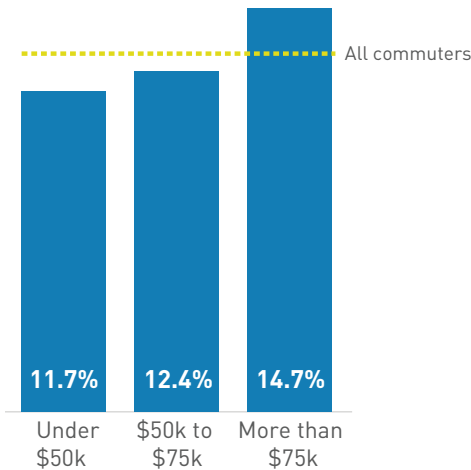
We used the same approach for the income analysis. The data show that a larger percentage of people with incomes over \$75K would be affected than people with incomes under \$50K. This doesn't, however, reflect the magnitude of impact; it indicates only the percentage impacted within each group. These results reflect the fact that this initial analysis includes only jobs within downtown Seattle and only people who drive to those jobs. It does not include people who may drive through downtown to get to a job elsewhere in the region. The added cost of parking downtown may deter some lower-income workers who drive, and affect transportation costs for those who do.

Percent of Drivers (Commute Trips Only)  
Impacted by Pricing, by Race



Source: LODES and ACS. Universe: Workers age 16 and over in PSRC counties.

Percent of Drivers (Commute Trips Only)  
Impacted by Pricing, by Income



Source: LODES and ACS. Universe: Workers age 16 and over in PSRC counties.





## Transit Riders

Compared to the general population of King County, transit riders (for all trips, on King County Metro services) are more likely to be older, lower-income, and people with disabilities. Therefore, congestion pricing benefits for transit may have a positive impact on regional equity. These benefits could include reduced transit travel times, which saves commuters time and frees transit service hours that could be reinvested in the system.

### Potential Area Pricing Benefits for Public Transit



**55 SERVICE HOURS**  
are gained  
**PER DAY**



That's like getting a  
**BONUS TRANSIT**  
**ROUTE**  
for free



Each commuter saves  
**6 MINUTES**  
on the bus  
**EVERYDAY**



That's like getting  
**1 EXTRA DAY**  
each year for  
**EVERY COMMUTER**



## NEXT STEPS FOR IMPACTS AND BENEFITS ANALYSIS

The populations that may be impacted as suggested by these analyses are still very preliminary and would vary widely depending on the specific design of a congestion pricing program in Seattle. We will conduct more in-depth analysis as we develop pricing proposal details (such as exact geography, methods, prices, discounts or exemptions, and other variables), which will allow more accurate prediction of likely impacts and benefits. We are committed to identifying and addressing potential

equity impacts as a core element of developing an equitable pricing program. One theoretical approach to doing so is shown in the graphic below.

This initial analysis was intentionally focused on potential equity effects. In addition to a continued focus on equity, we will also develop a transportation model to analyze effects on congestion, greenhouse gas emissions, mode shifts, costs and benefits, and time savings.

### Sample Approach to Creating a More Equitable Pricing Program

#### PRICING AND INVESTMENT STRATEGY COMBINATIONS

Variable pricing + targeted exemption + transit and vulnerable communities focus

Variable pricing + targeted exemption + transit focus

Variable pricing + targeted exemptions + limited transit investment

Variable pricing + targeted exemptions + no supportive investments

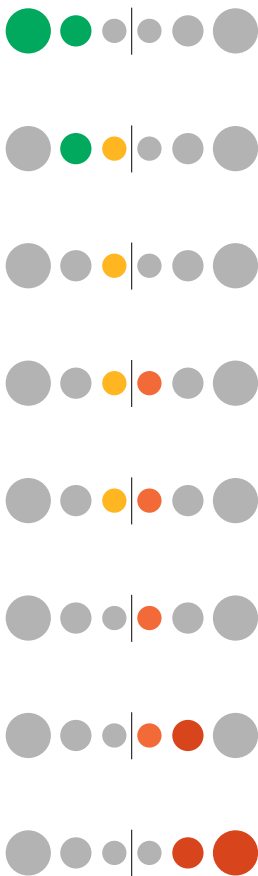
24-hr flat rate + transit and vulnerable communities focus

24-hr flat rate + transit focus

24-hr flat rate + limited transit investment

24-hr flat rate + no supportive investments

#### EQUITY IMPACTS



MORE EQUITABLE



LESS EQUITABLE

# TRAVEL TIMES



## CHALLENGE

Overall travel times are increasing on most corridors in the Puget Sound region, particularly during the afternoon commute. This can slow the most efficient travel options that move more people, including the 37% of commuters on a bus.<sup>14</sup>



## OPPORTUNITY

Traffic that flows more reliably helps to get people and goods where they need to go on time, any time of day. Trips can be faster for both drivers and people riding transit.

Average travel times to or through Seattle on I-5, the SR 520 bridge, and the I-90 bridge **triple during the afternoon peak.**<sup>15</sup>



**Non-peak  
travel time**



**Peak travel  
time**



## EQUITY

Unpredictable travel times can compromise quality of life and job security, especially for people who work multiple jobs or who have fewer travel options.

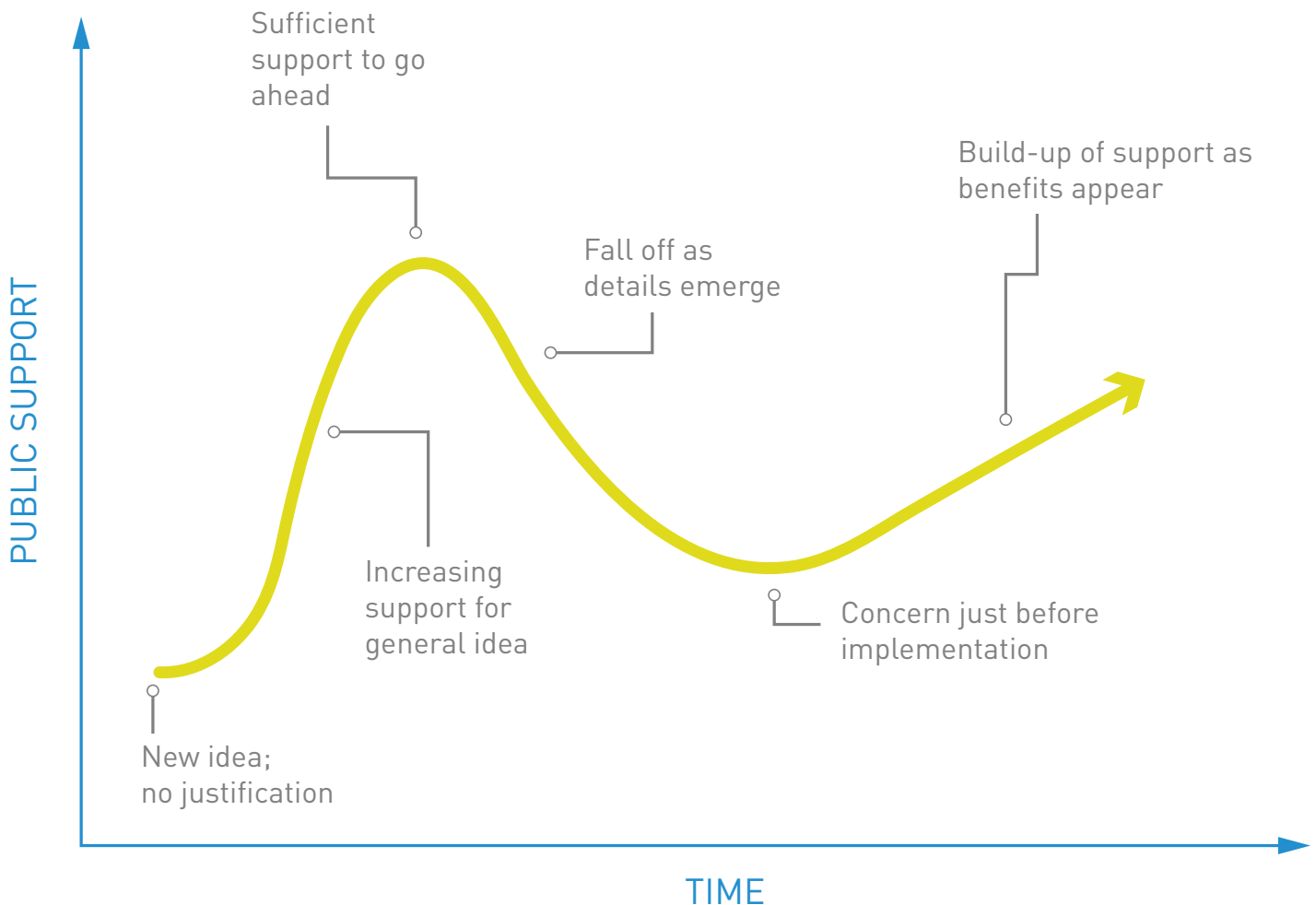
## 3.4 ENGAGEMENT AND COMMUNICATIONS

Other cities' recent experiences in implementing congestion pricing show that effective communication is key to success. Implementing a pricing program is challenging: public support can be expected to rise and fall over the course of public conversation leading up to implementation, and to rise again after the public experiences the benefits of the project. Pricing policies often trigger the phenomenon known as "acceptability decreases with detail." Once the pricing system is in place, however, support generally increases.

There are two possible explanations for this: (1) the system works and people are happy with the benefits, or (2) people's initial fears are not realized. This is often described as "familiarity breeds acceptability."

Cities that have implemented pricing programs have used communications programs that are goal- and solution-oriented, tailored to specific questions, and simple to understand. Best practices suggest the approaches described on the following pages.

**Road Pricing Public Support Curve**



Source: Adapted from Centre for Transport Studies Stockholm



## USE GOAL- AND SOLUTION-DRIVEN MESSAGING

Stockholm and London both established clear messaging around goals early in their processes. Though public support varied throughout the policy-making phase, high-level messaging and communications of goals was consistent; in Stockholm, public support ultimately skyrocketed after implementation of a pilot program. London's Ultra-Low Emissions Zone specifically aims to address air quality. Transport for London's website includes research and data about air pollution and its impacts, especially on children.

Page from Transport for London's Website

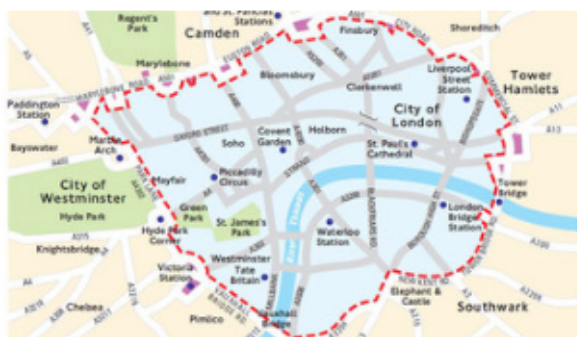
# Ultra Low Emission Zone

## ULEZ is coming

To help improve air quality, an Ultra Low Emission Zone (ULEZ) will be in place in central London from 8 April 2019 in the same area as the Congestion Charge. Most vehicles including cars and vans will need to meet new, tighter exhaust emission standards (ULEZ standards) or be liable for a daily charge to drive within the ULEZ area.

[Check your vehicle](#)

[Check by postcode](#)



### Where and when

Will the ULEZ or Low Emission Zone affect you? [>](#)



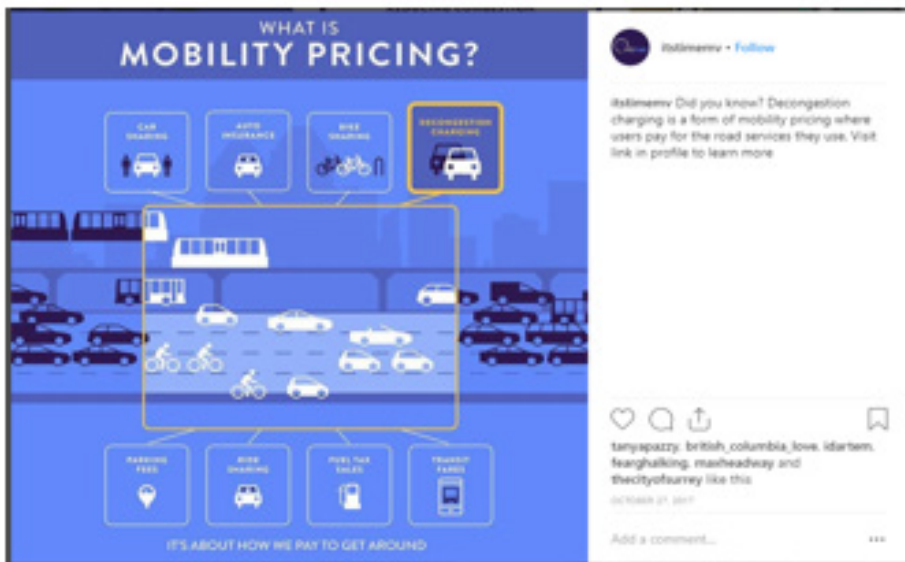
### Why we need the ULEZ

Every child in London is breathing in toxic air [>](#)

## UNDERSTAND AUDIENCES AND STAKEHOLDERS

Successful programs have engaged a variety of audiences early and regularly, especially potential supporters, skeptics, and populations that may be (or perceive themselves as) adversely affected. Washington State began discussion and outreach for its road usage charge program nearly 10 years before implementing a participatory pilot project. This process produced more than 2.5 applicants for each slot available in the pilot. Vancouver, BC developed educational materials for both print and social media to increase the reach of their mobility pricing communications. “It’s Time” Metro Vancouver Instagram posts leveraged social media to communicate the policy purpose and educate the public about opportunities to engage in the plan development.

### Example Social Media Posts from Vancouver

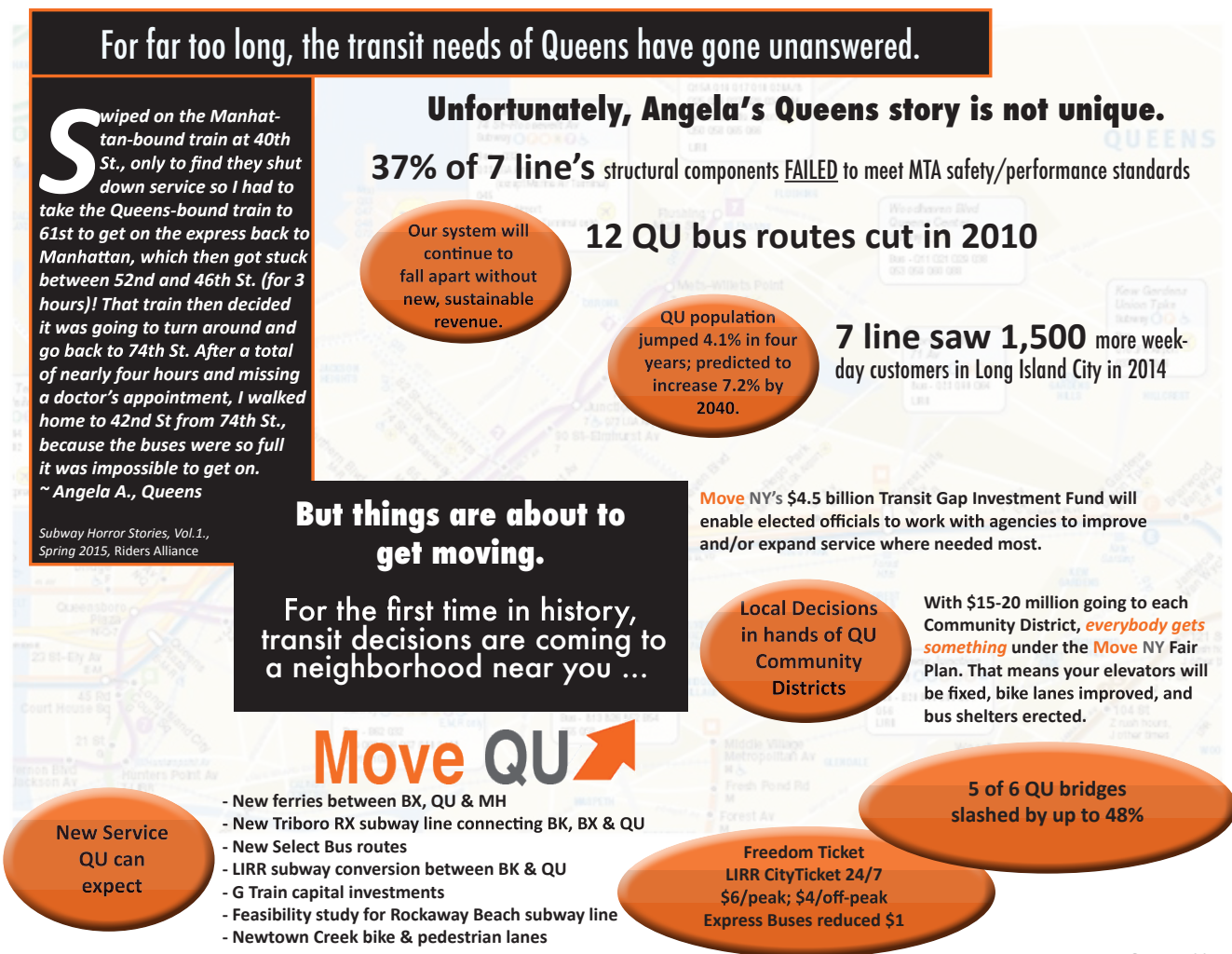


Source: Metro Vancouver Mobility Pricing Independent Commission

## DEVELOP CLEAR COMMUNICATIONS AND MATERIALS

Develop communications that support pricing goals and messaging, are tailored to specific audiences, and reflect the stage of policy development. In New York City, pricing advocacy group MoveNY created factsheets for specific neighborhoods and outer-borough areas, explaining the benefits of a congestion pricing program to small geographies on an individual basis.

### Example from MoveNY Communications Materials



Source: Move NY

## OUTREACH AND COMMUNICATIONS NEXT STEPS

With our initial research and analysis completed, an important next step will be to begin engaging people who live in, work in, and visit Seattle in a conversation about pricing. As part of that we will develop a full public engagement and communications strategy with an equity focus. That strategy will help us to provide authentic opportunities for feedback and to ensure that we are transparent about how we use that input.









# 4

## NEXT STEPS

With this initial research and analysis phase complete, we have:

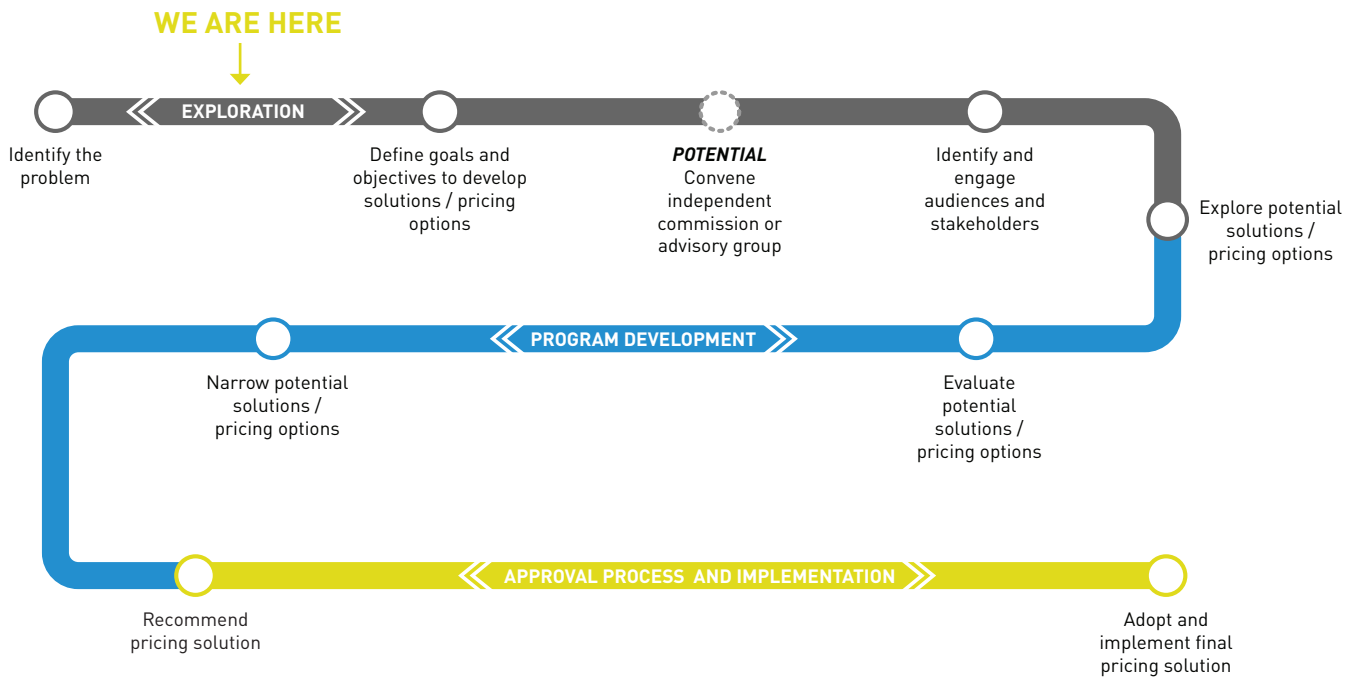
- Identified four tools as promising concepts for future study
- Noted potential equity impacts that require further analysis
- Started to understand the types of benefits a pricing program could provide

Our next steps to build on the work summarized in this report are described in this chapter.

## 4.1 POLICY DEVELOPMENT

The graphic below depicts next steps and potential milestones for developing a congestion pricing program in three phases: exploration, program development, and approval and implementation.

### Stages of Policy Development



A well-designed pricing program can support equitable, efficient, and affordable travel and improve our quality of life.

### DEVELOPING AN EQUITY STRATEGY

We will work in partnership with the community to develop a comprehensive equity strategy around pricing, ensuring that both the planning process and any future program are inclusive and equitable. Designing an equitable pricing program will require a commitment to both process and program equity, including deep engagement, extensive analysis, careful program design, and appropriate supports and mitigations.





## BEGINNING PUBLIC ENGAGEMENT

We will ensure authentic opportunities for feedback, and demonstrate how feedback is incorporated. With a focus on process equity, we will seek broad engagement. We will reach vulnerable communities, including those who are less likely to participate in traditional outreach activities. And we will share information that helps everyone understand what congestion pricing is and is not.



## REFINING AND PRIORITIZING GOALS

To support more robust analysis of a potential pricing program, we will work with the public and stakeholders to clearly articulate values and goals to help define what a pricing program should achieve. To date, congestion reduction, climate impact mitigation, equity, livability, and revenue potential have been discussed as possible goals.



## CONTINUING IMPACTS AND BENEFITS ANALYSIS

As we engage with the public and begin to refine what a pricing program might look like, we will continue to analyze potential impacts and benefits. As part of this, we will gather new data and create models and tools that will allow us to compare the impacts and benefits of different policy variations, including how those accrue to diverse populations in Seattle and the region. We will maintain our focus on program equity, conducting the analysis in ways that shed light on impacts and benefits to our most vulnerable neighbors.



## IDENTIFYING SUPPORTIVE PROJECTS AND PROGRAMS

As part of establishing a successful and equitable pricing program, we will engage with the public and begin to identify options for reinvesting pricing revenue in transportation-related projects, programs, and services. This is a key element of program equity and requires a clear understanding of community impacts and benefits.



## UNDERSTANDING IMPLEMENTATION

Implementing congestion pricing in Seattle would require approval by a majority of Seattle voters, and there may be a role for the Washington State Transportation Commission in setting rates. Once a policy is designed, much work remains to secure approval and prepare for implementation.



## CONCLUSION

Congestion pricing has the potential to provide many benefits that people in Seattle and the region value, including mobility, climate protection, and health. Much work remains before we will be ready to implement congestion pricing, and we look forward to engaging with the community as we move forward.

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