

**BEFORE THE PENNSYLVANIA
HOUSE TRANSPORTATION COMMITTEE**

**Testimony of
Scott Petri and Daniel Mulvenna**

Regarding

**House Bill 631
Harrisburg, Pennsylvania
April 18, 2019**

My name is Daniel Mulvenna and on behalf of the Philadelphia Parking Authority, I am pleased to present this testimony to Chairmen Tim Hennessey, Mike Carrol and other honorable members of the committee. The Philadelphia Parking Authority's mission is to provide for safe and continuous traffic flow in the right of way. One of the guiding principles of that mission is utilizing innovation and technology to improve the quality of life for the traveling public. Like many other major cities, Philadelphia is faced with a growing and all too common issue of traffic congestion. Unlike most cities however, Philadelphia has the smallest roadways and sidewalks. Traffic congestion is damaging to both public safety and economic growth. With the advent of the online market place, population growth in center city, and Transportation Network Companies, congestion is only going to worsen in Philadelphia. In attempt to mitigate the effects of this problem, a new industry has risen around dockless mobility scooters and dockless bikes-shares. In municipalities that have authorized this mobility, response from the public has been mostly positive, especially among underserved communities and minorities. For example, a recent report from Denver found limited availability to be the biggest complaint. With more jobs added to the local economy, reduced traffic congestion during peak hours, and the promise of a more environmentally friendly mode of transportation, the micromobility industry appears to be here to stay with municipalities as a new objective. As transportation partners in the city of Philadelphia, the Philadelphia Parking Authority is proud to be part of this conversation. With that being said, we are neutral at best in this matter, but only if the enabling law enacted by the legislature gives to local municipalities the discretion they deem appropriate. The PPA is also concerned with the impact to public transportation. SEPTA is a key transportation partner for our region. An

independent study should be undertaken to ensure there will not be a negative impact on ridership. There are many residents in Philadelphia who depend on public transit. Will residents who are unable to access scooters be negatively impacted? When weighing your decision on permitting micromobility devices, we strongly urge that you consider the economic impact on public transportation such as SEPTA.

A micromobility program begins with regulation and enforcement, which leads to the question, how will these devices be regulated and enforced? The answer to these questions may be different for each municipality, but all can benefit from a few guidelines. Defining where, when, and how these vehicles will be allowed to distribute, travel, and park is an issue municipalities are approaching differently. Some may allow for devices to be parked in the “furniture zone”, others may find it beneficial to create on-street parking corrals, but first municipalities should reserve the right to determine the where, when, and how of parking and distribution of vehicles. With regulation comes enforcement. As regulators of Taxi’s, Limos and TNC’s we urge you to require operators to be responsible for user violations, given the impracticality of regulating individual use. In addition, reserving the right to impound and penalize operators for improperly placed devices will give municipalities the ability to prevent further abuse. In one instance, Arizona State University impounded over 800 scooters in one month because of abuse. Data on safety and injuries currently is scarce and until we have more information, municipalities should have oversight over operators in order to keep their vehicles in operational order and from operating on sidewalks. Additionally, public safety would benefit from having regular maintenance schedules and data surrounding maintenance.

How municipalities fund a regulatory program should center on fees tied to operators. Fee structures greatly differ among municipalities. Finding the right structure ensures the proper funding to make a micromobility program viable. Some of the fee types currently seen in municipalities are annual, permit, per trip, and per device per day. Permit fees should be balanced so as not to exclude smaller companies and limit public access due to high prices. For this very reason, some municipalities have already lost operators. Fees are best used when they are tied into maintaining, regulation, and infrastructure improvement. We urge the legislature to allow municipalities to receive device and per trip, and annual fees. Doing so would allow a municipality to scale its enforcement and infrastructure costs to the size of new fleets.

Municipalities have also used fees as a way of capping fleet sizes. Almost all municipalities have fleet caps, with a range of 500 devices to 10,000 plus. To arbitrarily set a cap on these devices could also ruin a program. Municipalities would be best served by setting performance caps to allow for flexibility of fleet sizes, but also reserve the right to limit fleet sizes at any time and or location. Allowing for flexibility to meet consumer demand and special events would create for a more dynamic system where the public would be better served. Finding the right fleet size will prove challenging, but can be better determined by having access to data.

Now more than ever, municipalities can determine the where, when, and how of micromobility devices by having access to data from operators. Data is the key to a micromobility program. With a data access plan in place, municipalities will be able to determine fleet sizes, device location, commuter trip specifics, and vehicle usage. There are now a few companies' partnering with municipalities to provide the necessary platform needed

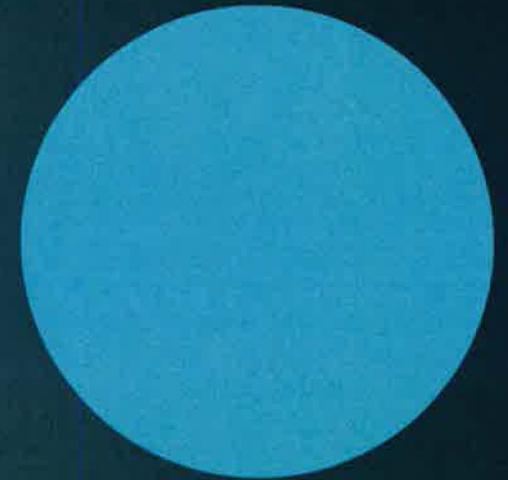
for a data access plan. Companies such as Remix and Passport use tools such as a General Bikeshare Feed Specification (GBFS) and Mobility Data Specification (MDS) to help municipalities tailor their program. Philadelphia, through the Office of Transportation, Innovation, and Sustainability (OTIS) is acquiring a data platform, which is an open API similar to that utilized in LA for all transportations providers. An API gives municipalities the ability to interact with a GBFS or a MDS. Conversely, municipalities would be best served by having access to both real-time and historical data, while requiring privacy and anonymity for riders. Access to data rounds out a successful micromobility program. A conversation with the regulators from Denver and a review of their pilot report showed their initial inadequacies stem from an insufficient data access program. Consequently they could not make informed policy. In contrast, Portland's recent pilot report shows how a city can successfully navigate these issues. Without data, municipalities are blind and unable to operate with the flexibility and nuance needed.

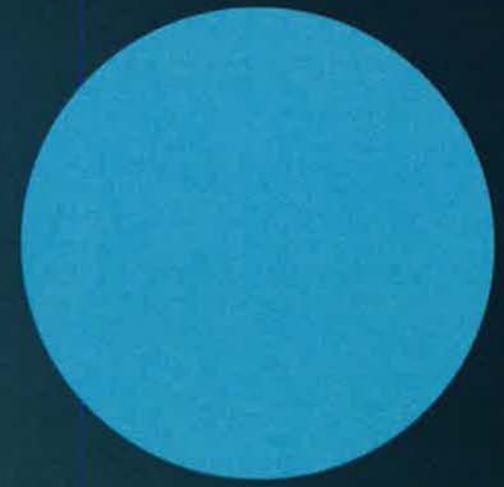
Early on municipalities failed to effectively confront TNC's such as Lyft and Uber. This mini revolution caused by TNC's was the first major shift transportation had seen in decades and has opened the doors for more to come. With the experience gained from the shift TNC's caused, municipalities can and should be able to react. For your consideration, we will be providing you with a useful resource from the data company Remix, called 'Remax Mobility Brief – Micromobility Policy Survey' by Rachel Zack, Isaac Shapiro, and Charlie Bailey, policy strategists at Remix. This study provides guidance for regulating Micromobility. Ultimately if the Commonwealth allows micromobility, the program should be through a pilot controlled at the municipal level and require the industry to comply with the following.

- Safety regulations established by the municipality.
- Pay fees such as, per trip, per device, and technology fees.
- Provide data in an open platform.
- Comply with drop off zones and areas where pick up and drop offs are prohibited.
- Right-size the size of fleets.
- Require equity as to where devices are deployed.
- Be responsible for all violations to ease enforcement.

Lastly, if you want to see how detailed a pilot program needs to be. I encourage you to review the program by the city of Portland included in your packet.

Micromobility

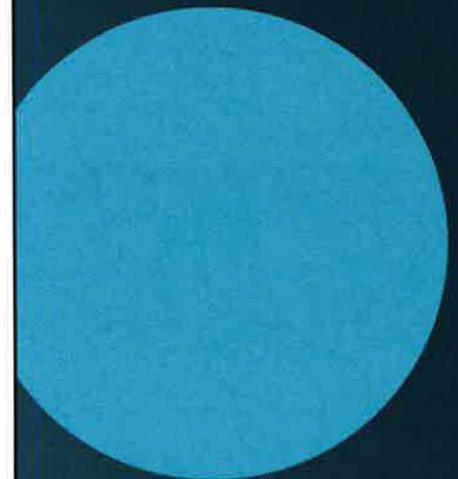




How Bird Works

Equipment

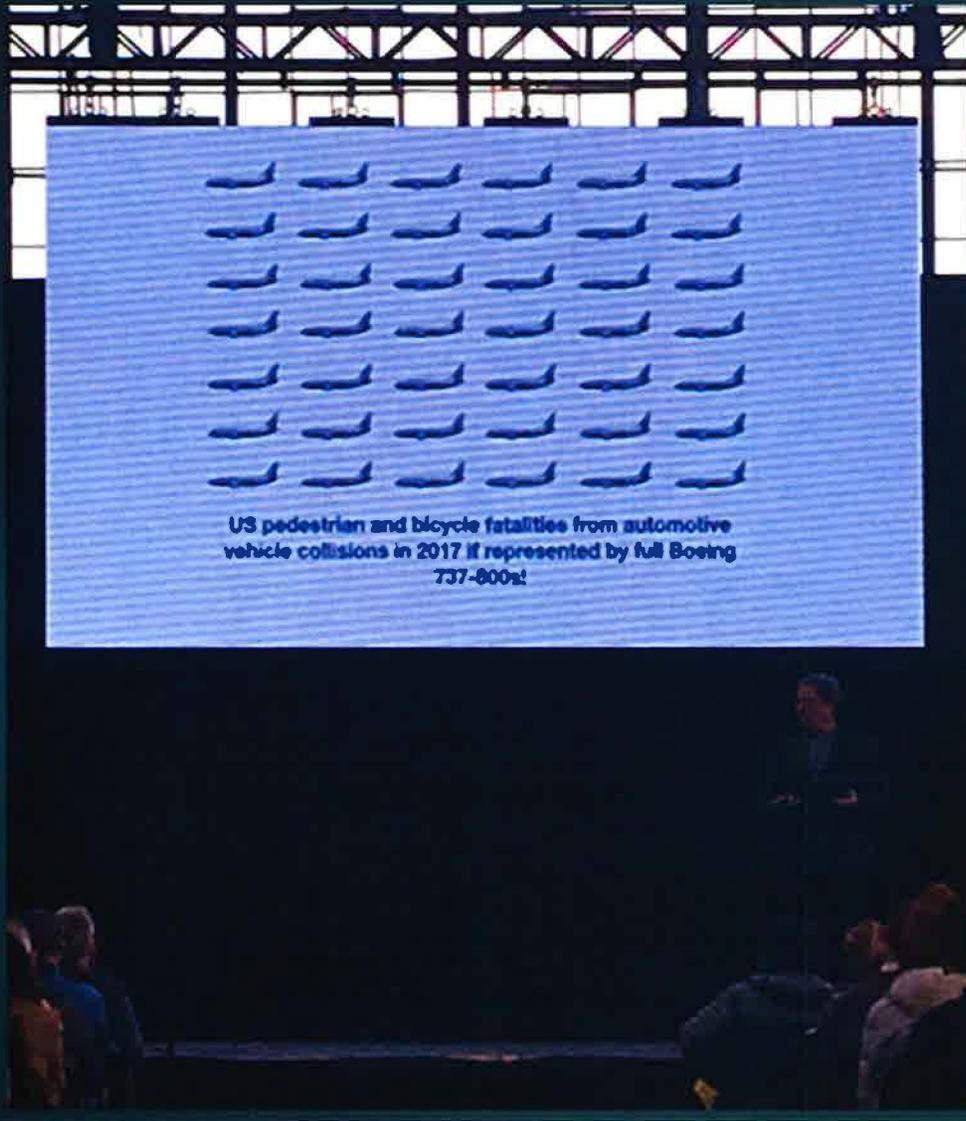
Riders push-off with their feet to get going and to assist the scooter during steep inclines



HOW MUCH DOES IT REALLY COST US CITIZENS TO SIT IN TRAFFIC

● Annual delay per commuter (hours) ● Annual fuel wasted (gallons) ● Annual cost per commuter (\$) ● Nationwide cost of congestion (\$ in billions)





US pedestrian and bicycle fatalities from automotive vehicle collisions in 2017 if represented by full Boeing 737-800s!

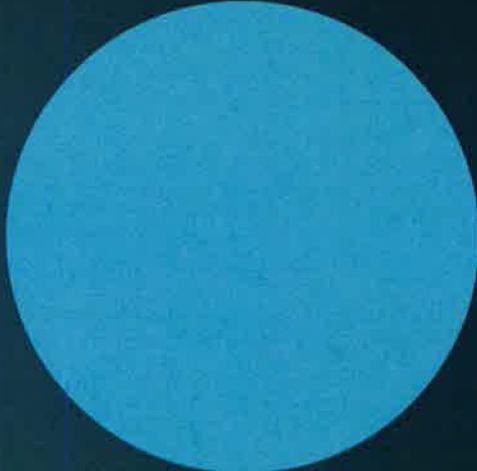


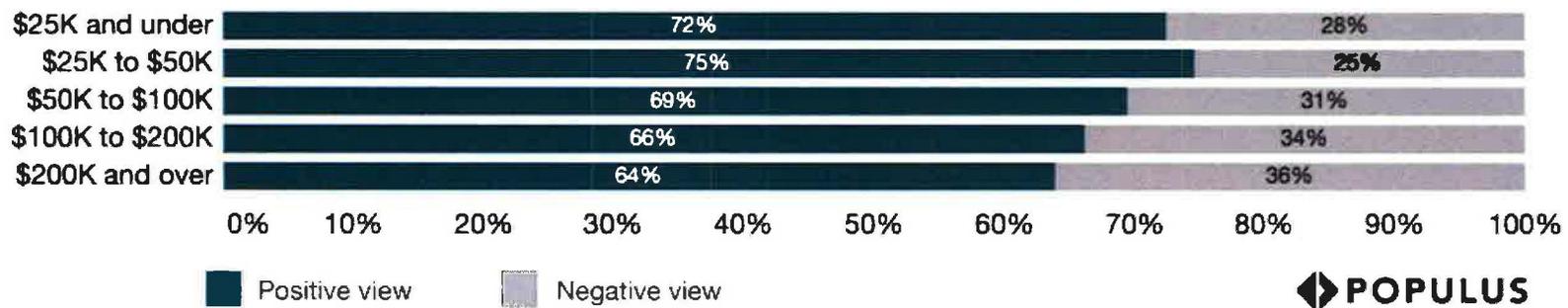
Fig 5. OPINIONS OF E-SCOOTERS BY GENDER



Source: Populus 2018 Groundtruth

POPULUS

Fig 6. PUBLIC PERCEPTION OF E-SCOOTERS BY INCOME

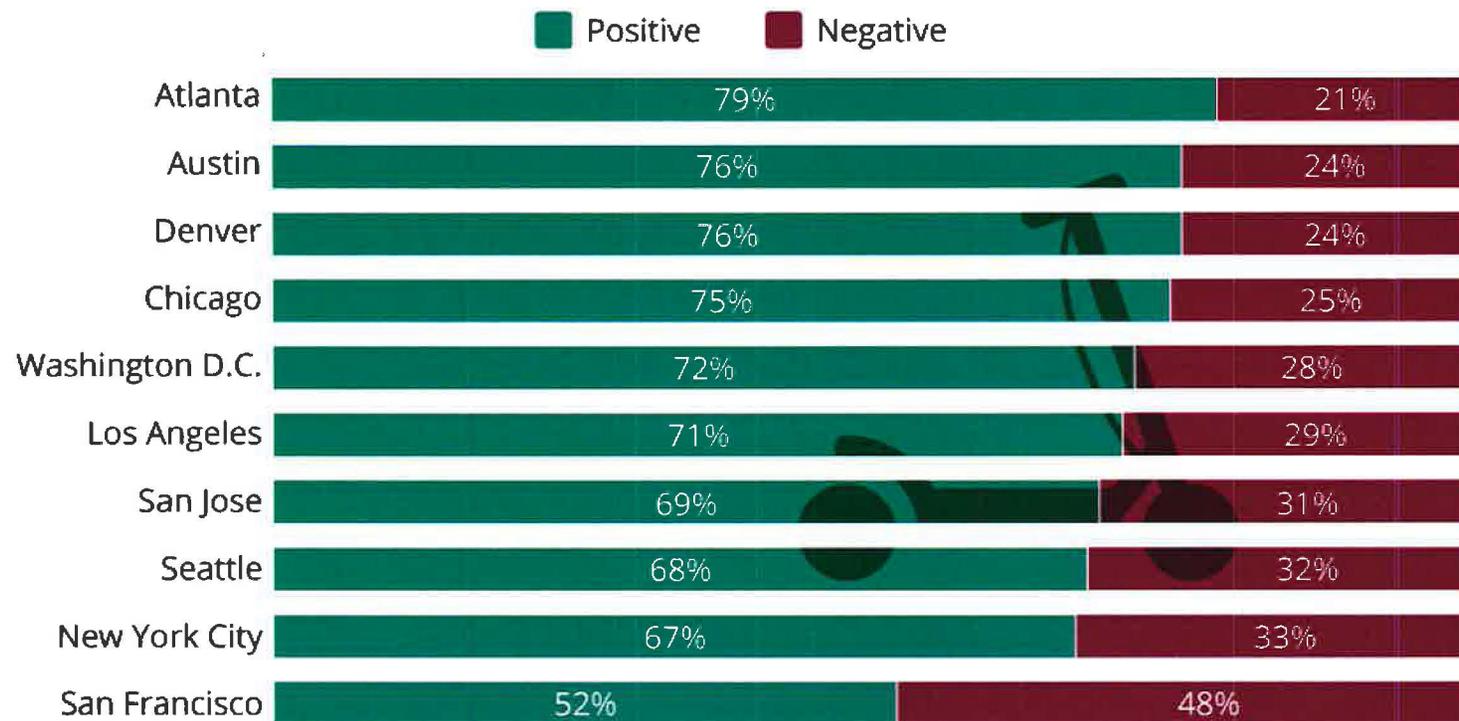


Source: Populus 2018 Groundtruth



Majority of U.S. City Dwellers View E-Scooters Positively

Public perception of e-scooters in major U.S. cities in 2018



@StatistaCharts

Based on a survey of 7,000+ individuals across 10 major U.S. cities conducted from May-July 2018

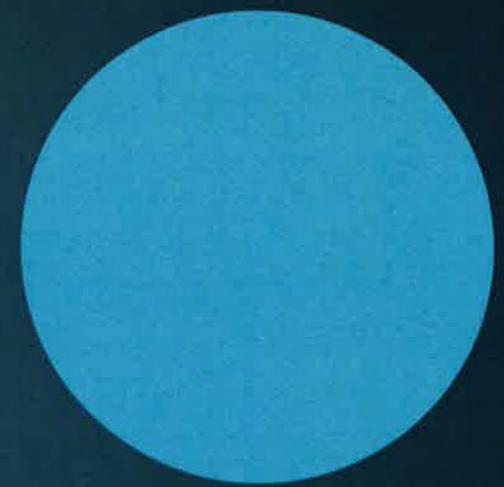
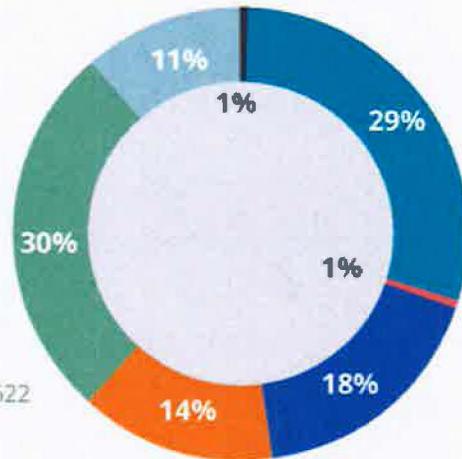
Source: Populus 2018 Groundtruth

statista

Portland

Figure 3 : Complaints by Category

-  Device Issue - 38
-  Helmet Issue - 1754
-  Injury - 33
-  Other - 1062
-  Parking Issue - 844
-  Unsafe Riding on Sidewalk-1622
-  Unsafe Riding on Street-671



In US cities, a rider using Lime products in conjunction with public transit would pay, on average,

80% less than the cost of owning and operating a personal vehicle



\$28.18

AVERAGE DAILY COST
OF CAR OWNERSHIP IN
US URBAN MARKETS



\$8.21

LIME-S (x2 TRIPS)
+ PUBLIC TRANSIT (x2 TRIPS)



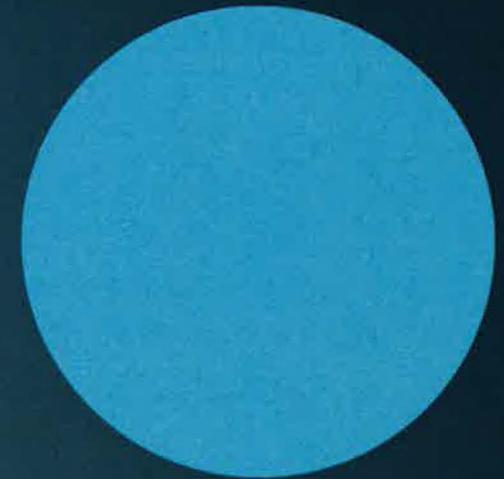
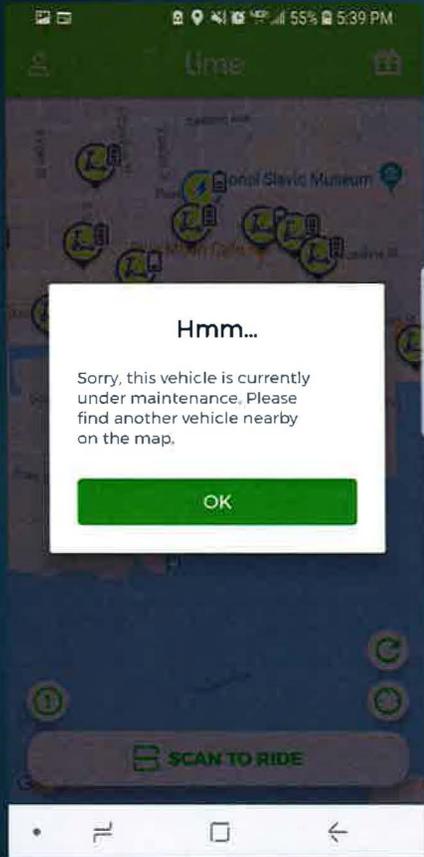
\$7.60

LIME-E (x2 TRIPS)
+ PUBLIC TRANSIT (x2 TRIPS)



\$4.25

LIMEBIKE (2.12 MILES)
+ PUBLIC TRANSIT (x2 TRIPS)

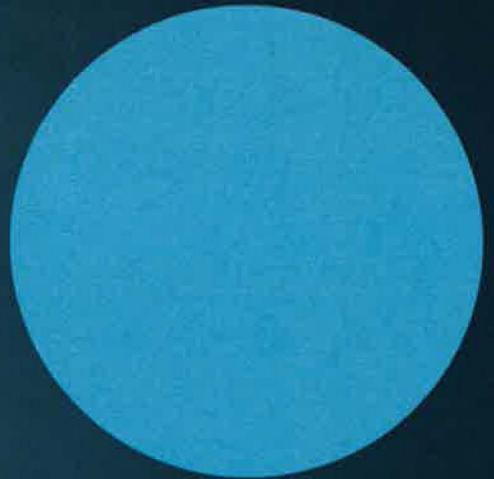
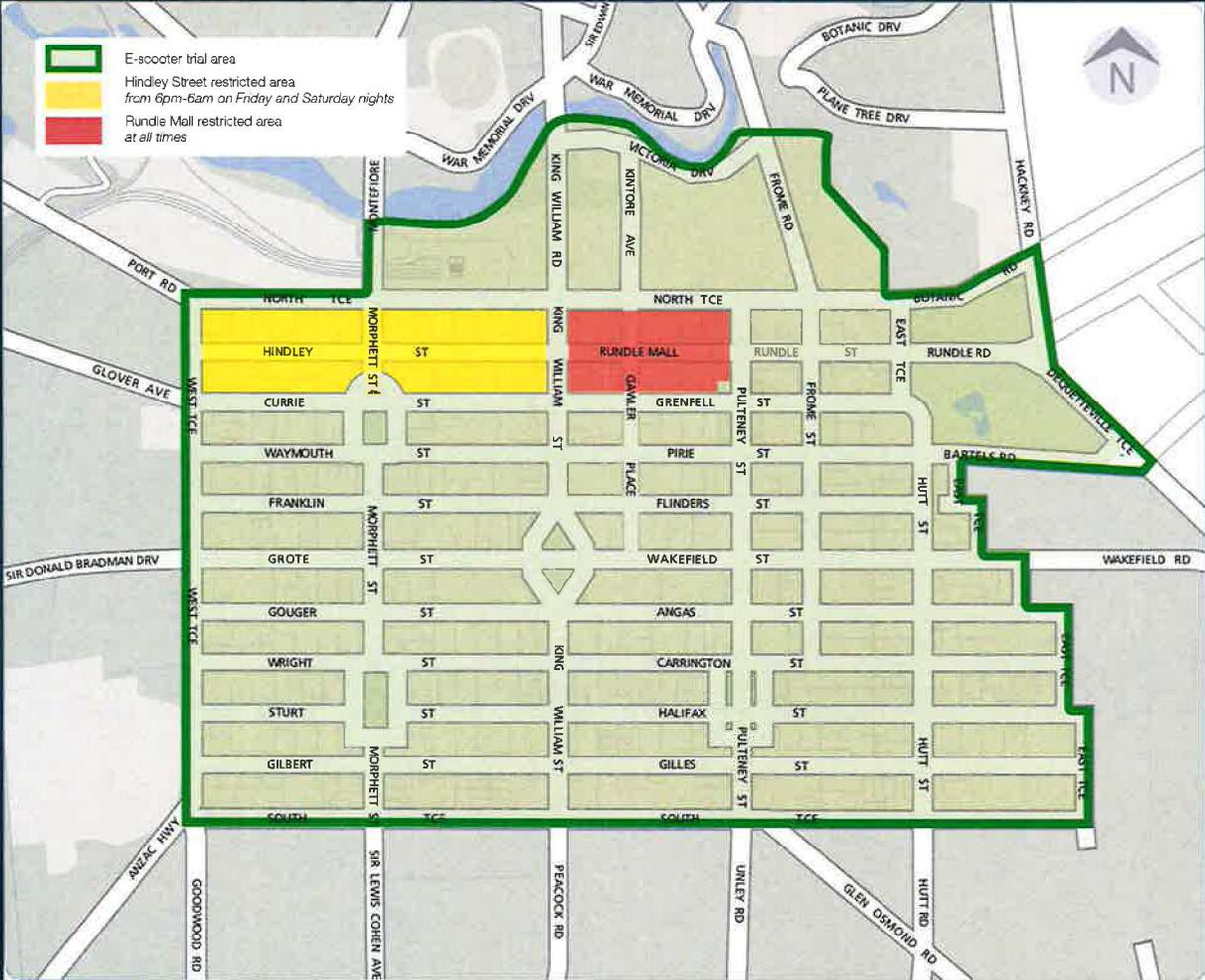




HAPPENING TODAY

- CITY CREWS TO CONFISCATE DOCKLESS SCOOTERS THROUGHOUT SAN FRANCISCO





[John Entwistle @marijuanadotorg](#) 19 Apr 2018

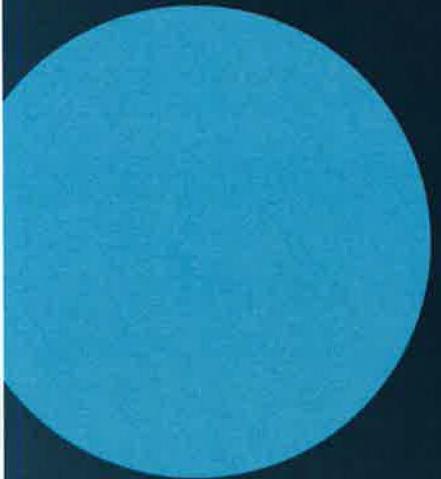
We simply do not have the resources to enforce the laws against cowboy parking in San Francisco. Don't even bother reporting it. But those damned scooters...

0 replies 25 retweets 125 likes



APR 19 2018

City (by population)	ENFORCEMENT			FEES				FLEET CAPS		DATA SHARING	
	Parking	Service Area	Maintenance /Safety	Annual Fee	Annual Per Vehicle Fee	Daily Fees, Per: Vehicle/ Trip/Station	Other Fees	Caps Over 1000	Performance Based Cap	Real-Time	Standard-Based
Los Angeles	•	•	•	•	•			•	•	•	•
Chicago	•	•	•	•	•				•		
Houston	•		•	•	•		•	•	•		
Dallas	•	•		•	•			No cap			
Austin	•	•	•		•					•	
San Francisco	•	•	•	•			•	•		•	
Columbus				•	•		•			•	
Charlotte	•		•								
Seattle	•	•	•	•	•			•	•	•	
DC	•	•	•	•	•						
Nashville	•	•	•	•	•			•	•	•	
Portland	•	•	•	•		•		•		•	
Kansas City	•	•	•	•		•				•	•
Atlanta	•			•			•	No cap		•	
Miami				•		•	•		•	•	
Minneapolis	•	•	•		•	•	•		•	•	
St. Louis	•	•	•	•	•			•	•	•	



Austin Trip Data

transportation.austintexas.io/dockless-data/

All Modes

Total Trips 734,465 <small>Updated 4/12/2019 at 02:33 PM Data</small>	Total Miles 787,707 <small>Updated 4/12/2019 at 02:53 PM Data</small>	Average Miles 1.07 <small>Updated 4/12/2019 at 02:33 PM Data</small>	Average Minutes 13.31 <small>Updated 4/12/2019 at 02:33 PM Data</small>
Total Devices 9,342 <small>Updated 4/12/2019 at 02:33 PM Data</small>	311 Service Requests 1,117 <small>Updated today at 06:52 AM Data</small>		

Dockless Scooters

Scooter Trips 683,773 <small>Updated 4/12/2019 at 02:33 PM Data</small>	Total Miles 704,357 <small>Updated 4/12/2019 at 02:33 PM Data</small>	Average Miles 1.03 <small>Updated 4/12/2019 at 02:33 PM Data</small>	Average Minutes 13.02 <small>Updated 4/12/2019 at 02:33 PM Data</small>
Total Devices 8,709 <small>Updated 4/12/2019 at 02:33 PM Data</small>			

Dockless Bikes

Austin Trip Data

transportation.austintexas.io/dockless-data/

Dockless Bikes

Bicycle Trips 50,692 <small>Updated 4/12/2019 at 02:33 PM Data</small>	Total Miles 83,350 <small>Updated 4/12/2019 at 02:33 PM Data</small>	Average Miles 1.64 <small>Updated 4/12/2019 at 02:33 PM Data</small>	Average Minutes 17.27 <small>Updated 4/12/2019 at 02:33 PM Data</small>
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Total Devices
633
Updated 4/12/2019 at 02:33 PM | Data

About

This page summarizes dockless mobility trips reported to the City of Austin Transportation Department as part of the Dockless Mobility operating rules.

Data is drawn from our [dockless vehicle trips dataset](#) and is updated on a daily basis.

A trip record is included in this summary report if it meets the following criteria:

- Trip distance at least 0.1 miles and less than 500 miles
- Trip duration less than 24 hours

You may also be interested in our interactive map, [Dockless Data Explorer](#)

City of Austin Transportation Department
[Data](#) [Code](#) [About](#) [Contact](#) [Disclaimer](#)

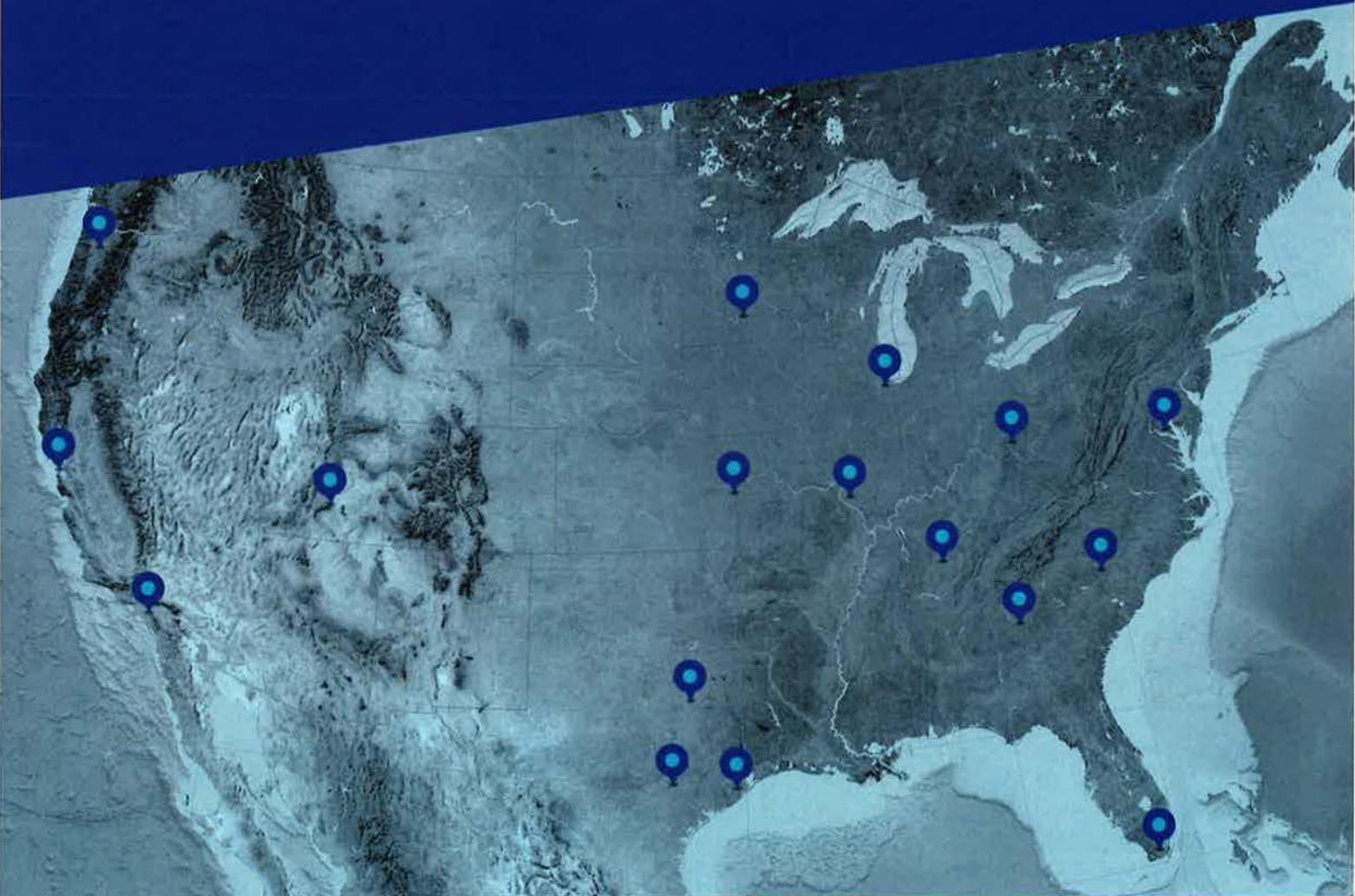
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8:29 AM
4/15/2019

REMIX MOBILITY BRIEF

Micromobility Policy Survey

Remix Policy Team



Executive Summary

IN AN EFFORT TO UNDERSTAND emerging best practices in the micromobility field, the Remix team reviewed 17 cities' scooter and bikeshare policies. Four key 'practice' areas emerged from our research:

enforcement, fees, caps, and data sharing. This executive summary covers some of our initial findings and recommendations, illuminating how cities are putting policy into action and setting themselves up for success.

City (by population)	ENFORCEMENT			FEES				FLEET CAPS		DATA SHARING	
	Parking	Service Area	Maintenance /Safety	Annual Fee	Annual Per Vehicle Fee	Daily Fees, Per: Vehicle/Trip/Station	Other Fees	Caps Over 1000	Performance Based Cap	Real-Time	Standard-Based
Los Angeles	●	●	●	●	●			●	●	●	●
Chicago	●	●	●	●	●				●		
Houston	●		●	●	●		●	●	●		
Dallas	●	●		●	●			No cap			
Austin	●	●	●		●					●	
San Francisco	●	●	●	●			●	●		●	
Columbus				●	●		●			●	
Charlotte	●		●								
Seattle	●	●	●	●	●			●	●	●	
DC	●	●	●	●	●						
Nashville	●	●	●	●	●			●	●	●	
Portland	●	●	●	●		●		●		●	
Kansas City	●	●	●	●		●				●	●
Atlanta	●			●			●	No cap		●	
Miami				●		●	●		●	●	
Minneapolis	●	●	●		●	●	●		●	●	
St. Louis	●	●	●	●	●			●	●	●	

This chart represents the status of policies in November of 2018. When determining whether or not an agency used a standard format for reporting, the team used a narrow definition, highlighting only requests for regular program reporting in standard format versus requests to simply show availability data through a standard such as GBFS.

ENFORCEMENT

When considering the need for enforcement, three key focus areas emerged across most cities: vehicle parking, service areas, and the maintenance of those vehicles to ensure rider safety.

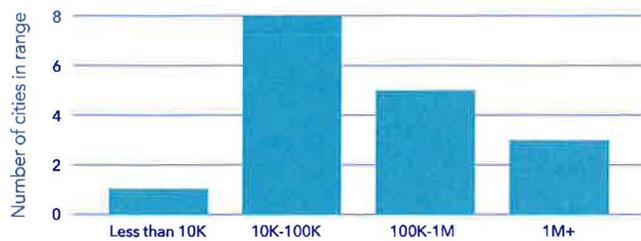
Parking	+++ +++ +++
Service Areas	+++ +++
Maintenance/Safety	+++ +++

The cities that we felt were best set up for success were the cities who set unambiguous guidelines for device parking with clear consequences for vendors if they fail to enforce them. Examples include cities who build digital enforcement infrastructure, such as the ability to geofence equity areas to enforce distribution requirements, or cities that can easily pull reports on device state-of-repair.

FEES

Micromobility providers' storefront is the public right-of-way, requiring additional city resources to be put toward managing that shared space. Fees allow cities to mitigate the financial impact of, and in some cases, capture revenue to invest in better infrastructure for safe operation. The review illuminated inconsistency in the total estimated amount of potential fee revenue, suggesting an inconsistent approach to fee amount and administration. Some cities may be underestimating the resources necessary for proper management and delivery of safe infrastructure for operations.

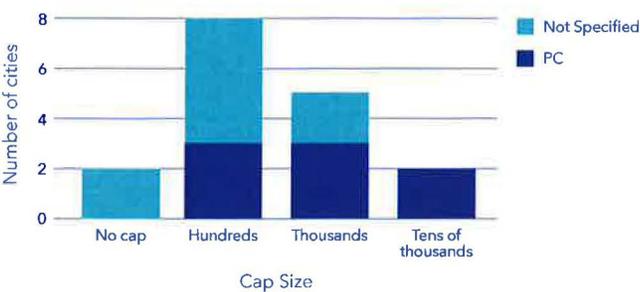
Estimated Annual Fee Revenue Ranges



CAPS

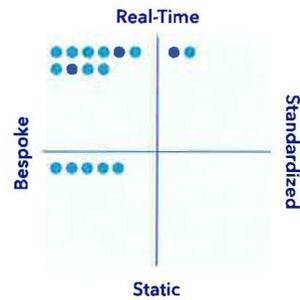
Caps, or an upper limit on the number of vendors and/or devices, was common across the 17 cities studied. Of cities who established fleet caps, some also provided a clear path to increased fleet size by establishing utilization thresholds as a guide to balance supply and demand, and performance measures to encourage outstanding service for their communities. There was no correlation between fleet cap size and city size. Only three cities chose to allow the supply of devices to reach the point of less than 100 persons per vehicle deployed. Two cities restricted supply to the extent of thousands of people per vehicle deployed.

Performance Cap (PC) Language vs. Not Specified



DATA SHARING

The 17 cities reviewed for this study show an increasing awareness for laying the digital infrastructure necessary to actively manage emerging mobility. New specifications, such as the General Bikeshare Feed Specification (GBFS) and Mobility Data Specification (MDS), have emerged, helping cities request standardized data. Additionally, cities are starting to request real-time data versus a static report format, allowing them more freedom to pull data as frequently as needed. By placing our findings on the axis below, we see that the majority of cities are starting to make real-time data requests. A small few are leading the way by requesting their regular reports be provided in a data standard.

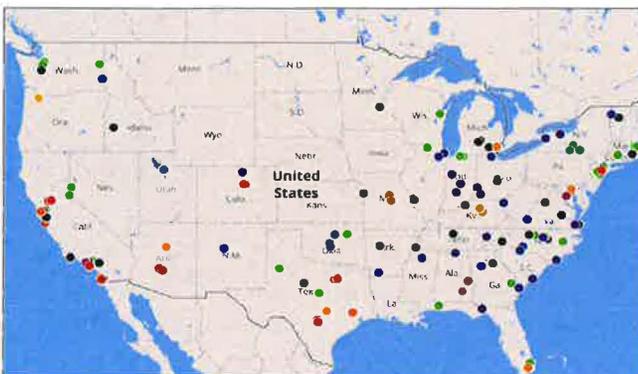


RECOMMENDATIONS

- When writing enforcement language, set clear, unambiguous rules around vehicle parking, service areas and vehicle maintenance.
- When setting fees for micromobility, consider establishing modest per-trip fees to pay for program management, enforcement and broader mobility goals such as safer streets, equity and designated parking. Fees to promote safer streets and better parking can help ensure the program is more successful.
- When establishing a cap, implement a utilization threshold to better balance supply with demand rather than accidentally stifling the growth of a program. Additionally, tie performance to opportunity to expand to encourage delivery on other key program goals.
- Establish digital infrastructure that allows for effective management and oversight of your program, as well as future planning efforts, such as building bike lanes or placing street furniture to improve program success.

Micromobility Policy Survey

TODAY, RESIDENTS IN OVER 50 U.S. CITIES are trying shared dockless e-scooters and bicycle services as a new way of getting around town. Based on recent statistics, they are getting used in a serious way. In a month's time, Portland estimated over 178,000 rides traveling more than of 270,000 miles. Santa Monica reported over half a million trips, and over a million miles on their dockless electric scooters alone. These figures represent a monumental change in city movement and local leaders are taking note.



US cities with current shared dockless services.

Source: Smartcities Dive

THE REMIX POLICY TEAM is a resource for cities striving to proactively plan the future of their transportation systems.

REMIX MOBILITY BRIEFS outline our perspectives on the future of mobility, and are informed by local best practices and conversations with industry experts.

With the launch of these services, cities have an opportunity to hatch partnerships that help ensure safety, provide a clear business environment, and help achieve local goals through policymaking. We selected 17 cities' recent policies to identify emerging best practices and themes, namely: enforcement, fees, fleet caps, and data sharing, and found cities have met the deployment of new dockless "micromobility"¹ services with an array of cautionary, enthusiastic and creative permit agreements. This report aims to answer the following questions:

- **Enforcement:** What are the core areas of concern for cities around micromobility service operations? How are these being conveyed?
- **Fees:** How are cities thinking about the financial impact of managing private micromobility provider operations on the public right-of-way? How might those fees be administered to represent not just this need, but to also make streets safer?
- **Caps:** How are cities thinking about fleet and vendor caps? What are the advantages and disadvantages of emerging practices?
- **Data Sharing:** What practices are emerging in requests for data? Which will provide cities with the digital infrastructure they need to actively manage and plan for the success of their programs?

¹ In this paper we will use the emerging term, 'micromobility,' as an umbrella for bikes, e-bikes, and e-scooter vehicles offered by micromobility providers through "dockless" smartphone enabled platform. The term has primarily emerged as a definition for lightweight electric powered vehicles, however, as many bikeshare systems move toward electrification, the line gets blurry.

Enforcement

Cities by and large are given the authority to enforce their traffic code. Each new traffic code regulation is, in turn, a new rule to enforce, often by way of patrol or public reporting. As cities write new ordinances and permits for dockless systems, three key topics emerged as central to enforce vendor operations: vehicle parking, service areas, and the maintenance of those vehicles to ensure rider safety. The chart below outlines the number of policies with language on each subject:

Parking	
Service Areas	
Maintenance/Safety	

Roughly three quarters of policies we surveyed had language on all three of these subtopics; parking regulations, the most common subtopic, appeared in all but two.

VEHICLE PARKING

Micromobility can potentially help agencies meet their equity goals related to the underserved edges to overcome specific, otherwise-vexing issues. A recent survey found that dockless electric scooters enjoy higher positive public perception from lower-income groups, indicating desire for the services in lower-income neighborhoods. These Sidewalks provide valuable space for people to travel and recreate safely on foot. The influx of micromobility devices increases competition for this already-scarce city resource. Despite this, cities frequently establish guidelines for micromobility device parking to occur in the "furniture zone." NACTO defines this area as "the section of the

sidewalk between the curb and the through zone in which street furniture and amenities, such as lighting, benches, newspaper kiosks, utility poles, tree pits, and bicycle parking are provided." The furniture zone is typically the only remaining space on the sidewalk that can accommodate these new vehicles, though it too faces capacity challenges.

As an alternative, some cities like Santa Monica are starting to incorporate "micromobility corrals" where on-street parking is repurposed to expand storage and create a more permanent and legible home for these vehicles. City policies require vendors to build in mechanisms for educating users about proper parking, including in-app messaging and external outreach. Most policies we surveyed place the onus on vendors to enforce parking policy and pass through the costs of managing delinquent vehicles, such as ticketing and towing, to vendors as well.

Some cities, such as Austin and San Francisco, go further by granting themselves the authority to set up geofences, or specific areas where parking is digitally prohibited outright through the vendor app. Cities may request geofences in areas with high pedestrian volumes, which may consistently push the limits of sidewalk capacity or special events.



Micromobility "Drop Zone" in Long Beach, CA

Source: Tom Bertulis

SERVICE AREAS

Whether citywide or confined to priority areas, cities and micromobility providers should have a shared understanding of where providers will deploy and rebalance vehicles. This helps both parties understand and manage vehicle supply, and gives cities the opportunity to maximize the public benefit of these programs.

Because the cities we surveyed vary greatly in total land area and number of permitted devices, we found no consensus on an approach to defining vendor service areas. Many cities leave this undefined in their policies, with the assumption that vendors will operate within city limits and rebalance devices accordingly. Others, such as Dallas, name specific streets as boundary lines. Still others, such as San Francisco, name specific neighborhoods that vendors must include within their service areas. This is often to achieve equity goals related to delivering new mobility options to traditionally underserved areas. Equity-focused pilot programs like Chicago's confine service areas to disadvantaged neighborhoods while excluding the rest of the city.

Anecdotally, we've found a relationship between fleet cap regulations and the size of vendor service areas. In Remix's hometown of San Francisco, for instance, SFMTA's selected e-scooter vendors cordoned their operations to small fractions of the city. Working within a cap of 2,500 total scooters, vendors chose these boundaries presumably to maximize device density in areas where they anticipate heavy usage.

MAINTENANCE/SAFETY

Any public fleet of shared vehicles will be subject to heavy use (and abuse), so timely and thorough vehicle maintenance is essential. Damaged vehicles present safety risks² that providers must mitigate. Many providers' bikes and scooters are designed for individual consumers rather than as commercial vehicles, making them especially vulnerable to vandalism and rapid wear

and tear. In response, many cities are requesting maintenance records from providers to hold them accountable for the safety and usability of their devices.

Seattle stands out for the specificity of its maintenance records requirements. In addition to service histories, the city requests information on product recalls, user reports of unsafe or damaged vehicles, and tallies of vehicles taken out of service for repair, all on a monthly basis.

Most city policies we surveyed that included language about incident reporting asked for summary data on weekly or monthly cadences. None required details regarding the severity, mode type, or weather/road conditions surrounding the collisions, which are common among already established state and local collision record-keeping systems for motor vehicles.

RECOMMENDATIONS

- Six to twenty bicycles can fit in a single on-street parking space. Before singularly citing the "furniture zone" as a guideline for scooter parking, cities should identify areas where sidewalks are already overcrowded, and consider converting on-street vehicle parking to a designated micromobility parking zone, to reduce potential conflicts with pedestrians.
- Guidelines for parking should be unambiguous and set clear consequences for vendors, should they fail to enforce these guidelines.
- Consider mobility goals such as equity, device density, or first/last-mile trips, and how these may play out geospatially. Define these zones where possible and establish enforceable rebalancing directives to providers.
- Require vendors to prove that their devices are in good repair through reporting.

² Source: <https://q13fox.com/2018/09/11/18-year-old-hospitalized-after-limebike-crash-possibly-due-to-brakes-being-cut/>

Fees

Fees are a common mechanism to recapture the cost of managing a permitted program or service. Fees were found to be administered in three ways across the surveyed cities: annual fees, per vehicle annual fees, and/or daily vehicle and/or trip fees. Out of the 17 cities surveyed for this paper, 14 administer annual permit fees, 11 administer annual per vehicle fees, and four take the extra step of charging daily fees, such as a per vehicle or per trip fee. It was also common to see enforcement fees for removal of abandoned or illegally parked vehicles defined in the regulation. See "Micromobility Fee Administration by City" table.

COST RECOVERY CONSIDERATIONS

Setting fees for new programs means considering the potential impacts and needs for successful management and oversight of a new program. Some of these considerations relate to administrative costs, such as the time it takes to develop, review, and oversee the program reporting. Other costs are enforcement related, such as the number of enforcement officers necessary to ensure compliance.

Though not included in our survey, the City of Oakland made public their line-itemed scooter program estimates, which help provide insight into administrative cost recovery considerations. Their scooter program will require at least three employees to manage day-to-day implementation and evaluations, complete community outreach, and enforce parking and distribution requirements. In addition to the personal investments, Oakland and other cities are setting aside budget for software to monitor scooter distribution. All together, Oakland estimates this will cost the city nearly \$288,000.

Micromobility Fee Administration by City

City	Annual Fee	Annual Per Vehicle Fee	Daily Fees, Per: Vehicle/Trip/Station	Other Fees
Los Angeles	•	•		
Chicago	•	•		
Houston	•	•		•
Dallas	•	•		
Austin		•		
San Francisco	•			•
Columbus	•	•		•
Charlotte				
Seattle	•	•		
DC	•	•		
Nashville	•	•		
Portland	•		•	
Kansas City	•		•	
Atlanta	•			•
Miami	•		•	•
Minneapolis		•	•	•
St. Louis	•	•		

INFRASTRUCTURE COST RECOVERY

Outside of city-by-city calculated administrative burden, a quick media survey reveals the common demands for ensuring program safety related to blocking the sidewalks, riding on the sidewalks, and safely sharing the road with large, fast-moving vehicles. Solving for these issues may mean investments in infrastructure. While some of this burden falls on the providers to enforce directly, others may be better addressed through city interventions, such as:

- Scooter corrals and bikes racks, which create formal and organized locations to leave scooters and bikes, leaving the sidewalks clear.
- Bike lanes, which give riders a safe alternative to the sidewalk; even better, protected bike lanes reduce conflicts with large, fast-moving vehicles discussed above.

Santa Monica and Seattle have begun investing in micromobility infrastructure, creating drop zones on the streets and sidewalks. According to Santa Monica's city manager, the \$1/per vehicle/per day fee structure is expected to generate over \$1 million annually specifically for mobility and safety improvements, including scooter corrals as shown below.



Newly placed micromobility "drop corral in Santa Monica"

Source: Rick Cole

Apart from addressing common management demands that come from perceived or real conflicts with micromobility services, these investments have programmatic benefits, such as improved safety, and the creation of a virtuous cycle of increased ridership and continued investment. In New York, investments in bike infrastructure doubled the amount of bike trips in the last 15 years with steady or declining numbers of cyclist injuries and fatalities. The scooter companies themselves see the benefits of infrastructure investments; [Bird](#)³ and [Lime](#)⁴ created funds "to bring more protected bike lanes and better infrastructure for "micro mobility solutions." This idea of funding infrastructure through fees on specific users is not new to the American transportation landscape. One of the largest national infrastructure projects, the Interstate Highway System, was largely built and is still maintained through the gas tax.

DYNAMIC FEES

Dynamic fees are fees that vary based on some criteria established by a city. Our survey returned some interesting use cases for dynamic fees, including per vehicle and per trip fees, as well as fees that adjust by equity distribution. Four of the 17 cities surveyed implemented a per trip or vehicle per day fee, making the overall revenue adjust based on fleet size or mode adoption. Dockless micromobility service adoption is rapid; multiple cities have reported 100,000+ miles traveled per month. With this kind of demonstrated popularity, it's arguable that administrative and management costs could increase over time. Fees administered by number of vehicles or trips allow for cost recovery to scale with the program.

We are seeing cities adopt this thinking. For example, Portland charges \$0.25 per trip, in addition to a \$5,000 annual permit cost for each operator. According to the Portland Bureau of Transportation (PBOT), 472,069 scooter trips were recorded in the first three months of the pilot program. This means Portland generated nearly \$120,000 in a quarter. Extrapolating out to a full year, Portland's dynamic fee structure can generate up to half of the city's entire Active Transportation budget just through the scooter program.

³ Source: <https://www.prnewswire.com/news-releases/bird-establishes-global-safety-advisory-board-develops-fund-to-create-protected-bike-lanes-300691108.html>

⁴ Source: <https://www.lime.com/blog/respect-the-ride-lime-commitment-rider-safety-education>

Minneapolis Public Works Transportation and Public Works Committee demonstrated similar thinking in their July 2018 proposal to City Council. The proposal included recommendations for a voluntary agreement with the licensee for shared City infrastructure improvements. Under the voluntary agreement, the licensee would pay an additional \$1 per shared scooter per day. The Committee estimated this fee would bring in approximately \$36,000 in total over the four month pilot program.

RECOMMENDATIONS

- Cities need to consider the full costs of managing successful micromobility programs by reviewing the increased administrative, enforcement and infrastructure demand created by the service or program when establishing their fee structure.
- Whenever possible, modest fees should be used to improve the infrastructure used by these services, the improvement of which is tied to the success of the overall program and resident safety.
- Residents are rapidly adopting micromobility services. Fees should be administered in such a way that they keep up with this growth, either on a per trip or per vehicle per day basis. Inversely, if popularity dwindles, the fees will adjust proportionately.
- Dynamic fees may bring increased need for increased computing power, which may add to the administrative costs of the program, but improve the overall public benefit of the program.

Caps

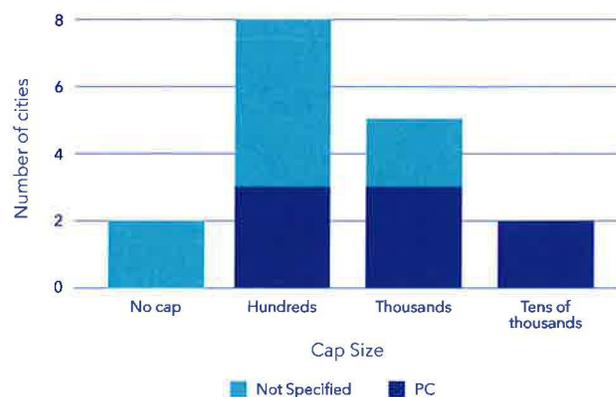
Early dockless companies “disrupted” markets by dropping thousands of vehicles on city streets overnight. This approach, in which operators risked oversupply in favor of ensuring availability, caused public outcry for protection of the public right of way. This, as well as concern from city officials around protecting accessibility on the sidewalks, ultimately led to the

issuance of several “cease-and-desist” orders. Likely in reaction to the early history of dockless programs, nearly every city surveyed instituted a fleet cap, or an upper limit on how many vehicles can be on the city streets. Caps allow cities to plan for increased street, bike lane and sidewalk demand, as well as provide an important policy lever, particularly when cap growth is based on performance.

VEHICLE CAPS

Per vendor cap size varies by city. The lowest cap surveyed was 100 vehicles per vendor, while the highest was 5,000 per vendor. To get an estimate of the total possible vehicles allowed on the roadway, we assumed three vendors would provide service, unless a vendor cap was specified. The result was a range of 300 vehicles on the roadway on the low end, and 25,000 vehicles on the roadway on the high end. We saw no relationship between cap size and population size, resulting in high variance in vehicle availability per person in several cities, and opening up more questions about how initial caps are set to ensure successful programs. Getting the cap size too small may inhibit adoption, or far worse, increase user risk. For instance, studies have shown a consistent inverse relationship between adoption of biking and the frequency of crashes.

Performance Cap (PC) Language vs. Not Specified



VEHICLE CAPS AS A LEVER (PERFORMANCE CAPS)

Many cities are using caps to reward vendor performance and actively balance supply and demand. These performance caps are a great way to clearly articulate and align desired program goals with vendor efforts. Utilization of the vehicles (about three times per day) has risen to the forefront of a good balance of supply and demand, and cities are using this metric to allow for increases or decreases in cap sizes. Nashville set incremental increases in the cap, starting at 500 vehicles, moving to 750 vehicles in the second month, and 1,000 in the third month, and gives the vendors the option to apply for expansion afterward. At each opportunity for expansion, the fleet vendors must prove they have met the regulations put forth, report on the number of violations received, and prove they meet or exceed the "average utilization threshold."

Cities are also using caps to encourage equity outcomes. Salt Lake City, for example, allows 200 vehicles per vendor, or 500 if vendors distribute the bikes in equity areas. Seattle set its cap at 5,000 per vendor (a total of 20,000 vehicles) and gave bonuses for additional accessible bikes, such as trikes, to be added into the fleet.



Early dockless bikeshare providers risked over supply in favor of ensuring as-needed availability. Performance caps with utilization thresholds encourage providers to balance supply and demand, while also allowing for continued program growth.

Source: AP

CAPS ON VENDORS

Some cities, particularly those experiencing a high volume of vendor interest, are choosing to cap the number of vendors operating in their jurisdictions.

The number of vendors has a direct relationship to the total potential vehicles on the roadway. For example, if the per vendor cap is 5,000 and the vendor cap is set at 3, a city will have a maximum of 15,000 vehicles. While having multiple vendors can mean healthy competition, especially in early markets, there are likely diminishing returns due to increased compliance work.

We found two examples of high-volume vendor cities who provided divergent yet thoughtful ways of approaching vendor and vehicle caps. San Francisco Municipal Transportation Agency conducted a request for proposal process to select scooter vendors and received twelve applications. The agency gave themselves the option to select multiple vendors, and ultimately selected two vendors with contracts at 625 vehicles per vendor. Alternatively, Seattle Department of Transportation, set their cap at four vendors at 5,000 devices, and gave themselves authority to reallocate unused fleet capacity to other vendors.

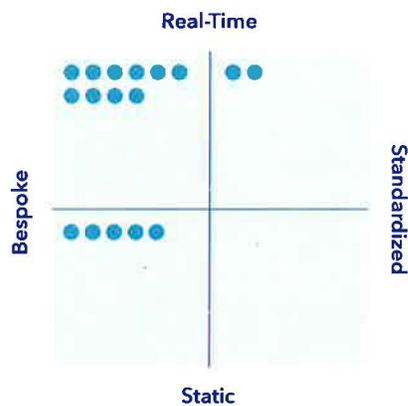
RECOMMENDATIONS

- Caps should be tied to program performance targets. "Performance caps" should align vendor and city understanding of success, and set regularly scheduled reviews.
- Performance caps arguably need no hard-and-fast limit. Instead, cities should set clear expectations for device utilization, relying strictly on this measure to indicate whether steps need to be taken to better balance supply and demand.
- Empirical research exposing the inverse relationship between adoption of cycling and crashes (safety in numbers) makes it important for cities to consider the possibility that setting too low of a cap and retarding swift adoption could expose program users to prolonged safety risks.
- Cities should strike a balance between encouraging healthy competition between vendors and capacity for administrative oversight when setting a vendor cap.

Data Sharing

The transportation industry has matured in its understanding and capacity for data analysis. New standards, such as the General Bikeshare Feed Specification (GBFS) and Mobility Data Specification (MDS) have emerged. This recent emergence of MDS is particularly exciting in that it enables cities to build off best practices of other cities and take advantage of an ecosystem of tools for analysis and enforcement of their policies and programs. Cities are starting to request real-time data (an innate component to MDS), versus a static report format, allowing them more freedom to pull data as frequently as needed. We've plotted the regulations we reviewed in the quadrants below, based on two axes:

1. Real-time vs. static, and
2. Bespoke vs. standardized formats.



Encouragingly, over half require data in a real-time format, and two are leading the way by requesting their regular reporting in a standard format, such as GBFS or MDS.

Based on our research, we see these core data sharing policy features:

- Universal agreement on the need for *trip* and *fleet availability* data
- A range of expectations for *data update frequencies*

- A variety of approaches toward *customer feedback* and other data
- The need for data sharing agreements between private vendors and public authorities to meet transportation, safety, and equity goals.

Since they're the essential components of the data policies we surveyed, we'll reiterate our findings on trip and fleet availability data here.

TRIP DATA

Until now, cities often relied on analyzing inferred trip data from sources such as surveys, complex travel demand models, or smartphone location data aggregators to achieve this goal. With micromobility, the data can be retrieved from its source at the provider level, allowing cities to work more quickly with private partners to reach mutual success. Though not included in our initial survey, [Santa Monica](#)⁵ is requesting information in the emerging open data standard, [MDS](#)⁶, mentioned earlier. In addition to the real-time and historical trip and availability data cities are looking for, MDS provides a method for cities to digitally communicate operational restrictions to multiple providers.

Trip-level data is most useful for understanding new mobility options' impacts on other city infrastructure, such as transit and streets, which helps explain why we find this requirement coming from cities of all sizes and regions. The policies we reviewed show a clear consensus on what a "trip" means to them. Cities from [Chicago](#)⁷ to [Houston](#)⁸ want to see:

- Start and end times of individual rides on each micromobility device;
- The path of each ride; and
- The unique identification number of the device used for each ride.

5 Source: https://www.smgov.net/uploadedFiles/Departments/PCD/Transportation/SM-AdminGuidelines_final.pdf

6 Source: <https://github.com/CityOfLosAngeles/mobility-data-specification>

7 Source: https://www.cityofchicago.org/content/dam/city/depts/cdot/bike/general/Chicago_DoBi_Pilot_Program_Updated_06.29.18.pdf

8 Source: <http://www.houstontx.gov/council/committees/tti/20171113/dockless-bikeshare-ord-draft.pdf>

Trip data enables cities to make informed observations about the land uses most supportive of micromobility device use, the streets most in need of multimodal design treatments, and how these new modes interact with the rest of the transportation system, among countless other analyses.

FLEET AVAILABILITY DATA

Second to trip data in importance to policymakers is fleet availability data. Just as users need a picture of available devices near them, cities require this information to identify underserved (or oversupplied) neighborhoods and hold providers accountable for proper device rebalancing and/or recharging. Overall, we found that cities requested the following to understand if they were achieving their desired supply and rebalancing goals:

- Real-time locations of active and inactive devices
- The provision of availability data in the open GBFS standard

Fleet availability data serves multiple purposes. Providers display this information so users can locate vehicles. It's also a core operational component of each provider's service. Users of each micromobility app need to see current device locations to make use of the service. This same data is also useful to cities managing their public right-of-way. For example, like many cities, the Los Angeles Department of Transportation (LADOT) intends to enforce a cap on the number of deployed devices within city limits. They are able to do so by using fleet availability data to measure whether operators are complying with their rules.

Fleet availability data sharing requirements are also integral to measuring the success of policy goals around equity. Cities like Santa Monica cite "community wellbeing, sustainability and equity" in their policies, and that up-to-date fleet data can be used to verify that fleets are being rebalanced to serve lower-income communities. Nashville's policy asks for scooters "to be available in neighborhoods and communities that are underserved by mobility and transportation options." Location-enabled fleet availability data can help a city determine whether a provider's device placement is equitably serving the public. Up-to-date fleet data can be used to verify that fleets are being rebalanced to serve lower-income communities and achieve intended equity goals.

RECOMMENDATIONS

- Require trip and fleet availability data from vendors to gain insight for planning and enforcement purposes.
- As cities pen enforcement, fee, and cap criteria, they should equally consider which standards and reports will best help them manage compliance of those criteria.
- Requesting MDS, a standardized, real-time format, is ideal, as that it is the only standard available that enables a line of digital communication between vendors and the city, and gives cities both current and historical trip insights, and device availability data.

Conclusion

At its core, the Remix Micromobility Policy Survey examined a moment in time where several cities sat down and brought their mobility priorities into focus. They asked: How should we be prioritizing the right-of-way? What behaviors would we like to encourage and discourage on our streets? How should we set ourselves up to manage compliance of multiple vendors? In many ways, the survey uncovered what we already knew: cities are the focal point of innovative new ideas and business models around transportation. They must embrace this responsibility with the longstanding need to ensure basic public responsibilities such as safety, equitable access, and opportunities for residents.

From our perspective, cities that will achieve the most success are those who are proactive in management and have clarity on how new mobility options can achieve wider goals for a vibrant, multimodal city. Attributes such as safety, equity, access, and sustainability are all opportunities presented by micromobility. Yet, to positively influence these traits, cities must

be positioned through thoughtful policies backed with strong digital infrastructure. With these elements in place, the benefits will expand beyond the success of a single program to include several city programs, such as infrastructure improvement prioritization, traffic calming measures, Vision Zero and beyond.



Micromobility and how it's managed has a major influence on how people move and how departments of transportation prioritize its existing infrastructure.

Source: Remix

WRITING YOUR MICROMOBILITY POLICY? Reach out to the Remix Policy Team at hello@remix.com.



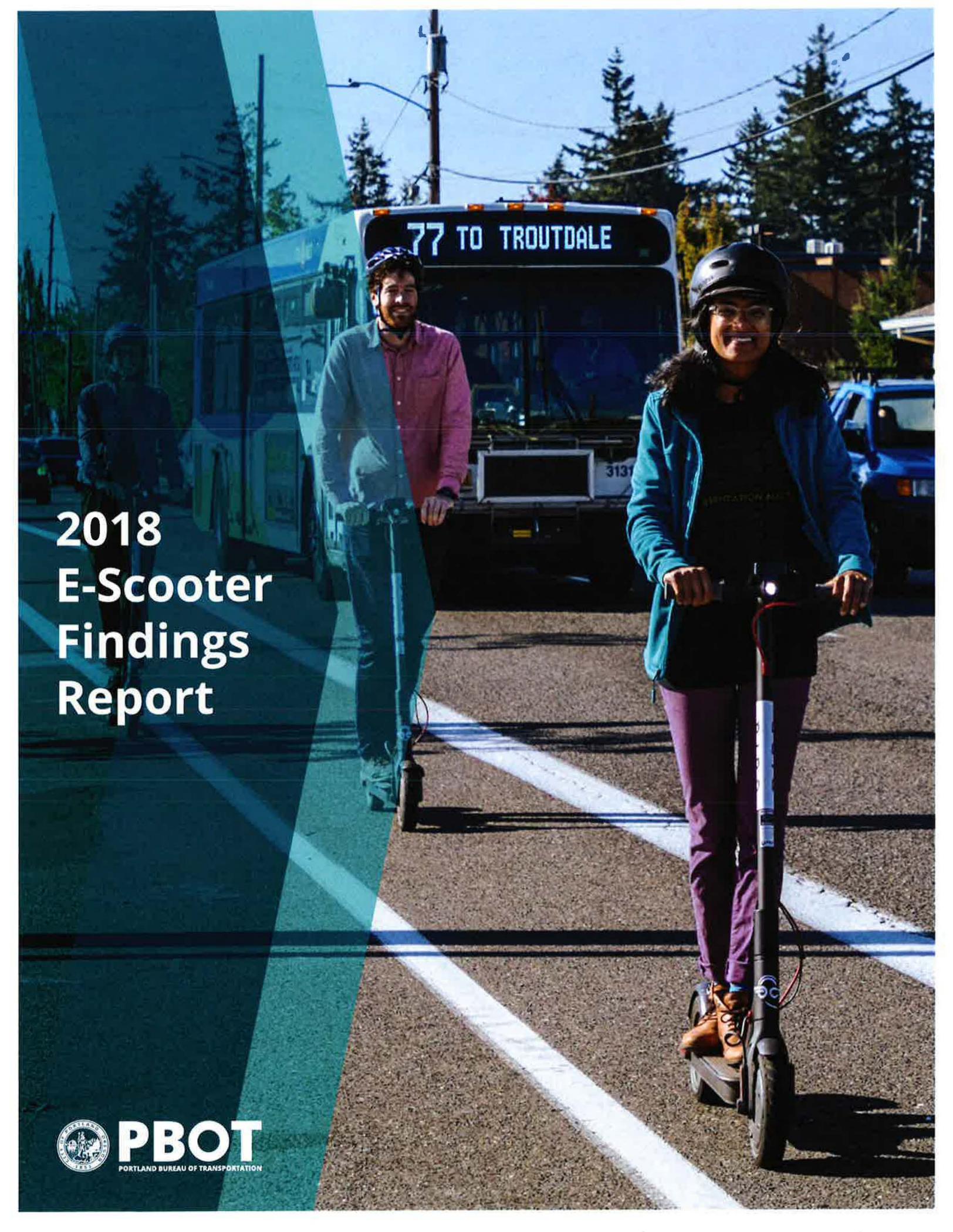
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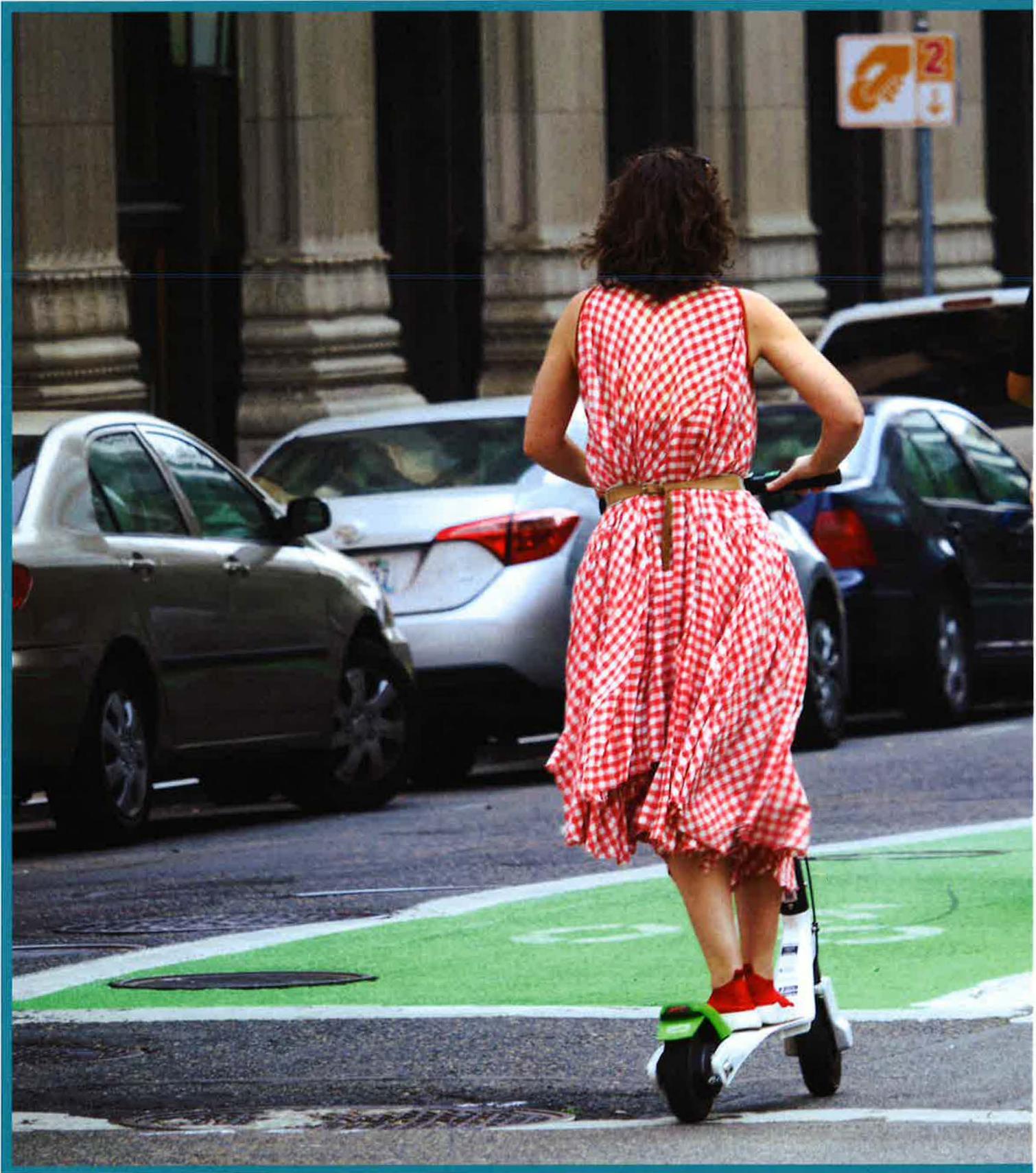
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2018 E-Scooter Findings Report



PBOT
PORTLAND BUREAU OF TRANSPORTATION





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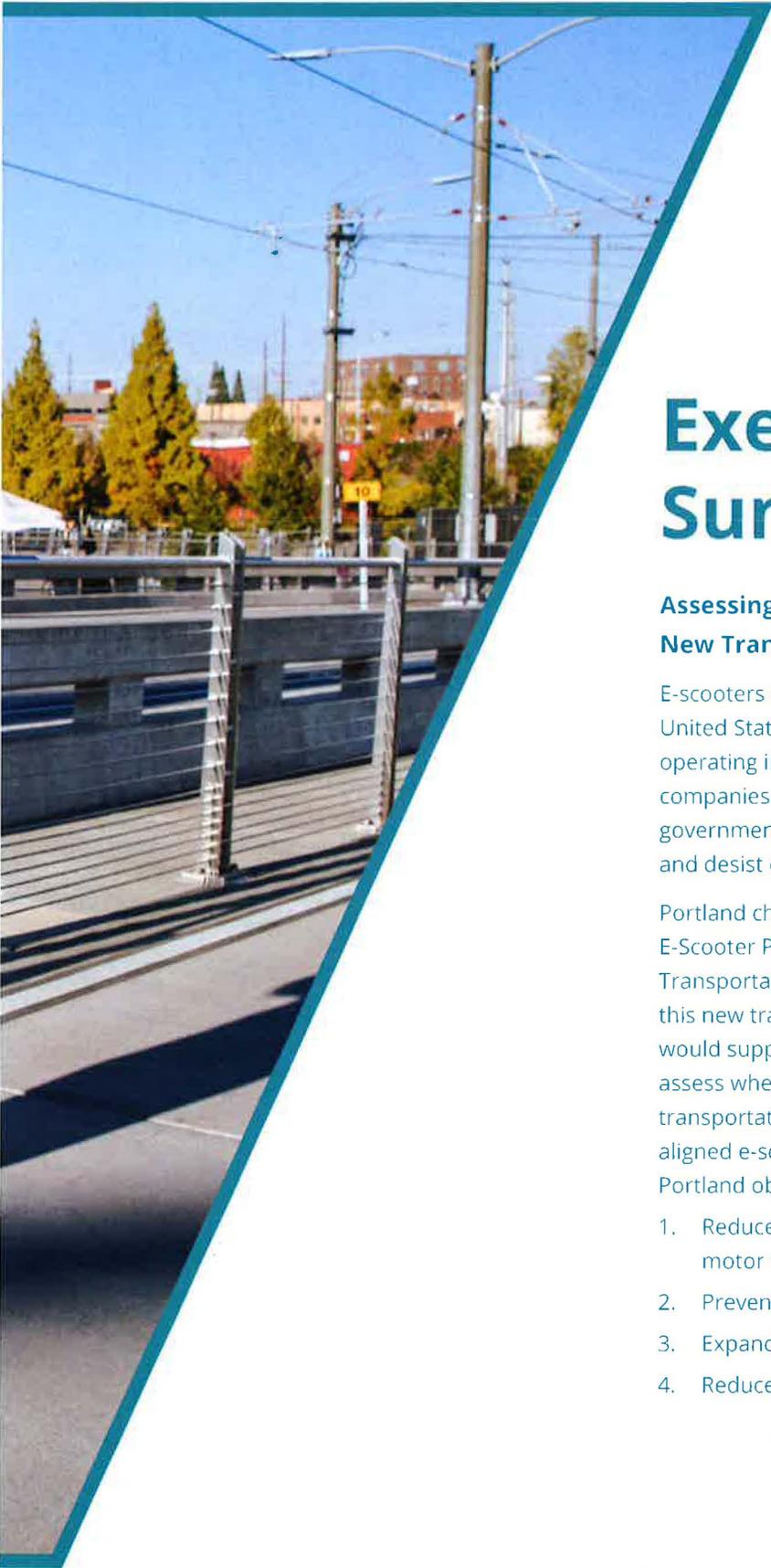
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Executive Summary

Assessing the Potential of a New Transportation Technology

E-scooters emerged in 2017 as a new shared mobility service in the United States. Less than a year after their debut, e-scooters were operating in 65 U.S. cities. They did not arrive without disruption; companies Bird and Lime began operations in 43 markets without government permits or consent. Several cities responded with cease and desist orders, fines, or both.

Portland chose a different, proactive path, creating the E-Scooter Pilot Program. With the pilot, the Portland Bureau of Transportation (PBOT) focused on giving Portlanders access to this new transportation option while also ensuring that e-scooters would support Portland's fundamental policy values. Designed to assess whether – and how – e-scooters could help meet Portland's transportation needs, the pilot featured a permitting framework that aligned e-scooter company business practices with four critical City of Portland objectives:

1. Reduce traffic congestion by shifting trips away from private motor vehicle use
2. Prevent fatalities and serious injuries on Portland streets
3. Expand access to opportunities for underserved Portlanders
4. Reduce air pollution, including climate pollution

Using Data and Community Engagement to Drive Decisions

PBOT instituted data-sharing requirements as one tool to assess the impact of e-scooters. Through the 120-day pilot period, companies were required to provide data that included real-time availability, trip starts and destinations, routes, and safety information as a condition of the permit. With this data in hand, PBOT could understand where and when e-scooters were used and monitor compliance with East Portland deployment requirements. Data enabled City staff to see e-scooter riding patterns and miles traveled. Technical data collection was supplemented by **a rider survey, citywide poll, focus groups, an online complaint form, and community and stakeholder input.**

Pilot Findings: 700,000 Trips and Lots of Potential

Tens of thousands of Portlanders and visitors alike enthusiastically embraced scooters. During the four-month period, **people took 700,369 trips covering 801,887 miles on 2,043 e-scooters.** Trip data analysis and PBOT's user survey data revealed more about ridership trends:

- **A majority of Portlanders viewed e-scooters positively.** In a representative citywide poll by DHM Research, 62 percent of all Portlanders viewed e-scooters positively at the end of the pilot. Support was even higher among Portlanders under 35 (71 percent), from people of color (74 percent), and those with incomes below \$30,000 (66 percent).
- **Portlanders primarily used e-scooters for transportation.** 71 percent of Portlanders reported that they most frequently used e-scooters to get to a destination, while only a third of respondents (28.6 percent) said they most frequently used e-scooters for recreation or exercise.
- **E-scooters replaced driving and ride-hailing trips.** 34 percent of Portland riders and 48 percent of visitors took an e-scooter instead of driving a personal car or using Uber, Lyft, or taxi.
- **E-scooter users preferred riding on low-speed streets and in bike lanes.** Many of the highest utilized streets were part of Portland's bikeway network. Staff observations also found lower rates of sidewalk riding on low-speed streets or those with dedicated space for non-motorized users. Users ranked bike lanes as their preferred road type, and sidewalks last.
- **E-scooters attracted new people to active transportation.** 74 percent of local users reported never riding BIKETOWN and 42 percent never bicycling.

Pilot Findings: Challenges Include Riding, Parking, and Equitable Access

The e-scooter pilot showed the potential of a small, light, electric shared vehicle to move people quickly and easily without adding to Portland traffic. At the same time, the pilot revealed several areas where more work is needed to integrate e-scooters safely and smoothly into the fabric of our city.

Despite an increase in scooter-related injuries during the pilot period, most injuries seen by emergency rooms across Multnomah County were not severe enough to warrant emergency transport. E-scooter injury visits accounted for about 5 percent of total traffic crash injury visits during the pilot period. PBOT additionally received 43 reports of collisions during the pilot period.

We heard from Portlanders throughout the pilot period about **illegal sidewalk riding and incorrect scooter parking.** With speeds capped at 15 mph, scooters are appropriate for bike lanes or low-volume streets, but they are too fast for use on sidewalks, where they make it unsafe or uncomfortable for people walking or using mobility devices. And while staff observations showed most scooters parked properly in the sidewalk furnishing zone, improperly parked scooters negatively impacted accessibility and created a hazard for people with visual impairments.



Although bicycles are allowed in Portland parks, including Waterfront Park and the Eastbank Esplanade, motorized vehicles are not. E-scooter use on Portland parks trails violated Portland Parks & Recreation's rules, but most riders (66 percent) said they weren't aware of the rules. **E-scooter use impacted other park users and presented a significant management challenge for Portland Parks & Recreation staff.**

To align business practices with the City's equity goals, PBOT required each e-scooter company to locate at least 100 scooters in East Portland communities each day and to offer a low-income fare. Only one company complied with the East Portland fleet requirement. Companies only enrolled 43 Portlanders in the low-income plan. Along with staff observations, this suggests low company performance in aligning business practices with City equity goals.

While many East Portlanders and Black Portlanders expressed enthusiasm for e-scooters, some focus group participants also expressed an **overall concern for traffic safety and the risk that Black e-scooter riders would be targeted for racial profiling and harassment.**

E-Scooter Pilot 2.0: Building on What We've Learned

E-scooters have the potential to advance Portland's transportation goals. This is one of this report's key findings. This report demonstrates that as Portland grows and traffic congestion gets worse, e-scooters can move more people safely and efficiently in the same amount of space. This helps reduce reliance on automobiles and shift trips to an efficient, potentially less-polluting travel option. We believe there is a preliminary indication that e-scooters are a less-polluting travel option. However, we need more data – especially regarding e-scooter operations and lifecycle costs – before we can definitively say how much or even whether e-scooters directly contribute to a reduction in greenhouse gasses.

During the pilot, riders took more than 700,000 e-scooter trips on various types of streets. Throughout the city, sidewalk riding was lower along streets with lower speeds or designated bikeways. For us, this clearly demonstrates how important it is to have protected facilities that minimize conflicts between pedestrians, e-scooters, and cars.

For all of the positives about scooters that emerged during the pilot, we also learned valuable lessons about the challenges related to making scooters a permanent part of Portland's transportation ecosystem.

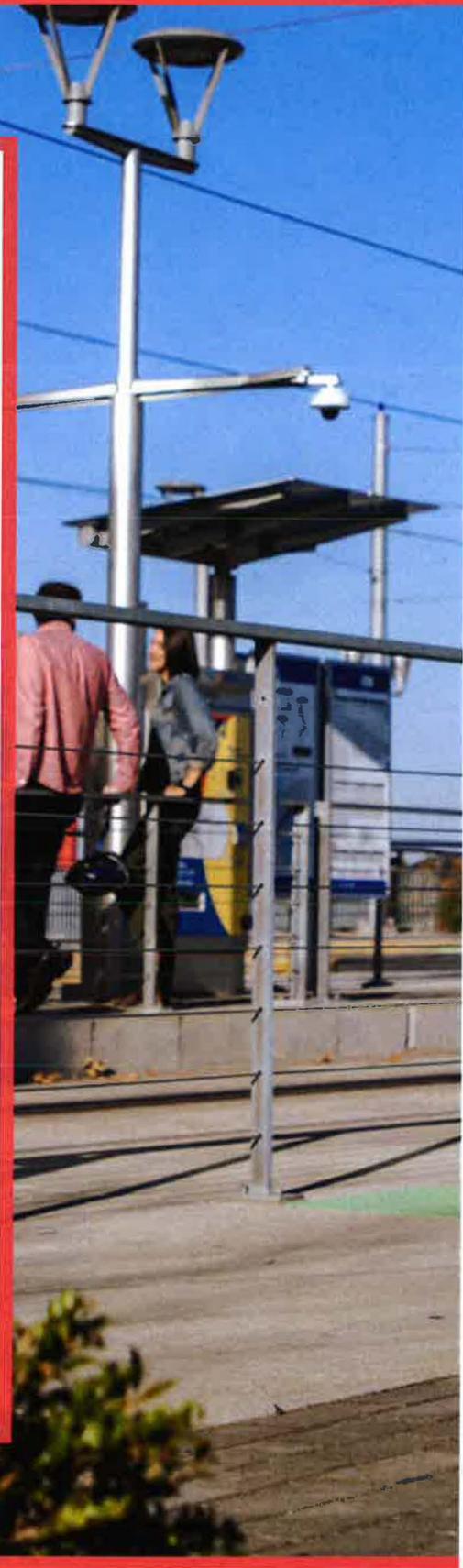
Given the scale and scope of these challenges, we believe it is advisable to conduct a second pilot in 2019. This pilot will be longer to give us more time to collect data and test innovative solutions to the challenges that emerged this past summer and fall. We will specifically focus our efforts on improving equitable access across the city and ensuring safe and legal riding and parking.

With the release of this report, PBOT plans to conduct additional public and stakeholder engagement through February 2019. Public engagement will inform a revision of PBOT's administrative rule and permit application. PBOT anticipates have e-scooters on the ground again in early spring.

New Mobility Background and Context

E-scooters are an emerging technology and new mobility service. Like bike share and car share, the service provides a shared vehicle – in this case, a small electric-powered scooter – to rent for one-way trips. This new service makes use of an existing technology – the scooters themselves – and adds app-based technology that provides the ability to share the devices using a short-term rental business model. To begin a rental, users unlock a scooter through the company's smartphone app. Some companies offer a call or text service to unlock for those without smartphones. To end a trip, users park the scooter on the sidewalk close to the curb and out of the pedestrian travel zone. Many companies require riders to confirm they have parked the e-scooter correctly by submitting a photo through the company's app in order to end their rental. E-scooters are powered almost exclusively by an electric motor, after an initial kick-off to start the device. E-scooter technology is rapidly evolving. In 2018 multiple companies introduced new e-scooter models and several new companies entered the market.

Relative to other active transportation options, e-scooters are more expensive. The average 19-minute e-scooter ride cost users \$3.85 (low-income fare varied by company: \$1.83-\$2.85). This is more expensive than taking TriMet (adult fare: \$2.50, low-income fare: \$1.25) or BIKETOWN (Pay-as-you-go fare: \$1.52; low-income fare: \$3 per month for 90 minutes of daily ride time).

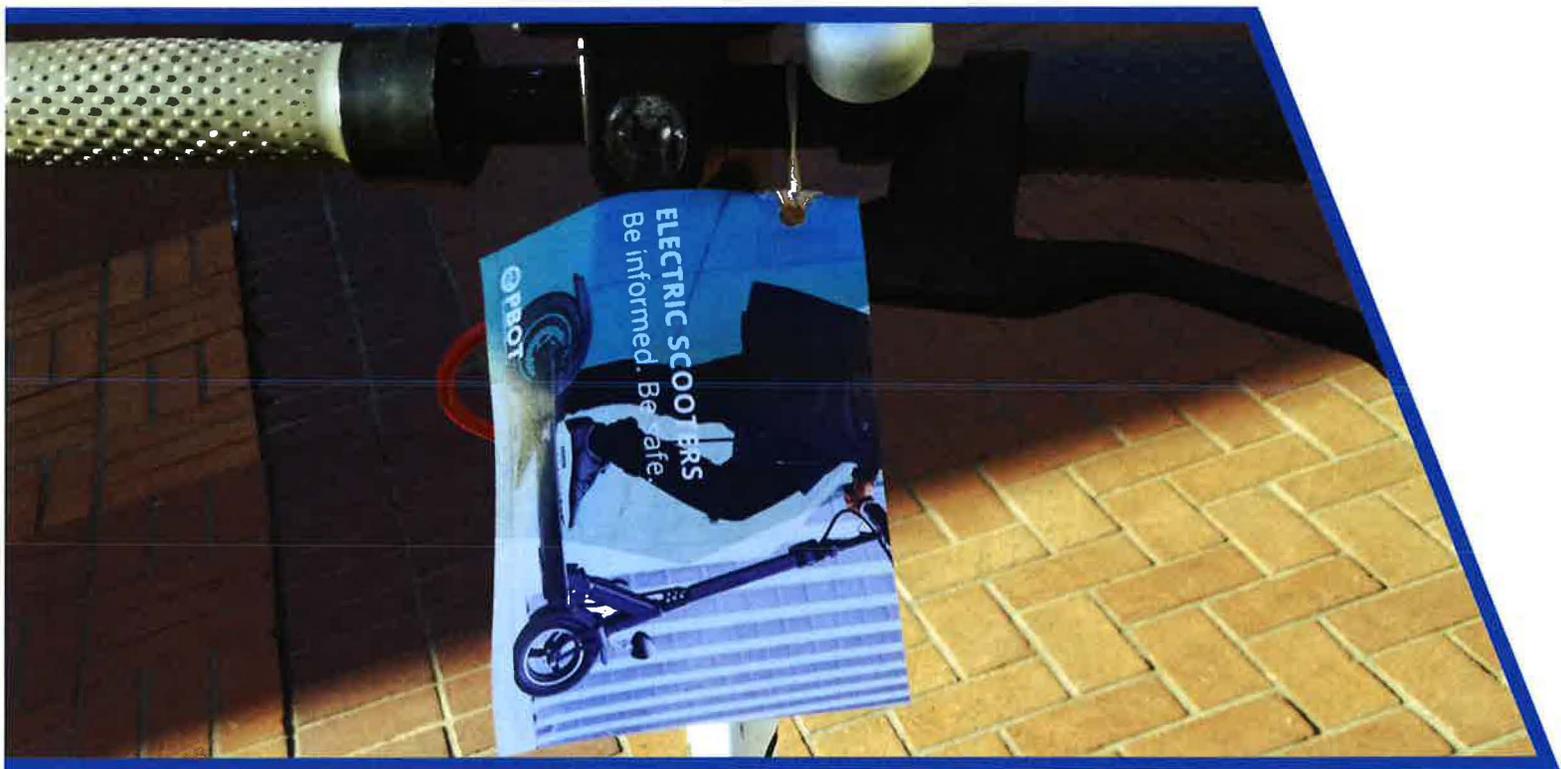




Operationally, e-scooters differ from other new mobility services in that the vehicles are usually picked up every night to be charged and are deployed the next day. Companies hire a mix of independent contractors as well as regular employees to charge, deploy, maintain, and respond to service requests. Throughout the day, e-scooters are distributed throughout the city based on where they are deployed and where people ride them and end their trips. During Portland's four-month pilot, companies reported working with 1,533 independent contractors (primarily chargers) and paying \$643,000 in total wages to contractors.

E-scooters first launched in the U.S. in September 2017. In Santa Monica, California, Bird Rides Inc., borrowing tactics from ride hailing companies, deployed e-scooters without the City's permission. Santa Monica's experience set the stage for a series of unpermitted entrances in the U.S. by Bird and Lime. Throughout the spring and summer of 2018, e-scooters appeared in more than 43 cities in the U.S., in many cases without permission from local officials or warning from the companies that operate the scooters. By August 2018, scooters were in 65 cities across the nation.¹

1. Brian Urban, (2018, Sept. 7). Electric scooters: sudden invasion of American cities, explained. Vox. <https://www.vox.com/2018/8/27/17676670/elec-scooter-rental-bird-lime-skip-spr-cities>. Accessed 5 Nov. 2018.



City of Portland 2018 E-Scooter Pilot

Against a national backdrop of unforeseen and unpermitted launches, City of Portland officials took a proactive approach to managing this new mobility service. In spring 2018, virtually every major e-scooter company contacted PBOT, requesting information about how the City might allow the new service. In May, PBOT presented the concept of an e-scooter pilot program to the bureau's Pedestrian Advisory Committee, seeking input on how the City should account for the needs of people with disabilities and others who depend on sidewalk space. PBOT advised e-scooter companies that it would provide a permit application process in June, and a pilot program to start in July. PBOT warned the companies not to start service until a pilot program could begin.

PBOT worked quickly to establish a permitting framework to run a 120-day e-scooter pilot from July through November

of 2018. The framework enabled Portland to set out regulations and put consumer protections in place. It also required participating companies to agree to a set of comprehensive data sharing requirements.

Portland's pilot began July 23 and ended November 20, 2018. Five companies applied for permits, and three were permitted: Bird Rides Inc., Lime, and Skip Transport Inc. All three companies were operating e-scooters on Portland streets by early August. Each company started with 100 scooters to introduce Portlanders to the new technology and increased the number of e-scooters to their full permitted fleet quota by August 15. From August 15 through the end of the pilot, each company was permitted to have 683 scooters available for rent each day, for a total of 2,043 permitted scooters.

Advancing Portland's Policy Goals

Portland's 2035 Transportation System Plan (TSP) guides City decisions about transportation investment, innovation, and permitting. The TSP envisions a safe, equitable, multimodal transportation system that expands mobility, protects livability, and promotes economic vitality in a rapidly growing city. TSP policies seek to balance various transportation modes to help Portlanders move around efficiently, safely, and affordably. Key TSP goals include:

- Reduce private motor vehicle use and congestion
- Prevent fatalities and serious injuries on Portland streets
- Expand access for underserved Portlanders
- Reduce air pollution, including climate pollution

These goals are also foundational to the administrative rule establishing Portland's e-scooter pilot (see Appendix A). The findings in this report assess e-scooter potential to advance these goals, in addition to evaluating operations and management.

As one of several new mobility offerings that rely on digital technology to deliver transportation services, e-scooters must be evaluated along with other emerging new mobility modes, including shared e-bikes, car share, and ride-hailing services such as Uber and Lyft. In addition, e-scooter operations should be considered in the context of existing and future infrastructure – including bike lanes and shared streets – that accommodates these efficient, active, low-emission vehicles.

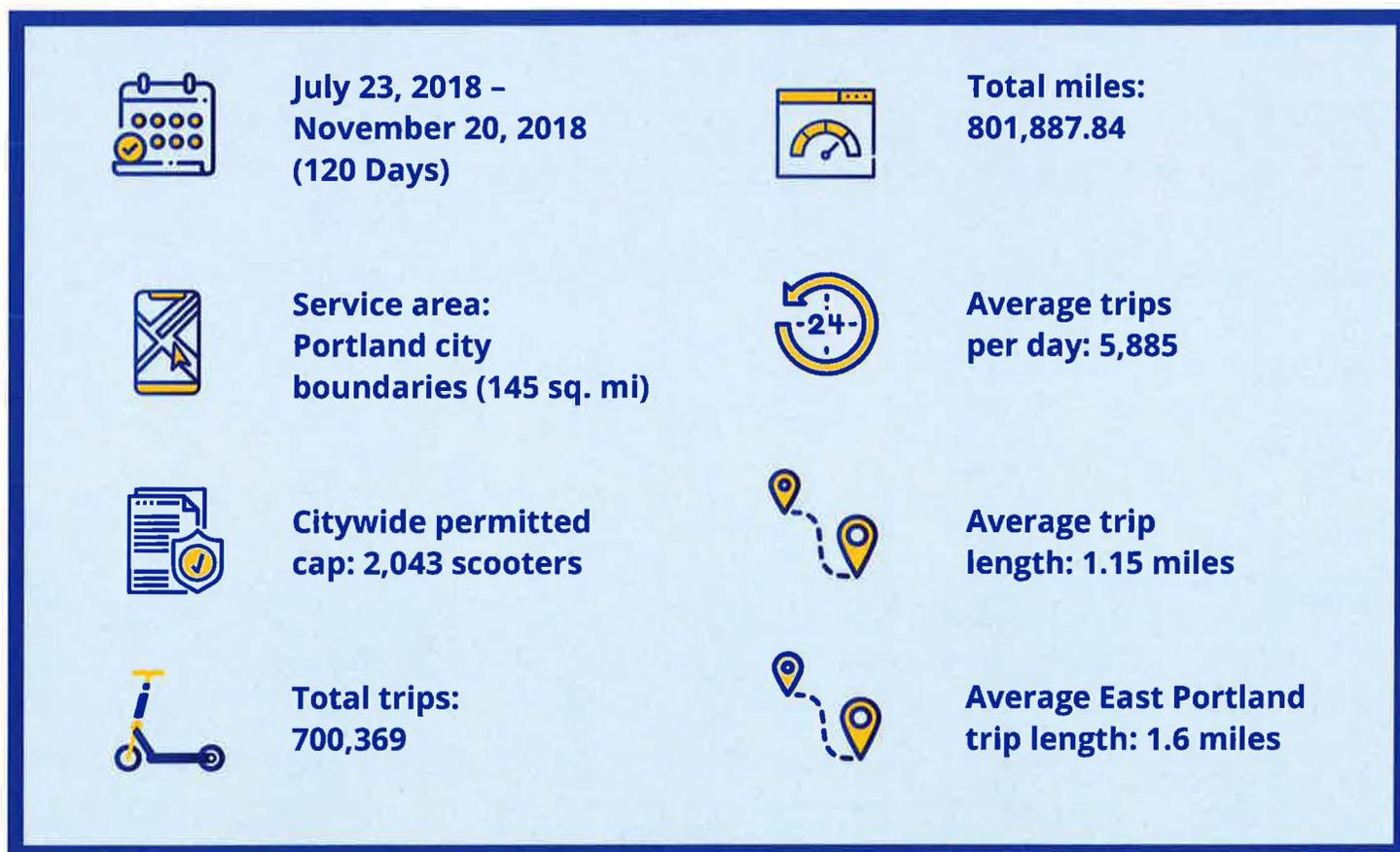
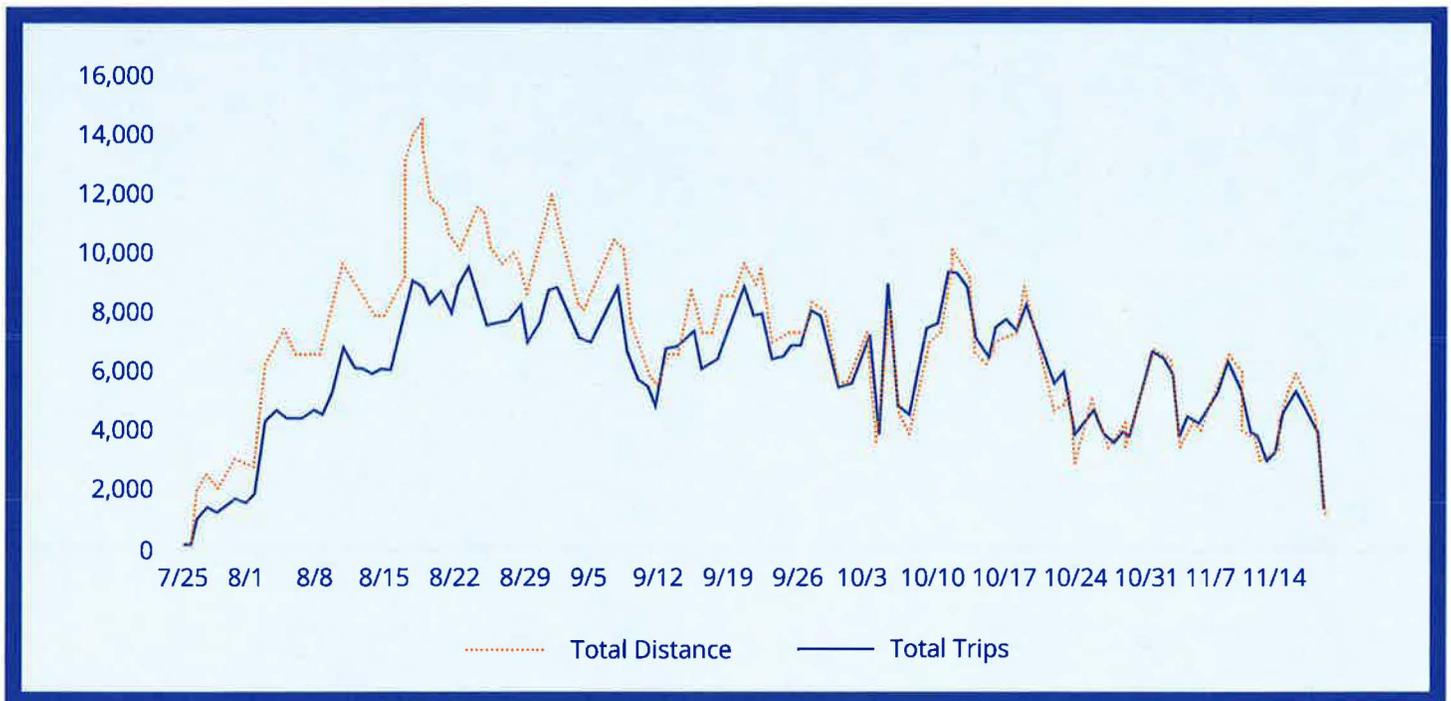


Figure 1 : E-Scooters Daily Trips and Distances Traveled

Pilot Program Regulatory Framework

Portland's e-scooter pilot program was established by administrative rule and a permit that set specific conditions for providing this transportation service within the city. The total number of scooters was capped at 683 per company. To advance citywide equity goals, PBOT required that each company deploy at least 100 scooters in East Portland each day. Companies were required to limit scooters to a maximum speed of 15 mph.

By Oregon state law, e-scooter riders must wear a helmet and are prohibited from riding on sidewalks. City code prohibits the use of motorized vehicles, including e-scooters, on trails in Portland parks. Administrative rules require companies and riders to park scooters on the sidewalk and close to the curb, in a manner that does not interfere with pedestrian access or travel.

As a condition of receiving a permit, companies were required to educate riders about safe riding and proper e-scooter parking.

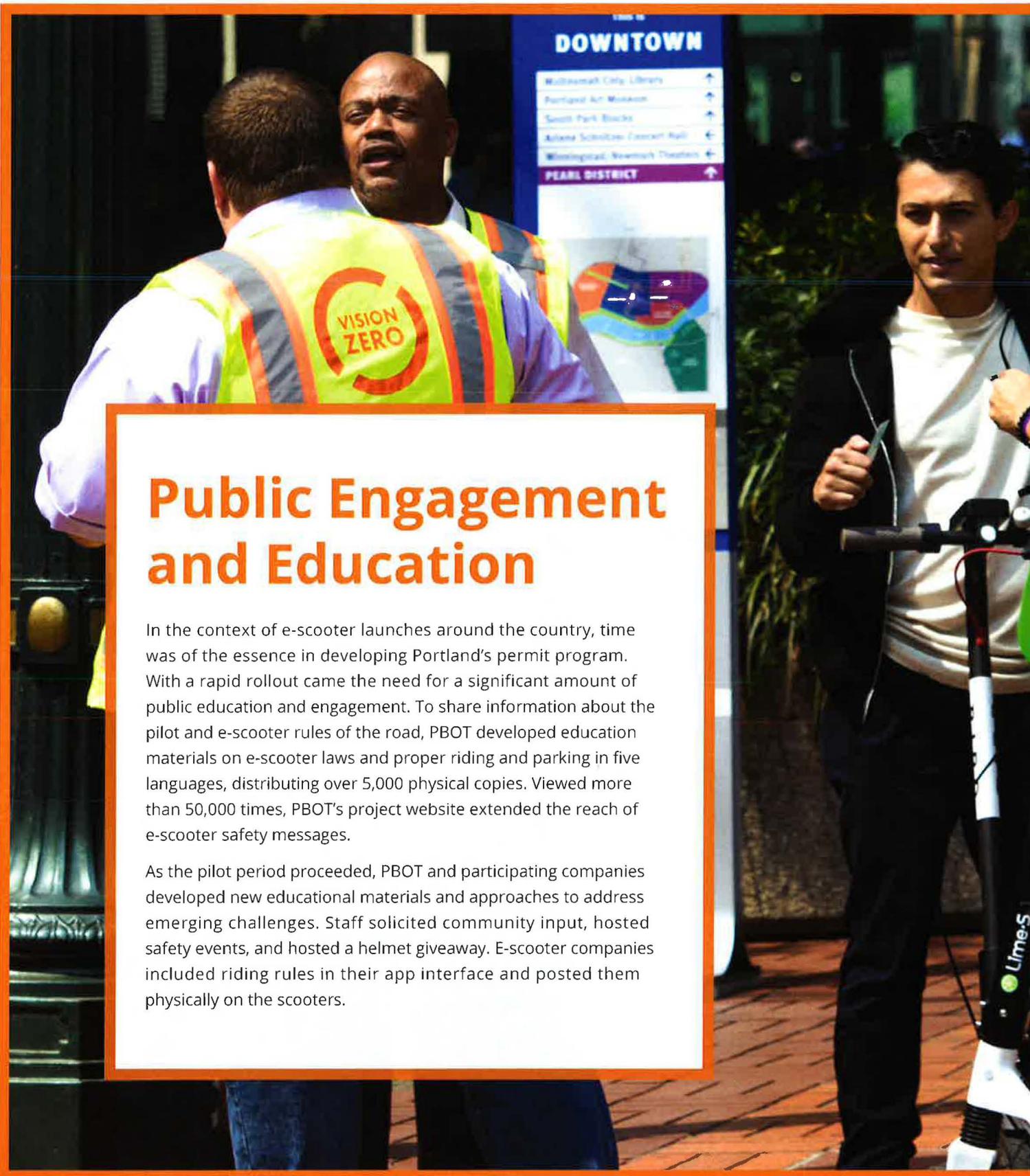
To advance citywide equity goals, PBOT required that each company deploy at least 100 scooters in East Portland each day.

Penalties and Warnings

PBOT worked with each company to better understand the operational realities under the City's administrative rule and permit. After an initial observation period, PBOT regulatory staff began issuing compliance warnings regarding e-scooter deployment and performance. Staff communicated deployment data to each company on a weekly basis from the beginning of the pilot, urging companies to continually improve rider education efforts as well as their own performance. About halfway through the pilot, staff had sufficient information about performance trends to initiate formal compliance conversations with each company. Companies were given deadlines to comply with the requirements of their permit, and PBOT issued warnings for improperly identified vehicles, insufficient data, citywide fleet compliance, and East Portland fleet compliance.

Over the course of the pilot period, PBOT issued two penalties, both to Skip Transport, Inc. One cited failure to meet East Portland fleet deployment requirements, and the other cited failure to meet the citywide deployment requirements outlined in the administrative rule and permit. Penalties were calculated for each day the company was out of compliance after a specified deadline.





Public Engagement and Education

In the context of e-scooter launches around the country, time was of the essence in developing Portland's permit program. With a rapid rollout came the need for a significant amount of public education and engagement. To share information about the pilot and e-scooter rules of the road, PBOT developed education materials on e-scooter laws and proper riding and parking in five languages, distributing over 5,000 physical copies. Viewed more than 50,000 times, PBOT's project website extended the reach of e-scooter safety messages.

As the pilot period proceeded, PBOT and participating companies developed new educational materials and approaches to address emerging challenges. Staff solicited community input, hosted safety events, and hosted a helmet giveaway. E-scooter companies included riding rules in their app interface and posted them physically on the scooters.



PBOT Education and Engagement

1. Tabled at eight community events, with test rides and information on e-scooter laws, safety, and low-income programs
2. Hosted an e-scooter safety event and spoke to 450 people
3. Educated riders on the street, distributed handbills and attached educational flyers to scooters
4. Placed warning signs at main entry points to the Waterfront Park Trail and the Eastbank Esplanade alerting riders not to ride on these trails
5. Responded individually to 2,860 comments via the e-scooter online complaint and feedback form

E-Scooter Company Education and Engagement

1. Listed e-scooter laws, rules, and safety information on the scooter, in the app, and on flyers and social media
2. Dedicated brand ambassadors who educated the public about safe riding
3. Each company was required to have a helmet distribution plan. Together, the companies handed out or mailed 2,292 free helmets to customers





Data Sources and Methodology

This findings report is informed by quantitative and qualitative data collected throughout the pilot. Sources of data included:

- **Availability, trip, collision, and complaint data** provided by companies (data specifications were modeled after the Los Angeles Mobility Data Standard and can be found in Appendix B)
- **Injuries and collisions reported** by individuals, Portland Police Bureau, Portland Fire & Rescue, news outlets, and the companies themselves
- **ER and urgent care** hospital visit data, provided by the Multnomah County Health Department
- **A User survey** authored by PBOT and distributed by companies to users
- **A Citywide representative poll** by DHM Research (results can be found in Appendix J)
- **Observational studies** of user riding and parking behavior conducted by PBOT staff
- **Three separate focus groups** with Portlanders from the Black community, with community members from East Portland, and one with people with disabilities
- **Community feedback and complaints** provided via an online submission form, through email and phone calls, and through engagement with stakeholder committees

2018 Portland E-Scooter Routes Traveled

Informed by company-provided route data, this map shows routes traveled by e-scooter riders most often. Darker blue dots signify more trips taken on that street segment. Many of the heaviest utilized routes – including NE Going Street, SE 122nd Avenue, NW Johnson, SW Naito Parkway, and the Willamette Greenway Trail – are also a part of Portland's bikeway network. It is clear e-scooters were utilized in East Portland, where the City required companies to deploy at least 100 scooters.

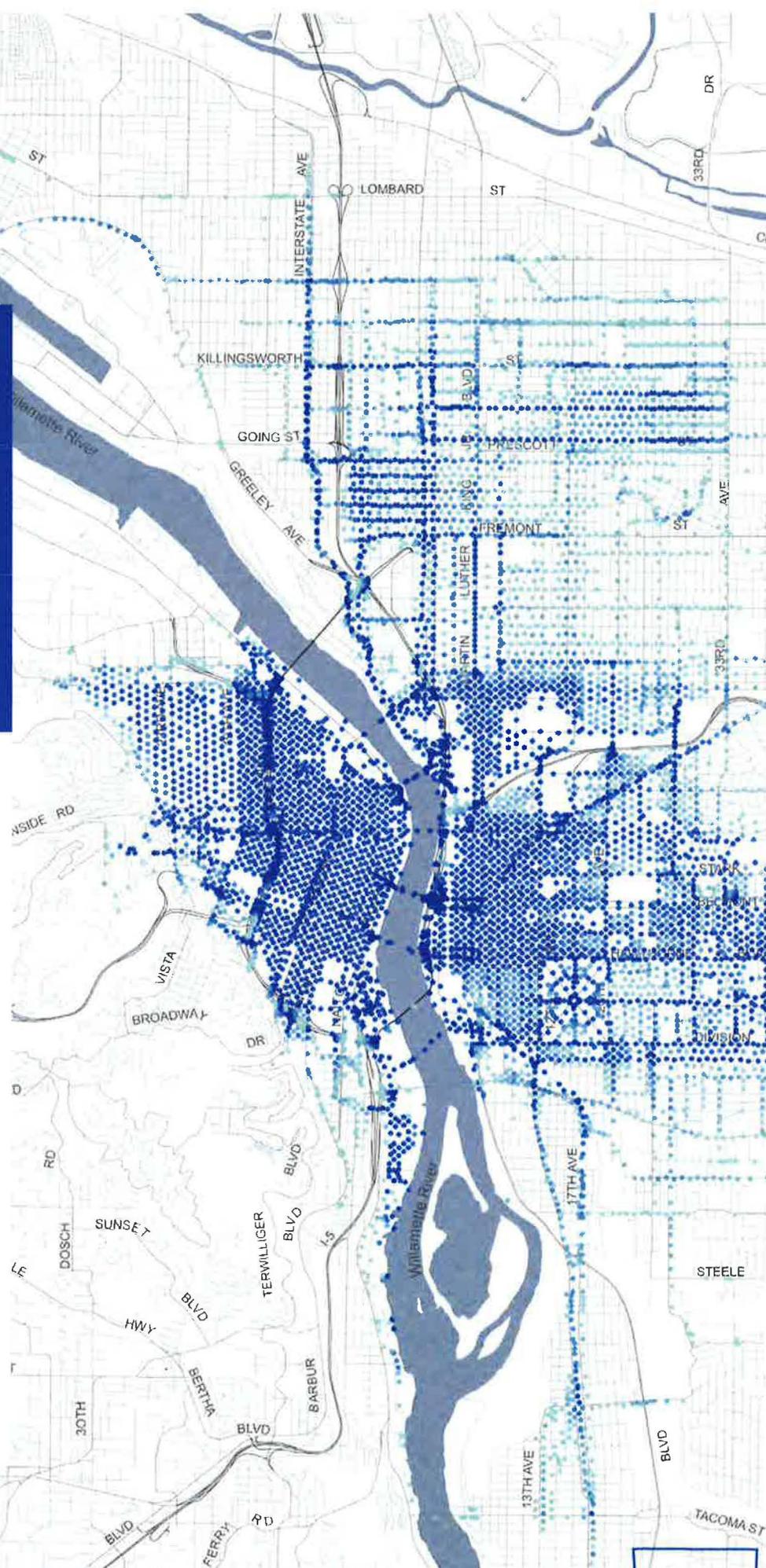
Total Number of Trips



Portland City Boundary



East Portland Pattern Area



2018 E-Scooter Pilot Findings

This Findings Report sets out to answer four key Transportation System Plan (TSP) goals:

- Reduce private motor vehicle use and congestion
- Prevent fatalities and serious injuries on Portland streets
- Expand access for underserved Portlanders
- Reduce air pollution, including climate pollution

QUESTION: Do e-scooters reduce private motor vehicle use and traffic congestion?

ANSWER: E-scooter trips replaced private motor vehicle use. However, the extent of motor vehicle use in managing e-scooter fleets is unknown.



Multiple responses from the e-scooter user survey support this finding:

- **E-scooters replaced personal car and ride-hailing trips.** Thinking of their last e-scooter trip, 34 percent of Portlanders said they would have either driven a personal car (19 percent) or hailed a taxi, Uber or Lyft (15 percent) had e-scooters not been available.
- **The auto trip replacement numbers were even higher among tourists and visitors (48 percent).** Thinking of their last e-scooter trip, 34 percent of visitors would have taken a taxi, Uber or Lyft, and 14 percent would have driven a personal vehicle had e-scooters not been available.
- **Portlanders reduced or considered reducing their auto ownership due to e-scooters.** Six percent of users reported getting rid of a car because of e-scooters and another 16 percent considered it.
- **Portlanders primarily used e-scooters for transportation.** Seventy-one percent of Portlanders stated they most frequently used e-scooters to get to a destination, while only a third of respondents (28.6 percent) stated they most frequently used e-scooters for recreation or exercise.

In addition to the survey results, pilot trip data shows a clear three-hour e-scooter evening commute peak, with 19 percent of all trips occurring between 3 p.m. and 6 p.m. on weekdays. As shown in the table to the right, weekend afternoons were also a peak riding time, with 10 percent of all trips occurring on Saturday and Sunday between 2 p.m. and 5 p.m.

While a large portion of e-scooter trips replaced car and ride-hailing trips, e-scooters also replaced lower-emission trips. Thinking of their last e-scooter trip, 42 percent of Portlanders said they would have either walked (37 percent) or ridden a personal bicycle (5 percent) had e-scooters not been available.

Finally, e-scooter operations likely added personal motor vehicle trips to the transportation system, to deploy and retrieve e-scooters each day. The extent and overall impact to the transportation system and traffic congestion is unknown.

Figure 2 : E-Scooter Use by Time of Day

Trip Start Time	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Grand Total
12 AM	1280	765	723	786	720	840	1470	6584
1 AM	989	517	475	518	545	575	1010	4629
2 AM	704	348	361	392	412	475	723	3415
3 AM	361	233	202	228	215	192	316	1747
4 AM	261	230	196	179	186	229	256	1537
5 AM	281	298	355	361	374	401	331	2401
6 AM	495	791	980	964	986	910	591	5717
7 AM	860	1839	2218	2354	2451	2187	950	12859
8 AM	1781	2942	3377	3640	3665	3430	2038	20873
9 AM	3515	3208	3408	3342	3579	3602	3730	24384
10 AM	5806	3746	3431	3552	3674	4110	5897	30216
11 AM	7935	5591	5188	5285	5611	6242	8081	43933
12 PM	9564	6958	6690	6654	7027	8058	9644	54595
1 PM	10584	7345	6614	6669	6952	8097	11120	57381
2 PM	10698	7731	7132	6796	6994	8726	12278	60355
3 PM	10754	8149	7855	7191	8204	9612	12175	63940
4 PM	10129	8677	8813	8532	8956	10125	11773	67005
5 PM	8485	8855	9235	9599	9468	9816	10165	65623
6 PM	6834	7477	7928	7923	8366	8516	8294	55338
7 PM	5303	5795	6231	6278	6709	7410	6474	44200
8 PM	4246	4526	4978	4838	5196	6330	5212	35326
9 PM	2112	2252	2439	2402	2539	3189	2579	17512
10 PM	1480	1478	1576	1510	1594	2124	1995	11757
11 PM	1007	1162	1110	1094	1299	1750	1620	9042
TOTAL	105464	90913	91515	91087	95722	106946	118722	700369

QUESTION: Do e-scooters prevent serious traffic injuries and fatalities? What are the safety impacts of e-scooters?

ANSWER: During the pilot period, scooter-related injuries increased however most scooter injuries were not severe enough to warrant emergency transport. There were no e-scooter-related traffic deaths during the pilot period. Eighty-four percent of emergency room visits were the result of an individual falling off a scooter.

The high number of public complaints regarding sidewalk riding, coupled with the 3 percent of injuries resulting from collisions with pedestrians, suggest an impact to pedestrian safety and comfort.

National data has found that when vehicle miles decrease, serious injuries and fatalities also decrease. With 34 percent of Portland scooter riders stating they replaced car trips with e-scooter trips, an increase in e-scooter use has the potential to contribute to a reduction in serious injuries and fatalities.



FINDING: Multnomah County Health Department's review found there were 176 scooter-related emergency room visits from July 25 – November 20, 2018. In the same period in 2017 there were 16 scooter-related emergency room visits. Visits increased from less than one per week before the pilot started to about 10 per week during the pilot period. Weekly visits peaked in late August and early September, then diminished to nearly pre-pilot levels before the pilot ended. This coincides with the typical annual peak in total traffic injury crash visits and vehicle miles traveled.

In addition to Multnomah County Health Department data, PBOT received 43 reports of collisions during the pilot period.

The scooter-related injury visits accounted for about 5 percent of total traffic crash injury visits during the pilot period. There were no e-scooter-related deaths during the pilot period. Although the number of e-scooter visits was lower than the number of bicycle-related visits (429), without comparable data on how many trips were taken and distance traveled while bicycling, we can't directly compare injury rates across modes.

There were several trends in the collision characteristics in triage notes:

- In 16 percent of reports, there was evidence of intoxication noted
- Helmet use was unknown in most injury reports (147, or 84 percent); in 3 percent of reports (six), it is noted that users were wearing a helmet, and in 13 percent of reports (23), it is noted that users were not wearing a helmet.

E-Scooter Related Emergency Room and Urgent Care Visits in Multnomah County July 25 – November 20, 2018

Colliding Mode	Total Visits	Percent of Total (Rounded to nearest tenth)
None/fall	146	83%
Car	22	12.5%
Truck	2	1.1%
Pedestrian (Scooter user injured after colliding with a pedestrian)	3	1.7%
Scooter (Pedestrian injured after being hit by a scooter user)	2	1.1%
Scooter (Scooter user injured after colliding with another scooter)	1	0.6%
Total	176	100%

Source: Multnomah County Health Department

National research has found that the strongest variables connected to traffic fatality rates are the number of automobile vehicle miles traveled and vehicles per capita.² With 34 percent of Portland scooter riders stating they replaced car trips with e-scooter trips, an increase in e-scooter use has the potential to contribute to a reduction in serious injuries and fatalities.

2. Ahangari, H., et al. (2017). Automobile dependency as a barrier to visits zero: evidence from the states in the USA. Accident Analysis and Prevention, 107(77-85)

Figure 3 : Complaints by Category

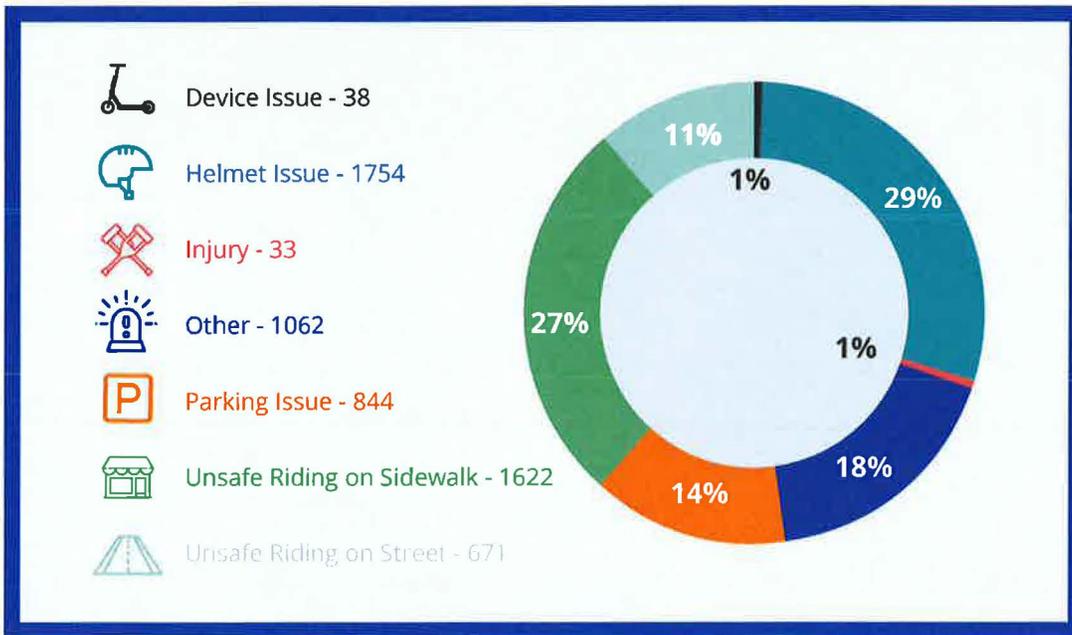
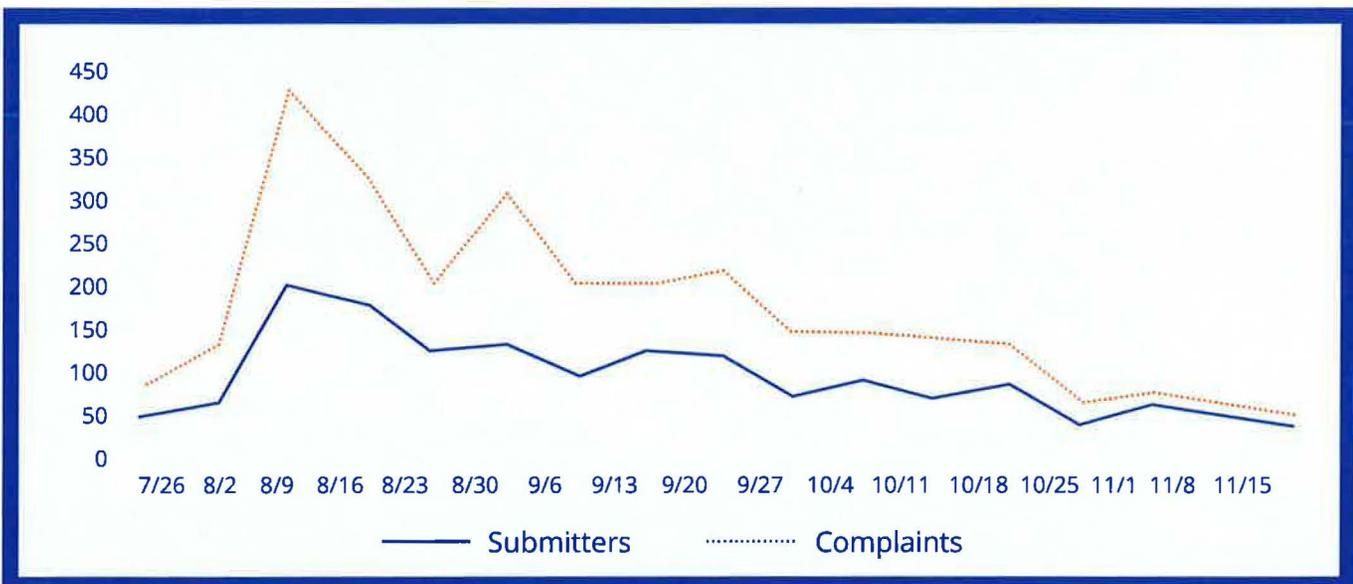


Figure 4 : Unique Complaints and Submitters per Week



FINDING: Sidewalk riding reduced pedestrian comfort.

We heard from Portlanders throughout the pilot that illegal sidewalk riding made sidewalks feel unsafe or uncomfortable for people walking or using mobility devices.

- 1,622 reports of sidewalk riding were submitted to PBOT's online form, 26.9 percent of all reports.
- Sidewalk riding was a key concern voiced by the Pedestrian Advisory Committee (PAC), TriMet's Committee on Accessible Transportation (CAT), and the Portland Commission on Disabilities (PCOD).

At TriMet's CAT, one committee member spoke to their fear of getting hit by a scooter rider: "I have to be really careful when stepping out of buildings now... scooters riding on the sidewalk is a safety issue for me and for others I know with disabilities."

With speeds capped at 15 mph, scooters are appropriate for bike lanes or low-volume streets but they are too fast for use sidewalks, where they make it unsafe or uncomfortable for people walking or using mobility devices.

Reduced safety and comfort of our most vulnerable road users undermines our citywide goals to prioritize people walking over all other modes. PBOT's Transportation System Plan (TSP) calls for decisions to consider the needs and safety of each group of users, and to ensure that "changes do not make existing conditions worse for the most vulnerable users" (see Appendix C).

In response to the public's concerns raised about sidewalk riding, PBOT conducted additional user education and on-the-street engagement and user observations.

FINDING: Users demonstrated a strong preference for bikeways and other protected infrastructure. In their absence, or on higher-speed streets, sidewalk riding increased.

In the PBOT user survey, respondents ranked the bike lane as their preferred place to ride and sidewalks their least preferred place to ride.

To better understand on-the-ground practices, PBOT conducted user riding observations. Staff observed 128 e-scooter users at seven locations across the city. Five of the seven locations had bike lanes on at least one street. All user observations were conducted during two-hour periods from 4 to 6 p.m., over eight days between October 2 and October 12, 2018. PBOT staff tallied the number of individual users, perceived gender, helmet use, facility type used (bike lane, with traffic, etc.) and took note of violations, such as riding in a park or riding the wrong direction with traffic. Observations showed that sidewalk riding was lowest on streets designed for people walking and rolling.

- When riding on a street with a neighborhood greenway, **zero percent** of riders used the sidewalk.
- When riding on a street with a protected bike lane, **8 percent** of riders used the sidewalk.
- When riding on a street with a bike lane, **21 percent** of riders used the sidewalk.
- When riding on a street with no bike facilities, **39 percent** of riders used the sidewalk.

When posted speed limits are 30 MPH or higher, most users rode illegally on the sidewalk.

- Where the speed limit is 20 mph, **18 percent** of riders used the sidewalk.
- Where the speed limit is 30 mph, **50 percent** of all riders used the sidewalk.
- Where the speed limit is 35 mph, **66 percent** of riders used the sidewalk.



"I have to be really careful when stepping out of buildings now... scooters riding on the sidewalk is a safety issue for me and for others I know with disabilities."

-Committee on Accessible Transportation Committee Member

FINDING: Helmet use is rare.

PBOT staff observed 90 percent of riders do not wear helmets. Of all complaints received by PBOT, 1,754 (29.1 percent) were regarding users not wearing helmets.

FINDING: While the majority of e-scooters are parked correctly, more work is needed to assure safety and access for pedestrians and people with disabilities.

PBOT staff conducted scooter parking observations from October 19 through November 20, 2018. Staff observed and recorded 357 parked scooters across the city with 67 percent observed in Southwest Portland, 17 percent observed in East Portland and 16 percent in other quadrants in Portland.

Parking observations showed:

- **72.8 percent** Properly parked in the furnishing zone (not blocking bike or pedestrian movement)
- **2.8 percent** Impeded ADA access (blocking access ramp, handrail, or curb cut)

- **5.3 percent** Completely blocked pedestrian movement (In middle of a sidewalk)
- **8.1 percent** Partially blocked pedestrian movement (placed partially outside the furnishing zone or parked next to a building)
- **0.6 percent** Parked within 30 feet of a bus stop, on a MAX or Streetcar platform (measured from the bus stop counter flow to traffic)
- **10.4 percent** Other (parked next to bike racks, in a park, on a street with no sidewalk or furnishing zone, or on private property)

Improperly parked scooters after a user's ride presented a challenge, especially for people with disabilities. This challenge increases in areas of Portland where the sidewalk is narrow or there is no sidewalk. Anecdotally, as the pilot progressed, staff received fewer complaints and saw better compliance to these rules.

QUESTION: Do e-scooters expand opportunity and access for underserved Portlanders?

ANSWER: E-scooters have the potential to expand opportunity and access for underserved Portlanders, though barriers exist.

**FINDING: While many Black Portlanders and East Portlanders expressed enthusiasm and support for e-scooters, focus group participants also expressed an overall concern with traffic safety and being targeted for racial profiling and harassment. The prohibitive cost of renting and a lack of knowledge of e-scooter laws and low-income plans also presented barriers to use.**

In a citywide representative poll, 74 percent of people of color viewed e-scooters positively. People living on low incomes also held positive views of e-scooters (66 percent).

PBOT hosted two focus groups in early November 2018. Portlanders from Black communities and East Portland communities participated in two focus groups, one with 10 participants and one with 12 participants. Both focus groups were facilitated and hosted by Self-Empowerment Inc (SEI).

Out of 22 Portlanders who participated, less than half (eight) had ridden an e-scooter. Focus group participants expressed enthusiasm as well as an overall concern for traffic safety and being targeted for racial profiling and harassment.

One individual spoke to the historical and current criminalization of people of color, stating, "it is not in our culture to pick up something off the street, ride it, and leave it for the next person." For some focus group participants, the overall threat of an escalating incident outweighed the desire to try e-scooters.

Other stated barriers to e-scooter use included needing to transport children, not having a helmet, not having a safe place to learn to ride, age restrictions, a reluctance to link a credit card to the app, and fear of being overcharged. Nearly all focus group members expressed a desire for more information, including what the e-scooter laws are and how to use the service.

Parents, youth, and single adults had differing views on e-scooters. Adults who did not have children were most enthusiastic. This group viewed e-scooters as another great transportation option, and a way to save money on Uber, Lyft, and taxis. Parents were the least likely to have ridden and did not see e-scooters as a way to transport their family. Youth expressed that e-scooters were fun and helpful to get to after-school activities, especially in the summer when their free youth bus pass is inactive. About half of the focus group members didn't know they could make money charging e-scooters, and most expressed interest in this kind of work.

According to reports from e-scooter companies, only 47 users were on low-income plans. While two companies stated they offered cash payment plans, they did not report that any users signed up for those plans. These small numbers, along with staff observations, suggest that companies did not adequately promote their low-income fares.

FINDING: East Portland deployment led to e-scooter utilization.

East Portland has historically been underserved by the transportation system, and PBOT was interested in understanding the utility and value of e-scooters in East Portland. On average, 243 e-scooters were deployed to East Portland (9.8 percent of the total fleet). Though this was significantly under the 300-scooter minimum requirement, 44,155 trips originated in East Portland during the pilot period. (See additional information in East Portland deployment compliance finding section.) This demonstrates demand for additional transportation options. One significant difference in e-scooter use in East Portland was the average trip length. Trips in East Portland averaged 1.6 miles, while in the Central City, trips averaged one mile.

In our user survey, we heard two distinct messages from East Portlanders. Many community members expressed appreciation that they had access to this new transportation option, and others expressed a concern for a lack of safe infrastructure:

"I LOVE having the scooters be part of the mix. They're fast, fun and convenient (when available, there needs to be a lot more). I live on 114th & E Burnside and have been pleased to see reasonable distribution of the scooters as far east as 150th. Keep and EXPAND the scooters!"

"I'd really like to see fewer cars everywhere, but the major thoroughfares are especially dangerous for non-driving travelers (peds, bikes, and now scooters)."

Comments from users and trip statistics show the desire for safer infrastructure and additional transportation options, such as e-scooters.

FINDING: Among people with disabilities, we heard that while e-scooters hold promise as a transportation option, improperly parked scooters impact access and safety for people with visual impairments and people who use mobility devices.

Seven Portlanders with disabilities and two City staff with disabilities participated in one focus group in early November, facilitated by staff in Portland's Office of Equity & Human Rights. The participants represented a wide range of mobility, hearing, and vision abilities.

Among people with disabilities, we heard that while e-scooters might not be a good fit for everyone, having more transportation options is a good thing for Portland.

While e-scooters hold promise, several individuals with disabilities expressed concerns about safety and user behavior enforcement. One participant, who is blind, said it is challenging to walk and that they bump into scooters often. Parking issues were the most challenging and concerning for focus group members when scooters blocked ADA access at a transit stop or access to ADA parking spots.

In the focus group, two individuals who had ridden e-scooters used them as a transportation option. For people in the focus group who haven't ridden, balance and blindness were stated barriers. For people who cited balance issues, a three- or four-wheeled scooter could be a good accommodation.

QUESTION: Do e-scooters contribute to a reduction in air pollution, including climate pollution?

ANSWER: More experience with e-scooters and more data collection are needed to determine whether e-scooters directly contribute to a reduction in greenhouse gases.



Based on our preliminary analysis of the available data, it is uncertain if e-scooters help advance Portland's Transportation System Plan goals and policies by contributing to a reduction in air pollution, including climate pollution. However, early findings show that e-scooters reduced automobile trips.

Analysis of the PBOT's user survey suggests that e-scooters facilitate mode shift, most notably away from walking, single occupancy vehicles, and ride-hailing. Comparing these percentages to the total number of scooter miles traveled during the e-scooter pilot (801,887 miles), we estimate that e-scooters replaced approximately 301,856 vehicle miles

that would have been traveled in single occupancy vehicles and other shared vehicle trips (see Appendix F). Given the geographic distribution of e-scooter rides during the pilot, it is reasonable to expect that many of those miles would have occurred in the Central City and inner eastside neighborhoods, areas which experience traffic congestion issues. Using the U.S. Environmental Protection Agency's average CO₂ emissions per vehicle mile, we estimate that during the pilot, e-scooters prevented automobiles from emitting approximately 122 metric tons of CO₂, equivalent to removing nearly 27 average passenger vehicles from the road for a year.



E-Scooters replaced approximately 301,856 vehicle miles

While these findings are promising, it is important to note three key limitations to this analysis. First, whether survey respondents would behave in accordance with what they stated in the survey is unknown. Second, without occupancy data on the number of shared Uber and Lyft rides (i.e., two or more riders), we assumed that 10 percent of those rides would have been shared and 90 percent would have been single rides. Third, we simply do not have the data necessary to account for the emissions associated with e-scooter companies' business models. This includes data about emissions associated with e-scooter companies' supply chains, manufacturing processes, charging and deployment

operations, frequency of scooter replacement, their waste stream, or more. Without these data, it seems reasonable to assume that if those emissions were accounted for, then they could potentially reduce or eliminate the greenhouse gas benefits modeled above. Understanding more about e-scooter-related emissions would also help evaluate the climate impact of e-scooter trips replacing walking and personal bicycling trips (42%) as reported in the user survey. Clearly, more data are needed to determine whether or how e-scooters contribute to Portland's adopted policy goals of reducing air pollution, including climate pollution.

QUESTION: Did companies comply with the permit requirements?

ANSWER: Overall, companies' compliance with the permit requirements varied. PBOT worked with individual companies on improving performance and better understanding each company's operational realities.



FINDING: The companies' compliance with the permit's data requirements varied. All companies supplied APIs to PBOT, however some key terms were not universally used and defined, which led to inaccurate data reporting by the companies.

PBOT required a robust suite of Application Programming Interfaces (APIs) including device availability, trips (start, end, and route data), collisions, complaints, and enumerated values that are referenced in the API specifications (Appendix B). This set of data was a primary source for both the findings report and company compliance.

The pilot revealed that participating companies categorize their device information differently and adapting to permit API specifications wasn't as straightforward as originally speculated. For example, it was discovered toward the end of the pilot that Bird's availability data, which was informing our compliance dashboards, was underreporting their Portland fleet. This issue appeared to be the result of undefined terms, thought to be universally understood, which was ultimately corrected. To rectify this discrepancy, PBOT asked for historical data to supplement what was collected during the pilot to produce a more accurate reflection of the pilot for the purpose of this report.

FINDING: Two companies complied with the citywide fleet requirement.

Companies were required to make 90 percent of their permitted fleet available per day. Data shows that Bird and Lime performed the best, deploying almost 100 percent of their fleet on average throughout the pilot. Skip averaged below 90 percent of the citywide fleet requirement.

Skip consistently deployed fewer devices due to a misunderstanding of the requirement, which the Bureau clarified after identifying the compliance issue. Later in the pilot, Skip chose to temporarily halt deployment due to rain, which has been accounted for in this compliance report.

Compliance was calculated based on data received through the API from all companies and historical data provided by Bird

FINDING: Only one company complied with the East Portland fleet requirement.

PBOT required companies to deploy at least 100 scooters or 20 percent of their fleet (whichever is less) in East Portland. Data shows that Bird performed the

best, deploying more than 100 percent of the minimum required scooters on average throughout the pilot. Both Lime and Skip deployed below 90 percent of the minimum required scooters on average throughout the pilot.

Compliance was calculated based on data received through the API from all companies and historical data provided by Bird.

FINDING: While companies performed well in responding to emergency and non-emergency response requirements from the City, companies' complaint data was not reported to PBOT's expectations. Therefore, we are unable to analyze how responsive companies were to public complaints.

Lime was the only company to report community-generated complaint data. However, all companies consistently responded to emergency and non-emergency requests from the City. Companies had between 20 and 60 minutes to respond to a City-initiated complaint depending on the nature of the complaint. Each company either met or made a good faith effort to meet these time requirements.

FINDING: Companies complied with capping the speed of their e-scooters. However, PBOT staff vehicle testing suggests several factors affect speed.

Early in the pilot, a local news outlet reported that e-scooters exceeded the maximum speed permitted in the administrative rule by almost 5 mph. Responding to this concern, three staff members conducted a test to understand the variability of scooter speeds and the ability of companies to modify their vehicles to comply with local regulations. Staff chose a minimally populated street with a low grade and tested the speed of scooters from each company using both a smartphone app and a handheld speed-reader. The test resulted in speeds ranging from 14.5 mph to 18.6 mph. Several factors, including but not limited to street activity, grade, user weight, user driving style, and environmental conditions, contributed to the variability in device speeds. Companies asserted that while these variables exist and should be reflected in local regulations, they can also cap the speed of devices within a reasonable margin.

FINDING: Companies complied with user education

requirements.

Companies educated their e-scooter users by listing applicable laws in their apps, on their vehicles, and distributed educational flyers and helmets at events.

In addition, companies required their users to take a picture of their parked e-scooter at the end of their trip. PBOT is unclear whether the pictures are monitored by the companies to ensure users are properly parking e-scooters.

FINDING: With regards to deployment locations, company compliance improved as the pilot progressed, but was still not satisfactory.

PBOT's permit parking requirements reflect our values of accessibility for our most vulnerable road users – pedestrians and people with disabilities. The permit language prohibited deployment under 19 conditions.

Major issues included deployments blocking access to transit, blocking access to ADA facilities, blocking pedestrian throughways, on private property, and in neighboring jurisdictions.

Through frequent management conversations, deployment compliance improved as the pilot progressed. The companies were quick to respond to specific deployment modifications PBOT requested.



2018 E-Scooter Pilot Financials

The Purpose section of Portland's New Mobility Shared Electric Scooter administrative rule, TRN-15.01 states that "1.D. Shared Scooter fees, surcharges and penalties will be placed in a New Mobility Account to be used by PBOT for administration and enforcement; evaluation; safe travel infrastructure; and expanded and affordable access."

The Fee Schedule in the Shared Electric Scooter Permit included:

- Permit Application Fee: \$250
- Pilot Permit Fee: \$5,000
- Per-Trip Surcharge: \$0.25

Together, these permit and ride fees covered project start-up and program administration costs for the e-scooter pilot, as well as educational materials and public outreach.

Permits & Fees			Expenses		
Pre-Pilot Phase			Pre-Pilot Phase		
n/a	\$	-	Program design	\$	48,995
Subtotal	\$	-	Subtotal	\$	48,995
Pilot Phase			Pilot Phase		
Application and permit fees	\$	15,500	Program administration and outreach	\$	155,415
Per trip surcharge	\$	187,577	Educational materials	\$	11,455
Fines and penalties	\$	9,000		\$	
Subtotal	\$	212,077	Subtotal	\$	166,870
Post-Pilot Phase			Post-Pilot Phase		
n/a	\$	-	Program evaluation	\$	71,417
Subtotal	\$	-	Subtotal	\$	71,417
Total Permits & Fees	\$	212,077	Total Expenses	\$	287,282
			Balance	\$	(75,205)





Conclusion and Recommendations

E-scooters have the potential to advance Portland’s transportation goals. This is one of this report’s key findings. This report demonstrates that as Portland grows and traffic congestion gets worse, e-scooters can move more people safely and efficiently in the same amount of space. This helps reduce reliance on automobiles and shift trips to an efficient, potentially less-polluting travel option. We believe there is a preliminary indication that e-scooters are a less-polluting travel option. However, we need more data – especially regarding e-scooter operations and lifecycle costs – before we can definitively say how much or even whether e-scooters directly contribute to a reduction in greenhouse gasses.

During the pilot, riders took more than 700,000 e-scooter trips on various types of streets. Throughout the city,

sidewalk riding was lower along streets with lower speeds or designated bikeways. For us, this clearly demonstrates how important it is to have protected facilities that minimize conflicts between pedestrians, e-scooters, and cars.

For all of the positives about scooters that emerged during the pilot, we also learned valuable lessons about the challenges related to making scooters a permanent part of Portland’s transportation ecosystem.

Given the scale and scope of these challenges, we believe it is advisable to conduct a second pilot in 2019. This pilot will be longer to give us more time to test innovative solutions to the challenges that emerged this past summer and fall. We will specifically focus our efforts on improving equitable access across the city and ensuring safe and legal riding and parking.

Next Steps

With the release of this report, PBOT plans to conduct additional public and stakeholder engagement through February 2019. Public engagement will inform a revision of PBOT’s administrative rule and permit application. PBOT anticipates having e-scooters on the ground again in early spring.



E-Scooter Findings Report Appendix

The E-Scooter Findings Report Appendix is available online at: <https://www.portlandoregon.gov/transportation/e-scooter>

- A. New Mobility Shared Electric Scooter Administrative Rule - TRN-15.01
- B. Permit Application
- C. TSP Goals
- D. API Data Methodology and Limitations / Assumptions

- E. Data Analytics Process
- F. Climate Reduction Methods
- G. User Survey Results
- H. Complaint Form Questions
- I. Multnomah County Health Department Injury Data
- J. DHM Research E-Scooter Pilot Project Survey Report





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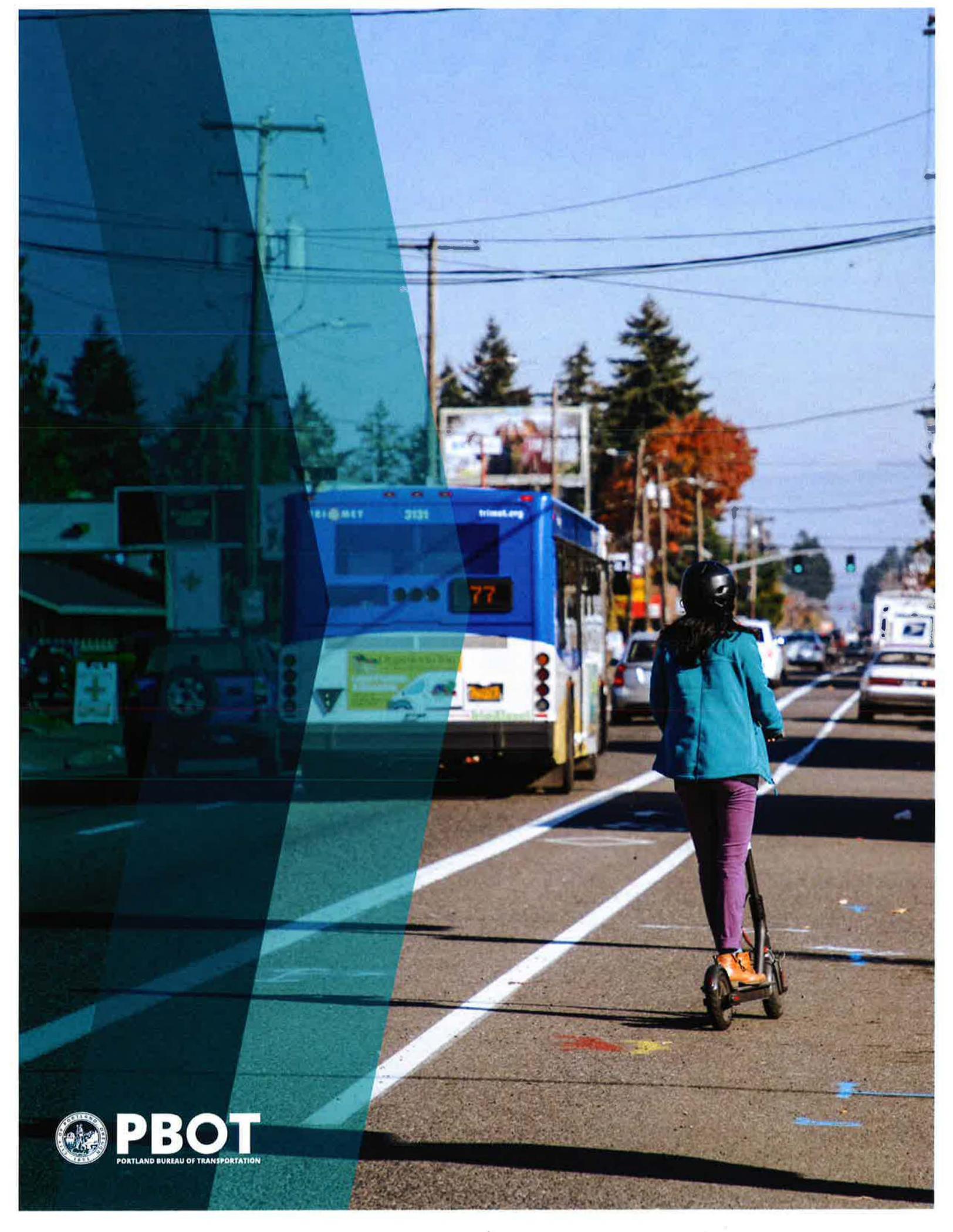
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