
Baltimore City

Dockless Vehicle Program

Annual Evaluation Report: Permit Year One

Scooting from Pilot to Permanence



May 2020

About Baltimore City DOT

The Baltimore City Department of Transportation (BCDOT) provides the City of Baltimore with a comprehensive and modern transportation system that integrates all modes of travel and provides mobility and accessibility in a convenient, safe, and cost-effective manner. BCDOT is working to promote options that move and connect Baltimore's neighborhoods—making it a livable, vibrant, and safe city where people enjoy living and visiting. BCDOT is adapting to emerging and future needs by supporting transportation options, such as ridesharing, walking, biking, public transit, and new mobility options. By providing access to more transportation modes, BCDOT is supporting the ability of community members to choose the mode that fits their needs in each circumstance.

Compilation of this report was led by the following BCDOT team members:

- Meg Young, Shared Mobility Coordinator
- Charles Penny, Transit & Sustainable Transportation Bureau Chief
- Theo Ngongang, Deputy Director of Policy and Planning
- On-call consultant staff from Kittelson & Associates, Inc.

A message from the Director:

The Baltimore City Department of Transportation (BCDOT) is excited to share the detailed second annual evaluation report for its Dockless Vehicle Program. The program represents a business model in which bicycles and scooters are made available for rent but can be located and left nearly anywhere throughout the city — they do not need a fixed station or dock. The program is an innovative, cost effective mobility approach that helps improve traffic and connects residents, businesses and visitors to many locations throughout the City of Baltimore. Baltimore's dockless vehicles are now a critical part of our effort to meet BCDOT's goal to create an equitable, reliable, accessible transportation options for every single resident across our amazing city. As we go into our second annual permit the Dockless Vehicle Program is rooted in thoughtful expansion, program evaluation and most importantly feedback from stakeholders and residents alike.

BCDOT is proud to be recognized as a national leader of dockless vehicle programs and we strive to improve our shared mobility efforts that will make a lasting impact on our transportation network. BCDOT has fully embraced the idea that people are finding new ways to get around cities, and those methods are changing dramatically. It is our priority to stay ahead of technological advances and incorporate new transportation services that can better help the public to move across our city more efficiently and safely.

As we scoot along, I look forward to continuing to work with local stakeholders, citizens and the business community to provide a 21st century solution for efficient, accessible and low-cost transportation options in the city.



**Steve Sharkey, Director
Baltimore City Department of Transportation**

On the cover: Dockless vehicle routes traveled in Baltimore City. The map shows routes with at least three trips per day from August 2019-February 2020.

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I. Overview



Over the past year, the Baltimore City Dockless Vehicle Program has progressed from a pilot to a permanent program. The Department of Transportation, with the support of a Dockless Vehicle Committee, evaluated the 2018 pilot and established a permit-based program. Rules and Regulations were approved and adopted, assuring the Dockless Vehicle Program would provide alternative safe, equitable, and reliable transportation for all users. The program continues to evolve and improve through careful evaluation and focus on all elements of the program, from rider behavior to investment in permit fees to address issues.

Introduction

The Baltimore City Department of Transportation (BCDOT) Dockless Vehicle Program allows private companies to provide rental electric scooters and bicycles to city residents, visitors, and workers. This report will evaluate the status of the program against key goals and will provide recommendations for improvement. After the 2018 pilot, the Dockless Vehicle Program was made permanent through legislation and the establishment of a competitive permitting process. BCDOT issued the first annual permits in August of 2019. While the program is now officially permitted, BCDOT continues to evaluate, monitor, and improve the program's effectiveness in a rapidly evolving streetscape. Programs for shared small vehicles, such as the Baltimore Dockless Vehicle Program, are still in development across the nation. Consistent standards for new vehicle types, like e-scooters, are not yet incorporated into national guidance manuals or regulations. Similarly, best practices for the development of local regulations are not yet clear. Many cities are adjusting their regulations to address issues that have arisen from the rapid proliferation of dockless vehicles in cities worldwide since 2017, and BCDOT is an active participant in conversations around developing comparable standards and performance metrics.

2019 Program Overview

After an enabling ordinance was passed in May 2019, the BCDOT Dockless Vehicle Program transitioned from a pilot to an officially permitted program. In August, BCDOT awarded one year permits to four operators: Bolt, JUMP, Lime, and Spin. Over the year, an average of 1,900 dockless vehicles were deployed daily, resulting in 1,992,305 trips taken by about 59,000 active monthly users. This includes over 200 people who subscribed to the Equity Plans (low-income, non-smartphone, and cash options), which permit holders were required to provide.

The Rules and Regulations for permit holders were developed based on a qualitative and quantitative assessment of the successes and challenges of the pilot program. The regulations for the permit, such as fleet size or equitable vehicle deployment, were based on analysis of operational data, public opinion surveys, and conversations with the public Dockless Vehicle Committee, which continues to advise the program. These Rules and Regulations were made public for comment and then formally adopted before the call for permit applications. BCDOT then led a competitive application process to attract dockless companies who would partner with the City to improve the program and make steps towards BCDOT's goals of safety, equity, and program growth.

2020 & Looking Ahead

At the start of 2020, JUMP, Lime, and Spin remained operational in Baltimore under the adopted Rules and Regulations and, as of May 7, JUMP and Lime have merged. The program is a unique partnership that encourages public and stakeholder participation and discussion about requirements and investment into the program. The program solicits and actively responds to public and stakeholder feedback and is guided by a volunteer technical committee – resulting in a novel approach to developing and iterating regulations in the new and rapidly developing field of shared micro-mobility. This report reviews the performance of regulations in achieving program goals and identifies areas for improvement. Recommendations for the program, which can be found at the end of this report, are based on data and qualitative information collected within the first six months of the permit program, including safety data, trip data, community feedback, and best practices. Special consideration around the unprecedented 2020 COVID-19 outbreak and response is also noted in Appendix 3.

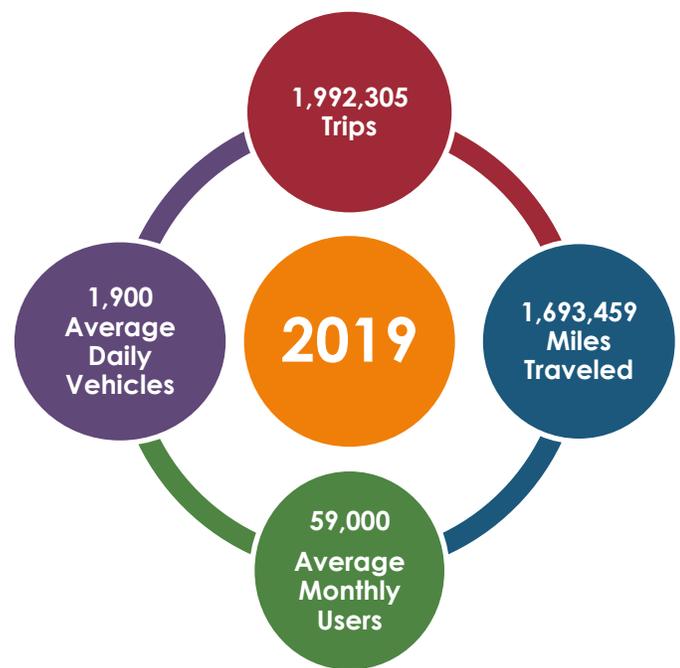


Figure 1: 2019 Dockless Program Stats

Program Timeline

August
2018

- Pilot Program launches with two companies deploying e-scooters in Baltimore City

October
2018

- BCDOT hires Shared Mobility Coordinator to manage pilot
- Dockless Vehicle Committee forms

January
2019

- Enabling Legislation Bill is introduced to City Council

February
2019

- Two additional dockless companies join pilot

May
2019

- Dockless Vehicle enabling ordinance signed into law, establishing operating laws and a dockless vehicle for-hire permit

July
2019

- Permit Rules and Regulations adopted after public comment
- Fees are approved by the Board of Estimates
- BCDOT holds a competitive application process

August
2019

- First permits are issued to four Dockless Vehicle providers

March
2020

- Permit Rules & Regulations are adjusted as part of COVID-19 response

Program Context & Goals

BCDOT is tasked with balancing the competing goals, priorities, and transportation needs of Baltimore City’s residents, visitors, and workforce. From the initial launch of the Dockless Vehicle pilot to the current permit program, BCDOT continuously aims to evaluate emerging transportation technology and services that can improve the quality of life in Baltimore City. This program exemplifies the need for careful evaluation so that BCDOT can implement regulations that promote the following goals:

1. **Directly increase equity of access for underserved communities**
2. **Promote efficient and sustainable transportation modes**

The first year of the permit shows improvement in these areas, but this evaluation sheds light on incremental revisions that can be made to increase the program’s success.

Increase Equity of Access

Transportation options help people in Baltimore City to live their daily lives and access jobs, healthcare, recreational space, healthy food, and everyday amenities. Through regulation that focuses on equity goals, dockless vehicles can be an additional transportation option, thereby helping to reduce racial, generational, and geographical transportation disparities that affect Baltimore residents. Regulations in the Dockless Vehicle Program seek to specifically address inequities in part through:

1. **Equity Plans-** Each permit holder is required to provide a low income, a non-smartphone, and a cash based plan. Permit holders are allowed to set the specifics of their plans, as long as BCDOT approves.
2. **Equity Zones-** BCDOT mandates equitable deployment and outreach—vehicles must be equitably deployed each morning across the city and to specific locations; outreach events must be hosted in locations across the city.

In the context of Dockless Vehicle regulations, encouraging equity does not simply mean mandating equal deployment in every community, nor is it fully accomplished by permit holders providing an inexpensive “Equity Plan” membership option. Working toward equity means trying to understand the different needs, desires, and experiences of different communities along with making efforts to communicate with people where they are and meet the needs that they communicate. These practices are informed by ongoing analysis and engagement that identifies the transportation needs and desires of marginalized groups.

This report will examine the effectiveness of Equity Plans as well as the tactics used to promote them; these plans attempt to provide options for people who lack the resources typically required to access dockless vehicles. The report will also analyze the effectiveness of Equity Zones, which refer to locations selected for mandatory daily scooter deployment based on metrics ranging from household vehicle access to connectivity to safe places to ride. These zones set out to provide dockless vehicle access to areas of the city that have been historically underserved due to underinvestment and exclusion from investment.

The regulations that govern the first year of the permit were designed to be responsive to the reality of Baltimore City. Median household income is approximately \$11,500 below (20%) the national average. For African Americans in Baltimore City, the income gap is even wider, with the median income coming in about \$22,000 below (38%) the national average. This low median income likely contributes to the high percentage of households (as many as 80% in some neighborhoods) that do not have access to a private motor vehicle. At an average cost of \$25.43 per day, owning a vehicle is a burden for low-income families.¹ While dockless vehicles are not the least expensive transportation mode available (the average trip costs about \$4), they may provide new connections for people who do not own cars or have

Comparative Costs for Different Travel Modes

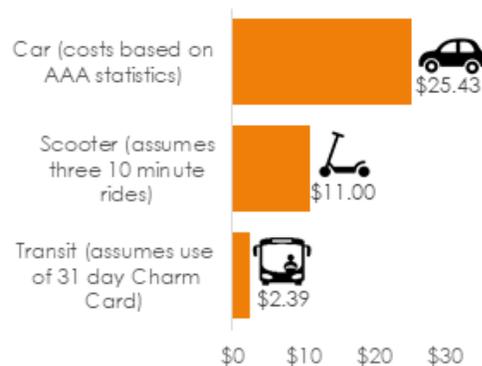
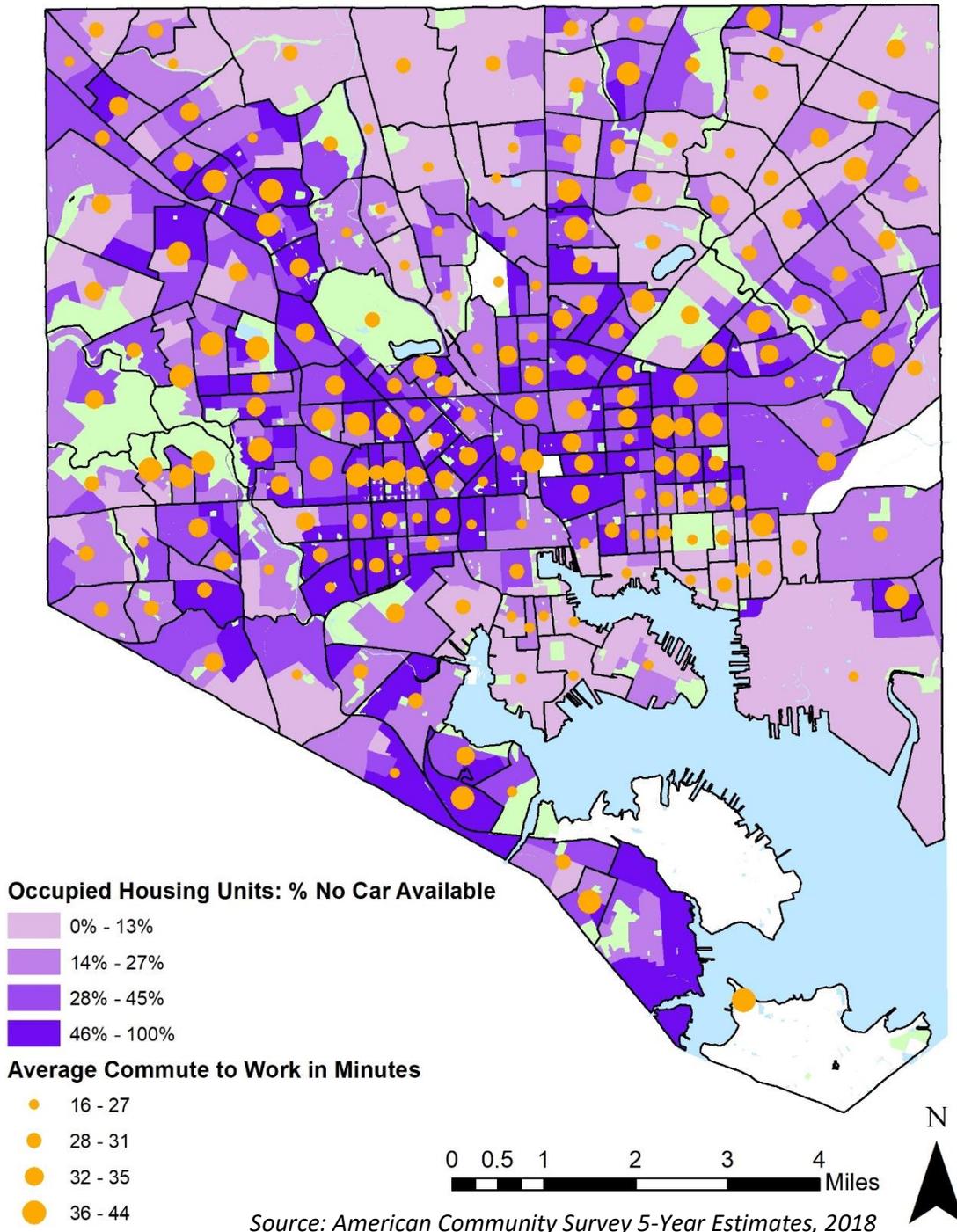


Figure 2 Comparative Daily Costs for Travel Modes

<https://newsroom.aaa.com/auto/your-driving-costs/>

convenient access to public transit. Many neighborhoods that are not geographically far from job centers still report an average travel time to work of up to 44 minutes in each direction. Unsurprisingly, many of these neighborhoods correspond with East and West Baltimore’s historically red-lined communities, established in 1937 by the Home Owners Loan Corporation.² Through more equitable geographic deployment than the unregulated private market would provide and reduced dockless vehicle costs for those who need it, BCDOT hopes that dockless vehicles can provide a means of reducing barriers to access by providing a new transportation option in all of Baltimore’s neighborhoods.

Vehicle Access by Census Block & Average Commute Time by Census Tract



² University of Baltimore, Baltimore Neighborhood Indicators Alliance “Vital Signs.” https://bniajfi.org/wp-content/uploads/2018/04/vs16_FullReport.pdf

Promote Efficient & Sustainable Transportation

The Dockless Vehicle Program is part of the BCDOT Transit and Sustainable Transportation Bureau, which is working to reduce congestion and the prioritization of automobiles on our roadways. Over the past year, the Dockless Vehicle Program has been integrated into BCDOT to align with the guiding policies of the recently passed Complete Streets Ordinance. Mandated by law and developed as part of the *Complete Streets Manual*, BCDOT's modal hierarchy prioritizes all other transportation modes over single occupancy automobiles. The alternatives—active transportation and transit—are better for the environment, reduce crash severity, are better for people's health, and are beneficial to the local economy. By promoting active transportation and transit, Baltimore can reduce severe crashes, lower car dependency, limit wear and tear on infrastructure, and reduce the City's carbon footprint.

The Dockless Vehicle Program also coordinates closely with BCDOT's other alternative transportation programs, such as Bike Baltimore and the Charm City Circulator. Dockless vehicle data is actively used to implement the *Separated Bike Lane Network Plan*, since people using bikes and scooters have similar requirements in terms of infrastructure quality and connectivity. Vehicles may also provide a "first and last mile" option for people who travel on the Charm City Circulator, which completes over 4.5 million trips annually.

Through these policies, BCDOT hopes to reduce the percentage of Baltimore commuters who drive to work. The proportion of Baltimore workers who drive alone to work has remained steady, but the proportion who bike to work has doubled since Baltimore City installed its first bike lane in 2007.³ By making more dockless vehicles available and using permit fees to fund infrastructure upgrades for active transportation, the Dockless Vehicle Program aims to move this needle even more. The effectiveness of these infrastructure upgrades paid for by permit fees should be reviewed annually. This year's program supported other City efforts, including utilizing data to evaluate bike facilities, funding bike facility upgrades, and contributing to the *Complete Streets Manual*.



Figure 3: The Baltimore City Complete Streets Modal Hierarchy

Dockless Vehicles On Complete Streets

In December 2018, the City of Baltimore adopted a new Complete Streets Ordinance that changes the way the City plans and implements transportation projects through a *Complete Streets Manual*. The manual dictates a modal hierarchy that prioritizes more vulnerable roadway users and the development of a street typology system that accommodates each mode on different types of roads. The Dockless Program shared the following lessons for considerations in the *Complete Streets Manual*:

- **Anticipate an increasing diversity of modes:** Increasing diversity mandates speed control and space for all users—street typologies are essential to allow route choices.
- **Be aware of increasing demand for curb space:** Frequent maintenance audits and curb space inventories are necessary for equitable usage.
- **Expect more people to try new modes:** We must focus on connections and transitions so that people can find the safest route for their mode of choice.

³ American Community Survey Five-year Estimates 2013-2017

Adapting to Emerging Mobility

Advances in transportation technology are transforming communities all over the world, including throughout Baltimore. New transportation services are offering mobility solutions to areas that were previously underserved, impacting how people travel, how often people travel, and where people travel. Today, new shared mobility services, such as ride hailing services (Uber, Lyft, etc.), app-based delivery services, and dockless vehicle services (scooters and bicycles) are becoming more popular, as they allow people to conveniently travel or meet their needs without owning a car.

In the future, rapidly advancing technologies, such as automated vehicles and urban air mobility, may offer individuals cheap, on-demand trips at any time of day without needing to own a car. Automated vehicles and delivery drones will also transform commerce and the use of curb space in cities. By embracing, adopting, and properly regulating these rapidly emerging technologies, the transportation system can improve for all users.

Evaluation Format

The Dockless Vehicle Program is evaluated through the lens of data and perspective provided by three groups of stakeholders:

- **Permit Holders** who operate vehicles and report data
- The **Baltimore community** who use vehicles or share the roadway with dockless vehicles
- **Baltimore City DOT**, which sets policies and manages the program

This evaluation will summarize the analysis of data received from each group to assess the performance of the Dockless Vehicle Program. **All data displayed is from August 15, 2019 (when permit Rules and Regulations took effect) to February 29, 2020, unless otherwise noted.** Each section begins with core questions to be answered with the data. The conclusions will be used to gauge how well the program is meeting its goals.

Recommendations, found at the end of the report, outline concrete changes that can be made to push the program toward its goals. Proposed changes to Rules and Regulations will be made available for public comment before being enacted. Currently, BCDOT is waiting until the lifting of the State of Emergency to release more details about proposed changes in order to adapt to the environment at that point in time.

Dockless Vehicle Committee

The success of the Dockless Vehicle Program, monitoring, and evaluation would not be possible without the direct involvement of diverse stakeholders. The Dockless Vehicle Committee (DVC) was formed to advise BCDOT on the impacts of the emerging Dockless Vehicle Program. The DVC participated in planning and executing a robust pilot evaluation through bi-weekly meetings throughout the length of the Dockless Vehicle Pilot. Since the permit launched, the frequency of DVC meetings was reduced to once a month; these stakeholders' perspectives are critical to helping BCDOT in monitoring and evaluating the program. All meetings are open to the public and adhere to the Maryland Open Meetings Act. More information about the DVC can be found at <https://transportation.baltimorecity.gov/dockless-vehicle-committee>.

Committee members are not appointed and voluntarily join meetings. BCDOT would like to acknowledge the following offices and organizations whose staff frequented DVC meetings over the past year:

- Baltimore City Mayor's Office
- Baltimore City Council
- Baltimore City Department of Planning
- Baltimore City Health Department
- Baltimore City Law Department
- Baltimore City Office of Information & Technology
- Baltimore City Mayor's Office of Sustainable Solutions
- Baltimore Police Department
- Baltimore City Office of Civil Rights
- Parking Authority of Baltimore City
- Bike and Brunch Tours
- Bikerore
- Downtown Partnership of Baltimore
- Friends of Library Square
- Johns Hopkins Bloomberg School of Public Health
- South Baltimore Gateway Partnership
- University of Maryland Baltimore National Study Center for Trauma and EMS
- Waterfront Partnership of Baltimore

II. Data Analysis



Core Evaluation Questions:

Where and when do people choose to use dockless vehicles?

Can the vehicles be accessed in an equitable manner under the current provisions?

Has safety improved under the permit program?

BCDOT receives vehicle and trip data from the permitted operators through a Mobility Data Specification Application Program Interface (MDS API—see text box), which is downloaded, aggregated, and displayed for analysis by Populus Technologies. These data are viewed as both potentially identifying and proprietary, so BCDOT utilizes several precautions when handling trip data. All data viewed on City servers is aggregated, and requests for data must undergo a screening by the Baltimore City Law Department under the Maryland Public Information Act. Types of data reported through the MDS API and their respective level of aggregation include:

- Location of Trip Origins and Destinations, aggregated to the Census Block level
- Deployment of vehicles, aggregated to the Census Block level or to specific study areas requested by BCDOT
- The number of trips on each block-length street segment

From this data, BCDOT can investigate when and where vehicles are deployed and on trips.

In addition to data conveyed through the MDS API, BCDOT requires permit holders to submit monthly reports with qualitative data.

These monthly reports include:

- The number of active users during the past month, including the number of Equity Plan subscribers
- Customer complaints, including reports of illegal parking and non-deployment requests
- Aggregated vehicle repair information
- Reports on any City meetings attended, community events attended, and marketing efforts

Analysis of this data can help assess how the program is meeting the goal of equitable access and how it is affecting the active transportation mode share across the city.

Trip Data Analysis

From trip data, BCDOT can monitor the growth of the Dockless Vehicle Program and look for trends and patterns. Knowing when and where people access vehicles can help identify the areas where the program is working or not working – information which can be used to increase ridership and meet the goal of increasing the active transportation mode share.

Looking at the data around deployment, or where vehicles are placed each morning, can let us know if vehicles are accessible across the city— this is one of the best proxies for increasing equity of access.

Mobility Data Specification

The Mobility Data Specification (MDS) is the Application Program Interface (API) that conveys trip data from dockless vehicles to BCDOT. MDS communicates real-time data from dockless vehicles to the companies and then to Baltimore City. The data contents, format, and coding are standardized so that each company, as well as cities across the nation, can collect, analyze, and share comparable data. The data are conveyed through an API or link that contains real-time data conveyed at least every 30 seconds. Data conveyed from permit holders include:

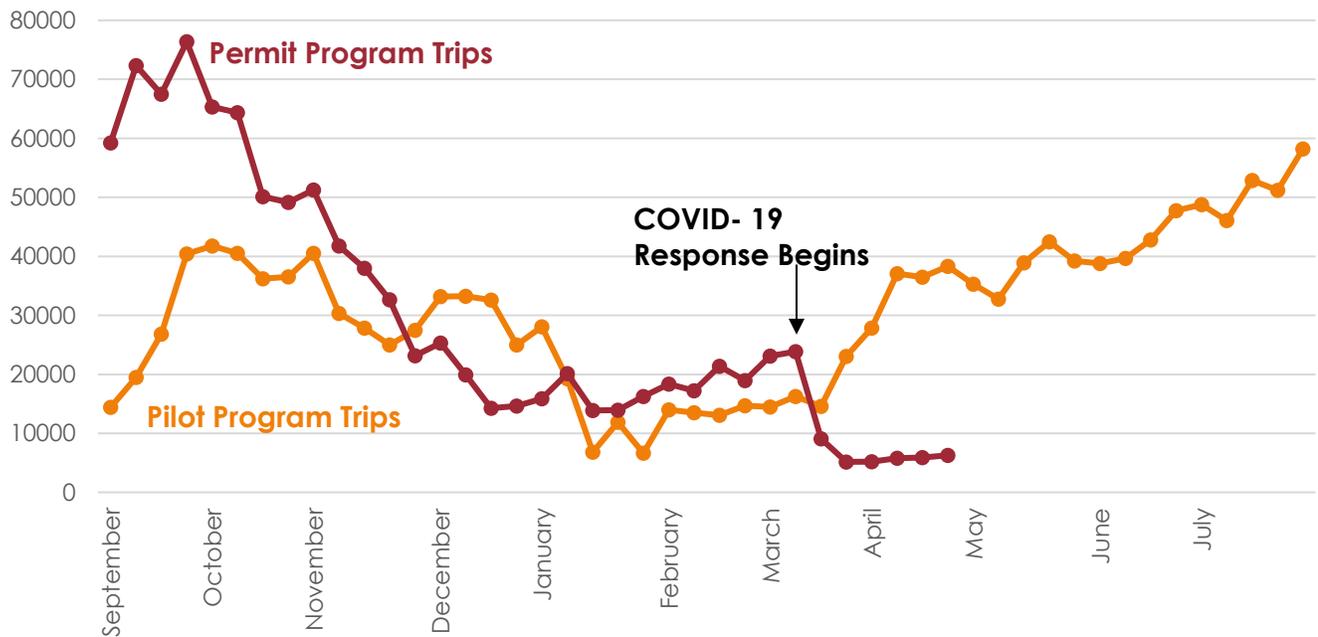
- Location of each vehicle
- Changes in rental status
- Maintenance or deployment events

MDS was developed by the City of Los Angeles and, recently, stewardship was transferred to the Open Mobility Foundation. It has quickly become the standard for data reporting. Baltimore participates in conversations with other cities and national groups about how the format serves the monitoring that Baltimore needs to perform for the permit program. MDS is a powerful tool that is still being refined to strike the balance between delivering useful data and protecting personal and proprietary information. More information can be found at:

<https://github.com/openmobilityfoundation/mobility-data-specification>

Trip Volume

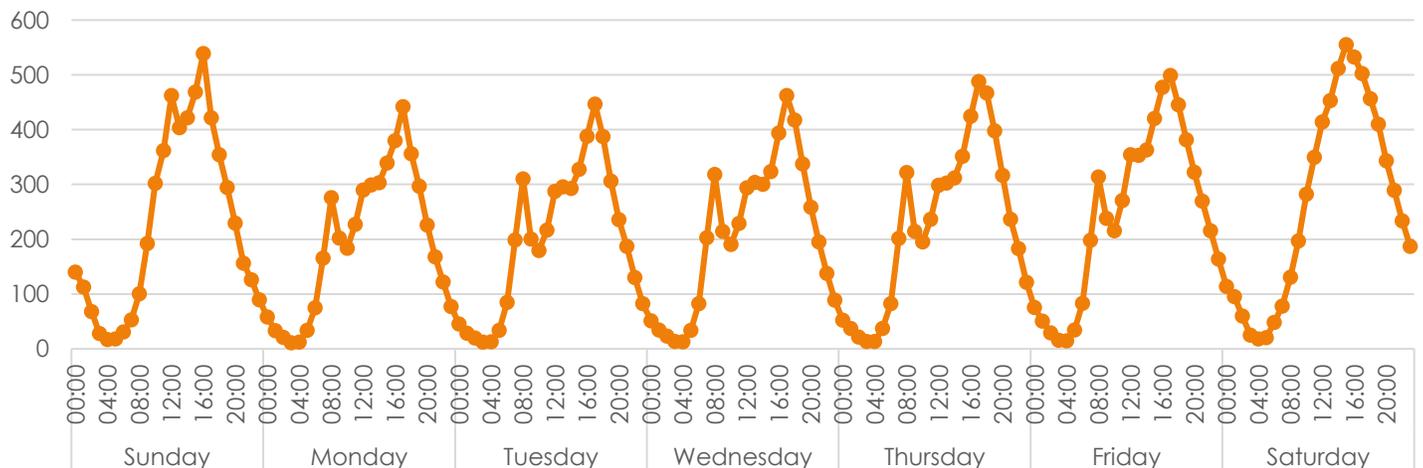
Total Dockless Vehicle Trips by Week - Pilot v. Permit



Based on total trip counts, the Dockless Vehicle Program has increased ridership since the pilot program during almost every week up until the COVID-19 response. For a full analysis on the impact of COVID-19, please see Appendix 3. The growth of ridership is a positive indicator of progress towards BCDOT’s goal of increasing active transportation mode share. What is unclear, however, is the exact reason for the increase in trips. One noticeable trend is ridership based on weather patterns—more trips happen during warmer months. To further investigate reasons for the increase in trips, questions were asked on the user survey, which is analyzed in the Community Priority section of this report (Section III).

Trip patterns over the course of a typical week continue along the same trend noted during the Dockless Vehicle Pilot—trends that are also seen in many other cities. Trip volumes roughly mirror those of cars. On an average weekday, there is a morning rush hour peak from 7-9am and an increase in trip volume around lunch time, with the greatest number of trips occurring during afternoon rush hour, when many people run errands in addition to simply commuting. This weekday pattern is encouraging because it means dockless vehicle trips are likely replacing car trips in some cases.

Average Hourly Rides by Day of Week



On the busiest weekday in the Dockless Program to date, September 26, 2019, there were over 4,780 trips during the 6-9:00am and 4-7:00pm rush hour periods alone. On weekends, trips patterns are less distinct, with the most trips being taken during the middle of the day and sometimes peaking around dinner time.

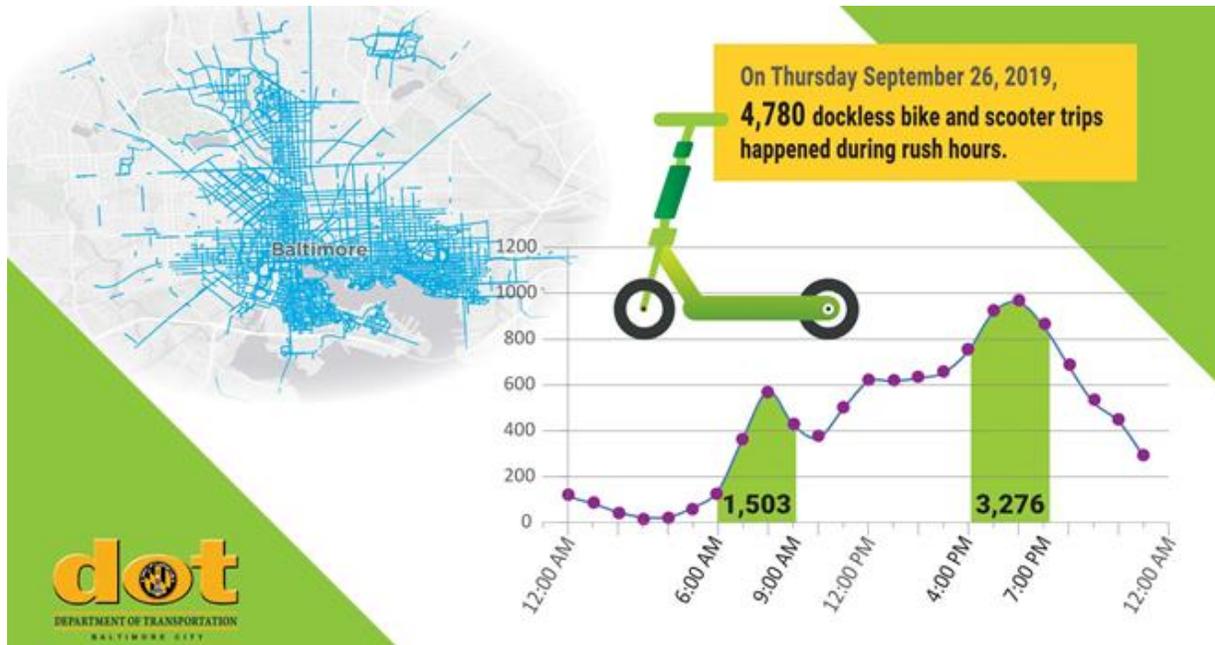


Figure 4: An infographic displaying the number and routes of dockless vehicle trips on one of the busiest days to date.

The average dockless scooter trip from August 15, 2019 to February 29, 2020 was 0.85 miles and lasted almost eleven minutes. This distance also appears to be weather dependent: trips during the months of August and September averaged just under a mile, while trips in January and February were closer to three quarters of a mile. Trips are also shorter downtown compared to areas near city limits. For example, trips originating near Reisterstown Plaza in Northwest Baltimore average 1.2 miles, and trips from Edmondson Village in West Baltimore average 1.8 miles.

Improving BCDOT Use of Data

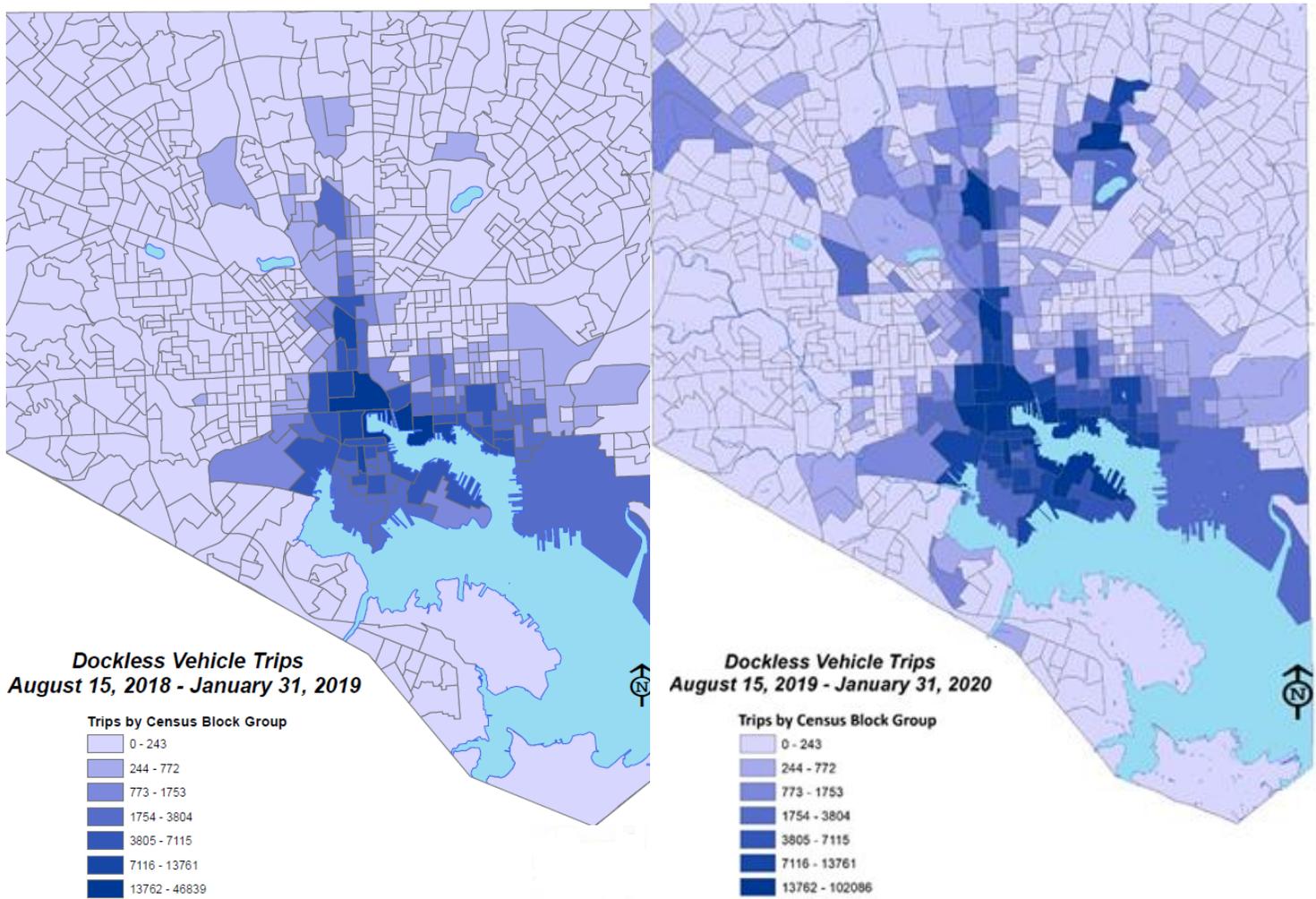
The data monitoring and analysis protocol for the Dockless Vehicle Program represents a change in operating procedures for BCDOT. Geographic tracking technologies on dockless vehicles allow for the collection of data, and the Rules and Regulations that govern the Dockless Program require that data be shared with the City. BCDOT is using the information for planning and evaluation purposes. New initiatives, such as an asset management inventory, increasing analyst staff, and participation in emerging technologies demonstrate that this approach to tracking and managing the inventory and operations of the transportation network is an emerging norm for BCDOT.

Data-driven monitoring of the Dockless Vehicle Program is also part of the citywide initiative, CitiStat, which uses performance management as an integral tool for statistically measuring the impact that our strategies, policies, and services are having on Baltimore's residents and visitors. The Dockless Vehicle Program reports to Transit Stat, which sets out to track, measure, and evaluate Baltimore's transportation systems in order to provide effective, efficient, and equitable systems that serve Baltimore's residents. In this program, dockless and other programs report data monthly to partner agencies, the public, and lawmakers.

Within the Dockless Vehicle Program, the immense amount of available data and cooperative inter-agency monitoring are an example of how Baltimore can participate in emerging mobility. Data from the Dockless Vehicle Program is already being used to improve the City's ability to measure the usage and safety of Baltimore City roadways and the impact that infrastructure changes have on the behavior of road users. This program is also serving as a model for refining policies around ride-hailing and curb space management.

Trip Locations

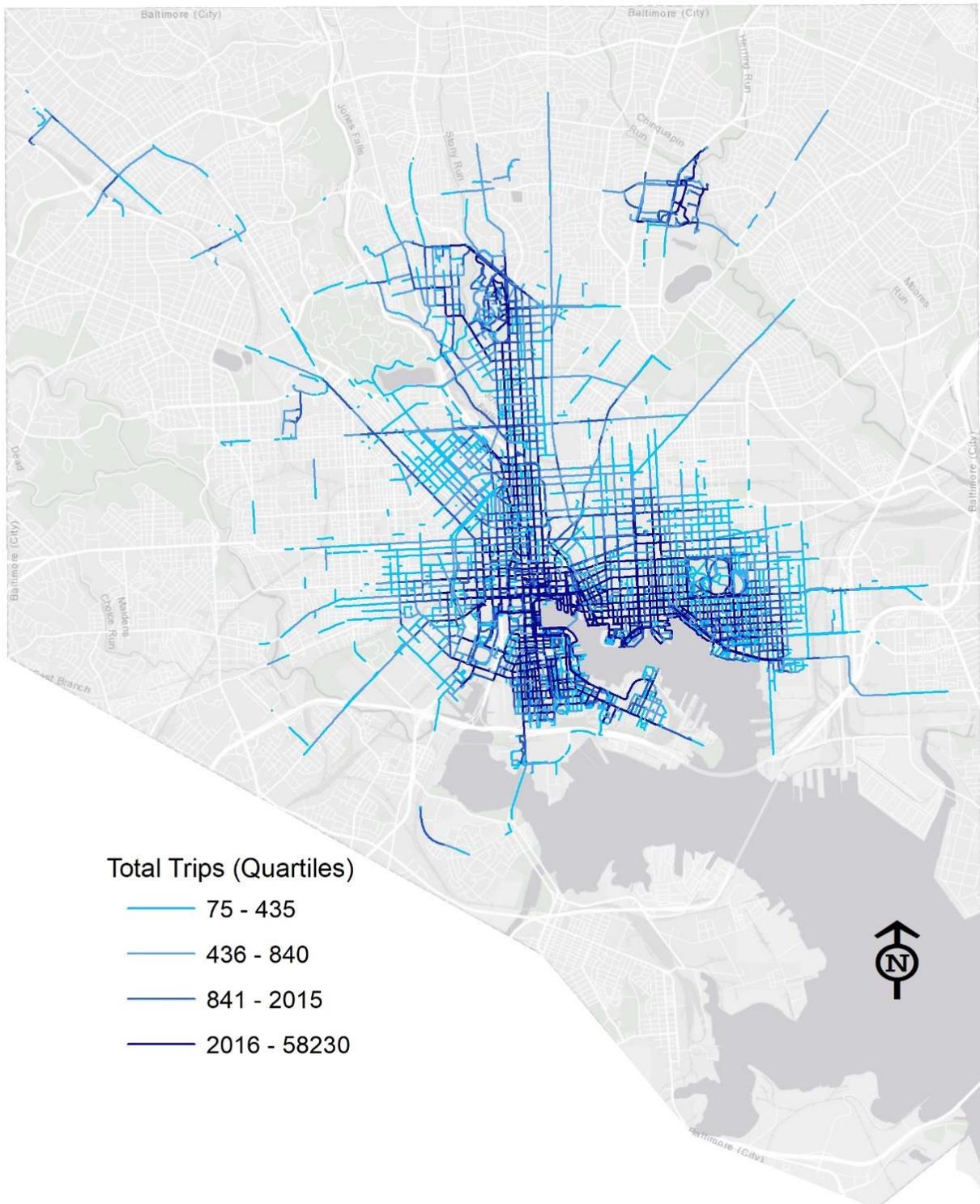
MDS trip data also show where trips start, the routes traveled, and the end points. Comparing trip locations over time reveals where ridership is increasing or decreasing.



Compared to trip starting points during the pilot and this year's permit, there is currently a wider spread across Baltimore. While the downtown core and Charles Street north-south corridor continue to show a concentration of trips, there are growing hot spots in other areas of the city. Ridership has noticeably increased around universities, like Morgan State University, and in Northwest Baltimore along the metro line. This is an encouraging trend, indicating more equity in access, but it is hard to attribute to any one change in the program. Likely contributors include equitable deployment requirements, community outreach, and increased signups for Equity Plans.

Displaying the beginning, end, and path of individual trips raises privacy concerns because it can reveal the movement patterns of individuals. For that reason, routing data is aggregated to the total number of trips per roadway block for viewing, even by BCDOT staff. This means that the data show how many trips have passed along a given block, but one trip/rider cannot be traced from one block to the next.

Routes Traveled August 15, 2019- February 29, 2020



Routing patterns show similar patterns to trip origins, with downtown and the Charles Street corridor and its parallel streets carrying heavy traffic. These data additionally show pockets of ridership, many of which are associated with either university campuses or BCDOT's designated Equity Zones. Examples include the line of trips stemming from the Cherry Hill Light Rail stop and several metro stations, indicating that dockless vehicles may be being used as a "first and last mile" connection to transit.

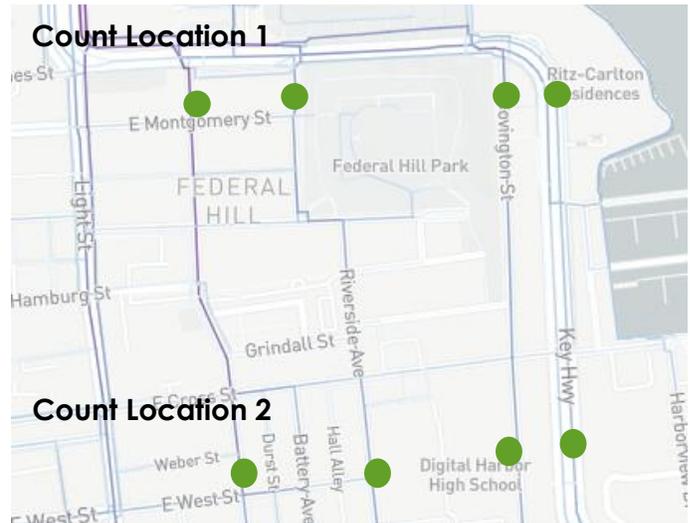
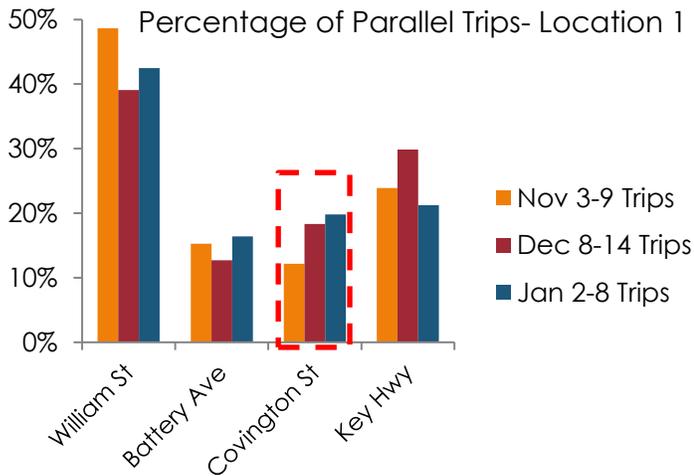
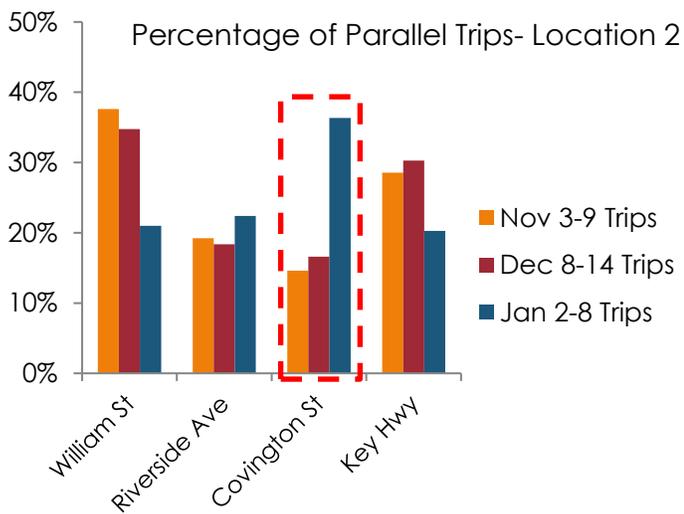


Figure 5: Bicycle Facility Case Study location and trip counts



Scooter routing data has also been useful in evaluating bike/scooter infrastructure projects. For example, in the case of Covington Street, the data show a shift in patterns when a bicycle facility was installed to give riders a safe option parallel to Key Highway. The share of trips on the parallel north-south routes including Covington Street indicates that the installation of the bicycle facility prompted a shift of trips to the new facility from Key Highway and other parallel streets. These data show the share of trips at two locations along Covington Street and, in both cases, Covington is the only street that shows a clear increase in the share of trips. This indicates that riders prefer to use safe and comfortable infrastructure when it is available and will even slightly divert their intended route to do so.

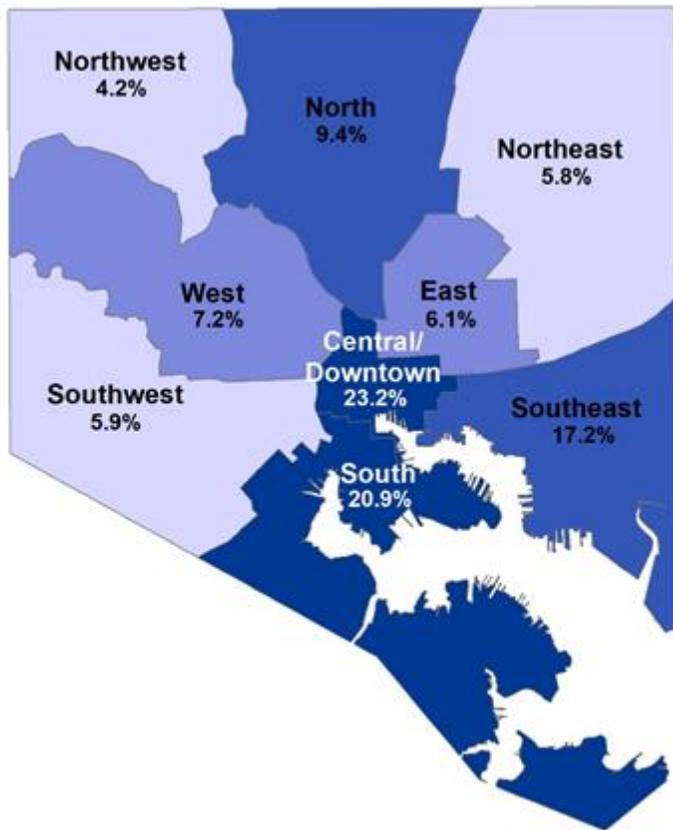
Equity of Access

To improve the equity of access to dockless vehicles, one of the main tools BCDOT employs is to set policies around deployment, or where the vehicles are placed and made available for rent each morning between 6-8am. Although there were Equity Zones during the pilot within which the participating companies were required to deploy a certain percentage of their fleet, those zones were large Community Statistical Areas, and deployment tended to be on the border of the zones. Furthermore, not all companies allowed their customers to use their vehicles in the entirety of Baltimore City without incurring an extra fee in some areas. This means that, for residents who live or work far from downtown, vehicles were less available and a trip within City limits could have incurred a fee during the pilot. To increase the equity of deployment, BCDOT developed requirements that permit holders serve the entire city and increase deployment to areas underserved during the pilot. For the first annual permit, deployment requirements were changed on multiple geographic levels:

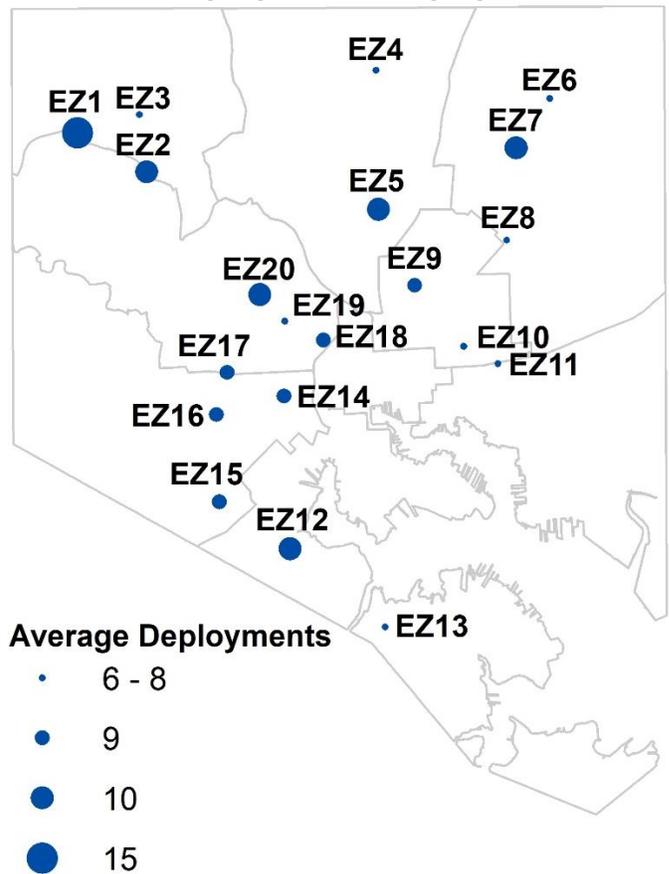
- The entire city must be designated as a service zone, so no ride in Baltimore results in an additional fee.
- 5-25% of vehicles must be deployed to each planning district, and vehicles must be rebalanced if a concentration of 35% of vehicles occurs in a zone at any point during the day.
- Each morning, three vehicles per permitted company are required to be deployed to each of the 20 Equity Zones designated around the city.

These requirements were developed to mitigate access inequities seen during the pilot while still allowing operators to deploy using their discretion. For information about the compliance to these regulations, please see the subsequent section about BCDOT program support. For a deep dive into each Equity Zone location and utilization, see Appendix 1.

Vehicle Deployment by Planning District, 7am



Vehicle Deployment to Equity Zones, 7am



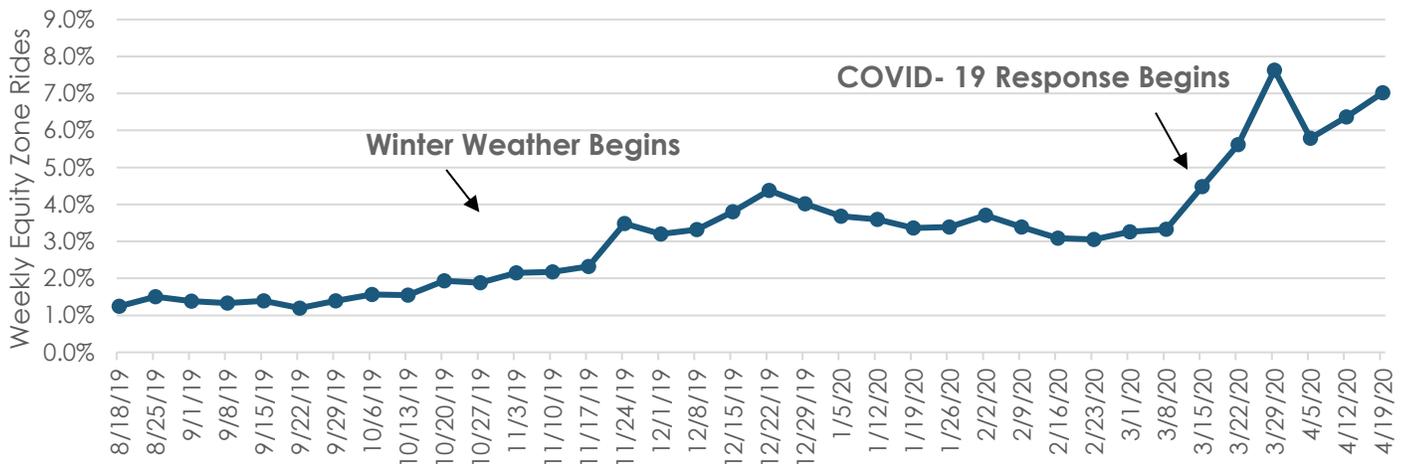
Morning deployment to districts and to Equity Zones provides vehicles that can be rented in all neighborhoods. In the deployment zones, the central, southern, and southeastern districts still get the most vehicles. This concentration is less pronounced than during the pilot, when the central and southeastern districts averaged over 30% of deployments daily. The northwest and northeast still see the lowest number of vehicles at 5%; however, during the pilot, only 2% of vehicles were deployed there daily. Tracking deployment and compliance was an important management tool used by BCDOT and is tracked in the BCDOT program support section.

Deployment to the 20 specific Equity Zones each day pushed permit holders to new areas where they did not deploy during the pilot, but which had nearby amenities that BCDOT expected may support ridership. Daily deployment to specific locations creates predictability that can benefit users without smartphones who want to use or track vehicles in real time. Many of the Equity Zones are located near transit, allowing customers to use scooters as a reliable “first mile/last mile” connection to transit.

Johns Hopkins University, Bloomberg School of Public Health Research

To help further research on the use of dockless vehicles in Equity Zones, BCDOT has partnered with researchers from the Johns Hopkins University, Bloomberg School of Public Health. The project was awarded a Strategic Consultation Grant, funding designated for JHU researchers to help improve City policies. Under this grant, JHU researchers have been granted access to MDS API data, will conduct BCDOT staff interviews, and will conduct interviews on the ground in Equity Zones. Research questions to be investigated include the purposes of trips in the Equity Zones, barriers to ridership, and any perceived safety issues. At the conclusion of the research project, BCDOT will receive a report with recommendations for improving policies around equity of access to increase mobility in underserved areas.

Weekly Equity Zone Rides as % of Total Weekly Rides



Equity Zone Origins Utilization

Equity Zone	Origins	Utilization
33rd at Greenmount	1989	112%
West Cold Spring Metro	1410	89%
McCulloh at Preston	1573	88%
Rogers Ave Metro	2259	88%
Hollins Market	990	83%
Library Square	1247	79%
Penn-North	1380	77%
West Baltimore MARC	1213	77%
Upton Metro	1154	73%
Northeast Market	1119	71%
Cherry Hill Light Rail Station	871	63%
Park Heights at Belvedere	695	59%
North Ave at Harford Rd	1079	54%
Harford Rd at Coldspring	683	49%
Belair Edison Main Street	818	46%
York Road at Bellona	623	45%
Washington Blvd	637	40%
Harford Road at Hamilton	708	40%
Westside Shopping Center	510	37%
Patapsco Ave	434	22%

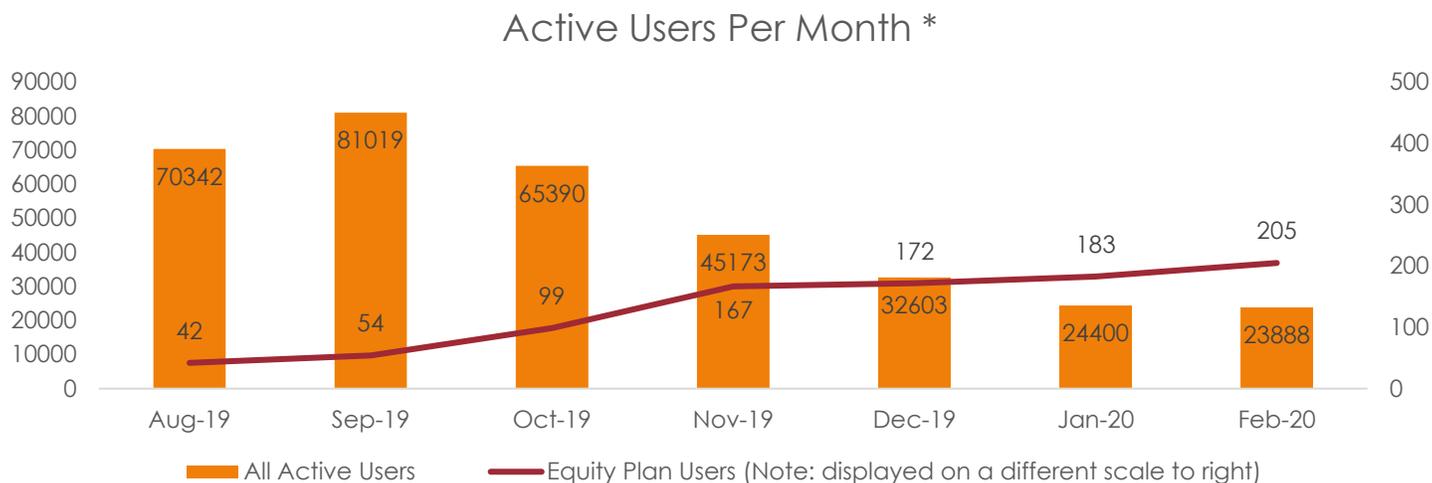
Results of the deployment to the Equity Zones are generally positive; at many of the locations, daily deployment was successful in spurring utilization and new pockets of ridership. When compared with total trips, the share of trips in Equity Zones has had two distinct periods of growth: when weather was colder in the winter and when the COVID-19 shelter in place order took effect. The fact that Equity Zones comprised a higher share of rides during these times implies a reliance on vehicles; while fair weather riding dropped, those who rely on vehicles continue to use them.

Equity Zones that had the highest ridership from August 15, 2019 to February 29, 2020 include East 33rd Street at Greenmount Avenue, the West Cold Spring Metro station, McCulloh Street at Preston Street, and the Rogers Avenue Metro. Each of these locations saw utilization of over 88% of the vehicles deployed each morning. Six zones saw moderate results, with utilization rates between 45-63%. In the poorest performing four zones, daily deployment has not resulted in as much ridership (Patapsco Avenue in Brooklyn had a 22% utilization rate), and those zones may be adjusted in the next permit.

Details on zone selection, utilization, and ranking can be found in Appendix 1: Equity Zone Deep Dives. Recommendations for Equity Zone requirements in the next annual permit can be found in the recommendations section.

Monthly Reporting Insights

In addition to vehicle and trip data, BCDOT requires monthly reporting to capture other activities of permit holders. BCDOT requires specific reporting of active users, customer complaints, repairs, and events attended so that requirements and tactics can reflect real life operations.



*Represents users reported by each Permit Holder; some users may be reported by multiple Permit Holders

The monthly reporting of active users and Equity Plan signups provides much more detailed data than that received during the pilot. During the pilot, BCDOT received the all-time number of signups without knowing how many people actively use the service. The new monthly reporting gives a better picture of the monthly rate of use; while equity program users remain a small fraction of total users, their numbers grew considerably over time. Pairing signup data with the reports on events showed that Equity Plan participant growth occurred as permit holders started to attend more community events. The most signups for Equity Plans occurred in October and November, which were also the months when permit holders reported the highest participation in community events. This indicates that the requirement for each company to participate in one community event in every planning district over the course of the permit may contribute towards the Dockless Vehicle Program's equity goal.

The format for reporting customer complaints was less prescriptive and less consistent among permit holders. From customer interactions, BCDOT was able to process six non-deployment requests. These requests from private property owners to not deploy directly in front of the property were, at first, mostly directed to permit holders individually. However, once reported to BCDOT, approved requests were sent out to all permit holders. This streamlined processing of requests allows for consistency in how requests are processed, uniform response from all permit holders, and better community understanding of the program.

Inconsistent reporting makes it impossible to compare vehicle maintenance issues between permit holders. This issue will be addressed in future versions of Rules & Regulations (see "Recommendations" section).

Tracking Safety

Tracking the safety of dockless vehicles and identifying ways to reduce crashes remains a priority for BCDOT and the Dockless Vehicle Program. A clear and standard way to track crashes and other incidences continues to elude programs nationwide. Current practices include:

- **Tracking crash reports filed with the police:** Currently, Baltimore Police Department representatives who attend monthly Dockless Vehicle Committee meetings track reports filed with the police. However, reports seem to be infrequent and in line with trends of bicycle crash reporting. Unlike car crashes, when those involved may need

paperwork for insurance settlements, there is little motivation to report bike or scooter crashes. There is frequently no property damage, and those seeking medical attention will do so without calling the police first. As a result, reports are seldom filed, and this has not proven to be a consistent method for tracking crashes.

- **Tracking EMS and hospital records:** Using hospital records to track injuries is one of the best methods to date for tracking the crashes that may have caused them. However, because there is no standard code to group incidents, there is no consistent way these injuries are classified. Therefore, the data are likely incomplete.
 - BCDOT used this method to track crashes during the Dockless Vehicle Pilot Evaluation by having the Baltimore City Health Department run a text analysis of narrative and chief complaints from hospital records.
 - This analysis identified an annual crash rate similar to that of bicycles and lower than cars at .087 hospital visits per 1,000 scooter trips.
 - The analysis also identified fewer injuries per active dockless vehicle account than per licensed driver. The annual average of 2,881 injuries among 326,209 licensed drivers equals a crash rate of 8.8 injuries per 1,000 drivers each year. For scooters, the extrapolated 126 scooter-related injuries per year among 191,218 users equals a crash rate of .66 injuries per 1,000 dockless vehicle accounts each year. When adjusted to represent active user accounts under this year's permit (an average of 59,000 per month), the crash rate increases to 2.1 injuries per 1,000 active accounts.
 - In 2019, the University of North Carolina released a study with more detailed and refined methods for text analysis of hospital records. The Baltimore City Health Department began to run this methodology on a monthly basis for BCDOT to analyze the permit program.
 - Preliminary numbers show more crashes than were found during the pilot and are more in line with numbers reported by other cities.
 - Release of a final report has been delayed by the COVID-19 response.
- **Non-scientific tracking through community surveys:** BCDOT's annual survey can provide self-reported data about crash rates, which can be informative, even if they are not statistically significant. This reported data can even include minor falls, so they should not be compared to hospital records. The qualitative data from the surveys is valuable for evaluation purposes, as it can describe the circumstances of the crashes.
 - During the 2019 pilot survey, 12.8% of respondents reported being involved in a crash. It should be noted that the community survey was open to everyone, even people who do not use dockless vehicles. More than half of these crashes (51%) were reported to be falls not involving anyone else besides the rider. Only 4.5% of those reporting a crash reported any injuries.
 - On the 2020 User Survey, 27.9% of respondents reported being involved in a crash. Almost two thirds (73.8%) of these crashes were reported to be falls not involving anyone else. The most commonly cited cause was road or sidewalk quality, which 40.9% of respondents reported as the reason for the crash.
 - 74.4% of those involved in a crash responded that they did not report the crash to anyone when it occurred.

Data Conclusions

Data reported through the MDS API and monthly reports provide significantly more information than was available during the pilot. The following limited conclusions can be drawn from the reported data, which, taken together, paint a positive picture of the Dockless Vehicle Program's growth and progress towards its goals:

- The number, location, and temporal pattern of dockless vehicle trips suggest that some of these trips are replacing auto trips, thus helping to meet BCDOT's goal of expanding the percentage of trips that are taken using active transportation modes.
- Bicycle/scooter infrastructure influences route choice, suggesting that riders seek out routes that feel safe, and possibly that additional safe and comfortable infrastructure would encourage more ridership.

- This is supported by user survey data about where users choose to ride and what improvements they would like in order to ride more (reported in the next section).
- Ridership is becoming more widespread geographically, and there is growing deployment and utilization rates outside of the downtown core. This is a change that could indicate increasing equity of access to dockless vehicles for Baltimore residents.
- Reports of active users show a growing share of users taking advantage of Equity Plans.

To improve data tracking and analysis, BCDOT's next steps include:

- Continuing to monitor and participate in conversations about MDS to standardize data format.
- Standardizing monthly reporting formats for incident reporting, customer interactions, and maintenance.

Lastly, there is significant room for improvement in terms of the availability and accuracy of safety data related to dockless vehicles:

- Few conclusions can be made from the various sources of non-comparable safety data except that BCDOT should participate in conversations with health officials to standardize the tracking of crashes and injuries resulting from dockless vehicle trips.
- BCDOT recommends that a standard ICD-10 code is used to classify all scooter crashes among hospital admittances; this would allow ongoing tracking of injuries and deeper analysis into the cause of crashes, which can be used to increase safety.

III. Community Input



Core Evaluation Questions:

*What are the priorities of people who use dockless vehicles?
Non-users?*

Are enough outlets provided for community feedback?

Due to the novelty of dockless vehicles, BCDOT and jurisdictions around the nation are still working to gauge their total impact on communities. While there are clear sources for geospatial data reported by vehicles, soliciting qualitative input from users and other stakeholders requires deliberate outreach. In Baltimore, BCDOT is working to have several options for ongoing feedback available to communities and individuals throughout the city. BCDOT has also implemented an annual survey in order to ask specific questions about dockless vehicles.

Feedback Channels

BCDOT provides several opportunities for feedback and involvement in the Dockless Vehicle Program. These channels are accessible to anyone who has questions or wants to share their perspective with BCDOT.

311 & Emails

The most frequent ways that BCDOT receives input about the Dockless Vehicle Program is through the City's 311 service and emails sent to the Shared Mobility Coordinator and other BCDOT staff. When someone calls 311 about a scooter, the service desk can answer many questions with a thorough FAQ provided by BCDOT. The most common reason for a call to 311 is to report an illegally parked scooter that needs to be moved. In this case, 311 directs the caller to the responsible company, who must move the vehicle within six hours. Less frequently, residents call 311 to report an ongoing issue or concern about the program. In this case, the caller may be given the BCDOT community email address, or, if the caller prefers, the comment is recorded by the call center and sent to BCDOT. In 2019, there were a total of 20 calls made to 311 about the Dockless Vehicle Program.

For longer comments, BCDOT directs people to the community email address: dot-community@baltimorecity.gov. This address is shared through 311, FAQ handouts, and all information shared at community meetings. From this email address, BCDOT has received six data requests and about ten reports of recurring issues. Since the pilot, the frequency of such emails has slowed.

Community Meetings

Through the BCDOT community email address and the department's Community Liaisons, BCDOT has also attended community meetings and formed ongoing partnerships. Since the permit launched in August 2019, BCDOT has attended 10 community association meetings at the request of the respective associations to answer resident questions about the program and educate attendees about the structure of the program. Frequent topics of discussion have included:

- How to report illegally parked vehicles
- What to do if one witnesses an incident involving a vehicle
- General questions about laws, riding safely, and how to sign up for Equity Plans

BCDOT tracks these common questions and adds them to FAQ documents that are posted on the website and supplied to 311 operators. From these meetings, BCDOT is hoping to spread awareness of the program and develop partnerships to support and sustain the program.

Partnerships

BCDOT has sought to form partnerships with institutions, organizations, and government entities that own large parcels of land and have large networks of constituents. Several groups were identified for ongoing partnerships:

- **State Agencies:**
 - The Maryland Department of Transportation's Maryland Transit Administration (MDOT MTA) was one of the first program partners. MDOT MTA joined discussions during the pilot to coordinate with BCDOT around the impact of vehicles on their transit stops and stations. BCDOT and MDOT MTA have entered an MOU to place designated parking areas ("corrals") and signage at some of MDOT MTA's busiest transit stops and stations in order to promote vehicles as a "first and last mile" solution for transit riders.
 - These corral sites have been selected to comply with all ADA guidelines and are based on guidance from a focus group from the IMAGE Center of Maryland (pictured at the beginning of this section).

This focus group visited several metro stations to select corral locations and establish best practices for considering people with disabilities when siting future corrals. With the introduction of parking corrals for dockless vehicles, BCDOT hopes to encourage “first mile and last mile” ridership while leaving stations navigable for others.

- The Maryland Stadium Authority (MSA) worked with BCDOT to designate a “no ride” zone, which operates using vehicle GPS technology to deactivate acceleration in defined areas in order to meet state code and decrease conflicts in heavy pedestrian traffic. The stadium “no ride” zone stops users from riding dockless vehicles in stadium parking lots where, on games days, thousands walk in the confined space. The MSA also set up preferred parking zones so users can park in a central location and can locate vehicles after games.
- **Local Universities:**
 - BCDOT has partnered with local universities to understand the impact of ridership on campus and develop campus-focused strategies and policies. Both Johns Hopkins University and Loyola University have shared observations with BCDOT staff, distributed safety information to students, and planned safety events on campus. Loyola’s York Road Initiative has invited Dockless permit holders to the Govans Farmers Market to share this information with neighboring communities.
- **Business Improvement Districts:**
 - One of the most active community partnerships has been with the Waterfront Partnership of Baltimore (WFPB). The WFPB serves the area around the Inner Harbor, wrapping around from Rash Field to Fell’s Point—some of the most popular places to ride dockless vehicles in the city. In an effort to quickly resolve issues in January 2020, WFPB activated their guides, who patrol the district on foot, to help directly report issues to permit holders. By reporting issues, such as vehicles in need of repair and vehicles in the water, in real time, permit holders have been able to resolve issues within the regulated six hours, allowing them to keep vehicles in working condition in the busiest district. By the end of March, reporting led to 38 resolved issues, including the quick retrieval of six vehicles from the Inner Harbor waterway.
 - Baltimore Development Corporation, which works with businesses across the city, has been distributing dockless vehicle educational cards provided by BCDOT by way of Development Officers. Additionally, they answer questions businesses may have about the Dockless Vehicle Program and have partnered with BCDOT to develop an information guide for businesses about all the ways their employees and customers get around Baltimore.
 - The Downtown Partnership of Baltimore (DPB) guides distribute dockless vehicle educational cards provided by BCDOT. DPB is also working to develop a reporting system similar to WFPB for their district.

Dockless Vehicle Committee

For those interested in receiving regular updates on trip data, program support, and management, the monthly Dockless Vehicle Committee meetings are open to the public, generally attracting around 20 attendees each month.

Announcements, meeting dates, agendas, minutes, and past presentations can be found at <https://transportation.baltimorecity.gov/dockless-vehicle-committee>. The DVC focuses on reviewing data, reporting issues, and providing feedback for BCDOT program support. Each meeting includes a review of recent data, request for future data analysis, updates on program activities, and discussions about program plans.

How can community groups get involved?

Community groups who would like to know more or get involved in the Dockless Vehicle Program should first email dot-community@baltimorecity.gov or contact a DOT Community Liaison. From there, a staff member will respond to discuss a few options, including:

- Discussion and troubleshooting of an ongoing program for the community related to dockless vehicles.
- Requesting that BCDOT attend a meeting to answer questions about the program.
- Requesting that permitted companies attend an event to host a safety demo or provide assistance in signing attendees up for Equity lanes.
- Business Improvement Districts can develop systems to report issues directly to companies.

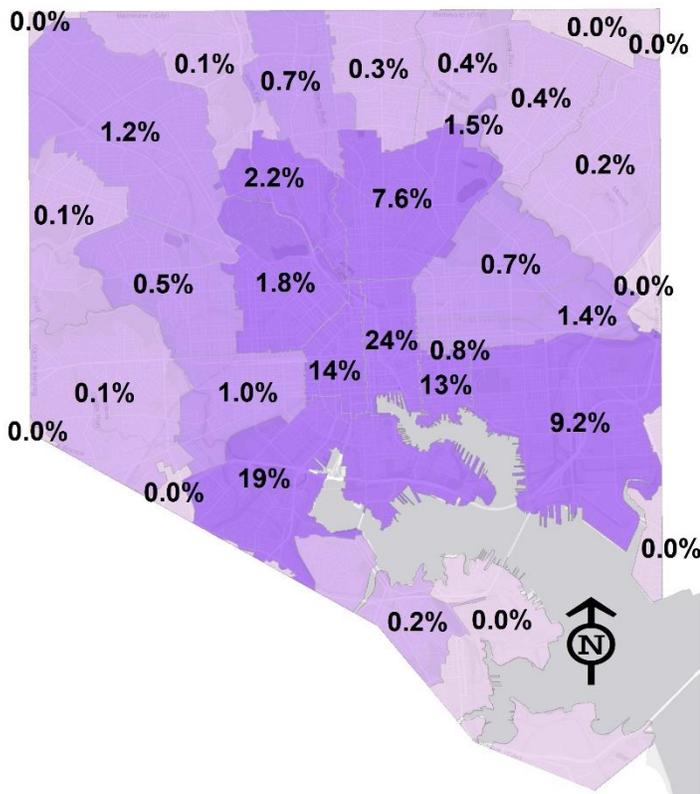
User Survey

BCDOT performed its second annual dockless vehicle survey for this evaluation, shifting from a community-wide survey to a survey directed at dockless vehicle users. The questions aimed to assess dockless vehicle users, user comprehension of traffic laws, the choices that these users make, safety issues, and overall program effectiveness. The survey was open for responses from February 28, 2020 until March 29, 2020. The survey was released online on the BCDOT website and on social media, and it was also included as a clickable link in provider smartphone apps.

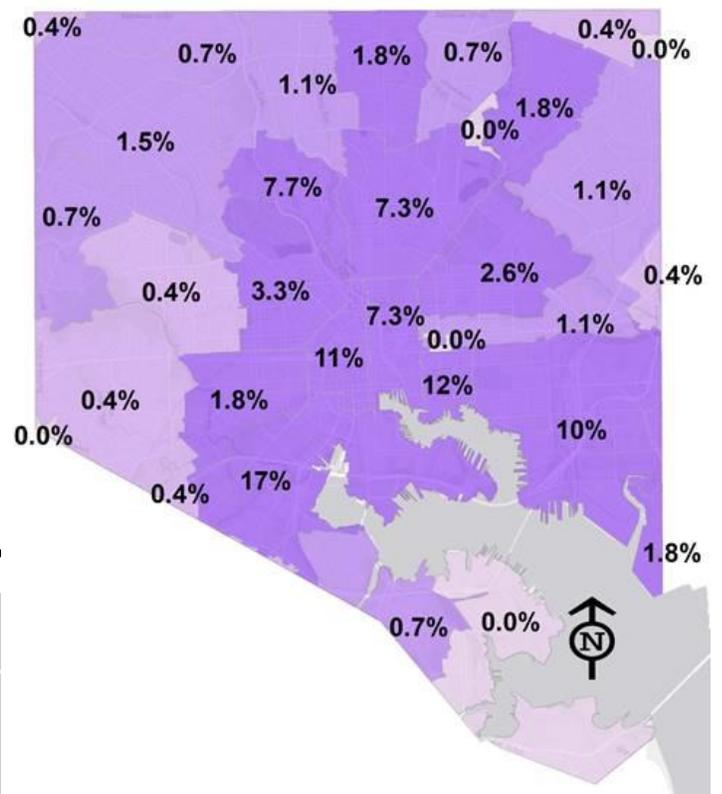
In total, BCDOT received 706 responses, 571 of which were from people who actively ride dockless vehicles. This response rate was lower than the 2019 community survey about dockless vehicles (5,283 responses), likely due to the COVID-19 outbreak and response. Due to the State of Emergency in Maryland, BCDOT did not perform planned outreach around the survey, and populations affected by the pandemic may not have completed the survey. For the full results and cross-referenced results of the user survey, please see Appendix 3.

Of the respondents, 380 riders completed the demographic sections, and, unfortunately, with this level of response, it is difficult to assess the exact demographics of riders. Equity Plan subscribers seem to be over represented, with 124 respondents indicating that they subscribe to one of the Equity Plans offered (low income, non-smartphone, cash). This amounts to 60.5% of all subscribers reported to BCDOT. To gauge the accuracy of demographics, reported zip codes were mapped against ridership.

Trip Origin Zip Codes 8/15/2019- 2/29/2020



Home Zip Codes reported by Survey Respondents

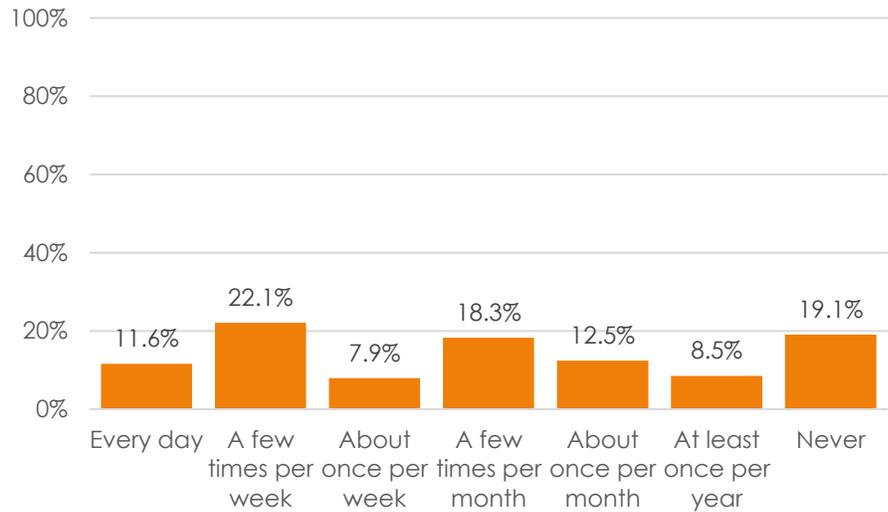


From these maps, it seems that the survey respondents may be somewhat representative of overall ridership. While there are notable differences, some zip codes are more represented in the response map than in the trip origin map. It should be noted that the trip origin map does not line up with the map of survey respondents' home zip codes, as someone living in any zip code may start a ride in any other part of the city. For example, zip codes in downtown Baltimore have a higher share of trip origins than responses, likely because people take trips there originating from the job center.

The most common reported frequency of riding a dockless bike or scooter was “a few times per week.” The 19.1% of respondents who reported never riding scooters were directed to demographic questions and excluded from analysis for all other questions. By categorizing results against demographics, there are clear patterns about frequent riders who ride a few times a week or more:

- Younger respondents aged 17-39 years old report being frequent riders.
- People who identify as Asian, Black/African American, or Hispanic/Latinx report being more frequent riders.

How often do you ride a dockless bike or scooter?

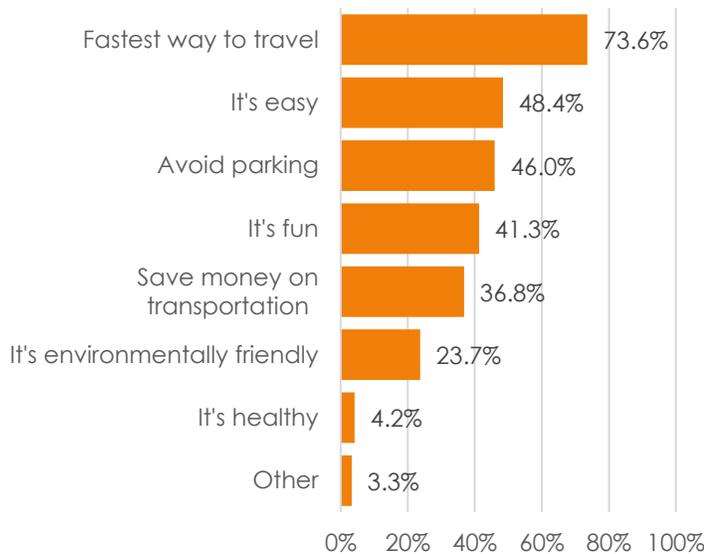


How often do you ride dockless vehicles?	17 to 24	25 to 39	40 to 54	55 to 64	65 and older
Every day	13.5%	14.9%	11.9%	0.0%	0.0%
A few times per week	35.1%	31.6%	25.4%	30.8%	33.3%
About once per week	13.5%	8.6%	13.6%	7.7%	0.0%
A few times per month	18.9%	23.6%	22.0%	23.1%	33.3%
About once per month	13.5%	11.5%	20.3%	30.8%	0.0%
At least once per year	5.4%	9.8%	6.8%	7.7%	33.3%
Total	100%	100%	100%	100%	100%

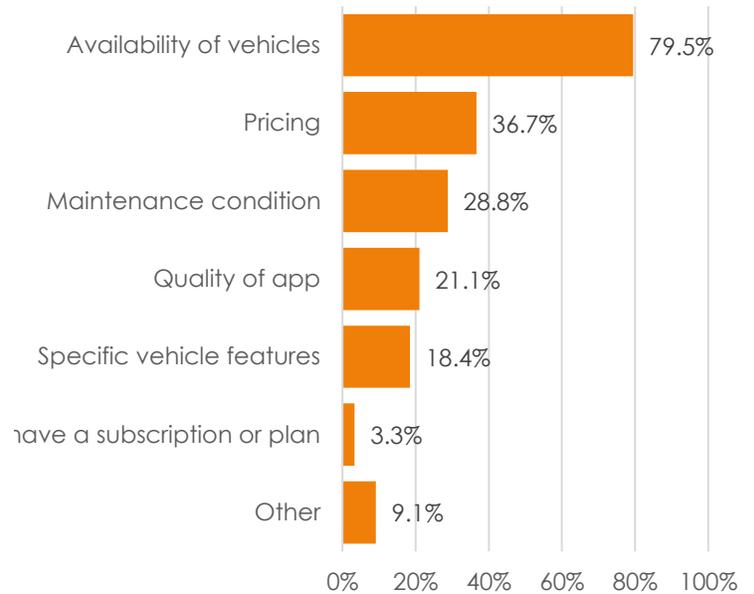
How often do you ride dockless vehicles?	White	Asian	Black/African American	Hispanic or Latinx	I prefer not to say
Every day	10.6%	14.3%	21.3%	27.3%	25.0%
A few times per week	29.5%	35.8%	34.0%	27.3%	28.5%
About once per week	10.6%	21.4%	8.5%	18.2%	0.0%
A few times per month	22.7%	14.3%	19.2%	18.2%	17.9%
About once per month	15.5%	7.1%	10.6%	9.1%	25.0%
At least once per year	11.1%	7.1%	6.4%	0.0%	3.6%
Total	100%	100%	100%	100%	100%

When asked about how they chose which permit holder’s service to use, most respondents cited vehicle availability (79%), followed by pricing (37%) and vehicle maintenance (29%). Respondents also cited the top reason for choosing a dockless vehicle for a trip is because it may be the fastest way to get where they are going (73.6%) and easy (48.4%). These combined answers suggest that making dockless vehicles an even easier and more convenient choice will allow for further growth in ridership. Intuitive and connected networks of safe and comfortable infrastructure for transportation modes, which BCDOT wants to encourage, like active transportation, are likely to encourage use.

Chose the top 3 reasons that you ride dockless bikes or scooters



How do you select which brand to ride? Select All



The highest proportion of respondents selected entertainment/socializing as one of their top three purposes for riding dockless vehicles, but the most commonly selected “most common purpose” was commuting. This mirrors responses collected during the 2019 pilot survey.

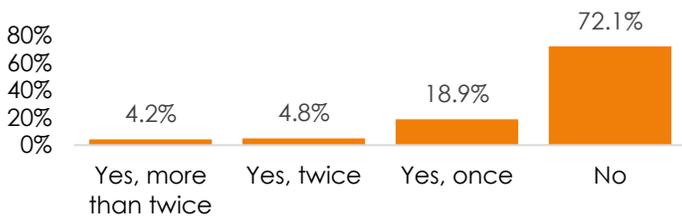
Rank the top 3 most common purposes of your dockless bike or scooter trips				
	Most common purpose	2nd most common	3rd most common	Percent who selected option as one of top 3
Entertainment/socializing	22.4%	14.5%	13.0%	50.0%
Commute to/from work or school	37.9%	6.7%	3.9%	48.5%
Shopping or errands	12.4%	13.9%	11.8%	38.2%
For trips during my work day	13.6%	11.2%	12.1%	37.0%
Connections to transit	5.2%	7.9%	8.8%	21.8%
Recreation or exercise	7.3%	6.4%	6.7%	20.3%

When asked about how dockless vehicles have impacted travel patterns, survey responses were similar to those received during the pilot. The mode that saw the most reports of reduced use was ride hailing or taxi, which included 51% of respondents. Dockless vehicles have also appeared to cause a slight drop in car ownership, with 10% of respondents stating they have reduced the number of cars owned by their household as a direct result of the availability of dockless vehicles. With 20,000 active users as of early 2020, survey responses suggest that dockless vehicles may have resulted in up to 2,000 automobiles taken off the streets of Baltimore City (assuming that survey respondents are representative of riders as a whole and that a negligible number of respondents live in the same household).

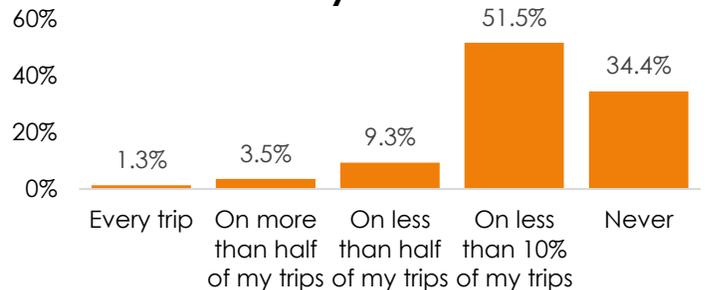
How has your use of other modes changes as a direct result of dockless vehicles?			
	Use Less Often	Same	Use More Often
Driving in my own car	36.9%	30.0%	4.9%
Riding as a passenger with friend or family in their car	26.4%	53.0%	5.4%
Taxi, Uber/Lyft, or informal hack	51.1%	35.0%	5.5%
Riding my own bike	16.6%	32.4%	4.3%
Personal scooter or other small vehicle	7.3%	14.7%	3.2%
Walking	32.8%	49.4%	13.6%
Bus, subway, light rail, or other train	20.8%	39.8%	7.2%
Water Taxi or other boat	9.6%	25.6%	3.0%

Asking questions about crashes can help add qualitative information to our knowledge of crashes, even if they do not provide scientific data. When asked about crashes, 28% of riders reported being involved in a crash, but 85% of riders seldom have close calls. Roadway quality is still reported as a major cause of crashes, and 74% of crashes involve only the rider. Not surprisingly, those who ride exclusively on the sidewalk are more likely to experience crashes and close calls.

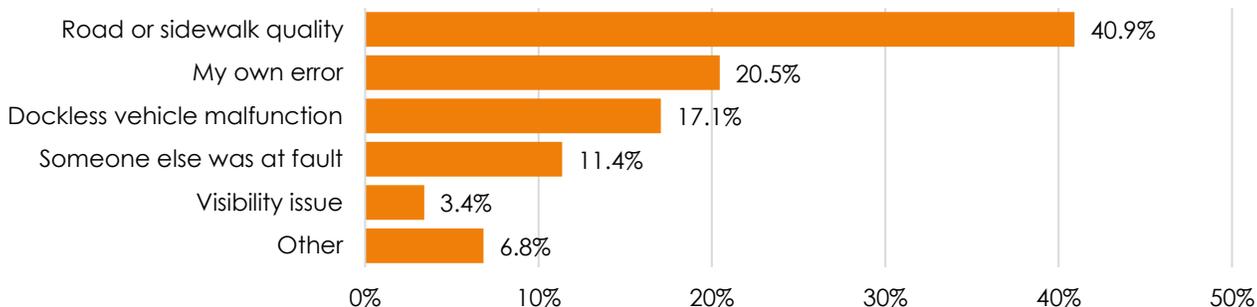
Have you ever experienced a crash while riding a dockless bike or scooter?



How often do you have a close call where you almost crash?



*In your most recent crash, what would you say was the main cause?



*This question was only asked of respondents who reported experiencing a crash.

By categorizing responses about crashes with responses about rider behavior, there are clear links between behavior and the frequency of crashes and close calls. Generally, riders who report always riding on the sidewalk experience more close calls and crashes. This is likely due to the limited space available on confined sidewalks and the unpredictability of pedestrian movements. These results underscore the need to continue educating riders about the safest place to ride and the need to provide safe facilities.

Have you ever experienced a crash while riding a dockless bike or scooter?	Do you usually ride on the sidewalk or the street?			
	Always street	Mostly street	Mostly sidewalk	Always sidewalk
No	73%	73%	76%	48%
Yes, once	13%	22%	17%	14%
Yes, twice	7%	3%	5%	14%
Yes, more than twice	7%	2%	3%	24%
Total	100%	100%	100%	100%

How often do you have a close call where you almost crash?	Do you usually ride on the sidewalk or the street?			
	Always street	Mostly street	Mostly sidewalk	Always sidewalk
Never	43%	31%	37%	38%
On less than 10% of my trips	50%	54%	50%	29%
On less than half of my trips	3%	9%	9%	19%
On more than half of my trips	3%	4%	4%	0%
Every trip	0%	1%	0%	10%
Total	100%	100%	100%	100%

Respondents were asked to prioritize improvements to the Dockless Vehicle Program under the purview of BCDOT and the individual permit holders. Four of the top five most popular responses related to safe riding environments via infrastructure improvements and enforcements, and 39% of all respondents selected “Build more connected, safe, and comfortable bike lanes” as the top priority for improving the program. Top priorities for permit holders pertain to vehicle maintenance and availability, and 37% of all respondents selected “provide more vehicles for rent” as their top priority for permit holders.

How could Baltimore City DOT improve the Dockless Vehicle Program?				
	Best option	2nd best option	3rd best option	Percent who selected option as one of top 3
Build more connected, safe, and comfortable bike lanes	39.0%	15.9%	11.0%	65.9%
Improve maintenance and enforcement of existing bike lanes	9.4%	13.6%	17.5%	40.6%
Allow companies to provide more dockless scooters	15.6%	8.1%	16.2%	39.9%
Make existing bike lanes safer/more comfortable	6.8%	17.9%	14.3%	39.0%
Change street design and/or increase enforcement to slow down cars	9.7%	13.0%	6.2%	28.9%
Build designated parking for dockless bikes and scooters	5.5%	7.1%	7.1%	19.8%
Require companies to provide more dockless bikes	5.8%	6.2%	6.2%	18.2%
Create more PSAs and messaging directed to drivers about safety	1.0%	5.2%	3.9%	10.1%
Require companies to provide more adaptive vehicles (vehicles for people with disabilities)	1.9%	2.3%	2.9%	7.1%
Create more safety tips for riders	1.9%	1.3%	2.6%	5.8%

How could Permit Holders (Lime, Jump, Spin) improve the Dockless Vehicle Program?				
	Best option	2nd best option	3rd best option	Percent who selected option as one of top 3
Provide more vehicles for rent	36.6%	11.9%	12.5%	61.1%
Make vehicles available in more neighborhoods	10.9%	15.5%	26.1%	52.5%
Better vehicle maintenance	20.1%	20.8%	8.9%	49.8%
Reduce rental cost	13.9%	18.5%	8.9%	41.3%
Improve vehicle design to make them safer	5.3%	5.9%	6.9%	18.2%
Provide more dockless bikes, specifically	4.3%	4.3%	8.6%	17.2%
Fix app issues	2.3%	3.6%	4.0%	9.9%
Make rental easier without a credit card	1.3%	2.0%	3.0%	6.3%
Provide new vehicles which fit my size or physical needs	1.0%	3.0%	2.0%	5.9%
Make rental easier without a smartphone	0.7%	2.0%	1.7%	4.3%
More responsive customer service	0.7%	1.0%	1.7%	3.3%
Have more instructions in the app about learning to ride safely	1.0%	1.0%	0.7%	2.6%
Have more safety events	0.0%	1.3%	0.7%	2.0%

Community Engagement Conclusions

As the Dockless Vehicle Program has moved from a pilot to a permit, the Baltimore community has come to accept dockless vehicles. From this year's engagement, it seems that the Dockless Vehicle Program has become part of a daily routine for some people. The option has allowed people to make a reduction in car dependence. Some of the top priorities which arose include:

- Improve availability of vehicles
- Build safe places to ride
- Increase parking compliance and courteous riding

People who seek to report one-off issues know the correct course of action to call the company that operates the vehicles. For solving ongoing issues and cultivating partnerships between communities and the Dockless Vehicle Program, continued engagement is still important. The program needs to continue to seek out perspectives from people who are not typically consulted in the development of City programs. This may take the form of continued engagement with members of the disability advocacy community who experience externalities of the program. It may also include speaking to users who subscribe to the low income, non-smartphone, or cash plans to help increase their use. The annual survey is a good means to ask focused questions about the program.

IV. BCDOT Program Support



Core Evaluation Questions:

How were permit fees expended?

How did BCDOT actions affect the program?

BCDOT is an active partner in the Dockless Vehicle Program—the program aligns with BCDOT’s goals and mission, so support of the program helps make strides toward departmental goals. Through the enabling legislation, the Dockless Vehicle Permit Program does not cost the City general fund any money, but all permit fees must be reinvested into the program. For the first year of the permit, the table below shows the approved fees, budget, and expenditures through March 30, 2020.

Dockless Vehicle Program 2019- Approved Budget and Expenditures through March 1, 2020*

	Program Expense approved by BOE	Approved Cost **	Progress through March 2020	Spent through March 2020
Education	Resident Mobility Advisors <i>\$1,000 x 6 meetings (stipends + meal)</i> <i>\$10,000 Micro-grants (5)</i>	\$16,000	Program outlined, put on hold during COVID - 19	\$0
	Community Education <i>\$5,000 Print Materials/designs</i> <i>\$14,000 PSA/Ad placement</i>	\$19,000	Educational Cards PSA Ad placements	\$7,224
Infrastructure	Shared Mobility Corrals <i>Construction of 20 Shared mobility corrals x \$1,000</i>	\$20,000	Striping Machine Racks Stencils Installation- 8 racks	\$7,653.33
	Micro-Mobility ROW infrastructure <i>Upgrades to micro-mobility lanes</i>	\$100,000	Bike Facility Audit	\$17,100.15
Management	Program Staff (consultant from on call contractor) <i>\$75 x 25 hours per week</i>	\$105,000	Average of 25 hours per week to date.	\$48,113.35
Evaluation	Evaluation <i>Data storage and analysis</i>	\$20,000	Populus Survey	\$17,500
TOTAL		\$280,000		\$94,215.83

* The permit year is extended until at least 30 days after the Maryland COVID-19 State of Emergency is lifted, so funds continue to be expended.

** These costs were shared by the 4 approved permit holders, each paying \$70,000 for the one-year permit.

The budget is broken down into several categories: education, infrastructure, management, and evaluation. In each category, BCDOT undertook substantial work, largely with the assistance of our community partners. Much of the work was executed through staff time and is not captured in the above budget. Rather, it is described in the subsequent sections.

Education

One of the main priorities for improvement after the pilot was informing both users and non-users about how to properly operate, park, and interact with dockless e-scooters. For the first annual permit, BCDOT earmarked \$35,000 of permit fees to be spent on different education tactics, including educating users, opening a dialogue with different neighborhoods, and releasing PSAs for the general public. Together, these tactics aim to reach a diverse audience.

To date, user educational cards and PSAs have been implemented. Other efforts to reach users and the general public have only been partially enacted. Efforts to launch a Resident Mobility Advisor program, in which residents convene on a regular basis and are paid to participate in a dialogue about community perspective, have been planned and coupled with similar efforts surrounding the Complete Streets Ordinance. This program, which has a budget of \$11,000, was slated to launch in early April to coincide with the release of the *Complete Streets Manual* draft; however, this has been put on hold due to the COVID-19 outbreak. Additional no-cost measures have also been utilized, including a monthly safety message selected by the Dockless Vehicle Committee, which appears as a banner in company apps.

User Education Cards

Educational cards were one of the first outreach materials purchased using permit fees. Cards were selected as a tool to be distributed by law enforcement (instead of warnings or tickets), Waterfront Partnership of Baltimore guides, Downtown Partnership of Baltimore guides, and other groups that interact with the public.



Figure 6: Educational Cards designed to inform users about newly passed dockless laws

The informational cards state the newly passed laws for operation and parking of e-scooters. Informing the public and targeting riders in high traffic locations was a necessary first step prior to issuing tickets to riders who simply may not know the laws. Printing these in a business card format allows them to be easily carried by those who are on the ground and patrolling area. The design was made by BCDOT with input from the Baltimore Police Department, and the first round of printing (5,000 cards cost) \$649. To date, the Baltimore Police and Waterfront Partnership of Baltimore guides have reported that the cards are useful to initiate conversations about courteous, safe, and legal riding.

PSA

To reach and educate the general public, BCDOT is employing the more traditional tactic of a Public Service Announcement (PSA). BCDOT has also integrated messaging about e-scooters into existing messaging campaigns and is using permit fees to buy additional placements.

To convey more specific messaging about the Dockless Vehicle Program, BCDOT and the Office of Civil Rights have partnered to film a video PSA about riding and parking. The PSA, filmed by Charm TV, focuses on how riding and parking can affect people with disabilities. To communicate the potential impacts and ways to courteously share public space, it features a member of the Maryland Commission on Disabilities and the Maryland chapter of the Federation of the Blind. To date, b-roll film and voiceovers have been filmed, but final filming was put on hold due to COVID-19. Costs approved for PSA filming are quoted at \$6,555.



Figure 7: BCDOT staff, Charm TV, and Janice Jackson from the Maryland Commission on Disabilities are on-site in the Inner Harbor filming a PSA

Infrastructure

One of the most important elements needed to increase the use of dockless vehicles is safe infrastructure for both riding and parking. Due to both costs and necessity, this was the largest allocation of permit fees. From permit fees, \$20,000 is dedicated to building parking corrals, and \$100,000 is dedicated to safety improvements for bicycle facilities.

Corrals

Parking corrals for dockless vehicles are being implemented in many cities in order to decrease parking that blocks sidewalks and to create centralized locations where users can expect to find dockless vehicles. BCDOT developed a simple design using paint, bike racks, and flex posts for on-street corrals. Even this simple design can give users a cue to park in the designated space, which leaves the sidewalks clear for pedestrians. Since designing the corral, BCDOT has worked to secure the equipment to install and to select locations. To date, 35 bike racks have been purchased for corrals as well as a striping machine and paint, totaling \$7,653.33.

Install was scheduled to begin at the start of the 2020 construction season (construction is paused during winter months due to the difficulty of installing thermoplastic striping on cold asphalt) but has been put on hold due to the COVID-19 response. Once construction resumes, BCDOT will begin corral installation in the Equity Zones first. This is in line with program goals and will create clarity for the permit holders, who are required to deploy to those locations. After Equity Zones, corrals at MDOT MTA stops will be installed. These locations are important for users who are connecting to transit and because some stops have a limited amount of space. Sites at these locations have been selected following a site visit with the IMAGE Center of Maryland, who walked MDOT MTA and BCDOT through how people with disabilities navigate public transit and the surrounding space.

Bike Facility Upgrades

Considering the two types of dockless vehicles seen in Baltimore, e-scooters and e-bikes, the safest and preferred place to ride is in a bicycle facility. Bike facilities are designed so that bicycles and e-bicycles and dockless e-scooters can easily share the lane, since e-scooters have similar weights and speeds to bicycles. However, based on the different geometry of e-scooters and the inferred differences in e-scooter user behavior compared to cyclists, BCDOT has identified a few strategic upgrades to bike facilities, which benefit e-scooters specifically:

- **Improved maintenance:** E-scooters have smaller wheels and can be more easily affected by ruts, bridge joints, or potholes in the bike facility surface.
- **Increased signage:** On BCDOT surveys, many e-scooter users indicate they do not use a bicycle to get around, so they are new to using bicycle facilities. Increased signage and green markings can help users find a safe route without having to reference a map in the middle of a trip.

In order to assess the locations for upgrades and to jumpstart general maintenance of bicycle facilities, the first procurement for bike facility upgrades using dockless vehicle permit fees was an audit of all existing facilities. This audit began in March 2019 with a quoted cost of \$17,100.15. This will help BCDOT allocate the remaining fees earmarked for infrastructure. The audit is expected to identify short-term fixes that can be installed with this year's permit fees as well as long-term issues which that form the basis of a maintenance plan.

Bicycle Facility Audit Categories

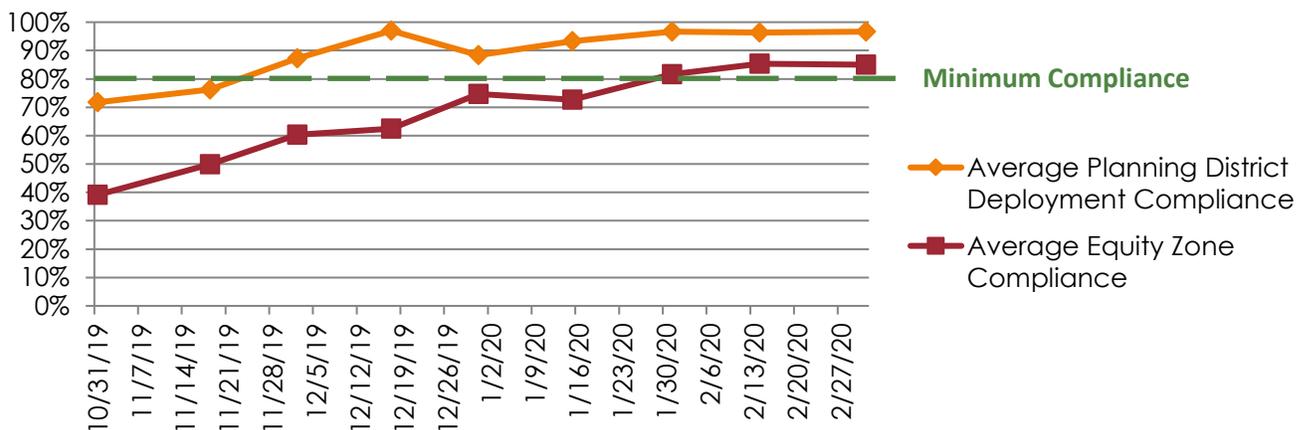
Short-Term Issues	Long-Term Issues
<ul style="list-style-type: none">• Broken flex posts• Potholes, utility cuts, or other ruts in pavement• Missing wayfinding signage• Missing "No turn on red" signage• Non-bike friendly storm drains	<ul style="list-style-type: none">• Faded or worn striping• Recurring drainage problems• Missing green striping or skips at intersections and other conflict points• Dangerous or unclear intersections that need to be reconfigured

Following the completion of the audit, BCDOT will procure items to fix short-term issues and will work with the BCDOT Bicycle Program to develop a long-term maintenance plan.

Management

The BCDOT Dockless Vehicle Permit is managed by a Shared Mobility Coordinator, a civil service position formerly filled by the Bike Share Coordinator. Approximately 80% of the Shared Mobility Coordinator's work time is spent actively managing this program. In addition, an on-site consultant assists with program management for about 20 hours each week. Through this \$105,000 contract, BCDOT is also granted access to the consultant's specialized staff (design engineers, copy editors, etc.), as needed. This contracting method was selected because the support needed for the first year of the program was anticipated to be higher than for existing programs. Using an on-call contractor allowed BCDOT to expedite the hiring of a part time program aide on annual basis that can be adjusted as the program matures. In addition to all of the program support, staff works on several routine management and oversight tasks:

- **Bimonthly check-ins:** BCDOT views permit holders as partners in the program and communicates with them regularly to keep them in the conversation. In addition to as-needed conversations, BCDOT sends each company a compliance check-in on the 15th and 30th of each month. Regular check-ins began on October 31, 2019 and check-ins included compliance rates for Planning District-level and Equity Zones deployment starting on December 31, 2019. BCDOT uses MDS data to verify where vehicles are deployed each morning and calculates the rate based on the number of sites in compliance across all days of the evaluation period. Since working with the Permit Holders on data issues and sending these check-ins, overall compliance has increased significantly, as shown below. Compliance rates below 80% result in warnings; after two warnings, fines are issued.



- **Inspections:** Every month, BCDOT performs vehicle inspections. Staff go to a different part of the city each month to perform visual checks and a riding test. Reports from inspections are sent to the permit holders so that they can improve their maintenance protocol. In one case, these inspections led to a fine for a company when the issue was recurring. Components checked include specification required in the Rules and Regulations:
 - **Vehicle ID and company phone number:** This must be legible on each vehicle so that a person can report any vehicle to the company.
 - **Front and rear lights:** Lights must be in working order and must turn on when the vehicle is rented.
 - **Speed governor:** This must be enacted when the vehicle is rented to cut off throttling at 15 mph on flat ground city-wide and at 8 mph in the slow ride zone.
 - **Kickstand:** The kickstand must be functional to keep the vehicle parked upright.
 - **Brakes and accelerator:** Both of these must be functional and must operate smoothly to reduce the likelihood of crashes.
- **Parking Response Checks:** For these checks, inspectors travel to a different Baltimore Planning District each month to look for illegally parked vehicles. When a vehicle is parked blocking ADA accessibility, inspectors move the vehicle. For all other infractions, the vehicle is reported to the company. When these vehicles are reported to the City, the permit holders have three hours to reposition the vehicles; when these vehicles are reported through the customer service line, the permit holders have six hours to reposition the vehicles. BCDOT tests response times through both reporting methods at random. If vehicles are not moved within the regulated time, the BCDOT towing division is authorized to seize and impound vehicles at the published rates. Performing these

checks in different neighborhoods throughout the city was designed to keep permit holders compliant in all areas. The checks also allow staff to observe parking and usage patterns on the ground throughout the city.

Evaluation

The main tool BCDOT uses to evaluate the operational components of the Dockless Vehicle Program is the Populus Technologies dashboard, which stores, aggregates, and displays the MDS API trip data. BCDOT outsources this service in order to store the data as securely as possible and not leave it susceptible to ransomware attacks or storage issues. Additionally, BCDOT receives support from staff who are experts in MDS and are working to set national standards for dockless vehicle and shared micromobility data. To select Populus, BCDOT received quotes and compared tools available from all comparable service providers.. Additional evaluation permit fees were earmarked for hosting and promoting the user survey; however, contracted consultant support hosted the survey and permit holders promoted the survey in their smartphone apps at no expense to BCDOT.

Using Populus, BCDOT can view data in standard geographies, like census blocks or block groups, and can input shapes unique to Baltimore, such as Equity Zones or healthcare locations. Using this display, BCDOT tracks the compliance of permit holders and analyzes trip patterns. Access to this powerful tool for researchers affiliated with local institutions of higher learning is also written into the permit Rules and Regulations. By entering into their own memorandum of understanding, Johns Hopkins University, Bloomberg School of Public Health has gained access to the Populus dashboard in order to conduct research on the impact of dockless vehicles on mobility equity.

BCDOT Support Conclusions

The planned and earmarked funding and staff support for the program was carefully devised and approved. BCDOT's efforts have been amplified by community partners to make a greater impact than spending would imply. This shows the importance of sharing information and how spending management time to sustain meaningful partnerships can be an effective strategy. Based on the expenditures to date and the projected after effects of the COVID-19 response, BCDOT support may have to be streamlined to prioritize support strategies that have already proven effective within a one year permit timeframe.

V. Recommendations



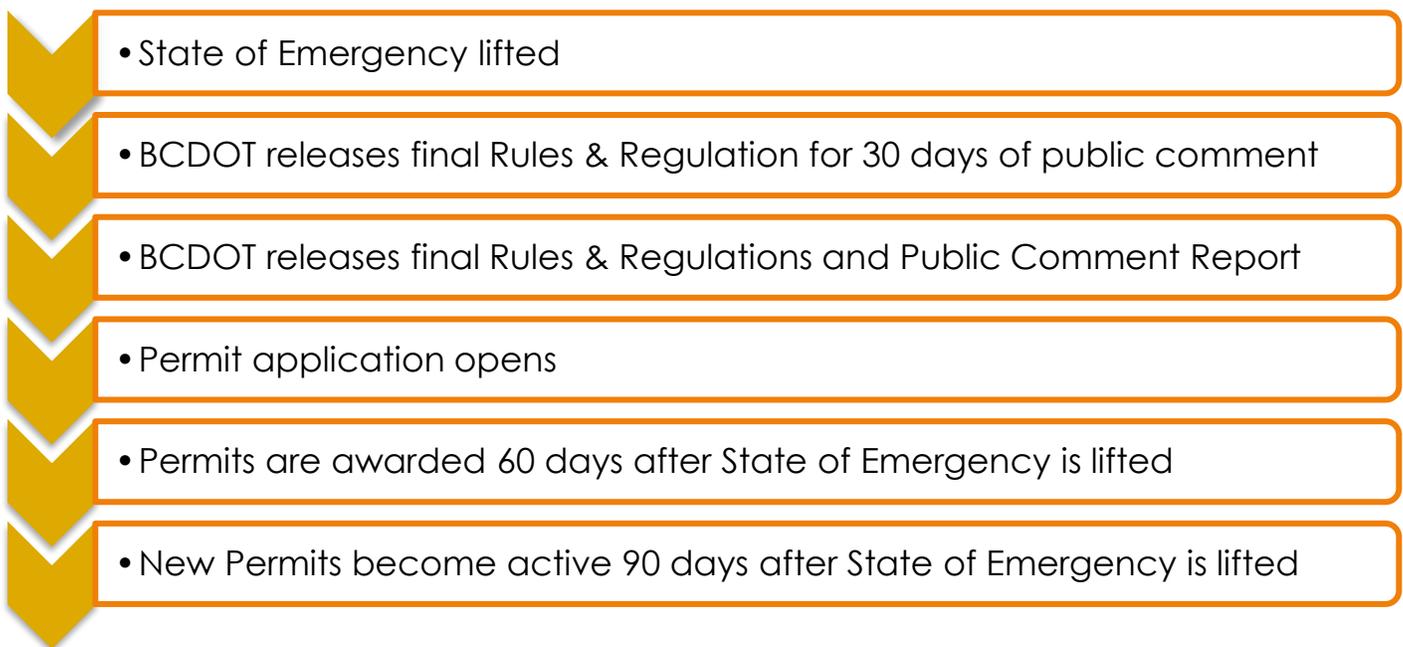
This evaluation is meant to improve the service of the Baltimore City Dockless Vehicle Program. Legislation allows for annual revisions to the Rules and Regulations, fees, and the dedicated support of the program. Making incremental adjustments can allow the program to better meet its goals and to keep up with the best practices developing nationwide.

Annual revisions based on data and evaluation allow for BCDOT to improve the Dockless Vehicle Program and change tactics to meet the goals of growing the program in a way that increases equitable access. BCDOT expects adjustment to continue annually for the foreseeable future as it learns more about this emerging mode and dockless vehicle operations shift with market demands and advancements in technology. BCDOT recommends changes to both permit requirements and program support, although **no changes will be finalized until the COVID-19 State of Emergency in Maryland is lifted.**

Permit Requirement Recommendations

Due to COVID-19 and the State of Emergency in Maryland, BCDOT recommends a shift in the permit timeline. While the first annual permit was issued for August 1, 2019 – July 31, 2020, BCDOT recently introduced an addendum to the Rules and Regulations to extend the current permit. The addendum will adjust the schedule for permit renewal in consideration of the current State of Emergency in the state of Maryland. Governor Larry Hogan's March 12, 2020 Executive Order suspends the termination or any required renewal of a permit until 30 days after the emergency terminates. Considering the need to adjust Dockless Vehicle Rules and Regulations to reflect the environment, BCDOT seeks to extend permits for 90 days after the State of Emergency is lifted. During the 90-day extension, BCDOT will open applications for dockless vehicle permit holders who wish to renew their permit and for new providers who wish to apply for a permit.

Proposed Timeline for Extension and Second Annual Permit



The public comment period for this proposed addendum for a 90-day extension is May 5–June 5, 2020.

Application Process

Once the state of emergency is lifted, BCDOT recommends a competitive but transparent application process similar to the 2019 application process. On the 2019 application, all applicants first agreed to abide by all adopted Rules and Regulations and then submitted responses to seven additional sections about planned operations. Each application was scored by a committee of seven people representing BCDOT, the Baltimore City Law Department, and the Baltimore City Department of Planning. The committee used a rubric to score and rank applications to choose companies that could best serve Baltimore City. BCDOT received seven applications and ultimately awarded permits to four companies. Awardees were notified approximately one week prior to the permit taking effect and were granted a compliance period of two weeks for permit holders that participated in the pilot and five weeks for new permit holders that had never operated in Baltimore.

For the next permit, BCDOT recommends a similar process and number of permits, with a few updates. One change BCDOT recommends is allowing a unique permit for each different vehicle type. This can incentivize companies to provide multiple vehicle types, such as e-bicycles and adaptive vehicles, in addition to e-scooters. By limiting the number of permits and designating them for different vehicle types, permit applicants are incentivized to seek permits for multiple vehicle types and thereby reduce competition. If a company is awarded multiple permits, they would receive the second permit at a reduced fee. Both providers that have already been active in Baltimore and new providers may apply and be considered for the next annual permit. On the next application, BCDOT also recommends a longer period between notification and the permit taking effect.

Fees

Per the City Ordinance, which authorizes the BCDOT Dockless Vehicle Program, the program must use fees to sustain the program. These fees can be changed annually as long as they are approved by the Baltimore City Board of Estimates. For the next annual permit, BCDOT recommends a reduction in in the annual fee. This reduction reflects the expenditures of the first annual permit, since the program has not spent all funds to date. A reduction also accounts for the current business environment during the COVID-19 pandemic. The following table details the proposed budget, which would reduce fees from \$70,000 annually to \$40,000 annually per permit.

Proposed Program Budget <i>(Unofficial- subject to change and approval by BOE)</i>		Cost
Infrastructure	Micro-Mobility ROW Infrastructure <i>\$40,000 Upgrades to micro-mobility lanes</i> <i>\$20,000 Construction of 20 Shared mobility corrals</i>	\$50,000
Education	Community Education <i>\$5,000 Print Materials/designs</i> <i>\$5,000 Digital Ads</i> <i>\$10,000 Placement and event sponsorship</i>	\$20,000
Management	Program Staff (consultant from on-call contractor) <i>\$70,000 Approximately \$70 x 20 hours x 50 weeks</i>	\$70,000
Evaluation	Evaluation <i>\$20,000 Data storage and analysis</i>	\$20,000
TOTAL		\$160,000.00 (Cost to be split amongst permit holders)

Rules & Regulations

Providers selected for permits are required to adhere to the Rules and Regulations adopted by BCDOT as well as all state and local laws. These Rules and Regulations ensure that permit holders are doing their part to operate responsibly and help meet program goals. For the next annual permit, BCDOT recommends updating Rules and Regulations based on how well each rule accomplished its respective intent. The full text of any proposed changes to the Rules and Regulations will be released upon the lifting of the COVID-19 State of Emergency, at which point they will be released publicly with 30 days for public comment. Once the Rules and Regulations are formally adopted, they will be released in a legal format in conjunction with the application for permits.

The following is a summary of some of the more significant current Rules and Regulations along with an evaluation and recommendation for updates. The performance of the rules and recommendations have been discussed in detail by the DVC for several months and reflect the national best practices from cities across the nation. Rules are listed in the order in which they appear in the current Rules and Regulations. Each rule is listed with the intent of the rules, an evaluation of success (poor, moderate, or good), and the metric that led BCDOT to that conclusion.

Summary of Current Requirements		Intent	Evaluation	Proposed Updates
Vehicles	Vehicles must meet national safety standards and must be equipped with kickstand, lights, decal, and speed governor.	Require standard components for safety as well as features needed for operations that are not required by safety certifications.	<i>Moderate</i> Vehicle inspections show compliance with current requirements, but citizen requests have shown need for improved features.	-Standardize font size for vehicle unique identifiers. -Require bell on vehicles. -Prohibit false information, such as a vehicle recording that says, "I will call the police"
	Permit holders must submit vehicle maintenance plans, and BCDOT may perform monthly vehicle inspections.	Ensure vehicles are in safe working order.	<i>Good</i> Over 95% of vehicles have passed vehicle inspections. Inspections have uncovered a few issues, which were quickly fixed by permit holders.	None
	Permit holders must be able to remotely shut down vehicles reported to have issues.	To ensure safety, vehicles reported to have issues cannot be ridden.	<i>Good</i> Permit holders have shut down vehicles reported by WFPB. During vehicle inspections, vehicles with clear issues were not available for rent.	None
Fleet Size	Permit holders must deploy a minimum of 150 and a maximum 1000 vehicles each day.	Allow enough vehicles for permit holders to profit and for consumers to reliably find vehicles.	<i>Good</i> Rides per vehicle per day remained within the goal range of 2-4 until the COVID-19 response.	Amend maximum vehicles allowed so that permit holders may retain any approved fleet increases from this year.
	Permit holders with two vehicle types have a maximum deployment of 2000 vehicles with 150 minimum of each type.	Incentivize permit holders to deploy bikes and/or adaptive vehicles.	<i>Moderate</i> Saw initial deployment of bikes and had initial discussions of a second permit holder deploying bikes.	Increase incentive to bring bikes or adaptive vehicles by holding two permits for permit holders that will deploy them.
	Permit holders may apply for fleet increases based on ridership quotas, compliance, etc.	Allow compliant permit holders to expand if they project that the market demands more vehicles.	<i>Good</i> Fleet increases were approved for Spin and JUMP.	Set a maximum limit for all permit holder fleet increases combined.

Summary of Current Requirements		Intent	Evaluation	Proposed Updates
Parking & Operations	Permit holders must display parking instructions and laws in smartphone apps.	Educate users about safe and legal operations.	<i>Moderate</i> Laws are in each app but are sometimes difficult to find. User survey results showed 75.5% law comprehension.	Clarify how accessible laws are in the app by requiring they must be within three clicks of the home screen.
	Permit holders must respond to requests to move illegally parked vehicles within three hours of BCDOT notification and six hours of public notification.	Ensure permit holders are responsive to BCDOT and the public.	<i>Good</i> Over 95% of vehicles reported during monthly response time checks are moved with time limits.	None
	Permit holders must move vehicles not ridden for five consecutive days.	Make sure vehicles are being checked for safety regularly, even if the vehicles was not rented.	<i>Moderate</i> BCDOT sends a list of vehicles that need to be moved every two weeks.	Clarify process for permit holders to identify their own vehicles.
	Permit holders must be capable of geo-fencing speed zones.	Limit speed in areas with high pedestrian traffic, as required by law or regulation: Harbor Promenade and Stadiums.	<i>Good</i> Vehicle inspections show compliance.	Require smooth speed transitions when leaving a geo-fenced area.
	Improperly parked and inaccessible vehicles may be towed.	Keep the right-of-way clear, and keep hazardous materials out of the environment.	<i>Good</i> Permit holders have agreed to tow vehicles from inaccessible locations in the Jones Falls and Inner Harbor.	None
Deployment	Permit holders must deploy vehicles equitably to planning districts and Equity Zones each morning, between 6-8am.	Provide equitable access to vehicles and avoid over concentration.	<i>Good</i> Compliance rates have improved, and there has been a growth in ridership outside of the downtown core.	-Adjust morning deployment windows to 5-9am. -Relocate or adjust underperforming Equity Zones.
	Deployment limits: no more than 12 vehicles per block face, no vehicles in front of K-8 schools, comply with non-deployment requests.	Prevent overconcentration, keep scooters away from schools, and honor non-deploy requests.	<i>Good</i> No complaints from the public. Six non-deployment requests have been approved and implemented.	None
	Entire fleet must be removed for severe weather or other emergencies.	Adhere to city-wide emergency response.	<i>Good</i> Vehicles were removed from ROW for the President's visit.	-Deployment suspensions to be linked to school schedules. -Clear vehicles from evacuation routes during snow emergencies.
	Permit holders may apply for a temporary exemption from deployment regulations.	Allow for unexpected incidences, safety, or market testing.	<i>Good</i> Exemptions approved for an inventory check and safety incidences.	Require a communications plan to notify the public of service changes.

Summary of Current Requirements		Intent	Evaluation	Proposed Updates
Education & Engagement	Permit holders must display a BCDOT selected educational banner in smartphone app for one week of each month.	Provide high-visibility safety messages to users.	<i>Good</i> Messages selected during DVC meetings to be relevant to the time of year and current events. Messages seen in each app and social media posts seen about some messages.	None
	Permit holders must attend a minimum of one community event per deployment zone annually (9 events total).	Require engagement with communities across Baltimore.	<i>Moderate</i> Few community events attended thus far, and plans were disrupted by COVID- 19.	Require at least two events per quarter except during winter.
	Permit holders must attend a minimum of four public meetings, if requested by BCDOT.	Ensure the permit holders will attend meetings at the request of BCDOT.	<i>Good</i> Permit holders have good DVC attendance and have been invited to other City events ,such as Bike to Work Day, etc.	None
Equitable Access	Require Equity Plans: low-income, cash payment, and non-smartphone options	Provide options for users who have barriers to riding due to income, banking status, or cell phone.	<i>Moderate</i> Information is available on websites, but monthly reporting from permit holders shows varying signups from each company and not as many as BCDOT projected.	-Provide incentive based on number of equity signups. -Clarify eligibility for low income plans for anyone receiving federal, state, or local assistance.
	Permit holders must maintain a 24-hour customer service line in multiple languages.	Provide equity and accessibility of customer service for non-English speakers.	<i>Moderate</i> Citizens have reported that service lines sometimes send callers to voicemail, and the call is not returned.	Specify a response time requirement.
	All permit holder websites and smartphone apps must be WCAG compliant based on standards posted on: https://www.w3.org/TR/WCAG21/	Provide equity and accessibility of smartphone apps and website for people with disabilities.	<i>Good</i> All permit holders have complied.	None

Summary of Current Requirements		Intent	Evaluation	Proposed Updates
Data and Reporting	Permit holders must provide a public GBFS API feed and an MDS API feed to BCDOT.	Provide public transparency and app integration with public GBFS API and help BCDOT track compliance and understand patterns using MDS API.	<i>Good</i> All feeds are functioning. Public GBFS allows the inclusion of vehicle locations in the Transit app. MDS API is directed to Populus for BCDOT to view.	Clarify compliance to new MDS updates within 10 days and require that data be cleaned within 24 hours.
	BCDOT may provide MDS API to third parties for research purposes through an MOU.	Encourage micromobility research from local institutions.	<i>Moderate</i> Data sharing MOU is now in place with Johns Hopkins University, but the process to establish MOU was lengthy.	-Clarify what kind of third parties are eligible. -Clarify MOU process and requirements.
	Permit holders must report non-deployment requests and issues related to public safety to BCDOT within 24 hours	Allow BCDOT to track and assist with urgent issues.	<i>Moderate</i> Six non-deployment requests have been reported. Minimal public safety issues have been reported, some of which well after 24-hour requirements.	-Clarify safety issues that need to be reported. -Require that public safety reports be filed for any deployment suspension requests related to safety.
	Permit holders must provide monthly data reporting to BCDOT	Allow BCDOT to track company performance that is not contained in API feeds.	<i>Moderate</i> All monthly data reports have been submitted, but BCDOT cannot compare maintenance or customer issues, due to inconsistent reporting.	Provide standard format in Rules & Regulations that specifies level of detail for all items.
	Permit holders must protect user privacy/payment info, and GPS must not rely on customer's smart phone. Smartphone app must not require customers to enable location services, nor require customers to share data with third parties.	Ensure digital privacy for users.	<i>Good</i> No known issues	None
Fees	Permit holders must pay permit fees and excise tax following Finance Department rules.	Fund program management and support.	<i>Good</i> All fees and taxes have been paid to date.	Reduce permitting fee to match expenditures.
	Permit holders must provide performance bond and liability insurance.	Fund retrieval of vehicles, impounding, and any liability issues.	<i>Good</i> All permit holders have maintained bond and insurance.	None

BCDOT Program Support Recommendations

BCDOT will continue to actively manage the Dockless Vehicle Program to ensure its success in meeting goals of ridership growth and affecting equity of access in Baltimore City. Using the proposed permit fees, BCDOT can plan to support the program and can make improvements to tactics employed during the first permit year.

Infrastructure Improvements

Based on both trip data and community feedback, BCDOT should prioritize safe, intuitive, and comfortable infrastructure for riding. To ensure safety and encourage proper parking, BCDOT needs to continue making upgrades to bike facilities and parking corrals. These two improvement types will increase safety for riders and reduce the impact on people who also need to use curb space.

Providing safe and clearly marked places to ride can greatly improve safety and encourage more people to ride dockless vehicles. For the second year in a row, survey respondents cited that bumps in the roadway caused crashes and that users will resort to riding on the sidewalk if they do not feel safe on the road. BCDOT recommends the following actions:

- Dockless vehicles should now be considered during street project design, thanks to their inclusion in the *Complete Streets Manual*.
- Trip data should be used to support the Bike Baltimore program in its implementation of the *Separated Bike Lane Network Plan*.
- Fees dedicated to infrastructure improvements should be spent based on the results of the bike lane audit commissioned this year. Using these funds for quick maintenance and response can ensure that they are used within the year of the permit.

One of the main issues that dockless vehicles cause for non-users continues to be illegal parking that blocks sidewalks, entrances, or other important locations. During parking response time checks performed this year, BCDOT found that most vehicles were parked correctly, but any vehicle blocking pedestrian flow or otherwise impeding roadway activity is unacceptable. Moving forward, to address parking issues, BCDOT recommends:

- Parking response time checks should continue across the city.
- Installation of corrals should continue as part of the Bike Baltimore Rack Program. With the remainder of this permit year, BCDOT plans to install corrals in Equity Zones and near transit stops. Next permit year, BCDOT will recommend additional strategic locations based on frequent trip destinations, requests, and equity considerations.

Community Education and Engagement

BCDOT continues to see the need for community education and engagement to share knowledge of the Dockless Vehicle Program, riding laws, and parking laws. The 2020 user survey specifically asked users about their knowledge of laws in Baltimore City, and while the average on all law questions was 75.5%, there is clearly room for improvement. Moving forward, BCDOT will focus on engagement through:

- **Monthly In-App Tips:** Monthly tips developed by the DVC during the first year of the permit were shared on social media and seem to be an effective way to get a short tip to users.
- **PSAs:** BCDOT and the Office of Civil Rights have started filming the first PSA about being considerate to others on the roadway. BCDOT plans to complete this project and focus on getting prominent air time for the messaging. After this, BCDOT hopes to develop additional short videos that explain riding and parking laws, as well as tips for safe riding.
- **Educational Cards:** Educational cards printed with riding and parking laws have been useful for groups who interact with dockless vehicle users. By distributing the cards to riders demonstrating unsafe or illegal riding behavior, problem riders can be reached effectively and can learn about how they should operate dockless vehicles. BCDOT will continue to print these cards so that they may be provided to community groups upon request.

- **Attendance at Community Events:** Through dedicated Community Liaisons, BCDOT staff will continue to attend community association meetings and events to answer questions about the Dockless Vehicle Program. When appropriate, staff will also discuss options for permit holders to attend events to showcase safe riding and Equity Plan sign-ups.
- **Resident Mobility Board:** BCDOT still plans to launch a Resident Mobility Board, where residents can engage in a dialogue about transportation in their community. The main focus will be the broader implementation of the Complete Streets Policy, but dockless vehicles should be one topic discussed so that the resident advisors can share the experience and needs of their communities.

With this continued community education and engagement effort, BCDOT can impact not only the safety of dockless vehicles users, but that of all roadway users who interact with them daily.

Management

In order to execute BCDOT program support, dedicated staffing remains essential. For the next permit year, BCDOT will continue to utilize consultant staffing support to assist the BCDOT Shared Mobility Coordinator with program management and support. Since the first year of the program established many processes and standard operating procedures, the estimated number of consultant hours needed to support the program has decreased by about 20%.

Looking Ahead

When the next permit is issued for the Baltimore Dockless Vehicle Program, BCDOT is optimistic about continuing to incrementally improve the program through regulation and support. To work towards program goals of ridership growth, improving equity of access, and maintaining responsible data management, BCDOT has set the following benchmarks for the program:

- Issue the second annual permits 90 days after the COVID State of Emergency is lifted.
- Develop a live dashboard to share aggregated data publicly.
- Install Equity Zones and MTA parking corrals once the Stay at Home Order is lifted/by the end of the first annual permit.
- Continue to release quarterly reports and an annual evaluation.
- Conduct a survey of users annually.
- Adjust permit Rules and Regulations annually
- Support a 10% increase of trips annually.
- Incrementally increase the mode share for active commutes to work.
- Work with partners to develop accurate tracking and reduce injuries associated with dockless vehicles.

Provided the continued support through fees, staffing, and support, the Dockless Program can play a growing role in reaching equitable access and sustainable transportation goals for the City of Baltimore.

