

Montgomery County
Department of Transportation

Ride On Flex Microtransit Performance Assessment



**Final Report
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Table of Contents

Chapter 1 - Overview of the Flex 1

Background	2
Flex Basics	4
Mobile Application	8
Marketing	11
Operations	13

Chapter 2 - Service Analysis 16

Zone Characteristics	16
Trip Request Data	20
Ridership Data	23
Regional Linked Trips	34
Customer Survey Results	36
Stakeholder Interviews	40

Chapter 3 - Performance Assessment 44

Performance Assessment Context	44
Potential Performance Measures	47
Performance Assessment	52
Recommended Performance Measures	55

Chapter 4 - Future Service Considerations 58

Service Strategy	58
COVID-19 Service Implications	62
Future Policy Considerations	65
Establishing & Modifying Zones	69

Chapter 1

Overview of the Flex

Public transit operators across the nation are adapting service delivery models to include an on-demand, e-hailing component. In what has become known as microtransit, public agencies are using smaller vehicles with dynamic routing and scheduling for direct curb-to-curb or corner-to-corner trips. Customers are then provided the opportunity to use a smartphone application (app) to plan, request, pay, and track the vehicle within a defined geo-fenced zone.

The Ride On Flex is the Montgomery County Department of Transportation's (MCDOT) first microtransit service. The Flex, which is a one-year pilot program, has two service zones that cover the Rockville and Wheaton-Glenmont areas. The technology behind the service, the Flex app, was developed in partnership with Via Transportation, Inc. (Via). The Flex is the first microtransit program in the state of Maryland and in the Washington, D.C. region.



Figure 1-1: Ride On Flex Vehicle

The Flex utilizes smaller, 11-passenger buses (shown in Figure 1-1) to easily navigate neighborhood streets. Primarily operating in lower-demand neighborhoods, the Flex is a first mile/last mile connection to important community destinations and the Washington Metropolitan Area Transportation Authority's (WMATA) Metro stations.

One of the advantages to microtransit is the increased flexibility for transit users versus traditional fixed routes. The Flex uses dynamic routing technology to adjust stop locations and vehicle routes in real-time with algorithms that work well for dispersed populations. Some providers find that microtransit can provide a more efficient alternative for lower productivity services including paratransit or other on-demand services.

Chapter 1 provides a background on the rise of microtransit nationally and information on the current Flex service. The Flex's development, launch, app, trip information, marketing, and operations are all highlighted in this first chapter.

Background

The Rise of Microtransit Services

The capability to use a smartphone app to plan, request, pay, and track curb-to-curb mobility services is transforming the urban traveler's modal choices. During the past decade, urban areas have been inundated with a menu of on-demand, e-hailing shared-use services. In 2009, Uber became the first private tech-based company to supply private-for-hire e-hailing service, in which the company's business model quickly galvanized an enterprise of peer-to-peer e-hailing firms, which are now known as transportation network companies (TNCs). In 2014, TNCs introduced ride-splitting into the sharing economy, which pairs customers with similar trip origins/destinations in real-time, emulating the public transit demand response service delivery model.

While TNCs were originally used as an alternative to taxis, during the past four years, the private tech companies have materialized into a first mile/last mile solution between public transit customer's trip origin and destination. Capitalizing on the novel service delivery model, transit operators started developing partnerships with TNCs. As part of the partnerships, public entities are contracting app-based Demand Response Transit (DRT) or microtransit service to tech-based companies.

Some Lessons Learned

Many microtransit programs are in their infancy, and as a result there is limited historical data and no set industry criteria or standards to use when conducting an assessment of the Ride On Flex service. However, based on a recent review of a variety of microtransit programs from across the country, there are some lessons learned that can be taken into account in this assessment and with future planning of microtransit services. These include:

- Microtransit programs have been well received by a variety of age groups that appreciate the flexibility and personal nature of the service.
- Operating costs for microtransit services, versus other public transit services, may be cost neutral, and not result in cost savings if replacing existing fixed routes.
- Microtransit can result in greater efficiencies and on-time performance in certain circumstances. However, when compared to typical transit industry performance measures, service productivity (i.e. trips per mile or hour) may be low.
- The most successful application of microtransit programs are either in close proximity to major high-frequency public transportation hubs or as a supplement/replacement for DRT or ADA paratransit.

Planning and Launch

The concept for the Flex was first developed in early 2018 as MCDOT was investigating solutions to low performing Ride On bus routes. The idea of replacing buses with smaller vehicles led to the concept of developing a microtransit zone along each of the low performing routes. MCDOT consulted with Via, a microtransit software provider, and peer transit agencies in Austin, Texas and Sacramento, California about their microtransit pilot programs. Following the consultations, it was determined that the route replacement approach would create microtransit zones that were too large for reliable service. Both Austin and Sacramento noted that they experienced success in converting portions of their existing ADA paratransit services into small, focused microtransit zones.

During the spring and summer of 2018, the zone concept was refined and an analysis of service zones was conducted for multiple locations across the county. A key element of success for other microtransit programs has been providing connections to major transportation nodes. With this in mind, areas around the county's Metro stations were heavily scrutinized. Based on feedback from focus groups held at Montgomery County's Regional Service Centers, the two existing zones were refined and finalized in late 2018. Approval to implement the service was received in January 2019; however, a delay with delivery of the Flex vehicles pushed the launch date into the summer.

On June 26, 2019, at 10:00 a.m. MCDOT launched the Flex with an event in downtown Rockville (Figure 1-2). Montgomery County Executive Marc Elrich commented that "the Flex service holds tremendous promise not only for taking cars off our roads, but also improving equity for residents who need an affordable solution for getting around quickly." Service on launch day went very smoothly and MCDOT received a groundswell of positive support from the community.

Figure 1-2: Montgomery County Leaders Attend the Ride On Flex Launch Event



Flex Basics

Requesting a Trip

After downloading the Ride On Flex App, customers can request a trip by entering their pickup and dropoff locations within one of the two defined geo-fenced service zones in Rockville or Wheaton-Glenmont. Trips are not provided between the two zones. The Flex has no fixed stops or schedule. It comes when the customer books their trip within the regular service hours.

Service Spans

Service is operated Monday through Friday, although service times vary between the two zones. The Flex is available in Rockville from 9:00 a.m. to 3:30 p.m. and in Wheaton-Glenmont from 6:00 a.m. to 9:00 a.m. and again from 3:30 p.m. to 7:00 p.m. These service spans are essentially trip request windows. For example, a request received at 8:59 a.m. in the Wheaton-Glenmont zone will be provided during the 9 o'clock hour. Customers are unable to reserve trips in advance of 6:00 a.m.

Pickup and Dropoff

The Flex will pickup customers at the closest corner to their origin and destination. Although a customer's origin or destination may remain consistent over the course of multiple trips, the pickup and dropoff corners may change depending upon the location of the Flex vehicle when the request is received. Dedicated stops have been established at the Glenmont, Rockville, and Wheaton Metro Stations for the Flex (see Figure 1-4). Customers utilizing a wheelchair will receive more direct, curb-to-curb service, if they selected the wheelchair accessibility option when signing up or through their Flex personal account details.



Figure 1-3: Ride On Flex Trips are Requested through the Flex App



Figure 1-4: Ride On Flex Stop at the Wheaton Metro Station

Fares

The Flex's fare structure follows Ride On's general fare policy. The fare for a one-way trip is \$2.00 for the general public, half-price (\$1.00) for individuals with disabilities and seniors (ages 65+), and free for students. Customers must pay this fare each time they board the vehicle. Discount passes and transfers can be utilized on the Flex through a customer's SmarTrip® card. Fares can be paid with cash or SmarTrip® onboard the vehicle. Each Flex vehicle is equipped with an electronic farebox, the same type that is used on other Ride On buses (see Figure 1-5). On Monday to Friday from 9:30 a.m. to 3:00 p.m. seniors (age 65+) and individuals with disabilities can use the Flex for free. While there is interest in pursuing fare payment options within the Flex app, this feature is currently unavailable.

The Zones

The Flex service is only provided within the two Flex zones - Rockville and Wheaton-Glenmont. The Rockville zone is served by one vehicle and covers an area of approximately 0.7 square miles. Wheaton-Glenmont is considerably larger at 3.4 square miles and is served by two vehicles. Detailed maps of both zones are provided in Figures 1-6 and 1-7.

Customers may travel to and from any location within one zone, but not between the two zones. When requesting a trip, the customer can be physically outside of a zone, but they must provide a pickup location within the zone.

The service hours of the two zones are unique because their design was purposefully crafted towards different trip purposes for the pilot project. For example, the Rockville zone is a mid day service, operating from 9:00 a.m. to 3:30 p.m. This provides residents, employees, and students with convenient transportation for running errands, lunch trips, attending appointments, and potentially one end of a commute but it does not allow for trips by typical commuters or shift workers. By contrast, the Wheaton-Glenmont zone is more of a commuter type service operating during the morning (6:00 a.m. to 9:00 a.m.) and evening (3:30 p.m. to 7:00 p.m.) peaks. This service span is ideal for commuters but limits the window of time that residents and employees may use the service for errands or appointments.



Figure 1-5: Fares are Paid Onboard the Flex Using Standard Bus Fareboxes

Figure 1-6: Rockville Flex Zone

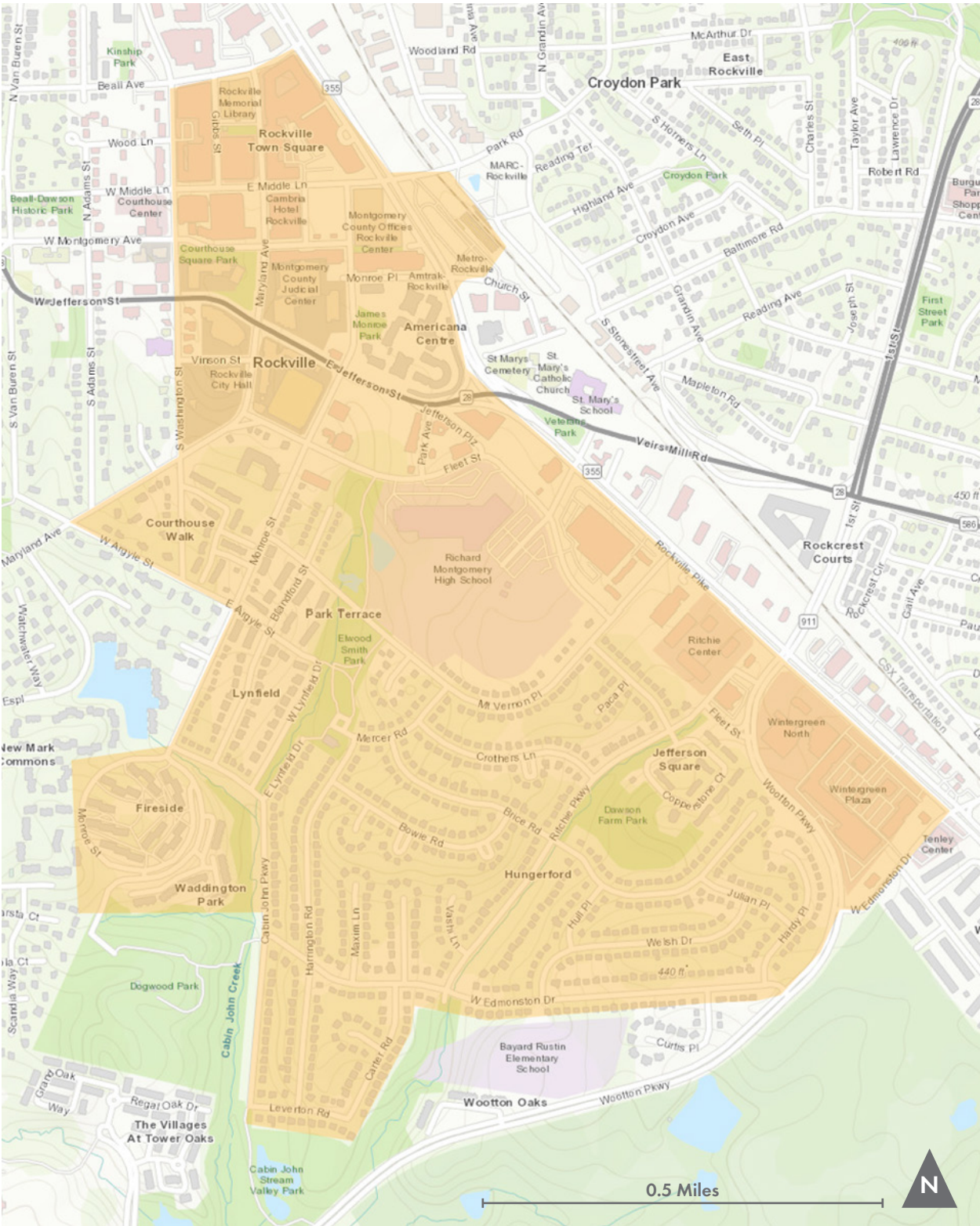
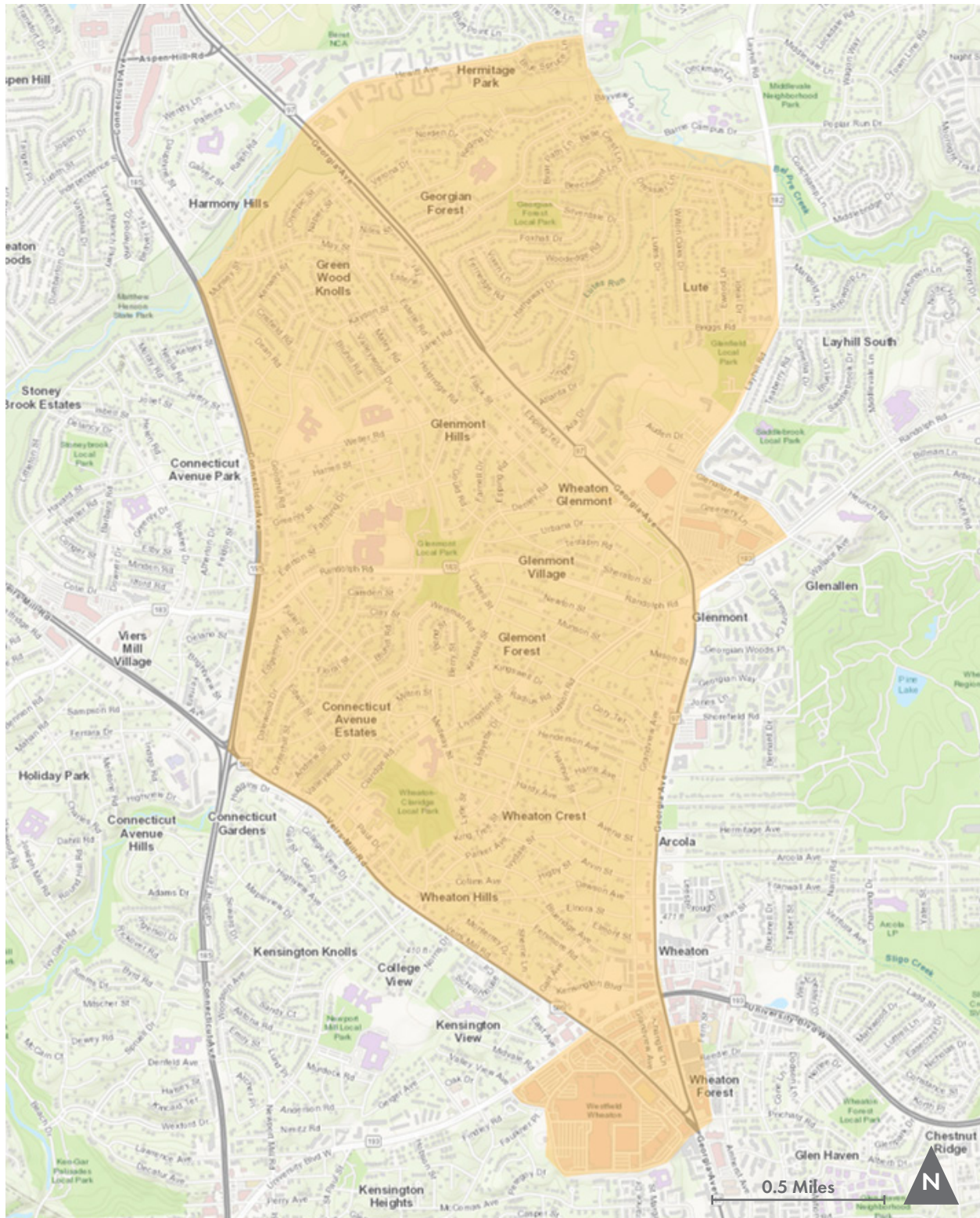


Figure 1-7: Wheaton-Glenmont Flex Zone



Mobile Application

The public's interface with the Ride On Flex is through the Flex Mobile Application (app). Customers are able to download the Ride On Flex app, developed by Via, through the Apple App Store and Google Play Store for free.

First Time Users & Registration

First time users of the Flex app are greeted with a home screen that allows them to log in to an existing account or to sign up with a new account. The account registration process is simple and straightforward. Required personal information includes the user's first and last name, email address, and cell phone number. The user must create a password for their account and also has the option of selecting wheelchair accessibility which provides the user with more direct "curb-to-curb" service versus the corner-to-corner service provided for other users. The account registration page is shown in Figure 1-9.

Requesting a Trip

With a registered account, the app then navigates the user to a map that highlights their current location. If the user is in or near the zones, the zones will be visible; otherwise the app will generate an out-of-zone message. Users may manually enter their pickup and dropoff areas or select these locations using the app's drop pin. During the pickup and dropoff selection process, the user has the ability to increase the number of passengers that will be traveling with them to a maximum of six per booking. With the origin, destination, and number of passengers, the app will then generate an estimated wait time until pickup and identify a nearby intersection that the user must travel to in order to board the Flex. The trip request process is further detailed on the following page in Figure 1-10.



Figure 1-8: Ride On Flex App Home Screen

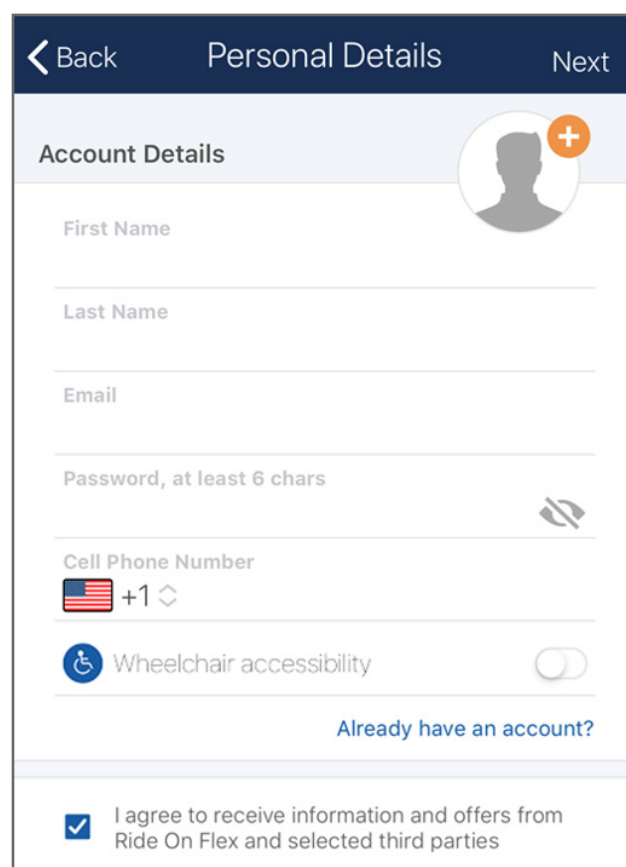
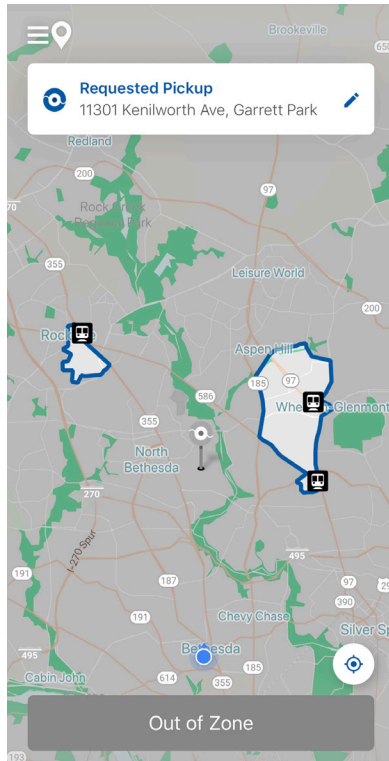

 The image shows the 'Personal Details' registration screen in the app. At the top is a dark blue header with a back arrow, the title 'Personal Details', and a 'Next' button. Below the header is a section titled 'Account Details' with a profile icon placeholder (a grey circle with a white plus sign) to its right. The form contains several input fields: 'First Name', 'Last Name', 'Email', and 'Password, at least 6 chars' (with an eye icon for toggling visibility). Below these is a 'Cell Phone Number' field with a US flag icon and a '+1' prefix. There is a 'Wheelchair accessibility' toggle switch. At the bottom of the form is a checkbox labeled 'I agree to receive information and offers from Ride On Flex and selected third parties'. A link 'Already have an account?' is located below the form fields.

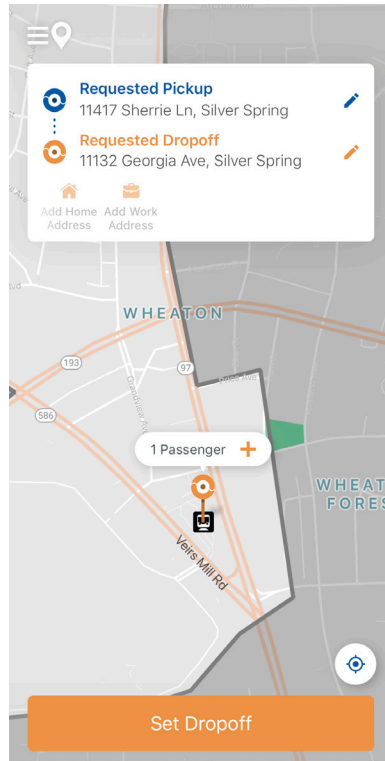
Figure 1-9: Ride On Flex App Registration

Figure 1-10: Trip Reservation Process



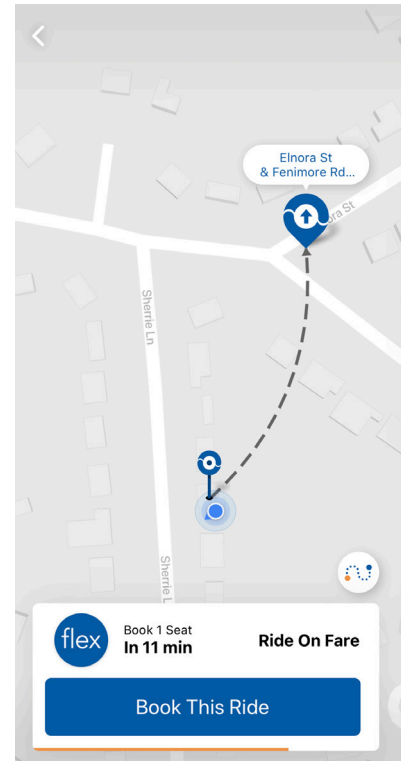
Landing Screen

The landing screen allows users to see the extent of the two Flex zones and whether their origin and destination are located within one of the zones. Note that the drop pin is outside of both zones and that the Set Pickup button is grayed out and displays Out of Zone. Users are able to request trips while they are physically outside of the two zones, but must have both their pickup and dropoff location within the same zone.



Set Pickup & Dropoff

Users can drag the app's drop pin to select and confirm their origin or manually type in their origin. The same is done for the dropoff location, pictured above. While setting pickup and dropoff locations, the app allows users to increase the number of passengers from the default value of one; a maximum of six passengers are allowed per trip request. The app also allows users to set their default home and work addresses.



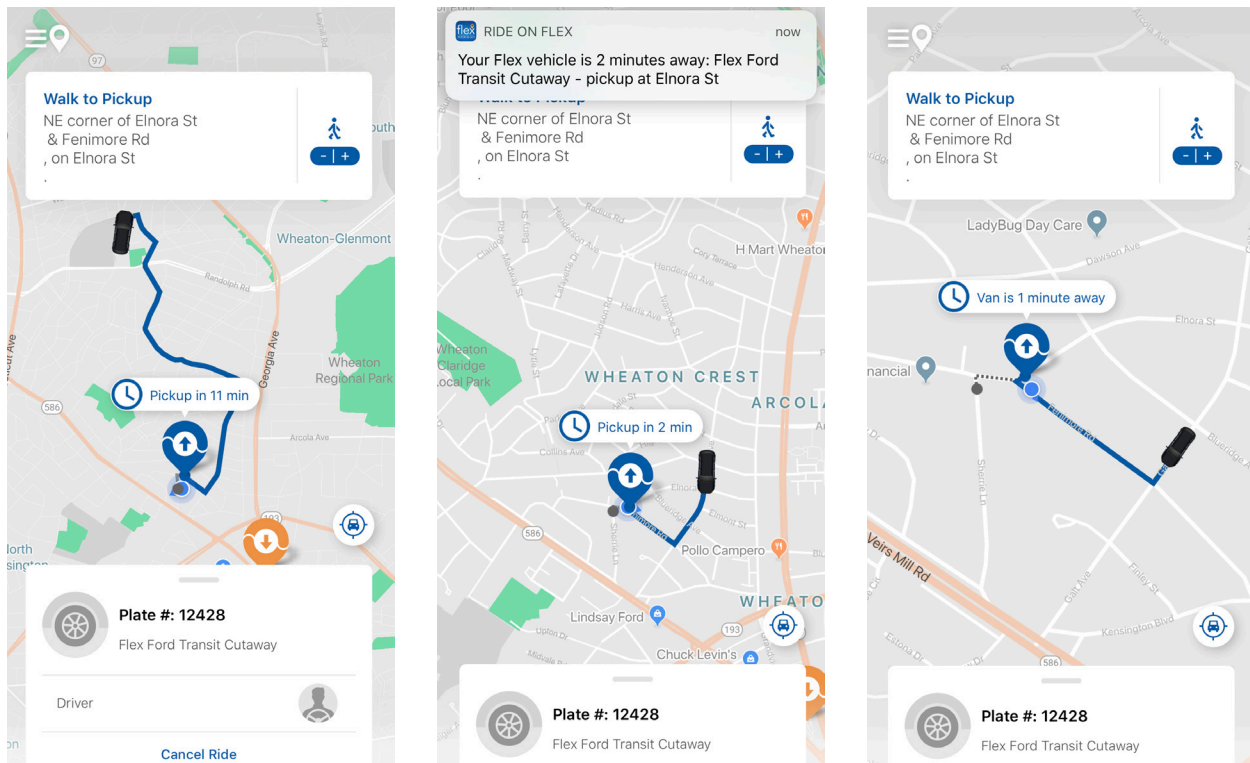
Book the Ride

Once the users' pickup and dropoff locations are set, the app determines the estimated wait time for the user. The app selects the nearest intersection to the user's origin that is also convenient for the Flex vehicle's routing. This eliminates the need for unnecessary looping of blocks or u-turns; pickup and dropoff locations may change based on the vehicles location when the request is received. With this information the user can then decide whether or not to book the ride.

Real-Time Arrival Information

After a customer has booked their ride, the app allows them to track their vehicle and receive real-time updates on the vehicle's estimated time of arrival. The app sends pop-up notifications to the customer's smartphone once the vehicle is two minutes away and once it has arrived at the pickup location. The real-time arrival process is detailed below.

Figure 1-11: Real-Time Arrival Experience



Trip Overview

Once the trip is booked, the app will take the user to a new screen that provides walking directions to the pickup intersection as well as basic vehicle information such as the license plate number and make and model. The app provides an area for information about the driver, but this feature is not utilized at the moment.

Real-Time Updates

Users can follow the vehicle's path while they wait for pickup. The app provides pop-up notifications on the user's smartphone when the vehicle is two minutes away and once the vehicle has arrived. Users may also cancel their trip through the app.

Real-Time Arrival

The Flex vehicle is trackable through the app up until the user boards the Flex.

Marketing

Outreach and marketing for the Flex was conducted by Ride On's marketing team. This effort, documented in Table 1-1, coincided with the planning and implementation of the service. As service concepts were being finalized in January and February 2019, the outreach team was conducting focus groups and corresponding with civic and neighborhood associations. In April 2019, the marketing team developed a media release, created a website for the service, and conducted public forums for comment.

In May and June, with a launch date set for June 26, the department began a marketing blitz. While the Flex only operates in the two zones, the campaign was targeted at the entire county. This approach aimed to spread information about the service concept and create some “buzz” for the pilot project. Marketing efforts consisted of print media including brochures, magazine articles, newspaper advertisements, and mailings to all addresses in both zones. Digital marketing included online digital advertisements, social media posts, YouTube videos, cable TV advertisements, and radio announcements. Advertisements were also posted at Metro Stations (Figure 1-12), bus stops, on buses, and within the Wheaton Mall (Figure 1-13). The department also distributed posters and window clings for businesses and organizations to display. Advertising was prominently displayed in both English and Spanish.

While the initial marketing blitz has slowed, advertisements remain in many locations and there are plans for additional outreach efforts as the service continues to grow. More strategic and targeted marketing is important to bolster the ridership of the two existing zones. Based on feedback from existing customers, word-of-mouth from family, friends, and neighbors has been a major contributing factor to the Flex's success.



Figure 1-12: Flex Advertisement at the Wheaton Metro Station



Figure 1-13: Flex Advertisement at the Westfield Wheaton Mall

Table 1-1: Timeline of the Ride On Flex Marketing Campaign

Month (2019)	January	February	March	April	May	June (Flex Launch)	July	August	September	October	November	December	Into 2020
Community Focus Groups													
Emails to HOAs, Civic Associations & Neighborhood Listserves													
Presentations to Local Commissions and Committees													
Public Forum													
Media Release Sent to News Outlets													
Magazine, Newspaper & Radio Interviews													
Created the Flex Website (rideonflex.com)													
Text Messages via GovDelivery													
Email via GovDelivery													
Nextdoor.com email blasts													
Facebook Posts & Stories													
Twitter and Instagram Posts													
Press Event for Launch Day													
Produced Promotional Videos													
Brochures for Distribution at Outreach Events													
Distributed Window Clings for Display													
Internal Ride On Bus Advertisements													
The Patch Digital Ads													
YouTube Video Placement													
Local Newspaper Ads (multilingual)													
Posters at Regional Service Centers, Libraries, High Schools, & Senior Centers													
External Ride On Bus Advertisements													
Cable TV Ads													
Metro Station Ads													
Direct mail to every home in the zip codes													
Outreach Teams at Metro Stations													
Radio Ads													

Source: Montgomery County Department of Transportation

Operations

The Flex is based and operated out of Ride On's Nicholson Court Depot, one of three transit depots within the Montgomery County Department of Transportation. This depot is conveniently located between the two existing Flex zones in Wheaton-Glenmont and Rockville.

Day to Day Operations

On a typical service day, two Flex vehicles will depart the Nicholson Court Depot and travel to one of the Wheaton-Glenmont zone's two staging areas (Georgian Forest Local Park and Glenmont Local Park), arriving around 5:45 a.m. These staging areas are centrally located within the Wheaton-Glenmont zone and provide an area for the vehicle to park while awaiting trip requests. Morning service requests are accepted in this zone from 6:00 a.m. to 9:00 a.m. Once all trip requests are completed, the two vehicles travel back to the depot.

At approximately 8:45 a.m., a single Flex vehicle arrives at the Rockville zone's primary staging area, the Elwood Smith Community Center. The Rockville Metro Station is occasionally used as a staging area and drivers are able to use the Montgomery County Executive Office Building for comfort stops. Trip requests in the Rockville zone are accepted from 9:00 a.m. to 3:30 p.m.

The driver shift structure for the Flex has evolved to include straight and split (extended break) shifts. When the Flex initially launched, driver shifts would typically include a Flex assignment and a fixed route assignment to make a full day. As the specialized nature of the service became evident, daily driver shifts were dedicated to Flex service. For this reason, the Rockville zone is currently covered

Figure 1-14: A Ride On Flex Bus being Cleaned at the Nicholson Court Depot



by two separate shifts. At approximately 12:00 p.m., an additional vehicle/driver from the depot will relieve the morning driver in the Rockville zone. The morning shift driver will then complete any outstanding trips and return to the depot. Following an extended break, the Rockville morning driver will then transition to evening service in the Wheaton-Glenmont zone. The same shift arrangement is used in opposite order for a morning Wheaton-Glenmont driver who then shifts to providing afternoon service in the Rockville zone.

Around 3:15 p.m., two Flex vehicles arrive in the Wheaton-Glenmont zone to provide afternoon and evening service from 3:30 p.m. to 7:00 p.m. Once all trips are completed, the two vehicles return to the depot for the day. Flex vehicles are thoroughly cleaned following each shift.

Vehicle Fleet

The Flex is currently operated with four dedicated Ford Transit Cutaways from Starcraft. The vehicles allow for a maximum seating capacity of 11. They are accessible, via a rear lift, and can accommodate up to two wheelchair passengers.

Flex vehicles are outfitted with audio and visual recording equipment, an electronic farebox, and other standard safety equipment. The key to the real-time booking and arrival component of the service is the driver's tablet. The tablet is mounted on the vehicle's dashboard during operations. When not in use, the tablets are stored under lock and key in the depot headquarters. A supervisor is responsible for checking the tablets out at the beginning of a driver's shift and back in once they are done for the day.

Montgomery County has purchased seven Ford Transit Cutaways from Starcraft, of which only four are currently wrapped with the Flex branding. The other three vehicles are wrapped in traditional Ride On colors and are used on low demand fixed routes. If or when the decision is made to expand Flex service these additional three vehicles will be wrapped with the Flex branding and used for expanded or enhanced service.

Figure 1-15: Ride On's Ford Transit Cutaways & Flex Buses



Onboard Mobile Tablet

The Flex service relies on mobile tablets that are equipped with Via's trip scheduling software. The tablet provides an interface for drivers to accept trips, mark no-shows, and view cancellations. The tablet also provides a constantly updated itinerary with turn-by-turn directions. For example, between trips, the tablet will instruct the driver to return to the staging area to await a future request. In the Wheaton-Glenmont zone, the Via software will select the staging area based on the two vehicles' positions to ensure service is evenly distributed throughout the zone. While the driver has ultimate control, every move of the vehicle is directed by the Via software.

Drivers have reported issues with the turn-by-turn navigation provided by the tablet. Via has been responsive in updating the algorithms to avoid u-turns and other unsafe maneuvers, but drivers must use their knowledge of the local street network to avoid unsafe turns and occasional street closures.

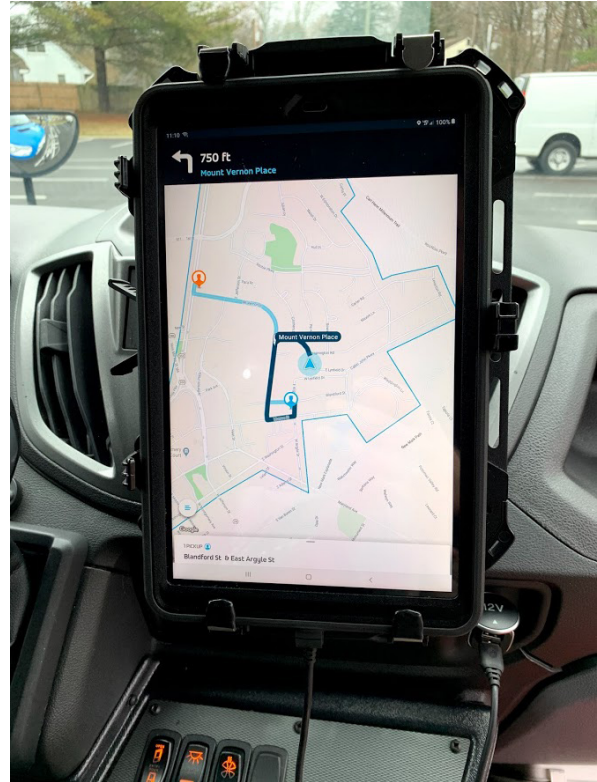


Figure 1-16: Flex Mobile Tablet

Operational Considerations & Challenges

Many lessons were learned in the early months of the Flex service. The two zones feature significant peak-hour traffic congestion on major corridors and the challenge of navigating narrow neighborhood streets. Drivers do their best to avoid gridlocked intersections. Consistent pickup and dropoff locations have been designated in hard to reach locations and facilities with multiple entrances, such as the Westfield Wheaton Mall.

The Flex service is very personal in nature. Many of the riders know each other and are on a first-name basis with the drivers. Customer service is a big element of this assignment. Passengers routinely ask for personalized service, and it can be difficult for drivers to say no to some customers. This requires a driver who is patient and approachable to riders. There is significantly more communication and coordination with customers than regular fixed route service. Drivers must manage reservation information on their tablet, ensure they pickup the correct passenger, and deal with a wide range of personalized requests and questions. According to operations staff, the biggest challenge has been training new and standby drivers. Even with the turn-by-turn software, it is important for the driver to have an underlying understanding of the street networks in each zone.

Chapter 2

Service Analysis

The Flex app is an invaluable tool that provides detailed data on Flex trip characteristics. The app's data allows MCDOT to make well-informed and data-driven service decisions for the Flex. The trip data has provided an excellent resource for this service analysis. Chapter 2 captures Flex trip characteristics over the first 120-days of service as well as other additional data-driven comparisons and analyses.

Zone Characteristics

Service, Geography, and Demographics

To gain some context for the trip data, it is important to first review the characteristics of the two Flex zones. The zones are somewhat similar in their placement around Metro stations, coverage of residential neighborhoods and busy commercial districts. However, the Wheaton-Glenmont zone is over four-times larger in area and roughly six-times larger in population (Table 2-1).

The two zones were designed with two different trip purposes in mind. During the Flex's launch event, then MCDOT Director, Al Roshdieh noted that "In Wheaton-Glenmont, we hope to see residents using Flex to fill first mile/last mile gaps in their daily commute. In Rockville, the service lends itself more towards daytime errands and trips." Illustrated in Figure 2-1, these rationales are reflected in the service spans and the higher percentage of multi-stage trips.

Figure 2-1: Overview of the Rockville & Wheaton-Glenmont Flex Zones


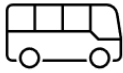




Flex Zone	 Service Spans	 Service Vehicles	 Zone Size (Sq. Mi.)	 Service Intent	 Most Popular Destination	 Multi-Stage Trips (3 or more linked daily trips)
Rockville	9:00 am to 3:30 pm	1	0.7	Errands/ Public Services	Rockville Metro Station	9%
Wheaton/ Glenmont	6:00 am to 9:00 am 3:30 pm to 7:00 pm	2	3.4	First-Mile/ Last-Mile to Transit	Glenmont Metro Station	3%

Table 2-1: Flex Zone Characteristics, Geography & Demographics

Zone	Rockville	Wheaton-Glenmont
Flex Trip Characteristics*		
Total Completed Trip Requests	1,187	2,808
Completed Trip Requests per Day	9.9	23.4
Average Trip Distance (Miles)	0.8	1.2
Average Trip Length (Minutes)	6	8
Geography**		
Square Miles	0.67	3.42
Estimated Population †	4,630	29,639
Average Population Density (Sq. Mi.)	6,910	8,667
Distance from Zone Centroid to Metro Station (Miles)	0.47	1.48 (Wheaton) 0.45 (Glenmont)
Households**		
Estimated Households †	1,972	8,927
Average Household Size	2.4	3.4
Households that Rent	53%	43%
Below Poverty Households	18%	12%
No Vehicle Households	17%	9%
1 Vehicle Households	50%	34%
Demographics**		
Median Age of Population	38.8	36.7
Aged 10-17	5%	9%
Aged 18-24	7%	9%
Aged 25-34	19%	16%
Aged 35-44	15%	15%
Aged 45-54	11%	12%
Aged 55-64	11%	12%
Aged 65 or Older	17%	11%
Limited English Proficiency	17%	23%
Minority Population	58%	80%
Below Poverty Population	12%	12%
Individuals with Disabilities	8%	6%

* MCDOT Flex Ridership Data, June 26, 2019 to December 16, 2019.

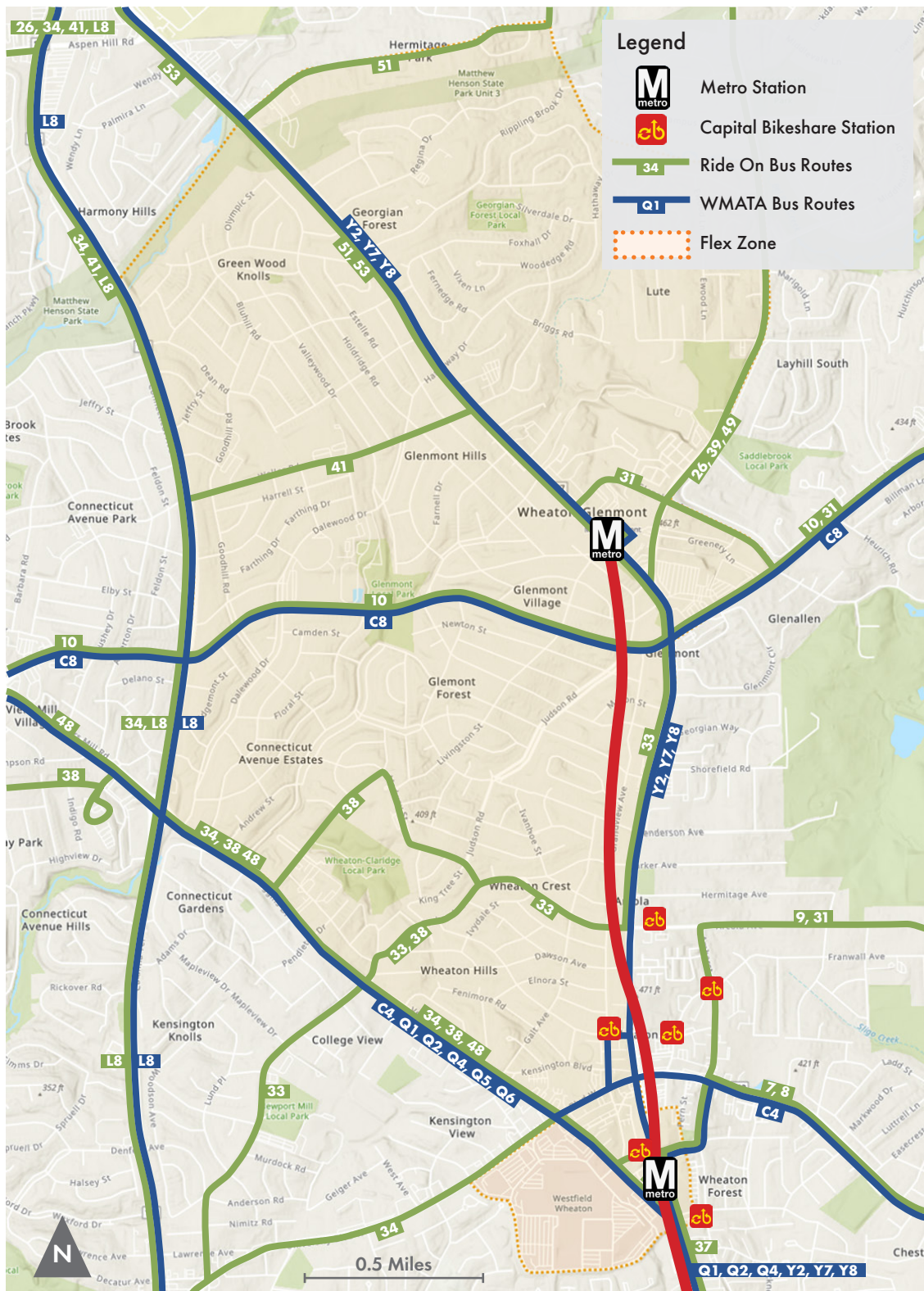
** U.S. Census Bureau, American Community Survey, 2018.

† Population and households estimates are based on size of zone and average density of block groups within the zone.

A prominent characteristic of the Flex zones is their placement around Metro stations. The Flex is an important first mile/last mile connection to these stations. Seen in Figures 2-2 and 2-3, both zones have high frequency bus routes along their perimeters with some local lower frequency bus service.

[illegible]

Figure 2-3: Public Transportation in the Wheaton-Glenmont Zone



Trip Request Data

Since the outset of the Flex service, Ride On has collected data on all trip requests, even if a trip was not provided. There are a variety of reasons that a trip request might not be fulfilled; including cancellation by the customer, the requested trip is outside of the service zone or service hours, a single driver in the zone is on break, or the vehicle is full and there are no seats available.

Trip request data from the first day of service on June 26, 2019 to December 16, 2019, or 120 service days, was analyzed for this report. Approximately 6,379 trip requests were made during this period, or an average of 53.2 requests per service day.

Trip Request Categories

Once a customer requests a trip, it is logged into Via's request database and eventually categorized based on the outcome of the request. For example, most requests result in trips that are categorized as "complete." However, there are seven unique categories that are used to track trip requests. These categories are defined in Figure 2-4.

Figure 2-4: Trip Request Status Overview



Requests to Date

From June 26, 2019 to December 16, 2019 the majority of trip requests were completed (62%); however, a sizable portion fell into one of the other six trip categories. An overview of trip requests by category is provided in Figure 2-5 with a monthly breakdown in Table 2-2.

Figure 2-5: Trip Request Status Overview

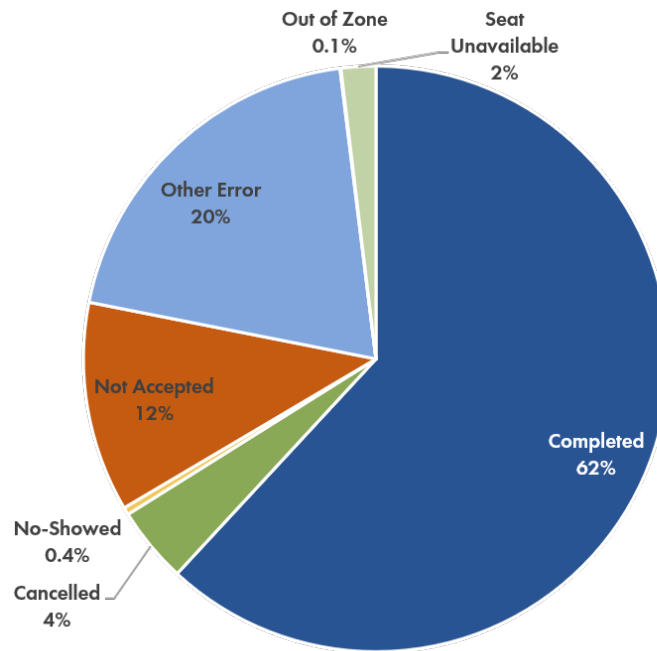


Table 2-2: Trip Requests by Month

Month	June	July	August	Sept.	October	Nov.	Dec. *	Total
Trip Requests	234	840	892	1,009	1,380	1,288	736	6,379
Service Days	3	22	22	20	23	19	11	120
Average per Day	78	38	41	50	60	68	67	53
Completed	24%	54%	64%	64%	66%	66%	68%	63%
Canceled	4%	4%	3%	5%	4%	4%	5%	4%
No-Showed	<1%	<1%	<1%	<1%	<1%	1%	<1%	<1%
Not Accepted	22%	14%	11%	10%	12%	10%	11%	12%
Other Error	50%	27%	19%	19%	16%	16%	13%	19%
Out of Zone	<1%	<1%	0%	0%	0%	0%	2%	<1%
Seat Unavailable	0%	1%	3%	<1%	1%	4%	1%	2%

Source: Montgomery County Flex Ridership Data, June 26, 2019 to December 16, 2019.

*Data for December only includes requests up to December 16th.

Emerging Trends

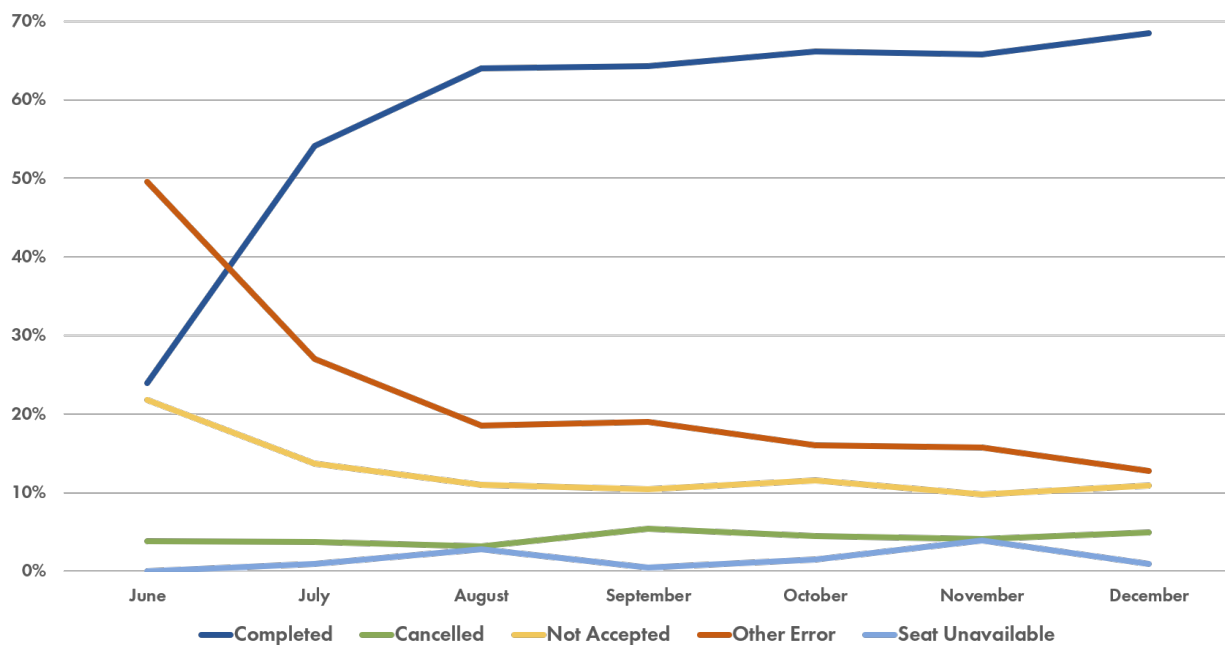
Evaluating the total number of trip requests can be slightly misleading given that the Flex is not only a new service but a completely new service concept for Montgomery County. Many residents and other interested individuals have tested out the Flex app during the first few months of service. This is evident in Figure 2-6, where the percentage of completed trips has risen over the first 120 days of service in contrast to declines in trips that are “not accepted” or fall into the “other error” category. Most new transit services typically take at least 12 months to reach their productivity potential. The percentage of requests that were converted into completed trips grew immensely over the first couple of months and service is starting to show stabilized growth.

Positive Trends

The percentage of trip requests that were categorized as “other error” have shown a steady decline. MCDOT staff have suggested that these errors are likely related to cellular connectivity, app related issues, and new Flex drivers. The decline suggests that as the service and associated software systems mature, these issues are becoming much less prevalent.

The “canceled” and “seat unavailable” categories have remained largely stable. These categories provide an excellent early indicator for potential capacity issues. As the Flex becomes more popular, it could become a victim of its own success by discouraging customers through longer wait and travel times.

Figure 2-6: Trip Request Categories by Month



Ridership Data

A grand total of 4,550 passenger trips were provided in the first 120 service days. However, Flex trips are tracked by trip request - a customer is able to request a trip for up to six passengers. Shown in Table 2-3, the average number of passengers per Flex trip is 1.14 and slightly over 10% of all completed trip requests have two or more passengers. The table also indicates that the percentage of multi-passenger trips has slowly grown from month to month. However, specific trip data, including origin/destination and distance, is tracked through the 3,995 completed trip requests. For this reason, the majority of data that is analyzed in this section closely examines the 3,995 completed trip requests.

Table 2-3: Completed Trip Requests and Total Passengers Per Trip

Month	June	July	August	Sept.	October	Nov.	Dec.*	Total
Completed Trip Requests	56	455	571	649	913	847	504	3,995
Total Passengers Transported	58	499	620	737	1,052	998	586	4,550
Average Passengers Per Trip	1.04	1.10	1.09	1.14	1.15	1.18	1.16	1.14
Percentage of Completed Trip Requests by Number of Passengers								
1 Passenger	96%	93%	93%	90%	90%	87%	88%	90%
2 Passengers	4%	6%	6%	7%	8%	9%	10%	8%
3 Passengers	0%	1%	<1%	2%	2%	3%	3%	2%
4 Passengers	0%	<1%	<1%	<1%	<1%	1%	<1%	<1%
5 Passengers	0%	<1%	0%	<1%	<1%	0%	0%	<1%
6 Passengers	0%	0%	<1%	<1%	<1%	0%	<1%	<1%

Source: Montgomery County Flex Ridership Data, June 26, 2019 to December 16, 2019.

*Data for December only includes requests up to December 16th.

Ridership Activity Centers

During the first 120 days of the service, the three Metro stations became the most popular activity centers. The Glenmont Metro Station is the most popular origin and destination for the Flex service. Its total activity number is nearly twice that of the Wheaton Metro Station. One of the key elements of the Flex zone design is proximity to a Metro station, so their presence at the top of the list is not surprising. However, the Metro stations appear to be more popular dropoff rather than pickup locations. Notably, at the Rockville Metro Station, dropoffs make up 76% of the total Flex trips.

Beyond the Metro stations, many of the ridership hot spots were located throughout the residential neighborhoods. The most popular non-residential location is the Wheaton Mall (14th most active) followed by Wheaton High School (22nd) and Richard Montgomery High School (26th). Trip activity for both zones is summarized in Table 2-4 and illustrated through heat maps in Figures 2-7 and 2-8.

Table 2-4: Top 30 Most Active Locations

#	Location	Zone	Number of Pickups	Number of Dropoffs	Total Activity
1	Glenmont Metro Station	Wheaton-Glenmont	675	734	1,409
2	Wheaton Metro Station	Wheaton-Glenmont	303	443	746
3	Rockville Metro Station	Rockville	79	250	329
4	Bluhill Rd. @ Edwin St.	Wheaton-Glenmont	113	91	204
5	Hewitt Ave. (Somerset & West Chester Apts.)	Wheaton-Glenmont	64	112	176
6	Daley St. @ Kenway St.	Wheaton-Glenmont	91	77	168
7	Farnell Dr. @ Gould Rd.	Wheaton-Glenmont	99	62	161
8	Monroe St. @ Mt. Vernon Pl.	Rockville	118	39	157
9	Goodhill Rd. @ Greenly St.	Wheaton-Glenmont	83	59	142
10	E. Argyle St. @ Blandford St.	Rockville	85	49	134
11	Fireside Park Apartments (southern area)	Rockville	85	38	123
12	Fireside Park Apartments (northern area)	Rockville	84	34	118
13	Hewitt Ave. @ Rippling Brook Dr. (Bel Pre Elementary School)	Wheaton-Glenmont	57	46	103
14	Wheaton Mall/CVS Pharmacy	Wheaton-Glenmont	43	59	102
15	W. Edmonston Dr. @ Welsh Dr.	Rockville	33	63	96
16	Berry St. @ Henderson Ave.	Wheaton-Glenmont	45	36	81
17	Dean Rd. @ Connecticut Ave.	Wheaton-Glenmont	39	40	79
18	Hull Pl. @ Welsh Dr.	Rockville	10	68	78
19	Monroe St. @ Cabin John Pkwy.	Rockville	43	32	75
20	Washington St. @ Beall Ave.	Rockville	28	44	72
21	Jeffry St. @ Bluhill Rd.	Wheaton-Glenmont	59	12	71
22	Dalewood Dr. @ Everton St. (Wheaton High School)	Wheaton-Glenmont	34	34	68
-	Georgia Ave. @ Layhill Rd.	Wheaton-Glenmont	54	14	68
24	Kingtree St. @ Lytle St.	Wheaton-Glenmont	48	17	65
-	Washington St. @ Wood Ln.	Rockville	26	39	65
26	Richard Montgomery High School	Rockville	62	2	64
27	Monroe St. @ Waddington Ln.	Rockville	34	28	62
28	W. Edmonston Dr. @ Ritchie Pkwy.	Rockville	11	49	60
29	Hewitt Ave. @ Blue Spruce Ln.	Wheaton-Glenmont	27	28	55
30	Monroe St. @ Monroe Pl.	Rockville	22	31	53

Source: Montgomery County Flex Ridership Data, June 26, 2019 to December 16, 2019.

Figure 2-7: Trip Activity in the Rockville Zone

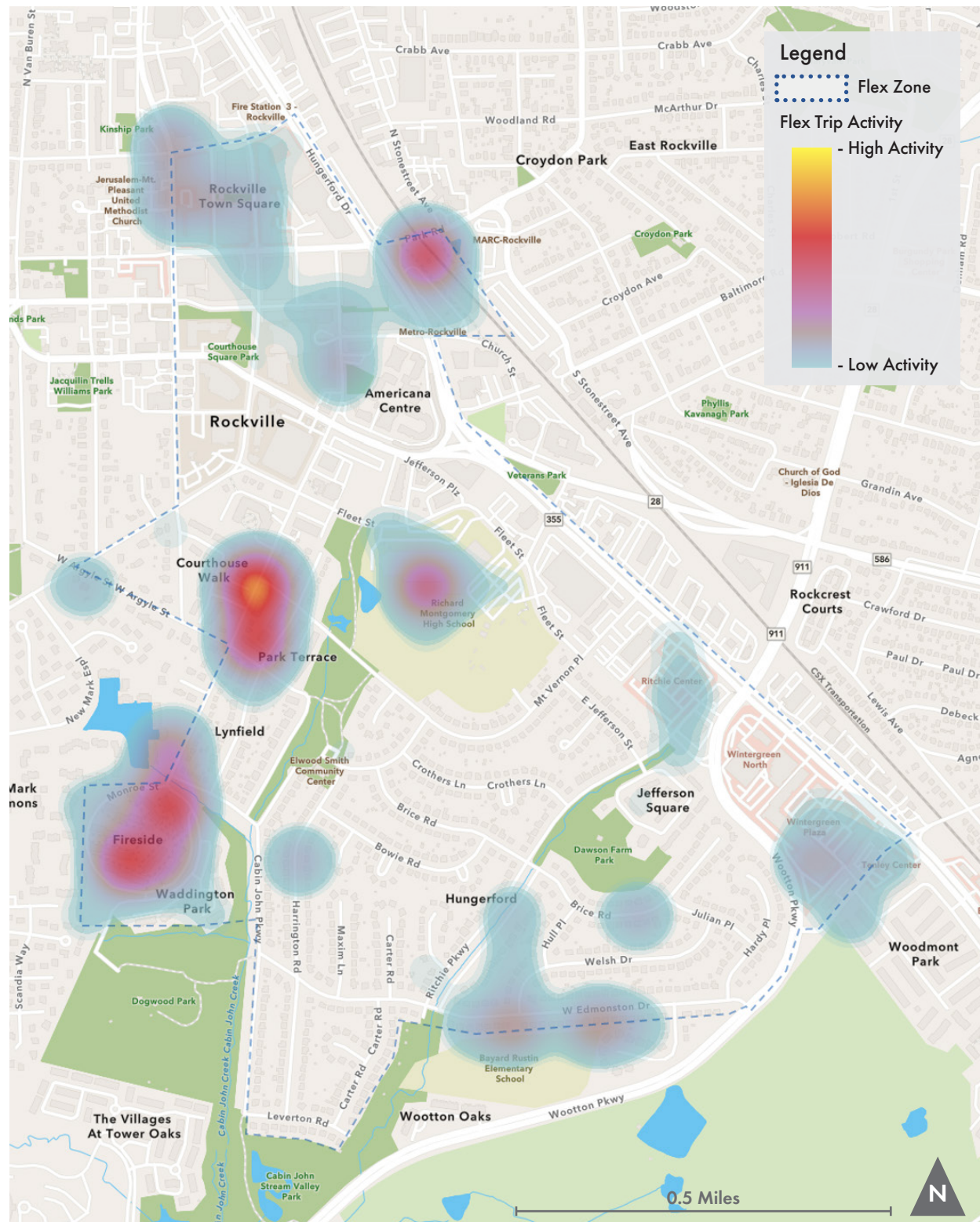


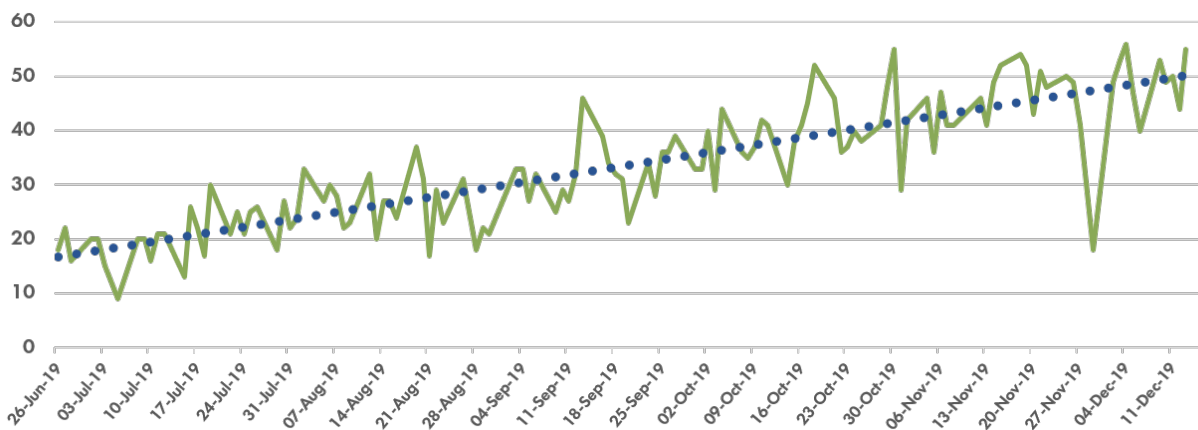
Figure 2-8: Trip Activity in the Wheaton-Glenmont Zone



Ridership Growth

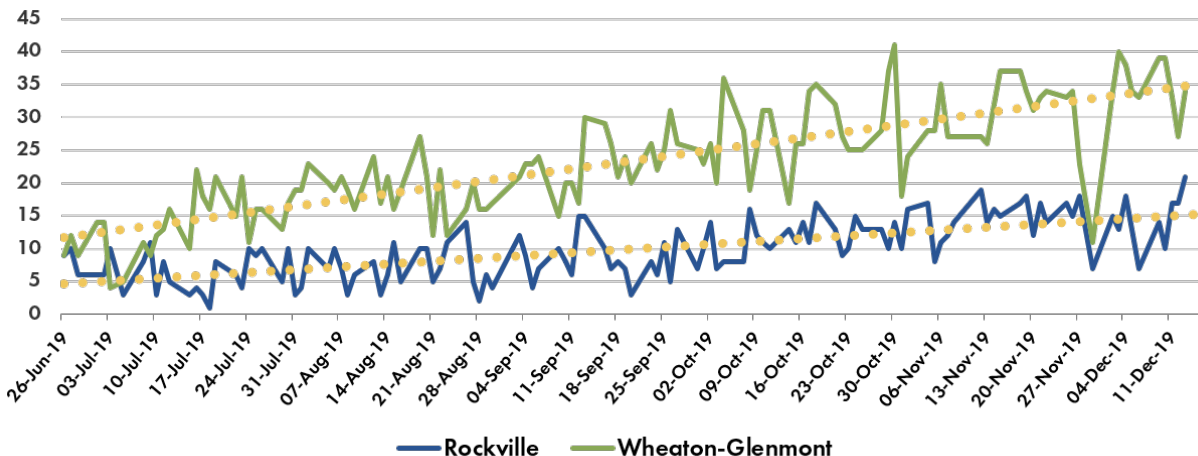
Ridership has consistently grown since the launch of the Flex in June 2019. Customers have taken approximately 3,995 trips from June 26 to December 16, 2019. Over the first six months of service, the Flex's ridership has nearly tripled. The average daily ridership over the first five days of service was 19.2 trips per day. From December 9 to 13, 2019, the average daily ridership was 50.2 trips per day; a 261% increase. This trend is captured in Figure 2-9.

Figure 2-9: Ride On Flex Trips Completed Per Day



Both the Rockville and Wheaton-Glenmont zones have experienced ridership growth, but at varying rates. Ridership in the Rockville zone has grown at a rate of 214% from the average of the first five days of service to the most recent five days, while the Wheaton-Glenmont zone has grown at a rate of 297% over the same period of time.

Figure 2-10: Ride On Flex Trips Completed Per Day by Zone



Ridership Patterns

Approximately 70% of Flex customers have taken more than one trip, suggesting a high customer return rate. However, 71% of all Flex trips are one-way (lacking a same-day return Flex trip). This indicates that the service is popular enough to retain customers but many of these customers either choose not to or are unable to use the Flex for a round-trip service. This section explores ridership patterns including return trips, customer retention, usage over time, and Flex trip characteristics.

Return Trips

Same-day, round-trip customers account for approximately 29% of the Flex ridership. Shown in Table 2-5, the Rockville zone has a much higher percentage of round-trips and multiple daily trips. The Wheaton-Glenmont zone has a dedicated group of commuters that use the service every morning and evening; however, a limited number of customers make round-trips solely during the morning or evening service spans.

Table 2-5: Overview of Customer Trip Patterns

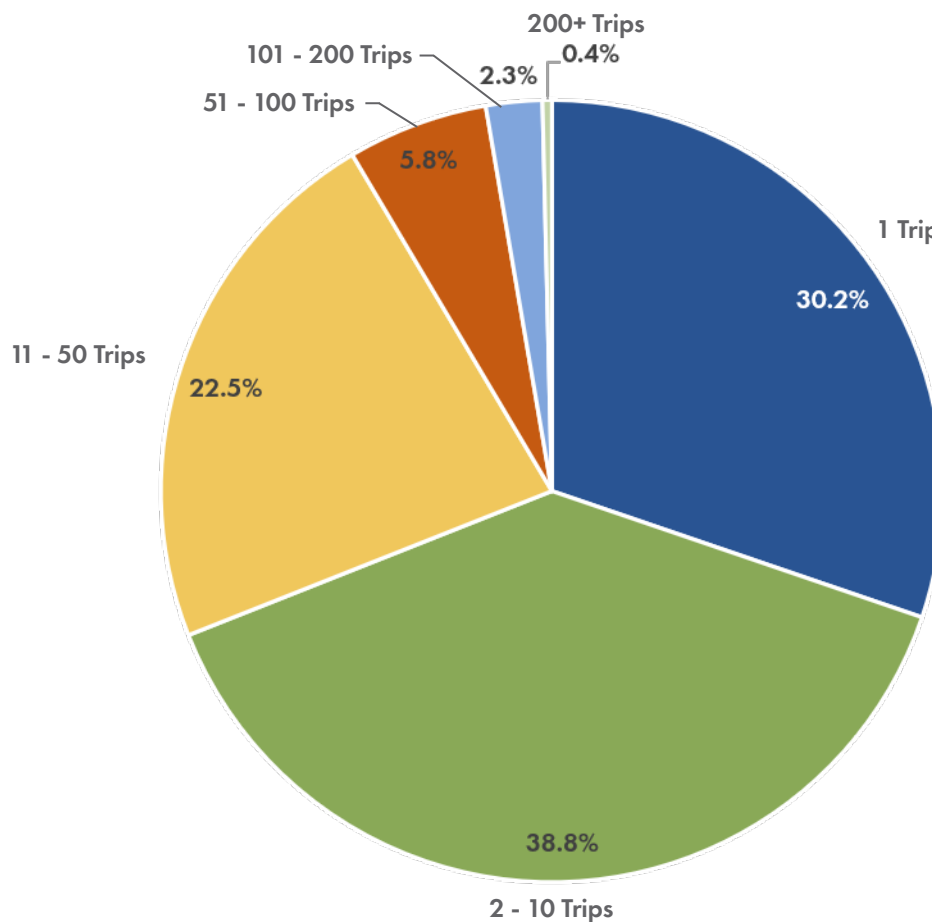
Zone	Rockville	Wheaton-Glenmont (Total)	Wheaton-Glenmont		Total
			6:00 am to 9:00 am	3:30 pm to 6:00 pm	
Total Trip Requests	1,187	2,808	1,386	1,422	3,995
Average Daily Trip Requests	9.9	23.4	11.6	11.9	33.3
Total Passengers	1,504	3,046	1,502	1,541	4,550
Average Passengers per Trip	1.3	1.1	1.1	1.1	1.1
Total Customers	93	168	102	140	258
Average Trips per Customer	12.8	16.7	13.6	10.2	15.5
Daily Trip Patterns by Percentage of Trips					
One-Way Trips	69%	71%	97%	91%	71%
Round-Trips	22%	26%	3%	8%	25%
More than 2 Daily Trips	9%	3%	0%	1%	5%

Source: Montgomery County Flex Ridership Data, June 26, 2019 to December 16, 2019.

Super Users

The idea of “super users” comes from the statistical outliers in microtransit trip data. These dedicated, nearly daily customers, account for a major percentage of ridership. For example, the top 10 most frequent customers took 34% of the total trips provided or an average of 135.4 trips per customer. For comparison, the average customer took 15.5 trips during the same period.

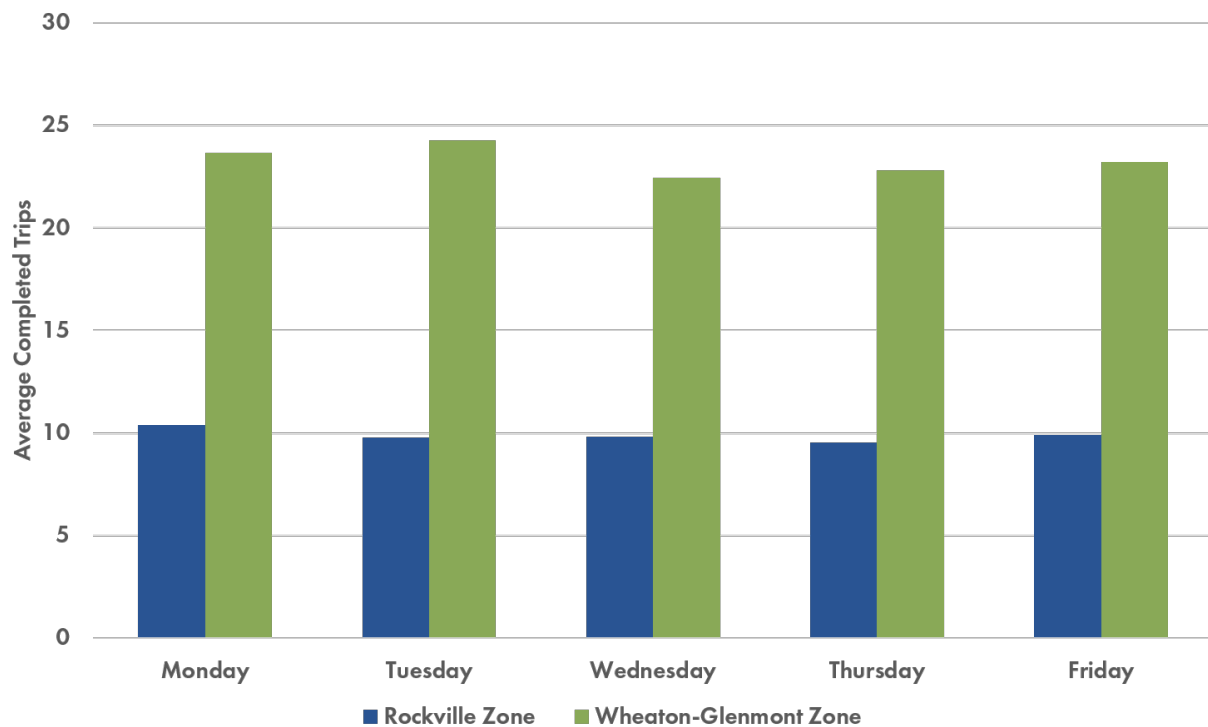
Figure 2-11: How Many Trips Customers Have Taken



Ridership by Weekday

Ridership trends are relatively stable from Monday to Friday. Seen in Figure 2-12, average weekday ridership in Wheaton-Glenmont is 23 trips per day and Rockville holds a consistent average of 10 trips per day. Wheaton-Glenmont has a minimal range of 22 to 24 average trips per day. The lack of variation could suggest that many Flex customers use the service daily.

Figure 2-12: Average Daily Trips per Weekday

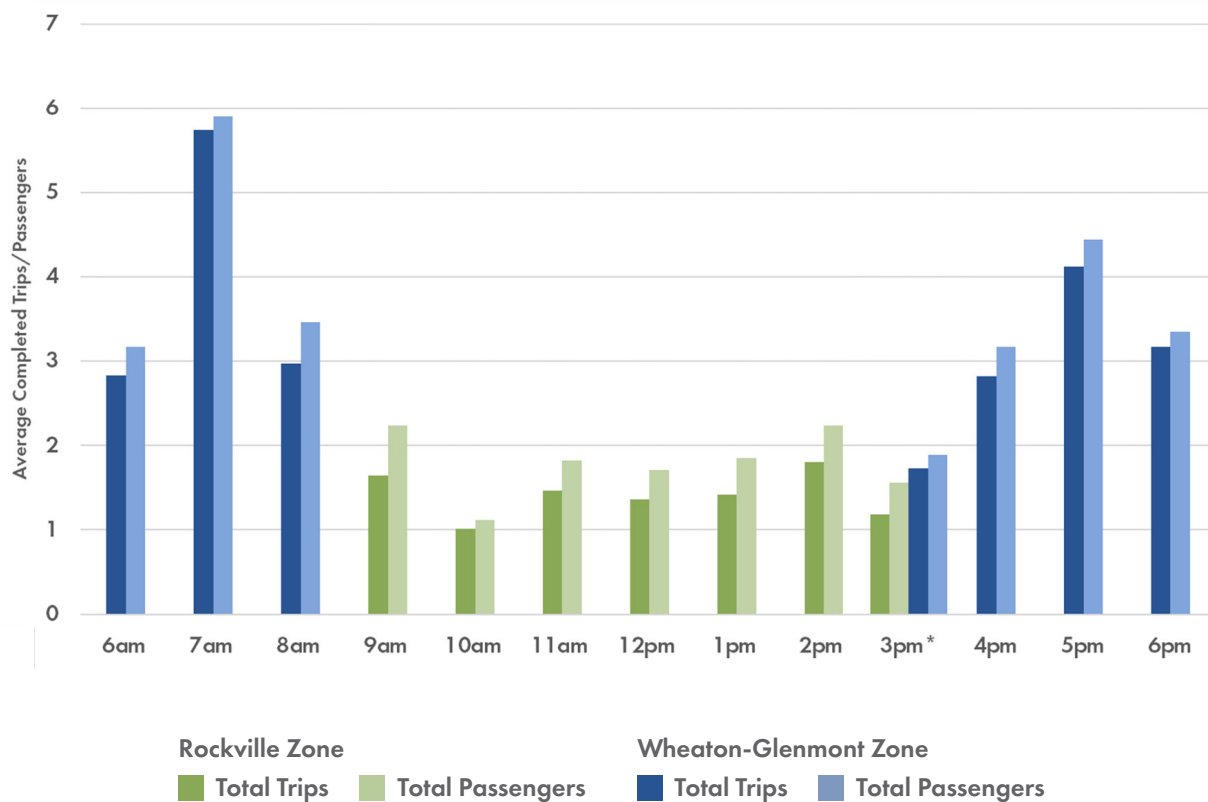


Ridership During the Day

Ridership trends in Figure 2-13 show peaks during the 7:00 a.m. and 5:00 p.m. hours. This highlights the commuter nature of the service in the Wheaton-Glenmont zone. With double the service capacity, ridership by hour in Wheaton-Glenmont easily outnumbers that of the Rockville zone. With mid day service, Rockville maintains relatively stable ridership with average peak during the 2:00 p.m. hour.

In addition to completed trips, Figure 2-13 illustrates the number of passengers transported by hour. Across both zones, the average ratio is 1.2 passengers to one completed trip. The Rockville zone surpasses this average every hour except 10:00 a.m.; indicating that just over 26% of the completed trips in Rockville included an additional passenger. This rate was much lower in Wheaton-Glenmont where 9% of the completed trips had an additional passenger.

Figure 2-13: Average Hourly Trips and Passengers

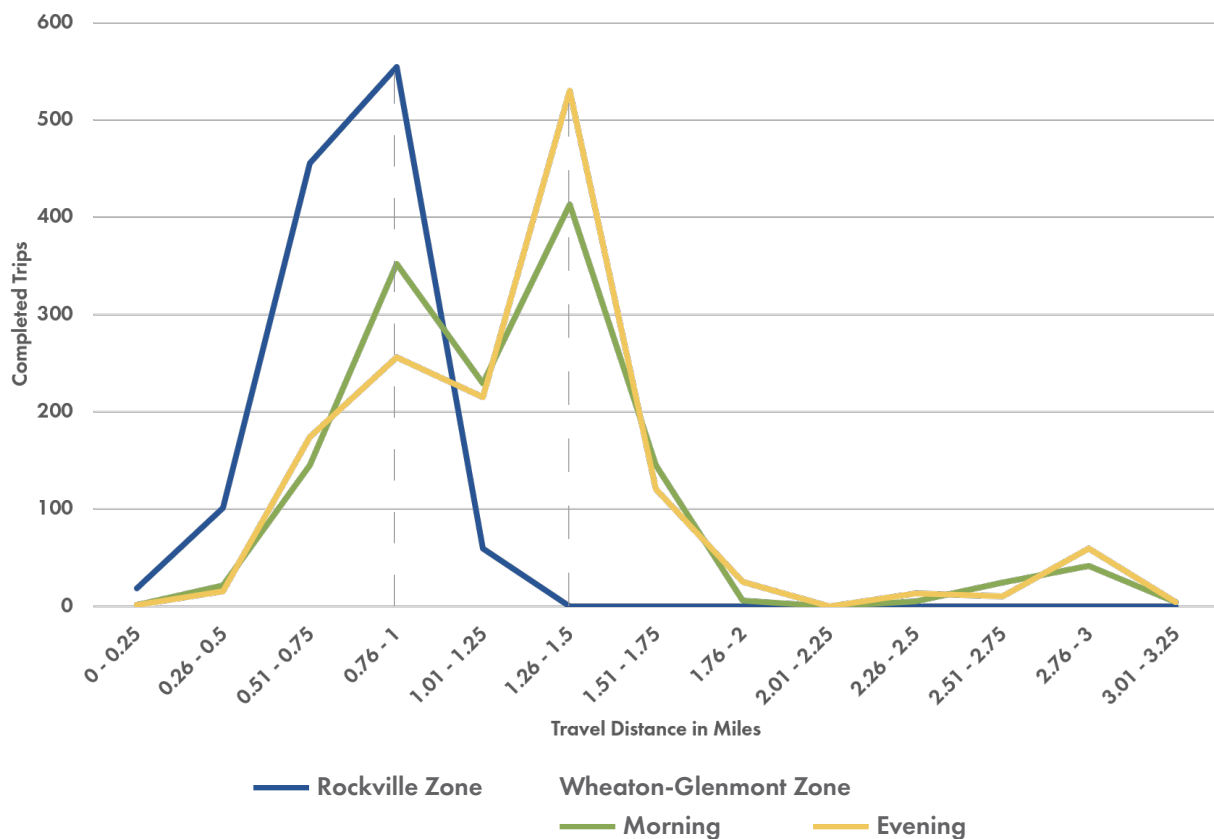


*The Rockville Zone ceases operations at 3:30 p.m. and the Wheaton-Glenmont Zone begins operating at 3:30 p.m.

Trip Distance

In the first 120 service days, the average Flex trip was 1.07 miles while the shortest recorded trip was 0.16 miles and the longest was 3.14 miles. Trip distances in both zones are illustrated in Figure 2-14. In the smaller Rockville zone, the average trip was 0.78 miles and the longest was 1.23 miles. The Wheaton-Glenmont zone averages 1.19 mile trips during the morning service and 1.24 during the evening service. Average trip distances have remained consistent over time in the Wheaton-Glenmont zone; however, trip distances have slightly decreased in the Rockville zone since the launch of service.

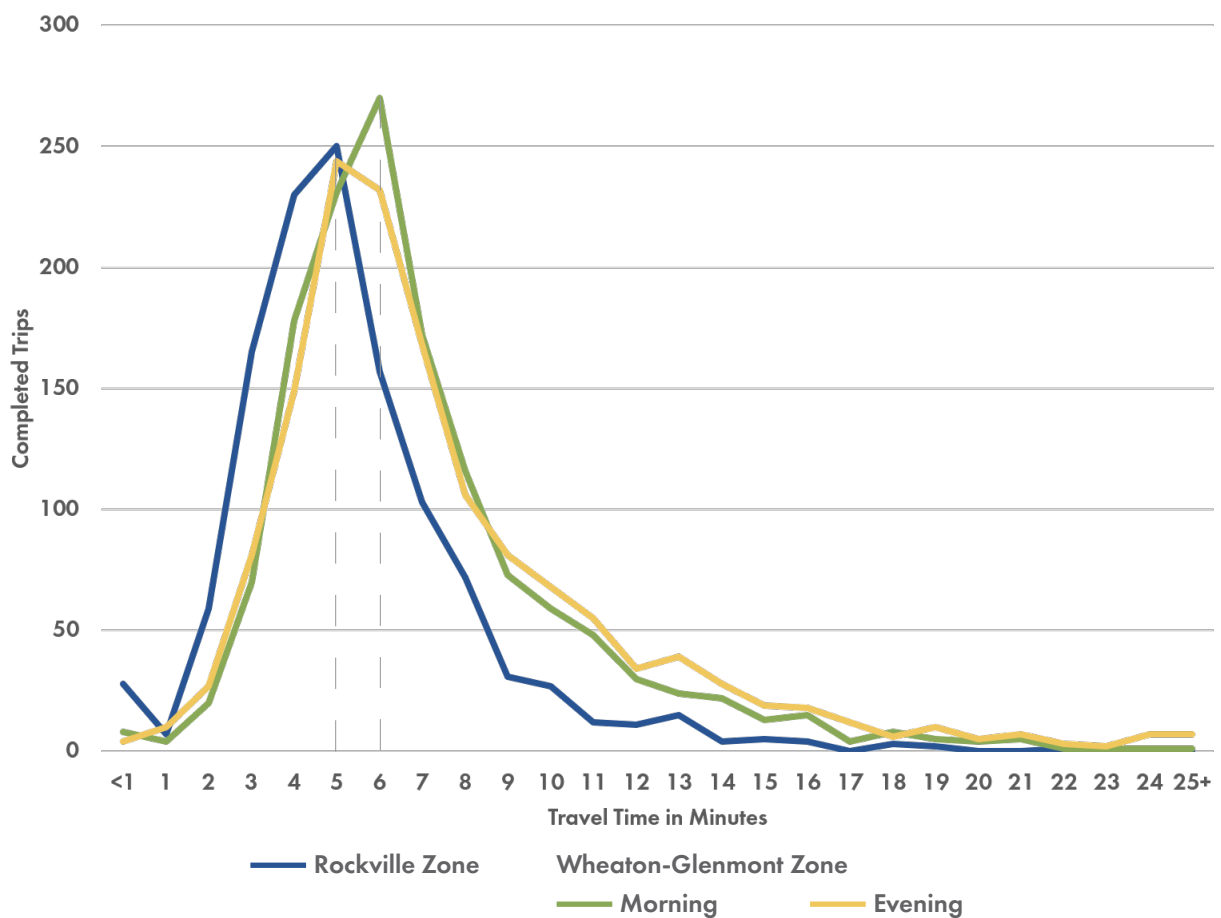
Figure 2-14: Total Customer Trip Distance



Trip Length

Shown in Figure 2-15, the majority of Flex trips take between six and eight minutes from the time that the passenger boards the vehicle until they reach their destination. Very few trips take longer than 20 minutes, but the longest trip to date was 38 minutes. The two zones average different trip lengths, which is not surprising given their different sizes. In the larger Wheaton-Glenmont, the average trip takes eight minutes to complete. However, a trip in the Rockville zone takes six minutes on average to complete.

Figure 2-15: Total Customer Travel Time



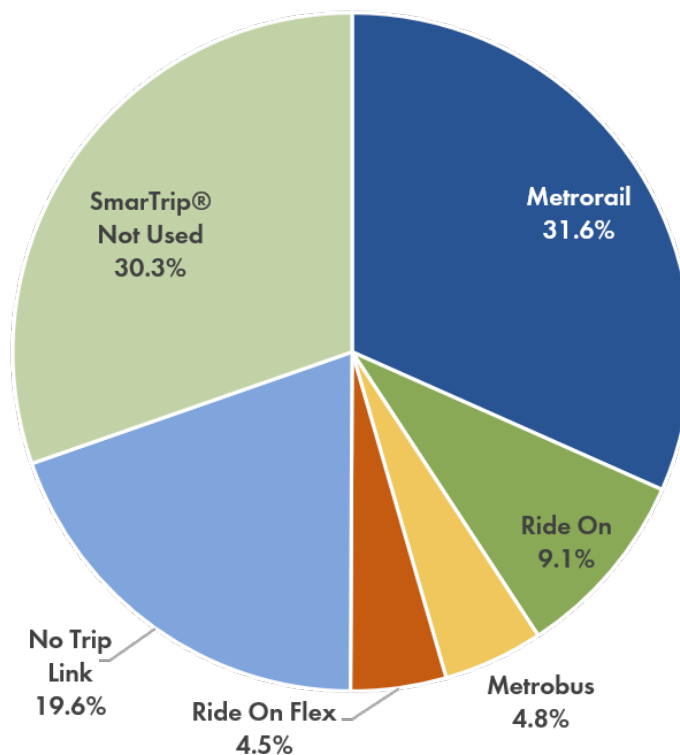
Regional Linked Trips

One of the strengths of the Flex service is the fare integration with the regional fare system, or SmarTrip®. Approximately 70% of Flex customers used their SmarTrip® cards when paying their fare. Through coordination with WMATA, SmarTrip® transfer data for the Flex was compiled and analyzed. WMATA's standard for a transfer or linked trip is that it must have occurred within 120 minutes of the previous or next trip.

Figure 2-16 illustrates the total percentage of Flex trips that were paid using a SmarTrip® card and the percentage of linked trips by service provider. Approximately 32% of Flex trips are linked to Metrorail, followed by 9% to Ride On fixed routes, and 5% to Metrobus. This combines to a total of 46% of Flex trips that contribute to the regional transit network. However, 30% of customers did not use a SmarTrip® card, suggesting that the overall percentage of linked trips is likely higher. Flex trip data indicates that 59% of all Flex trips are to/from a Metro station.

Approximately 5% of Flex customers had a linked trip to the Flex. This supports the Flex trip data which indicates that 5% of Flex trips included multiple daily trips. And roughly 20% of Flex customers that used a SmarTrip® card did not transfer to or from another transit service.

Figure 2-16: Percentage of Flex Passenger Trips with SmarTrip® Links

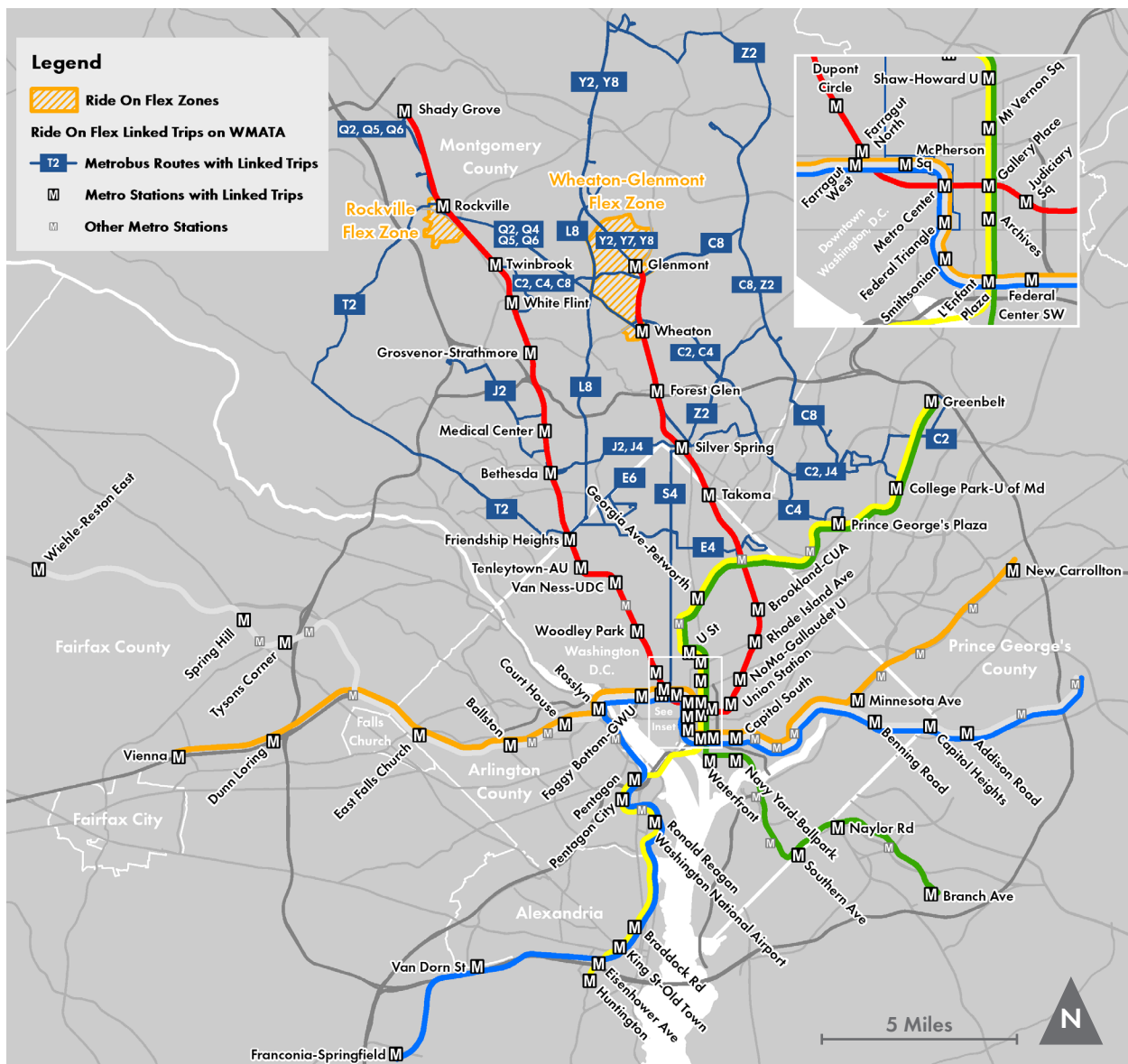


Source: Washington Metropolitan Area Transit Authority, SmarTrip® Data, June 26, 2019 to December 16, 2019.

Figure 2-17 displays the extent of the SmarTrip® trip linkages between the Flex and WMATA bus and rail services. Flex customers have traveled across the Washington region, 76% of all Metro stations have a Flex trip link. The Metro stations with the largest number of trip links, outside of the Flex zones, included Silver Spring, Spring Hill, Archives, and Farragut North.

The Metrobus routes with the largest number of trip links are the T2, Y7, Y2, and Y8. When combined the Georgia Avenue-Maryland Line (Y2, Y7, and Y8) accounts for the largest share of linked trips followed by a number of routes on the Veirs Mill Road Line (Q2, Q4, Q5, and Q6).

Figure 2-17: Extent of Flex Linked Trips in the Washington Region



Source: Washington Metropolitan Area Transit Authority, SmarTrip® Data, June 26, 2019 to December 16, 2019.

Customer Survey Results

Beginning in September 2019, Ride On began a survey effort that has sent survey links to each of the approximately 2,900 registered users through the Flex app.

Through this survey, customers were asked the following five questions:

1. How many rides have you taken on the Ride On Flex service?
2. If you have never taken a ride, what are the main reason(s) why you have never done so?
3. Which of the following would make Ride On Flex a more appealing service?
4. In what zip code do you live?
5. What feedback do you have about the Ride On Flex application?

Frequency of Use

The Flex customer survey was released in early September 2019, approximately two-and-a-half months after service was launched on June 26, 2019. The relatively short time frame between the service launch and the survey has resulted in a large percentage of survey respondents that have never requested or taken a Flex trip. Approximately 81% of respondents have never requested a trip and an additional 3% of respondents have requested a trip but have never actually used the Flex.

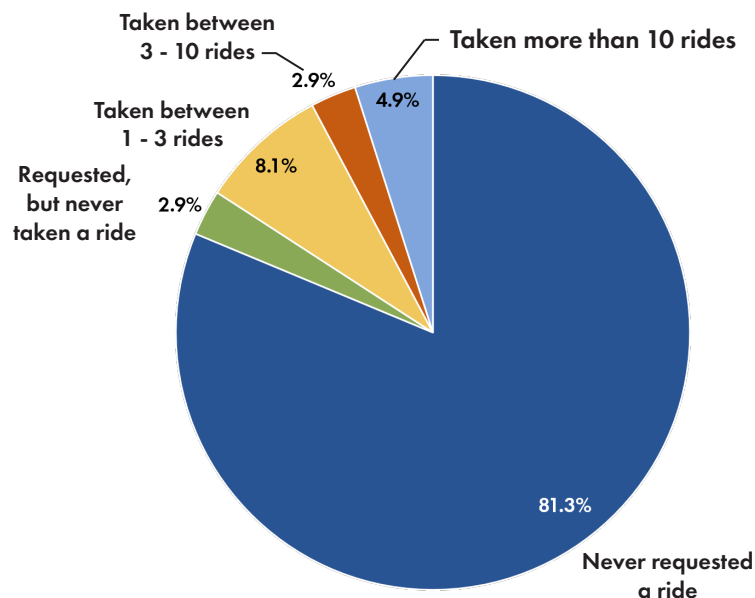


Figure 2-18: Ride On Flex Trips Completed Per Day

Through the general feedback question (Question 5), many survey respondents indicated that they were forced to take the customer survey before they were able to access the Flex app. This appears to be the case for individuals who have downloaded and opened the app after the release of the survey. This may have somewhat unintentionally turned the customer survey into a community survey and resulted in an abnormally high number of responses from individuals who had never taken a ride.

The first survey question asked app users how frequently they have used the Flex service, the responses are summarized in Figure 2-18.

Why App Users Aren't Using the Flex

The second question of the survey was aimed at potential customers who have downloaded the Flex app but have not used the service. The results to the survey question, shown in Figure 2-19, indicate that roughly 18% of survey respondents have taken a ride on the Flex.

A relatively large percentage of app users, approximately 41%, said that they just wanted to test out the app. This was backed up through the survey's general feedback question (Question 5) where some respondents indicated that their app use was related to general interest or professional research on the Flex.

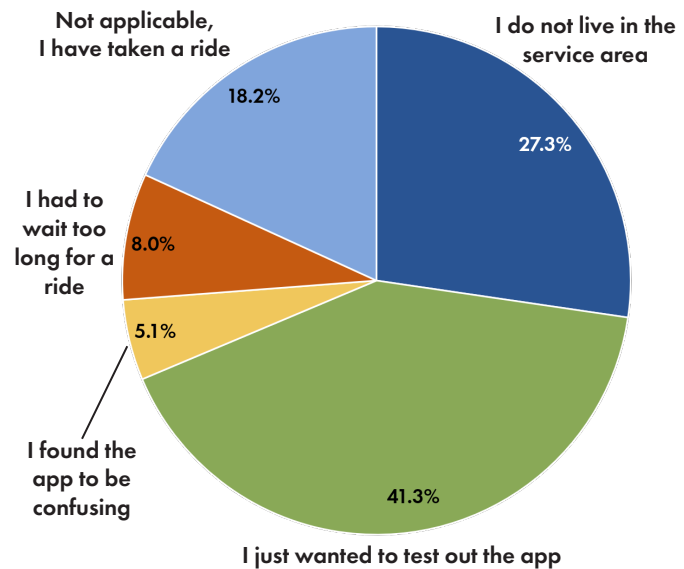


Figure 2-19: Why App Users Have Not Used the Flex

What Would Make the Flex a More Appealing Service

The third survey question asked respondents to rank four potential service enhancements that would make the service more appealing. The four options included:

- Better user experience on the app
- Door-to-door service (rather than corner-to-corner)
- Expanded service coverage area
- Shorter wait times

The survey results, provided in Figure 2-20, showed that an expanded service area was the most popular enhancement; a likely response give that most survey respondents reside outside of the two Flex zones.

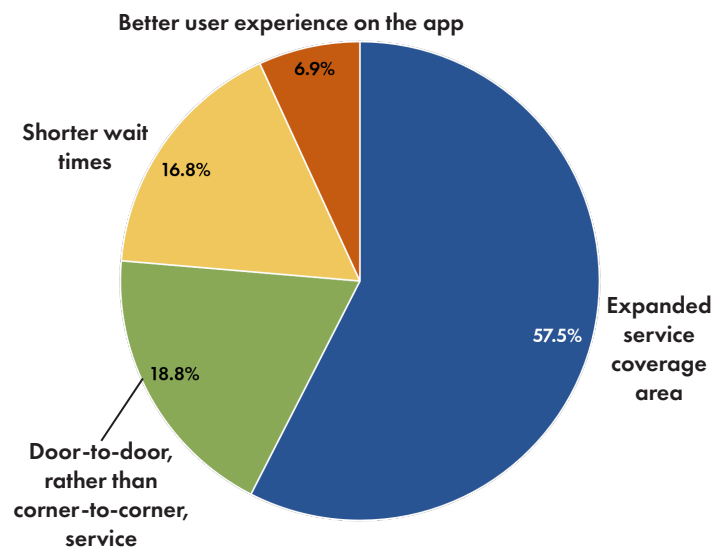


Figure 2-20: What Would Make Flex More Appealing?

Survey Respondent Geography

To better understand the extent of the survey's reach, the resident zip codes provided by survey respondents are summarized in Table 2-6 and all responses that included Montgomery County zip codes are mapped in Figure 2-21.

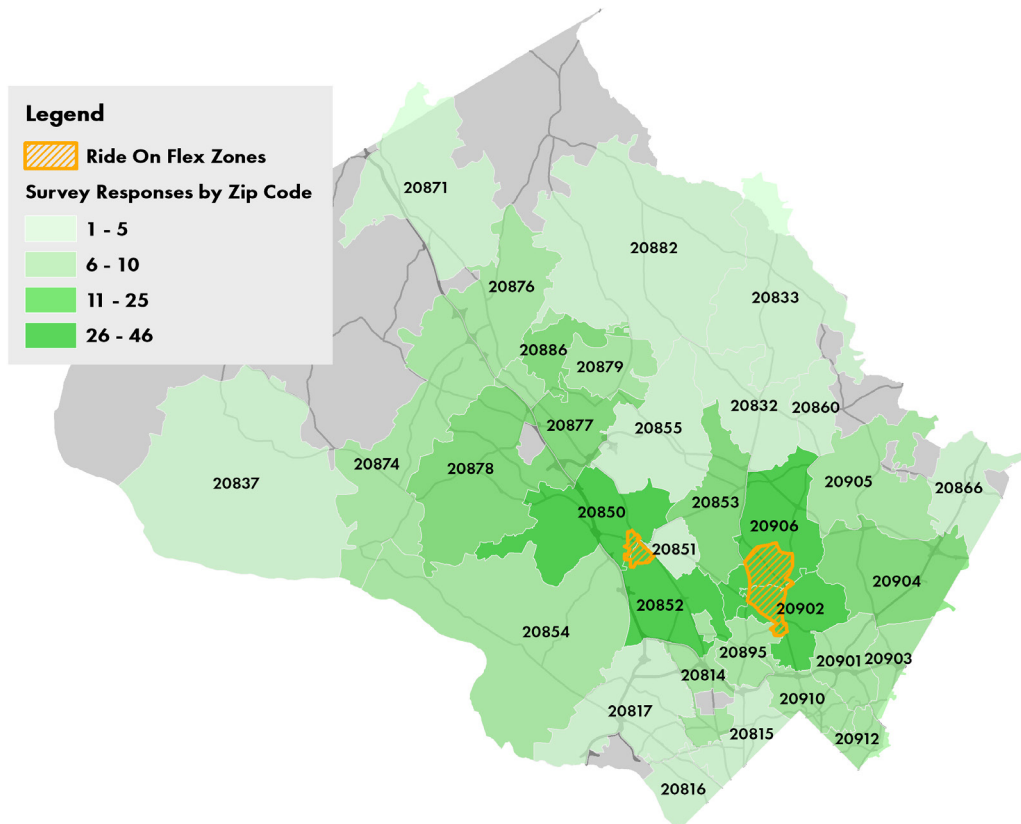
Survey responses were received from 24 states plus the District of Columbia as well as England and Israel. But most responses were in Montgomery County.

As seen in Figure 2-21, each of the two Flex zones straddle two different zip codes. The two zip codes in the Wheaton-Glenmont zone (20902 and 20906) combined for a total of 28% of the survey responses. The two Rockville zone zip codes (20850 and 20852) combined for a total of 11% of the responses.

Top Zip Codes	Count	Percent
20906 (Silver Spring/Glenmont)	133	19%
20902 (Silver Spring/Wheaton)	59	9%
20850 (Rockville/North Potomac)	47	7%
20852 (Rockville/North Bethesda)	31	5%
20853 (Rockville/Aspen Hill)	21	3%
20886 (Montgomery Village)	21	3%
Responses by Jurisdiction	Count	Percent
Montgomery County	500	73%
Maryland	517	75%
United States	652	95%
Total (World)	688	100%

Table 2-6: Zip Code Survey Responses

Figure 2-21: Survey Responses by Zip Code in Montgomery County



General Survey Feedback

The final question of the survey asked respondents to provide any feedback they had for the Ride On Flex in an open ended comment form. A total of 535 comments were received. They ranged from service expansion requests to technical issues with the app. Many commentators noted that they thought the idea of the Flex was exciting and they were just testing out the app. Most comments were positive and supportive.

Some comments included specific service enhancements like extended hours and service zones. Zone and service hour expansions for the two existing zones was a common topic. Other specific areas mentioned in the survey comments for future expansion included the Connecticut Avenue, Randolph Road, and Rockville Pike corridors as well as Bethesda, Kensington, Leisure World, and Silver Spring.

While it is difficult to summarize the entirety of the comments, the following word cloud highlights the most commonly used words in the general feedback comments.

Figure 2-22: Word Cloud Generated from Survey Comments



Stakeholder Interviews

In the development of this report various stakeholders and groups have been engaged or interviewed by the study team to gain multiple perspectives from customers to managers to peer agencies. Highlights from these meetings and interviews are included in the following sections.

Flex Customers

During ride alongs on the Flex, the study team engaged and conducted casual interviews with customers. Many were repeat customers that were observed using the service throughout the day. Customers came from all walks of life, including commuters, parents dropping off their children at school, individuals running errands, and older adults going to medical appointments.

The vast majority of customers that were interviewed did not own or have access to a vehicle. Without the Flex they would either walk, take a longer bus ride, or use Uber or Lyft. They noted that as the popularity of the Flex has grown, they have experienced longer wait and travel times. One customer mentioned that they routinely check the Flex app for wait and travel time as well as Uber and Lyft to make a determination if the higher cost of the TNC ride is worth the shorter wait time. Some customers noted that they also use Ride On's fixed routes, but find that these services come too infrequently, have long travel times, or require a lengthy walk to the bus stop.

Every customer that we spoke with asked for a larger zone and longer service spans.

Each customer had an idea of where to expand the zone or the hours that the Flex should operate, but in one way or another every customer that we spoke with asked for a larger zone and longer service spans. Drivers reported that customers, even daily riders, routinely ask to travel outside of the zone. Customers requests noted during the ride alongs included shopping centers, specific grocery stores, and even full corridors including Rockville Pike. Perhaps the most common request noted during the casual interviews was the need to expand the service span. Many customers in the Rockville zone noted that they cannot use the Flex for their return trip home from work or school. Others noted that the Rockville service does not start early enough.

Study Advisory Group

At the outset of the technical assistance, a project kick-off meeting was conducted with key Montgomery County and Ride On staff. The meeting provided the opportunity to obtain more general background information on the Flex service planning and implementation. The implementation of the service went very smoothly; there was a tremendous amount of buzz around the Flex pilot and Ride On received many positive reviews.

Prior to the launch, Ride On conducted a considerable amount of outreach to other public transit agencies, including agencies where microtransit pilots had failed. Via, the contractor for the software platform, was also very supportive and has continued to work with Ride On to customize their software specifically for the county's requirements.

Operations Group

The operations group that manages and runs the Flex was interviewed during the preliminary research portion of this analysis. Much of that material is found in the operations section of this report. This section provides a summary of operational concepts and other comments noted during the interview.

The Flex service's operational concept is to connect individuals to high frequency transit service. The concept works especially well in areas with "deep neighborhoods" where residents must walk a considerable distance to reach a major arterial with high frequency transit service. The Flex is primarily focused on making these valuable connections, but it also allows residents to travel around a small area to complete basic trips.

With the success of the Flex program, expansions are on the table, but there is a big question of whether to expand service into new areas or bolster service in the existing zones. According to operations staff, there are some prime areas for expansion in the county, but they believe that targeted marketing in the existing zones could generate additional ridership.

The expansion of service would aid in scheduling driver shifts. With the current service spans and the need for trained drivers, Flex drivers must work split shifts where they take an extended break between time behind the wheel. The more hours that the service runs, the more desirable straight shifts can be assigned. There is a need for additional trained drivers as standby operators.

When the Flex first launched, many of the veteran Ride On drivers were skeptical of the service and avoided the assignment during picks (Ride On allows drivers to pick their assignments based on seniority, three times per year). The first grouping of drivers were all relatively new to Ride On but had experience with ridesharing companies (e.g. Uber and Lyft). Since the launch, this dynamic has reversed, the Flex is now one of the most sought after assignments for veteran drivers.

Washington, D.C. Department of For-Hire Vehicles "DC Microtransit"

The closest service peer for the Flex can be found in neighboring Washington, D.C. DC Microtransit is currently managed by the District's Department of For-Hire Vehicles (DFHV) through a contract with Transco and Via. Service is provided seven days a week, with weekday service running from 6:30 a.m. to 10:00 p.m. and weekend service from 8:00 a.m. to midnight. The vehicle fleet is owned and operated by Transco; it features 18 dedicated vehicles including 12 Ford Transit Cutaways and five Dodge Caravans. A minimum of two vehicles are staged in the roughly 11.5 square mile zone at all times.

The DC Microtransit program was launched in July 2019, around the same time as the Flex began service. But the concept of the program was born out of a neighborhood ride program that provided “fixed microtransit” along the Georgia Avenue corridor. The service was run through multiple taxicab contractors utilizing the operators vehicles. The service was ultimately unsuccessful due to long wait times, driver no-shows, and undependable service.

Funded by innovation grants and DFHV funds, the current service was implemented based on lessons learned from the neighborhood ride program, but even by DFHV’s account, initial planning and marketing efforts for the service were limited. The initial zone, shown in Figure 2-24 was drawn based on unmet transportation needs and a lack of east to west bus service. Service started very slowly but as word got out, ridership began growing at a rapid pace.



Figure 2-23: DC Microtransit Vehicle

Source: DC Department of For Hire Vehicles

The service is contracted to Transco, a local taxicab provider, which maintains and operates the vehicles. Currently, Transco owns all of the microtransit vehicles (Figure 2-23) with wheelchair accessible vehicles available. Through contracting, DFHV has required Transco to contract with Via to utilize their microtransit software. Transco also operates the call center, a backup option for customers without smartphones who can call to request a ride.

The service is fare free although a new fare strategy is being investigated for the near future. Current plans include offering free fares to key community destinations (e.g. grocery stores, recreation centers, etc.) and a \$4.00 per trip fare for all other destinations.

DFHV has been pleased with the initial productivity of the DC Microtransit service. Future plans have been developed that include a new microtransit zone covering Ward 8 or southeast D.C. (shown in Figure 2-25). Moving forward, DFHV would like to transition its Transport DC customers onto DC Microtransit. Transport DC is a premium same-day alternative to MetroAccess that is contracted through DFHV to multiple taxicab providers in the city. DFHV has also set performance goals for DC Microtransit that include ridership, shared rides, cost-effectiveness, and customer satisfaction.



**Figure 2-25: Future Ward 8
DC Microtransit Zone**

43

Chapter 3

Performance Assessment

The Ride On Flex and other microtransit services have placed a new emphasis on the rider through an innovative and user-focused approach to public transportation. This service model has presented challenges in how to quantify the performance of these services versus traditional fixed routes and DRT service. Microtransit's user-focused approach favors flexibility and efficiency, common themes in many DRT services.

This chapter provides a context for the performance assessment, explores traditional and emerging microtransit performance metrics, and provides a performance evaluation for the Flex's first 120 days of service.

Performance Assessment Context

Performance measures provide quantifiable, data-driven answers to the question of whether a transit service is successful or not. For the Flex, defining these performance measures is a crucial step in determining the future of the service. Comparing the Flex (microtransit) to traditional public transit services has been a key discussion point during the course of the study. When examining traditional performance metrics, the Flex would be closely related to DRT; similar to the ADA paratransit that is contracted to MetroAccess in Montgomery County. However, the Flex is a new service model that allows the general public to travel on-demand (MetroAccess is not open to the general public and requires advanced reservations). On-demand capability can generate greater ridership than a traditional DRT service; however, it also faces the challenge of unpredictable demand that could result in under-utilized vehicles.

The Flex is best assessed through a combination of traditional metrics and a new class of performance measures that have emerged from similar on-demand mobility services (e.g. bikeshares, carshares, e-scooters, microtransit, TNCs, etc.). Never before have there been so many options available for transportation - these "new age" metrics provide a greater focus on an integrated transportation system and the specific needs of customers. The role of the Flex is not to compete with public transit or private operators, but rather to provide a valuable and equitable linkage in a highly diverse transportation environment.

Traditional Performance Measures

A comprehensive set of traditional public transit performance measures is conveniently compiled into the Federal Transit Administration's (FTA) National Transit Database (NTD). The NTD provides consistency across all transit systems when evaluating performance metrics. While the NTD requires a wide range of data, the primary performance measures focus on operating cost and total passenger trips (displayed in Table 3-1). These performance measures are essential for all public transit services as they are required by the FTA.

In the realm of traditional performance measures, microtransit is more akin to DRT services which have a more tailored set of performance indicators. The Transit Cooperative Research Program's (TCRP) *Guidebook for Measuring, Assessing, and Improving Performance of Demand-Response Transportation* (TCRP Report 124) outlines key performance measures for DRT; including those required by the NTD and expanding to measures that track safety and on-time performance. These measures are also included in Table 3-1.

Traditional performance measures are essential and valuable for comparing the Flex to other services. These measures can also be used to evaluate the effectiveness of the Flex service versus low-performing fixed routes. However, new metrics made possible through mobile technology can provide a broader illustration of the service's impact in the community. These metrics draw heavily upon the traditional performance measures but place a greater emphasis on the customer's experience.

Table 3-1: Traditional Performance Measures

Performance Indicator	Definition	Standard/Goal
National Transit Database		
Operating Cost per Vehicle Revenue Miles	Operating cost / revenue miles	Minimize
Operating Cost per Vehicle Revenue Hour	Operating cost / revenue hours	Minimize
Operating Cost per Passenger Mile	Operating cost / passenger miles	Minimize
Operating Cost per Passenger Trip	Operating cost / passenger trips	Minimize
Trips per Vehicle Revenue Mile	Passenger trips / revenue miles	Maximize
Trips per Vehicle Revenue Hour	Passenger trips / revenue hours	Maximize
Key DRT Performance Measures, TCRP Report 124		
Passenger Trips per Revenue Hour	Passenger trips / revenue hours	Maximize
Operating Cost per Revenue Hour	Operating cost / revenue hours	Minimize
Operating Cost per Passenger Trip	Operating cost / passenger trips	Minimize
Safety Incidents per 100,000 Vehicle Miles	(NTD major + non-major safety incidents) / (vehicle miles) x 100,000	Minimize
On-Time Performance	(On-time trips + no-shows + early trips) / (completed trips + no-shows + missed trips)	Maximize

Emerging Performance Measures for Microtransit

Microtransit programs are in their infancy and currently there are no formal industry standards for productivity and performance. It is anticipated that over time more performance measures and established standards will be available from maturing programs. As these measures are forthcoming, a number of studies have been released that investigate effective microtransit performance measures.

Notably, in February 2020, the FTA published *Mobility Performance Metrics (MPM) for Integrated Mobility and Beyond* (MPM Report), authored by TransitCenter. The MPM Report provides a comprehensive summary for developing performance metrics specifically for Mobility on Demand (MOD) Sandbox Projects. The report highlights the need for a new set of performance metrics that:

- Measures how well an integrated public/private mobility system meets the needs of individuals
- Evaluates the system's performance while meeting overall travel demand
- Addresses the service's impact locally, regionally, and nationally
- Evaluates the service in relation to the agency's overarching goals and objectives

The FTA has taken a customer centric perspective in their approach to developing performance measures for MOD projects. The MPM Report has outlined five specific customer experiences and stages of travel with a microtransit service; including:

- Offset time - the difference between the preferred departure time and actual departure time
- Spontaneity time - earliest departure, how far in advance do passengers have to book their trip?
- Wait time - the amount of time between the trip request and boarding the vehicle
- Travel time - amount of time spent in the vehicle and walking to an access point
- Time prediction accuracy - reliability, is the real-time prediction accurate?

The MPM Report and other research studies provide an excellent resource for developing potential performance metrics for the Flex. These studies have also identified the challenges in collecting and tracking new types of performance data. Many of the potential performance measures included in the following section are derived from the MPM Report.

Potential Performance Measures

Microtransit providers have used a wide range of performance indicators to measure the success of their programs. Out the outset of the Flex pilot program, MCDOT identified two key benchmarks: an average of 80 to 100 completed daily trips (roughly 3.5 to 4.5 boardings per hour) and a 10 minute or less response time. Prior to the COVID-19 related service suspension, the Flex's average daily ridership was in the 70 to 80 range and showing signs of growth. Additionally, response times have consistently averaged under 10 minutes throughout the course of the pilot program. This section seeks to identify additional performance measures that MCDOT can use to demonstrate the effectiveness of the Flex.

The following categories provide an outline of potential performance measures that MCDOT should consider for future use. These measures have been developed through the Flex trip data analysis, used by other microtransit providers, and/or documented in previously noted studies. These are intended to provide MCDOT with a menu of options; tracking each and every performance metric listed would be cumbersome. The following metrics are also useful in informing a discussion around the long-term goals for the Flex.

The following five categories were used to group the potential metrics as they captured popular and emerging themes in microtransit. Displayed in Figure 3-1, the five potential performance measure categories are productivity, cost effectiveness, shared ride, connecting to transit, and customer satisfaction.

Figure 3-1: Potential Performance Measure Categories



Productivity

The potential productivity metrics highlight traditional performance measures while also considering the nature of microtransit service. While shared ride metrics are covered in a later section, minimizing the number of deadhead miles and hours per day is a key performance metric for an on-demand service. Using the advantages of app-based data, these metrics could also be easily tracked.

Table 3-2: Potential Productivity Performance Measures

Performance Measure	Definition	Potential Data Source	Metric Source
Productivity			
Completed daily trips	Total or average daily trips	Ride On, Via	MCDOT
On-time performance	On-time performance of response time, the time between the trip request and the vehicle's arrival	Ride On, Via	MCDOT, MPM
Passenger trips per revenue hour	Passenger trips / revenue hours	Ride On, Via	NTD, TCRP
Passenger trips per revenue mile	Passenger trips / revenue miles	Ride On, Via	NTD
Peak capacity	Maximum number of passenger trips per hour	Ride On, Via	MPM
Number of deadhead miles per day	Miles driven per day without customers onboard	Ride On, Via	MPM
Number of deadhead hours per day	Hours driven per day without customers onboard	Ride On, Via	MPM
Impact on Accessibility	New trips possible due to Flex service	Customer reviews and driver interactions	MPM
Mobile app downloads	Number of Flex App downloads	Via	MPM
Percentage of regular app users	Percentage of app users that regularly use the Flex	Via	MPM

Cost-Effectiveness

On-demand transit services are generally more expensive than fixed route services on a per hour, per mile, and per trip basis. Well-designed microtransit services need to balance higher costs by adopting appropriate standards that properly balance farebox recovery with overall costs. The subsidy ratio shows how much of the operating costs are being offset by fare revenue. Re-evaluating the fare may be necessary if farebox recovery is negligible. Rider satisfaction with the current cost of service as well as a fare change's Title VI implication should be considered in any fare evaluation.

Table 3-3: Potential Cost-Effectiveness Performance Measures

Performance Measure	Definition	Potential Data Source	Metric Source
Cost Effectiveness			
Operating cost per revenue hour	Operating cost / revenue hours	Ride On, Via	NTD, TCRP
Operating cost per revenue mile	Operating cost / revenue miles	Ride On, Via	MPM, NTD
Operating cost per passenger trip	Operating cost / passenger trips	Ride On, Via	MPM, NTD, TCRP
Fare collected per passenger trip	Farebox recovery / passenger trips	Ride On	-
Annual subsidy	Required operating funding	Ride On	MPM

Shared Ride

Shared rides are trips made with more than one passenger onboard. The Flex's software directs the driver to take the most efficient and effective path to provide transportation to as many individuals as possible. Given the size and scope of the Flex service, shared trips can have a major impact on the service's performance measures.

Table 3-4: Potential Shared Ride Performance Measures

Performance Measure	Definition	Potential Data Source	Metric Source
Shared Ride			
Percentage of shared rides	Percentage of total rides where there are more than one passengers onboard	Ride On, Via	MPM
Utilization of vehicles	Riders in a vehicle / vehicle capacity	Ride On, Via	MPM
Percentage of multi-passenger trips	Percentage of completed trips with more than one passenger per reservation	Ride On, Via	-

Connecting to Transit

The limited service area of the Flex makes connections to high frequency transit service very attractive for customers. The trip analysis revealed that the three Metro stations in the two zones were the most popular activity centers for the Flex. While this in and of itself is a powerful metric, tracking linked trips clearly illustrates the impact of the Flex locally and regionally. Trip tracking is accomplished through SmarTrip® fare cards. While not every Flex passenger utilizes a SmarTrip® fare card, it is the preferred fare payment option in the Washington region. Trip linkages could be also taken from Flex user's cell phone location data. Similar to other popular apps, the app could track users to identify user patterns and better understand trip needs.

Table 3-5: Potential Connecting to Transit Performance Measures

Performance Measure	Definition	Potential Data Source	Metric Source
Connecting to Transit			
Number of trips to/from Metro stations	Number of daily trips linked to and from a Metro station or high frequency transit line	Ride On, Via, WMATA	-
Number of linked trips per day	Number of daily trips linked to other transportation modes (bus, rail, bikeshare, carshare, etc.)	Ride On, Via, WMATA	MPM
Number of linked trips per vehicle revenue mile	Number of linked trips / revenue miles	Ride On, Via, WMATA	MPM
Number of linked trips per vehicle revenue hour	Number of linked trips / revenue hours	Ride On, Via, WMATA	MPM

Figure 3-2: The Flex at the Wheaton Metro Station Bus Bays



Customer Satisfaction

Customer satisfaction is a major element of the Flex; ride alongs revealed a tight knit group of riders where word-of-mouth was the primary marketing tool. The Flex's regular customers can make or break the success of the service. MCDOT must be responsive to their experiences and complaints. The best performance metrics are the ones that matter the most to the customer. Tracking satisfaction and being responsive to customer requests will ensure continual community support for the Flex.

Table 3-6: Potential Customer Satisfaction Performance Measures

Performance Measure	Definition	Potential Data Source	Metric Source
Customer Satisfaction			
Returning customers	Percentage of customers who returned to the service after their first trip	Ride On, Via	MPM
Customer complaints	Timeliness of responses to customer complaints	Ride On	MPM
Wait time	On-time performance of response time, the time between the trip request and the vehicle's arrival	Ride On, Via	MPM
Number of trips canceled	Number of trips canceled following the reservation request	Ride On, Via	MPM
Ease of use	How easy is the app and service to understand	Surveys, customer reviews, and driver interactions	MPM
Missed trips	Number of trips that are unable to be completed due to demand	Ride On, Via	MPM
Fatality or serious injury per 100,000 trips	(NTD major + non-major safety incidents) / (vehicle miles) x 100,000	Ride On, Via	MPM, TCRP
Incidence of crime per 100,000 trips	(Criminal conduct with police involvement) / (vehicle miles) x 100,000	County Police, Ride On, Via	MPM

Performance Assessment

Typically, new transit services should be in operation for at least 12 to 18 months before a full performance assessment is conducted. However, with extensive data available for the Flex pilot program, an assessment of the first six months of service was conducted. This assessment was informed by ridership, operating, and financial data provided by MCDOT.

It is important to place these performance metrics in context. The Flex is a new service and a new service model. Productivity over the first few months was relatively low, which was expected. However, as ridership has grown so have the productivity measures.

Zone-Based Flex Performance Measures

Table 3-7 provides an overall summary and zone-by-zone break-down of the performance data that was available for the Flex. These metrics are based on trip data from the first 120 days of service and monthly accounting summaries.

During this time period, the Flex completed 4,550 passenger trips or an average of 33.3 passenger trips per day. The Wheaton-Glenmont zone produced higher ridership than the Rockville zone. The two Wheaton-Glenmont vehicles averaged 1,523 trips per vehicle while the Rockville zone, with one vehicle, totaled 1,188. The shared ride data shows that 15% of all trips were shared. The percentage was slightly higher in the Wheaton-Glenmont zone (16%) than the Rockville zone (12%). However, roughly 20% of Rockville's trips included more than one passenger versus 6% in Wheaton-Glenmont.

Metro stations are the top activity centers for the Flex. In the Wheaton-Glenmont zone, approximately 69% of morning trips end at one of the two Metro stations. In the evenings, 59% of trips originate from the two stations. The smaller percentage of evening return trips suggests that some Flex customers are finding alternative methods for their evening commute. This could also indicate that the Flex does not operate late enough for some commuters' return trip. The Rockville zone, with its midday service, is not convenient for typical commuters. Nevertheless, the Rockville Metro Station is the most popular destination in the zone. There is relatively large disparity between trips ending at the station (21%) and trips originating from the station (7%).

On average, the smaller Rockville zone had shorter customer wait times and shorter trips by time and distance. Despite the difference in zone size, 0.7 and 3.4 square miles respectively, the Rockville and Wheaton-Glenmont zones had relatively similar average trip distances of 0.72 and 1.22 miles. Likely due to the commuter nature of the Wheaton-Glenmont zone, a slightly higher percentage of trips included a daily return trip; 26% to Rockville's 22%.

With growing ridership, these base line metrics will continue to improve.

Table 3-7: Flex Performance Summary for the First 120-Days of Service

Zone	Rockville	Wheaton- Glenmont (Total)	Wheaton-Glenmont		Total
			6:00 am to 9:00 am	3:30 pm to 6:00 pm	
Productivity					
Completed Passenger Trips	1,504	3,046	1,502	1,541	4,550
Average Completed Daily Trips	9.9	23.4	11.6	11.9	35.3
Total Trip Requests	1,845	4,517	N/A	N/A	6,362
Percentage of Completed Trip Requests	64%	67%	N/A	N/A	67%
Percentage of Canceled Trips Requests	3.7%	4.5%	N/A	N/A	4.3%
Passenger Trips/Rev. Hour	1.52	1.95	2.09	1.84	1.81
Passenger Trips/Rev. Mile	1.38	0.89	0.91	0.87	0.99
Cost-Effectiveness					
Operating Cost/Pass. Trip	N/A	N/A	N/A	N/A	\$57.06
Operating Cost/Rev. Hour	N/A	N/A	N/A	N/A	\$83.86
Operating Cost/Rev. Mile	N/A	N/A	N/A	N/A	\$56.50
Fare Collected/Pass. Trip	N/A	N/A	N/A	N/A	\$1.13
Shared Ride					
Percentage of Shared Passenger Trips	12%	16%	17%	15%	15%
Percentage of Multi- Passenger Trip Requests	20%	6%	7%	6%	10%
Connecting to Transit					
Percentage of Trips to Metro stations	21%	15% (Wheaton) 24% (Glenmont)	27% (Wheaton) 42% (Glenmont)	2% (Wheaton) 6% (Glenmont)	34%
Percentage of Trips from Metro stations	7%	10% (Wheaton) 22% (Glenmont)	1% (Wheaton) 4% (Glenmont)	19% (Wheaton) 40% (Glenmont)	25%
Customer Satisfaction					
Average Wait Time (Mins.)	6.23	8.97	8.87	9.07	8.15
Average Trip Time/ Duration (Minutes)	5.86	7.75	7.47	8.02	7.18
Average Wait & Trip Time (Minutes)	12.09	16.72	16.34	17.09	15.33
Average Trip Distance (Miles)	0.72	1.22	1.19	1.24	1.07
Percentage of Daily Round-Trips	22%	26%	3%	8%	25%
Rider Retention	63%	73%	71%	69%	70%

Source: MCDOT, Flex Data includes June 26, 2019 to December 16, 2019.

Performance Measures Over Time

To better understand how the service has grown during the first 120 days, it is important to examine the Flex's performance over time. Shown in Table 3-8 are the Flex's performance measures by month. June service consisted of the launch and three service days which account for a very high trip per day figure (78). However, the majority of these riders only used the Flex once, as rider retention is very low at 39%. Over the next few months, the service stabilizes and ridership continues to grow. During this time, key metrics greatly improve. For example, the operating cost per passenger trip dramatically drops from \$81.20 in July to \$44.14 in November. Other noteworthy metrics that illustrate the growth of riders are the percent of deadhead platform hours and the percent of shared rides.

Table 3-8: Flex Performance Measures by Month

Month	June	July	August	Sept.	October	Nov.	Dec.*
Productivity							
Completed Passenger Trips	56	455	571	649	913	847	504
Average Completed Daily Trips	78	38	41	50	60	68	67
Total Trip Requests	234	840	892	1,009	1,380	1,288	736
Percent of Completed Trip Requests	24%	54%	64%	64%	66%	66%	68%
Percent of Canceled Trip Requests	3.8%	3.7%	3.1%	5.4%	4.5%	4.1%	4.9%
Trips per Revenue Hour	N/A	0.85	1.07	1.34	1.63	1.83	N/A
Trips per Revenue Mile	1.02	1.04	1.11	1.14	1.09	1.03	1.00
Percent Deadhead Platform Hours	N/A	90%	87%	83%	81%	78%	N/A
Cost-Effectiveness							
Total Operating Subsidy	N/A	\$36,947	\$37,711	\$38,514	\$45,429	\$37,389	\$40,670
Operating Cost per Passenger Trip	N/A	\$81.20	\$66.04	\$59.34	\$49.76	\$44.14	N/A
Operating Cost per Platform Hour	N/A	\$69.11	\$70.54	\$79.25	\$81.28	\$80.98	\$79.70
Operating Cost per Revenue Mile	N/A	\$77.90	\$59.48	\$51.97	\$45.85	\$42.98	N/A
Fare Collected per Passenger Trip	N/A	\$1.10	\$1.09	\$1.14	\$1.13	\$1.18	N/A
Shared Ride							
Percent of Shared Passenger Trips	6%	12%	14%	17%	17%	17%	31%
Percent of Multi-Pass. Trip Requests	4%	8%	7%	11%	12%	15%	14%
Connecting to Transit							
Percent of Trips to Metro stations	34%	40%	37%	34%	37%	34%	34%
Percent of Trips from Metro stations	16%	27%	30%	25%	27%	24%	28%
Customer Satisfaction							
Average Wait Time (Minutes)	7.68	7.92	8.67	8.38	8.15	7.70	8.30
Rider Retention per Month	39%	65%	70%	70%	75%	72%	71%

Source: Montgomery County Flex Ridership Data, June 26, 2019 to December 16, 2019.

*Data for December only includes requests up to December 16th.

Recommended Performance Measures

Proposed Flex Performance Measures

Based on the availability of data and observed trends in the performance assessment, the following performance measures are recommended to MCDOT for consideration in the Flex service.

Figure 3-3: Recommended Performance Measures for the Flex



- Average Daily Passenger Trips
- Percentage of Canceled Trips
- Passenger Trips per Platform Hours
- Percentage of Deadhead Platform Hours



- Operating Cost per Passenger Trip
- Operating Cost per Revenue Mile



- Percentage of Multi-Passenger Trips
- Percentage of Shared Trips



- Percentage of Trips to/from Metro Stations
- Percentage of linked trips (SmarTrip®)



- Average Wait Time
- Number of App Downloads
- Post-Trip App Based Satisfaction Survey

Data Collection

Regularly tracking performance data will provide a much more detailed understanding of the impacts of the service and customer trends. Before selecting performance measures, MCDOT should consider the amount of time and effort that will be required to collect and analyze each metric. For example, calculating the percentage of linked trips based on SmarTrip® data will require coordination with WMATA and a designated MCDOT staff member who can analyze and summarize that data for decision makers. Even metrics that involve operating cost and vehicle information will require some level of manual tracking. The ease of data collection should be a primary factor when selecting performance measures.

Data is available for all of the recommended performance metrics with the exception of a post-trip app based satisfaction survey. A post-trip survey could solicit continuous feedback from customers. Examples could be drawn from similar surveys on popular TNC apps where a one to five-star rating is given for the trip and customers have the opportunity to comment on their experience. This survey would need to be developed through coordination with Via to be featured through the Flex app.

Establishing Performance Goals

For each selected performance measure, MCDOT should establish a performance goal. Prior to the launch of the Flex pilot program, MCDOT identified a specific performance goal: a 10 minute or less response time. This is similar to other microtransit programs including AC Transit, Cap Metro, and the City of West Sacramento that have all established performance goals around customer wait times of 15 minutes or less. Microtransit programs with larger zones (over 10 square miles) typically have response time goals of 20 minutes to one hour.

The nearly universal use of response times as a performance measure highlights the importance of the customer's experience in microtransit. When establishing performance goals for the Flex, MCDOT should consider how those goals contribute to the division's overall goals and objectives:

MCDOT's Division of Transit Services Mission Statement

The Division of Transit Services accomplishes an essential mobility mission of Montgomery County by connecting people, communities, workplaces, educational institutions, recreational opportunities and many other essential destinations. To the extent that transit reduces the number of vehicles on the roads in Montgomery County, especially during the rush periods, transit increases the efficiency of the infrastructure. Moreover, transit plays a key role in the viability of the local economy and in the livability of our neighborhoods.

MDOT MTA's Performance Standards

The Maryland Department of Transportation Maryland Transit Administration's (MDOT MTA) Locally Operated Transit System (LOTS) Program Manual includes performance standards for urban DRT services (Table 3-9). These performance standards are uniquely suited for comparing the Flex's performance to other urban DRT services. This is not to say that these standards should be applied to the Flex, but they offer an excellent benchmark for evaluating the pilot program.

In Table 3-9, the Flex is measured against MDOT MTA's recommended performance standards for urban DRT service. The Flex excels in the passenger trips per mile category. This is likely due to the short nature (first mile/last mile) of the service. The operating cost per hour and passenger trips per hour both fall into the acceptable category. The performance metrics show that there is additional system capacity to easily go beyond three trips per hour. Two categories, operating cost per passenger trip and farebox recovery, fall into the needs review categories. The key to improving these two metrics is greater ridership.

Table 3-9: MDOT MTA's Recommended Performance Standards for Urban DRT Service

Urban Demand Response Service	MDOT MTA Performance Standards			The Flex (First 120 Days)
	Successful	Acceptable	Needs Review	
Operating Cost per Hour	< \$71.19	\$71.19 - \$91.53	> \$91.53	\$83.86
Operating Cost per Mile	< \$4.07	\$4.07 - \$8.14	> \$8.14	N/A
Operating Cost per Passenger Trip	< \$20.34	\$20.23 - \$30.51	> \$30.51	\$57.06
Local Operating Revenue Ratio	< 60%	40% - 60%	< 40%	N/A
Farebox Recovery Ratio	> 12%	6% - 12%	< 6%	2%
Passenger Trips per Mile	> 0.25	0.15 - 0.25	< 0.15	0.99
Passenger Trip per Hour	> 3.0	1.5 - 3.0	< 1.5	1.8

Source: MDOT MTA, LOTS Program Manual, Recommended Revised Performance Standards, March 28, 2016.

Note that Flex performance measure thresholds are highlighted in green.

Chapter 4

Future Service Considerations

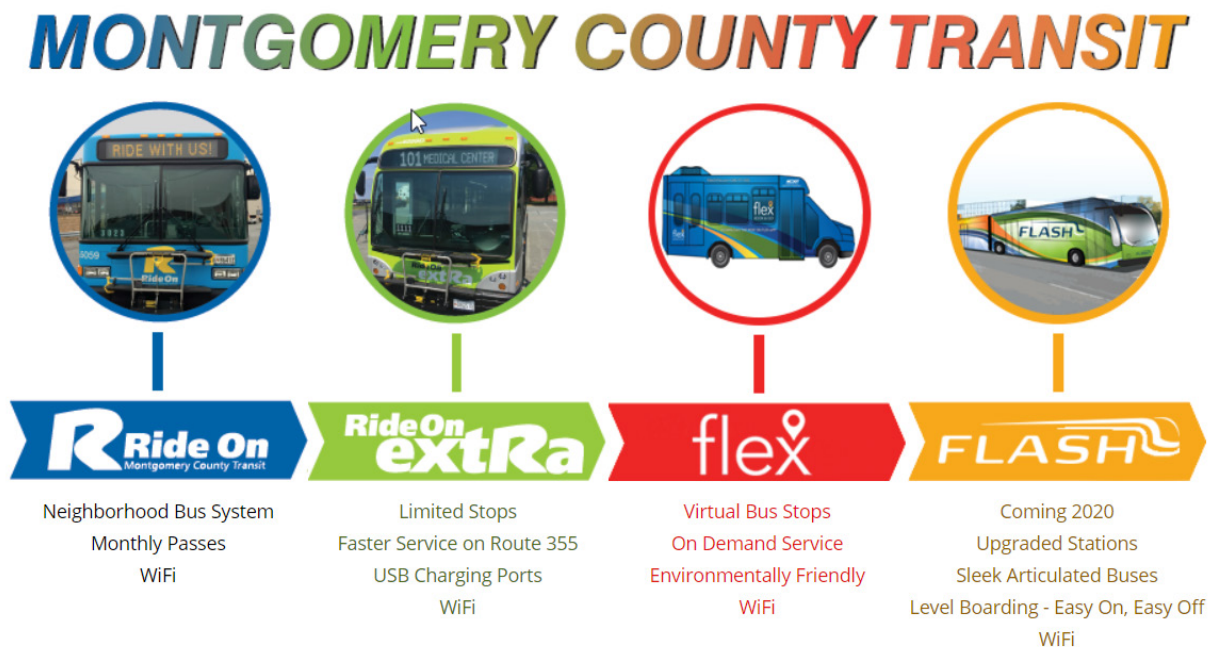
The Ride On Flex celebrated its one-year anniversary on June 26, 2020 - effectively completing the one-year pilot program. However, on March 19, 2020, the Flex was suspended indefinitely due to Coronavirus Disease 2019 (COVID-19). A timeline for the resumption of service is currently unknown. This chapter provides potential strategies to relaunch the Flex in addition to other service considerations beyond the pilot program.

The potential for future Flex service is analyzed through a microtransit propensity index that compiles several service area characteristics. This chapter also provides a peer review of other transit services through their approaches to Title VI considerations, e-fare policies, ADA accessibility measures, zone size, vehicle use, and other service characteristics.

Service Strategy

The Flex is one of MCDOT's four service tiers in addition to Ride On, Ride On Extra, and the Flash (Figure 4-1). These service models provide a wide range of service characteristics. The Flex is the most flexible and easily deployed service at MCDOT's disposal.

Figure 4-1: MCDOT's Transit Services



Maintaining Service Reliability

One of the key concepts of the Flex service is a short response time and timely trip. Convenience and reliability will drive ridership growth. MCDOT's designated goal of a 10 minute response time should be a guiding element for designing and implementing Flex service. When configuring a zone, one must first ask, can the bus reach every destination in the zone in less than 10 minutes? The size and layout of each Flex zone will be heavily influenced by the local street network, location of vehicle staging areas, and anticipated demand.

With a defined zone, service planners must ensure service reliability by providing an adequate number of Flex vehicles within the zone. Data from the pilot project, shown in Table 4-1, shows that one vehicle in the 0.67 square mile Rockville Flex zone met the 10 minute response time goal 90% of the time. Comparatively, two vehicles in the 3.42 square mile Wheaton-Glenmont zone met the response time goal 71% of the time. Both zones have average response times of less than 10 minutes.

Table 4-1: Flex Zone Service Reliability Characteristics

Zone	Rockville	Wheaton-Glenmont
Flex Service Characteristics		
Service Spans (Monday to Friday)	9:00 am to 3:30 pm	6:00 am to 9:00 am 3:30 pm to 7:00 pm
Service Vehicles	1	2
Zone Size (Square Miles)	0.67	3.42
Average Square Miles per Vehicle	0.67	1.71
Flex Reliability Characteristics		
Percent of Trips with 10 Minute or Less Response Time	90%	71%
Average Response/Wait Time (Minutes)	6.2	9.0
Average Wait & Trip Time (Minutes)	12.1	16.7
Percent of Canceled Trips	3.7%	4.5%

Source: MCDOT Flex Ridership Data, June 26, 2019 to December 16, 2019.

Service Zone Size

The size of a service zone is a key characteristic of any microtransit service. The current Flex zones of 0.7 (Rockville) and 3.4 (Wheaton-Glenmont) square miles are relatively small in comparison to other microtransit services. For example, during a review of similar microtransit programs, service areas ranged from four to 30 square miles. Generally speaking, service zones in more urban/suburban areas are typically no larger than 10 square miles. The size increases for zones in exurban/rural areas where 20 to 30 square miles is the norm.

Ride On has kept their microtransit service areas focused and small. Smaller service areas are able to provide a more efficient service, allowing customers a quick and reliable trip. An effective service strategy, which has been deployed by Dallas Area Rapid Transit (DART) in the implementation of their GoLink service, is to create zones that are sized appropriately to be served by one or two vehicles. As demand grows, additional vehicles can be assigned to that zone. This creates zones that are reasonably sized and lend themselves to less deadhead and more convenient trips for customers.

Larger service zones may result in longer, less efficient service but may attract a larger pool of riders and can provide a wider variety of trip types. Large service zones are more likely to be successful in lower demand areas and during lower demand hours. In some instances, larger zones are an appropriate solution. However, zone sizes should be tempered with the realities of response times, capacity, and convenience.

Service zones do not have to be contiguous; Norwalk Transit's (Norwalk, Connecticut) Wheels2U microtransit operates in "one" zone with two service areas. Shown in Figure 4-2, the downtown area is fully covered, in addition to a hotel and high-density housing district just north of downtown.

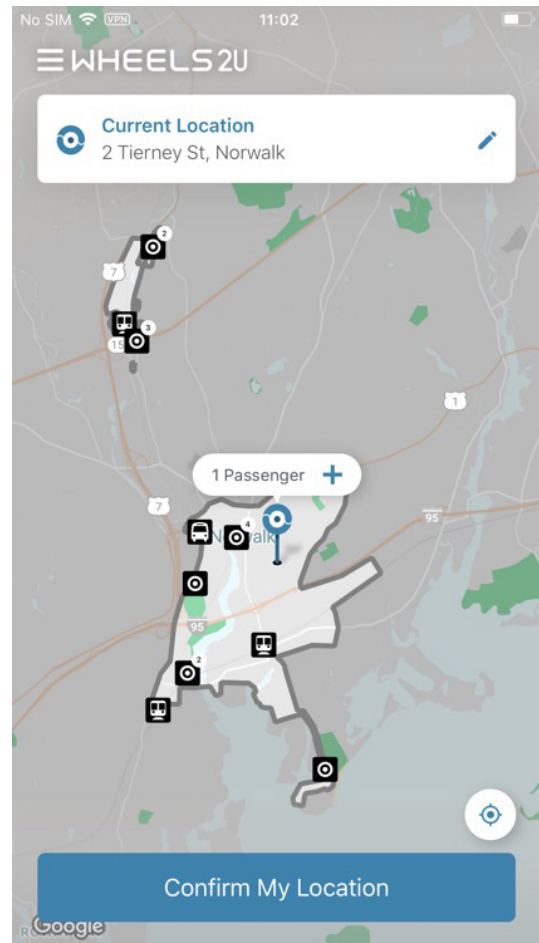


Figure 4-2: Norwalk Transit's Wheels2U Service Zone

Source: Wheels2U App

As the Flex matures and performance data becomes more readily available, service zones boundaries should be reexamined based on demand and customer requests. For example, in the Rockville service zone, some riders have expressed a desire to expand the service zone to include additional shopping destinations along Rockville Pike. While in the Wheaton-Glenmont zone, riders have requested that the zone be expanded to include the Wheaton Library and Recreation Center.

Number of Service Zones

The Flex currently serves two zones; this is very similar to other pilot projects that have begun with only one to two zones. Based on the success and popularity of the pilot services zone(s), the decision is made whether or not to expand. For instance, Cap Metro's (Austin, Texas) Pickup service began with one zone and has now expanded to six. Dallas Area Rapid Transit (DART) has experienced great success with GoLink, starting with two zones, the system is now made up of 13 separate zones.

Illustrated in Figure 4-3, DART has expanded their GoLink service across the Dallas metro area. The service zones primarily serve as end-of-line collectors for high frequency service and “infill” service for neighborhoods that are in close proximity to high frequency lines. The GoLink zones are a major component of the high coverage concept in the DART Zoom Network Redesign.

The number of Flex zones should be ultimately determined by transportation need and a cost benefit analysis. The Flex is an excellent solution for expanding coverage into under and unserved areas. However, passenger capacity and productivity will be less than traditional fixed route service. As performance metrics are defined and operating data becomes more readily available, MCDOT will have a better idea of where and how the Flex service can be an appropriate mobility solution.

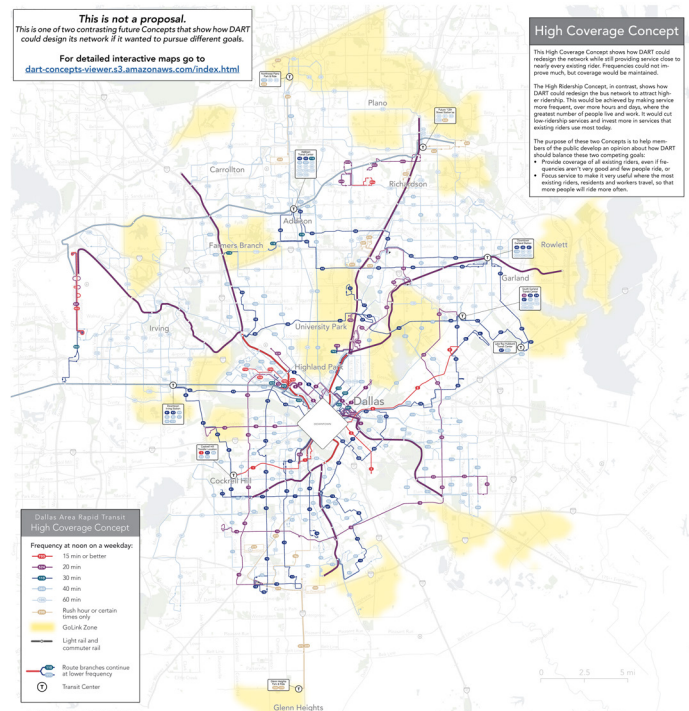


Figure 4-3: DART's High Coverage Concept

Note the GoLink Zones in yellow

Source: DART Zoom

Service Days & Hours

The Ride On Flex service is operated Monday through Friday, although service times vary between the two zones. The Wheaton-Glenmont service operates during the morning and evening rush hours, mainly transporting commuters to and from work and school. The Rockville service operates during the middle of the day and is typically used for access to public services such as the bank, the library, and grocery shopping. Many other successful microtransit services only operate on weekdays and during the morning/evening peak periods. Several peer microtransit services have added Saturday service. Saturday service would likely operate similarly to the Rockville service being used for access to public services and other social/recreational activities.

Service could also be implemented later in the evening. Flex service could provide transportation for third shift and service industry workers who commute during off peak hours. Evening/late night service could also generate trips to Montgomery County's downtown areas to access bars, restaurants, movie theaters, and other nightlife. If the recent trend of COVID-19 related street closures for outdoor dining continues, microtransit could be used to alleviate potential parking concerns generated by these closings.

COVID-19 Service Implications

Social distancing measures enacted to limit the spread of COVID-19 during Spring 2020 have deeply impacted the transit industry, resulting in the suspension of services, elimination of fares, and a reevaluation of current practices. The following sections outline how MCDOT and other transit agencies have implemented new regulations for the health and safety of passengers and drivers. This also includes some strategies for relaunching the Flex. However, any policy changes should be grounded in guidance from health, safety, and transit authorities; including the FTA and American Public Transportation Association (APTA). The FTA regularly updates their COVID-19 website (<https://www.transit.dot.gov/coronavirus>) with valuable information including the FTA's Resource Tool. Another excellent source of information is APTA's website (<https://www.apta.com/public-transit-response-to-coronavirus>) which includes resources for a service restoration strategy.

MCDOT Service Impacts

In response to COVID-19, MCDOT implemented its Essential Services plan which reduced regular Ride On services and suspended the Flex on March 19, 2020. As of early August 2020, MCDOT has restored at least limited service on all Ride On fixed routes. However, a timeline for the resumption of the Flex is unknown as the Flex cannot comply with the current rear door boarding policy.

On all fixed route services, MCDOT has instituted new health and safety measures to promote social distancing. All riders are required to wear a mask or face covering while they are on board the bus. Riders also board and exit the bus using the rear door (Figure 4-4); front door boarding is provided for individuals with disabilities, those using mobility assistance devices, and others that request to use the ramp. Rear door boarding and an effort to reduce operator and customer interaction has resulted in free fares.

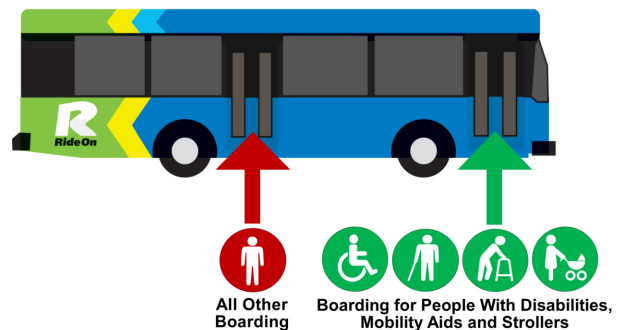


Figure 4-4: MCDOT's Rear Door Boarding Policy

Policy Changes

Boarding Policies

Of Ride On's new boarding policies, rear door boarding presents the greatest challenge for the Flex service. While Flex vehicles technically have a rear door, it is designed for wheelchair access. To utilize the rear door, the driver would need to exit the vehicle and deploy the wheelchair lift for all passengers. This would likely offset any potential advantage as it increases customer and driver interaction and could present additional safety concerns if the lift was deployed in high traffic areas.

Resumption of the Flex service is largely dependent upon allowing front door boarding. Baltimore County's CountyRide, which provides DRT service in vehicles similar to those used by the Flex, has limited its capacity to two riders per vehicle. The policy requires that one rider should be seated in the back of the vehicle and the other should be seated towards the front but at least six feet from the driver. Flex service could follow this guideline and use the on-demand scheduling capabilities provided by Via to limit group sizes and the number of shared trips.

Changes within Buses

Ride On drivers are required to wear a mask at all times and are given hand sanitizer to frequently apply throughout their shift. Flex drivers should be given the same personal protective equipment. Hand sanitizer would also be provided for riders using hand sanitizer dispensers. These measures better protect drivers and riders by providing them with the means to limit the spread of COVID-19. Shown in Figure 4-5, Annapolis Transit recently installed plexiglass "sneeze guards" in all of their buses to further protect drivers from airborne droplets. Collaborating with the Annapolis Public Works Department, pieces of plexiglass were cut and installed to provide a barrier between driver and rider. Other transit providers have used caution tape to restrict access to certain rows of seats. Flex service should only allow for passengers to be in the second row (from the driver) and the back row of the bus. If a customer is the only rider on the bus, they should be made to sit as far away from the driver as possible.



Figure 4-5: Protective Equipment

Source: Annapolis Transit

Fare Policies

Ride On and other transit systems across the country have eliminated fare payment with the intention of promoting social distancing on transit vehicles. Going fare free with other Ride On services is an option for the Flex as it would decrease driver and passenger interaction. In the short-term, free fares could also generate additional interest in the Flex as individuals returning to public transit may prefer a more personalized experience. In the long-term, this situation could provide an opportunity to integrate other app-based fare payment options. The Flex mobile app requires users to create an account; therefore, electronic fare payment could be incorporated to continue generating fare revenue while limiting person-to-person contact. However, this is no small task as fare integration (SmarTrip®)

is universal in the Washington region. Developing an electronic fare payment system outside of the integrated system would limit transfers and be counter-productive to the Flex's operating model.

Service Changes

Replacing Low-Performing Routes with Microtransit

The Denton County Transit Authority (DCTA) in Texas has used the COVID-19 pandemic as an opportunity to advance their microtransit program, using it to replace lower-performing routes. DCTA reasons that microtransit's mobile app registration model allows for better contact tracing if an outbreak is to happen. Eliminating the fixed route models and moving towards on-demand service gives drivers and operators more control over how many people are aboard the bus. DCTA had already invested heavily in microtransit solutions, and they were able to quickly divert resources from fixed routes to microtransit. An immediate redirection of resources to microtransit may be difficult since most Ride On services use 30 or 40 foot buses that are unable to safely navigate smaller residential streets. As Ride On continues phasing services back in, considerations could be made to use microtransit as a temporary replacement for lower performing routes. Providing these services can better maintain social distancing and put riders at ease while providing valuable data that gauges rider's interest in microtransit services as a long-term solution post COVID-19.

Transportation for Essential Trips

Belleville Transit (Belleville, Ontario) eliminated fixed route services and began exclusively providing microtransit service in response to COVID-19. Focusing on essential trips and using a limited number of vehicles, Belleville Transit found that on-demand transportation eliminated transfers and provided customers with shorter trip times. Other transit systems have used their microtransit services to focus on moving essential workers. In Berlin, Germany, Berliner Verkehrsbetriebe (BVG) microtransit service zones were expanded to access more hospitals and healthcare facilities. In Columbus, Ohio, the Central Ohio Transportation Authority (COTA) expanded microtransit zones to include more grocery stores and provide more trips for essential work and services.

Food and Supply Delivery Services

To further limit person-to-person contact, demand response services throughout the country have used their vehicles and resources to deliver food and supplies to people in need. Instead of transporting people to goods and services, these programs transport goods and services to people. Many of these services do not have mobile scheduling, instead scheduling rides over the phone. Microtransit could provide delivery services by allowing food and supply vendors to call a ride, then load the food/supplies onto the vehicle. Food delivery may need drivers to help deliver food to the door of the delivery recipient. Funding from the CARES Act is allowed to be used by transit agencies for meal delivery so long as the delivery service does not result in the reduction of passenger transportation service for users.

Future Policy Considerations

Title VI

As a federally funded transit system, Ride On must establish policies to ensure major service changes or fare changes to ensure there is not a disparate impact or a disproportionate burden on low income and minority populations. Since the Flex service was an addition to current services and there was no service reduction, and fares are consistent with other Ride On services, an equity analysis was not completed. If at some point Ride On decides to replace or reduce fixed route bus services with the Flex, a service equity analysis will be warranted.

Under the current design, the Flex is complementary to local bus service; however, MCDOT intends to perform an equity analysis once the service has matured beyond the pilot project. Most other microtransit services are similar, and have not needed a service and/or fare equity analysis. However, some have conducted this analysis to understand whether the change from a fixed route bus service to a microtransit service would have a negative impact on Title VI populations.

Public-Private Partnerships

One of the hallmarks of microtransit service is the public entity's partnership with a private technology based company. Through this partnership, a technological platform is implemented that connects vehicles and public transit customers. Some partnerships also include contracting out the provision of transportation services. As noted earlier, the Flex employs Via for the technology platform. Flex vehicles are operated in-house and owned by MCDOT. Several other communities have followed a similar path, including Arlington, Texas and Sacramento, California. This arrangement allows for greater control over operations, and is similar to other successful transit agency based microtransit services in Austin, Texas and the Oakland, California area.

It appears that Ride On is satisfied with their partnership with Via, but procurement processes will require open solicitation in the future. There are other options for the technology platform and potential public-private partnerships. For instance, DART has partnered with Spare; Hillsborough Area Regional Transit (HART) in Tampa partnered with Transdev; and VIA Metropolitan Transit in San Antonio partnered with RideCO.

Fare Policy

The Flex's fare policy follows Ride On's general fare policy. The fare for a one-way trip is \$2.00 for the general public. Fare discounts for the Flex are the same as Ride On fixed route discounts. Seniors (65 years and older) and persons with disabilities are free to ride during the midday (9:30 a.m. to 3:00 p.m. on weekdays and 8:30 a.m. to 4:00 p.m. on Saturdays) and pay half fare (\$1.00) at all other times. Children and youth (ages 18 and below) can ride for free anytime. Customers must pay this fare each time they board the vehicle just like a regular Ride On bus. Fares can be paid with cash or SmarTrip®.

Other microtransit programs have taken a different approach to fares. The DC Neighborhood Connect service was designed and implemented as a mobility option for people with lower incomes; trips are provided free of charge between defined community destinations within the zone. By contrast, the City of West Sacramento's On-Demand service charges a fare of \$3.50 per trip, higher than the \$2.25 per trip fare charged by the Yolo County Transportation District that operates fixed route service.

Ride On Flex customers pay their fare just like any other bus rider in Montgomery County. The integration of the Flex into the regional fare system enables customers to easily transfer from one service to another. Many other microtransit programs are not integrated with regional transit providers and do not permit transfers to/from other transit modes. The Flex's integration into the regional fare system gives the Flex an added advantage over other microtransit programs. As noted earlier, while there is interest in pursuing fare payment options within the Flex app, this feature is currently unavailable. Providing an electronic payment option could better maintain social distancing aboard transit vehicles and encourage more people to ride.

Pickup and Dropoff Locations

Customers using the Flex are generally picked up at the closest corner to their origin, and dropped off at the closest corner to their destination. For customers that utilize a mobility assistance device, the Flex app provides an ADA option for curb-to-curb service. Some communities have implemented microtransit services that utilize designated bus stops, where customers are required to travel to and from virtual bus stops within the zone. For example, Ozark Regional Transit (Springdale, Arkansas) recently replaced a low demand fixed route with microtransit that uses the former route's bus stops. Other communities have used a combination of physical and virtual bus stops, with passenger pickup and dropoff locations within the zone ranging from specific bus stops to locations within a two block distance from a stop.

Vehicle Used - Bus, Van, or Taxi?

The Flex service exclusively uses cutaway buses, but some members of the community have raised issue with the operation of cutaway buses in residential neighborhoods. Some residents have expressed concerns with the noise and pollution caused by the bus's diesel engine. Several factors should influence whether a microtransit service is implemented using cutaway buses, vans, or taxi cabs. As decision makers deliberate on what the future of Flex service will look like, determining the advantages and disadvantages of various vehicles types could be a key determinate for the future of the Flex.

Cutaway Buses: Advantages and Weaknesses

Cutaway buses are perhaps the most versatile vehicle in any transit provider's fleet. Small enough to operate within a narrower right-of-way but with enough seating to provide fixed route service, they provide maximum flexibility for a transit provider. All cutaway buses are also capable of providing ADA compliant public transit services. Since Flex is operated by a public transit system, investment

in cutaway buses gives operations managers the highest flexibility for vehicle deployment.

Despite their utility across a wide range of service types, cutaway buses with twelve seats may be an inefficient vehicle, especially during off-peak hours. In the Rockville service area, drivers have observed that there are rarely more than two people on a vehicle at once. Due to increased maintenance and operating costs, cutaway buses may be better utilized for other service types. Additionally, cutaway buses have lower gas per mileage usage and are far noisier than vehicles that are more compact. In low-density areas during off-peak hours, smaller vehicles may be better utilized for microtransit services.

Vans: Advantages and Weaknesses

Other microtransit services use passenger vans to provide their service. Vans are lower capacity vehicles that can be equipped with ADA accessible ramps. Passenger vans are built on a smaller vehicle chassis, allowing for more maneuverability in tight areas. Drivers have mentioned that Via's routing algorithm does not take into account how large a cutaway bus is. Using passenger vans minimizes the risk of damaging parked cars and could increase the service's efficiency.

Passenger vans lack the utility and capacity of cutaway buses, being unsuitable for high-demand areas and service zones. One issue with passenger vans is their lack of capacity. The peak commuter Flex service in Wheaton-Glenmont has experienced large passenger loads. The limited capacity of passenger vans may be far less efficient during the AM and PM rush hours. Despite these limitations, Flex-branded passenger vans could be a worthwhile



Figure 4-6: Cutaway Flex Bus



Figure 4-7: Passenger Vans

Source: DC Department of For Hire Vehicles

investment if Ride On were to implement Flex permanently.

Taxis: Advantages and Weaknesses

In certain operating arrangements, taxi cabs are the primary service vehicles rather than cutaway buses or passenger vans. The Neighborhood Connect service in Washington, D.C. is operated by the city's Department of For Hire Vehicles. Prior to a temporary service suspension due to COVID-19, Neighborhood Connect operating model utilized existing taxi cab companies by subsidizing service to various grocery stores, hospitals, universities, and other major destinations in two service areas located within Wards 4, 5, 7, and 8. The various taxi companies in the district are contracted to provide a subsidized taxi service to individuals using the Neighborhood Connect Service. While some passenger vans have been acquired and branded for the service, cab companies are allowed to use unbranded vehicles so long as they are still ADA accessible. This limits the service vehicles to wheelchair accessible minivans.



Figure 4-8: Accessible Taxi Cabs

Source: DC Department of For Hire Vehicles

Establishing and Modifying Zones

As Flex service continues to be modified and expanded, design guidelines must be established for Flex zones. To better predict the potential productivity and ultimately the success of zone, potential future Flex zones should be analyzed for suitability. Key variables for this analysis should draw upon demography, geography, and infrastructure network. The Flex pilot demonstrated that microtransit will likely be successful in densely populated residential neighborhoods that are in close proximity to major trip destinations but have limited fixed route service. Using this service concept and available data from the U.S. Census Bureau, Maryland iMap, and Montgomery County Planning, a comprehensive microtransit propensity score was developed to assess for microtransit suitability in the county.

Microtransit Propensity Index (MPI)

The MPI was developed to help guide MCDOT in modifying and expanding future Flex service. An MPI score was calculated for each Census Block Group in Montgomery County. Factors such as population density, household density, intersection density, percent below poverty, and percent zero-vehicle households are considered positive indicators of a successful microtransit service zone. Areas within 1.5 miles of a major transit hub received a score multiplier given the importance of a first mile/last mile connection to high frequency transit. Extensive sidewalk coverage and the presence of fixed route bus services are considered to be potential impediments to successful microtransit service, and those area's scores were consequently impacted. Internet and smartphone access was not included in the MPI because usage data is not readily available and the use of smartphones is widespread throughout the county.

The MPI was calculated using the following formula:

$$\frac{(((PD + HHD + PBP + PNV) - SWD)(ID + TC))}{(EFR)}$$

The MPI - as well as population density, household density, percent no-vehicle households, and percent below poverty - was scored based on each block group's relation to the study area mean and standard deviation. Table 4-2 describes the scoring system and Figure 4-9 outlines the MPI variables.

Table 4-2: Microtransit Propensity Scoring System

Microtransit Propensity Scoring System	
1 - Below average	Metric was below the study area average
2 - Above average	Metric was greater than study area average, but less than one standard deviation from the mean
3 - High	Metric was greater than one standard deviation from the mean
4 - Very high	Metric was greater than two standard deviations from the mean

Figure 4-9: Summary of Microtransit Propensity Variables

 <p>Population Density (PD) People per square mile. Any block group with a density of less than 2,000 was not scored</p>	 <p>Household Density (HHD) Households per square mile</p>
 <p>No Vehicle Households (PNV) Percentage of no-vehicle households</p>	 <p>Below Poverty Individuals (PBP) Percentage of individuals living below the federal poverty level</p>
 <p>Sidewalk Density (SWD) Miles of sidewalk per square mile</p>	 <p>Intersection Density (ID) Intersections per square mile, given a score based on mean and standard deviation</p>
 <p>Existing Fixed Route Service (EFR) Block groups were given a score from 1-3 based on the level of existing fixed route service. No fixed route service = 1 One fixed route provider = 2 Two fixed route providers = 3</p>	 <p>Transit Center Multiplier (TC) Applied to locations within 1.5 miles of a transit center Metro Station = 10x Purple Line Station = 5x Flash BRT = 4x Ride Transit Hub = 3x MARC Station = 1.5x</p>

- Silver Spring and Takoma Park
- Metro stations along MD-355 (Twinbrook, White Flint, Rockville, and Grosvenor-Strathmore)
- Future Purple Line Stations, particularly the Long Branch and Manchester Place stations
- Georgia Avenue between the Forest Glen and Wheaton Metro Stations
- Surrounding the Briggs-Chaney Park-&-Ride
- Portions of Gaithersburg

Figure 4-10: Microtransit Propensity in Montgomery County



Figure 4-11: MPI Results in Silver Spring, Takoma Park, and Wheaton-Glenmont

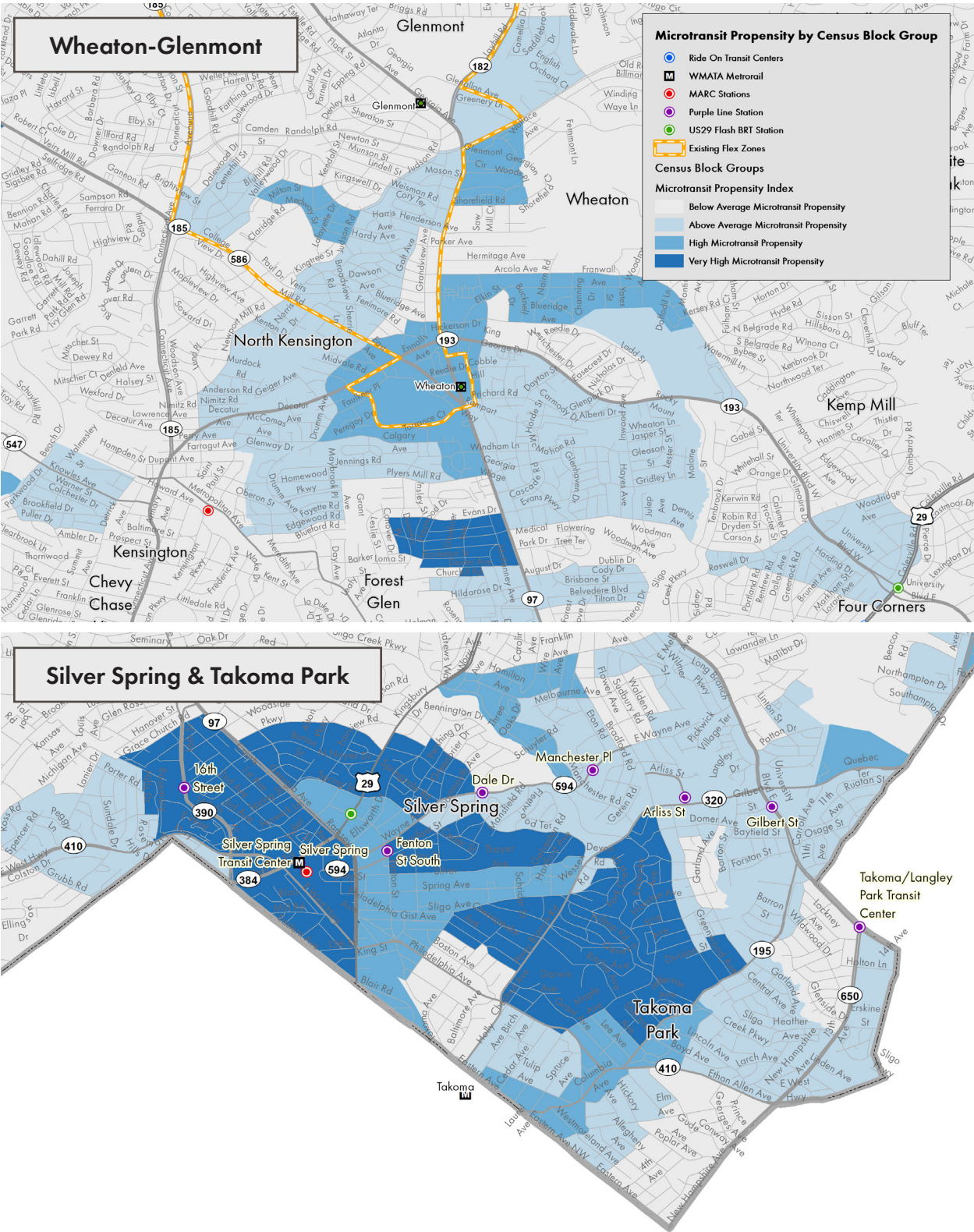


Figure 4-12: MPI Results in Bethesda, North Bethesda, and Rockville

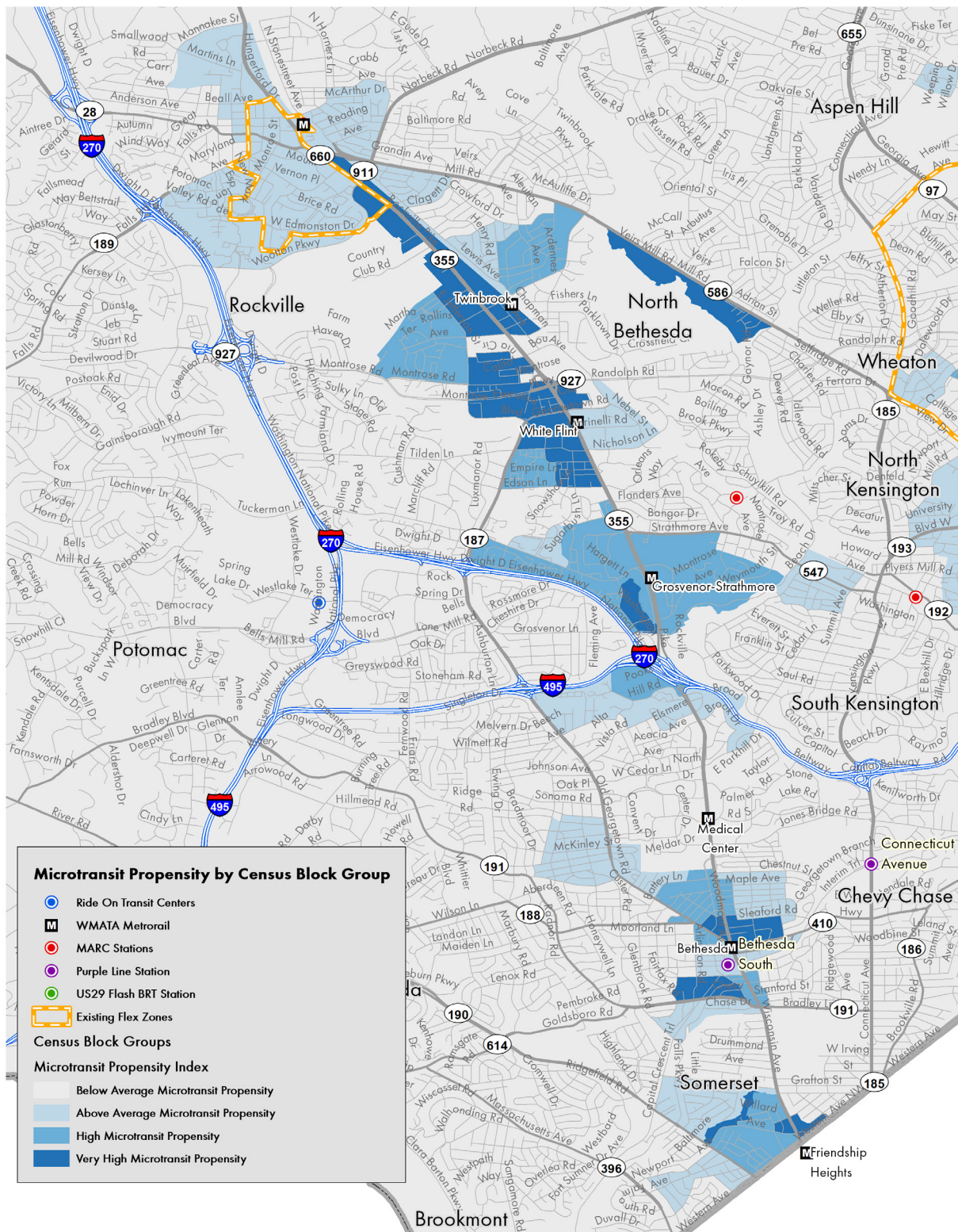
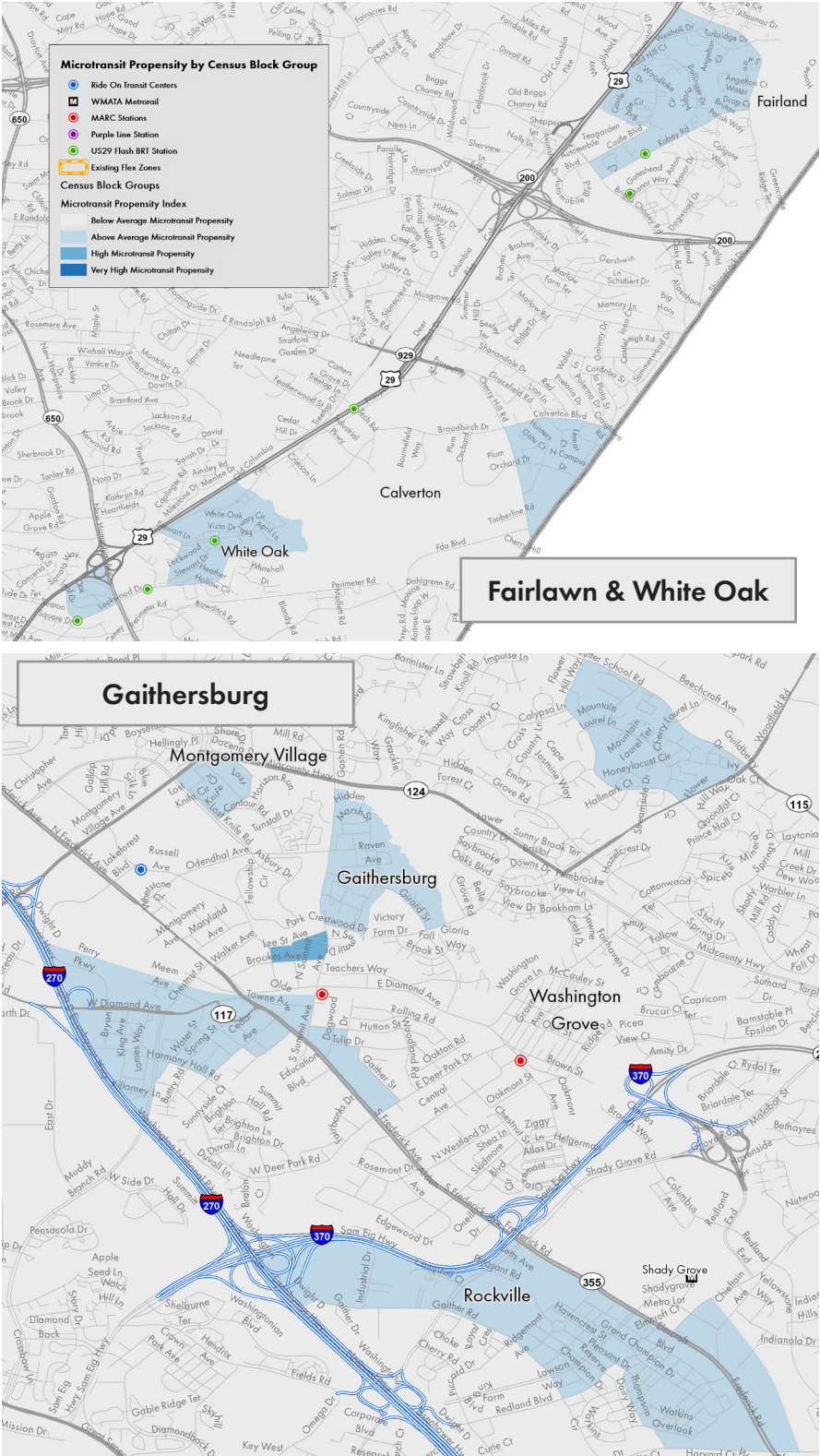


Figure 4-13: MPI Results in White Oak, Fairlawn, and Gaithersburg



Qualifying the MPI

The MPI was developed to determine which areas might be more predisposed to Flex service, and the results of this analysis are not meant to suggest that microtransit will succeed in areas with higher propensity and fail in areas with lower propensity.

After comparing the MPI in existing service areas to the average daily trips, in Figure 4-14, several discrepancies were found. For example, the area surrounding the Wheaton Metro Station has both high levels of average daily trips and an above average MPI. However, the residential areas surrounding the Glenmont Metro Station have greater daily ridership but score a below average MPI. These results could be influenced by the presence of super users in the block groups; their trip characteristics greatly increase the average in some block groups despite the lower population density.

Despite some shortcomings, the MPI analysis' identification of Metrorail stations as the most important connection for microtransit seems accurate based on the average daily trips in both the Rockville and Wheaton-Glenmont zones. The MPI is an imperfect - but useful - tool, and the results of the MPI analysis should be utilized in tandem with stakeholder interviews, community surveys, and performance data analysis to aid in the establishment and modification of microtransit zones.

Other Considerations

Beyond the MPI, other factors should be considered when designing new microtransit service zones. Different demographic, geographic, and infrastructure characteristics, as well as continued evaluation of existing zones, should inform the decision-making process. Other factors to consider when creating microtransit zones are summarized briefly in the following sections.

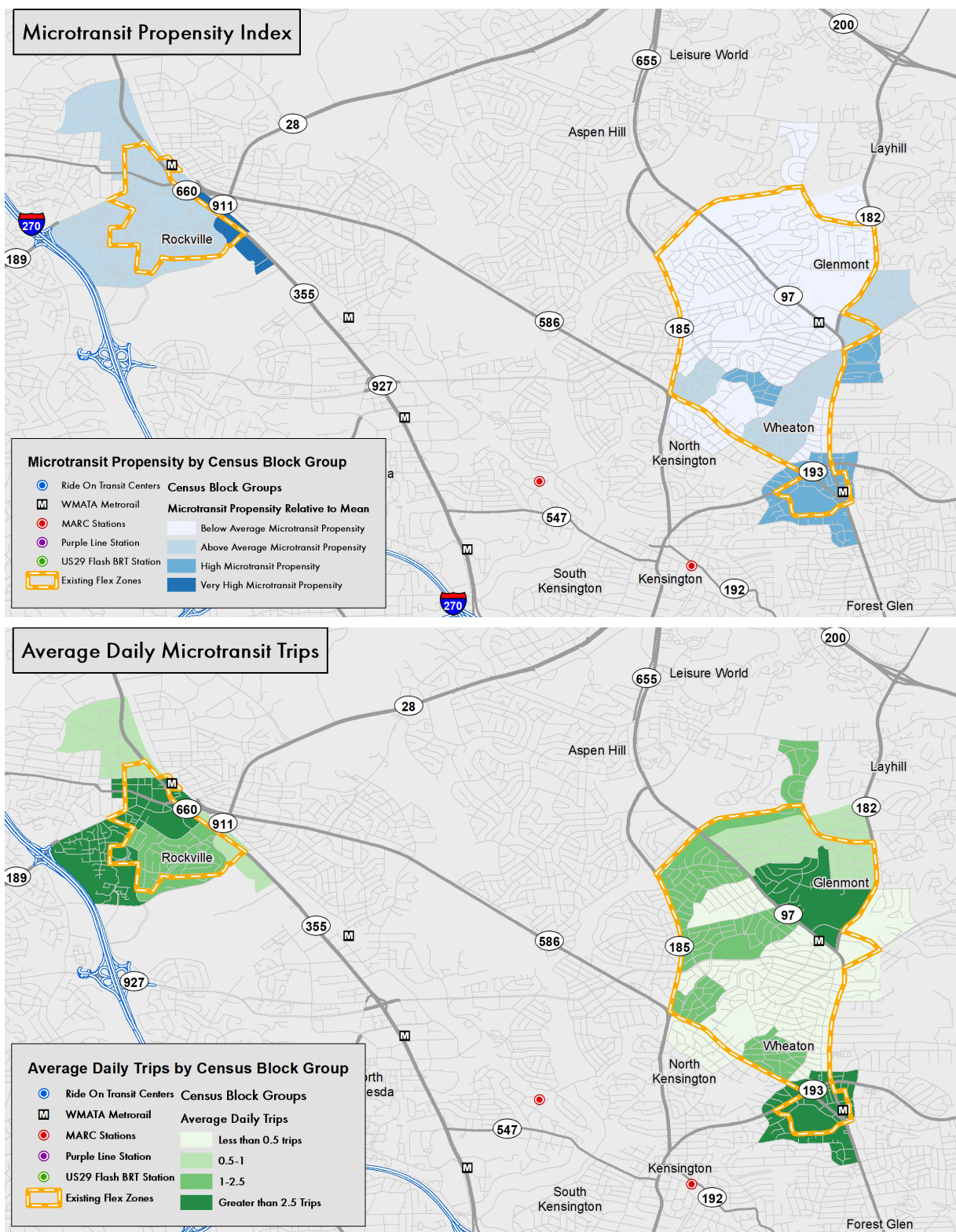
Demographic Characteristics

An area's demographics provide service planners with valuable information about whether an area is suitable for microtransit. Population density, household density, and access to a private vehicle are all included in microtransit propensity metric, but other demographic indicators should also be used. Microtransit service should be established with equity in mind. Analyzing the percentage of below poverty and minority populations can ensure the provision of equitable microtransit service in compliance with Title VI of the Civil Rights Act of 1964.

Geographic Characteristics

Determining how large a new service area should be requires a geographic land use analysis that identifies major trip generators that microtransit could efficiently connect to isolated residential communities. Since microtransit should first and foremost complement the high-frequency transit network, areas with major transit hubs were already prioritized in the microtransit propensity metric. Additionally, areas with shopping centers, educational facilities, and major medical centers should

Figure 4-14: Existing Flex Zones by MPI and Average Daily Trips



also be considered. MCDOT officials expressed a desire to have the Flex service be intertwined with various county facilities, including libraries, recreation centers, and parks.

Infrastructure Characteristics

Suburban development trends including gated communities, un-gridded street design, and limited sidewalk connectivity have hampered the efficiency of traditional fixed route services. These development patterns have occasionally had an adverse impact on fixed route ridership in some suburban neighborhoods. The Rockville and Wheaton-Glenmont service areas were drawn to supplement fixed route service and connect isolated neighborhoods to centralized transit hubs and shopping, medical, and educational facilities. Sidewalk connectivity and intersection density were used in the microtransit propensity metric, but other factors like traffic density could be used to determine where especially congested intersections and corridors are located. Microtransit could assist in alleviating congestion seen in some locations.

Performance Assessment

As the performance of existing microtransit zones is continuously assessed, new service considerations should take into account the characteristics of the highest performing microtransit zones. This should include the most common origins and destinations, hours of service, zone size, and number of vehicles. The demography and geography of existing zones should be analyzed and compared to other areas of the county. Areas that have similar characteristics may have potential for a successful microtransit service.