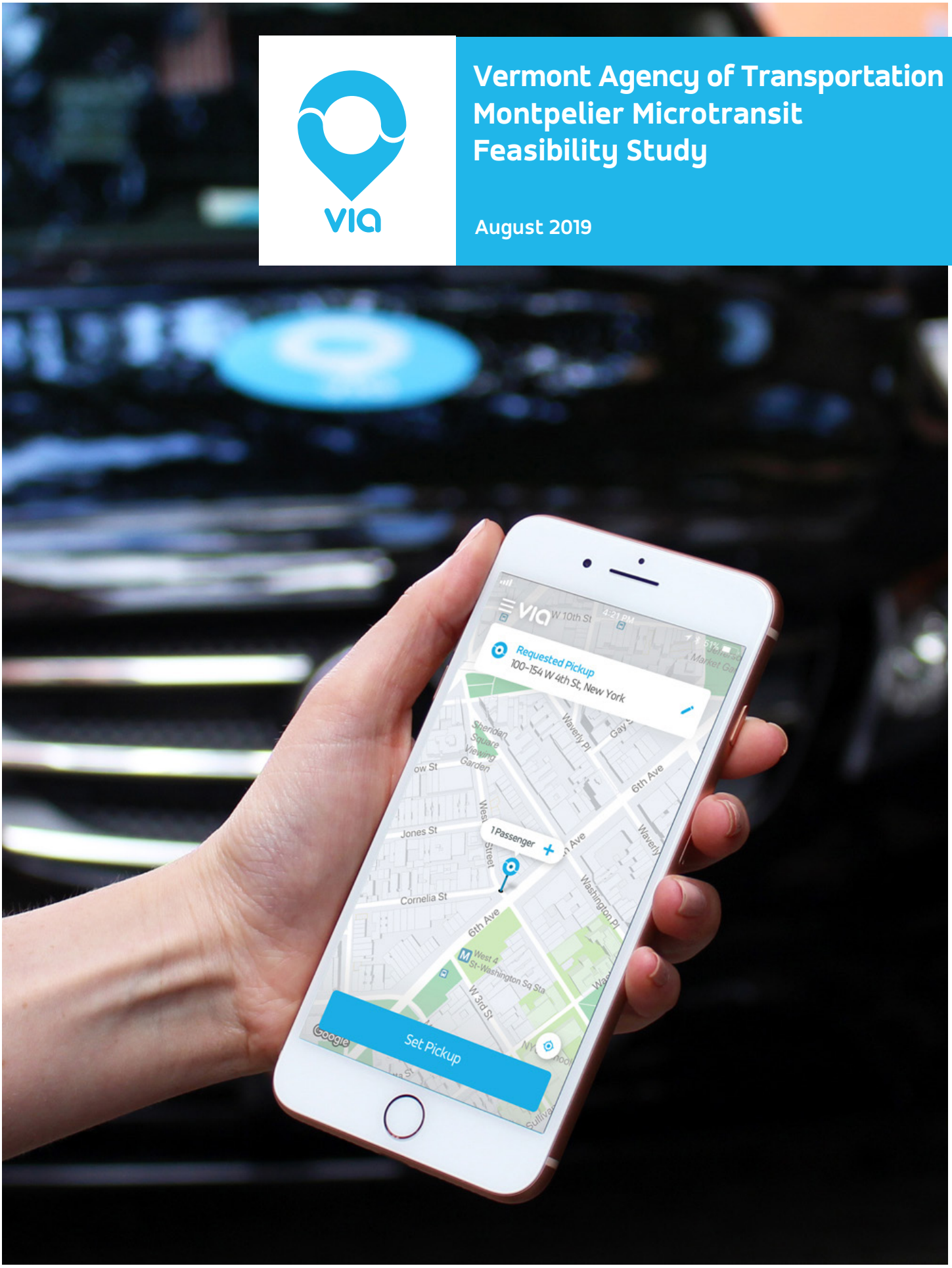
Vermont Agency of Transportation Montpelier Microtransit Feasibility Study

August 2019



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1. Executive Summary

The Vermont Agency of Transportation (VTrans) has carried out this microtransit feasibility study (the Study) to understand how shared, on-demand transit (microtransit) can successfully complement or replace fixed-route bus routes and specialized transportation services in Montpelier and surrounding areas. These fixed-route and specialized transportation services are operated by the Green Mountain Transit Agency (GMTA). In order to understand whether microtransit could expand the reach of sustainable, high-quality transit services to as many people as possible, VTrans engaged Via to analyze existing transit and specialized transportation ridership data, develop models from simulation of microtransit services, and determine fleet requirements for an efficient microtransit network. This Study explores opportunities for strategic deployment of microtransit technologies, and recommends next steps for VTrans and GMTA in Montpelier.

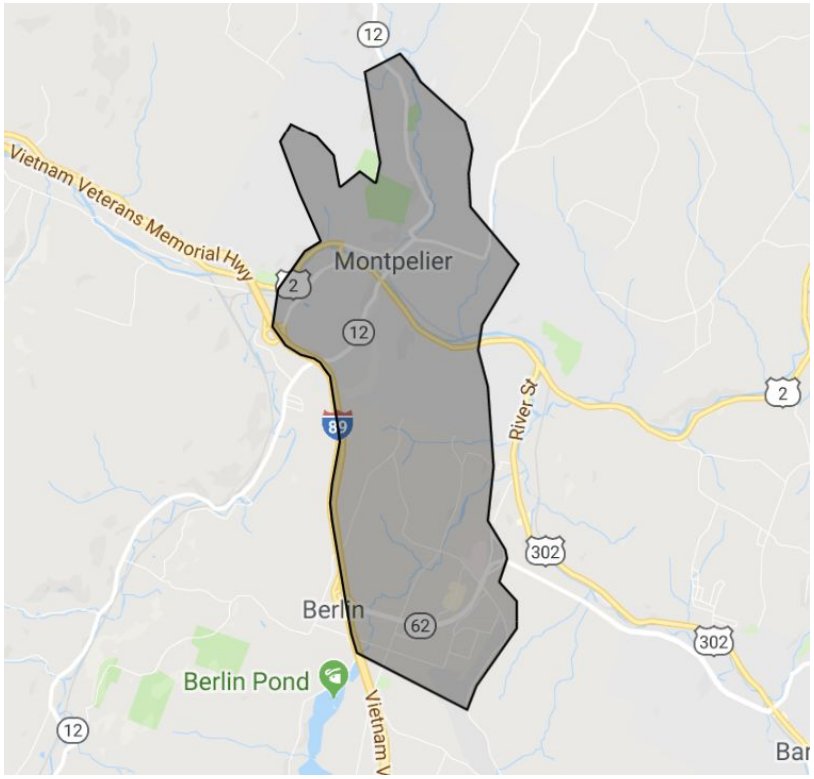
To understand how microtransit can be most effective in Montpelier, Via considered the following data:

- Historic fixed-route and specialized transportation ridership to understand base demand and travel patterns;
- Land-use, demographic, and economic data to further understand potential travel demand;
- Input and feedback from VTrans, GMTA, and the Montpelier Microtransit Working Group;
- Quality of service assumptions and service design parameters grounded in Via's experience planning, designing, and operating services in other markets; and
- OpenStreetMaps and Google Maps data including road layout, traffic speeds, and turn restrictions.

These data were analyzed and converted into inputs for Via's proprietary simulation tool. Via simulated permutations of several microtransit service scenarios, with a focus on understanding the different fleet sizes and service quality parameters that could be used to replace the fixed-routes in Montpelier, specialized transportation services in the area, or both. In addition to simulating existing riderships, Via also modeled high-demand scenarios, based on the expectation that a high-quality microtransit service may induce demand by competing with private vehicle travel.

On the basis of this analysis, we recommend using microtransit to replace the three fixed routes operating within Montpelier as well as the specialized transportation services that provide critical mobility to the disabled, elderly, and others with special requirements. In order to accommodate all existing riders and some growth, we recommend, at minimum a fleet of three to five vehicles, with the entire fleet in operation during peak hours. Our simulations indicate that a fleet of five vehicles

should accommodate peak-hour ridership of up to 35 trips per hour, in excess of the approximately 27 trips per hour taken during peak hours on the existing system.



For riders within the proposed 7.8 square mile service zone, a microtransit service will reduce wait times and journey durations, with the majority of riders waiting less than 15 minutes from the time they request a vehicle and travelling for less than ten minutes once their vehicle arrives. This should substantially improve rider experience, as current bus headways are up to an hour. Riders will also benefit from real-time vehicle tracking, automated payments, and more direct trips to their destinations.

Microtransit will improve quality of life for local residents, increasing access to healthcare, employment, educational institutions, businesses, and community centers.

2. Via Overview

Via plans, designs, and operates microtransit systems around the world. Microtransit technology enables customers to share rides by dynamically routing vehicles in real-time in response to demand. Using advanced algorithms, microtransit optimizes the balance between maximizing fleet utilization and ensuring that each rider has a high-quality experience.

2.1 Firm History

Via was founded in 2012 with a simple, yet highly ambitious mission—to deliver the world's most convenient and affordable shared rides to everyone, everywhere. Via delivered its first rides in 2013 in Manhattan, starting with just a handful of drivers. Identifying a gap in the transit network between the Upper East Side and Midtown Manhattan, Via launched as a shared, dynamic service that enabled commuters to reach work conveniently, and at a transit-comparable price. Via was the first transportation network company to offer shared, dynamic rides, and is still the most efficient and most advanced shared ride platform in the world—we provide more shared rides in New York City, for example, than Uber and Lyft combined.

2.2 Current Operations

Over the past six years, Via has become a world leader in planning, designing, and operating on-demand transit and new mobility services. Today, we are supporting on-demand and innovative transit solutions through over 80 partnerships with public agencies and institutions in more than 20 countries. Our core competencies are:

- **Microtransit Planning:** Via's proven service planning and alternatives analysis approach guides our clients through a structured microtransit planning process, broad enough to ensure no use-case opportunity is missed while detailed enough to produce a clear path to deployment, if desired. Our proprietary microtransit simulation tool, a core component of our service planning offering, allows Via to test permutations of the proposed service and clarify complex trade-offs between quality of service (QoS) and operational efficiency.

- **Microtransit Operations:** Since launch, our microtransit business has grown to provide over two million rides per month to over one million customers in both our partnership services in over 70 locations and in our consumer-facing services in New York City; Chicago; Washington, DC; Amsterdam; London; and Milton Keynes. To date, we have provided more than 60 million rides.

- **New Mobility Solutions:** In addition to Via's microtransit platform, we have developed expertise in new mobility solutions including Mobility-as-a-Service (MaaS) technology and integrations, dynamic road pricing, tolling, demand management, autonomous vehicle routing and ridesharing platforms, and micromobility offerings. Via continues to develop technology and expertise as we seek to offer our partners a suite of fully-integrated, technology-enabled mobility solutions.

To support our growth and global operations, Via has a software team of 200 full-time professionals with deep experience in advanced algorithms, data science, digital mapping, database architecture, product management, and app development, and 300 full-time employees focused on operations, growth, member services, expansion, business development, and partner success.

Via's direct-to-consumer services are shown in the map above in light blue; Via partner deployments in dark blue; and Via's microtransit planning studies in orange.

3. Feasibility Study Methodology

The purpose of this Study is to understand if microtransit is feasible in the Montpelier area, and, if so, how different service design parameters will impact the performance of the microtransit network. Via's approach to the Study included:

1. Working with VTrans and GMTA to understand the goals of the Study;
2. Reviewing ridership data and interviewing VTrans and GMTA staff to better understand existing transit and specialized transportation ridership data, as well as other drivers of potential demand for microtransit services in the Montpelier area;
3. Projecting demand;
4. Simulating scenarios to determine if microtransit is a cost-effective and feasible alternative to fixed-route transit in the Montpelier area; and
5. Generating different microtransit service scenarios using simulation outputs and making recommendations as to the feasibility and potential operation of microtransit in the Montpelier area.

3.1 Understanding Goals

Microtransit can achieve a number of goals for transit agencies, including:

- Providing transit in previously underserved areas (transit deserts)
- Providing suburban mobility
- Retiring under-performing fixed route services
- Providing first- and last-mile connections to fixed route services
- Mitigating traffic congestion
- Reducing parking congestion
- Upgrading a paratransit offering

VTrans and GMTA indicated two primary goals for a microtransit service: 1) increasing ridership and improving the quality of service for three existing fixed route services in the Montpelier area; and 2) upgrading existing specialized transportation services and, to the extent feasible, providing both general and specialized transportation services using the same fleet.

3.2 Reviewing Existing Conditions

Via worked with VTrans and GMTA staff to define a proposed microtransit service zone that included the areas served by the three fixed-route services of interest. Care was taken to ensure that major employers, commercial areas, healthcare providers, and other points of interest were included in the service zone. Agency staff provided ridership data for both fixed-route transit and specialized transportation, along with information on the operation of these services.

3.3 Projecting Microtransit Demand

For Via's microtransit simulations, demand was modeled as the **volume and distribution of ride requests** over a given period of time. For this report, historic fixed-route and specialized transportation ridership was used to project demand (see Existing Conditions and Demand for more details). Real-world ridership will depend on a wide range of factors, some specific to the Montpelier area, others dependent on operational elements like marketing budget or quality of service goals. These factors include:

- Travel patterns
- Alternative modes of travel (e.g. availability of buses, taxis, bicycles)
- Demographics (e.g. age, income, access to vehicles, mobility characteristics, mode choice)
- Pedestrian infrastructure
- Seasonality of demand (e.g. tourist season)
- Employment density
- Residential density
- Retail and entertainment density
- Fare structure
- Parking availability
- Marketing budget and effectiveness
- Weather conditions
- Congestion levels

Via benchmarked against quality of service at peak hours, when demand is highest, in order to accurately guide fleet size requirements. During off-peak hours, the full fleet would not be required.

3.4 Simulation Overview

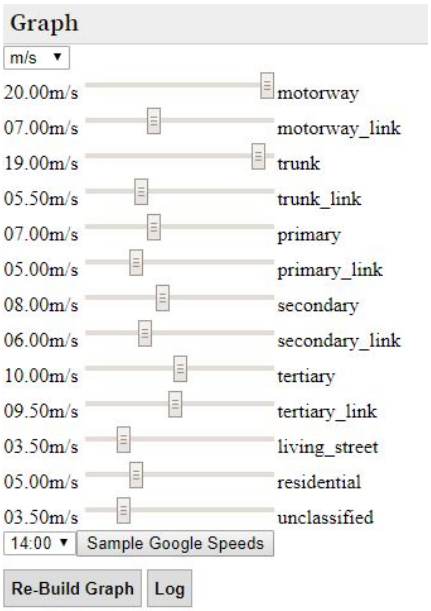
Microtransit simulations were conducted to determine the quality of service based on different fleet sizes, demand scenarios, and service areas. This highly technical exercise leveraged Via's microtransit simulation tool, which predicts how different zones and fleet configurations will perform as real microtransit services. This process is described below:

1. **Uploaded microtransit service zone options.** The origins and destinations of all trips are limited to these zones. Different zones were tested in order to understand how zone boundary changes impacted overall service performance.

2. **Generated underlying road map** by pulling data within the service zone boundaries from OpenStreetMap, including all roads categorized by type, turn restrictions, and street walkability and drivability information.

Screenshot of Via's simulation tool, showing a potential microtransit zone (outlined in blue) and three "terminals," which are discussed below. The red lines show roads, with different widths representing different road classifications, each with a different traffic speed.

3. **Determined traffic speeds** by querying Google's Maps APIs for traffic speeds specific to the time of day during which the service is being simulated. This ensured that wait times and trip times of the simulated service reflect real-world traffic data at the time of day for which service is being modeled.



Screenshot of Via's simulation tool, showing the different road types in a microtransit zone. Each road type has a different average vehicle speed, taken from Google's Maps API based on the selected time of day.

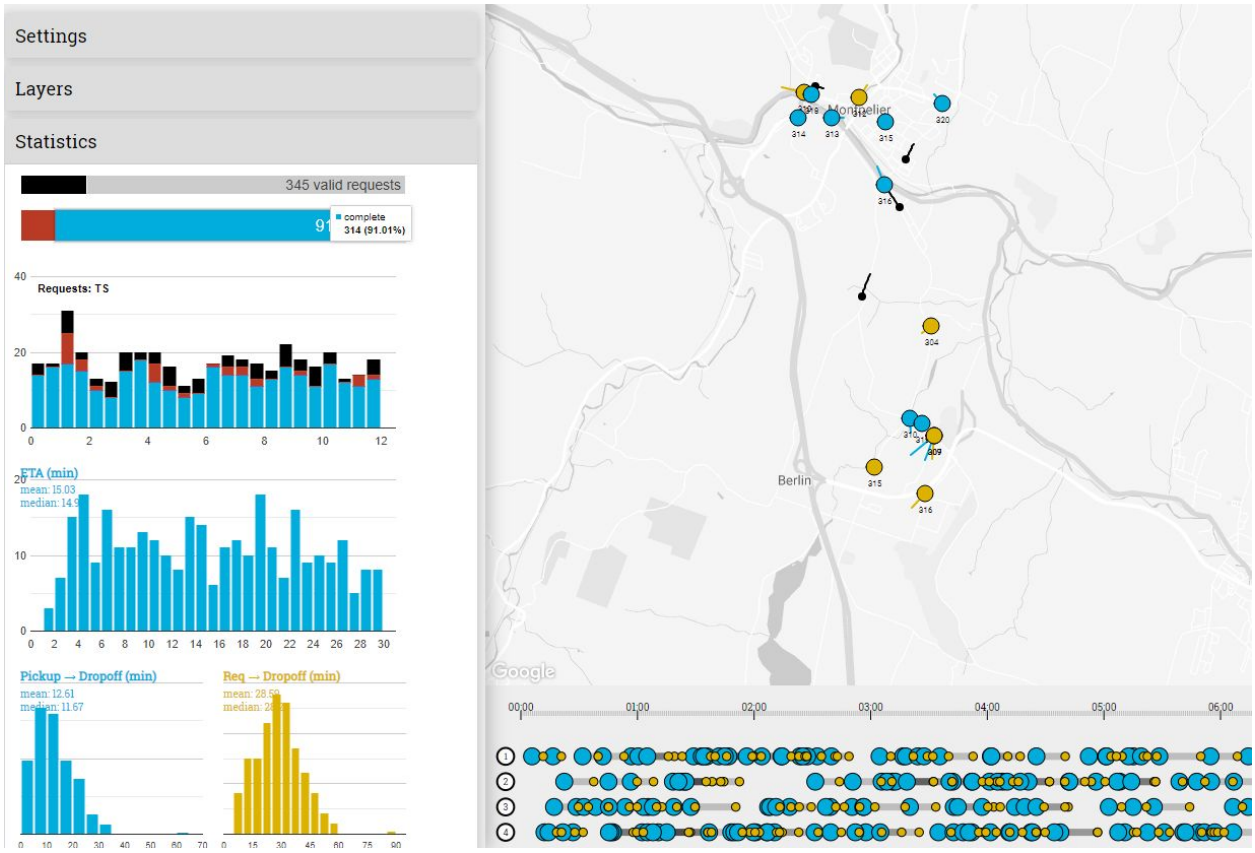
4. **Set "terminals"** to designate staging areas for vehicles that do not have active ride assignments. Terminals are safe parking areas that are distributed throughout the service zone. When empty, vehicles are routed to the terminal where the system has predicted demand. This ensures that each vehicle is used efficiently and that passengers benefit from the shortest possible wait times.

5. **Generated "Virtual Bus Stops"** to determine safe places for pickups and drop-offs. Virtual Bus Stops were generated throughout the zone, at points where vehicles can safely park. Virtual Bus Stop generation considered unique features of the zone, such as the pedestrian walking map, no parking/standing areas, and bus stops.

6. **Input demand scenario(s)** to simulate the number and types of trip requests we expect to see in the zone. See Section 2.3, Projecting Microtransit Demand, for more details.

7. **Set simulation parameters** by determining the optimal configuration for achieving service quality and passenger aggregation targets. These inputs—like fleet size, vehicle capacity, optimal wait times, and walk distances to/from Virtual Bus Stops—are those we adjust most

frequently when creating and iterating upon a new service. After these variables were set, we performed a number of different simulations for each zone, testing how adjusting service parameters impacted the quality of service, capacity, and efficiency. A screenshot of the simulation tool is shown below.



Screenshot of a simulation performed using Via's simulation tool. The map displays routing, pickups, and drop-offs, while the dashboard left of the map displays key performance indicators including the number of requests, wait time distributions, and pickup and drop-off walking distance.

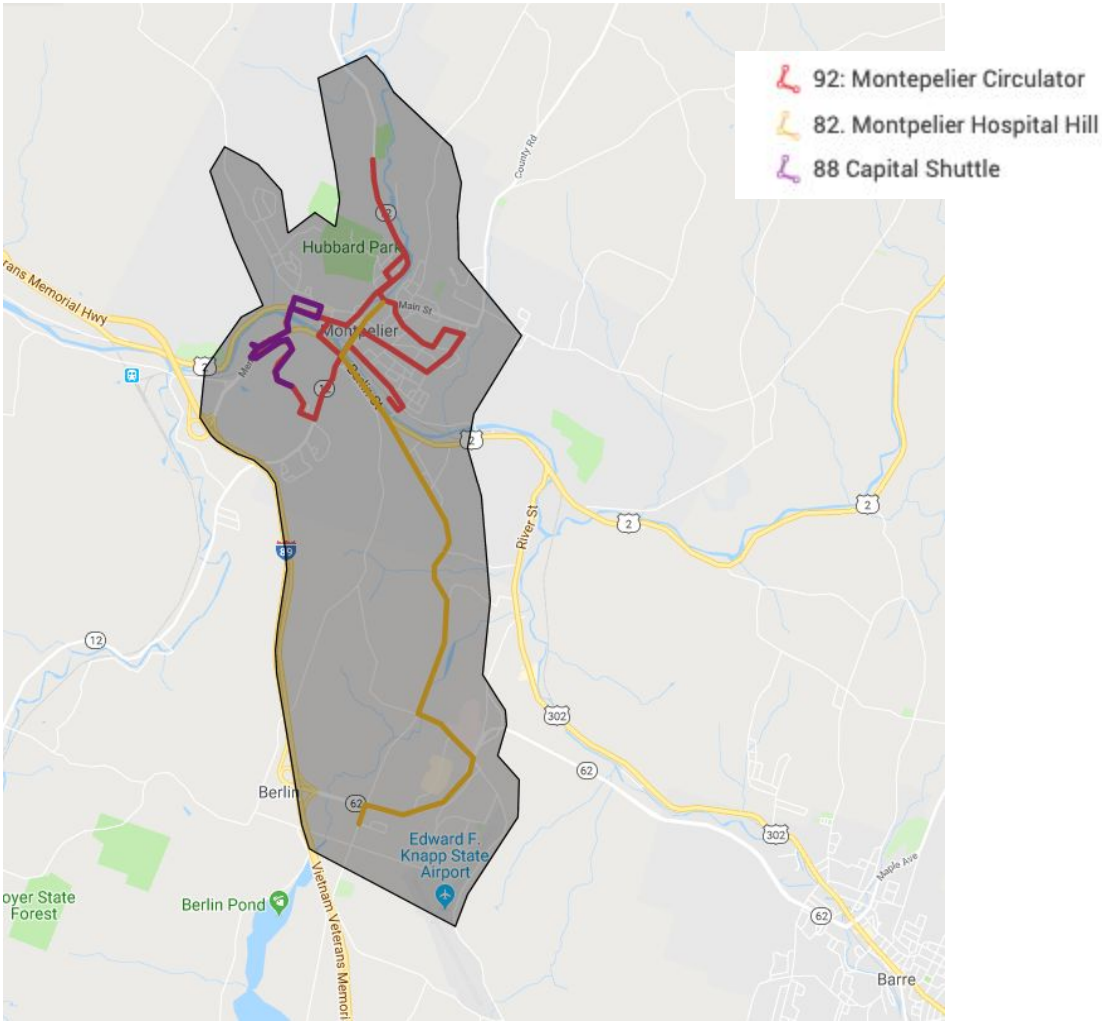
3.5 Scenarios and Recommendations

After completing a series of simulations, we determined the total microtransit fleet size necessary to accommodate the peak-hour demand associated with different average daily ridership scenarios, as well as minimum vehicle size, and approximate weekly vehicle hours, since the number of vehicles required to be on the road to provide a steady quality of service will vary with demand at different hours of the day and on different days of the week. On the basis of these scenarios, we were able to determine that microtransit is a feasible replacement for fixed-route transit and specialized transportation in the Montpelier area, and to recommend service parameters to VTrans and GMTA.

4. Existing Conditions and Demand

4.1 Fixed-route services

Montpelier, the state capital of Vermont, is located in Central Vermont, approximately 40 miles southeast of Burlington. The city has a population of approximately 7,500.[1] The proposed service zone also includes portions of Berlin, a town of approximately 3,000.[2] Major demand centers include downtown Montpelier, in the northeastern corner of the proposed service zone and Hospital Hill, at the southern end of the zone. Major employers in the proposed service zone include the State of Vermont, the Central Vermont Medical Center, and the headquarters of the National Life Insurance Company.



[1] U.S. Census Bureau
[2] Id.

At present, three fixed-route buses are operated by GMTA within Monteplier and between Montpelier and Hospital Hill. These are:

- **Route 92, Montpelier Circulator:** The Montpelier Circulator runs in two loops around downtown Montpelier, and will deviate up to one half of a mile from its route on request. In addition to the center of Montpelier, the circulator serves the Hunger Mountain Co-Op, the Community College of Vermont, the Montpelier pool and recreation center, and National Life. The bus takes one hour to run both loops, operates from Monday-Friday between 6:50 and 5:30, and is free.

- **Route 82, Montpelier Hospital Hill (MHH):** The MHH route runs from downtown Montpelier to Hospital Hill, providing connections to the Central Vermont Medical Center, Berlin Mall, the Berlin Shaw's, and at BlueCross Blueshield of Vermont at specific times and by request. The bus will deviate up three quarters of a mile from its route by request at least 24 hours in advance. The route runs with one hour headways on Monday-Friday from 7:16am to 6:16am and on Saturday from 8:16am to 6:16pm. The fare is $1.50.

- **Route 88, Capital Shuttle:** The Capital Shuttle runs in a loop between the Vermont Department of Labor, which is the site of a major parking lot, the Vermont Statehouse, and National Life headquarters. Deviations of up to one tenth of a mile are permitted on request. The Shuttle runs every 20 minutes, Monday-Friday from 7:20am until 5:25pm and is free.

4.2 Specialized Transportation Services

In addition to these fixed-route buses, GMTA provides several forms of specialized transportation in the Montpelier area. These services include:

- **Non-Emergency Critical Care Transportation:** Transportation for qualifying individuals to reach ongoing radiation and dialysis treatments.

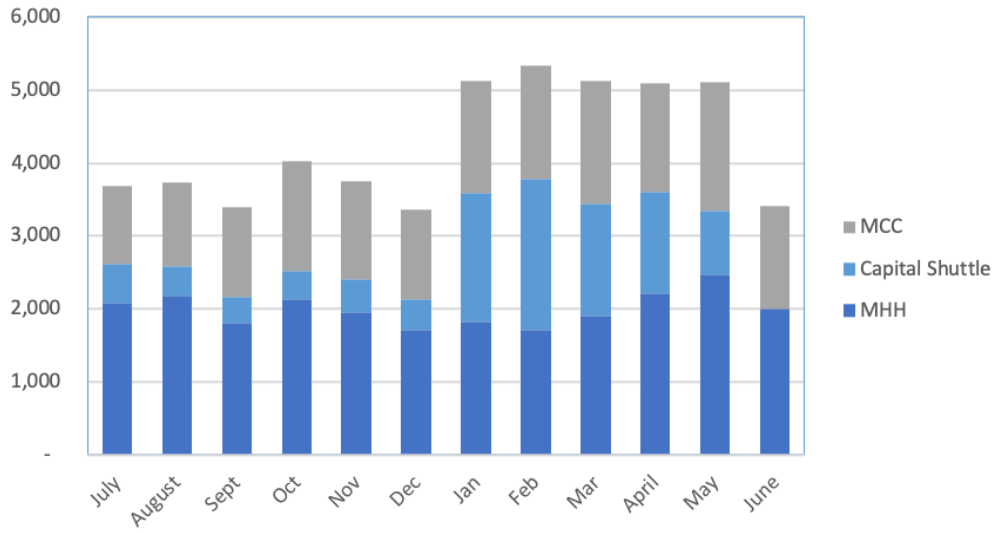
- **Elderly and Disabled Transportation:** Special transportation services for individuals who are 60 years of age or older and/or individuals with disabilities for non-Medicaid medical appointments, meal sites, senior centers, shopping and pharmacy trips, radiation and dialysis treatment and general daily needs.

- **Medicaid Services:** Transportation services for medicaid-eligible individuals for medically necessary and approved trips.

4.3 Estimating Demand

Via analyzed stop-level longitudinal transit ridership data for the Montpelier area fixed-route bus routes as well as origin-and-destination data for all specialized transportation trips in the Montpelier area. Transit ridership is approximately 20 percent higher during the legislative session (January through May).

Fixed-Route Ridership by Month

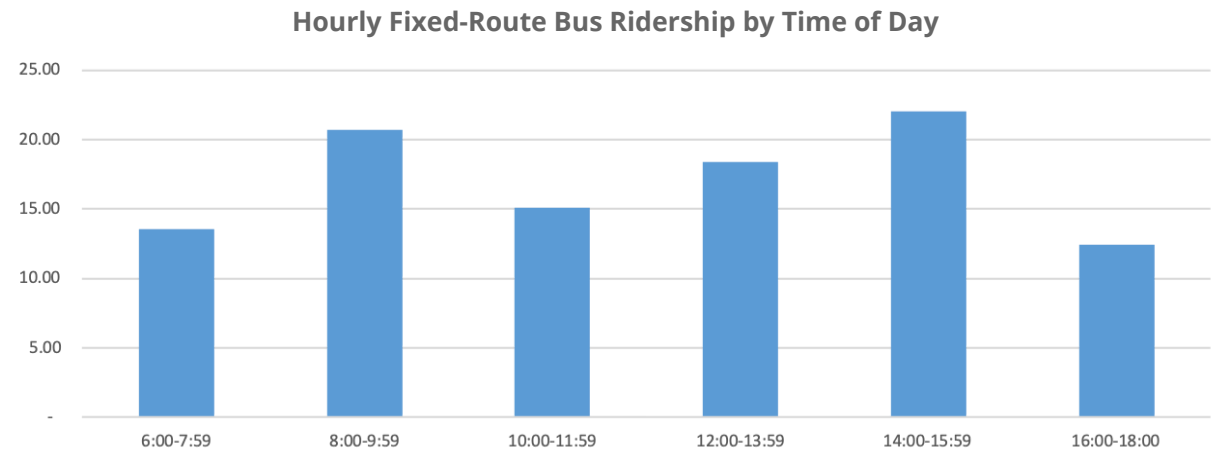


In addition, Via was provided specialized transportation data for trips in the Montpelier area November 30, 2017 through November 30, 2018. This data was filtered to include only trips within the proposed microtransit service zone (both origin and destination are inside of the zone), approximately 7,800 trips in total.

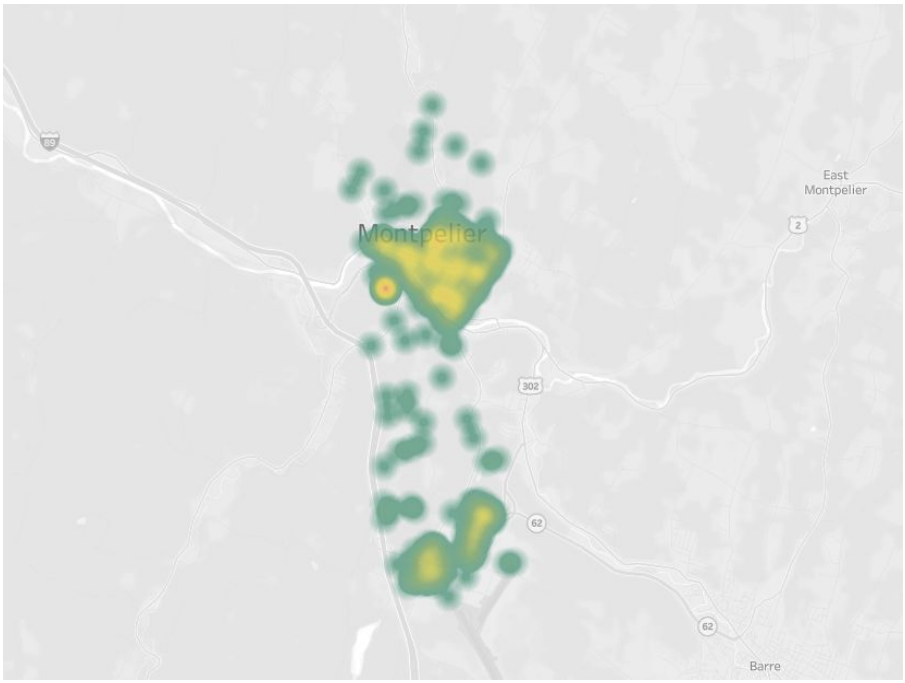
GIS analysis of specialized transportation OD data show that an average of about 20 trips a day are taken within the service zone. Many of these trips appear to be within the downtown Montpelier area or between the downtown Montpelier area and Hospital Hill—most likely for medical visits.

Existing Daily Ridership	**Average Day**	**Legislative Session**
	Trips / day	*Trips / day*
Fixed-route ridership	165	224
Specialized transit ridership	20	20
Total	**185**	**244**

Daily peak transit ridership is during the afternoon, between 2pm and 4pm. At this time, an average of 21 trips an hour are taken. Given the increase the approximately 20 percent increase in demand during the legislative session, it is assumed that peak-month, peak-hour demand is about 25 rides an hour. Specialized transportation contributes about 2 additional riders to this demand, for a total maximum peak-hour demand of 27 trips.



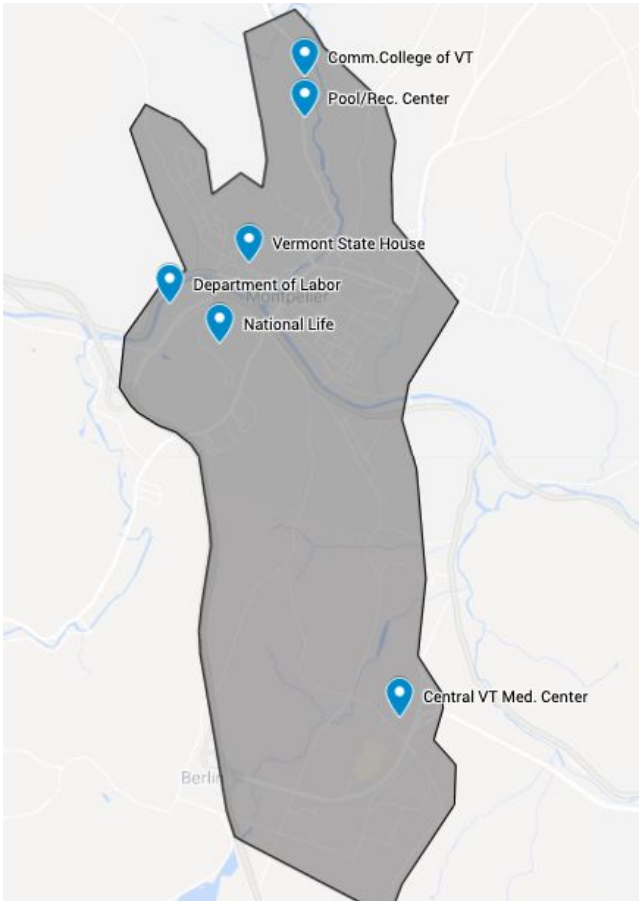
Approximately 40 percent of fixed-route travel is between Montpelier and Hospital Hill, 50 percent is within downtown Montpelier and between downtown Montpelier and National Life, and the remaining 10 percent is to and from other points.



A heat map of predicted trip origins and destinations. Yellow and orange indicate a high density of trip origins and destinations, while green indicates a lower density of origins and destinations.

5. Service Zone and Service Design Parameters

The proposed service zone was initially determined on the basis of input from VTrans and GMTA. It includes Hospital Hill, National Life, and downtown Montpelier, and extends north to the Vermont Community College. On the basis of feedback from the Montpelier Microtransit Working Group, the service zone was extended to the northwest to include Hubbard Park neighborhood. This service zone includes all of the areas served by the Montpelier Circulator, the Montpelier Hospital Hill bus, and the Capital Shuttle.



Via began by assuming the following service design parameters. In most cases, these service parameters establish outer bounds, and the average customer experience is characterized by much shorter walking distances, wait times, and detours than the maximum permitted. These parameters were informed by Via's experience operating similar services.

Design Parameter	Recommendation
Maximum pick-up / dropoff walk	400 meters, or approximately 6 minutes (average walking distances were significantly shorter, see Section 5, Simulation Results, for more details).
Maximum wait time	30 minutes (average wait times were significantly shorter, see Section 5, Simulation Results for more details).
Maximum detour	10 minutes. This means that no passenger riding in a given vehicle will experience a detour of more than 10 minutes.
Fleet Composition	Vehicles with either 12 or six seats. Most of GMTA's existing fleet of vehicles has 12 seats, while microtransit services deployed successfully in other areas sometimes use smaller, six-seater vehicles.

6. Simulation Results

The results of the simulations are shown in the following section. Four scenarios were modeled:

- Scenario 1: Fixed-Route Bus Replacement (**Existing** Demand)
- Scenario 2: Fixed-Route Bus and Specialized Transportation Replacement (**Existing** Demand)
- Scenario 3: Fixed-Route Bus and Specialized Transportation Replacement (**Medium** Demand)
- Scenario 4: Fixed-Route Bus and Specialized Transportation Replacement (**High** Demand)

Vehicle hours are provided for all scenarios to assist VTrans and GMTA in understanding the relative costs of different approaches to providing microtransit. Via assumes that the number of vehicles operating at different times of the day will be adjusted to meet demand, with the most vehicles operating during peak hours in the afternoon and a reduced fleet operating on Saturdays.

Scenario 1: Fixed-Route Bus Replacement (Existing Demand)

In order to replace the three fixed-route buses operating in the proposed service zone, microtransit service must be able to support a peak-hour ridership of up to 25 rides an hour within the quality of service parameters defined above. Via's simulation results indicate that a fleet of four vehicles can meet this level of demand. Three vehicles should be adequate at times of day when demand is lower. Should VTrans and GMTA elect to offer a more limited service on Saturdays or Sundays, a still smaller fleet might be sufficient. While this service could be provided using the existing GMTA fleet, smaller six-seater vehicles would also be adequate.

Daily Ridership	Peak-Hour Ridership	Vehicles	Vehicle Size	Vehicle Hours	Average Wait Time	Average Walk
Trips per 12 hour day	*Trips per hour*	*Number of vehicles*	*Seats per vehicle*	*Vehicle hours per week*	*Minutes from Request to Pickup*	*Meters from Request to Pickup Site*
225	25	3-4	6+	256	10-15	145

Scenario 2: Fixed-Route Bus and Specialized Transportation Replacement (Existing Demand)

In order to replace specialized transportation services within the proposed service zone in addition to the three fixed-route buses, a microtransit service must be able to support a peak-hour ridership of up to 27 rides an hour. In addition, specialized transportation trips often require longer pickup

and dropoff times, as rides may require more time to enter and leave the vehicle. Via's simulation results indicate that a fleet of five vehicles should be adequate to meet this level of demand, with four vehicles sufficing during most of the day even three vehicles sufficing during slower periods of the day.

Daily Ridership	Peak-Hour Ridership	Vehicles	Vehicle Size	Vehicle Hours	Average Wait Time	Average Walk
Trips per 12 hour day	*Trips per hour*	*Number of vehicles*	*Seats per vehicle*	*Vehicle hours per week*	*Minutes from Request to Pickup*	*Meters from Request to Pickup Site*
244	27	3-5	6+	266	10-15	130

Scenario 3: Medium Demand

While simulation results indicate that five vehicles are necessary to support peak-level demand for the combined ridership of existing fixed-route and specialized transportation services, a fleet of this size should also be adequate to support significant additional ridership if deployed throughout most of the day. This capacity may be important if access to microtransit service unlocks additional demand. A five vehicle fleet should be adequate to support up to 300 rides a day, and a peak-hour ridership of 35.

Daily Ridership	Peak-Hour Ridership	Vehicles	Vehicle Size	Vehicle Hours	Average Wait Time	Average Walk
Trips per 12 hour day	*Trips per hour*	*Number of vehicles*	*Seats per vehicle*	*Vehicle hours per week*	*Minutes from Request to Pickup*	*Meters from Request to Pickup Site*
300	35	4-5	6+	328	10-15	130

Scenario 4) High Demand

If demand for microtransit services greatly exceeds existing demand for transit and specialized transportation, or if VTrans and GMTA are interested in exploring operational alternatives, the agencies may choose to procure an operator that will provide microtransit services, including vehicles and drivers, under a Transportation as a Service (TaaS) model, explained further below in the Microtransit Operation Models section of this report. VTrans and GMTA should only pursue such a model if it allows for lower costs-per-vehicle hour than the existing model, in which case a larger fleet that can support increased demand of up to 400 may be feasible. This model is also highly scalable, should the agencies eventually be interested in increasing fleet size to support an enlarged service zone, or to meet higher levels of future demand.

Daily Ridership	Peak-Hour Ridership	Vehicles	Vehicle Size	Vehicle Hours	Average Wait Time	Average Walk
Trips per 12 hour day	*Trips per hour*	*Number of vehicles*	*Seats per vehicle*	*Vehicle hours per week*	*Minutes from Request to Pickup*	*Meters from Request to Pickup Site*
400	45	5-6	6	410	10-15	135

Summary of Results

The recommended fleet sizes for these different demand scenarios are shown in the table below. Microtransit becomes more efficient as the density of ride requests increases, meaning trips are more easily aggregated.

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Units
Ridership	225	244	300	400	*Trips / day*
Peak Hour Ridership	25	27	35	45	*Trips / hour*
Fleet Size	3-4	3-5	4-5	5-6	*Vehicles*
Vehicle Size	6+ Seats	6+ Seats	6+ Seats	6+ Seats	*Seats / vehicle*
Vehicle Hours (M-Sa.)	256	266	328	410	*Vehicle hours / week*
Average Wait Time	10-15	10-15	10-15	10-15	*Minutes from Request to Pickup*
Average Walk	145	130	130	135	*Meters from Request to Pickup Site*

Quality of Service

The table below provides more detail on the expected service quality for microtransit users in the Montpelier area.

Parameter	Quality of Service
Average Wait Time (ETA)	15 minute average wait times. Via simulated a service which reached all riders within 30 minutes.
Average Walk Distance	Average walk of 100 to 200 meters (1-2 minutes) for ambulatory passengers, with a maximum walk of 1,640 feet. Curb-to-curb service is provided for limited mobility and wheelchair passengers.
Average Ride Duration	10-15 minutes
Accessibility	Public microtransit services are fully accessible. Via assumed a minimum of one wheelchair accessible vehicle (WAV) in each scenario which will provide limited mobility passengers with equivalent levels of service.
Fare	Via recommends setting a fare marginally higher than the existing GMTA fixed-route bus fare of $1.50 and waiving this fare during a very limited trial period through either a general promotion or using discount codes.

Because improvements in convenience and quality of service can draw more riders into the transit network, the microtransit system may reach capacity during peak periods. Should the service prove so popular that users are turned away when requesting a ride, Via recommends a number of short-term solutions such as pricing incentives, booking eligibility restrictions, and other tools that ensure those who need the service most are prioritized, and the service is scaled in a cost-efficient way.

7. Microtransit Operating Models

VTrans seeks to understand how different the financial and service considerations of different operating models. Via has considered two alternatives:

1. **Software as a Service (SaaS):** In this model, the microtransit vendor provides the necessary microtransit technology, including the microtransit operating system and mobile applications, along with a full suite of tools and support services. This model is for agencies who prefer to use their own drivers, vehicles and dispatchers.
2. **Transportation as a Service (TaaS):** In this model, the microtransit vendor provides a turnkey solution that includes microtransit technology, plus drivers, vehicles, and operations management.

7.1 Software-as-a-Service (SaaS)

VTrans and GMTA may prefer to provide microtransit services using the existing GMTA fleet, drivers, and operations team. In this case, either agency may procure a microtransit platform solution. Depending on the solution the agencies select, ongoing service design and optimization, operational support, and customer service may be included. The advantages of this approach include the greatest continuity from existing fixed-route bus and specialized transportation services and limiting the necessity to reallocate vehicles and drivers to other routes or services.

It is recommended that any platform solution include, at a minimum, the following:

- Dynamic vehicle routing
- Passenger aggregation (sharing)
- Rider and driver apps
- Supporting for booking by phone, some form of cash payment for unbanked individuals, etc.
- Backend administrative tools
- Ongoing technical, operational, and marketing support
- Analytics tools and reporting

7.2 Transportation as a Service (TaaS)

VTrans and GMTA may choose to procure a vendor to provide microtransit services in the proposed service zone with a solution that includes provision of drivers and vehicles in addition to the underlying technology. Via does not recommend launching a TaaS service for a fleet size of less than six vehicles, due to the significant fixed costs involved in running such a service. The advantages of a TaaS solution include potentially lower hourly per-vehicle costs than current operations, as well as

scalability—a service could be launched with current service hours and a given fleet size and, as ridership grows, VTrans and GMTA could evaluate whether to increased fleet size and/or extend operating hours.

7.3 Operating Model Summary and Recommendations

Scenario	Weekly vehicle hours[3]	Annual Vehicle Hours	Estimated hourly cost	Estimated annual cost
Operating model	*Vehicle hours / week*	*Vehicle hours / year*	*Cost / vehicle hour*	*Cost / year*
Software-as-a-Service	266	14,000	$60-70	$840,000 - 980,000
Transportation-as-a-Service	266	14,000	$45-70[4]	$630,000 - 980,000

[3] Based on weekly vehicle hour estimates from Scenario 2
[4] Hourly vehicle costs are based on data from six similar microtransit services

8. Recommendations and Conclusions

Via's simulations indicate that microtransit can efficiently replace the existing fixed-route transit and specialized transportation services in the Montpelier area, providing a higher quality of service to existing GMTA riders. Further, a microtransit service will be easily scalable to accommodate increased levels of demand over time.

Four vehicles should be adequate to accommodate existing peak transit demand (approximately 225 riders a day, with a daily peak of 25 riders an hour). Specialized transportation (paratransit and demand-response) serves approximately 20 additional riders a day. Five vehicles with as few as six seats each should be adequate to support peak-hour, peak-month demand across existing transit and specialized transportation ridership, and should be capable of supporting a level of induced, additional demand as well, up to approximately 300 rides a day. With a sixth vehicle, a microtransit service could support a ridership of up to approximately 400 rides a day, or about double the average daily ridership today.