

Vermont Statewide Microtransit Study Final Report

Vermont Public Transportation Association (VPTA)
Vermont Department of Transportation (VTrans)

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Table of Contents

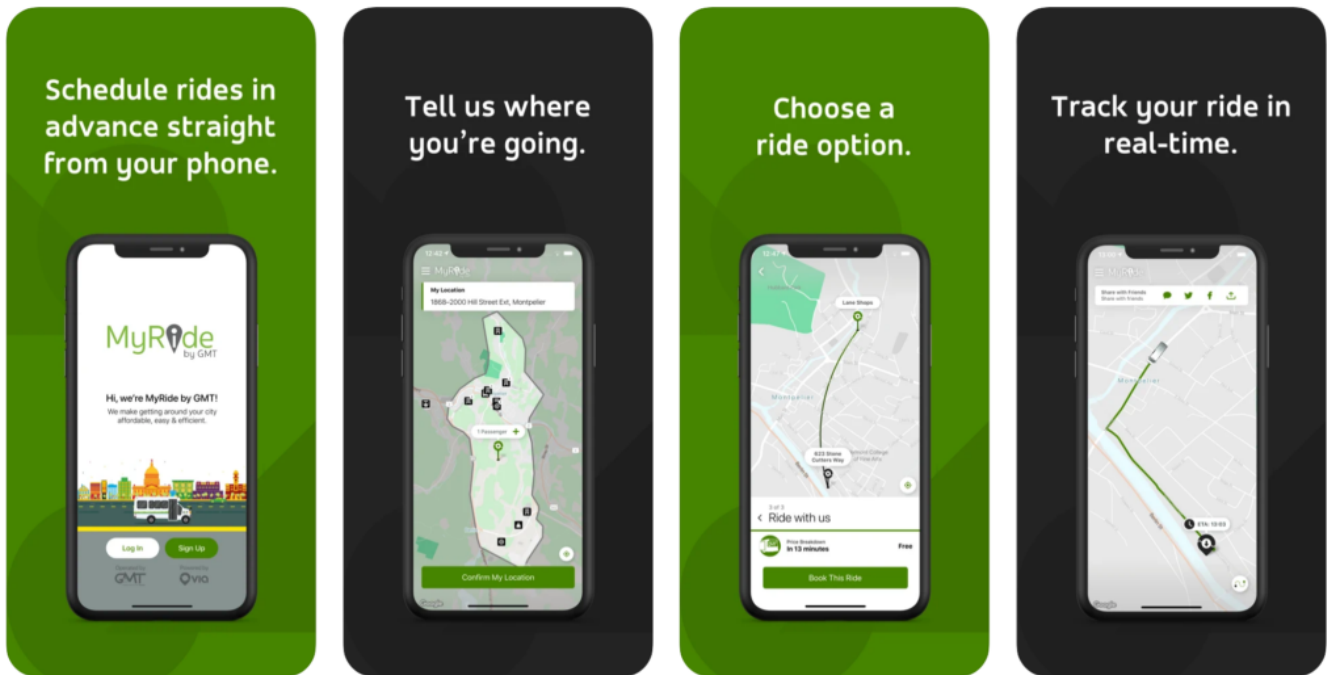
1. Executive Summary	3
1.1 Introduction to Microtransit	3
2. Methodology	6
2.1 Service Alternative Selection	6
2.2 Demand Estimates	6
2.3 Service Simulation	6
2. Summary of Projects	6
2.1 Barre (Green Mountain Transit)	7
2.2 Bennington (GMCN)	8
2.3 Brattleboro (MOOver)	9
2.4 Manchester (GMCN)	10
2.5 Middlebury (TVT)	11
2.6 Morrisville and Hyde Park (RCT)	12
2.7 Newport/Derby Line (RCT)	13
2.8 Randolph (TVT)	14
2.9 Rutland (MVRTD)	15
2.10 Springfield (MOOver)	16
2.11 St. Albans (GMT)	17
2.12 Windsor (MOOver)	18
3. Prioritization Table	19
4. Project Conclusions	20
4.1 Recommended Use-Cases in Vermont	20
4.2 Recommended Technology Features	23
4.3 Statewide Coordination	24
4.4 Other Recommendations	24

1. Executive Summary

This document summarizes the findings from the Vermont Public Transportation Association (VPTA) and Vermont Department of Transportation (VTrans) Statewide Microtransit Studies. In total, twelve studies were conducted across Vermont, investigating the potential for microtransit to serve diverse communities in areas covered by six different transit agencies. A memorandum summarizing the findings of each study has already been produced. The purpose of this report is to share a high level summary of the findings including recommendations for statewide coordination, common themes, and lessons learned.

1.1 Introduction to Microtransit

Microtransit, also known as on-demand transit, is a technology-enabled transit system that dynamically routes vehicles based on real-time passenger demand. While demand-response transit has existed for decades, often in the form of Dial-a-Ride and other paratransit services, microtransit has grown in popularity just in the last few years. The key difference is that microtransit is technology driven and encourages riders to book trips through a mobile phone app, allowing on-demand booking in addition to pre-booking. While the configuration of each microtransit service is different, typically, passengers are asked to walk a short distance to meet a vehicle (where it is safe to do so) to reduce detours and maximize the efficiency of the service. There are no fixed routes or pre-determined schedules. Instead, routing is based on where riders want to travel and when. Microtransit is often implemented using small buses or vans, and rides are shared as they are with traditional bus service.



GMT MyRide microtransit booking application

Microtransit services are typically open to anyone to use for any trip purpose. This is unlike some paratransit or other dial-a-ride services that limit trips to seniors or people with disabilities or to medical appointments. Microtransit can be used for shopping, recreational trips, regular work commutes, medical visits, or any other trip purpose. Wheelchair-accessible vehicles ensure the microtransit service is

accessible for people with disabilities. Microtransit can often complement an existing paratransit service by offering an alternative that has fewer restrictions such as advanced booking requirements, therefore reducing the demand for paratransit services.

Typically, microtransit services operate within a pre-defined zone, meaning passengers can only book trips where both their origin and destination are within the same area. For passengers who want to travel beyond the zone boundaries, microtransit can provide a first/last-mile connection to fixed-route buses or trains that connect beyond the zone boundaries. In this case, passengers will only be able to complete part of their journey using microtransit.

There are no predetermined routes or stops, meaning vehicles are scheduled and routed as trip requests are made. If there are no requests, vehicles usually have designated staging areas where they can wait until a new trip request is scheduled. These are determined based on the size of the zone and frequent ride request locations. This minimizes the amount of driving a vehicle does with no passengers on board.

Most services allow passengers to book a trip using a smartphone application, a website, and by calling a dispatcher. To book a ride, a customer indicates the number of passengers in their party and their desired pickup and dropoff locations. When booking using the app, passengers will see a map of the service zone where they can book rides. The application often highlights key destinations and transit hubs in the service area to encourage travel to these locations. Once the passenger submits a trip request, they are given a proposal that tells them when the vehicle will arrive and where to meet it. Typically, passengers must wait between five and twenty minutes for a trip, although this may vary depending on the level of demand and the number of vehicles available. Passengers can track the vehicle in real-time using the app. The passenger is also provided with vehicle information—for example: license plate, driver name, driver photo, and vehicle ID number. Passengers can usually cancel a ride at any time before pickup. However, last-minute cancellations may negatively affect other passengers, and thus a small fee is often charged to discourage cancellations. For trip requests made through a call center, passengers can choose to receive text message updates for their trips. Call center bookings also ensure the service is accessible to those without access to a smartphone.

Once the vehicle arrives, the driver confirms the passenger's details using the driver app. The driver app also allows for communication between the dispatcher and the driver, as well as turn-by-turn directions and the manifest of scheduled trip requests. The driver app is consistently refreshed and updated as new customers book rides.

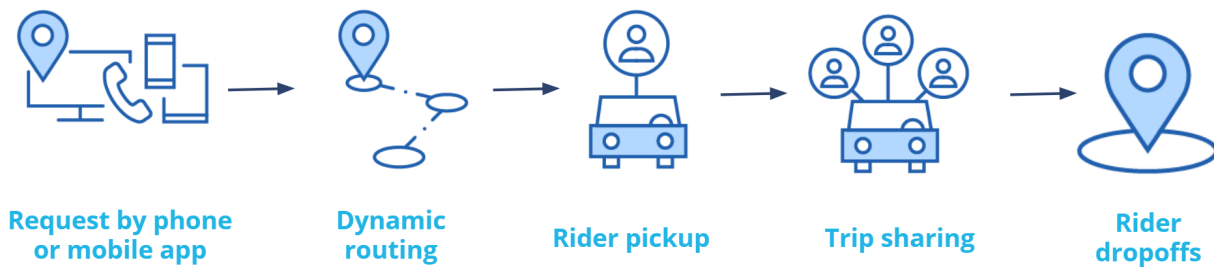
While some microtransit services are fare-free, others charge fares comparable to other public transit services. Passengers can pay for their trips using credit and debit cards, transit passes, cash, or vouchers (each agency must determine what payment methods will be accepted for its service and how much to charge). Options for people without credit cards or bank accounts are made available to ensure the service is accessible to all.

Once the passenger(s) has boarded the vehicle, they are driven to their destination. Along the way, the vehicle will pick up and drop off other passengers heading in a similar direction, but services are configured to avoid lengthy detours for passengers already on board. The passenger can continue to track their trip's progress using the app. Passengers may also be asked to walk a few minutes from their dropoff

point to their final destination. For passengers who are unable to walk, most services provide curb-to-curb service for these passengers or an alternative ADA paratransit service.

After each trip, passengers may be automatically emailed a receipt. Passengers may also be able to provide real-time and post-trip feedback through the app.

Some microtransit services offer pre-booked rides in which passengers select a window in which they would like to be picked up or dropped off in advance of their trip. Pre-booking can be helpful for those needing to travel for appointments or work shifts that are scheduled days or weeks in advance.



Microtransit customer journey

2. Methodology

2.1 Service Alternative Selection

Each Study included an analysis of existing conditions, such as an analysis of demographics in the area and an assessment of existing transit services (if any). Alternatives were developed on the basis of this analysis, with guidance from each agency partner along with VTrans. Typically, service alternatives were limited to a single town or community. However, in some instances, the project team elected to proceed with alternatives including multiple adjacent towns.

Microtransit alternatives were designed to improve local mobility and promote regional connectivity through transfers to other transit services where possible. Some service alternatives considered replacing, supplementing, or modifying fixed-routes, while others considered introducing transit to previously unserved areas. Alternatives were also developed with a consideration for the overall cost and scope of service, informed by agency guidance on the availability of resources to support microtransit.

2.2 Demand Estimates

Demand estimates were developed for each microtransit alternative. This is an important step to ensure that sufficient vehicles are available to complete all trips during peak hours. Demand estimates represent expected ridership for a zone. Low, medium, and high demand estimates intend to provide a range of possible future ridership levels, where medium demand is the most likely case scenario. Depending on the level of marketing and community support, it is likely to take 6-12 months for ridership numbers to grow.

Demand estimates were based on Via's internal demand model, along with our analysis of existing transit in the zone. This demand model compares these factors to other Via deployments in Vermont and globally, and compares factors such as restrictions on origins/destinations, zone size, setting (urban, suburban, rural), and density.

2.3 Service Simulation

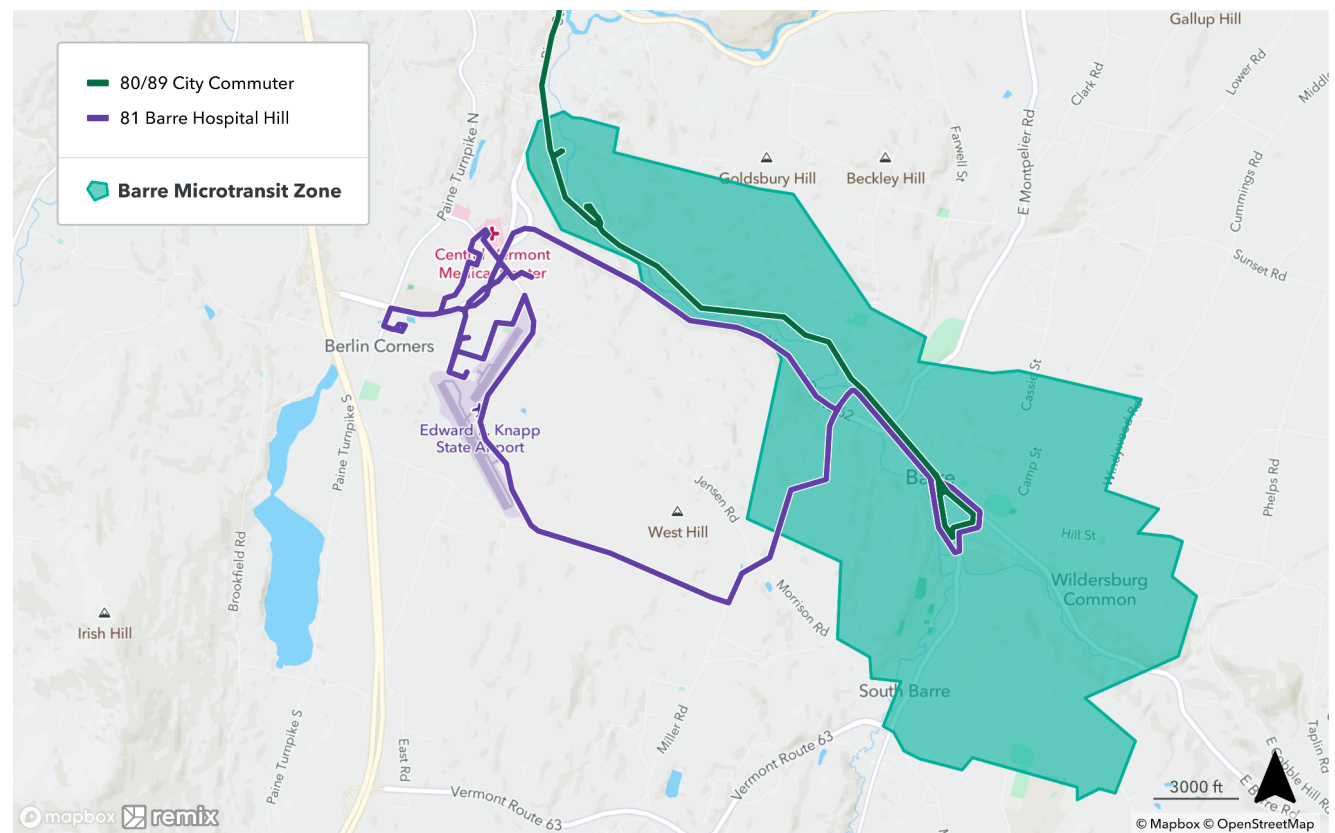
Using the demand estimates, the performance of each microtransit service alternative was simulated. Simulations helped clarify tradeoffs between factors including zone size, vehicle requirements, and quality of customer experience. Each simulation included outputs like the number of vehicles required to meet expected levels of demand, projected service efficiency (in terms of customers per vehicle per hour), and measures of customer experience (like average wait to pick up). Working with agency partners and VTrans, simulation results guided the selection of service models that strike a balance between coverage, quality of service, and service efficiency.

2. Summary of Projects

The study developed recommendations for twelve different communities across Vermont. The findings from each study are outlined in the table below:

2.1 Barre (Green Mountain Transit)

Service Zone



Study Overview

- GMT studied the potential for microtransit to expand service coverage in Barre. Service would provide trips around town, and facilitate FMLM connections to existing fixed-routes which provide service to Montpelier and Berlin Corners/Hospital Hill.
- The Study considered replacing Route 81 Hospital Hill with microtransit (and introducing a larger zone) but recommended beginning with a smaller zone (pictured above) and leaving route 81 in place as an initial step.

Existing Conditions

- Barre is a City of ~8,500 residents southeast of Montpelier.
- The City includes Hospital Hill, a major travel generator with shopping and medical destinations.
- GMT provides a microtransit service in Montpelier which includes Berlin Corners (and replaced a fixed-route formerly serving the area).

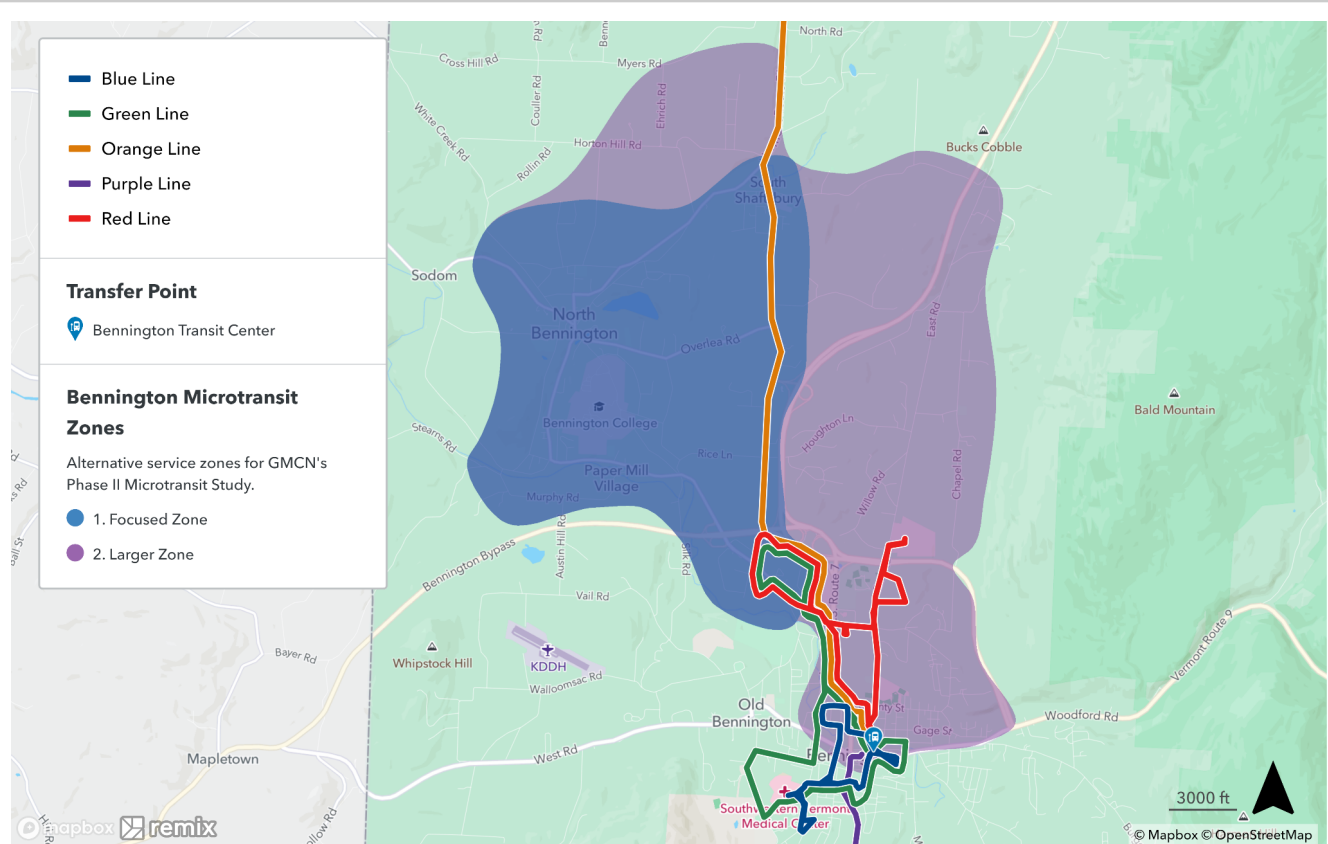
Key Estimates and Recommendations

A microtransit service capturing the Barre areas shown on the map above was most promising.

- Zone Size: 8mi²
- Daily Ridership: 70
- Annual Ridership: 23,000
- Fleet Size: 2 - 4 vehicles
- Budget: \$570,000 - \$1,100,000

2.2 Bennington (GMCN)

Service Zone



Study Overview

- Evaluated the potential for microtransit to replace its Brown Line, which provided service in areas North of the town center, including Bennington College.
- The Study investigated two zones which would meet these goals – one would provide service in a focused zone but allow trips to/from the Bennington Transit Center, and one would provide service in an expanded area.

Existing Conditions

- Manchester is a small town of ~4,500 full-time residents. The town is home to resorts and shopping outlets which attract tourists, especially during the summer season.
- Orange Line operates between Manchester and Bennington five times per day. Other transit agencies operate service between Manchester and Rutland (MVRTD) and Stratton Village (MOOver)

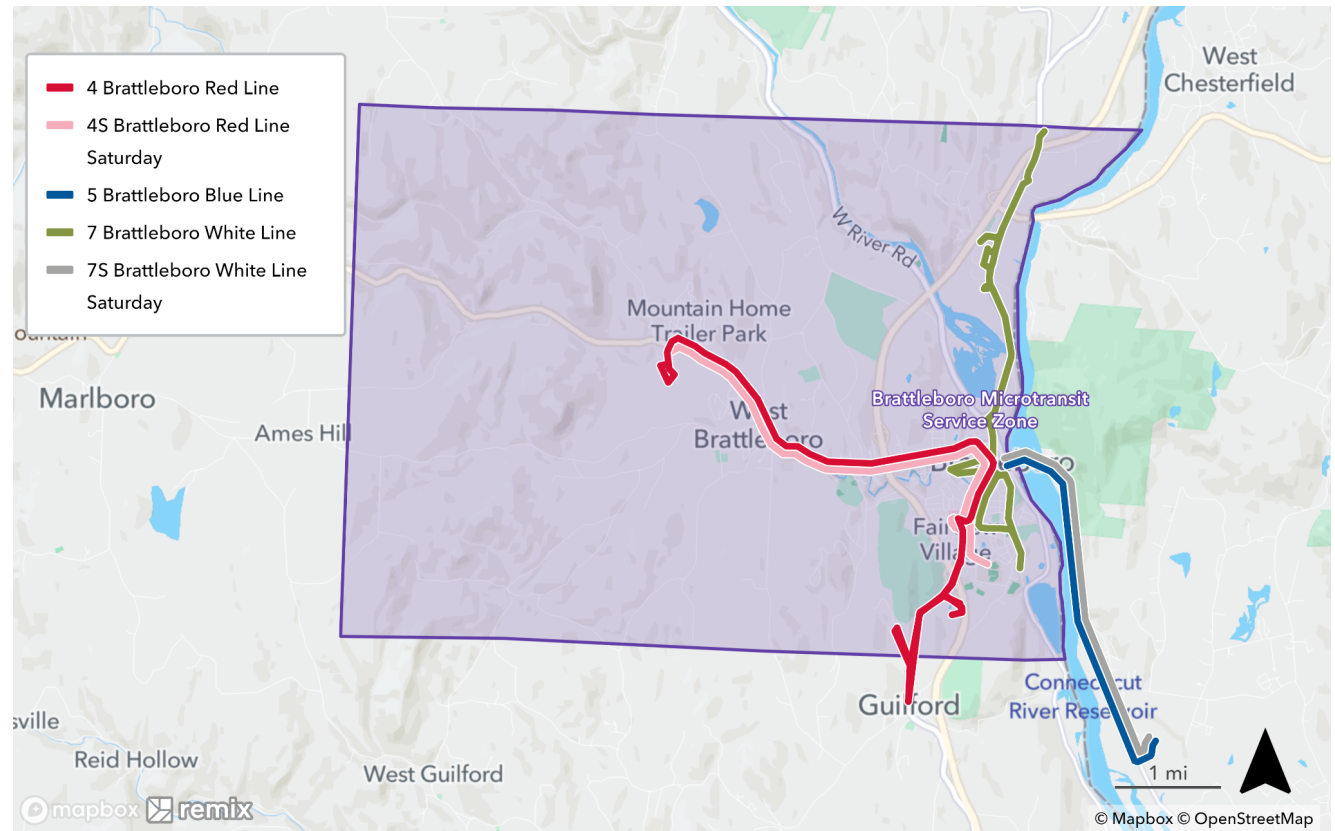
Key Estimates and Recommendations

The study recommended GMCN proceed with the largest service deemed financially feasible.

- Zone Size: 8mi²; 8mi²
- Daily Ridership: 25; 50
- Annual Ridership: 8,000; 15,000
- Fleet Size: 1 - 2 vehicles
- Annual Budget: \$225,000 - \$450,000

2.3 Brattleboro (MOOver)

Service Zone



Study Overview

- MOOver operates three local bus routes in Brattleboro during the daytime.
- This study explored supplementing daytime bus routes with a nighttime microtransit service, which would be provided by a single vehicle.
- A one-vehicle microtransit service could allow people to travel in the evenings, but may not have sufficient capacity for the expected demand levels.

Existing Conditions

- The Town of Brattleboro has a population of 12,200. Most destinations are located in the eastern portion of the town.
- Recent surveys found that employees at various large companies struggle to commute home from second and third shifts.
- Ridership and productivity are highest on the Red route, with 4,000 monthly riders and a productivity of about 12.5 boardings per vehicle hour.

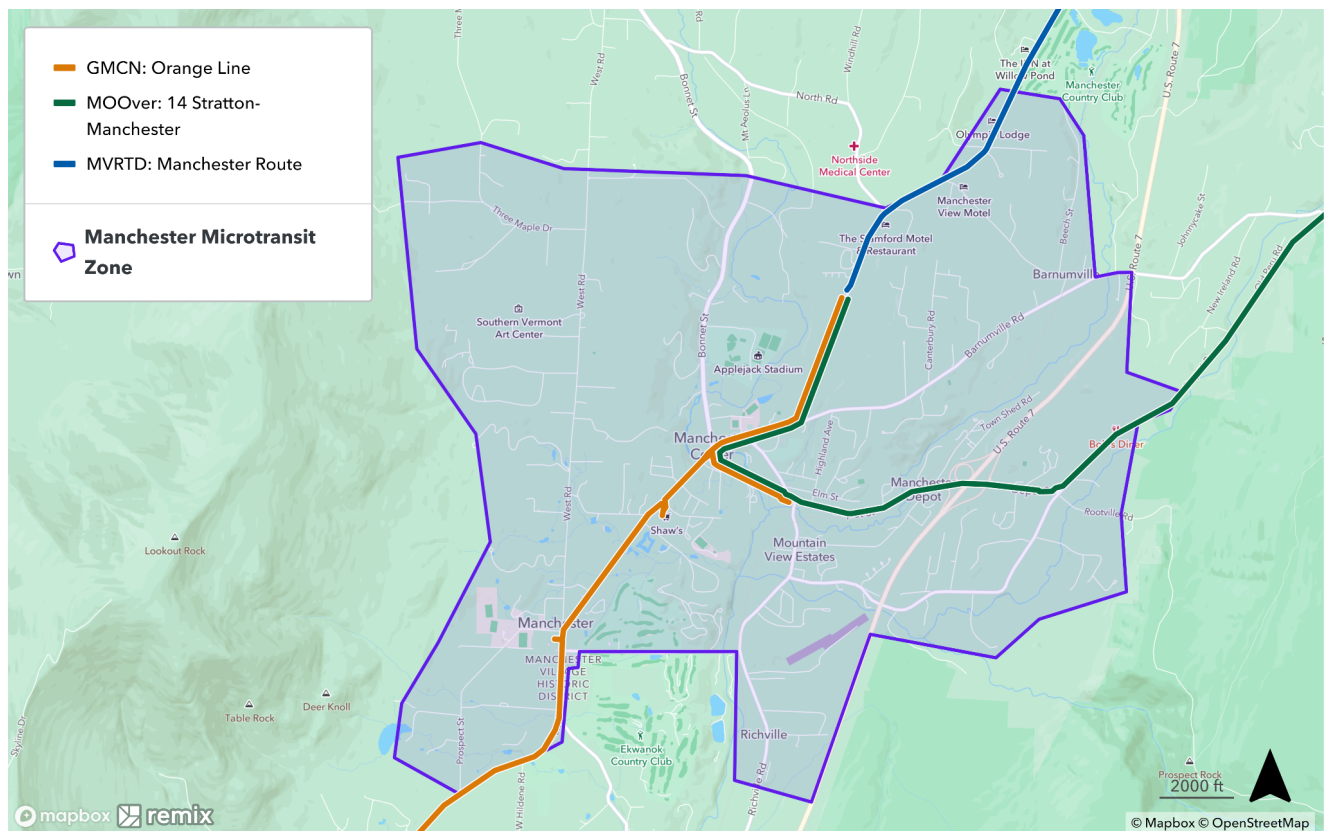
Key Estimates and Recommendations

The study recommended evening service covering the entire Town.

- Zone Size: 33mi²
- Daily Ridership: 17 - 29 (maximum capacity with 1 vehicle)
- Annual Ridership: 5,900 / year (maximum capacity with 1 vehicle)
- Fleet Size: 1 vehicle plus spares (assumed available supply)
- Annual Budget: \$100,000 - \$140,000

2.4 Manchester (GMCN)

Service Area



Study Overview

- GMCN used the study to evaluate microtransit as a local coverage option for Manchester Centre. The town was served by regional fixed-route bus service, but did not have any locally-focused services at the time of the Study.
- Service would provide local travel and FMLM connections to the Orange Line and other fixed-route services. VTrans plans to introduce a new park and ride at Manchester Junction, providing an ideal location for FMLM transfers

Existing Conditions

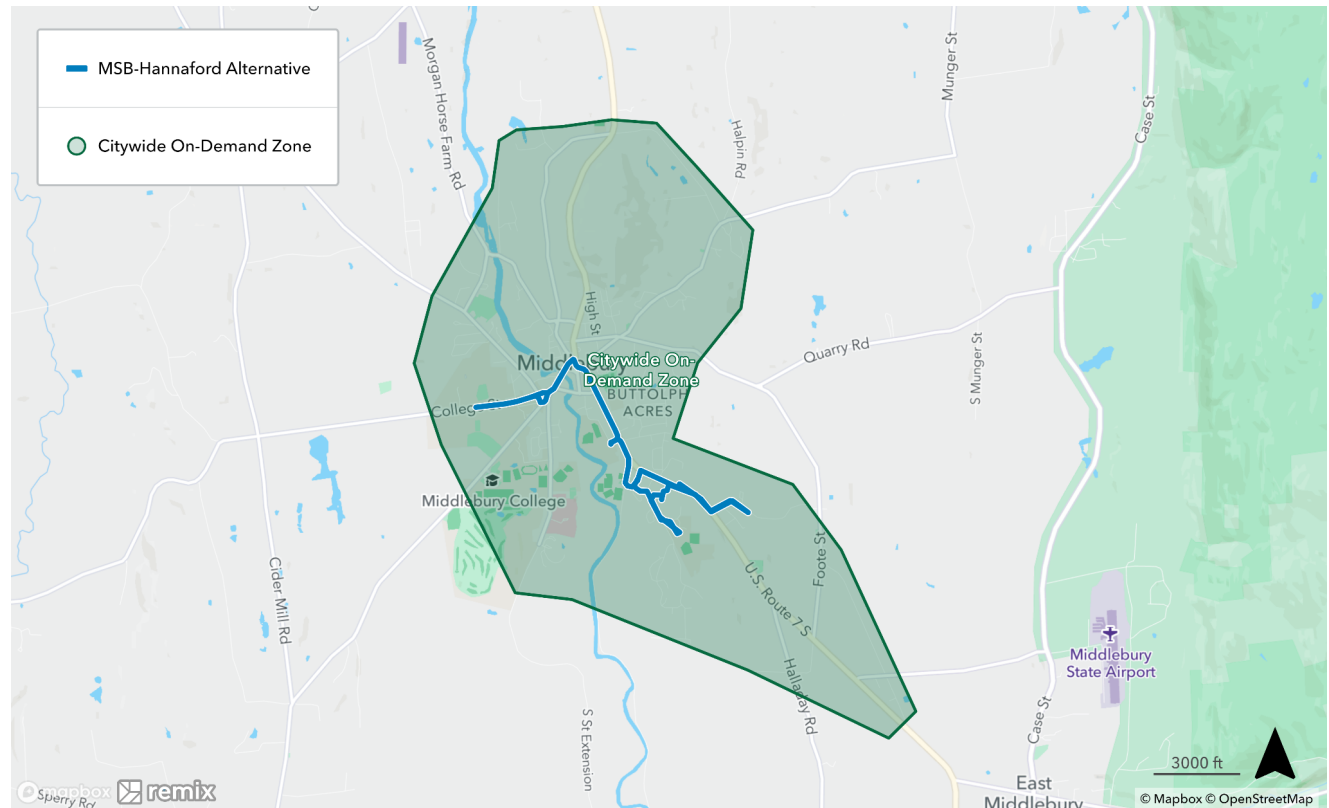
- Manchester is a small town of ~4,500 full-time residents. The town is home to resorts and shopping outlets which attract tourists, especially during the summer season.
- GMCN operates the Orange Line bus between Manchester and Bennington with five round trips per day.
- GMCN provides demand-response service in the area, but relatively few trips start and end within town. Most trips are to/from Bennington, and many trips are to/from a medical treatment center in North Adams, MA

Key Estimates and Recommendations

- Zone Size: 9.5mi²
- Daily Ridership: 30
- Annual Ridership: 9,500
- Fleet Size: 1 vehicle (plus spares)
- Annual Budget: \$180,000 - \$240,000

2.5 Middlebury (TVT)

Service Zone



Study Overview

- TVT investigated using microtransit to replace the four NW Middlebury bus routes that are all interlined using a single vehicle
- A second alternative that also explored a citywide microtransit service with adjustments to the Hannaford route was explored

Existing Conditions

- Middlebury is a small community of around 7,000 residents in Central Vermont.
- Addison County has 6 regional routes and 5 local routes in Middlebury (Middlebury Shuttle Bus, or MSB). The MSB currently provides transit throughout Middlebury. The regional routes primarily connect Middlebury, Vergennes, and Bristol, while also extending to Rutland and Burlington.

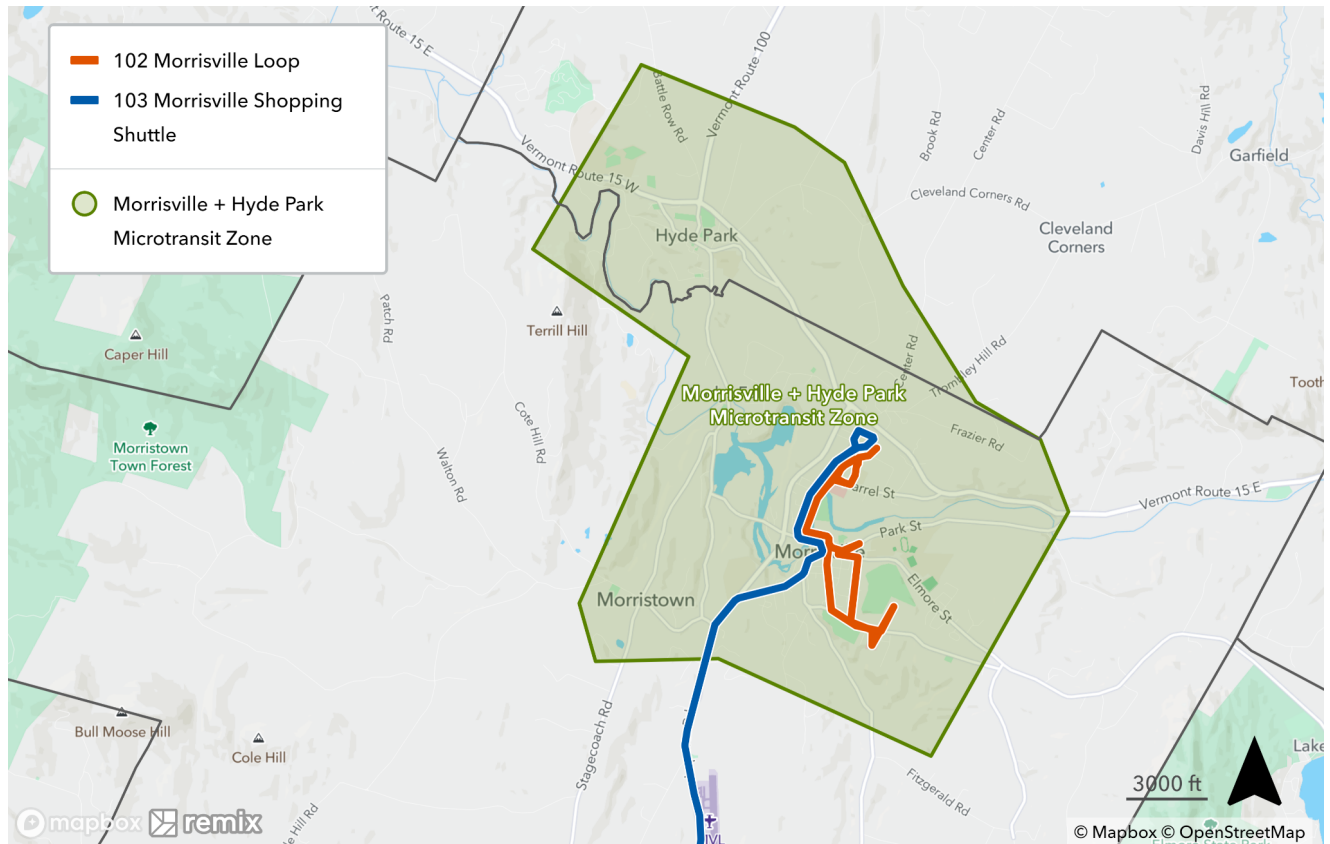
Key Estimates and Recommendations

The study recommended replacing the four NW bus routes with microtransit and potentially offering a citywide microtransit service with adjustments to the Hannaford bus route.

- Zone Size: 6.7mi²
- Daily Ridership: 120
- Annual Ridership: 30,000
- Fleet Size: 2 - 3 vehicles
- Annual Budget: \$420,000 - \$780,000

2.6 Morrisville and Hyde Park (RCT)

Service Zones



Study Overview

- RCT explored using microtransit to replace the Morrisville Loop and expand transit service to nearby areas such as Hyde Park
- The study recommended replacing the Morrisville Loop with a microtransit service. With just one vehicle, a microtransit service could cover all of Morrisville and extend to parts of Hyde Park.

Existing Conditions

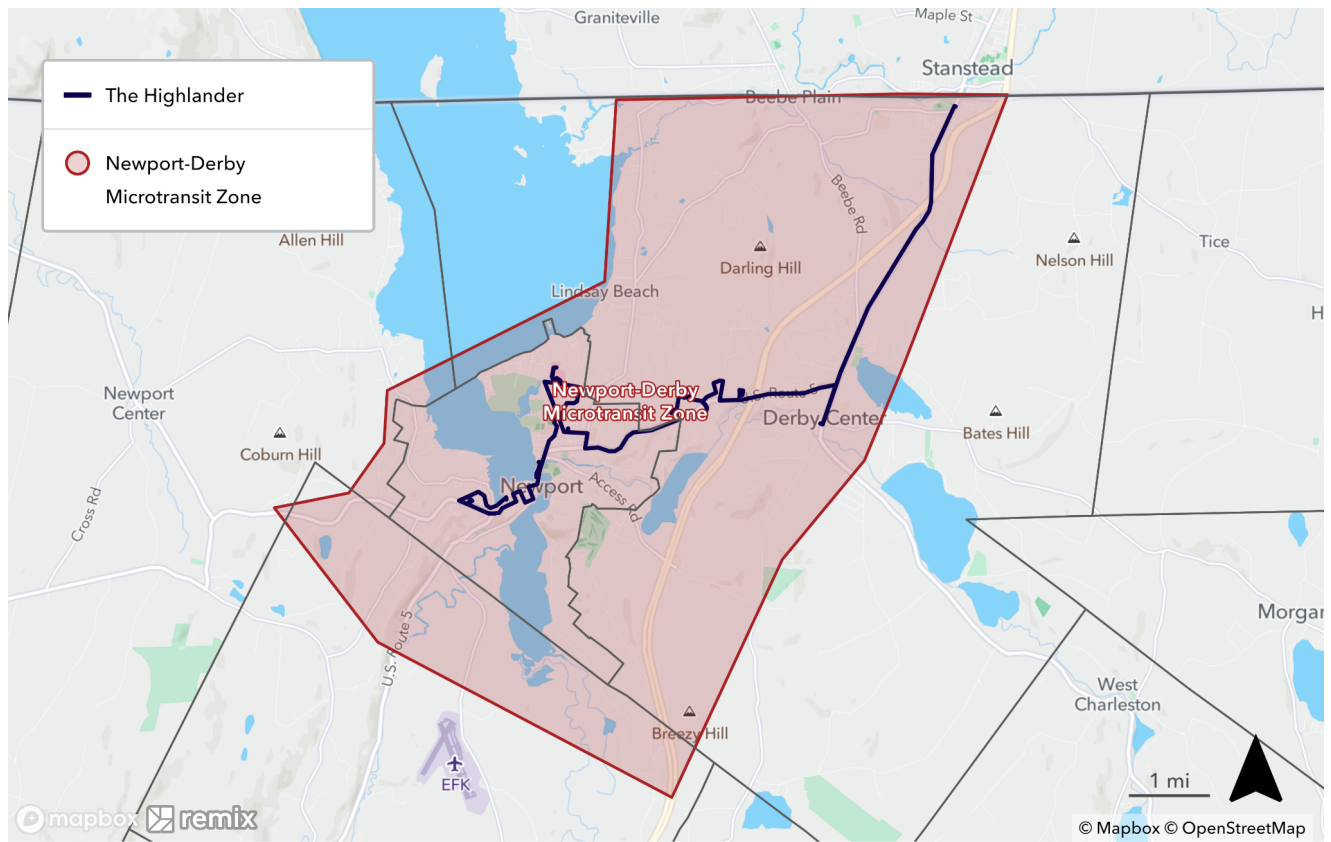
- Approximately 3,600 people live in the study area. Most of this population is in Morrisville (2,100 people).
- The only route entirely within the study area is the Morrisville Loop which operates on weekdays from 8:00 am to 10:20 am and 1:10 pm - 2:55 pm. The break in the middle of the day is used to operate one round trip of the 102 Morrisville Shopping Shuttle.
- There is no local transit service in Hyde Park.

Key Estimates and Recommendations

- Zone Size: 10mi²
- Daily Ridership: 45
- Annual Ridership: 11,500
- Fleet Size: 1 - 2 vehicles
- Annual Budget: \$175,000 - \$300,000
- RCT received funding from VTrans to pilot the service and is expected to launch in Spring 2023.

2.7 Newport/Derby Line (RCT)

Service Zone



Study Overview

- The Highlander Shuttle covers Newport City and Derby's most populated areas and operates with one vehicle.
- If funding is available, RCT could consider replacing the Highlander Shuttle with a Microtransit Service that expands into more areas of Derby and Newport.
- However, microtransit would require three vehicles to operate during peak hours and cost more than the existing Highlander service. It would increase coverage and ridership.

Existing Conditions

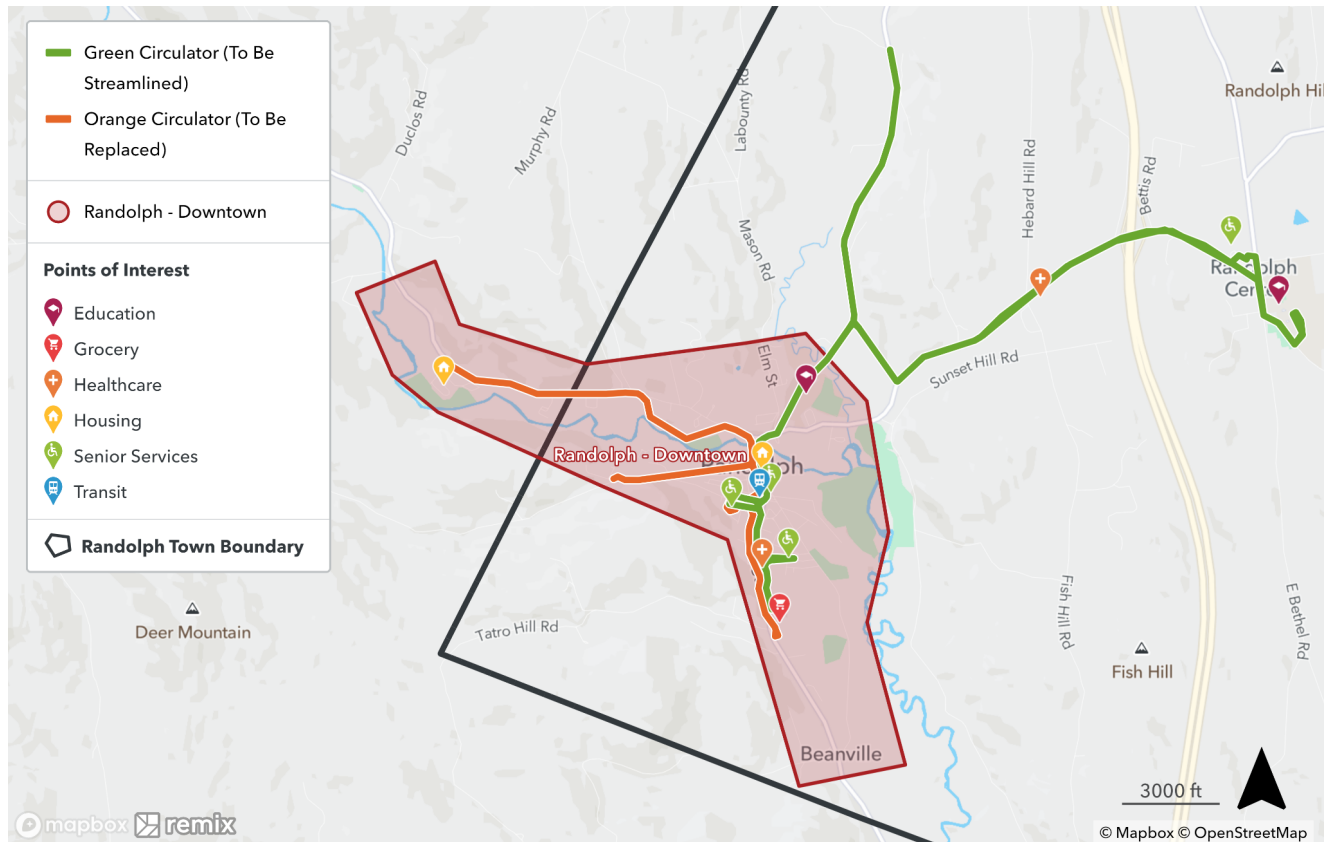
- The total population in this area is 8,800, mostly in Newport City and near the Stanstead/Derby Line.
- The Highlander Shuttle is the second most popular RCT bus route, with 950 monthly riders (about 18% of RCT's total ridership).
- The Highlander Shuttle has a productivity of 3.9 passenger boardings per vehicle hour.
- Popular travel destinations in the area include North Country Hospital, Walmart, and other shopping destinations along Route 5.

Key Estimates and Recommendations

- Zone Size: 40mi²
- Daily Ridership: 100
- Annual Ridership: 29,000
- Fleet Size: 2 - 3 vehicles
- Annual Budget: \$465,000 - \$800,000

2.8 Randolph (TVT)

Service Zone



Study Overview

- This study evaluated improved service in Downtown Randolph using microtransit.
- This could allow routing for Green Circulator — which covers a broader range of destinations — to be streamlined.
- A two-vehicle system is recommended, leaving room for additional ridership growth. TVT would likely need to procure one additional vehicle to launch microtransit.

Existing Conditions

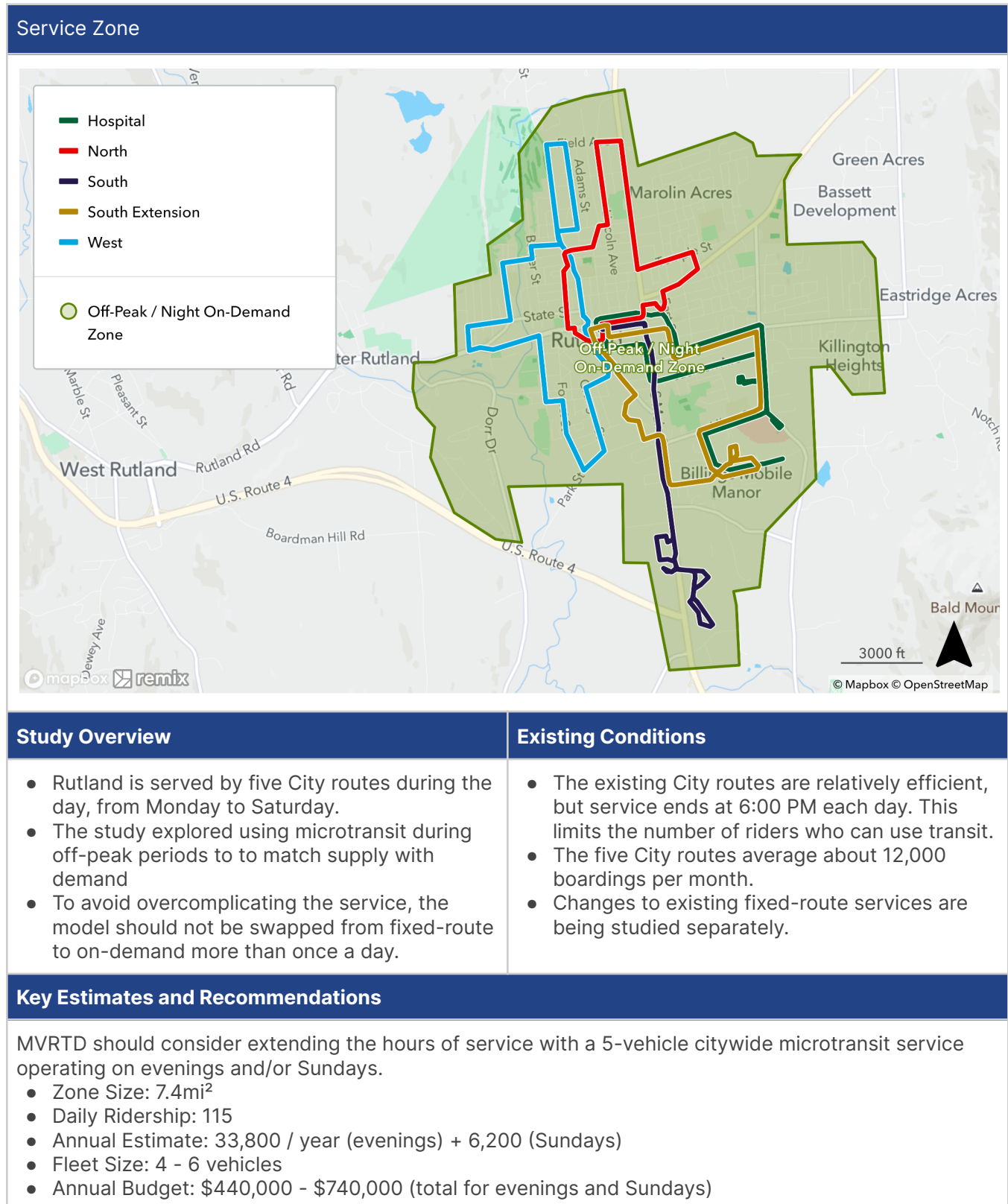
- Randolph is served by two routes, the Green Circulator and Orange Circulator.
- The circulator routes struggle to cover the entire town efficiently, and headways are long (typically >60 minutes).
- Population is concentrated in the downtown area. About 80% of all circulator boardings occur downtown.

Key Estimates and Recommendations

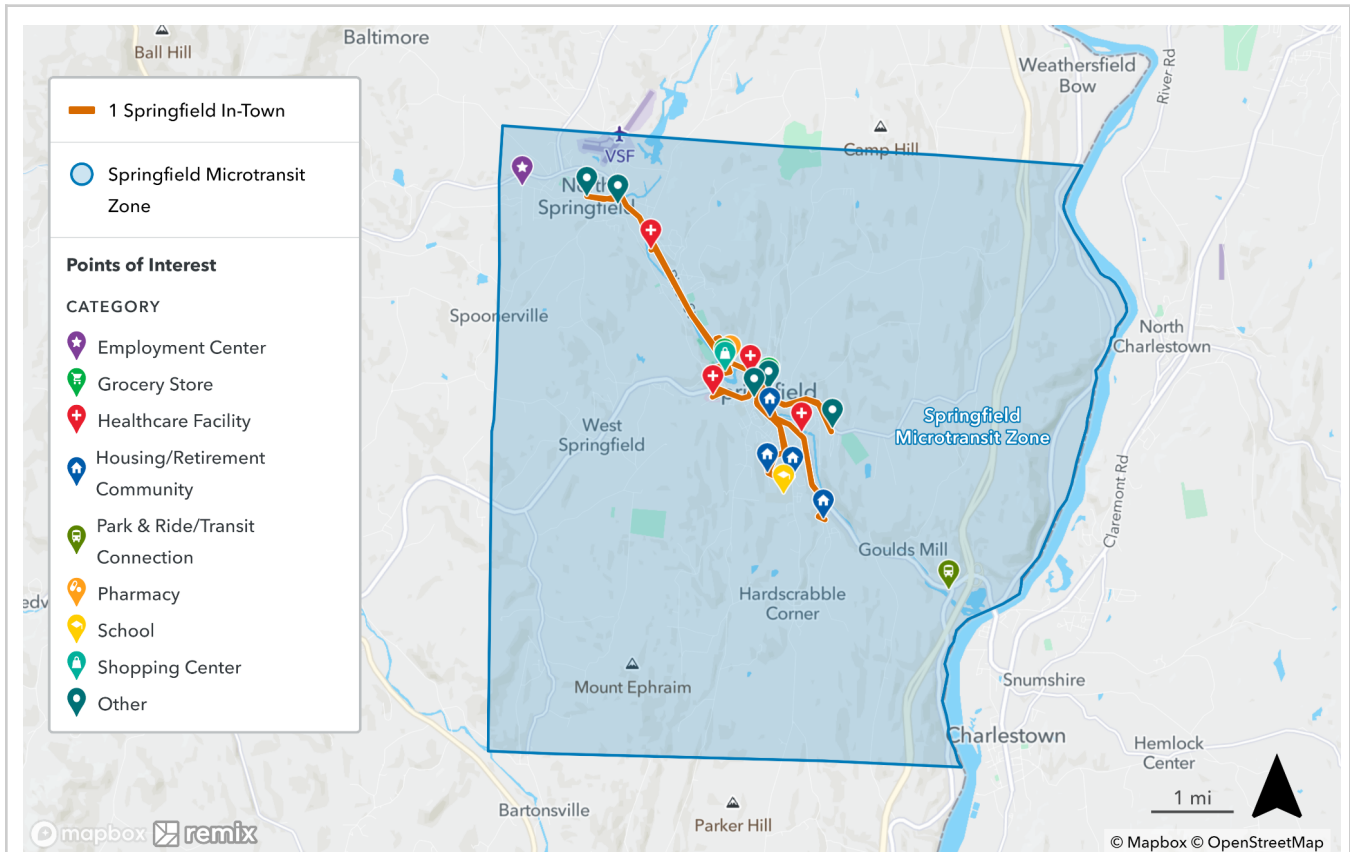
TVT should consider replacing the Orange Circulator with a microtransit service.

- Zone Size: 4mi²
- Daily Ridership: 45
- Annual Ridership: 12,000
- Fleet Size: 1 - 2 vehicles
- Annual Budget: \$210,000 - \$420,000

2.9 Rutland (MVRTD)



2.10 Springfield (MOOver)



Study Overview

- Local travel within the Town of Springfield is currently provided by the Springfield In-Town Route, which has a ridership of 25 to 30 passengers per day and productivity of 5 boardings per vehicle hour.
- To improve coverage and reduce wait times in the town, MOOver should consider replacing the Springfield In-Town route with a microtransit service.
- Microtransit would expand transit coverage from 5,000 people living within a half-mile of a bus stop to the entire town (9,000 people).

Existing Conditions

- The Springfield In-Town Route only covers the most densely populated parts of Springfield and operates only every 75 minutes, leading to long journey times and long waits.
- Route 57 operates between Ludlow and Bellows Falls, stopping and providing connections in Springfield and North Springfield.
- MOOver offers door-to-door services for people with disabilities, people over 60, and Medicaid-eligible trips. Approximately 15 demand-response trips are completed per day in Springfield.

Key Estimates and Recommendations

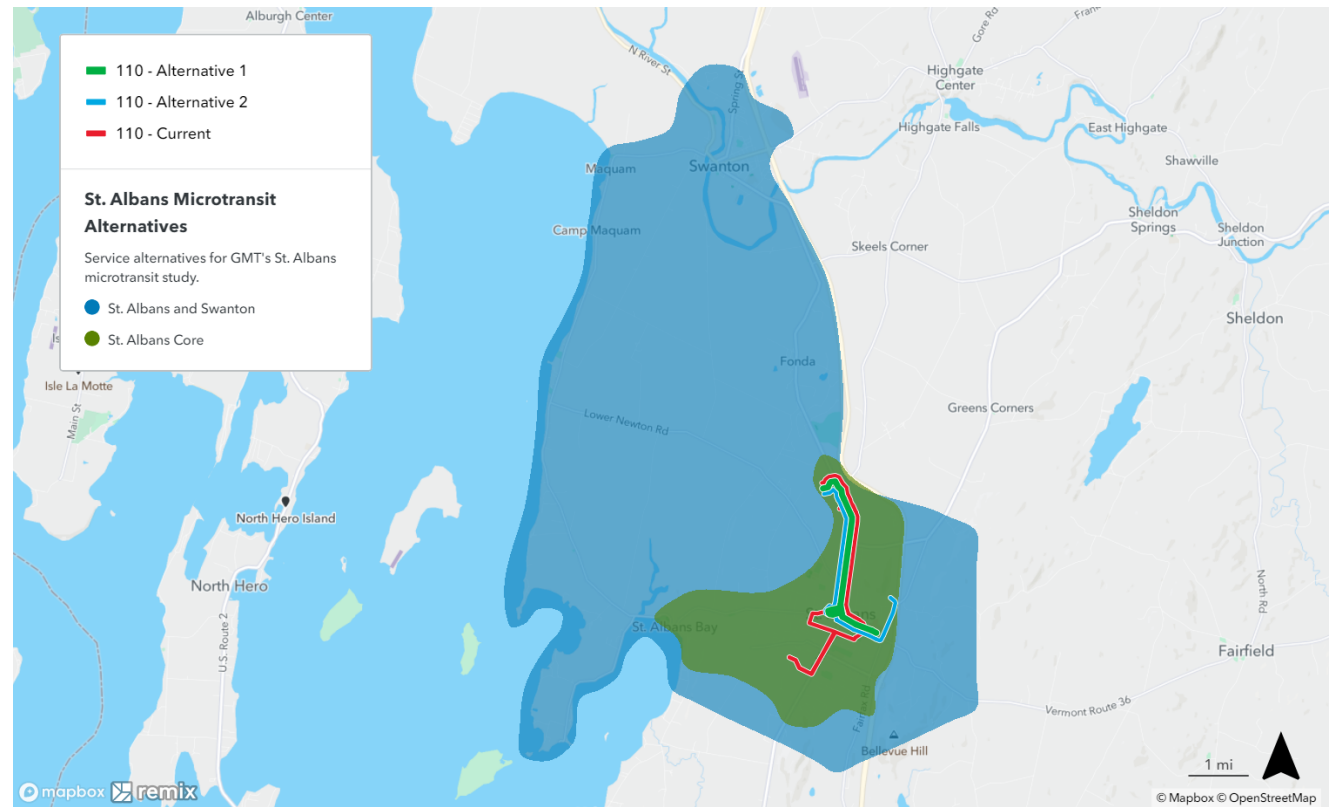
- Zone Size: 50mi²
- Daily Ridership: 75
- Annual Ridership: 20,000
- Fleet Size: 1 - 2 vehicles
- Annual Budget: \$190,000 - \$400,000

Current Status

- Study completed in May 2022.

2.11 St. Albans (GMT)

Service Zone



Study Overview

- GMT studied the potential for microtransit to complement and expand local service in St. Albans. In response to input from local stakeholders, the Study also considered using microtransit to cover the nearby town of Swanton.
- The Study considered modifying local Route 110 in conjunction with the introduction of microtransit. With microtransit serving areas outside of the City center, route 110 could be streamlined to make fewer deviations and increase frequency.

Existing Conditions

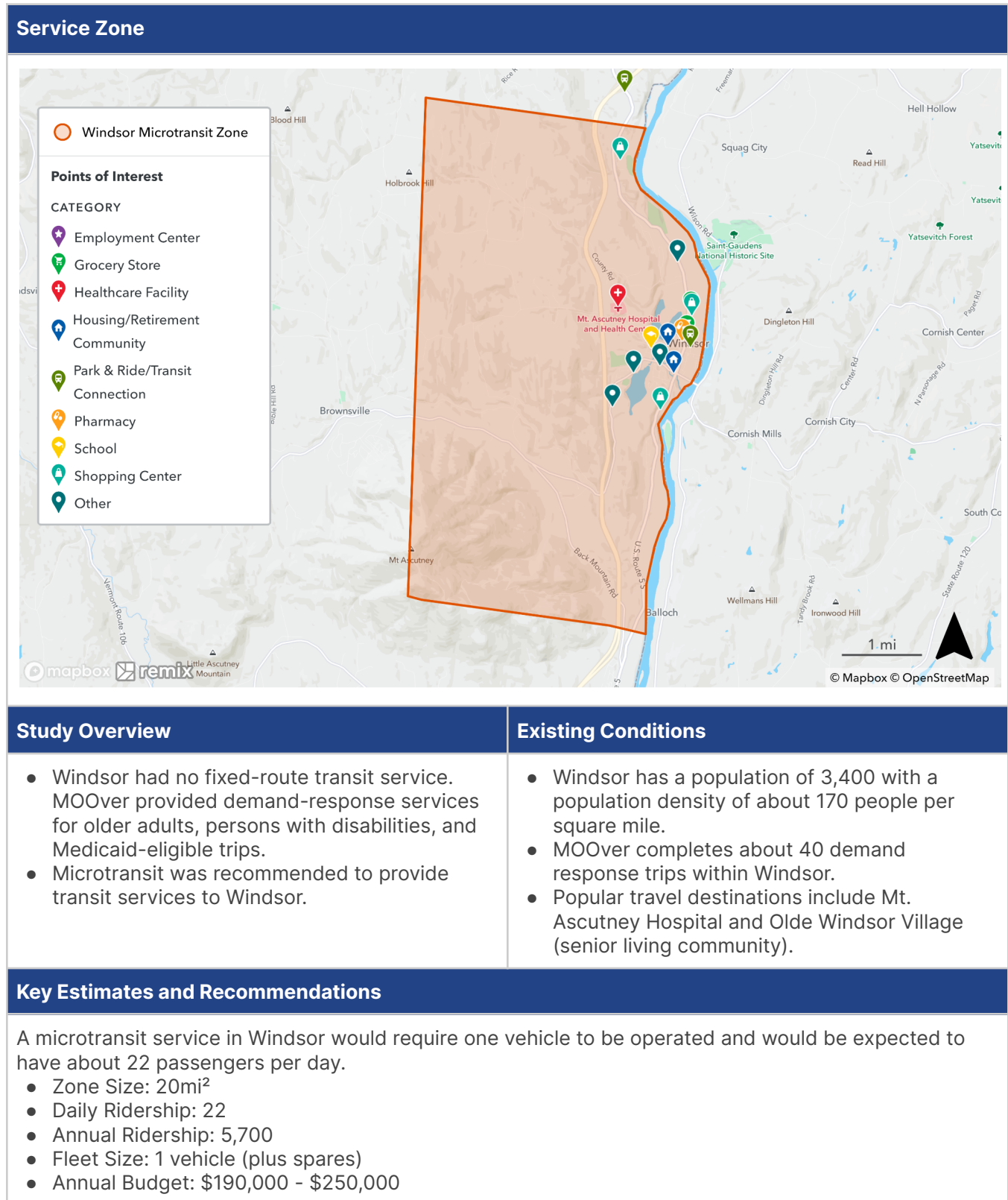
- St. Albans a City of ~7,000 residents north of Burlington.
- Existing local fixed-route service achieves strong ridership and productivity but doesn't cover all areas of town.
- A commuter service provides a daily trip between St. Albans and Burlington.
- The City is a regional travel hub, with many residents traveling from more rural surrounding areas each day.

Key Estimates and Recommendations

Microtransit could expand service in either of the two zones shown on the map above.

- Zone Size: 9mi²; 54mi²
- Daily Ridership: 90; 125
- Annual Ridership: 27,000; 37,000
- Fleet Size: 2 - 4 vehicles
- Budget: \$620,000 - \$1,200,000

2.12 Windsor (MOOver)



3. Prioritization Table

The following table shows how each of the alternatives performs on several key metrics. Green shading indicates services in the best performing quartile (top three) based on each metric. For example, services with a lower total annual cost are considered 'highest performing' on the cost metric.

Service	Annual Ridership	Service Area Population	Pre-existing local service?	Annual Cost	Net Cost per Passenger	Utilization
Barre GMT	23,000	10,700 + 5,800 jobs	Yes	\$510,000	\$26	3.4 - 4.0
Bennington¹ GMCN	15,000	9,700 + 5,800 jobs	Yes	\$450,000	\$31	2.0 - 3.0
Brattleboro² MOOver	5,900 <i>Evenings</i>	12,200 + 10,400 jobs	No	\$120,000	\$20	2.6 - 4.4 <i>Evenings</i>
Manchester GMCN	9,500	3,100 + 3,100 jobs	No	\$210,000	\$22	3.2 - 3.8
Middlebury TVT	30,000	6,100 + 3000 jobs	Yes	\$520,000	\$17	3.5 - 4.5
Morrisville + Hyde Park RCT	7,000	3,600 + 3,800 jobs	Yes	\$190,000	\$16	4.6 - 5.2
Newport + Derby RCT	29,000	7,900 + 5,400 jobs	Yes	\$660,000	\$23.50	3.3 - 3.8
Randolph TVT	12,000	2,000 + 1,500 jobs	Yes	\$350,000	\$29	1.7 - 2.7
Rutland MVRTD	33,800 <i>Evenings</i> 6,200 <i>Sundays</i>	15,600 + 10,500 jobs	Yes	\$490,000 <i>Evenings</i> \$105,000 <i>Sundays</i>	\$14 <i>Evenings</i> \$17 <i>Sundays</i>	4.7 - 5.7 <i>Evenings</i> 4.0 - 5.0 <i>Sundays</i>
Springfield MOOver	20,000	9,000 + 4,100 jobs	Yes	\$350,000	\$18	3.0 - 5.0
St. Albans³ GMT	37,000	18,400 + 10,500 jobs	Yes	\$880,000	\$24	3.0 - 4.0
Windsor MOOver	5,700	3,400 + 1,500 jobs	No	\$220,000	\$38.50	2.0 - 3.0

¹ The larger of two two alternatives for the Bennington Study is included in this table.

² Assumes maximum supply of 1 vehicle and annual ridership of 4,400 - 7,400 passengers.

³ The larger of two two alternatives for the St. Albans Study is included in this table.

4. Project Conclusions

The studies identified several conclusions that are relevant for all transit agencies in Vermont.

4.1 Recommended Use-Cases in Vermont

Some communities are better suited for microtransit transit than others. For example, several agencies were initially considering replacing rural commuter services with microtransit. However, these long, infrequent routes typically cover significant distances and would require passengers to plan their trip well in advance. They are not well suited for replacement with microtransit as a vehicle is unlikely to be nearby when requested, and the benefits of flexible routing are limited when traveling along routes with limited stops or deviations.

Below, we discuss which of VPTA's transit service categories are best suited for microtransit replacement. VPTA's transit service categories for services in Vermont are described below⁴:

1. **Urban:** Routes operating primarily in an urbanized area with all-day, year-round service. The city served by the route has a population of at least 17,500 people and high-density development.
2. **Small Town:** Routes operating in towns with 7,500 to 17,500 people with all-day, year round service. The route typically stays within one town or two adjoining towns and does not run through long stretches of rural areas.
3. **Demand Response:** Primarily service that does not operate on a fixed schedule nor on a fixed route; also includes routes that might otherwise fit in the "Rural" category but operate less than once a day (i.e., shopper service operates only once a week or a few times a month). This category includes all NEMT service in Vermont, ADA complementary paratransit service, trips brokered to taxi services, and trips operated by volunteer drivers. Volunteer drivers use their own vehicles, donate their time to transport riders, and are eligible to receive reimbursement for mileage at the IRS-approved rate. Microtransit services are listed in this category separately from the rest of demand response service.
4. **Rural:** Routes operating in towns with fewer than 7,500 people or connecting two small towns running through undeveloped areas. These routes operate year-round with daily service, but the frequency may be low (more than one hour between trips).
5. **Rural Commuter:** Routes that are similar to the Rural category above but operate primarily during peak commute periods. These routes usually connect several small towns or villages with intermediate stops and operate primarily on state routes in rural areas. Some routes connect outlying areas to the nearby city, with a significant portion of the mileage in rural areas.
6. **Express Commuter:** Routes that operate primarily during peak commute periods and often include express segments. These routes are characterized by one-directional ridership (in most cases), longer route lengths, and serve either of the two largest employment centers in the region: the core of Chittenden County or the Upper Valley area spanning Vermont and New Hampshire. These

⁴<https://vtrans.vermont.gov/sites/aot/files/publictransit/documents/FY22%20Public%20Transit%20Route%20Performance%20Report.pdf>

routes primarily travel on interstate highways and provide limited stops, often serving park and ride lots and major employers (rather than other local destinations).

7. **Tourism:** Seasonal routes that serve a specific tourist trip generator, such as a ski area. 8) Intercity: Routes operating regularly scheduled, fixed route, and limited stop service that connects places not in close proximity and makes meaningful connections to the larger intercity network.

Service Category	VPTA Cost per Trip Targets	Microtransit Suitability
Urban	Successful: \$5.99 Acceptable: \$13.49	Sometimes Suitable All forms of transit perform well in high-density urban areas. While microtransit is no exception, high performing bus routes should rarely be replaced with microtransit. However, some underperforming urban routes may be candidates for replacement, and microtransit technology may be suitable to enhance the efficiency and user experience of ADA complementary paratransit or other specialized mobility services.
Small Town	Successful: \$10.41 Acceptable: \$23.42	Suitable Microtransit offers a promising form of service for small towns, where population may be insufficient to support efficient local fixed-route bus service. In small towns, microtransit can connect customers with regional fixed-route (or rural commuter) services for trips between towns.
Demand Response	Successful: \$30.65 Acceptable: \$68.96	Suitable Microtransit itself is a form of demand-response service, but is differentiated from traditional forms of service (including ADA complementary paratransit, dial-a-ride service focuses on seniors and people with disabilities, non-emergency medical transportation, and other services with customer eligibility requirements) in two primary ways: 1) microtransit uses automated technology to dynamically match customers with vehicles in real-time, and 2) microtransit services are typically open to the general public. Microtransit can be suitable for customers who have historically used other types of demand-response service, and may be able to achieve lower costs per trip by aggregating more customers in vehicles than legacy demand-response systems.
Tourism	Successful: \$4.86 Acceptable: \$10.94	Sometimes Suitable Microtransit has a slightly higher barrier to access than a scheduled fixed-route bus, as customers are required to book trips in advance (either by calling a dispatcher or by downloading a microtransit application). While some tourists may be interested in using microtransit service during their stay, microtransit is more likely to be used by residents and workers.

Rural	Successful: \$22.56 Acceptable: \$50.76	Suitable Microtransit can provide a relatively efficient form of coverage for rural areas, which are typically always expensive to serve. In rural settings where demand is sparse, microtransit usually functions best on a “pre-scheduled” basis, where customers are required to book trips before they wish to schedule (typically the day before). In rural settings, a pre-scheduled model can allow smaller fleets to serve larger areas.
Rural Commuter	Successful: \$33.38 Acceptable: \$75.11	Unsuitable Rural commuter services are typically long-distance and make stops in multiple towns. It is challenging to aggregate customers taking intercity trips without some form of schedule. To aggregate customers, microtransit vehicles would need to spend long periods of time circulating/deviating in towns before departing for the next town. With a significant portion of routes in rural areas, it is unlikely that microtransit vehicles would aggregate additional passengers in areas between towns. Customers may encounter long waits for service if a microtransit vehicle isn’t in their town at the time they wish to travel. For these reasons, fixed-route service is more suitable for rural commuters.
Volunteer	Successful: \$26.16 Acceptable: \$58.86	Likely Unsuitable Volunteer drivers typically agree to provide trips on a one-off basis, and receive mileage-based reimbursement for each trip. Microtransit service relies on a shift-based model, where drivers/vehicles are available for certain periods of time during which they accept trip requests from the general public (and are generally required to accept all trips). Microtransit drivers are compensated on an hourly basis. At present, there is not a way to compensate volunteer drivers on an hourly basis, making microtransit likely unsuitable for volunteer-driven service.

4.2 Recommended Technology Features

The following technology features would be valuable for microtransit services in Vermont:

- **Intermodal Capabilities:** Intermodal trips involve multiple different modes of public transportation in a single trip. In Vermont, the most common type of intermodal trips are likely to be a combination of demand-response service and a fixed-route bus. For example, a rider in Waterbury could use GMT Route 83 to travel to Montpelier, before switching to the MyRide microtransit service to reach their final destination.

The level of intermodal capabilities within a microtransit service can vary. Some services, particularly those where microtransit covers a different area than fixed-route buses, may benefit from a system where riders can view multiple step trips at the time of booking (i.e. taking microtransit to a transit center and then a bus to the next town over). Meanwhile, other services may only need a system that shows other available transit modes alongside microtransit trips. More in-depth integrations can add cost and complexity to the launch process, so agencies should carefully consider which features are needed.

- **Fixed-Route Bus Referral:** Microtransit zones should be designed to provide one-seat rides wherever possible, resulting in zones that sometimes overlap with fixed-route bus services. These zones are intended primarily to expand coverage beyond the reach of the fixed-route network, not to transport riders along corridors already served by bus routes. For example, the recommended zone in Barre (refer to [2.1 Barre](#) for a map) is centered along Barre-Montpelier Road (US Hwy. 302). This corridor is already served by GMT Routes 80/89. To avoid shifting riders away from the fixed-route bus service, microtransit could be configured to show riders “referrals” to Routes 80/89 if their requested origin and destination is near existing bus stops.

There are multiple parameters affecting if riders are shown a fixed-route referral when requesting microtransit service. These can include (1) distance from requested pickup location to the nearest on-route bus stop, (2) distance from the requested dropoff location to the nearest on-route stop, (3) time until a bus will reach the stop closest to the rider, (4) travel time difference between microtransit and fixed-route service, and/or (5) number of transfers required to complete the trip on fixed-route services. These parameters can be configured to match the unique characteristics of each microtransit deployment. Additionally, each agency can choose to have referrals presented alongside a microtransit trip as an optional alternative, or have the bus referral supplant a microtransit trip as the only option presented to a rider.

- **Commingling:** The software underpinning a microtransit service can be configured to pool different trip types – for example, ADA paratransit trips, countywide dial-a-ride services, and microtransit rides — on the same vehicle. This technology can help reduce overall fleet size, but must be implemented carefully to avoid degrading quality of service for any one group of riders.

Microtransit zones are generally much smaller than ADA paratransit or dial-a-ride service areas, meaning that the vast majority of paratransit and dial-a-ride trips start or end outside the microtransit zone. As a result, most trips will not be eligible for commingling. Additionally, mixing on-demand services (where riders request an immediate pickup) with pre-scheduled services (where riders book a trip hours or days in advance) can cause delays if the vehicle fleet is undersupplied.

4.3 Statewide Coordination

Vermont could realize several benefits from the statewide coordination of microtransit services, each of which is described below. In fact, some of these benefits are already being realized through the active leadership role being taken by VTrans and VPTA.

- **Knowledge Sharing:** By developing this report and sharing lessons learned from the existing microtransit services in Montpelier and other communities, Vermont has already positioned itself as a leader in microtransit globally. VTrans and VPTA should continue to share knowledge across the state to ensure agencies make decisions that are optimal for Vermont's unique population and geography.
- **Overhead Costs:** There are several overhead and administrative costs that are relatively fixed regardless of the scale of the service. This means that there are cost benefits when centralizing these functions across multiple microtransit services. For example;
 - **Microtransit technology costs** typically make up a smaller percentage of overall costs as microtransit services grow in scale. Microtransit technology costs are typically higher for larger services as they are often priced based on a monthly price per vehicle or per vehicle hour. However, the fee charged per vehicle or vehicle hour is often lower for larger customers as vendors are able to benefit from economies of scale.
 - **Dispatch and administration** costs can be shared across multiple services. One dispatcher is typically required during all hours of operation. This individual responds to customer and driver questions, records phone bookings, and intervenes when unforeseen circumstances arise (such as a traffic incident). It may be possible to consolidate this role across multiple Vermont transit agencies and reduce the number of dispatchers required.
- **Marketing and Customer Awareness:** Some agencies may choose to use the same phone number and/or smartphone app. Particularly for geographically adjacent agencies, this could allow them to benefit from economies of scale in marketing and customer education. Marketing costs may be lower as each transit agency would not be required to develop and promote their own app. A larger user base would mean the microtransit application is likely to appear higher in search results. Customers could use the same booking process even when traveling in different areas, and may also find it easier to refer friends and family who may otherwise not know about microtransit as it grows in scale.

4.4 Other Recommendations

- **Single-vehicle services:** There are many small communities in Vermont that may only require a single vehicle. While it is possible to operate a microtransit service with just one vehicle, there are challenges with single vehicle fleets that mean these services should be avoided when possible:
 - Firstly, given that the vehicle must be able to be booked at all times during service, this poses a challenge for driver breaks, maintenance, and unforeseen delays. If the primary

vehicle is unavailable, a backup vehicle must be available or the passenger may be stranded. In a single vehicle service, this means one spare vehicle is required for each primary vehicle, which is higher than the ~20% spare ratio required for larger services. The same applies to drivers, with a replacement driver required during lunch breaks and other periods. In larger services, spare vehicles and drivers can be shared across multiple bus routes and microtransit zones. To avoid these issues, smaller microtransit services should ideally be integrated into a larger system (including dial-a-ride, NEMT, and with nearby communities). This does not mean passengers should be able to travel throughout all areas, but rather that drivers and vehicles can be shared across the system.

- A single vehicle service has limited capacity to absorb sudden spikes in demand. This means there is a greater likelihood that passengers face long delays during busy periods.

To avoid single vehicle services, agencies should consider operating larger zones with multiple vehicles, commingling a variety of demand-response services across a single fleet, or sharing vehicles and drivers across several microtransit services in nearby communities.

- **Cell phone coverage:** In some areas, cellphone coverage may be poor. Therefore, agencies should ensure that phone booking is offered and that trips can be pre-booked. It may be possible to offer WiFi in remote or isolated stop locations. Finally, the microtransit routing platform for drivers must be able to operate even when cell service is temporarily unavailable.
- **Successful Engagement with Seniors:** Vermont has a significant population aged 65 or more. Older adults are less likely to drive or own personal vehicles and more likely to rely on public transit as their main mode of transportation. Moreover, older adults can sometimes be reluctant to adopt new forms of transportation, especially technology-enabled solutions. However, specific and targeted engagement with older adults can help encourage the adoption of the new microtransit service.
 - Focus materials on service features that would appeal to older adults such as the availability of booking by phone, wheelchair-accessible vehicles, and curb-to-curb service for those that need it.
 - Provide relevant examples of trips such as to grocery stores or medical appointments and de-emphasize the use of commuter trips as many older adults will be retired.
 - Clearly communicate any discounts or promotions that are specific to older adults.
 - Provide a phone number for questions on any print or digital marketing materials.
 - Use accessible colors and fonts.
 - Focus on offline channels such as direct mail, pamphlets, and fridge magnets.
 - Post printed marketing materials in relevant locations such as healthcare facilities, senior centers, retirement homes, food banks, and other relevant social service agencies.
 - Offer in-person educational sessions at convenient locations, such as retirement communities or senior centers. During these sessions help customers create accounts and walk them through how to book rides and select if they need a wheelchair-accessible vehicle.
- **Working with Volunteer Drivers.** Vermont has a strong tradition of delivering transportation assistance with volunteer drivers. Volunteer drivers may be able to deliver trips coordinated by a

microtransit platform, particularly in a commingled system which manages one-off trips (like NEMT) which VT's volunteer drivers already deliver. This could allow the State and its transit providers to centralize the delivery, administration, and reporting on multiple service categories. Though a microtransit platform may be able to manage trips that are already being delivered by volunteer drivers, there are several barriers in place to volunteer drivers delivering microtransit service. Specifically:

- Microtransit requires that drivers sign up for shifts, during which they can accept trips from the general public. Unlike other general public transit services, volunteer-driven trips are coordinated on an individual customer basis, where a subsidy for the trip is attached to a passenger (from funding sources like Medicaid). The trip-based structure of a volunteer driver does not align with a shift-based model for transit drivers.
- Volunteers are reimbursed using a mileage rate which is established by the Federal Internal Revenue Service (IRS), and transit providers do not have flexibility to compensate volunteers using different structures. This prevents transit agencies from reimbursing volunteer drivers for a microtransit shift, during which some time may be idle, or some trips may be delivered for customers who are not eligible for mileage-based subsidies under VT's current program.
- While some volunteer drivers in VT are true volunteers who may consider delivering trips with no compensation, many use mileage-based reimbursement as a form of supplemental income, or otherwise would not consider delivering trips without reimbursement. It is unlikely that transit providers would be able to attract volunteer microtransit drivers without offering some form of reimbursement.

Considering the prevalence of volunteer drivers in the State, Vermont may consider pursuing policy changes which would allow more flexibility to reimburse volunteer drivers in a manner that better aligns with a microtransit shift schedule.