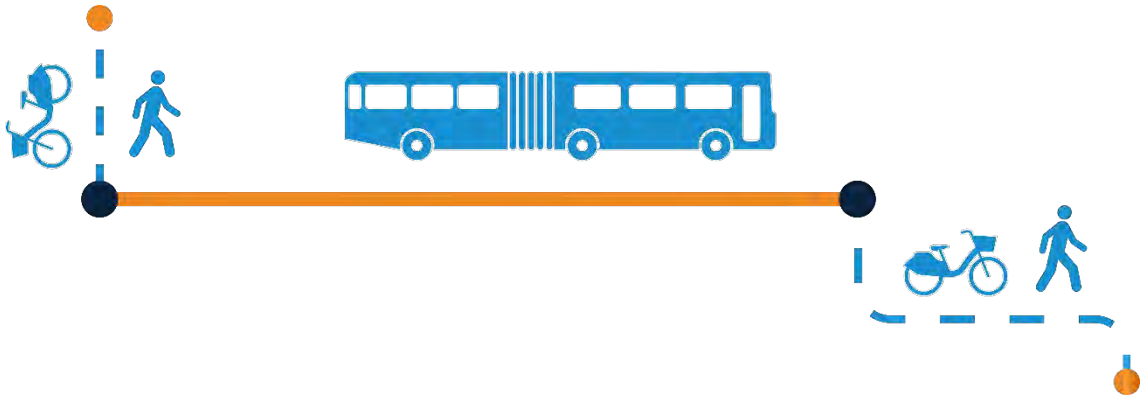
Regional First- and Last-Mile Mobility Study



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CHAPTER 1
INTRODUCTION

1.INTRODUCTION

The purpose of this First- and Last-Mile Mobility (FLMM) study is to provide an overview of the types of FLMM solutions that are most applicable to the RFTA service area and the information and resources needed for RFTA and its partner agencies to develop these solutions further. Through working with stakeholders, the public, and an analysis of existing conditions within the RFTA service area, the project team narrowed down the list of potential FLMM solutions to those most applicable for the region. This FLMM Study prioritizes FLMM solutions that would enhance and connect to existing RFTA services and that received support from the community. Other opportunities within the full range of FLMM options may arise in the future.

A Regional Bikeshare Plan was created in tandem with this FLMM Study. Bikeshare expansion is a key strategy to reduce FLMM barriers and improve access to transit throughout the region. The Regional Bikeshare Plan is presented as a separate document and includes a summary of the existing WE-cycle system, community and stakeholder engagement, and bikeshare service expansion plans for communities in RFTA's service area.

1.1 WHAT IS FIRST- AND LAST-MILE MOBILITY?

Transit is only effective when riders can access it. If a rider lives too far from their nearest transit stop or station, or if their final destination isn't convenient to transit, the likelihood that they'll use transit drops. These barriers can be mitigated by improving access to transit through improved mobility.

First- and Last-Mile Mobility (FLMM) refers to strategies for getting riders from their homes to a transit stop or station (first mile) and/or from their destination stop or station to their final destination (last mile). Not all trips are the same, and first-mile trips often differ from last-mile trips in length, mode of travel, and purpose. Similarly, trips to access transit are not necessarily limited by a one-mile radius but can differ depending on the mode of travel used to access the transit service. Furthermore, the concept of FLMM has been changing over the years. In 2019 the European Environment Agency introduced the term "First, Last, and Only Mile".[1] The term "only mile" was introduced to account for those short trips within a community that do not involve accessing transit but are still vital in providing independent mobility and reducing reliance on

What do these terms mean?

Seamless integration of multiple modes and payment systems

Introducing new mobility options is important for first and last mile access. Providing an integrated trip-planning and payment system, that accommodates all available modes allows users to make one transaction for a trip, regardless of whether multiple modes are used, creating a seamless experience for the traveler.

Flexible Routing of Transit

Fixed route transit travels along a predetermined route following a fixed schedule. Introducing flexibility into transit can provide services where they are needed most. This can be done using tools such as on-demand services during off-peak periods or allowing transit to deviate from a fixed-route to become a more flexible service.

Time-of-use carpooling

Older carpooling systems relied on users finding a match to make a regular trip. This was typically done by matching up with another user's schedule. New technology can now provide dynamic carpool matching whereby a user can be pre-screened and then search for a carpool at any time of the day and be matched in real-time, similar to an on-demand taxi or ride-hailing service (such as Lyft or Uber).

[1] Source: https://trid.trb.org/view/1689712

automobile travel. Many FLMM services can provide both access to transit as well as supporting trips within communities, providing wider benefit.

FLMM services are continually evolving as new technology, services, and products come online. This includes technology for flexible routing of transit, dynamic carpooling, and seamless integration of multiple modes and payment systems. New products, such as e-bikes, e-scooters, and electric shuttles are changing the landscape of FLMM.

1.2 WHY IS FIRST- AND LAST-MILE MOBILITY IMPORTANT TO TRANSIT AGENCIES?

Improving access to and from transit for a wider breadth of people will ultimately lead to increased transit ridership and can help achieve agency goals of reducing auto-dependency, greenhouse gas emissions, and vehicle miles traveled. Providing convenient, quality FLMM solutions so that riders can have a seamless experience from when they leave their home to when they arrive at their destination will improve rider satisfaction and encourage more people to ride transit.

FLMM strategies can also help create a more equitable transportation system when strategies target communities who are underserved by existing transit services or who have difficulty accessing transit because of their income, physical ability, or the language they speak. Transit agencies should provide a range of FLMM solutions to meet the differing needs of the populations within their service area. This includes providing better access to transit for multiple modes and abilities. It can also include providing new incentives and travel options for accessing transit. Supporting a diverse range of FLMM strategies can not only improve transit ridership, but it can lead to positive economic and public health outcomes by improving access to jobs, healthcare, and opportunities for education and recreation.

1.3 FIRST- AND LAST-MILE MOBILITY AND RFTA

FLMM solutions increase the diversity of mobility options available in the region and can help RFTA meet agency goals. For example, RFTA's 2019 *Strategic Plan*[2] includes a specific FLMM objective within the "Accessibility and Mobility" section to "provide increased first- and last-mile options for customers throughout the service area." Similarly, FLMM can have a positive impact on the "environmental sustainability" outcome, by encouraging more people to access and travel by transit and reduce the number of people driving alone to their destinations.

RFTA's *Regional Travel Patterns Study* (2014)[3] shows that there are significant mobility needs between communities in the Roaring Fork Valley. The study showed that 62% of the region's workforce commutes to a different town or city than they live. Approximately 44% of commuters travel up-valley (towards Aspen), with 9% traveling down-valley (towards Parachute). Census data[4] from 2019 shows that 78% of workers in the Cities of Aspen and Glenwood Springs commute from outside of their city's boundaries. The *Regional Travel Patterns Study* also showed that the majority of people currently walk to/from their transit station or stop to access a transit service, e.g., 89% of commuters in Pitkin County walked to transit from their homes during the winter months. Nearly 20% of commute trips are made by bus. There is high variation in the percentage of commuters who ride the bus

[2] Roaring Fork Transportation Agency. 2019 Strategic Plan. 2019. https://3qpuead9yxf3lp4zqrcwbatd-wpengine.netdna-ssl.com/wp-content/uploads/2019/09/18091_2019-strategic-plan-draft.pdf

[3] Roaring Fork Transportation Agency. 2014 Regional Travel Patterns Study. 2015. https://3qpuead9yxf3lp4zqrcwbatd-wpengine.netdna-ssl.com/wp-content/uploads/2015/12/2014-RFTA-Travel-Patterns-Report_2015-09-09.pdf

[4] Source: https://onthemap.ces.census.gov/

depending on where a commuter lives. For example, in winter, 28% and 29% of survey respondents living in Carbondale and Aspen commute by bus, respectively, compared to 36% of survey respondents living in Basalt and El Jebel. Nearly 50% of survey respondents who live in Snowmass Village commute by bus. Less than 10 percent of survey respondents living in New Castle commute by bus and 11% of survey respondents living in Glenwood Springs commute by bus.[5]

RFTA has an established history and involvement in FLMM. It has initiated several projects and policies to improve FLMM access throughout the system. These include:

- A partnership with Masabi to provide mobile-based ticketing (2022)
- The creation of an FLMM fund to support communities looking to improve transit access and mobility (2021)
- Ongoing financial support for bikeshare in the region (2022)
- Additional proposed projects from the Destination 2040[6] ballot measure (updated 2022), including:
    - Pedestrian crossings at Buttermilk
    - Real-time traveler information
    - A new transit station at Glenwood Springs
    - New pedestrian crossings at Glenwood Springs
    - Transit service improvements
    - Bikeshare expansion

RFTA continues to support transportation choices and improve first- and last-mile connections to transit. In late 2021, the RFTA Board approved the creation of a FLMM Reserve in RFTA's General Fund and transferred $3 million to kickstart the fund. The purpose of the FLMM Reserve is to set aside resources to help fund discretionary grant applications for FLMM projects submitted by RFTA member jurisdictions. The first project funded by the FLMM Reserve is Basalt Connect, a new Downtowner service providing on-demand rides in Old Town Basalt, Willits, and nearby neighborhoods. The recommendations presented in Chapter 4 of this Study are all suitable project candidates for RFTA's FLMM Reserve.

1.4 FIRST- AND LAST-MILE MOBILITY OPTIONS

The range of FLMM options have increased exponentially over recent years as practices have evolved and new technology, services, and products have become available. FLMM options include:

- **Transportation Demand Management Programs:** these include programs to educate, encourage, and promote use of existing modes and services.
    - Examples include encouragement campaigns, bicyclist education, parking cash-out, TNC discounts, carshare/bikeshare subsidies, new resident/employee/student transportation kits, and guaranteed ride home.
- **Infrastructure:** this could include building new infrastructure or reapportioning existing infrastructure.
    - Examples of new infrastructure projects could include bicycle and micromobility parking, improvements to pedestrian infrastructure and crossings, multi-use trail construction, pedestrian-scale lighting, and transit-oriented development (TOD).
    - Examples of reapportioning existing infrastructure could include on-street bicycle lanes, curbside management, carshare parking, and preferential parking for carpool or vanpool vehicles.

[5] Source: Roaring Fork Transportation Agency. 2014 Regional Travel Patterns Study. 2015. https://3qpuead9yxf3lp4zqrcwbatd-wpengine.netdna-ssl.com/wp-content/uploads/2015/12/FINAL-Regional-Bicycle-Pedestrian-Transit-Access-Plan-2015.pdf

[6] Source: https://www.rfta.com/2040roadmap/

- **Transportation Services:** these include new modes or services.
    - Examples include on-demand microtransit, point-to-point or round-trip carshare, bikeshare or shared micromobility, carpool and vanpool, ride-hailing services, and shuttle services.

Active transportation infrastructure is an essential tool for overcoming FLMM barriers. While this study does not focus specifically on active transportation infrastructure and access to transit (e.g., sidewalk gaps, high quality bicycling infrastructure, and crossings), the majority of people currently access transit by walking and increasingly by bicycle and these improvements are critically important in supporting FLMM.

CHAPTER 2
EXISTING FIRST- AND LAST-MILE MOBILITY SERVICES

2. EXISTING FIRST- AND LAST-MILE MOBILITY SERVICES

There are several FLMM and transit services already operating within the RFTA service area. This section describes these in terms of whether they are RFTA, local agency, other agency, private, or non-profit delivered services.

RFTA SERVICES
Bus Rapid Transit (BRT) service (VelociRFTA)
Local bus service
Hogback Route regional bus service (Rifle to Glenwood Springs)
RFTA-Masabi partnership for mobile-based ticketing
LOCAL AGENCY SERVICES
City of Aspen: • Aspen Downtowner: free door-to-door electric vehicle shuttle services within the Aspen core area • Carpool Kiosk: located at the Brush Creek Park and Ride lot and provides parking vouchers for free preferential parking • Free shuttles: free local bus service along four fixed routes and one dial-a-ride route • Car To Go: a carshare service charging a monthly membership and per hour and per mile usage fees
City of Glenwood Springs: • Ride Glenwood Springs local bus service
Town of Basalt: • Basalt Connect: free on-demand transit service in the Downtown Core and Willits areas
Town of Carbondale: • Carbondale Circulator: local bus service operated by RFTA
Town of Snowmass Village: • Village Shuttle: local bus service with one on-demand route
OTHER SERVICES
Bustang West Line bus service (CDOT)
California Zephyr train service (AMTRAK)
Greyhound bus (private)
WE-cycle bikeshare (non-profit)
Local taxi services (private)
Transportation Network Companies (private)

2.1 RFTA SERVICES

RFTA services include all those provided by RFTA that run regionally or as part of local service in the RFTA service area.

RFTA BRT

RFTA's bus rapid transit route, VelociRFTA, operates frequent service between Aspen and Glenwood Springs. The service operates at 12- to 15-minute headways throughout most of the day, with service every 30 minutes or hourly in the evening and at night. Stops along the route include Park & Ride stations in West Glenwood, Carbondale, Basalt, and Brush Creek, with other stops in Aspen at the Rubey Park Transit Center and Aspen/Pitkin County Airport, and in Willits and El Jebel. The trip duration from West Glenwood to Downtown Aspen is about 75 minutes, which is about 40 minutes faster than the RFTA Local Route. Rides are free within a zone and the cash fare ranges from $2 to $5 to travel beyond the initial zone. A variety of discount passes are available that can reduce the cost of rides from approximately 25% to 40%.

Figure 1. VelociRFTA bus in Carbondale.

Local RFTA Bus Service

To augment the VelociRFTA Bus Rapid Transit service, the "Local" Route L serves more stations thorough the Roaring Fork Valley with 30-minute headways, which are less frequent than the peak-period headways of 12-minutes on the VelociRFTA. Some stops serving smaller communities, such as the Holland Hills DV and Downtown Basalt, are only served by the Local route. Fares follow the same zone map as the rest of the RFTA system and are free within a zone and range from $2 to $5 to travel beyond the initial zone.

Hogback Route Regional Bus Service

The Hogback Route[7] is a RFTA-provided bus service connecting Glenwood Springs to New Castle, Silt, and Rifle. With six stops, the route integrates into RFTA's existing fare map. Riders pay $4 to get from Rifle to Glenwood Springs and can transfer to other local or RFTA routes to reach destinations up the Roaring Fork Valley. The cash fare from Rifle to Aspen / Snowmass Village is $8. The bus operates from 5:15 AM until around 9:00 PM seven days a week.

RFTA-Masabi Partnership

Masabi[8] is an international fare collection and mobile ticketing company. They specialize in mobile and smartcard fare media and have partnered with transit agencies around the world to modernize and optimize fare systems. RFTA and Masabi began their partnership in 2021 with a view to improve RFTA's integrated payment systems. This will positively impact transit riders by providing increased flexibility when purchasing a ticket across all RFTA services. Benefits of the RFTA-Masabi partnership to transit riders include improved trip planning, electronic fare payment and ticketing, and an integrated payment system which can include several mobility options.

[7] Source: https://www.rfta.com/routes/hogback-rifle/
[8] Source: https://www.masabi.com/

2.2 COMMUNITY-SPECIFIC SERVICES

Community-specific services include those FLMM or transit services offered by local agencies within the RFTA service area.

CITY OF ASPEN

The Aspen Downtowner

The Aspen Downtowner[9] is a free, on-demand, door-to-door shuttle service that launched in 2016 with the goal of alleviating some of the parking scarcity and congestion in Downtown Aspen. Users can book rides via the Downtowner app from 11:00 AM to 11:00 PM seven days a week. The vehicles are equipped with heaters and ski racks.

Figure 2. The Aspen Downtowner provides year-round service.

Source: Aspen Chamber Resort Association

Carpool Kiosk

The Carpool Kiosk[10] is a service provided at the Brush Creek Park & Ride Lot where carpoolers can pick up a daily carpool permit that allows them to park for free in preferential parking spaces in Aspen. The kiosk is a drive-through and is open from 6:00 AM to 2:00 PM daily.

Free Shuttle

The Aspen Free Shuttle[11] is a network of circulators, including two seasonal routes, that connect people in downtown to recreation destinations, transit centers, and other community amenities throughout Aspen. Six of the shuttles operate year-round, primarily starting at 6:20 AM with headways every 20- to 30-minutes. The Galena Street route operates in the winter and offers on-demand stops along a fixed route from downtown to the Silver Queen Gondola. The Maroon Bells Wilderness route connects riders to the Maroon Bells parking area in the summer months. The Mountain Valley Dial-a-Ride serves the Mountain Valley residential area on a fixed route service free of charge, and additionally provides a flexible door-to-door service for $1. To supplement transit, the city contracts with High Mountain Taxi to provide a free off-peak service from Rubey Park at 12:30, 1:00, 1:30 and 2:00 AM on Fridays and Saturdays during the spring and fall seasons. Taxis drop passengers off at any City of Aspen bus stop.

Car To Go

Car To Go[12] provides carshare service to residents of Aspen who may not own a car but occasionally need one to supplement other forms of transportation. The service operates on a monthly membership basis and charges per hour and per mile usage fees. The fleet of nine electric and hybrid vehicles can be reserved via an online portal after an initial approval process.

[9] Source: https://www.cityofaspen.com/270/Downtowner
[10] Source: https://www.cityofaspen.com/DocumentCenter/View/7582/21-129-CarpoolKiosk_Flyer_v2
[11] Source: https://www.cityofaspen.com/279/Free-Aspen-Shuttles
[12] Source: https://www.cityofaspen.com/221/Car-To-Go

CITY OF GLENWOOD SPRINGS

Ride Glenwood Springs

Ride Glenwood Springs (RGS)[13] is the City of Glenwood Springs' free, year-round public transit bus service. Connecting RFTA, Amtrak, and Greyhound services to central Glenwood Springs, the northbound and southbound services follow the same route and depart every 30 minutes. The service operates from 6:53 AM to 7:53 PM. In 2019, RGS conducted an on-demand transit study that found an on-demand option could better serve areas outside the existing service areas, better adapt to declines in ridership, and improve access to RFTA and other services, particularly during peak periods.

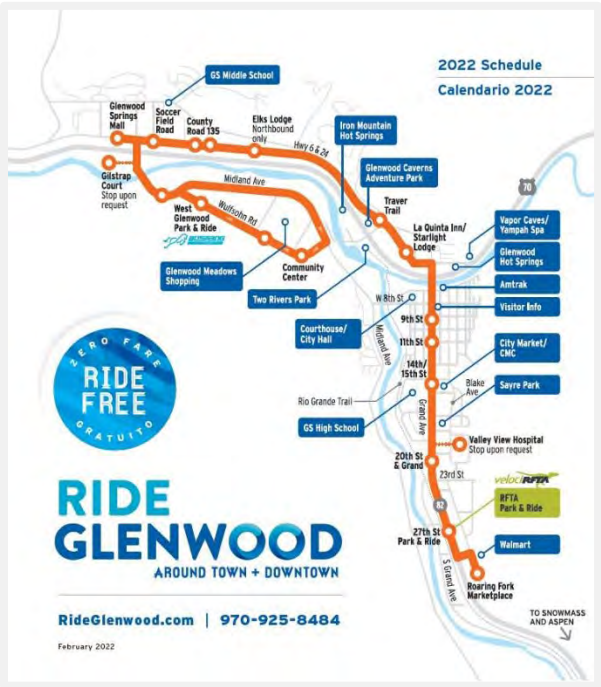

Figure 3. Ride Glenwood Springs 2022 route map.

TOWN OF CARBONDALE

Carbondale Circulator – Operated by RFTA

The Carbondale Circulator[14] augments other RFTA routes during the hours of 5:00 AM to 9:00 PM when the Local Valley Route doesn't stop within Carbondale. Serving Downtown Carbondale, the RFTA Park & Ride, and local stops in-between, the free service operates at 15-minute headways.

TOWN OF BASALT

Basalt Connect – Downtowner Service

The Basalt Connect service provides free, on-demand rides in Basalt and started providing service in February 2022. Basalt Connect operates daily between 6 and 9 AM and 3 to 10 PM in February, March, and April. There will be no service in May, October, and November. The hours will be expanded from 6 AM to 10 PM on weekends June through September. Users can download the Basalt Connect app on a smart phone and request a ride with a tap of a button.

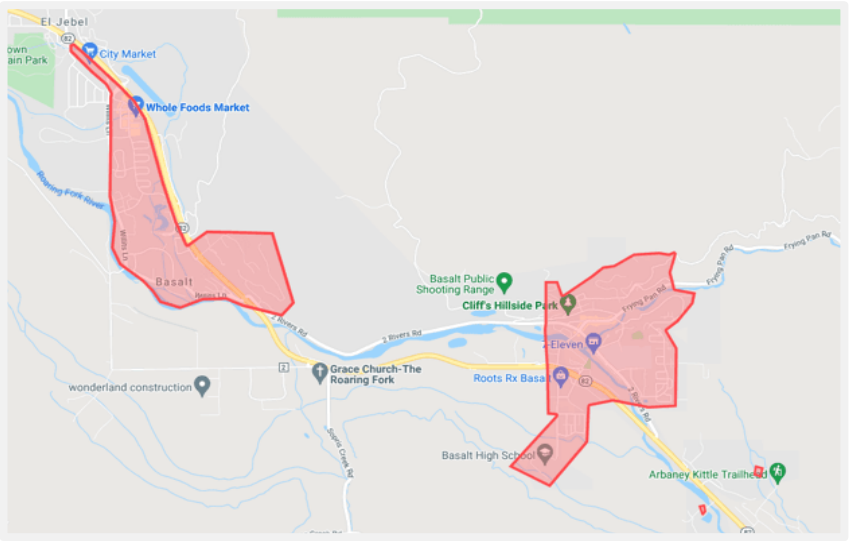

Figure 4. Basalt Connect service area.

[13] Source: https://www.cogs.us/187/Ride-Glenwood-Springs
[14] Source: https://www.rfta.com/routes/carbondale-circulator/

TOWN OF SNOWMASS VILLAGE

Village Shuttle Route 22 (Snowmass)

The Village Shuttle Route 22[15] serves Snowmass Village from 6:45 AM to 2 AM Monday to Saturday (6:45am to midnight on Sundays), with routes every 10 to 30 minutes. Outside scheduled times, rides can be booked on-demand by calling a phone number. Fares cost $1 per person per ride.

2.3 OTHER AGENCY SERVICES

Transit run by other agencies includes services that connect to major cities within Colorado or further afield. Each of the services described below can be accessed from the City of Glenwood Springs.

Bustang West Line

The Bustang is an intercity network of bus routes serving destinations in Colorado and operated by the Colorado Department of Transportation. The West Line[16] connects Grand Junction and the Western Slope to Metro Denver, with four daily departures in each direction. It serves stops in South Glenwood and Glenwood Springs, providing connections to existing RFTA service. Fares from Glenwood Springs range from $5.00 to $28.00 depending on the final destination.

Amtrak California Zephyr

The California Zephyr[17] is a national passenger train passing through Colorado on its route connecting Emeryville, CA, and Chicago, IL. The train stops at Glenwood Springs Station once a day in each direction. Depending on the time of year, fares can range from approximately $50 to reach Denver Union Station to over $200 to travel the entire route.

2.4 PRIVATE OR NON-PROFIT SERVICES

There are multiple services provided by non-governmental agencies that can be accessed in the RFTA service area, as described below.

Greyhound

Greyhound[18] services the city of Glenwood Springs, with regular coach connections to Denver, Grand Junction, and other destinations. Travel between Glenwood Springs and Denver ranges from $35-$70 for a one-way trip and takes 3.5 hours. The Greyhound Bus Stop is located at the West Glenwood Mall Bus Shelter at the intersection of Highways 6 and 24.

[15] Source: https://snowmasstransit.com/217/Route-22On-Demand
[16] Source: https://ridebustang.com/west-line-schedule/
[17] Source: https://www.amtrak.com/california-zephyr-train
[18] Source: https://www.greyhound.com/en

WE-cycle

WE-cycle[19] is the bikeshare system serving Aspen, Snowmass Village and the communities in the Mid-Valley. The service is free to the public and operates seasonally with 284 bikes across 55 stations. During the 2021 season, the system provided 50,573 rides to nearly 6,000 unique riders. In 2020, WE-cycle implemented an e-bike pilot to help encourage additional ridership and to test their utilization. The pilot found usage among the six e-bikes was three times that of the non-electric bikes. In 2021, the system had 26 e-bikes and WE-cycle integrated two solar-powered e-stations.

Figure 5. WE-cycle station in Summer 2021.

Local Taxi Services

There are multiple privately run local taxi services operational throughout the RFTA service area.

Transportation Network Companies (TNCs)

Of the two major TNCs (Transportation Network Companies), Uber is listed as running to and from the Aspen/Pitkin County Airport[20], and Lyft is listed as operational in the City of Aspen[21], but appears to have coverage throughout the RFTA service area.[22]

[19] Source: https://www.we-cycle.org/ [20] Source: https://www.uber.com/global/en/airports/ase/
[20] Source: https://www.uber.com/global/en/airports/ase/
[21] Source: https://www.lyft.com/rider/cities
[22]: Source: https://www.lyft.com/rider/cities/resort-rockies-co

CHAPTER 3
COMMUNITY ENGAGEMENT

3. COMMUNITY ENGAGEMENT

Community engagement for the Regional Bikeshare Plan was combined with RFTA's Regional First- and Last-Mile Mobility Study. The engagement process was designed to include all demographics and allow input on ways to improve access to transit, jobs, services, and other destinations within the Roaring Fork Valley as well as preferences about bikeshare and potential new station locations. The Public Engagement Strategy included a variety of tools for virtual and in-person outreach and a targeted effort to engage with historically hard-to-reach population groups in a way that was comfortable for them to communicate and provide input.

Figure 6. A woman provides feedback on FLMM barriers at an outreach event in Carbondale.

The overall goals for the community engagement process were to:

1. Generate quantifiable information that directly informed the Plan's recommendations.
2. Ensure that the process was equitable and included strategies to "meet people where they are" and obtain input from hard-to-reach populations.
3. Employ a variety of methods to reach a wide and diverse audience, utilize existing communication networks, and allow people to respond in different ways depending on their level of comfort during the COVID-19 pandemic.

175+ Participants engaged through in-person tabling at local community events	**77+** Participants engaged at in-person tabling events were Latino	**8** Community Ambassadors engaged their networks
140+ Responses to the online survey	**3** Focus groups provided in-depth feedback	**120** Responses to the interactive web map

Figure 7. Public participation by the numbers.

3.1 ENGAGEMENT STRATEGIES

Multiple outreach strategies were used to gather input from stakeholders and the public on their first-and last-mile preferences and the Regional Bikeshare Plan. Stakeholder outreach strategies included:

- **Technical Advisory Committee (TAC) Meetings**: the committee was responsible for reviewing project deliverables, providing feedback, and providing direction and decision-making in the development of the Regional Bikeshare Plan. The TAC included staff from RFTA, the EOTC, Eagle and Pitkin Counties, the Towns of Basalt, Carbondale, New Castle, and Snowmass Village, and the Cities of Aspen and Glenwood Springs, and WE-cycle.
- **Focus Groups:** virtual focus group meetings were held with the following stakeholders:
  - » Active transportation advocacy groups.
  - » Bike shops.
  - » Community-based organizations.

Public outreach strategies included:

- **Project flyer:** a one-page information sheet was created that described the project, the planning process, and ways for people to engage with the project, including a QR code for community members to access the project website, the survey, and the web map:
  - » More than 400 one-pagers were distributed in both English and Spanish including at mobile home communities, residential neighborhoods, and bus stops.
- **Project website:** RFTA hosted a project website that provided information about the project, advertised in-person and virtual outreach events, and linked to the interactive web map and online survey tools.
- **Virtual Open House:** The project team hosted a virtual open house to provide an opportunity for members of the public to learn more about the Regional Bikeshare Plan and First- and Last-Mile Mobility Study and ask questions directly to RFTA staff.
- **Interactive web map:** a crowdsourcing web map was created that allowed users to comment on an existing bikeshare station, add a potential station location, or like or dislike a previously suggested station location.
  - » Approximately 70 people provided approximately 140 locations for potential bikeshare stations.
  - » 13% of respondents identified themselves as persons of color.
- **Survey:** a survey was created to collect information from respondents about their bikeshare preferences and demographics and to provide general comments on bikeshare and transportation in the region. The survey was available in an electronic and paper-based format.
  - » Approximately 140 responses were received.
  - » 10% of respondents identified themselves as persons of color.

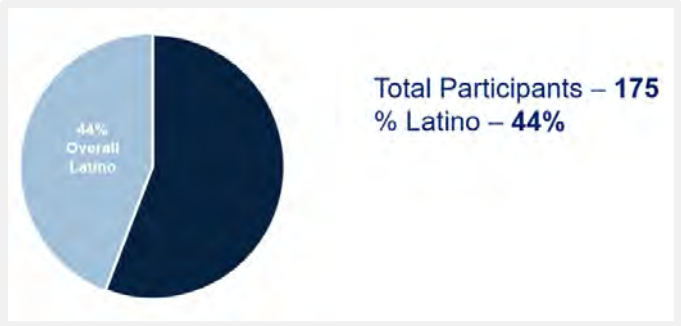

Figure 8. Approximately 44% of the 175 people that engaged at in-person tabling events were Latino.

- **Community ambassador program:** local organizations were identified to serve as community ambassadors and to help connect more effectively with local communities, especially Latino and other hard-to-reach populations. These organizations, which included community-based organizations, libraries, and HOAs, utilized their networks to share project information, the survey, and website; and to advertise in-person engagement activities.
  - » One mobile home park HOA was able to share project information to more than 400+ residents.
- **In-person tabling events:** five in-person events were coordinated with local markets, existing events, or conducted at local transit stops to engage residents and to meet Latino and other harder-to-reach populations. Project boards outlined project information and two interactive exercises allowed participants to provide information about potential new locations for bikeshare stations and to identify the biggest challenges to accessing public transit. In-person events were held in:
  - » Aspen
  - » El Jebel/Basalt
  - » Carbondale
  - » Glenwood Springs
  - » New Castle

Figure 9. A local family provides input on mobility needs in Glenwood Springs.

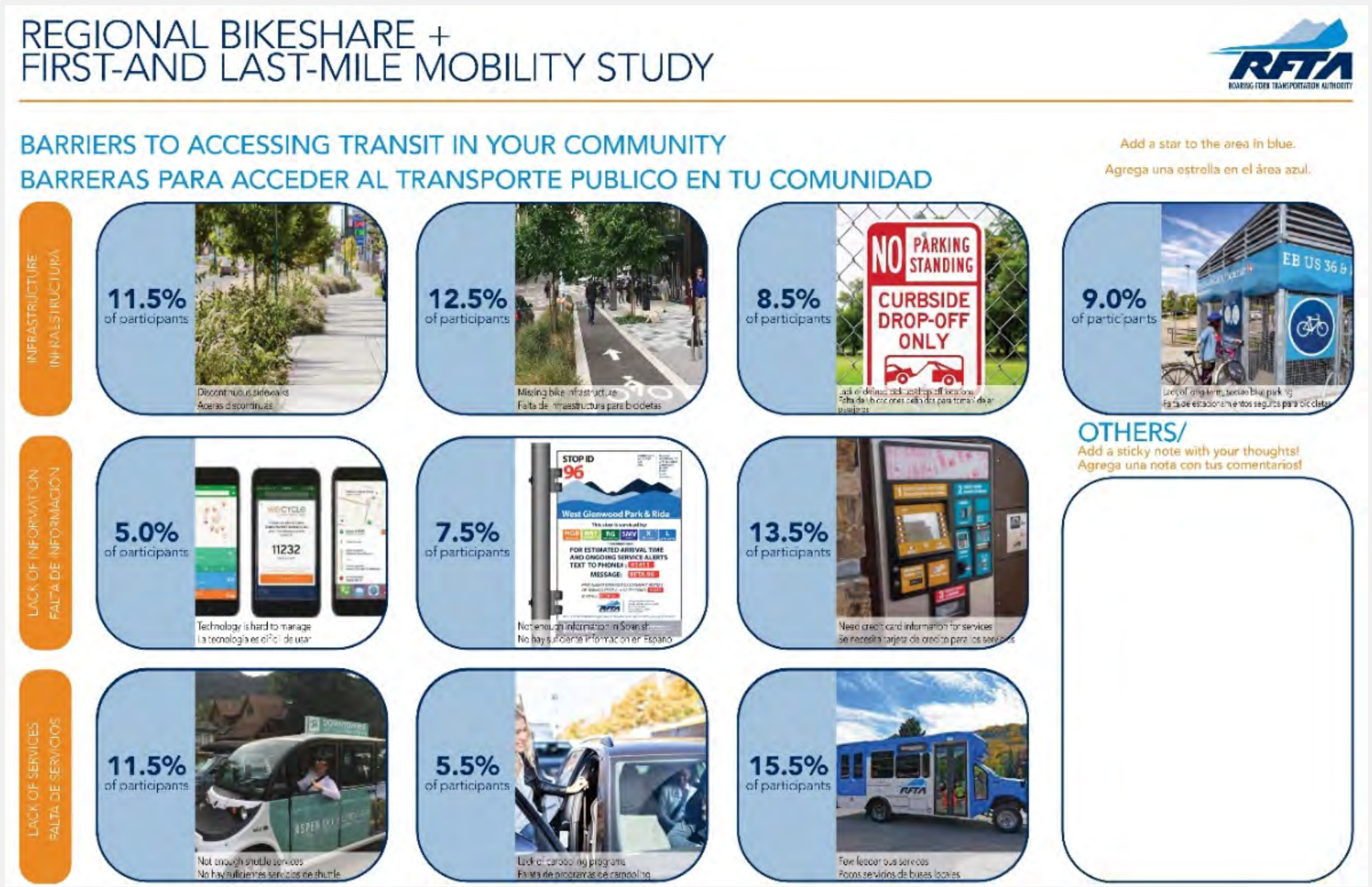

Figure 10. First- and Last-Mile Mobility Study results that indicate the percent of total participants from all communities that find these barriers present.

3.2 KEY THEMES

The following themes emerged from public and stakeholder outreach around first- and last-mile mobility. The key themes identified below, combined with the results of the online survey were used to develop the FLMM recommendations.

- There were concerns raised that there is inequity in infrastructure and transit investment throughout the Roaring Fork Valley.
- Members of the Latino community feel that there should be more communication and targeted campaigns to share information and changes in transit service or payment with this community since they represent a large portion of RFTA's ridership.
- Community members would like to see bikeshare expanded to residential neighborhoods and town centers.
- Community members want more designated, and comfortable bike infrastructure and more secure bike parking. A lack of secure bike parking was often cited as a barrier to transit access.
- Community members want to see expansion of local feeder buses to improve access to regional transit services.
- There is a need for infrastructure changes to make it safer and more comfortable for people walking and bicycling to access transit.
- The importance of increasing the use of technology to aid with transit and other mobility options.
- The need for improvements to transit access, information, and equity, specifically with regards to the Spanish-speaking community within the RFTA service area.
- Most people walk to access transit stops and stations.

Summaries of the public feedback received in each community are included in **Appendix A**.

Information	• Lack of information or encouragement campaigns in Spanish.
Services	• Lack of feeder services to/from transit.
Infrastructure	• Lack of long-term secure bike parking. • Lack of defined pick-up drop-off areas. • Lack of crossing points to access transit.

Figure 11. Summary of key findings from community engagement.

SURVEY FEEDBACK

Alongside our in-person public outreach, the project team also set up an online survey and comment map to solicit feedback throughout the Valley.

Across the region, most people walk to and from transit stops. These results show the importance of pedestrian access to transit stops, especially at destination station and stop locations. The proportion of people driving alone to access transit is relatively small.

Respondents were asked a series of questions to show their level of agreement with a range of FLMM statements. Less than half of respondents agreed that bicycle parking was available when needed.

The statements most people agreed with were that sidewalks and bike routes connect to their first transit station. The statements that were less agreed with were that bike parking is available when needed and that the station is a short distance from home.

Survey respondents were asked to indicate which strategies RFTA and other agency partners could implement to improve access to transit by making it easier to travel to and from bus stops. Table 1 and Table 2 show the top three most common responses. The most common responses focus on improving access for people walking or biking to the bus stop, including improving bike parking, providing bikeshare, and providing safer crossings near transit stops. This indicates that infrastructure improvements to transit should focus on creating and improving the quality of connections for people walking and bicycling.

The results of the survey suggest that FLMM recommendations should analyze potential bike parking solutions and reduce the distance between transit stops and home locations. Reducing the need for people to use their private vehicle and park at transit will also increase the number of available parking spaces for those that do not have any other option. Similarly, improving pick-up and drop-off designations should reduce the need for people to park at a transit station or stop.

Table 1. What can RFTA do to make your connection to transit easier?

Option	Number of Responses
Provide bikeshare at or near station	25
Add covered or secure bike parking	22
Provider safer crossings	21

Table 2. What can RFTA do to make your connection from transit to your next destination easier?

Option	Number of Responses
Provider safer crossings	20
Improve bike access	18
There is nothing RFTA can do to make my connection to transit easier	17

CHAPTER 4
RECOMMENDATIONS

4. FIRST- AND LAST-MILE MOBILITY RECOMMENDATIONS

4.1 FIRST- AND LAST-MILE MOBILITY RECOMMENDATIONS FRAMEWORK

First- and last-mile mobility (FLMM) recommendations were split into three different types of programs:

- Transportation services
- Information and encouragement campaigns
- Infrastructure

Each of these themes is described in more detail, with examples, below. Each is an essential component and the three types of programs often work together to create a robust FLMM system. For example, providing bikeshare services will not work unless information on how to use and join the service is readily available. Similarly, bike infrastructure is required to ensure users of the service can access locations safely and comfortably.

Figure 12. The Aspen Downtowner is a transportation service.
Source: City of Aspen

TRANSPORTATION SERVICES

These are services most people identify with FLMM. Transportation services include shuttle services, micromobility, bikeshare, and carpooling.

EDUCATIONAL PROGRAMS AND PROMOTIONAL MATERIALS

Educational programs and promotional materials are a critical piece of FLMM. Examples include wayfinding, encouragement campaigns, apps, and other methods of providing transportation information and encouraging transit use.

Figure 13. Marked crossings near bus stops make it safer for people to walk or bike to the bus.
Source: Toole Design

INFRASTRUCTURE

Providing safe and comfortable infrastructure is a key piece of FLMM. Oftentimes, this infrastructure is necessary to ensure transportation services can be used.

FIRST- AND LAST-MILE MOBILITY TYPOLOGY

Different FLMM recommendations work best in different locations and contexts. For example, a microtransit service requires a certain level of density to perform efficiently. In less dense areas, a flexible carpool program may be a more appropriate service.

To provide a framework for the FLMM recommendations, the consultant team developed the FLMM typology using desktop analysis and feedback from stakeholders.

The FLMM typology includes:

- Cities (Aspen and Glenwood)
- Towns (New Castle, Carbondale, Mid-Valley (e.g., Basalt and El Jebel), and Snowmass Village)
- BRT stops outside towns and cities
- Local stops outside towns and cities

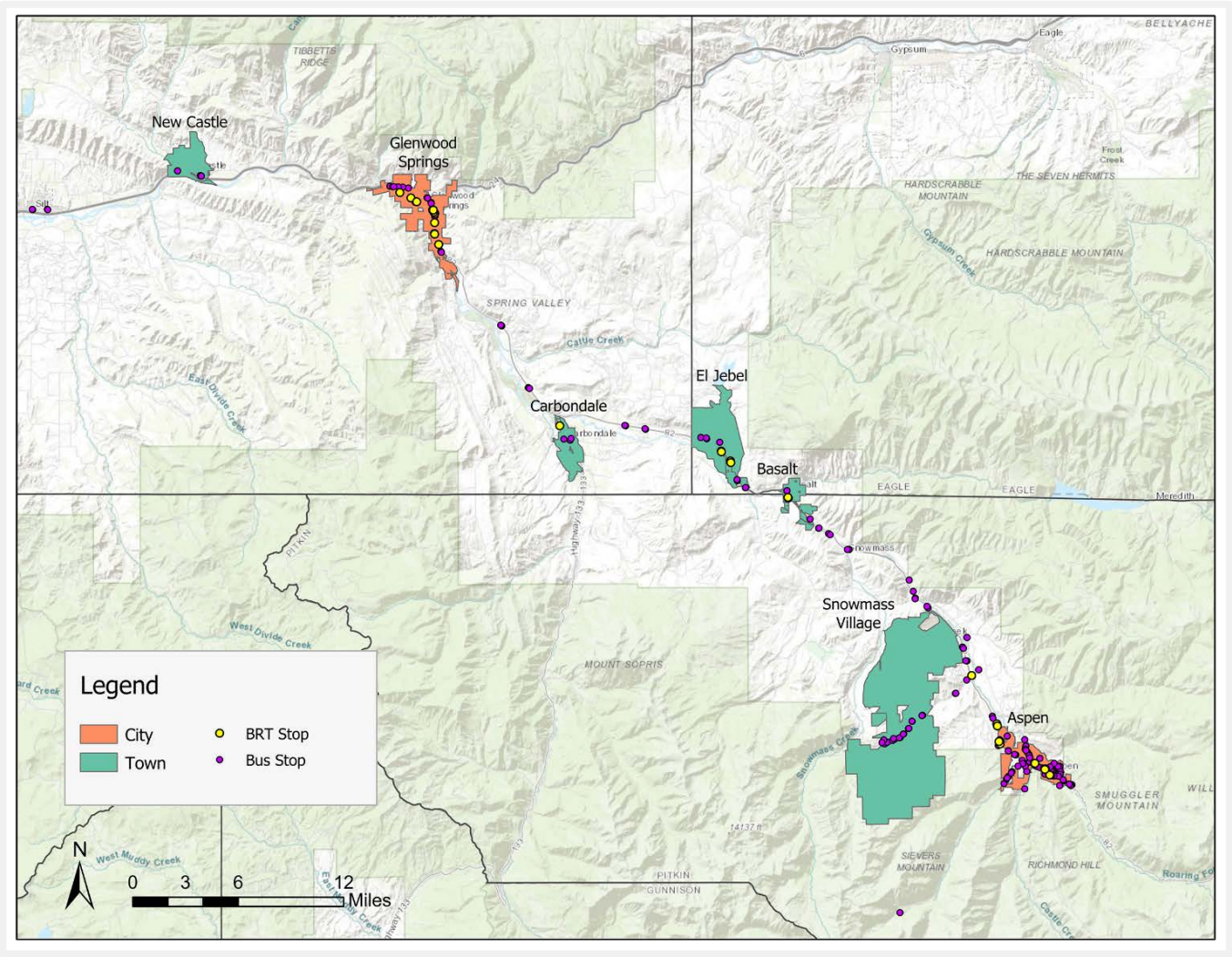

Figure 14. First- and Last-Mile Mobility recommendations typology.

4.2 FIRST- AND LAST-MILE MOBILITY RECOMMENDATIONS

The first- and last- mile mobility (FLMM) recommendations are based on analysis of the RFTA service area combined with input from the public and stakeholders. The project team looked at the full range of FLMM options, split them into three overarching categories (infrastructure, transportation services, and information and encouragement), and then narrowed down the list of potential FLMM recommendations to a selection that best meets the needs of the community. The recommendations are split between those that are applicable to the overall RFTA-service area those that are only applicable to certain communities and contexts.

Overall RFTA-service area recommendations:

- Secure bike parking facilities
- E-bike incentive program
- Engagement and materials for Spanish speakers

Community- and context-specific recommendations:

- Microtransit
    - Fixed route microtransit
    - Dynamically routed microtransit
- Community carpooling
- Pick-up and drop-off locations

These FLMM recommendations were applied to the typology described above using a variety of community characteristics, including existing transit services, population size and density, and surrounding land use. The matrix below shows how applicable each first- and last-mile recommendation is to each community or transit stop type.

Each of these recommendations is explained in more detail in the remainder of this section. The subsequent pages describe each recommendation, including the potential benefits and implementation considerations, such as including risk and mitigation strategies and equity considerations.

A summary of FLMM recommendations in each community is provided in Appendix B.

Table 3. Recommendations by Area Typology

Recommendation	City (e.g., Aspen or Glenwood Springs)	Town (e.g., Basalt, Carbondale, or New Castle)	BRT Stop and Surroundings	Rural Local Stop and Surroundings
Microtransit: Fixed Route Enhancements	Likely applicable	Maybe applicable depending on circumstance	Likely unapplicable	Likely unapplicable
Microtransit: Local Circulator Enhancements	Maybe applicable depending on circumstance	Likely applicable	Likely unapplicable	Likely unapplicable
Secure Bike Parking Facilities	Maybe applicable depending on circumstance	Likely applicable	Likely applicable	Likely unapplicable
Community Carpooling	Maybe applicable depending on circumstance	Likely applicable	Likely applicable	Maybe applicable depending on circumstance
Pick-up and Drop-off Enhancements	Maybe applicable depending on circumstance	Maybe applicable depending on circumstance	Likely applicable	Maybe applicable depending on circumstance
E-bike Incentive Program	Likely applicable	Likely applicable	Likely applicable	Likely applicable
Materials for Spanish Speakers	Likely applicable	Likely applicable	Likely applicable	Likely applicable

Secure Bike Parking Facilities

Bicycling is a popular and growing mode of transportation for commuting and recreation in the Roaring Fork Valley. Stakeholders and the public stated that a key barrier to accessing transit by bike is a lack of secure bike parking at their transit station or stop. While some stops and stations may have bike racks, bicyclists do not feel that their bike is secure enough to leave for long periods of time. Furthermore, the elements in the Roaring Fork Valley can result in sustained wear and tear on the bike due to it being exposed to high-altitude sun, wind, rain, and snow.

To overcome this barrier and encourage increased access to transit by bike, secure bike parking facilities can be installed at key transit stops and stations. These facilities would provide users with a place to safely store their bikes as they go to work or other destinations.

Figure 15. Secure bike locker provided by King County Metro Transit in Washington.
Source: King County Metro

Potential Benefits

- It provides bicyclists with more peace of mind when leaving their bike unattended at a transit station or stop.
- It encourages accessing transit by bike by providing a highly visible facility.
- It helps alleviate current capacity issues from bicyclists bringing their bikes on RFTA buses. This can preserve bike rack capacity at the front of RFTA buses for bicyclists that don't have access to secure parking at their transit stop.
- Can reduce greenhouse gas emissions by encouraging transit riders to bike to transit rather than drive.

Public input collected during the First- and Last-Mile Mobility Study showed a general need across the valley for secure bike parking. Twenty percent of survey respondents suggested they access transit from their home using a personal bike, but the statement "that there is bike parking available" was the least agreed upon statement regarding people's first transit station. Providing covered bike parking was also the second most popular improvement identified by respondents for their origin transit station.

Key Considerations

- Secure bike parking facilities should be situated as close to the transit stop as possible. The facility should be lit, covered, and sheltered from the elements.
- Secure parking facilities should be accessed via some form of access control. This is often provided through memberships and digital access cards. Memberships can be for a single secure bike parking facility or to access a network of facilities.
- Considerations should be made for incorporating e-bike charging facilities as the popularity of e-bikes continues to grow.

APPLICATION

Secure bike parking facilities are most applicable to locations that are origins of trips, rather than destinations. This strategy is recommended at transit stops and stations in towns and at BRT stops throughout the RFTA region. Rural bus stops may not have the ridership to warrant implementation of a secure bike parking facility.

- Most racks within the secure bike parking facility should be standard “inverted U” racks, as these have an intuitive design that can be easily used by a wide range of different bike types. To increase bike storage capacity in locations with heavy use, pneumatic two-tier racks may be used for some of the parking supply.
- Facilities should include a basic bike repair station, including a bike pump, tire patch kits, tire levers, and multi-purpose bike tools.
- Security cameras can be installed if deemed necessary.

Risk and Mitigation Strategies

Risk	Mitigation
Liability exposure of storing personal belongings in a public agency-operated facility.	Membership to the facility includes a customer contract or waiver to reduce public agency liability.
Liability exposure to personal safety when using the secure bike parking facility.	Site the facility in a visible location; integrate personal security into the facility design process; active and passive security options (e.g., security doors, security cameras, etc.); lighting and illumination.
Cleaning and maintenance costs.	Account for operating and maintenance funds in planning; site design to simplify maintenance and cleaning.
Abandoned bikes taking up space.	Develop and clearly communicate policy for how long bikes can be left at the facility before removal. Establish a protocol for removing and reclaiming abandoned bikes.

Equity Considerations

Increasing the supply of long-term bike parking at transit stops and stations adds theft prevention and security that can increase access to transit by bike and positively impact those members of the community who do not own or have access to a private automobile. It is important to provide awareness and promotional campaigns (particularly focused on non-English speaking populations), to ensure that people are aware of these facilities and how to access them. Any use policies will need to address privacy concerns and ensure that any membership or pricing model considers the impact on low-income users.

Further Planning

To implement a network of secure bike parking facilities, a planning process should be conducted to identify the locations that would most benefit from this improvement. This should consider existing transit ridership and the bus routes that have the greatest challenges with bike rack capacity. Location siting may need to consider sites on RFTA or other public right-of-way or partner with private entities for sites outside of the right-of-way.

Cost considerations:

- Standalone facility (assuming power provided): $100,000 - $200,000
- Facility situated in an existing structure (e.g., parking garage, commercial space, etc.): $50,000 - $100,000
- Maintenance: Usually maintenance is completed by the transit operator’s maintenance contractor or maintenance division as an extension of service. Costs can differ depending on the existing contract and facility type.

Additional Resources and Case Studies

- The Atlanta Regional Commission's "Bike Parking at Transit Stops: A Summary of Best Practices" provides detailed information about best practices for bike parking at transit and includes case studies from around the United States[23].
- RTD has implemented several secure bike parking facilities in the Denver Area. RTD has shared concept designs[24].

[23] Accessed here: https://urbantransnorthamerica.box.com/s/1l8726z6v1awlmcemk6ll3jrlk9ixetc
[24] Accessed here: https://urbantransnorthamerica.box.com/s/tau3n2sqwpqw2zp1p38vozgnkkg3savw

E-Bike Incentive Program

E-bikes are being rapidly adopted throughout the United States, with some sources suggesting a growth of 240% in the 12 months leading up to July 2021.[25] E-bikes offer greater flexibility and accessibility to a wider segment of the population and can become a very powerful mode of transportation when combined with transit. However, the people that could benefit most from e-bikes often find them too expensive.

Several communities have set up programs that incentivize e-bike purchases for certain populations through partnerships with local bike shops, nonprofits, and government agencies. These programs support the purchase or loan of e-bikes to members of the community that may be lower-income, essential workers, or otherwise deemed eligible. These programs range from providing interest-free loans to buy e-bikes to giving them away directly to program participants.

Figure 16. E-Bike incentive program in Eugene, Oregon.

Potential Benefits

This recommendation will get more e-bikes into the hands of community members that need them most to access transit and to provide an additional form of mobility in their local community. It can also help to normalize bicycling and accelerate investment in bicycling infrastructure. E-bikes are particularly useful in areas with steeper topography.

Public outreach to RFTA users showed that people are willing to bike to transit (20% of respondents biked to their first transit station). Increasing the availability of e-bikes will increase the number of people who can reliably bike to transit, thereby reducing the barriers of distance and typography.

APPLICATION

E-bike incentive programs are applicable to all typologies due to the flexibility of e-bikes, which can provide a mobility option in all contexts. However, they may have the most benefit in areas that are not dense enough or in advance of bikeshare implementation. There may be benefit in including e-bike chargers at secure bike parking facilities to further support this program.

Key Considerations

An e-bike incentive program can take many forms, from promoting existing state or federal e-bike incentives to developing a localized program. Some key considerations include:

- Creating strong partnerships to support the e-bike incentive program:
  - Local bike shops should be engaged early and be invited to participate in the program to provide e-bikes or fulfill regular maintenance.
  - Local community-based organizations and nonprofits are needed to promote the program and identify/qualify eligible recipients and should be compensated for their time.
  - Businesses and sponsors (e.g., solar power companies) can help fund the program.
- Ensuring that recipients are provided with some form of e-bike training, including a review of any local e-bike laws, guidance on how to ride on roads with traffic, and regulations that preclude e-bikes from certain roadways and paths.

[25] Source: https://www.npd.com/news/blog/2021/the-cycling-market-pedals-ahead-in-2021/

- Identifying what type of e-bike is eligible for purchase:
    - E-cargo bikes are useful for families to transport children and/or groceries. They could also support additional income as a delivery vehicle.
    - E-bike kits can be used to adapt regular bikes to e-bikes. They are generally cheaper, but often not as high quality as an off-the-shelf e-bike.
    - Folding e-bikes are a more flexible option and especially useful for connecting to transit (i.e., the e-bikes can be folded-up and taken onto the bus) and for people who live in apartments or have space constraints.
- Providing secure bike parking facilities so e-bike owners feel safe locking up and leaving their e-bike.

Risks and Mitigation Strategies

Key risks and potential mitigation strategies around provision of e-bike incentive programs include:

Risk	Mitigation
Misuse of incentives.	Careful administration and programs for qualifying eligible recipients are essential to ensure the incentives go to the intended audience.
Alienating local bike shops.	Local bike shops should be engaged in the planning process and involved in the program as e-bike providers or performing maintenance.
Difficulties evaluating the program.	Program evaluation is important to showcase the benefits e-bikes and incentives can have on mobility. Consider periodic surveys of participants to evaluate the program over time.

Equity Considerations

E-bike incentive programs can be developed to specifically aid the members of the community with the highest needs and can therefore be excellent strategies for reducing mobility inequities. It is important to provide awareness and promotional campaigns about the program (particularly focused on non-English speaking populations). This could be achieved through partnerships with community-based organizations. The price-point payment schedule for any participant costs should also be a key consideration.

Further Planning

The formation of an e-bike incentive program would first need a lead agency to take the idea forward, formulate the goals of the program, and identify the intended target audience(s). Funding sources and key partnerships would need to be established along with awareness and education campaigns, and a way to determine eligibility for the program.

Cost considerations:

- Costs associated with this program depend on the type of bikes and the scale of the program. Some or all of these costs may be offset by grants, sponsorship, or other funding.
- Heavy-duty Colorado-rugged e-bikes cost around $1,500-$2,000 each.[26] Discounts may be available for bulk purchases.

[26] Source: https://fatteBikes.com/

Additional Resources and Case Studies

There are many types of e-bike incentive programs. Below is a list of several existing examples:

- California's "Clean Cars 4 All" program (SB 400) aims to provide $7,500 in grant funding to eligible low-income recipients upon trading in older cars. Recipients are provided pre-paid cards that can be used for purchasing an e-bike or for use on public transit. Currently, the program is only available in the Bay Area[27].
- Austin Energy's "Electric Ride" Rebate program provides $300 per e-bike for individuals[28]. A similar program through Green Mountain Power in Vermont offers a $200 rebate[29].
- The Equitable Commute Project in New York City provides subsidies to eligible participants of 50% off the cost of an e-bike[30].
- The Metropolitan Transportation Commission (MTC) in the San Francisco Bay Area launched the "Richmond-San Rafael E-bike Commute Program," which aims to provide discounts on e-bike purchases to residents living and working in Richmond and San Rafael to reduce bridge traffic congestion[31].
- The City of Denver's Office of Climate Action, Sustainability, & Resiliency has recently launched numerous e-bike initiatives. In 2021, the office funded the development of e-bike libraries in low-income housing and for essential workers. The e-bikes are free to use for residents. An additional program provided e-cargo bikes to agencies within Denver to support deliveries[32].

[27] Source: https://www.baaqmd.gov/funding-and-incentives/residents/clean-cars-for-all/mobility-options
[28] Source: https://austinenergy.com/ae/green-power/plug-in-austin/more-ways-to-go-electric/e-ride-rebate
[29] Source: https://greenmountainpower.com/rebates-programs/electric-vehicles/electric-bike-rebate/
[30] Source: https://www.theverge.com/2021/12/10/22826701/ebike-bronx-frontline-worker-equitable-commute-project-subsidy
[31] Source: https://mtc.ca.gov/operations/programs-projects/forward-commute-initiatives/richmond-san-rafael-forward
[32] Source: https://www.denvergov.org/Government/Agencies-Departments-Offices/Agencies-Departments-Offices-Directory/Climate-Action-Sustainability-Resiliency/News-Events/News/2021/Climate-Protection-Fund-to-Support-Electric-Bikes-for-Essential-Workers

Materials for Spanish Speakers

Oftentimes, transit agencies produce informational and encouragement campaigns based on white, Anglo-culture without considering the other cultures of people they serve. In many cases these campaigns are simply translated into different languages, without considering the appropriateness of the overall messaging.

Transit agencies are beginning to tackle this issue by conducting programs to better understand the various communities that they serve. This includes conducting in-depth research of Spanish-speaking communities through focus groups, surveys, and stakeholder groups. This research helps transit agencies understand the barriers these communities face when traveling and using transit.

Many Spanish-speaking communities exist within the RFTA service area, and public and stakeholder outreach clearly identified a need for transit information and encouragement materials tailored to those communities.

Figure 17. Examples of transportation service materials in Spanish.

Potential Benefits

Many Spanish speakers in the RFTA-service area rely on transit to access jobs and services. Spanish-speaking residents have expressed difficulty understanding the transit system and the English-centric information currently available. Creating transit information and encouragement campaigns that are sensitive to cultural differences between communities within the RFTA service area will encourage more people to use transit and break down knowledge barriers. The campaigns will also enhance RFTA's position as an equitable transit service provider.

APPLICATION

Engagements and materials for Spanish speakers are applicable to all typologies and locations with Spanish-speaking populations. Spanish-speakers are a high proportion of transit ridership and many Spanish-speakers rely on local and regional transit services for access to jobs and essential services.

Key Considerations

- Catalog any existing Spanish materials.
- Conduct an audit to evaluate what needs exist within the Spanish-speaking communities, including reaching out to and engaging with Spanish-speaking communities through surveys and/or focus groups.
- Refine existing materials or develop new ones, ensuring that:
  - Correct vocabulary is used.
  - New materials are reviewed by a native Mexican Spanish speaker (as opposed to a native European Spanish speaker).
  - Cultural sensitivity has been considered.
  - Transportation jargon and concepts have been written in accessible ways.
  - Electronic materials have an obvious Spanish option.
- Compile physical resources into travel kits for distribution.
- Develop Spanish-speaking templates and guidelines for future campaigns, including new services, route changes, cancellations, etc.

Risks and Mitigation Strategies

Key risks and potential mitigation strategies around materials for Spanish-speakers include:

Risk	Mitigation
Misunderstanding the needs of Spanish-speaking communities.	Ensure Spanish-speaking communities and organizations are involved in developing Spanish-language materials.
Inadequate funding for material distribution and updates.	Establish funding and align updates to Spanish-language materials with schedules for updating English materials.

Equity Considerations

This recommendation is specifically developed to improve equity for Spanish-speaking communities.

Further Planning

The development of materials for Spanish-speakers should first start with identifying key community partners to help formulate focus groups and other avenues of engagement. Leveraging these connections with communities will form the basis for future engagement and messaging.

Cost considerations:

- Associated costs include hiring an outreach consultant, if necessary, to develop the program and organize engagement. Costs for a consultant would range from $30,000 to $50,000.

Additional Resources and Case Studies

Portland Metro's Regional Travel Options (RTO)[33] program is committed to educating the region's Latino community about the availability and benefits of non-automobile travel options. To better understand the community and how to effectively engage with them, Metro undertook a Spanish Language Marketing Pilot Project to test a set of methods to provide travel information to Spanish speakers in the region. The project consisted of a robust research phase, with over 400 intercept surveys and a focus group contributing to the marketing phase implemented the following year. Evaluation of the program will be based on the success and receptiveness of marketing methods, feedback on educational materials, and anecdotal findings by project participants.

[33] Source: https://getthereoregon.org/wp-content/uploads/2021/03/2015-DLC-Spanish-Final-Report.pdf

Microtransit

Microtransit is a small-scale, demand-responsive, fixed- or non-fixed route transit service. Riders often call or use a mobile app to schedule a trip with a microtransit service provider. Generally, microtransit is provided in locations or for travel patterns that do not meet service standards for traditional fixed-route transit but have a concentration of trips occurring around the same time. There are many variations of microtransit, from Uber/Lyft-type services that use personal minivans to collect people, to dedicated, privately owned and operated shuttles.

Transit service providers have historically provided microtransit in the form of Call-a-Ride services. Recently, private providers have entered the microtransit market and cities are running pilot programs to evaluate their effectiveness at providing additional or complementary transit service.

Figure 18. Microtransit program in Wisconsin provided by Via.
Source: Green Bay Metro

Fixed-Route and Deviated-Fixed-Route Microtransit

Fixed-route and deviated-fixed-route microtransit, also called circulators, provide small-scale transit service along a predetermined, designated route. Fixed-route microtransit is similar to traditional transit in that the vehicle follows a predetermined route, however the vehicle will only stop if a rider has reserved a ride. Deviated-fixed-route microtransit provides additional flexibility whereby a rider can request a vehicle to stop within a buffered area or pre-determined geographical boundary around a fixed-route service. These services are different from dynamic microtransit services which are not limited to a fixed route and where routes can vary significantly and schedules are not set due to their dependence on customer demand. More information on fixed-route, deviated-fixed-route and dynamic microtransit is included below.

Potential Benefits

The following benefits may be realized by commuters, residents, and operators:

- Opportunity to improve the flexibility and efficiency of an existing service or vehicle fleet.
- Shortened wait times for passengers.
- Improved user experience when using an app-integrated technology solution with mobile payment and real-time tracking.
- Service improvements for previously underserved destinations.

Community engagement in the RFTA service area found that one of the current barriers to using transit is the time it takes to wait, ride, and transfer on transit. Microtransit can decrease the overall trip time for riders by allowing transit vehicles to stop closer to the rider's origin and destination and sometimes avoiding the need to transfer.

Types

Fixed-Route Microtransit

Fixed-route microtransit is a variation on traditional fixed-route transit services where vehicles serve stops along a specified route, but only when a ride is reserved by the rider. Sometimes referred to as circulators, fixed-route microtransit can maximize resources in scenarios where periods of peak demand exist and can be served by traditional fixed-route service, but where service also needs to be available at other times. Applications typically include campuses or smaller downtown areas where a limited number of destinations allows rides to be grouped to maximize ridership. Snowmass Village's Shuttle Route 22 service outside of peak periods is an example of fixed route microtransit.

Deviated-Fixed-Route Microtransit

A deviated-fixed-route microtransit service can deviate from the specified route to reach other origins and destinations. Deviations can be applied to a traditional fixed route service to increase ridership during off-peak times, during special events, or to serve a certain area at a specific time. Typically, deviations must be scheduled in advance using a third-party app or phone service.

APPLICATION

Fixed-route microtransit is most applicable to larger communities in the Valley, such as Glenwood Springs and Aspen, that already have fixed-route transit and a larger urban area. Fixed-route microtransit can enhance existing fixed route transit services in specific circumstances. For example, a fixed-route service that is predominantly used during the peak periods, but considerably less so outside the peak, may benefit from becoming fixed-route microtransit and only making stops on-demand during the off-peak. Fixed-route microtransit is less applicable to rural and less dense areas.

Good applications for deviated-fixed-route microtransit could be a fixed route service that includes key destinations a ½- to 1-mile off the route that only need service at certain times (e.g., schools, churches, sporting events, etc.). Generally, point-deviated-fixed-route services only travel to one of the "off route" points to pick-up or drop-off riders who pre-book their trip. For "off route" destinations with a regular demand interval, certain periods during the day can be specified to serve those points when needed (e.g., a bus route may deviate to a school ½ mile off-route to pick up in the afternoon).

Point-Deviated-Fixed Route

This model serves a limited number of stops outside a fixed route. In scenarios where there is demand at a small number of specific origins or destinations, a point-deviated-fixed-route can ensure the service only deviates to predetermined stops when rides from those locations are scheduled. This helps the service to stay on time and on schedule as much as possible.

Key Considerations

Increased Flexibility

One benefit of using fixed-route, deviated-fixed-route, or point-deviated-fixed-route microtransit is the potential to add flexibility to an existing system without increasing or changing the vehicle fleet. Adapting a route that normally serves a certain population and expanding the reach of the service has the potential to increase ridership. This could come from people who would not otherwise use transit if pick-up or drop-off were not convenient. Alternatively, converting an existing low-ridership route to be solely demand responsive can reduce operating costs, lower emissions, or have other benefits.

Existing Transit Reliability

A fixed route service converted to be solely demand-responsive may exclude riders who are unable to book a ride or may be perceived as a service reduction. Meanwhile, converting an existing route to allow deviation may cause transit delays for other users and impact rider satisfaction. Fixed-route, demand-responsive, or deviated service

should be tested and only implemented where complementary or an enhancement to existing and traditional fixed route services. If a point-deviated-fixed-route service is being explored for a daily school pick-up or other regular interval, consider modifying the schedules for affected routes to reduce disruption.

Technology

There are many technology providers that specialize in routing and scheduling of fixed-route microtransit services. Some of these services offer different solutions and features that may vary based on the application.

Circulator Integration

A circulator may operate outside periods of high demand when few riders are served. Integrating on-demand functionality into a circulator can improve service efficiency and reduce costs. Circulator integration can also operate in a hybrid model where service is divided between multiple vehicles, some of which operate at specified headways while the others are solely on-demand.

Terrain Challenges

The Roaring Fork Valley has many steep, winding, and narrow roads connecting houses to commercial nodes. While deviations can be customized to serve trip-generating areas, such deviations could experience significant delays if the vehicle is routed down steep, narrow, or isolated roads. Point-deviated-fixed-route microtransit can help to control inappropriate routing by identifying specific points and times for service. Furthermore, service providers who provide routing functionality can customize where drivers are directed to avoid streets that are not appropriate for microtransit service, especially if they use a larger vehicle.

Risks and Mitigation Strategies

Key risks and potential mitigation strategies around fixed-route microtransit services include:

Risk	Mitigation
Members of the community feel that it reduces the frequency or quality of the overall transit services provided.	Ensure the potential benefits of fixed-route microtransit are studied and tested through pilot programs and the results objectively presented to the public.
Reallocation of funds that could otherwise be used to improve service on established routes.	Identify a unique funding source/category when piloting the program to ensure service goals are attainable without affecting other riders.
Ridership doesn’t grow as expected.	Launch the service in tandem with a robust marketing and outreach campaign that targets existing and potential RFTA riders and commuters.
Technology and fare interface is confusing or different from other RFTA services, deterring would-be riders.	Ensure service has print and online information accessible for those who are unwilling or unable to download an app. Seek fare integration with connecting services or operate the service at a reduced cost or for free for a pilot period.

Equity Considerations

Fixed-route, deviated-fixed-route, and point-deviated-fixed-route microtransit services can improve access to transit for those that need it most, including population clusters that may have mobility issues and those that do not have access to a private automobile or other mobility options. However, new microtransit services should be careful to avoid causing disruption to or eliminating existing services that have proven beneficial to historically underserved communities. The booking process must be clear and obvious and available in Spanish and other languages. There should be multiple ways to reserve a ride that accommodate people with different levels of technological connectedness.

Further Planning

As a first- and last-mile mobility solution, fixed-route microtransit has specific applications. Existing circulators, such as the Carbondale Circulator, Snowmass Village Shuttle, or Aspen Mountain Valley Dial-a-Ride, could improve their flexibility by integrating with an on-demand model using app-based technology. This flexibility should be tested using a hybrid approach that integrates with existing service design. Furthermore, existing services that have RFTA connections could be promoted as an alternative to driving to a Park & Ride.

Cost considerations:

- Communities are advised to undertake a procurement process using a Request for Information (RFI) to understand the technology options, infrastructure needs, and costs associated with implementing a third-party app.
- There may be opportunities to leverage the partnership between RFTA and Masabi to investigate app integration.

Additional Resources and Case Studies

- OmniRide's Dale City Local Route in Washington D.C.: the service configuration allows certain buses on the schedule to deviate ¾-mile from the fixed route to make pick-ups off-route for an additional fee. While this service uses technology for routing purposes, there is no user-facing tech, and rides requiring deviations must be booked via phone.[34]
- North County Transit District (NCTD) in San Diego County, CA.: NCTD provides their FLEX On-Demand service in deviated-fixed-route and point-deviated-fixed-route configurations. The routes typically run on a set schedule where vehicles can deviate to specified points along the route. There is no user-facing technology, and rides requiring deviations must be booked via phone.[35]

[34] Source: https://omniride.com/service/schedules/dalecity-local/
[35] Source: https://gonctd.com/services/flex-on-demand/

Dynamically-Routed Microtransit

Dynamically-routed microtransit serves passengers anywhere within a defined zone. The zone is typically between 2 and 15 square miles and can include areas such as a small downtown, neighborhoods, and/or commercial districts. Rides are reserved using an app or by calling a booking service. While dynamically-routed microtransit is most successful when augmenting fixed-route service, it can also help serve a common destination (e.g., a hospital or recreation center) or core area (e.g., a downtown area or main street). The Aspen Downtowner and Basalt Connect services are examples of dynamically-routed microtransit.

Potential Benefits

The following benefits may be realized by commuters, residents, and operators:

- Improvements to the flexibility of an existing service or vehicle fleet.
- The addition of a new service where traditional transit service is not viable.
- Improved access to high-capacity transit, such as VelociRFTA.
- Shortened wait times for passengers.
- Improved service to previously underserved areas.

Public engagement in the RFTA service area revealed that for some respondents, RFTA stations or stops are not close enough to their homes. Dynamically routed microtransit could increase the catchment area and capture some of those potential riders.

APPLICATION

Dynamically-routed microtransit is most applicable in a less dense urban area or in smaller communities that would benefit from improved intercommunity connections. This includes towns such as New Castle, Carbondale, Basalt and the Mid-Valley communities, and Snowmass Village. These are locations that may not have local fixed route service but could benefit from a more flexible transit option that could potentially connect riders to higher frequency or express transit services.

Key Considerations

Existing Service Integration

Most microtransit systems are tailored to fit the specific needs and demands of the resources available and the population they are serving. Oftentimes, a new microtransit service is introduced to optimize an existing transit station or specific route. It can also enhance the efficiency and user experience of existing call-a-ride, paratransit, or circulator services.

Flexibility and System Optimization

The benefits of microtransit lie in the technology behind the service. Technologies like routing, ride-matching, and demand forecasting can improve existing services and help them serve more riders. Furthermore, the technology is customizable, so different configurations are possible without infrastructure or fleet changes. For example, a dynamically-routed microtransit service area could cover a neighborhood with very low ridership, where serving it on with traditional fixed route transit would disproportionately inconvenience other riders. Dynamically-routed microtransit could address these issues and still provide that neighborhood with transit service. Given these services are technologically driven, the service area boundaries can be easily redrawn and updated as needed.

Fare Integration

Almost all microtransit technology providers integrate payment processing into the booking process. This allows riders to book and pay for rides at the same time. Some providers, such as RideCo, Via, and TransLoc, include fare integration with other services and could be configured to allow riders to transfer from another service, such as VelociRFTA, to reach their destination without any additional fare. Vehicles can also be equipped to accept fares from passes or accept cash.

Risks and Mitigation Strategies

Key risks and potential mitigation strategies around dynamically routed microtransit services include:

Risk	Mitigation
There is often a perception that dynamically-routed microtransit is less desirable than traditional fixed route transit service that provides permanence to a neighborhood or community.	Carefully study and collect data where pilot locations are most appropriate prior to implementation. Produce a marketing campaign to explain the true benefits of dynamically-routed microtransit.
Large number of single-passenger trips contributes adversely to congestion.	Design service areas to minimize dog-leg journeys where other passengers aren't likely to be traveling.
Confusion about where pick-ups and drop-offs are made.	Consider sharing pick-up and drop-off locations with existing bus stops in downtown areas.

Equity Considerations

Dynamically-routed microtransit services can improve access to transit for those that need it most, including populations that may have mobility issues and those that do not have access to a private automobile or other mobility options. However, new microtransit services should be careful to avoid causing disruption to or eliminating existing services that have proven beneficial to historically underserved communities. The booking process must be clear and obvious and available in Spanish and other languages. There should be multiple ways to reserve a ride that accommodate people with different levels of technological connectedness.

Further Planning

The technology options below can improve routing, booking efficiency, and customer experience, which can be used to increase the flexibility of existing fleets and encourage more people to use transit. These benefits could be applied to existing services in Aspen, Glenwood Springs, and Carbondale to improve their utilization. If demand exists, the Carbondale Circulator and Snowmass Village Shuttle could also be modified to operate as a dynamically-routed microtransit service.

Technology Comparison

Technology Solution	Routing Integration	Existing Fleet Integration	Fleet Management	Program Size	Payment Processing	Fare Integration*	Rider Authentication
Trakk[36]	✓	✓		Small-Medium	Yes		✓
VIA[37]	✓	✓	✓	Medium-Large	Yes	✓	✓
TransLoc[38]	✓	✓	✓	Medium-Large	Yes	✓	✓
TripShot[39]	✓	✓		Small-Medium	Yes		✓
RideCo[40]		✓		Medium-Large	Yes	✓	

*Depends on fare media tech used by agency

[36] Source: https://www.gettrakk.com/
[37] Source: https://ridewithvia.com/
[38] Source: https://transloc.com/
[39] Source: https://www.tripshot.com/
[40] Source: https://rideco.com/

Additional Resources and Case Studies

- Guelph Transit in Ontario, Canada, enhanced their Dial-A-Ride service with RideCo. The fully on-demand service integrates with their existing Access-A-Ride service and retains the flexibility for rides to be booked either via app or via phone number. The optimization increased service to 200+ passengers per weekday.[41]
- Green Bay Metro enhanced its existing paratransit service using VIA. Operating a fully on-demand service, it allows rides to be booked both via app and via the existing call-a-ride phone number. Ridership increased by 250% since implementation.[42]
- Plymouth Metrolink in Plymouth, MN used RideCo to improve the flexibility of their Access-A-Ride service, rebranding to Click-and-Ride. Operating fully on-demand, rides are booked via an app or online up to 20 minutes in advance.[43]

[41] Source: https://guelph.ca/living/getting-around/bus/mobility-service/
[42] Source: https://greenbaywi.gov/325/Program-Overview
[43] Source: https://www.plymouthmn.gov/departments/public-works/transit/click-and-ride?locale=en

Community Carpooling

Communities can facilitate or market dynamic carpool matching for rides to and from transit stations or other destinations through services like Waze Carpool, Scoop, and SPLT. Dynamic carpool matching and dispatch can significantly increase the number of people carpooling, in part by getting around some of the reasons traditional carpools were unappealing, such as having to ride on a schedule with the same group of people every day. Companies like Waze, Scoop, and others can create neighborhood areas or pool employees from specific worksites for more dynamic access to carpools. Carpoolers should be guaranteed preferred parking at BRT stations, RFTA Park & Rides, and other key destinations.

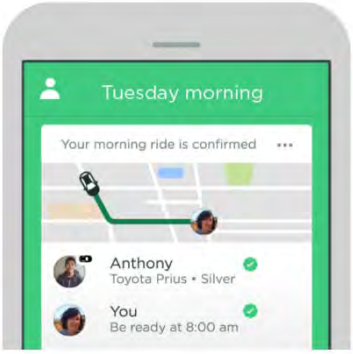

Figure 19. Scoop Carpool App Platform.
Source: Go Redmond.com

Potential Benefits

Carpooling is an alternative to other FLMM solutions that can be organized without the significant operational cost of a transit or microtransit solution. It may be applicable in areas, such as New Castle, where the travel demand and distance make other transit enhancements less cost-effective. When carpooling replaces single-occupant vehicle trips, it increases average vehicle ridership and reduces commuting costs, parking demand, and traffic congestion. There are also benefits to commuters, such as community carpooling apps that include a cost-sharing component to make sharing rides easier.

Community engagement in the RFTA service area showed that community members thought there was a lack of carpooling options in the Roaring Fork Valley.

Key Considerations

Carpooling programs work best when there are enough consistent riders to produce the critical mass needed for the program to sustain itself. To ensure that a high number of riders are being matched with one another, a consistent marketing campaign and technology platform should be used throughout the region. Direct marketing, such as posters at Park & Ride stations, should point riders to the preferred community carpooling platform.

APPLICATION

Community carpooling is most applicable to locations outside of larger urban areas where transit services may not be a viable option. This includes towns and rural areas within the valley where carpoolers can be matched within their communities. Carpool trips may be used to access transit or other destinations.

Equity Considerations

Community carpooling can provide a reliable mobility option to those that may have reduced mobility or that may not own or have access a private automobile. It may also reduce costs by allowing riders to share costs with other carpoolers.

Further Planning

Identify the platform that will be promoted in the region and pilot it in areas like New Castle and Snowmass Village with an associated marketing campaign to highlight its benefits to reduce commute costs and congestion. Measure the impacts through data shared by the app provider, user surveys, and direct engagement, such as tabling events at a RFTA Park & Ride and promoting it at the Brush Creek Park & Ride Carpool Kiosk.

Cost considerations:

- Some community carpool apps may be free to use and market, such as Waze Carpool.
- Communities are advised to undertake a procurement process to understand the costs associated with implementing a third-party carpool platform.

Risks and Mitigation Strategies

Key risks and potential mitigation strategies around community carpooling include:

Risk	Mitigation
Technology causes a barrier to use.	Provide information and workshops through partner agencies and community groups to support technology use.
Multiple carpool platforms are available and the program misses critical mass.	Ensure the same platform is agreed upon and promoted across connecting cities/towns.
Poor uptake.	Identify carpooling champions in communities to advertise the benefits of carpooling.

Technology Comparison

Below is a comparison of available dynamic community carpool technology options.

Technology Solution	Integrated cost sharing**	Cost Responsibility	Level of marketing effort***	Ideal trip length
Moovit[44]	✓	User	●●○○	Short-Medium
Waze[45]	✓	User	●○○○	Short-Medium
KCLUB*[46]		N/A	●●●●	Short
Carpool World[47]		N/A	●●●●	Medium
Ridesharing Service (RideAmigos[48], Agile Mile[49], etc.)		Agency	●●●○	Short-Medium
Poparide USA[50]	✓	User	●●●○	Long

* Targeted to parents and children for managing school trips
** Integrated cost sharing includes the ability to share the cost of a ride between two or more riders in the carpool.
*** Some carpool programs have readily available marketing materials that can be used to promote the service. For any service, the jurisdiction will take primary responsibility for marketing the service.

[44] Source: https://moovitapp.com/
[45] Source: https://www.waze.com/
[46] Source: https://karpoolclub.com/
[47] Source: https://www.carpoolworld.com/
[48] Source: https://rideamigos.com/
[49] Source: https://agilemile.com/
[50] Source: https://www.poparide.com/blog/looking-for-blablacar-usa/

Pick-Up and Drop-Off Enhancements

Many commuters could choose to get dropped off at a transit station or stop by friends or family or use a taxi or TNC (such as Uber or Lyft). This can help reduce the need for parking at the station and can reduce congestion on regional roadways if combined with transit. Providing clarity to drivers regarding where they are allowed to stop to drop off passengers helps reduce conflicts with other modes and provide convenient access to transit services.

Pick-up and drop-off locations should be conveniently located to the transit service, provide secure, safe, and covered waiting areas, and provide a safe place to alight from a vehicle. Signage and wayfinding can encourage use. Pick-up and drop-off locations are best located at high-frequency transit stops and BRT stations.

Formalized pick-up and drop-off locations could also be places for people who are carpooling to meet or for the carpool driver to pick them up on the way to their final destination.

Figure 20. Designated curbside drop-off site.

Potential Benefits

Providing clarity and improving access for pick-up and drop-off can encourage connections to transit, reduce parking demand, and reduce the number of automobiles on regional highways.

Public outreach showed that respondents thought pick-up and drop-off locations could be enhanced. Twenty-five percent of survey respondents did not think that drop-off locations existed at their origin transit station.

APPLICATION

Pick-up and drop-off enhancements are most appliable to BRT stops with high ease of access by private vehicles. BRT stops may have a wide and low-density or rural catchment area that has few mobility choices due to distance or terrain. In these contexts, pick-up and drop-off infrastructure can help reduce the need for parking and increase the use of regional transit services. Pick-up and drop-off enhancements may also be applicable in some town transit stops or stations that also have wide catchment areas.

Key Considerations

- Pick-up and drop-off locations should be clearly signed and designated.
- Pedestrian safety should be the top priority, with locations for safely exiting the vehicle and accessing transit.
- Pick-up locations require safe, covered, and secure waiting areas.
- Pick-up and drop-off locations should minimize interference with transit operations.
- Potential to work with taxi service providers to subsidize trip costs if a rider is using the service to access transit.
- Branding and marketing are important components of creating new pick-up and drop-off locations, especially upon initial implementation.

Risks and Mitigation Strategies

Key risks and potential mitigation strategies around pick-up and drop-off enhancements include:

Risk	Mitigation
Conflicts with other modes.	Clearly planned out pick-up and drop-off facilities should minimize conflicts.
Lack of knowledge about how to use new pick-up and drop-off facilities.	Signage and design of the pick-up and drop-off facilities should be intuitive to reduce any ambiguity at transit stops or stations.
Behavioral errors, such as long-term parking in a pick-up and drop-off zone.	Enforcement and informational campaigns, especially at the time of opening.

Equity Considerations

Pick-up and drop-off enhancements support transit use for people who cannot drive, do not have access to their own vehicle, are not old enough to drive themselves, or who have mobility issues. Situating pick-up and drop-off locations as close as possible to transit embarkment can improve conditions for those that may have limited mobility.

Further Planning

- Develop criteria for selecting the transit stations or stops that would benefit most from formalizing pick-up and drop-off. Criteria may include:
    - Current number of pick-ups and drop-offs, either informally, by taxi, or by TNC.
    - Land use and density surrounding the transit station or stop.
    - Frequency of transit.
    - Destinations of transit routes. For example, routes that serve schools and hospitals may have a higher rate of pick-ups and drop-offs.
- Consider formalizing taxi and TNC pick-up and drop-off locations to minimize conflicts with other road users.
- Work with local communities to implement physical changes to improve pick-ups and drop-offs and identify sources of funding.
- Create a campaign to market informal carpooling, including information on which transit stations or stops have formalized pick-up and drop-off locations.

Cost considerations:

- Costs depend heavily on design alterations that need to be made at a location. Costs will be reduced if changes are limited to painting pick-up and drop-off locations and adding signage. Costs will be increased if any vertical or horizontal concrete or asphalt work is needed at a location.

Additional Resources and Case Studies

WMATA (Washington Metropolitan Area Transit Authority) has begun introducing “Kiss & Ride” areas into transit station and stop redevelopments. A recent case study is the King Street-Old Town Metro Transit Station in the City of Alexandria, VA, which was completed in the Fall of 2021. The design also includes an area for car sharing. For more information, please see the project website[51].

[51] Source: https://www.alexandriava.gov/tes/info/default.aspx?id=85338

CHAPTER 5
NEXT STEPS

5. NEXT STEPS

The FLMM recommendations contained within this report are intended to support communities within the RFTA-service area who want to improve access to transit. City and Town staff from local agencies should carefully review these FLMM recommendations and consider applying to RFTA's FLMM fund to move forward with the recommendations most relevant to their respective communities.

FLMM is a priority for RFTA, and as such, FLMM solutions will continue to be supported to the extent possible. Local and regional agencies should continue to work with RFTA to develop and apply for local, regional, state, and federal funding sources to support FLMM infrastructure, services, and programs.

APPENDIX A
INDIVIDUAL COMMUNITY PUBLIC FEEDBACK SUMMARIES

APPENDIX B
INDIVIDUAL COMMUNITY FIRST- AND LAST-MILE MOBILITY RECOMMENDATIONS