



One Chattanooga: Transit for All

Appendix D: Microtransit Analysis Memo

Prepared April 2025



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Introduction

This memorandum is intended for internal use and describes the methodology and findings of the microtransit zone analysis conducted as part of the Transit Vision development (the Plan). CARTA currently operates a microtransit service (CARTA Go) in the Brainerd area. The service is in high demand, but the geographically large zone (nearly 30 square miles) and inefficiencies in the customer interface and technology platform create operational challenges.

Four microtransit zones are recommended for implementation under One Chattanooga: Transit for All: Amnicola, Enterprise South, Hixson, and Mountain Creek + Red Bank. However, in the transit vision document, these zones are depicted with ambiguous boundaries to illustrate that the zones may be altered as travel and development patterns change.

In addition to refining service zone boundaries, this memorandum also contains recommendations for vehicle needs, service spans, and service fares. These recommendations are preliminary and based on modeling results for the zones as described. Future vehicle needs and other service elements will need to be reevaluated should the zones change drastically.

Methodology

Methodology for the analysis was developed with the following goals in mind:

- Revise previously identified zones
- Reduce duplication between fixed route and microtransit service wherever possible

In the 2023 On-Demand Transit Study, Via identified six microtransit zones for CARTA. Four of these zones were recommended for implementation: Amnicola + Highway 58, East Brainerd, Hixson, and Mountain Creek + Red Bank. To refine the zone boundaries, travel pattern data was overlaid with transit propensity and ridership information to identify the greatest demand for microtransit, including areas outside currently recommended zones.

The updated recommended zones were developed with the assumptions listed below. These assumptions were used to develop preliminary ridership, vehicle needs, and trip duration estimates, as well as reduce instances of service redundancy within the microtransit zones, while also allowing connections to the larger fixed route network by facilitating connections between service at key points and/or mobility hubs. Appendix D-1 contains tables that summarize the results of the microtransit zone service modeling.

- Zones can be anchored by a fixed route. Trips may also be completed to and from the nearest mobility hubs along the routes.
- Trips must be greater than 0.5 miles. The trip cannot be completed using a fixed route or within 0.25 miles (walking distance) of a fixed route.
- For zones with a fixed route connection, the assumed microtransit mode share is 0.55%. For those without, it is 0.4%.

- If a zone boundary, or a portion of a zone boundary, is a street, addresses on both sides of the street are serviceable.
- Corner-to-corner service will be provided through designated virtual bus stops. Operators should avoid courtesy stops. Riders that indicate they have a disability will be provided with curb-to-curb service.
- The desired customer wait time is 30 minutes. Maximum allowable in-vehicle time is 30 minutes. If these constraints are violated, it is a “trip unable to serve” in the model.
- Microtransit service will operate between 5 AM and 8 PM, Monday through Saturday. This is the same as the existing CARTA Go service hour span.

Recommended Zones

Four refined microtransit zones are recommended for implementation: Amnicola, Enterprise South, Hixson, and Mountain Creek + Red Bank. The zones are depicted in Figure 1. Most of these zones are anchored to a fixed route to provide first/last-mile service to the route.

The following sections describe each recommended zone. Maps that depict the original zones (either CARTA Go or those developed by Via) with ridership and trip data are also included to provide insight into how the recommended zones were developed. The plan team did study the Lookout Valley zone identified by Via but concurred that trip activity and transit propensity are not high enough to warrant microtransit service.

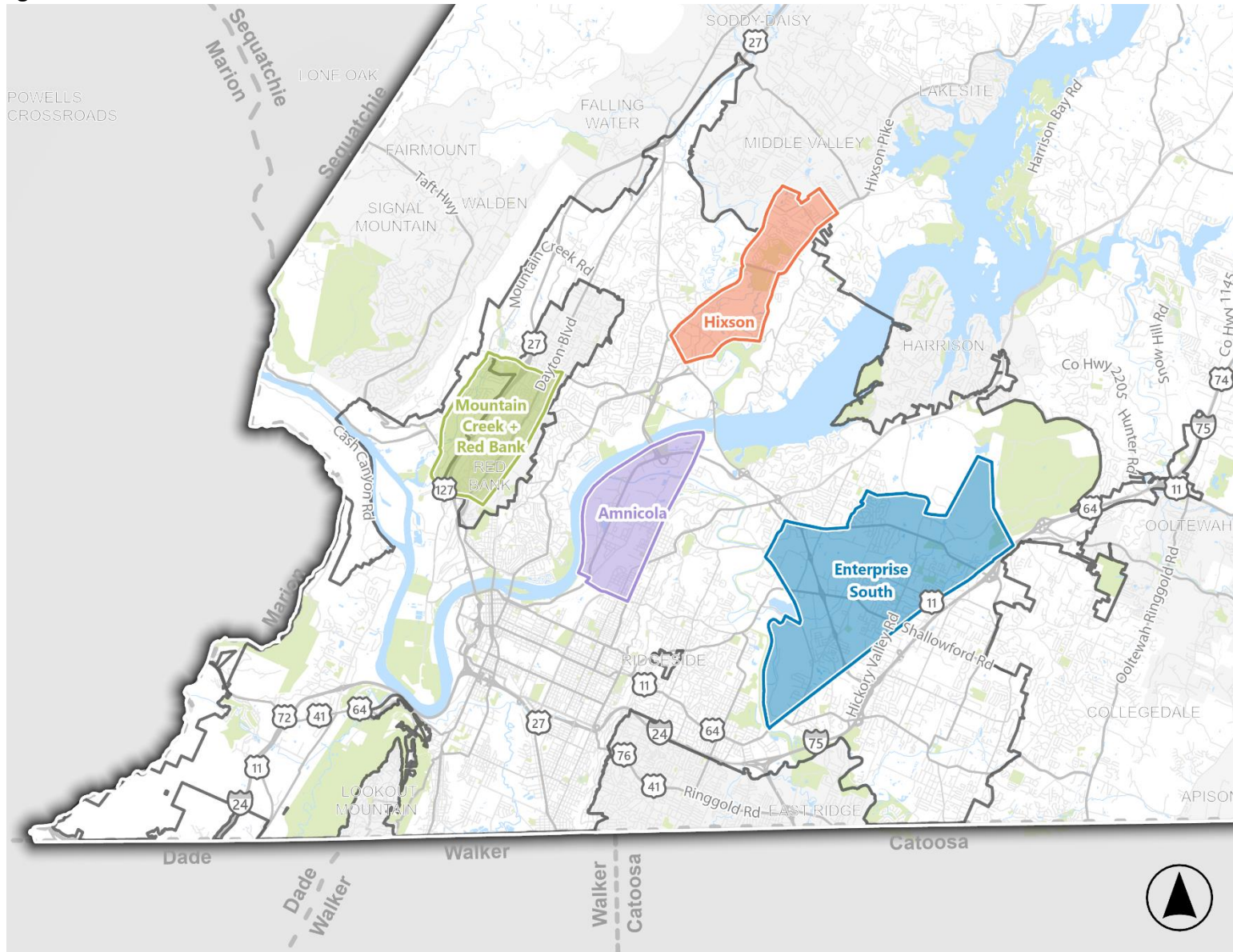
Table 1: Recommended Microtransit Zone Summary

Zone	Approx. Size	Est. Daily Ridership	Approx. Population ¹	Approx. Jobs ²	Avg. Total Trip Duration (min)
Amnicola	4.5 sq mi	20	5,500	11,000	24.6
Enterprise South	12.5 sq mi	68	13,700	30,000	36.5
Hixson	4.0 sq mi	16	7,100	3,300	38.7
Mountain Creek + Red Bank	4.5 sq mi	24	10,700	1,700	34.9

¹ Based on 2020 US Census data by Census block group.

² Based on 2022 LEHD OnTheMap job data by Census block.

Figure 1: Recommended Microtransit Zones



Amnicola

Approximate Size	Estimated Daily Ridership	Approximate Population	Approximate Jobs	Average Total Trip Duration (min)
4.5 sq mi	20	5,500	11,000	24.6

The Amnicola zone covers the industrial area along Amnicola Highway between the Tennessee River and Dodson Avenue/railroad tracks, and Chattanooga State University and Wilcox Boulevard. The zone is anchored to Route 10 along Dodson Avenue. Destinations served by this zone include Chattanooga State University, Avondale Community Center, Chattanooga Police and Fire Departments, and several industrial plants and warehouses.

The Amnicola + Highway 58 zone identified by Via was split between this zone and the recommended Enterprise South zone. Trip activity is

concentrated at the southwestern portion of the Amnicola zone, with some additional high-activity areas along Highway 58 in Washington Hills. The highest-activity areas are covered by fixed route service. The activity along Highway 58 would be served by the modified Route 3.

There are also patches of high activity around the industrial plants/warehouses along Amnicola Highway. The existing fixed routes, Routes 3 and 28, are unproductive and have operating costs that approach paratransit levels, suggesting that microtransit might better serve the area. Thus, the Amnicola zone focuses on this area to continue providing transit service that is more efficient and cost effective.

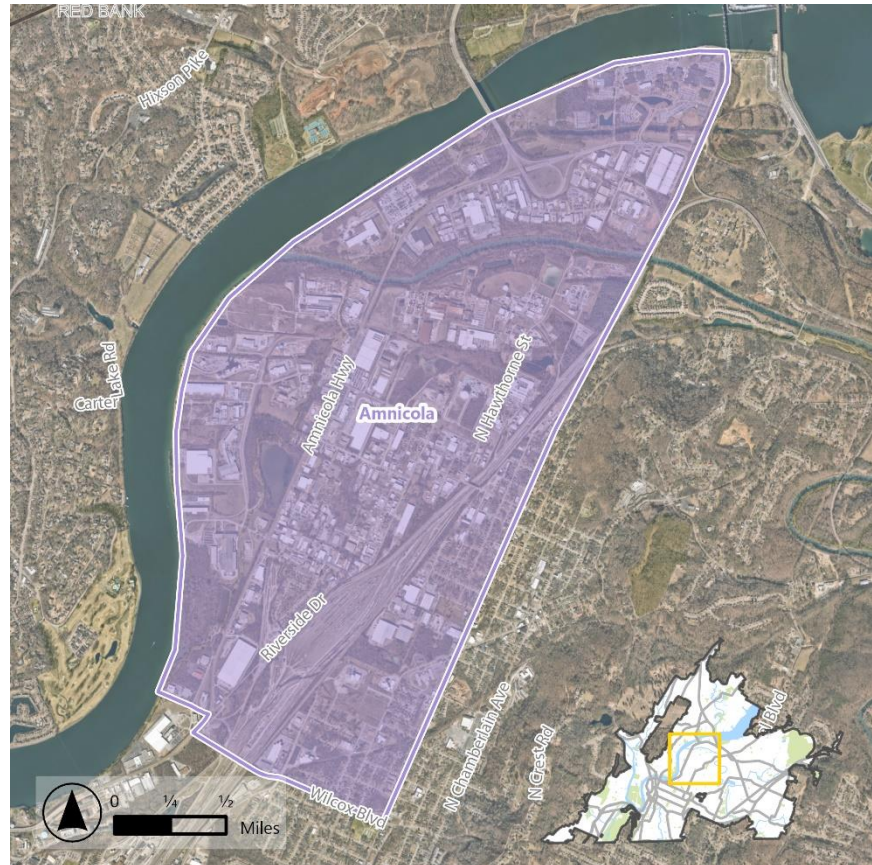


Figure 2: Recommended Amnicola Zone

Figure 3: Amnicola Zone with Ridership and Trip Data

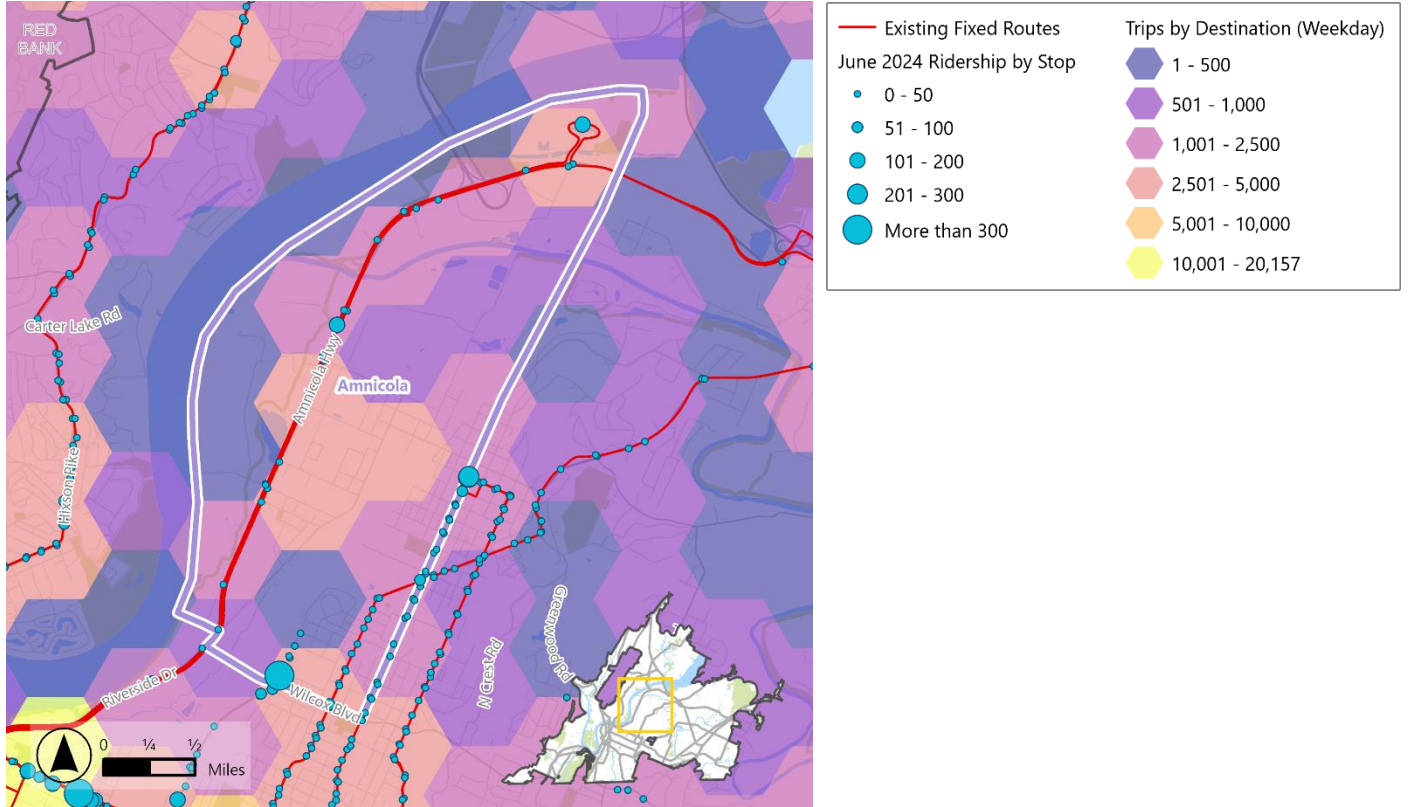
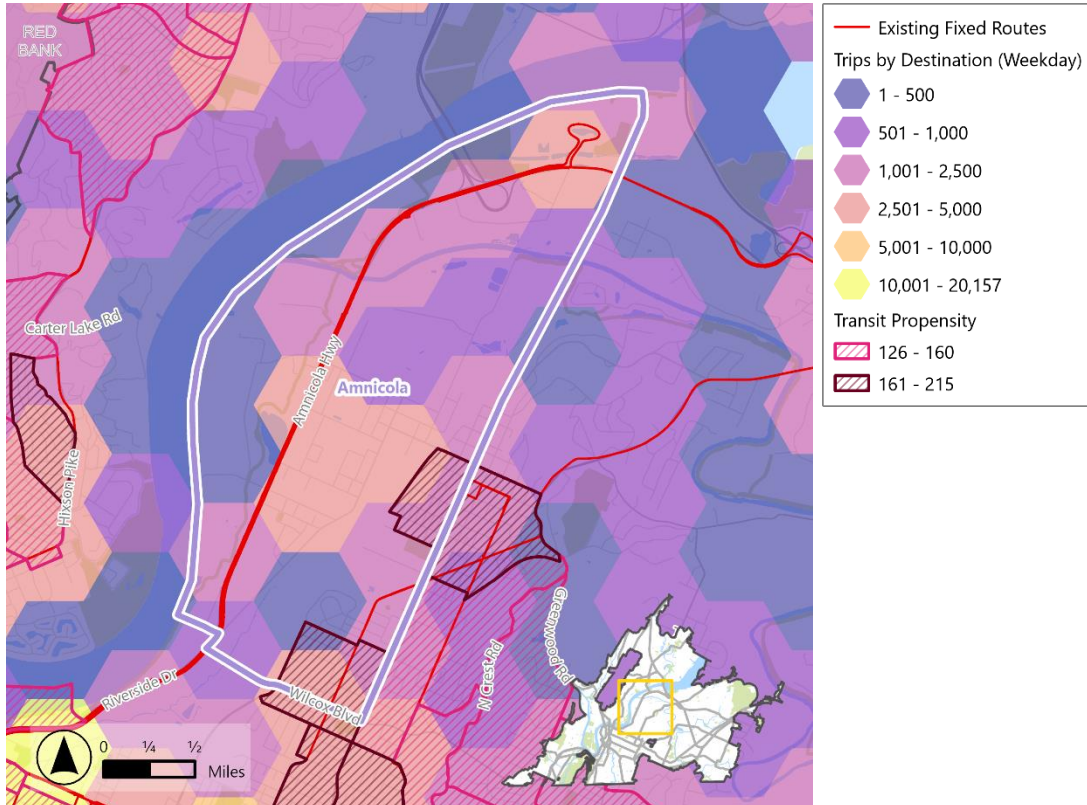


Figure 4: Amnicola Zone with Transit Propensity and Trip Data



Enterprise South

Approximate Size	Estimated Daily Ridership	Approximate Population	Approximate Jobs	Average Total Trip Duration (min)
12.5 sq mi	68	13,7000	30,000	36.5

The Enterprise South zone will serve the area north of Brainerd Road, extending roughly to Bonny Oaks Drive, between the airport and Volkswagen Drive. This zone is anchored to Route 4 along Brainerd Road and covers much of the existing CARTA Go zone. Destinations served by this zone include Chattanooga Metropolitan Airport, the Volkswagen plant, the Amazon Distribution Center, commercial destinations along Brainerd Road/US 64, and the industrial area along Highway 153.

This zone stems from the existing CARTA Go zone and the Via Amnicola + Highway 58 zone. These zones are both geographically large, so the plan team narrowed to focus on higher-demand commercial and industrial areas, as well as a transit-propense neighborhood north of Bonny Oaks Drive that does not have fixed route service. High-activity areas along Gunbarrel Road and Brainerd Road will be served by the extended Route 4 and do not need to rely on microtransit service.

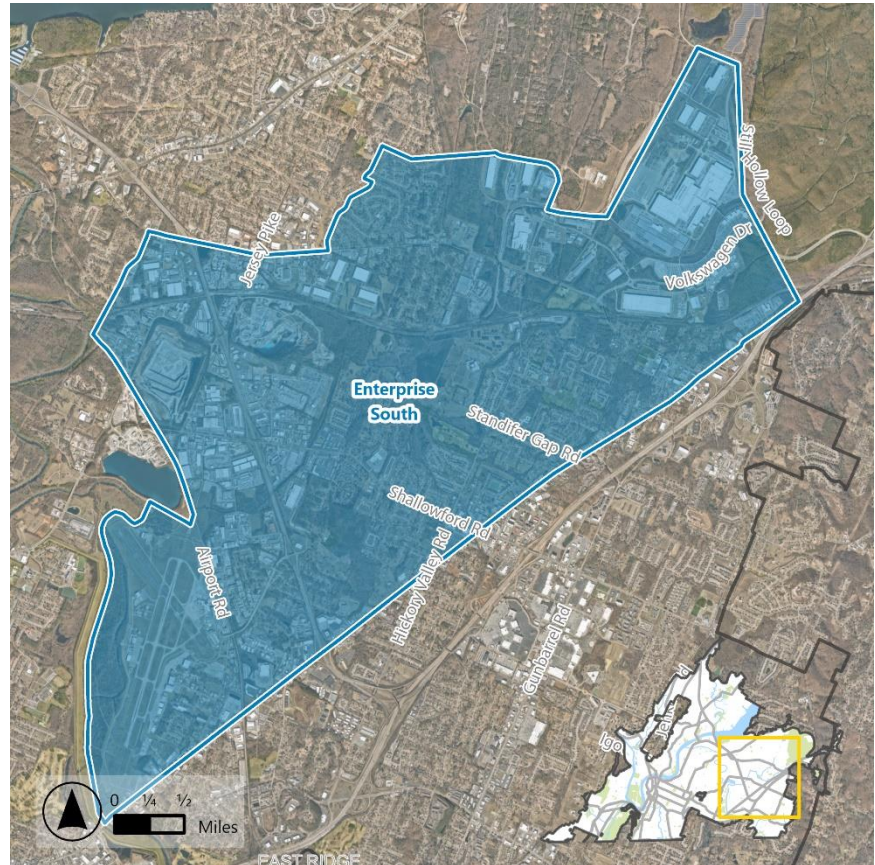


Figure 5: Recommended Enterprise South Zone

Figure 6: Enterprise South Zone with Ridership and Trip Data

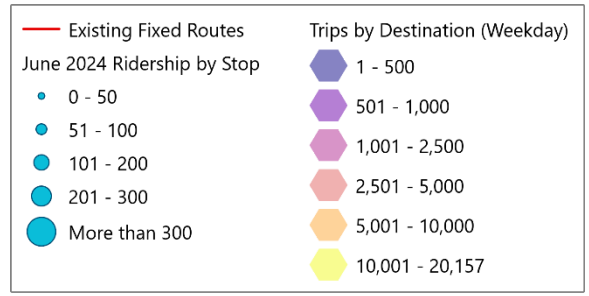
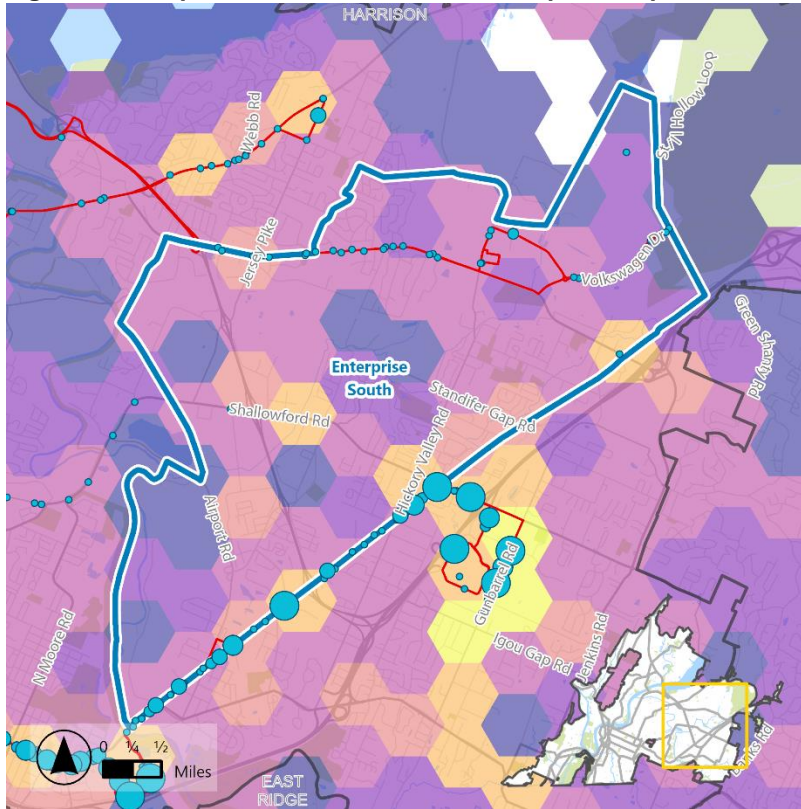
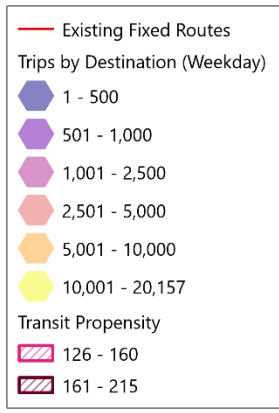
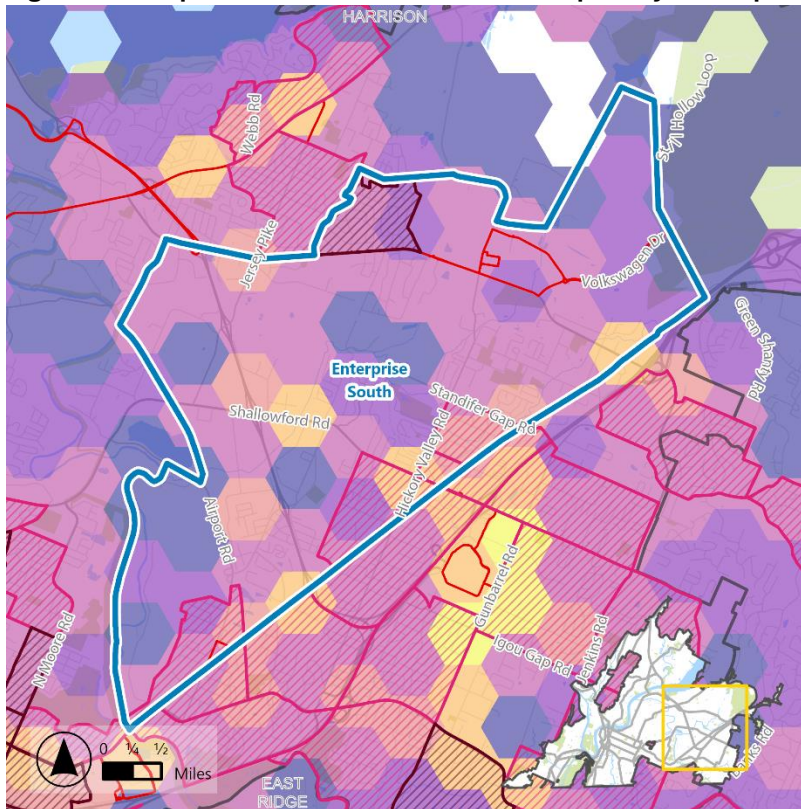


Figure 7: Enterprise South Zone with Transit Propensity and Trip Data



Hixson

Approximate Size	Estimated Daily Ridership	Approximate Population	Approximate Jobs	Average Total Trip Duration (min)
4.0 sq mi	16	7,100	3,300	38.7

The Hixson microtransit zone will serve a corridor between Hixson Pike and Middle Valley Road, extending from Northgate Mall to the Chattanooga city limits. This zone is anchored to Route 16 at Northgate Mall, which is a proposed mobility hub. Destinations served by this zone include Northgate Mall, the Northgate Branch of the Chattanooga Public Library, CHI Memorial Hospital – Hixson, and several residential developments.

The proposed Hixson zone is a shrunken version of the zone identified by Via. As shown in Figure 9, there is a stretch of high trip activity extending along Highway 153 from

Northgate Mall that was covered by the Via zone. With the extension of Route 16, this demand will be served by fixed route service and microtransit is not necessary. Other areas of high trip demand are concentrated along Hixson Pike; this demand can be picked up by the proposed microtransit zone. Trip activity decreases further away from the commercial corridors of Highway 153 and Hixson Pike, so microtransit coverage of these areas is less warranted.

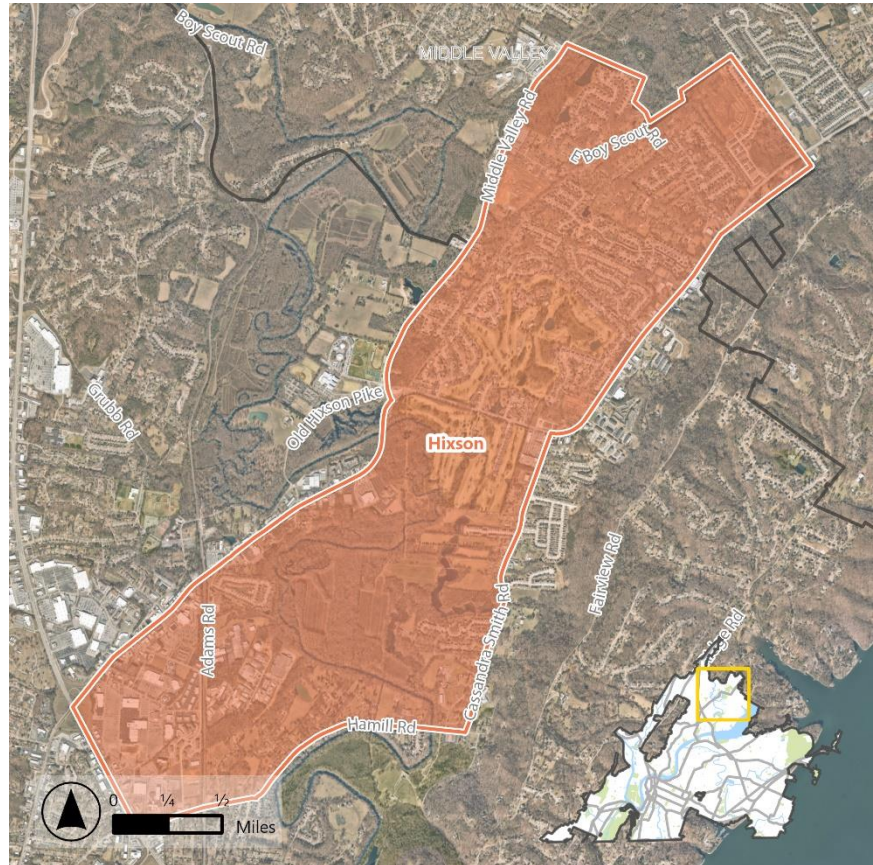


Figure 8: Recommended Hixson Zone

Figure 9: Hixson Zone with Ridership and Trip Data

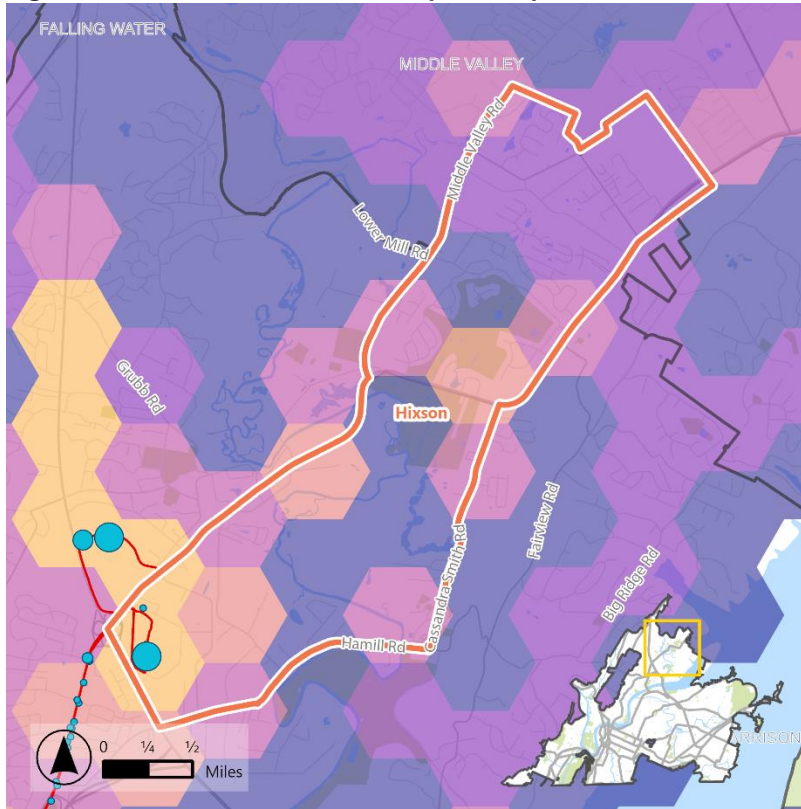
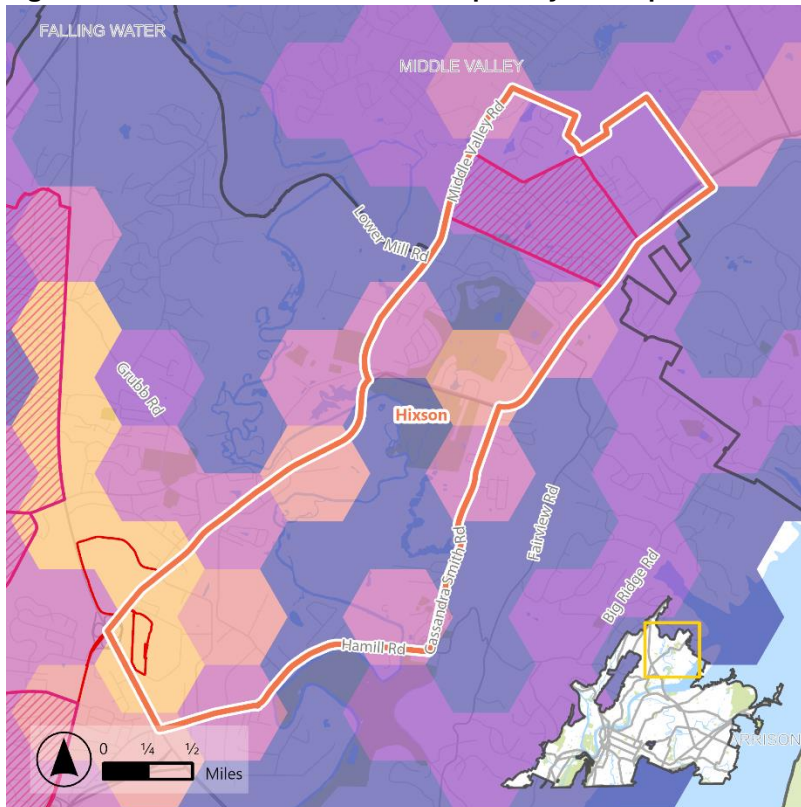


Figure 10: Hixson Zone with Transit Propensity and Trip Data



Mountain Creek + Red Bank

Approximate Size	Estimated Daily Ridership	Approximate Population	Approximate Jobs	Average Total Trip Duration (min)
4.5 sq mi	34	10,700	1,700	34.9

The Mountain Creek + Red Bank zone covers an area bounded by Mountain Creek Road, US Highway 127, Morrison Springs Road, and the edge of development just east of Dayton Boulevard in Red Bank. This zone is not anchored to any fixed route service with the proposed short-term network. Destinations served by this zone include Walmart, Komatsu, Erlanger North Hospital, commercial destinations along Dayton Boulevard, and new residential and senior housing developments.

This proposed zone is also a modification of the zone recommended by Via. However, the plan team recognized that Via’s zone was large and wanted to focus it on the areas of highest demand. Trip activity is concentrated at the southern end of Via’s zone, mostly along the US Highway 127 corridor with some pockets along Morrison Springs Road and Dayton Boulevard. The Via zone also connected to Northgate Mall and Route 16 as well as the North Shore Shuttle. The proposed Mountain Creek + Red Bank zone removes these areas from the zone to limit duplicative service. Riders will still be able to connect to mobility hubs in these locations.

Additionally, there is relatively high transit propensity in the community surrounding the zone (see Figure 13). CARTA currently does not have fixed route service in the area, but there is a new route recommended under One Chattanooga: Transit for All along Dayton Boulevard. This microtransit zone brings transit service to a population that would likely rely on it to complete daily tasks and make first/last-mile connections to a new fixed route that connects them to other regional destinations.



Figure 11: Recommended Mountain Creek + Red Bank Zone

Figure 12: Mountain Creek + Red Bank Zone with Ridership and Trip Data

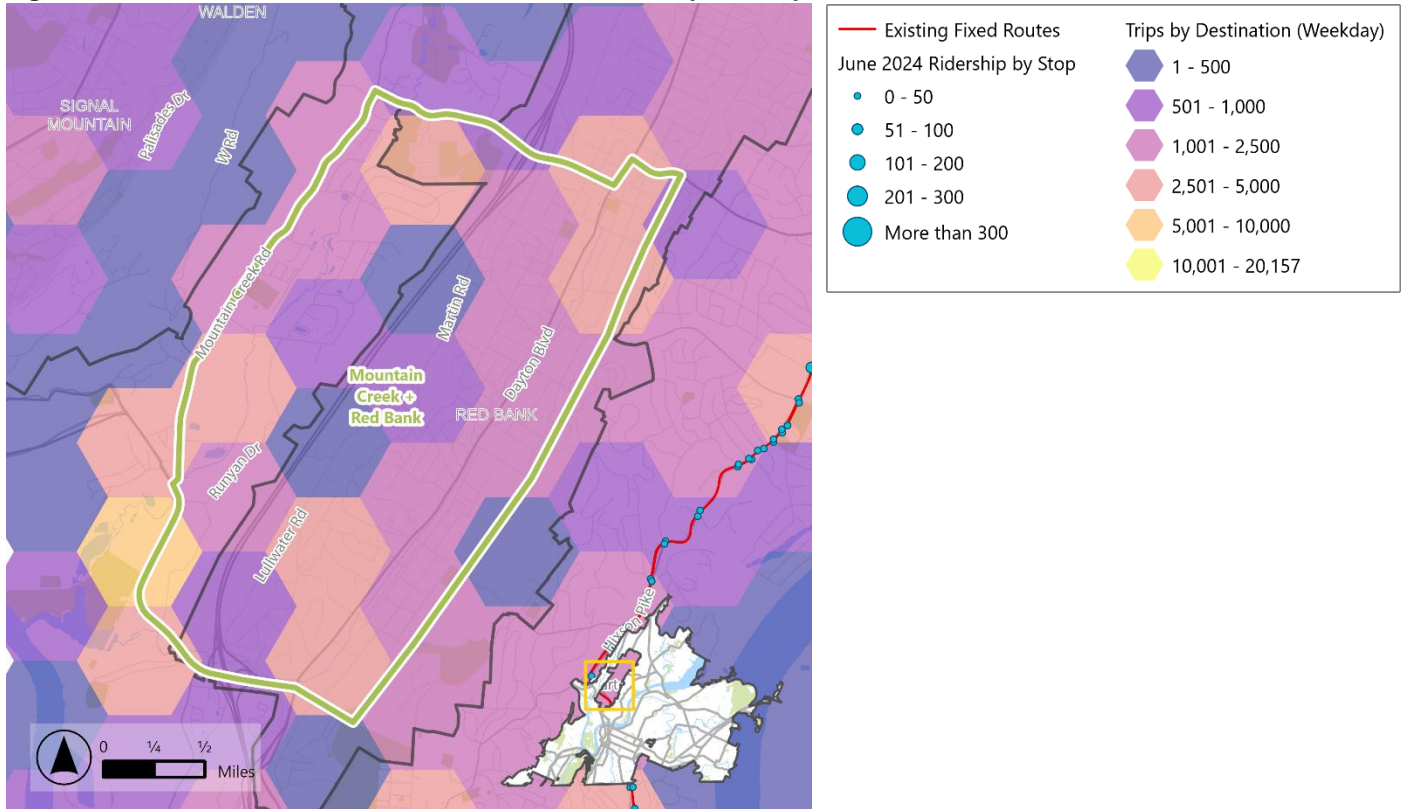
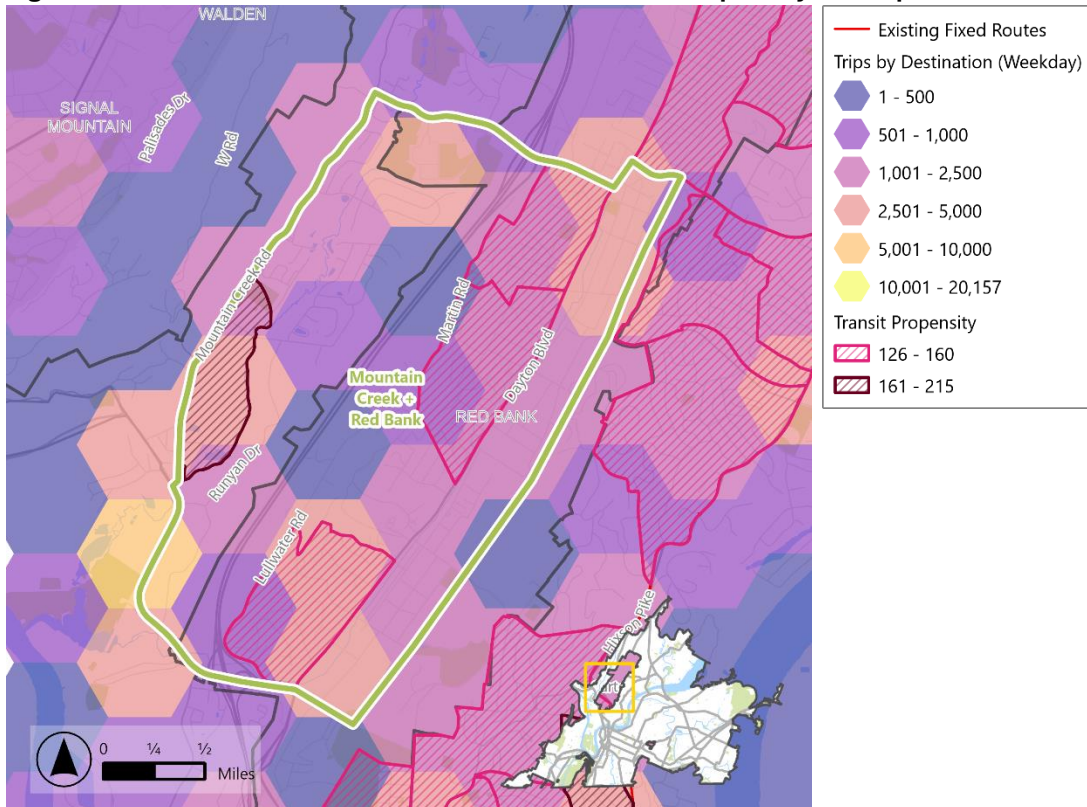


Figure 13: Mountain Creek + Red Bank Zone with Transit Propensity and Trip Data



Service Recommendations

Service Hours

The existing CARTA Go service hours are 5 AM to 8 PM, Monday through Saturday. CARTA Go is not in service on Sundays, New Year's Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day. The recommended microtransit zones should maintain these same service hours.

Vehicles

The plan team developed preliminary vehicle need estimates for each of the zones. These vehicle needs are based on the size of the zone, average travel times, estimated ridership/demand throughout the day, and the number of vehicles that would be required to meet estimated levels of demand. Most zones only require one vehicle to efficiently operate throughout the day, due to relatively low demand. The Enterprise South zone, as the largest recommended zone, requires two vehicles for most of the day and three during the peak period (10 AM to 3 PM). Estimated vehicle needs for the zones are summarized in Table 2.

Table 2: Estimated Microtransit Vehicle Needs

Time of Day	5 AM – 10 AM	10 AM – 3 PM	3 PM – 8 PM
Amnicola	1	1	1
Enterprise South	2	3	2
Hixson	1	1	1
Mountain Creek + Red Bank	1	1	1

Trip Timing

The plan team also developed preliminary trip duration estimates, including average wait times for a ride, average in-vehicle times, and average total trip durations. Trip timing estimates are summarized in Table 3.

Table 3: Microtransit Trip Timing Estimates

	Average Wait Time	Average In-Vehicle Time	Average Total Trip Duration
Amnicola	15 min	9.6 min	24.6 min
Enterprise South	18.2 min	18.3 min	36.5 min
Hixson	24.1 min	14.7 min	38.7 min
Mountain Creek + Red Bank	20.8 min	14.1 min	34.9 min

The Hixson zone has the longest estimated total trip duration, followed by the Enterprise South zone. The Enterprise South zone is the largest recommended zone, resulting in longer in-vehicle

travel times as people can travel longer distances. Wait times are slightly lower in this zone as more vehicles would be available. The Hixson zone has the longest average wait time likely because of the disconnected street network in this area of Chattanooga, making it more difficult for vehicles to quickly move throughout the zone to pick up riders.

Fares

The existing CARTA Go fare structure matches that of the fixed route service (see Table 4 below). CARTA also offers 24-hour, 7-day, and 30-day unlimited ride passes that can be used on microtransit vehicles. The plan team recommends maintaining this fare structure with the recommended zones. Should the fare structure change for fixed route service, microtransit should also reflect those changes.

Table 4: Fare Structure

Fare Type	One-Way Fare
Adult	\$1.50
Senior Citizens (Ages 65+)	\$0.75
Persons with Disability	\$0.75
Students	\$0.75
Child (5 & under)	FREE

Appendix D-1: Microtransit Zone Modeling Results

Amnicola

	5 AM – 10 AM	10 AM – 3 PM	3 PM – 8 PM
Ride Count	6	8	6
Vehicles in Service	1	1	1
Trips Unable to Serve	0	0	0
Average Wait Time (min)	18.3	11.7	15.0
Average In-Vehicle Time (min)	9.7	12.2	6.9
Average Total Duration (min)	28.1	23.9	21.9

Enterprise South

	5 AM – 10 AM	10 AM – 3 PM	3 PM – 8 PM
Ride Count	19	24	25
Vehicles in Service	2	3	2
Trips Unable to Serve	0	1	0
Average Wait Time (min)	19.6	15.8	19.2
Average In-Vehicle Time (min)	17.9	18.1	18.8
Average Total Duration (min)	37.5	34.0	38.1

Hixson

	5 AM – 10 AM	10 AM – 3 PM	3 PM – 8 PM
Ride Count	3	6	7
Vehicles in Service	1	1	1
Trips Unable to Serve	0	0	0
Average Wait Time (min)	30.6	18.5	23.1
Average In-Vehicle Time (min)	12.8	18.8	12.5
Average Total Duration (min)	43.4	37.3	35.6

Mountain Creek + Red Bank

	5 AM – 10 AM	10 AM – 3 PM	3 PM – 8 PM
Ride Count	5	8	11
Vehicles in Service	1	1	1
Trips Unable to Serve	0	0	0
Average Wait Time (min)	24.8	16.0	21.6
Average In-Vehicle Time (min)	15.2	11.9	15.2
Average Total Duration (min)	39.9	27.9	36.8