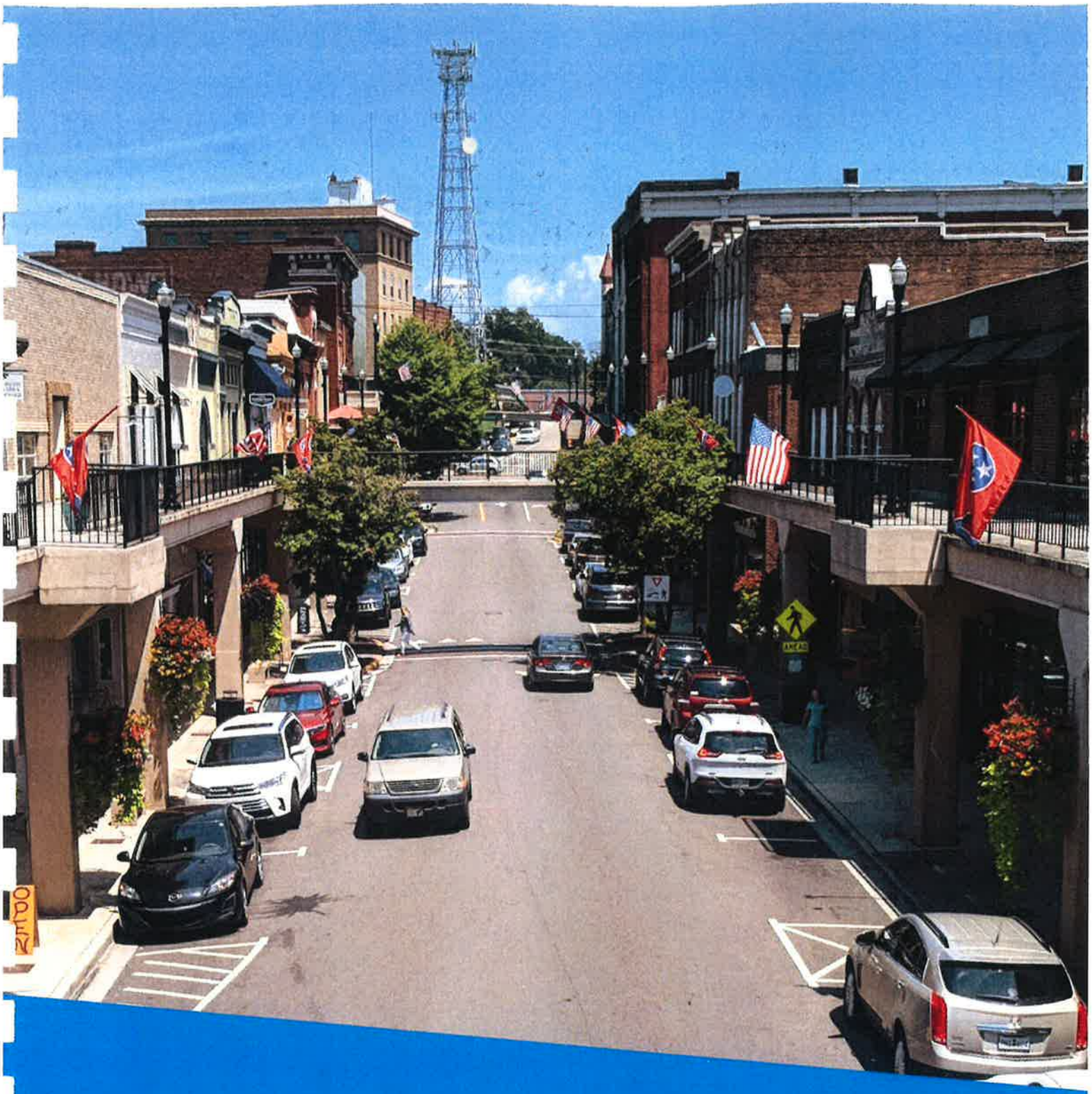

Morristown Deviated Fixed-Route Study
Final Report

AECOM Imagine it. Delivered.

September 20, 2018

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Acknowledgements

AECOM is pleased to submit this study and analysis for the provision of fixed route bus service to the Morristown community. Through this planning process, our team identified specific mobility needs to be addressed in the Morristown area.

Key members of the AECOM team included:

- Kurt J. Neufang, AECOM
- Matt Meservy, AECOM
- Adam Migliore Meyer, AECOM
- Kathy Hart, SmartMaps
- Valerie Romano, AECOM

On behalf of the AECOM team, we would like to thank TDOT, the East Tennessee Human Resource Agency (ETHRA) and the local stakeholders in the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) for their guidance and assistance during this study. It has truly been a team effort.

This project provided a unique opportunity to understand the potential for fixed-route bus service in the Morristown portion of the urbanized area, and how the service could best meet the growing mobility needs of the community. Through local stakeholder meetings, public outreach meetings and reviewing the potential fixed route areas, we feel confident that we have crafted an implementation plan that will serve local riders who are seeking transportation for employment, education, retail, and human service needs.

Additionally, the service design includes an operational cost model for complimentary paratransit services at designated stops, and operate on a five-day service schedule, Monday through Friday, 6:30 am to 6:30 pm.

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Executive Summary

The growing transit need in the Morristown area was illustrated in the data AECOM collected during the Express Route study. We concentrated our research and analysis on the local demographic data in the areas of poverty, households without vehicles that need a dependable fixed route transit alternatives, business development and trip generators for work trips, recreational trips and human service needs. Route analytics was an important aspect of the route study process. Our team has addressed similar objectives in other east Tennessee communities, and we are excited to share a transit implementation plan that can meet the objectives to begin a fixed route bus service.

This deviated fixed route study analyzed the existing conditions of the proposed service area and provides recommendations that will improve the local operational investment in a viable public transit system. This required looking at the growth potential of the service and understanding the potential rider/population demographics, development patterns, and land use plans within the Morristown study area.

The objectives for this study included:

- Coordinating with ETHRA to identify funding levels to support the service;
- Recommending an infrastructure to accommodate the variety of transit needs within the service;
- Analyzing efficiency measures that can help contribute to the success of a new system;
- Developing a staffing structure to address operational, administrative and maintenance issues;
- Recommending specific service needs such as vehicles, software, signage bus stop amenities and other support elements for a deviated fixed route service;
- Recommending service schedules and stop locations that will maximize ridership and connectivity;
- Providing a public outreach effort to address input from the community stakeholders;
- Developing a phased-in implementation schedule that meets the local needs.

Coordination with local stakeholders, Morristown-Hamblen Library, Walters State Community College, local businesses and service agencies were key components of the success of this study. This plan outlines a bus route service schedule, a cost-allocation funding model and a capital plan that can meet the operational requirements for implementing successful transit services. Specific bus stop time-points, a staffing plan and a new logo are included as part of our recommendations. Our team prepared the implementation plan in conjunction with the "best practices" for FTA funded services to meet the operational and administrative requirements for the recommended service.

It was determined that three fixed routes, operating on 30-minute headways, would best serve the needs for the initial bus service in the Morristown community. The recommended fare structure is $1.50 per one-way trip, 75 cents (half fare) for eligible persons with disabilities and free transfers. A 10-ride card would be purchased for $13.50 and 20-ride card for $27.00, providing a discount for those purchasing their trips in advance. Riders age 12 or under would ride fare free.

The buses would begin their service and pulse at the ETHRA Transit Center, located at 2800 West Andrew Johnson Highway in Morristown. The schedules have been devised so that the Morristown-Hamblen Public Library would serve as a central location for passengers to transfer between routes.

The routing structure was established to account for major trip generators such as the College Square Mall, Walters State Community College, Morristown-Hamblen Public Library, Walmart Supercenter, various apartment complexes, retail, healthcare and governmental service locations that would support a ridership base that would likely utilize the new transit service. A map showing the proposed routes is included as Figure ES-2 on page ES-4.

The timepoints noted for the proposed routes are:

Route 1 Outbound

1	2	3	4	5
Transit Center	Morristown-Hamblen Library	College Square Mall	Walters State Community College	Walmart Supercenter

Route 1 Inbound

1	2	3	4	5
Walmart Supercenter	College Square Mall	Food City	Morristown Hamblen-Library	Transit Center

Route 2 Outbound

1	2	3	4	5
Transit Center	Fairway Apartments	Walter Ridge Apartments	Tennova Healthcare	Morristown-Hamblen Library

Route 2 Inbound

1	2	3	4
KC Home	Greyhound Station	Morristown-Hamblen Library	Transit Center

Route 3 Outbound

1	2	3	4
Transit Center	Morristown Housing Authority	Lincoln Manor Apartments	Mayfair Apartments

Route 3 Outbound

1	2	3	4	5
Laurelwood Apartments	Morristown-Hamblen Library	Volunteer Blind Industries	Food City	Transit Center

Two public outreach meetings were held in conjunction with this study. One was conducted at the City Center in Morristown and one was hosted at the Morristown-Hamblen Public Library. Additionally, surveys were distributed and collected, including an on-line survey, to help facilitate valuable community input. The results of the surveys were very positive and the feedback was very supportive of a new fixed route bus service.

Though the initial recommendations for bus service implementation is primarily in the Morristown central business district, there were several identified areas for potential future transit services. Business parks and future business development locations were noted as potentially needing connective mobility services for employee work trips. This study has focused on a system that would support the initial "start-up" of bus service activity, and certainly, this service could look to expand where future services are needed.

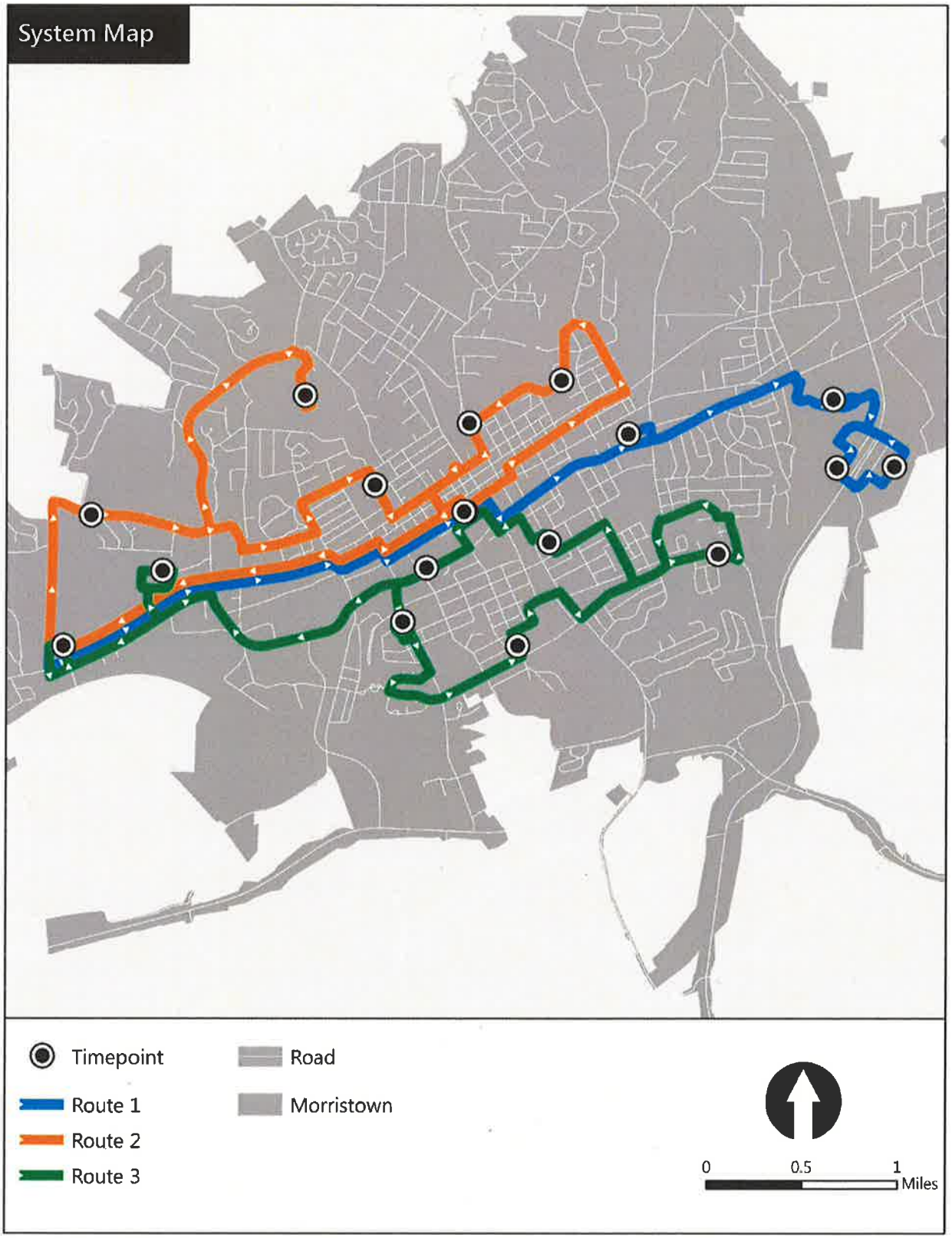
Additionally, a regional connective approach for bus service might include the communities of White Pine and Jefferson City. Expansion into these locations would be predicated on local funding support and service demands that can reasonable be met with the available ETHRA resources.

As part of the study process, several branding concepts and logos were developed and considered for the Morristown fixed-route service. The Lakeway Transit brand and logo presented in Figure ES-1 was selected by the steering committee.

Figure ES-1 : Lakeway Transit Logo

Lakeway Transit

Figure ES-2: Proposed System Map



The anticipated funding levels to support the proposed fixed route bus service include local, state (TDOT) and Federal Transportation Administration (FTA) transportation funds. Table ES-1 highlights the anticipated funding needed to provide the recommended levels of service. A financial plan for the Morristown fixed-route system was developed in partnership with ETHRA. The purpose of the financial plan is to estimate the approximate costs associated with operating fixed-route service and the required ADA complementary paratransit service for budget planning purposes.

The five-year budget model was prepared for fiscal years (FY) 2020 through 2024 based on current ETHRA operations, administrative, and capital costs. An annual inflation rate of 3 percent was applied to account for increased administrative, fuel, and supply costs in the future. The model estimate 249 operating days per year, which represents Monday through Friday service except for ten holidays. Several cost drivers are accounted for in the model, which equate to an overall operating cost of $52.50 per hour.

Table ES-1: Five-Year Budget Model

Item	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Annual Operating and Administrative Costs					
Fixed routes	$824,000	$848,000	$874,000	$900,000	$927,000
Increase in demand response costs	$67,000	$69,000	$71,000	$73,000	$75,000
Route supervisor salary and benefits	$51,000	$53,000	$54,000	$56,000	$58,000
Subtotal	*$942,000*	*$970,000*	*$999,000*	*$1,029,000*	*$1,060,000*
Annual Operating Revenue					
Estimated farebox recovery	3.00%	3.50%	4.00%	4.50%	5.00%
Subtotal	$28,300	$34,000	$40,000	$46,400	$53,000
Capital Expenses					
Vehicle – Transit Supervisor	$45,000				
Vehicle painting	$57,000				
Transit stop amenities	$46,000	$14,100	$14,200	$14,200	$14,300
Transit facility upgrades	$7,500				
Printing for schedules and fare media	$9,500	$9,800	$10,100	$10,400	$10,700
Subtotal	*$165,000*	*$23,900*	*$24,300*	*$24,600*	*$25,000*
Operating and Capital Total	**$1,107,000**	**$993,900**	**$1,023,300**	**$1,053,600**	**$1,085,000**

ETHRA and AECOM, 2018.

1. Introduction

The Morristown Deviated Fixed-Route Study (Study) is an effort to improve mobility options for residents of Morristown and the surrounding community. Morristown is a vibrant community with a population of over 29,000 people. There are multiple employment and retail locations, medical facilities, and higher education facilities such as Walters State Community College. However, there is currently no fixed-route transit service connecting residents with these opportunities. Furthermore, eight percent of Morristown's population does not have access to a vehicle and 18 percent live below the poverty level.[1] This Study's purpose is to engage the community and stakeholders in identifying opportunities for deviated fixed-route transit service.

This Study is a cooperative effort between several project partners: East Tennessee Human Resources Agency (ETHRA), Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO), City of Morristown, and the Tennessee Department of Transportation (TDOT).

East Tennessee Human Resources Agency

EHTRA is a regional service agency serving 16 counties in East Tennessee, including Hamblen County. The agency was founded in 1973 and provides a holistic range of services to the community[2]:

- **Advocacy:** advocating for consumers
- **Education:** training and classes from career development to DUI classes
- **Employment support:** training and job assistance resources to the community
- **Housing and utilities:** assistance with rent costs and home utilities, heating, and cooling costs
- **Independent living** for persons over age 60, family caregivers, or adults with disabilities
- **Judicial support:** providing offender supervision alternatives in support to the court systems and the community
- **Nutrition:** nutritious meals for senior citizens and children as well as groceries for households in need
- **Transportation:** providing demand response, ride to work programs, and DUI driver training

[1] American Community Survey 2012-2016 five-year estimates
[2] ETHRA Public Transit website, https://www.ethrapublictransit.org/

ETHRA offers two primary transportation programs: ETHRA Public Transit and Ride to Work. ETHRA Public Transit's goal is "to provide affordable, safe, dependable public transportation." The service is a door-to-door transportation service with flexible schedules. To utilize the door-to-door service, passengers must schedule trips three business days in advance. Reservations requested within three days of the trip are considered based on available space. Fares are $3 for a one-way trip. An additional $3 is charged when a county line is crossed. Non-scheduled stops along the route are an additional $1 per stop. The service operates Monday through Friday from 8:00 am to 4:30 pm.

The Ride to Work program is funded by the Federal Transit Administration's (FTA) Section 5307 Job Access and Reverse Commute program; and provides job-related trips to low-income individuals who have gone through an eligibility process. Trips related to job search, job training, and job interviews are also eligible. Individuals enrolled in this program can access the service for free during a nine month period. After nine months, regular fares will be applied. This program limits participation to 12 years.

Lakeway Area Metropolitan Transportation Planning Organization

LAMTPO operates as the regional transportation planning and coordinating agency for portions of the urbanized areas in Morristown, Jefferson City, White Pine, and Hamblen and Jefferson counties. The United States Census Bureau designated these areas as urbanized in May 2002. LAMTPO was formed soon after as a joint effort by the municipalities and counties in the urbanized area. The planning organization produces several transportation planning documents including the Bicycle and Pedestrian Plan, Human Services Transportation Coordination Plan, and Long-Range Transportation Plan.

City of Morristown

Morristown is the county seat of Hamblen County, Tennessee, and the principal city of the Morristown, Tennessee Metropolitan Statistical Area, which encompasses all of Grainger, Hamblen, and Jefferson counties. The Morristown metropolitan area is also a part of the Knoxville-Sevierville-La Follette Combined Statistical Area. The city is home to the Morristown Hamblen Healthcare System, Tennessee College of Applied Technology, and Walters State Community College.

Tennessee Department of Transportation

The TDOT Office of Public Transportation promotes public transportation by providing both financial and technical assistance to transit agencies and transit projects in the state. The Office of Public Transportation is responsible for transit planning and the administration of capital and operating assistance in both urbanized and rural areas throughout the state.

2. Transit Need and Demand

Chapter 2 assesses transit need and demand in the Morristown portion of the urbanized area by reviewing local and regional plans, identifying major travel nodes and activity centers, assessing trends in land use, development, employment, and demographics, and by completing a mobility gaps analysis.

2.1 Local and Regional Plans

Planning for transit in Morristown has been an ongoing effort since LAMTPO was formed in 2002. The *LAMTPO Transit Feasibility Study* identified several transit alternatives for the region, including a fixed-route circulator in Morristown. Subsequent studies have assessed coordination between human service agencies, intercity bus needs, and express service to Knoxville. Summaries of these past local and regional planning efforts are provided below.

Morristown Fixed Express Route Study (2018)

A feasibility study was prepared in 2018 exploring the feasibility of operating express fixed-route bus service between Morristown and Knoxville. An express service would provide new mobility options for residents in the region to connect to employment opportunities. The study considered two alternatives for routing between Morristown and Knoxville, and three options for routing within Morristown. The study concluded that using US 11E instead of I-81 and I-40 was the preferred alternative as it would allow for connections to Strawberry Plains, Jefferson City, and Carson-Newman University. Estimated operating costs, recommended performance measures, and an implementation plan were included in the study report.

TDOT Assessment of Intercity Bus Service Needs Study – Final Report (2015)

This study was conducted to determine whether or not intercity bus needs throughout Tennessee were adequately being met in order to satisfy TDOT's requirement under FTA Section 5311 to spend at least 15 percent of its annual Section 5311 apportionment to carry out a program to develop and support intercity bus transportation, unless the governor certifies that the intercity bus service needs of the state are being adequately met. The study involved a multi-step approach:

- Review historical development of intercity and regional bus service in and through Tennessee
- Conduct intensive public outreach efforts targeting multiple audiences and stakeholders
- Inventory the current intercity bus network, intercity bus facilities, and intermodal connections
- Conduct data analysis of intercity bus corridors, populations served, and how current services meet the state's intercity bus needs
- Conduct a transit/intercity bus propensity evaluation to provide quantitative evidence of intercity bus needs
- Utilize the Transit Cooperative Research Program (TCRP) intercity bus demand model to determine intercity bus needs and service gaps, network connectivity issues, or overall system functionality concerns
- Conduct a comparative assessment of current network and projected intercity bus needs utilizing both quantitative and qualitative techniques

- Assess connectivity between intercity bus service and other transit modes
- Compile a comparative assessment of rural transit needs and intercity bus needs across the state
- Consult with intercity bus operators and other public transit providers regarding intercity bus service

The report concluded that intercity bus needs were being adequately met by Rural Transit Agencies (RTAs) and private bus operators and therefore, it recommended that TDOT dedicate all of its Section 5311 apportionment to support the state's public transportation services. The report also recommended that TDOT may consider using part of its apportionment to support feeder service agreements between the private bus operators and the RTAs.

LAMTPO Human Services Transportation Coordination Plan (2015)

The Human Services Transportation Coordination Plan (HSTCP) was prepared by the LAMTPO in 2015 as an update to the previous HSTCP. A human services transportation plan is required by federal law in order to receive several FTA grants. It was prepared following the adoption of the federal Moving Ahead for Progress in the 21st Century Act (MAP-21), which eliminated and merged several FTA programs such as Section 5316 Job Access and Reverse Commute (JARC). The HSTCP addresses these changes in FTA funding.

The HSTCP included stakeholder outreach, self-assessment survey results, an overview of existing transit services, identification of transit issues, and recommendations. In particular, the HSTCP focused on the need to improve education and awareness in the community of public transportation.

The main issues identified with current transit service were:

- Transportation services need to be provided to most major employers and/or industrial parks within the region.
- Transportation services need to be flexible to allow for convenient access to childcare facilities.
- Maximize use of public transportation to offset the higher costs of fuel.

The following recommendations were presented in the plan:

- To continue and expand the coordination process with various agencies, and local, state, and federal governments.
- Provide transportation services to the many industrial parks, where more skilled and higher paying jobs are located.
- Provide a mix of services and vehicles that can provide a more efficient transportation service to rural residents or outlying job locations.
- Analyze and evaluate the potential for providing transportation services later in the evening and at night that can accommodate the second and third shift workers at major employers.
- Analyze and evaluate the need for transportation services seven-days-per-week to accommodate jobs that are available on the weekends.

- Provide additional transportation services to areas where higher concentration of low-income or subsidized housing is located.
- Provide marketing efforts that will include specific efforts to target persons who are disabled to inform them of the transportation options that are available.
- Provide transportation information by personally meeting with disability advocacy groups.

LAMTPO Transit Feasibility Study (2006)

A Transit Feasibility Study was performed in 2006 through LAMTPO to understand the mobility needs of this newly designated urbanized area. The study area included Morristown, Jefferson City, White Pine, and portions of Hamblen and Jefferson Counties. Public involvement was an integral component of this study in order to gather input from a local perspective. Several service and organizational alternatives were considered in the study:

- Fixed-route circulator in Morristown
- Point-deviation service throughout the LAMTPO urban area
- Fixed-route circulator and regional point-deviation service

The Morristown Circulator was proposed in the plan to consist of an east and west loop that would serve major origins and destinations in the central Morristown area. One vehicle would be used on each loop with the east loop operating clockwise and west loop counter-clockwise. The two loops would meet at a transfer point located downtown. The service would operate on a 30 minute frequency from 6:00 am to 6:00 pm on weekdays. The service would be funded by FTA Section 5307 (50 percent), TDOT Urban Operating Assistance (UROP) funds (25 percent), and local government (25 percent).

The objective of the study was not to recommend a single alternative, but rather evaluate the alternatives qualitatively based on geography, access, capital and operational costs, local funding requirements, capacity, and visibility factors. Alternative 3, which proposes a fixed-route and regional point deviation service, received the highest ratings, but was also the most expensive.

The study also looked at park-and-ride opportunities, a voucher system for private taxis, and the creation of a transit center. The study recommended initiating transit service first using FTA Section 5307 funding before implementing a transit center.

2.2 Major Travel Nodes and Activity Centers

The major travel nodes in Morristown include Andrew Johnson Highway, Cumberland Street (Highway 343), Davy Crockett Parkway (Highway 32), and US 11E. Davy Crockett Parkway connects Morristown with I-81 located to the south. Activity centers were identified and mapped within Morristown in order to understand potential origins and destinations for fixed-route transit. Input on the locations of the activity centers was provided by the project stakeholders and community during public workshops.

As noted in Table 2-1 and Figure 2-1, Morristown has multiple activity centers that can be described according to several categories: civic, education, grocery, health, library, residential, shopping, social service, and transit. These activity centers are geographically distributed throughout the city, and are most concentrated in the downtown area.

Table 2-1: Activity Centers

Map ID	Activity Center	Category
1	Aldi	Grocery
2	Walmart Supercenter (Andrew Johnson Highway)	Shopping
3	Ingles Market (West)	Grocery
4	United Way	Social Service
5	Stepping Out	Social Service
6	Life Care Center of Morristown	Health
7	New Transit Center	Transit
8	Maple Apartment Complex	Residential
9	Fairway Apartments	Residential
10	Human Services Department	Civic
11	Food City (Sandstone Drive)	Grocery
12	Fairway Apartments	Residential
13	Bartlett Place	Health
14	Walmart Neighborhood Market (Andrew Johnson Highway)	Shopping
15	Walter Ridge Apartments	Residential
16	Morristown Hamblen Healthcare System	Health
17	Lakeway Regional Hospital	Health
18	Boys and Girls Club	Social Service
19	Morristown Housing Authority	Civic
20	Tennessee College of Applied Technology Morristown	Education
21	Ministerial Association Temporary Shelter (MATS)	Social Service
22	Lions Volunteer Blind Industries	Social Service
23	Hamblen County Clerk	Civic
24	Hamblen County Circuit Court	Civic
25	Henry Manor	Residential
26	Helen Ross McNabb Center	Residential
27	Lincoln Park Apartments	Residential
28	Senior Citizen's Center	Civic
29	Morristown-Hamblen Library	Library
30	Greyhound Bus Station	Transit
31	Healthstar Physicians	Health
32	Morristown Farmers Market	Grocery
33	Alps Adult Day Services	Social Service
34	Lincoln Manor Apartments	Residential
35	Laurelwood Apartments	Residential
36	Regency Retirement Village	Residential
37	KC Home	Residential
38	Crestmore Mobile Home Park, Inc	Residential
39	Walmart Neighborhood Market (Buffalo Trail)	Shopping
40	Food City (Berkline Drive)	Grocery
41	Carlyle Senior Living	Residential
42	Carlyle Town Houses	Residential
43	Village at Barkley Landing	Residential
44	Central Services	Social Service
45	American Jobs Center	Civic
46	Shady Acres RV Park	Residential

Map ID	Activity Center	Category
47	Scenic Vista II	Residential
48	Eastpoint Apartments	Residential
49	Price Less Foods	Grocery
50	Morristown County Driver Services Center	Civic
51	Mayfair Apartments	Residential
52	Collegewood Apartments	Residential
53	Ingles Market (East)	Grocery
54	Walters State Community College	Education
55	College Square Mall	Shopping
56	Walmart Supercenter (Crockett Trace Drive)	Shopping
57	Social Security Administration	Civic
58	Food City (Cool Springs Road)	Grocery

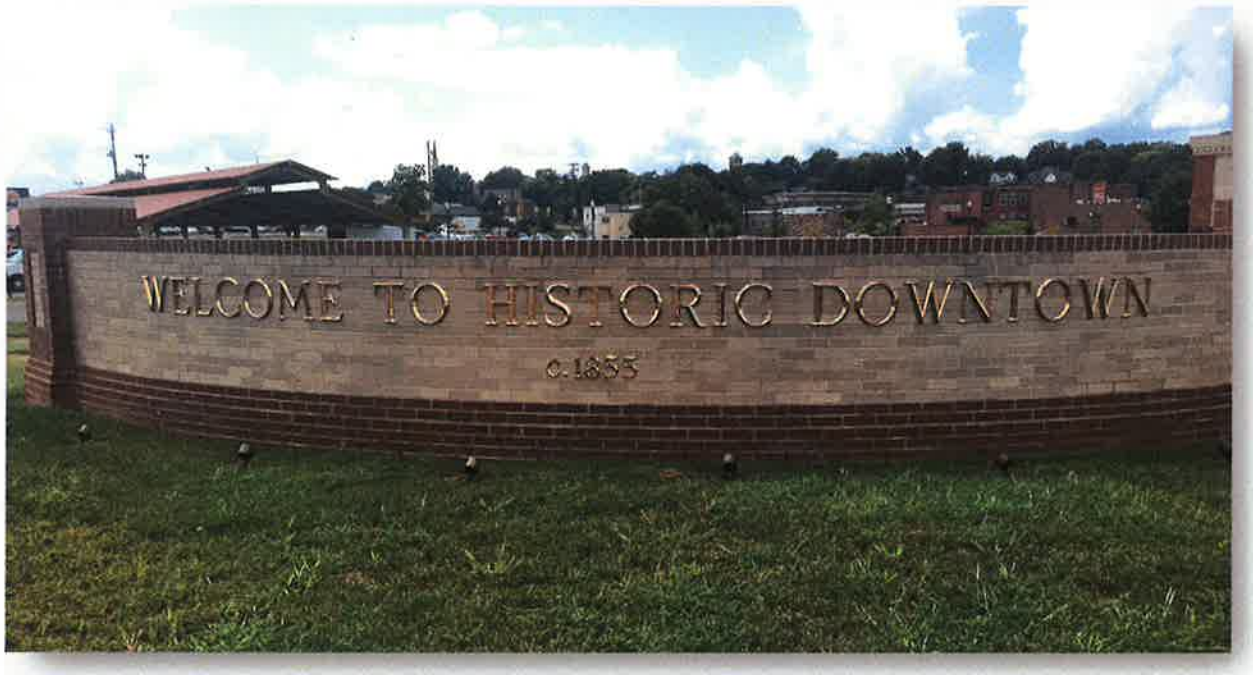
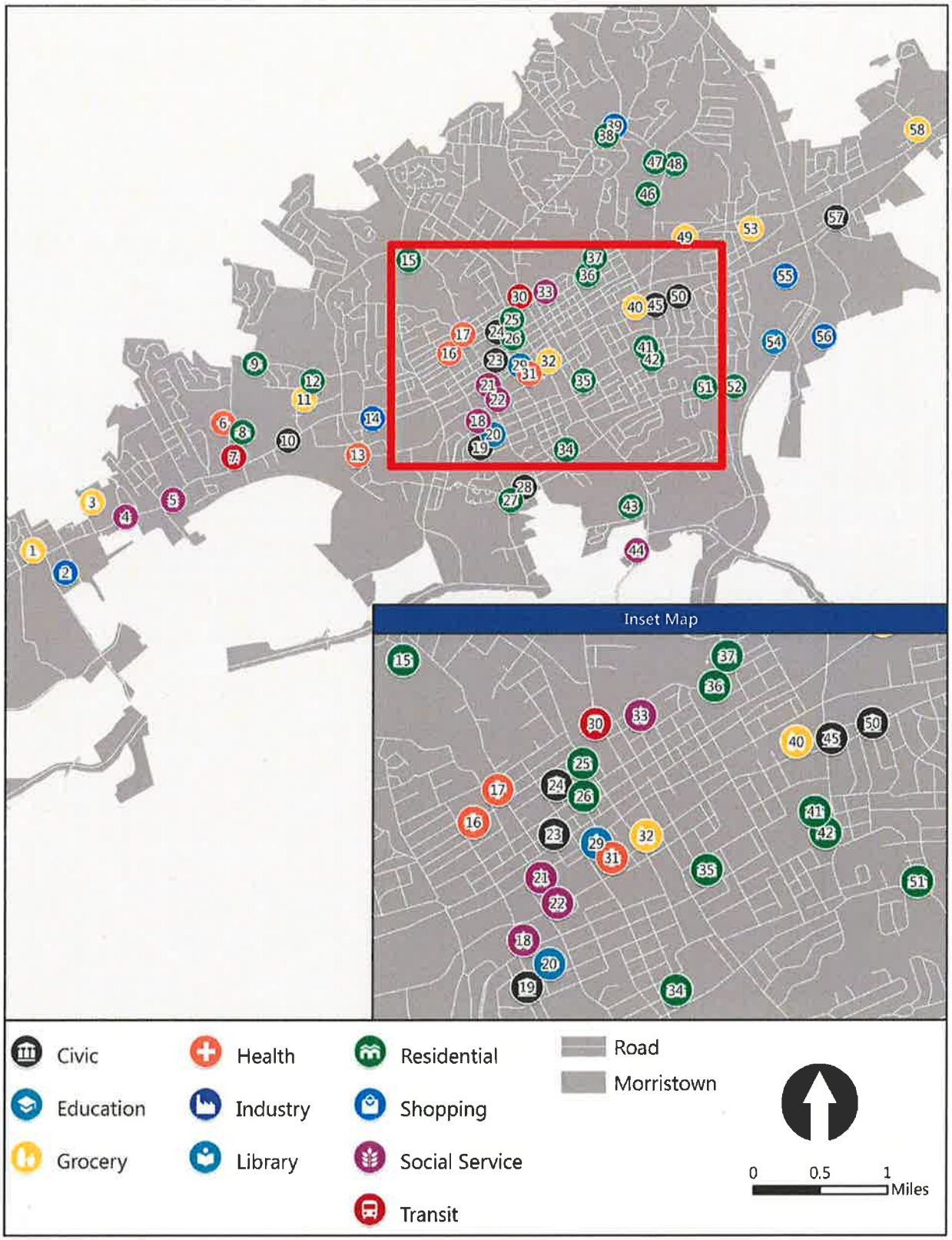


Figure 2-1: Activity Centers



2.3 Land Use and Development

Figure 2-2 on page 2-8 shows the development footprint in relation to Morristown and the Study Area. This figure shows the year the structure on each parcel was built. This figure highlights where older development is located and where new development is taking place.

Zoning districts in relation to the Study Area are shown in Figure 2-3 on page 2-9. The zoning map shows generalized land use. Commercial land uses are found along Morris Boulevard, Cumberland Street and First Street. Industrial land is found in the southwest portion of Morristown and along Morris Boulevard, Cumberland Street and Liberty Hill Road. The remainder of the land in Morristown is mostly residential.

Figure 2-4 on page 2-10 shows expected population growth in Morristown and in the Study Area. The growth shown represents the projected increase in population based on the LAMTPO forecast by Transportation Analysis Zone (TAZs). The majority of population growth is anticipated to be located in the southwestern portion of the Study Area.

Expected employment growth in Morristown and in the Study Area is shown on page 2-11 in Figure 2-5. Similar to population growth projections, the values shown represent the estimated increase in employment based on LAMTPO's forecasts by TAZs. Based on this information, employment growth within Morristown's city limits varies between zero growth to over 2,000 additional employees in some areas. Most of the employment growth is anticipated to fall inside the city limits, with the largest increase projected in the southwestern portion of the Study Area.

Figure 2-2: Existing Development

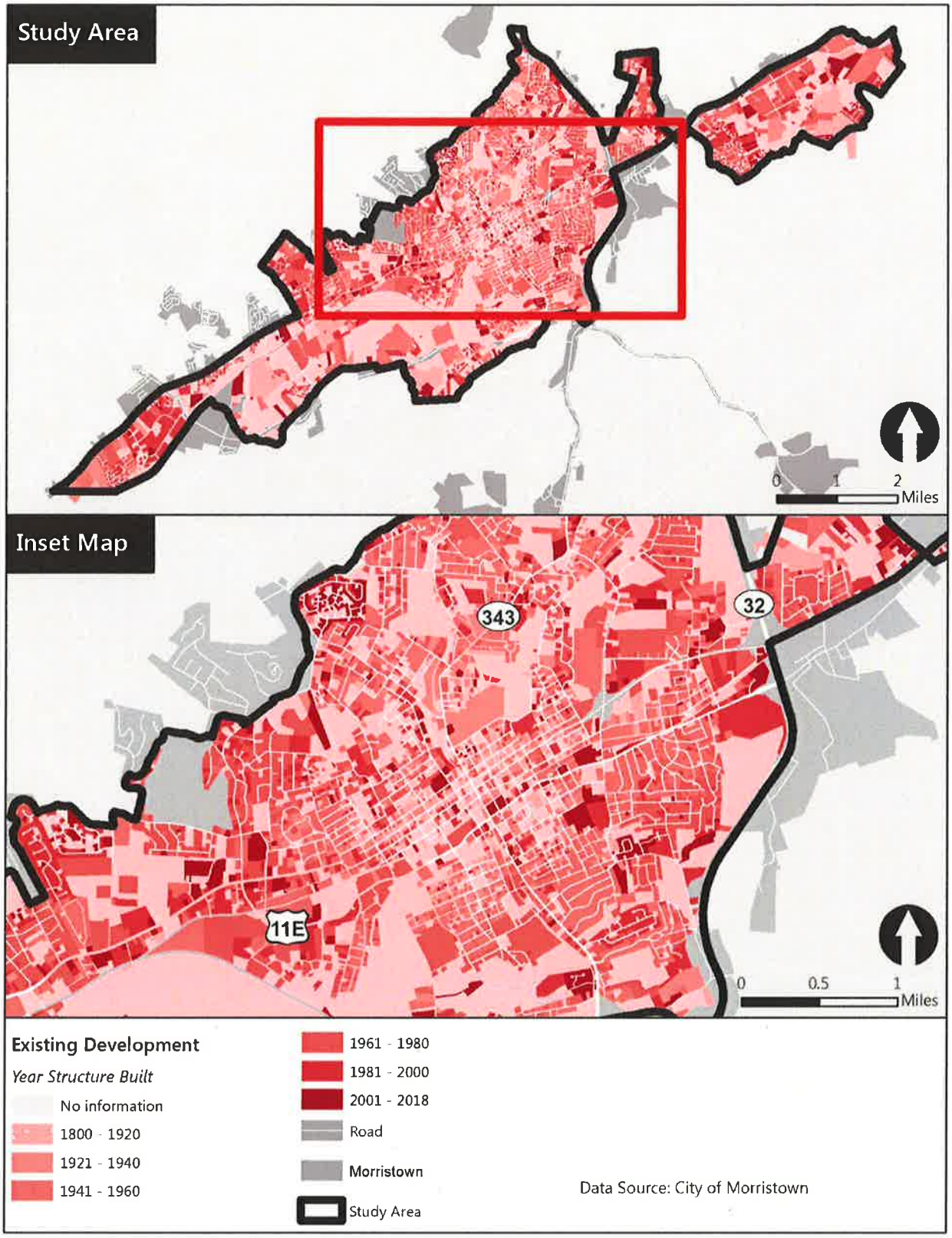


Figure 2-3: Zoning Districts

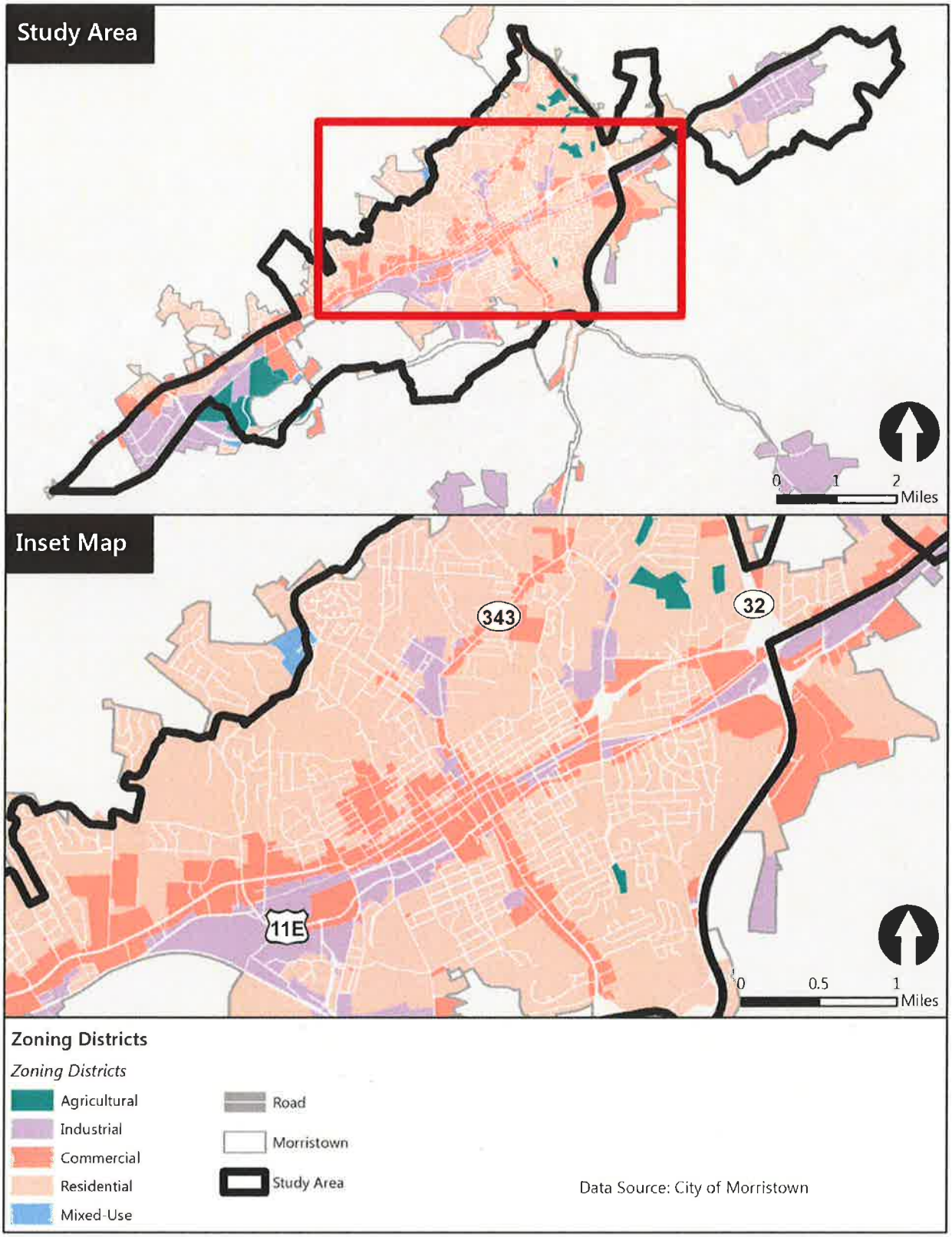


Figure 2-4: 2014 -2040 Population Growth

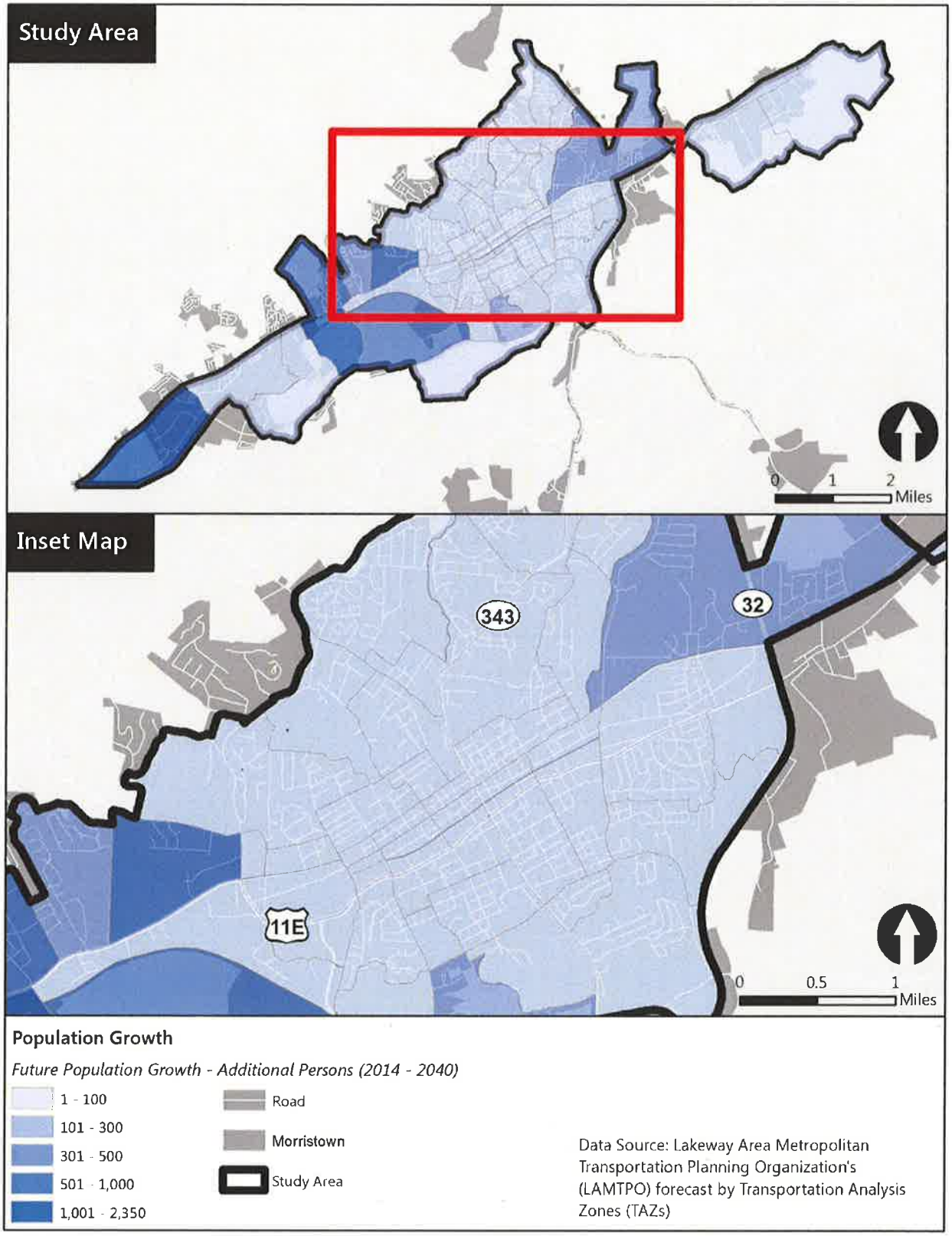
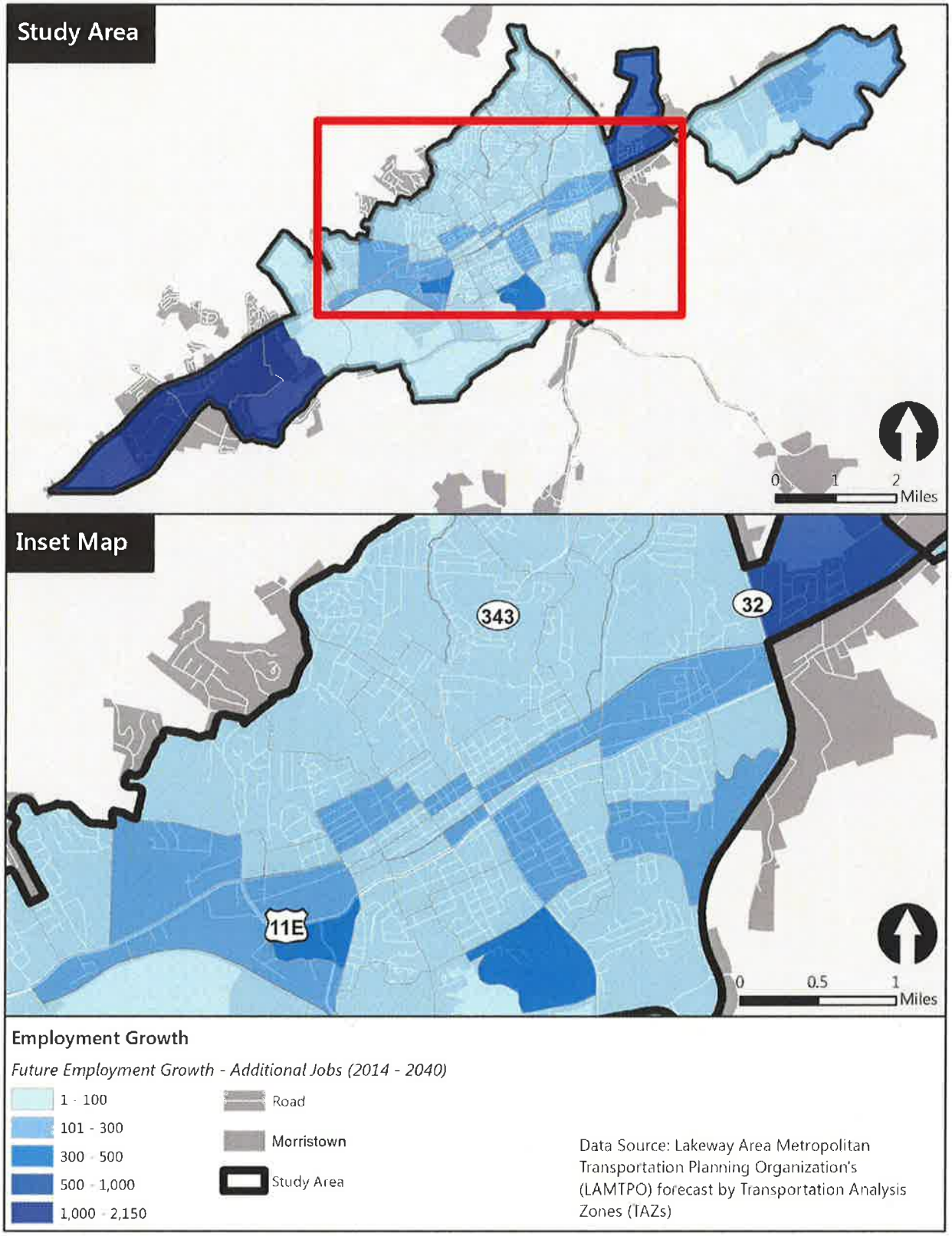


Figure 2-5: 2014 -2040 Employment Growth



2.4 Regional Employment Profile

Figure 2-6 and Table 2-2 show employment flows within the region according to Longitudinal Employer Household Dynamics (LEHD) information (2015). Based on this analysis, nearly 21,500 workers travel from outside the city limits to work in Morristown. An estimated 5,264 people both reside and work in Morristown, and approximately 5,354 workers who live in Morristown travel outside the city limits to their primary employment location.

Figure 2-6: Regional Employment Flows

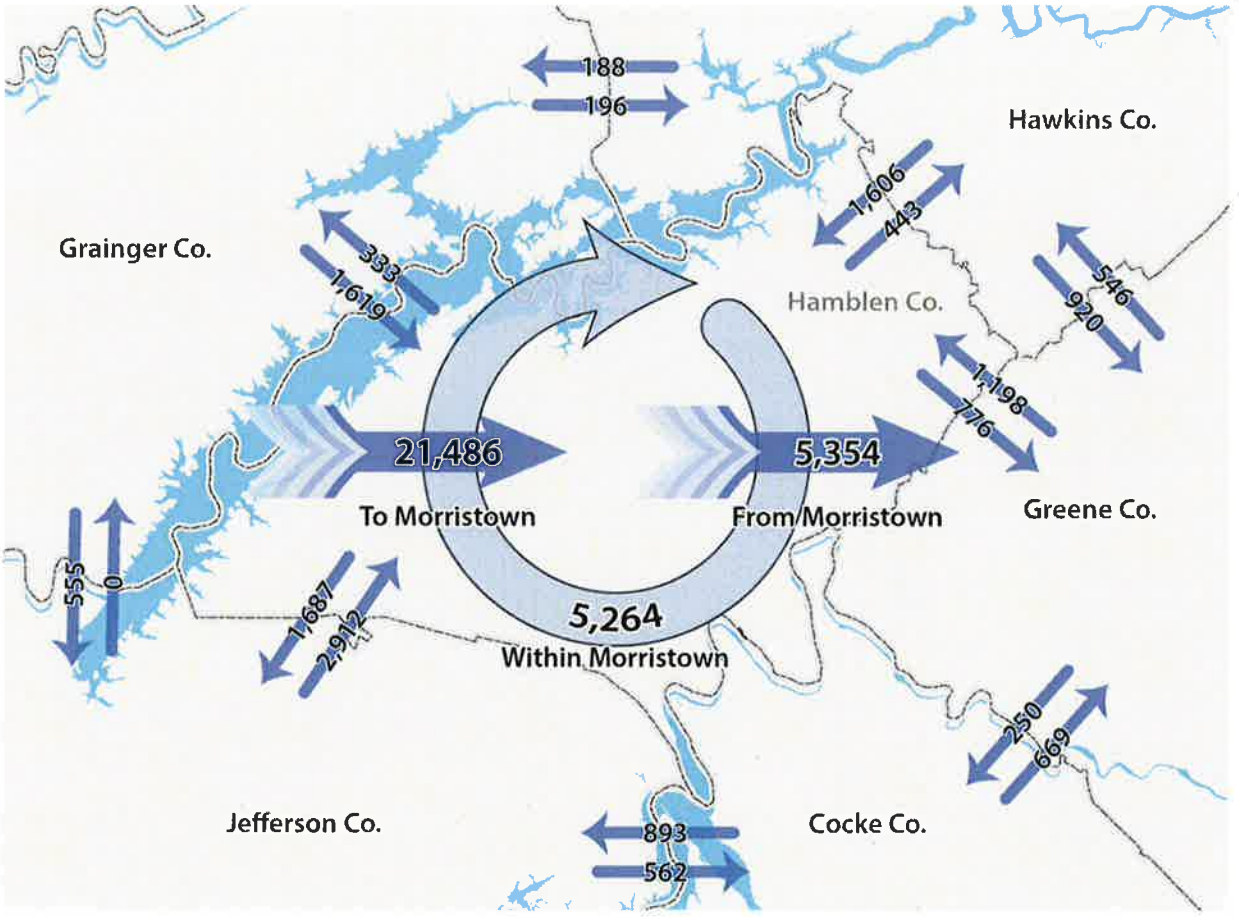


Table 2-2: Employee Travel To and From Morristown Limits

Employee Travel Flows To Morristown City Limits		
From	Employees	Percentage
Morristown	5,264	19.7%
Jefferson City	454	1.7%
Knoxville	453	1.7%
Bean Station	342	1.3%
Kingsport	329	1.2%
Newport	234	0.9%
Johnson City	218	0.8%
Greeneville	203	0.8%
White Pine	198	0.7%
Nashville-Davidson Co.	127	0.5%
Other Locations	18,928	70.8%

LEHD, 2018.

Employee Travel Flows From Morristown City Limits		
To	Employees	Percentage
Morristown	5,264	49.6%
Knoxville	770	7.3%
Jefferson City	319	3.0%
Nashville-Davidson Co.	241	2.3%
Greeneville	197	1.9%
Sevierville	155	1.5%
Chattanooga	141	1.3%
Newport	141	1.3%
White Pine	136	1.3%
Memphis	135	1.3%
Other Locations	3,119	29.4%

LEHD, 2018.

Table 2-3 shows the top employers by number of employees in the study area as reported by the Morristown Area Chamber of Commerce. The sectors reflected in the list of the top employers include Manufacturing, Trucking, Retail, Higher Education, Hospital/Healthcare and Government.

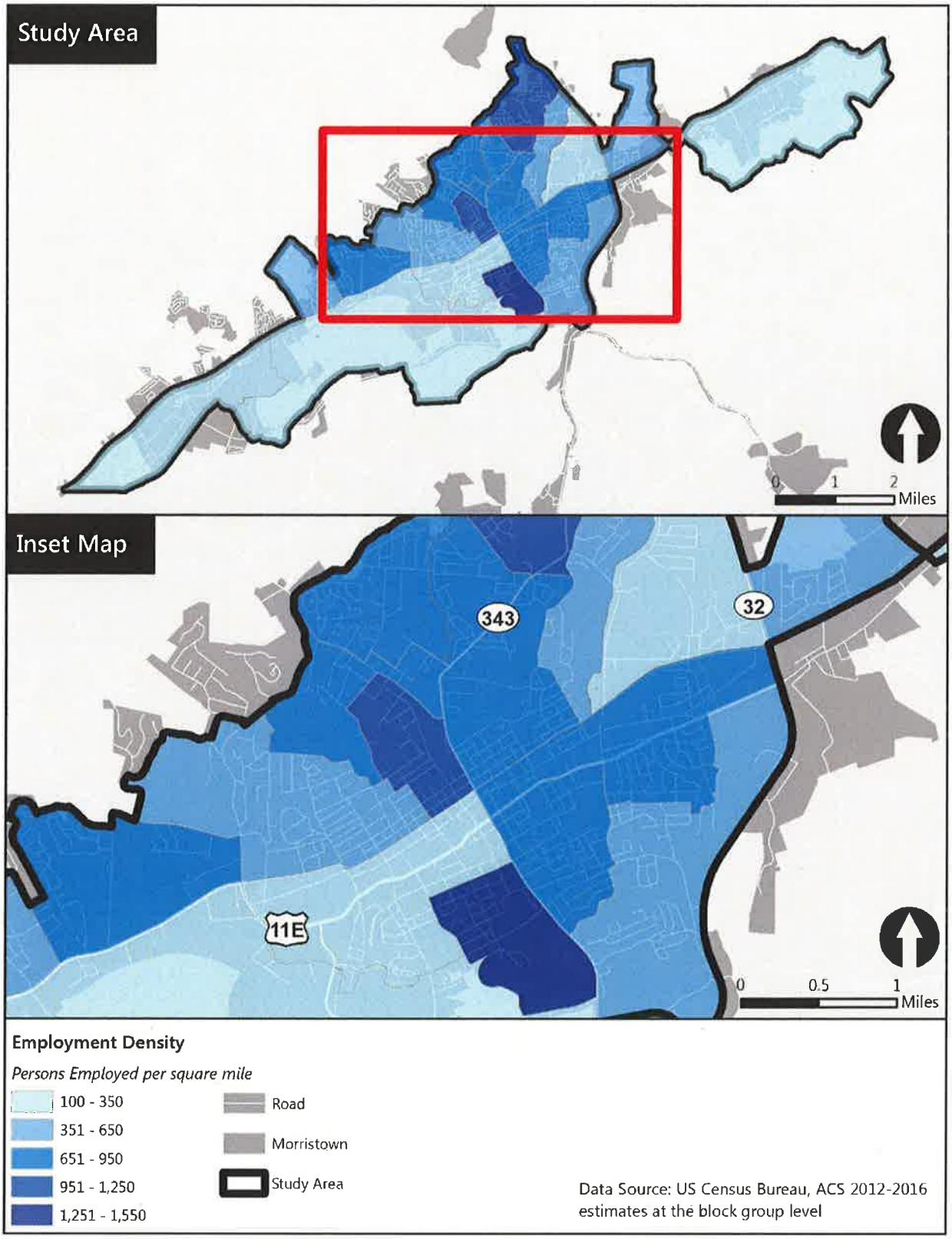
Table 2-3: Major Employers in the Study Area

Employees	Employer	Sector
1,029	MAHLE, Inc.	Manufacturing
1,001	Old Dominion Freight Line	Trucking
997	Koch Foods	Manufacturing
864	JTEKT Automotive	Manufacturing
757	Walmart (Morristown)	Retail
743	Walters State Community College	Higher Education
716	Morristown Hamblen Healthcare	Hospital/Healthcare
526	Alcoa Howmet	Manufacturing
513	Team Technologies	Manufacturing
455	Lear Corporation	Manufacturing
438	Rich Products	Manufacturing
390	Lakeway Regional Hospital	Hospital/Healthcare
373	Healthstar Physicians	Healthcare
338	City of Morristown	Government
333	Oddello Industries	Manufacturing
315	Nashua Corporation	Manufacturing
301	Walmart (Jefferson City)	Retail
300	Housecall Health Services	Healthcare
300	Jefferson Memorial Hospital	Healthcare
280	Lakeway Achievement Center	Manufacturing
263	Otics USA	Manufacturing
260	Meritor Heavy Vehicles Systems	Manufacturing
250	Hamblen County	Government

LAMTPO, 2017.

Figure 2-7 illustrates employment density in Morristown according to US Census Bureau data from the 2012-2016 American Community Survey (ACS). The higher employment densities are located near Lincoln Heights Middle School, the area around Dr. Martin Luther King, Jr. Park and to the north in the area between Buffalo Trail and Davy Crockett Parkway.

Figure 2-7: Employment Density

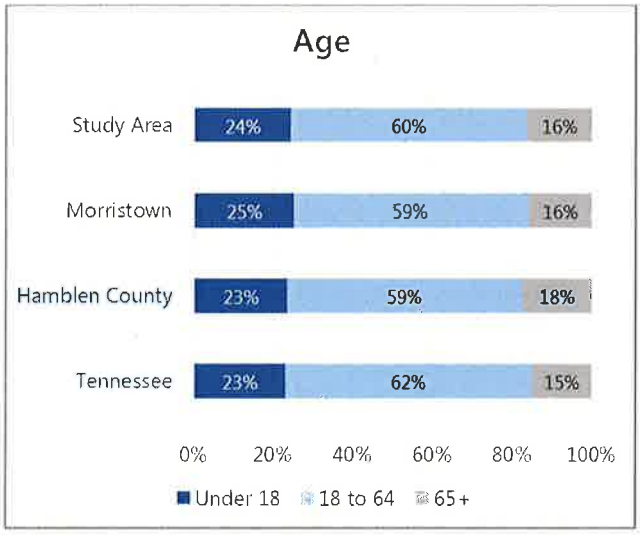


2.5 Demographic Profile

A demographic profile was prepared in order to gain a better understanding of the city's residents and transportation needs. Understanding where concentrations of population, individuals living below poverty, and households without access to vehicles are located is critical to planning a successful transit service for the community. The profile compares the demographics of the study area to Morristown, Hamblen County, and Tennessee in order to provide both local and regional perspectives. The study area was defined as block groups with at least 25 percent of their land area included within the Morristown census place boundary (Figure 2-8, page 2-20). Block groups allow for finer analysis of demographic data. The demographic profile was prepared using ACS 2012-2016 five-year estimates from the US Census Bureau at the block group, place, county, and state levels.

Population and Age

The population of the study area is 30,332. In comparison, the population of Morristown is 29,395. The populations of Hamblen County and Tennessee are 63,203 and 6,548,009, respectively. The study area population is slightly larger than Morristown's population because block groups do not necessarily follow city boundaries.

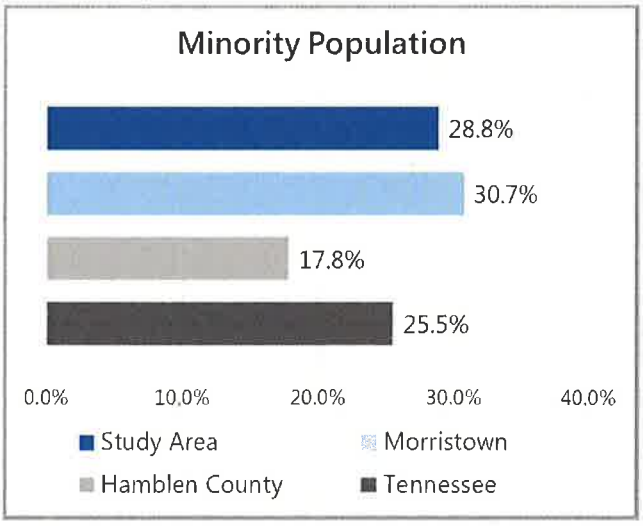


Population density within the study area is greatest in central Morristown, notably along Cumberland Street between 1st Street and Buffalo Trail and between Parker Road and West Louise Avenue (Figure 2-9, page 2-21).

The age distribution is similar in the study area, city, county, and state. The Under 18 age group varies between 23 and 25 percent of the total population. The 18 to 64 age group varies between 59 and 62 percent, and the 65 or older age group varies between 15 and 18 percent.

Race and Ethnicity

The study area and Morristown have larger percentages of minorities compared to the county and state. The minority population in the study area is 28.8 percent and 30.7 percent in Morristown. In comparison, the minority population in Hamblen County is 17.8 percent and 25.5 percent in Tennessee.

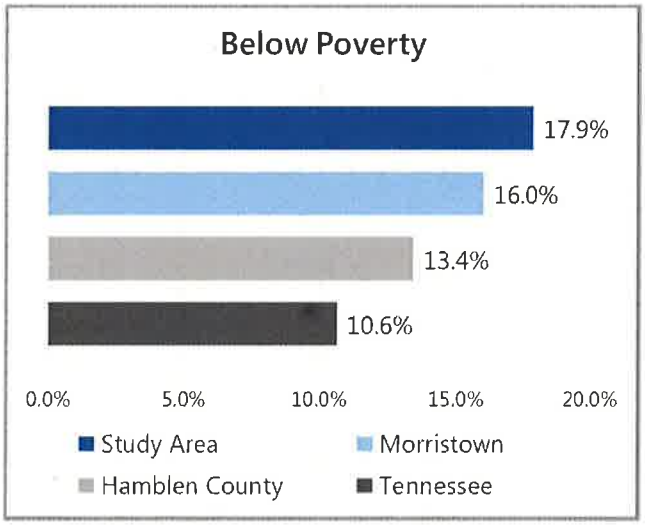


The concentration of minority populations is more evenly distributed than population density within the study area. Areas of higher concentration are located along Cumberland Street between 1st Street and Buffalo Trail and between Parker Road and West Louise Avenue. An additional area of greater concentration is the block group bounded by Andrew Johnson Highway, Walters Drive, Economy Road, and Central Church Road (Figure 2-10, page 2-22).

The Hispanic/Latino population of the study area is 19.4 percent and 20.9 percent in the city. The percentages in the county and state are lower: 11.2 percent and 5.0 percent, respectively.

Poverty

The percentage of individuals living below the poverty level is greatest in the study area at 17.9 percent, compared to 16.0 percent in Morristown, 13.4 percent in Hamblen County, and 10.6 percent in Tennessee.



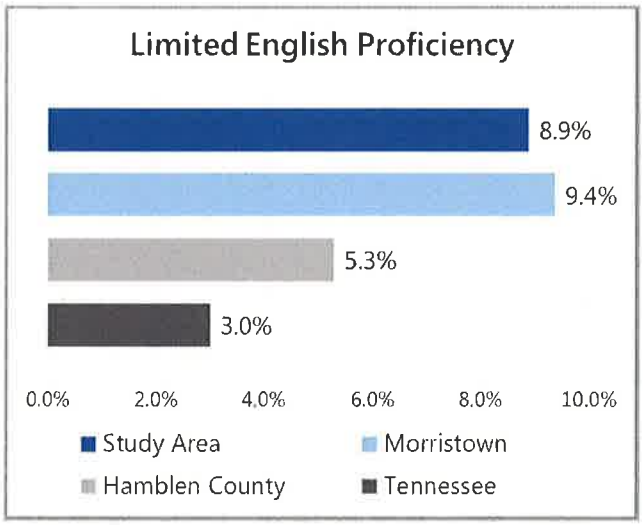
Concentrations of individuals living below the poverty level within the study area are highest from Parker Road north to Andrew Johnson Highway and east to Cumberland Street. The other region with one of the highest concentrations is from Cumberland Street and 1st Street northeast to Highway 32 (Figure 2-11, page 2-23).

The median household income in the study area is $31,661, which is similar to the median

household income in Morristown ($31,259). Median household incomes in the study area and city are less than in Hamblen County ($39,270) and Tennessee ($46,574).

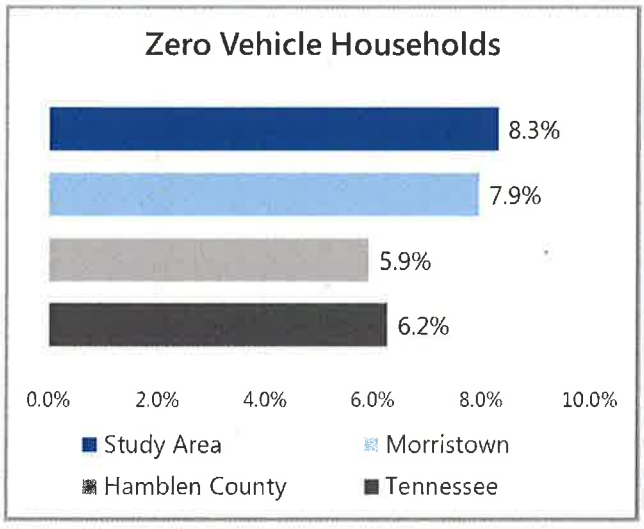
Limited English Proficiency

Limited English proficiency (LEP) is defined by the ACS as individuals that speak English less than very well. The percentage of adults in the study area that speak English less than very well is 8.9 percent compared to 9.4 percent in Morristown. The percentages of LEP populations are greater in the study area and Morristown than in the county and state. LEP populations are 5.3 percent in Hamblen County and 3.0 percent in Tennessee. The majority language group for LEP populations in all four areas is Spanish. The block group with the highest concentration of LEP populations (25 percent) is bounded by Andrew Johnson Highway, Walters Drive, Economy Road, and Central Church Road. Other areas of higher LEP concentrations are located along Cumberland Street and Buffalo Trail (Figure 2-12, page 2-24).



Access to Vehicles

The percentage of households without access to a vehicle is the greatest in the study area at 8.3 percent, followed by Morristown at 7.9 percent. In comparison, the percentages are 5.9 percent in Hamblen County and 6.2 percent in Tennessee.



Areas that have the greatest concentrations of households without access to vehicles include the block group bounded by Andrew Johnson Highway, Walters Drive, Economy Road, and Central Church Road as well as two block groups on the south side of Andrew Johnson Highway. The westernmost block group on the south side covers a large land area, but is mostly undeveloped with the majority of developed areas present along Andrew

Johnson Highway and some residential development on either side of Highway 160. The easternmost block group on the south side includes several neighborhoods as well as the Morristown Housing Authority (Figure 2-13, page 2-25).

Means of Transportation to Work

The majority of residents in the study area commute to work alone by car (82 percent), followed by commuting by carpool (14 percent). Commuting by public transportation is less than one percent in the study area, Morristown, and Hamblen County. In Tennessee, one percent of commuters commute by public transportation.

A greater percentage of commuters commute alone in Hamblen County and the state as a whole, compared to the study area and Morristown.

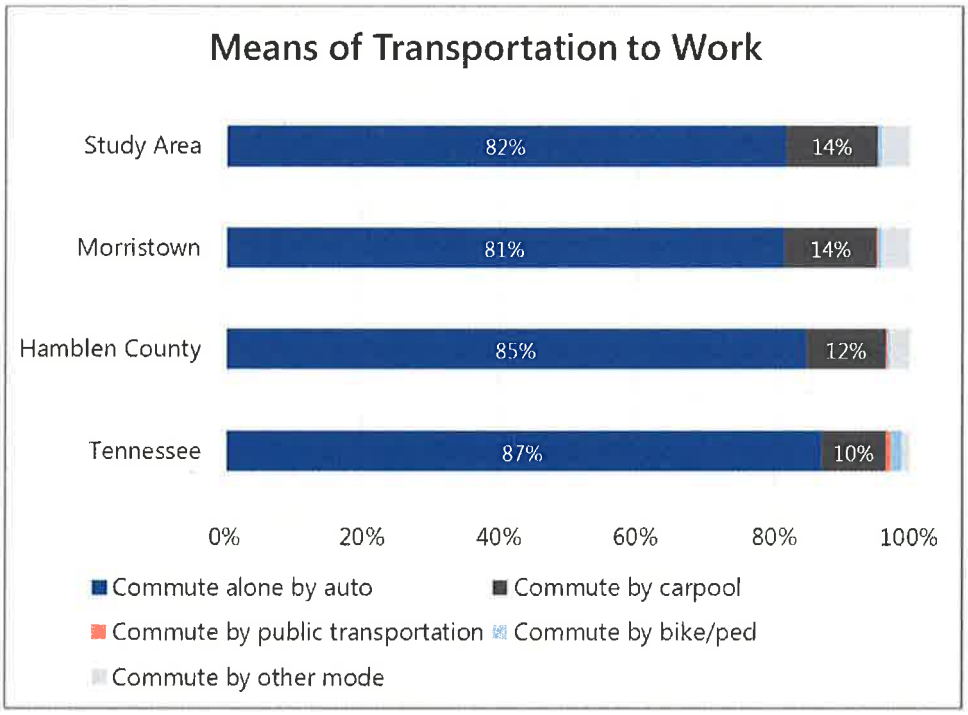


Figure 2-8: Study Area

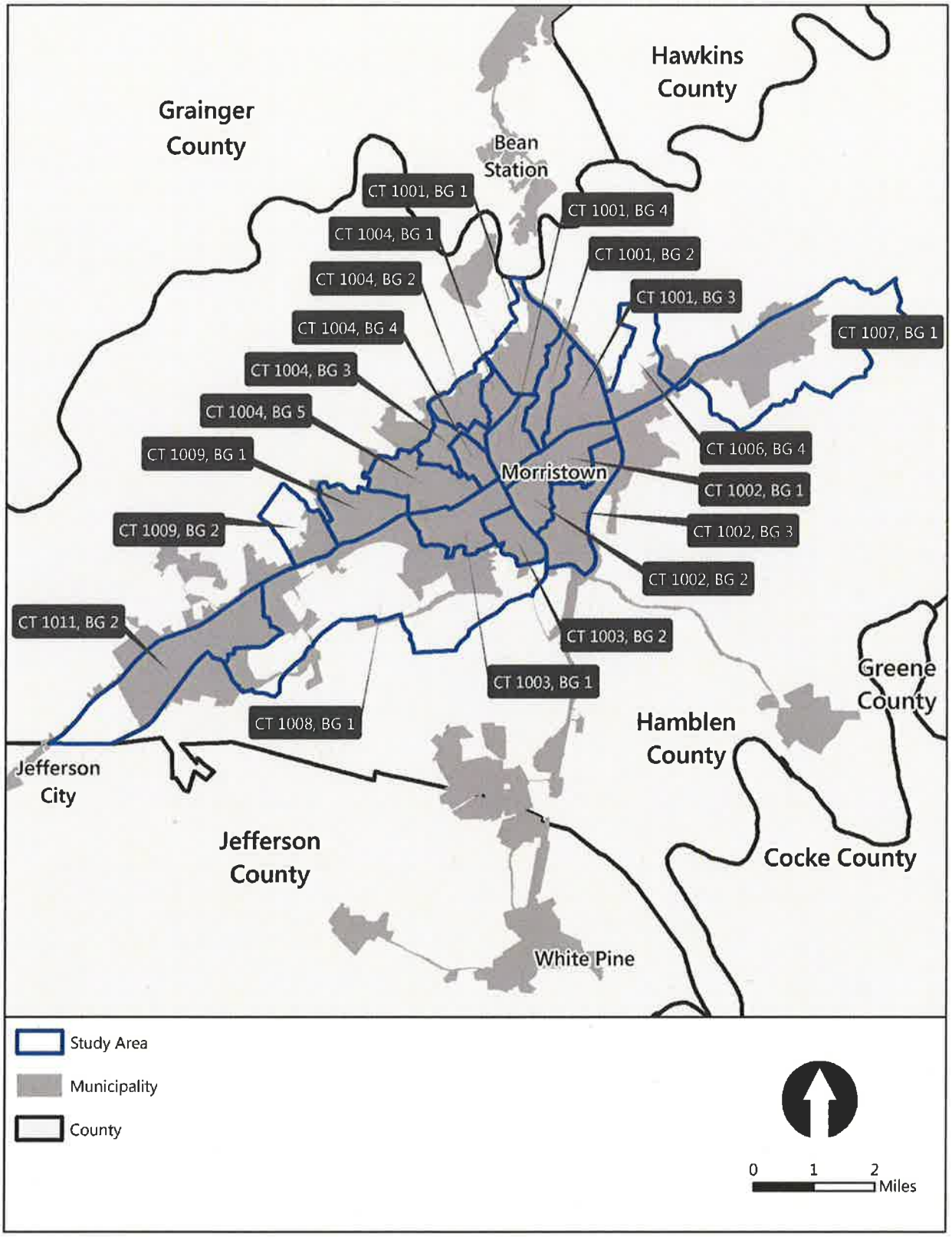


Figure 2-9: Population Density

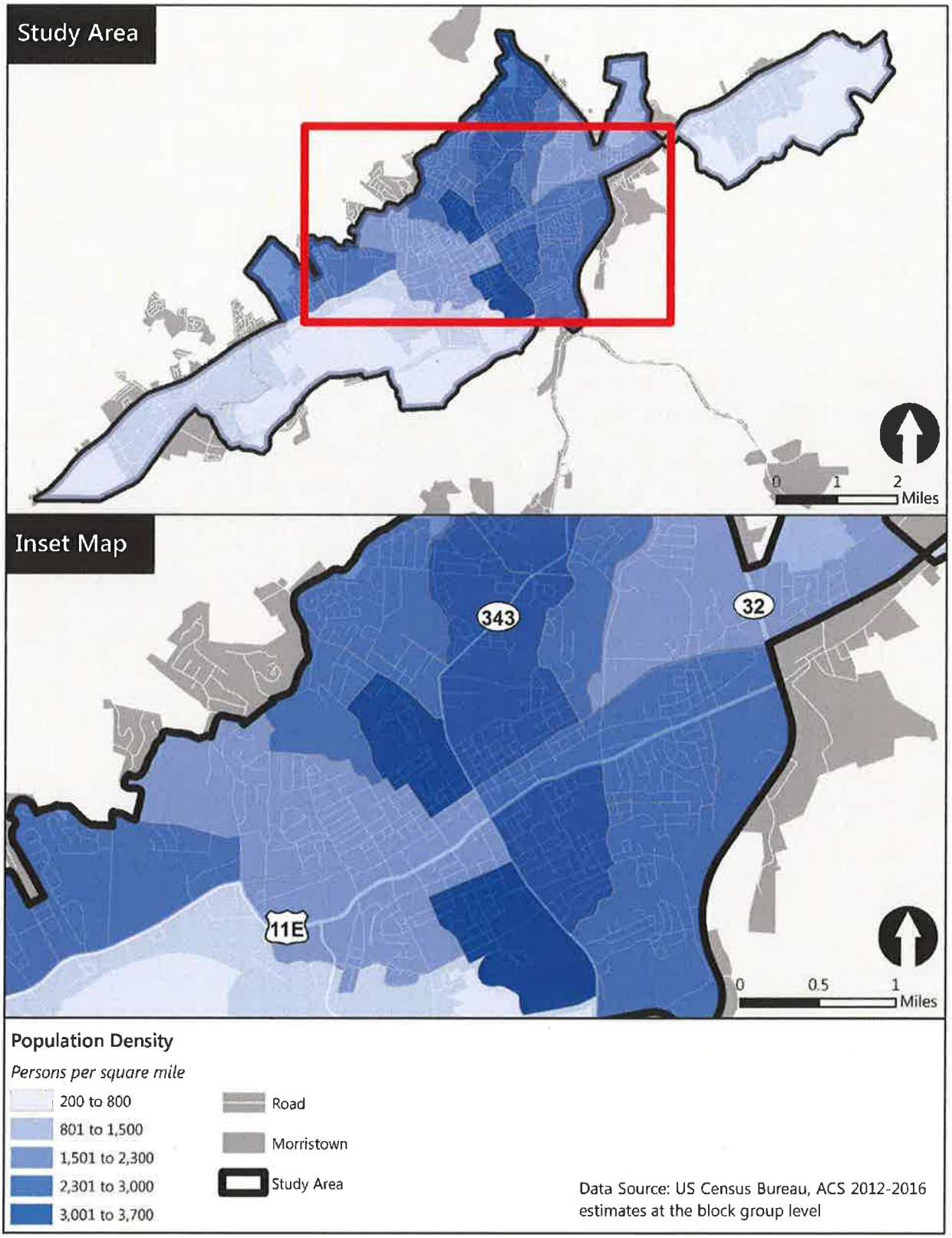


Figure 2-10: Minority Population

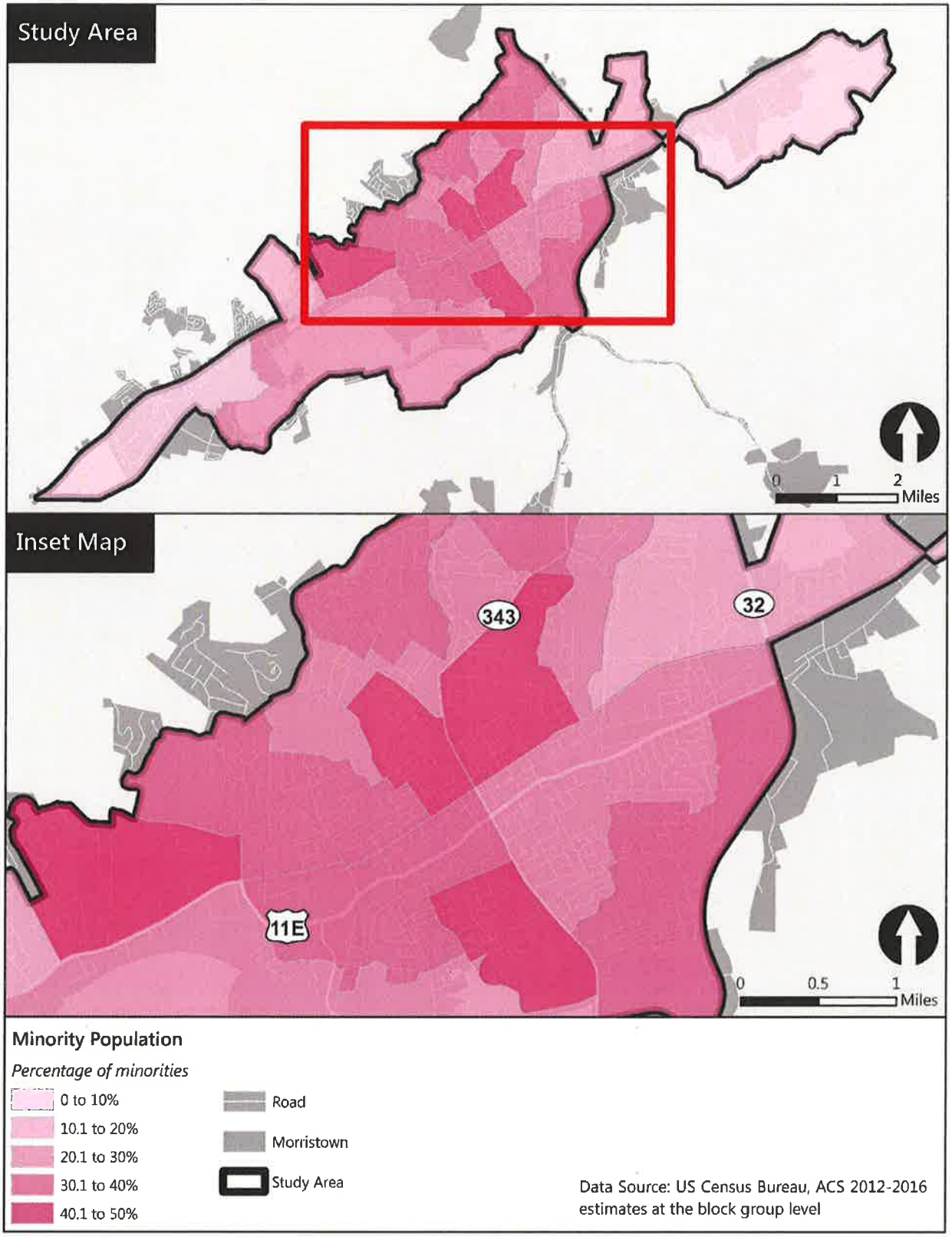


Figure 2-11: Individuals Living Below Poverty

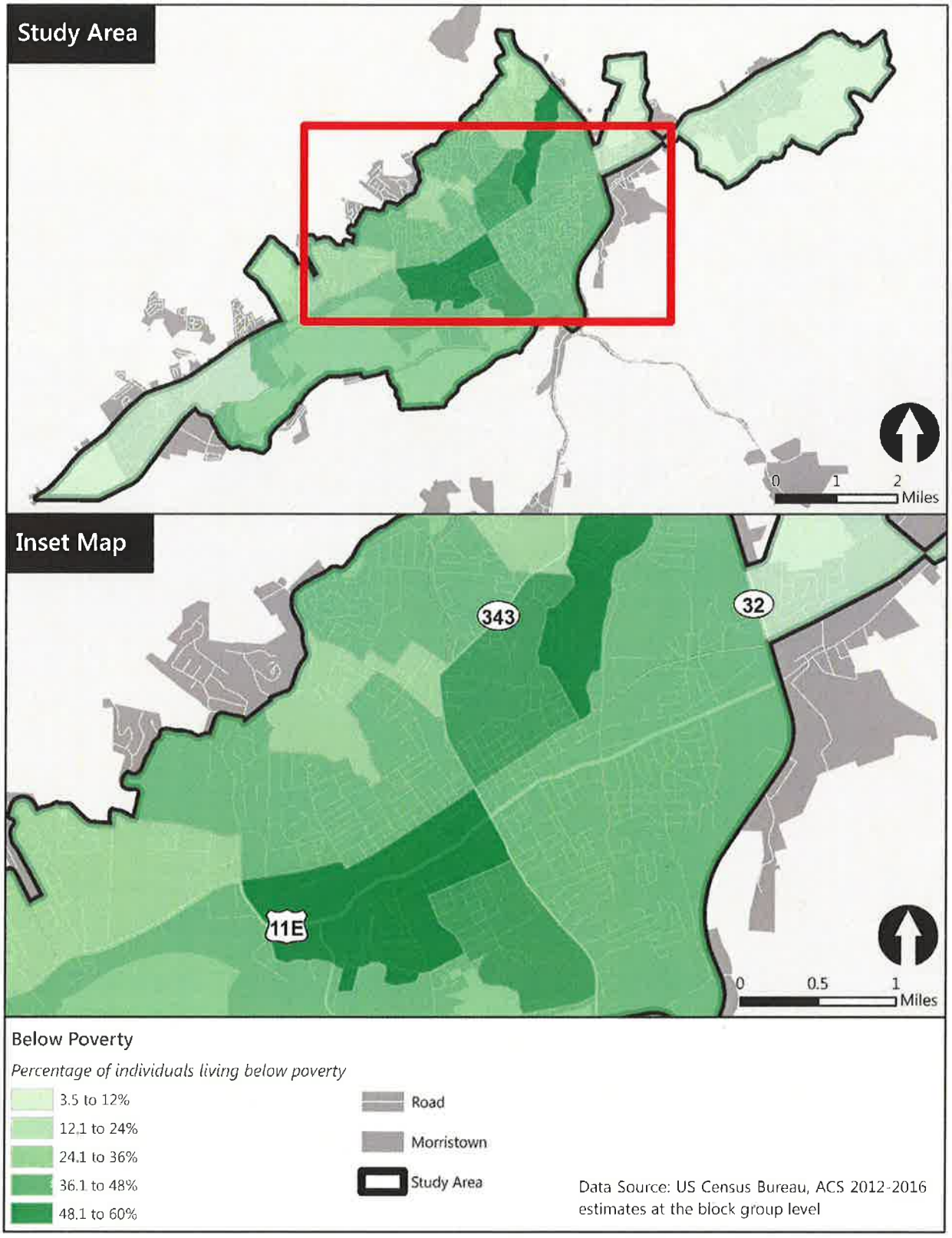


Figure 2-12: Limited English Proficiency

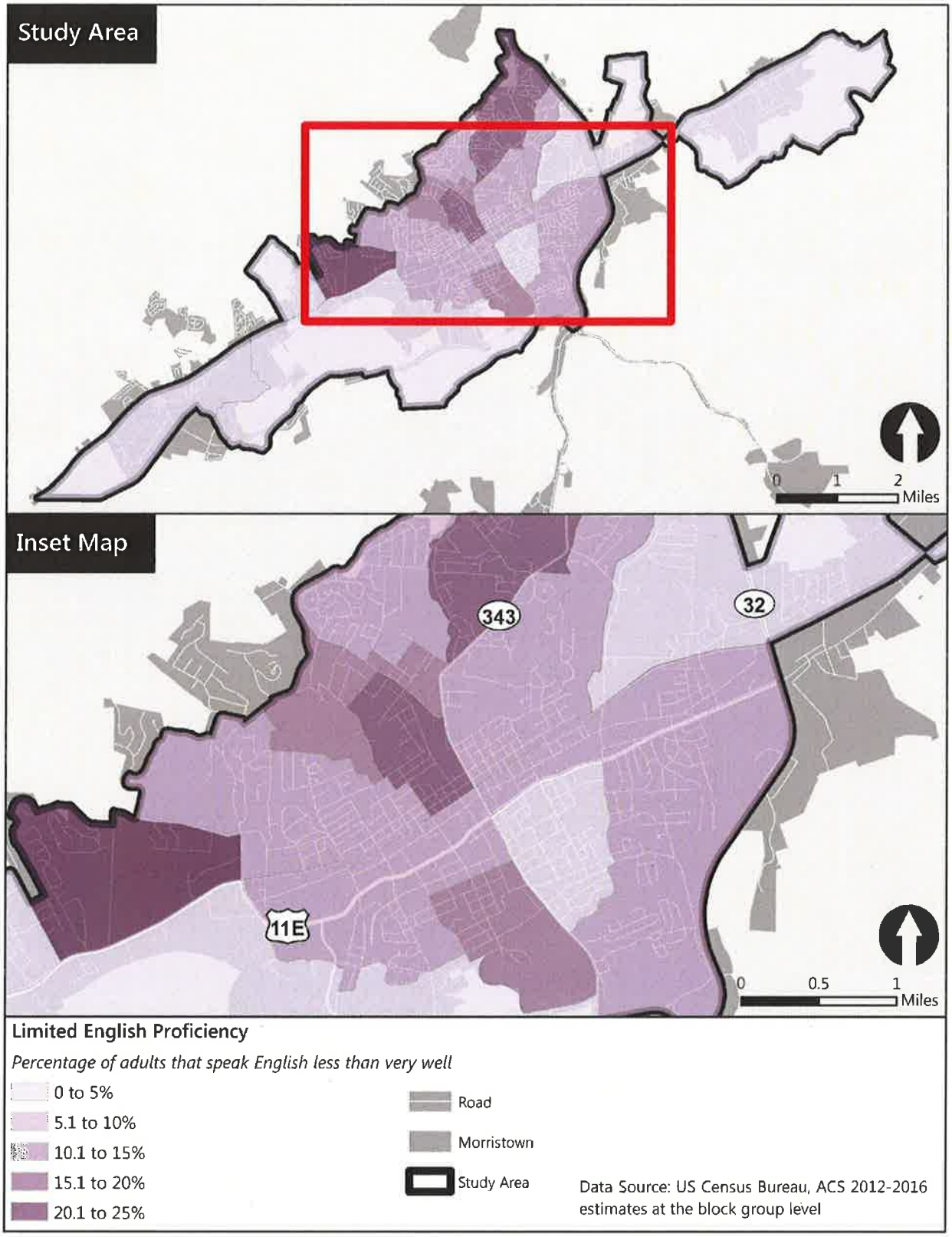
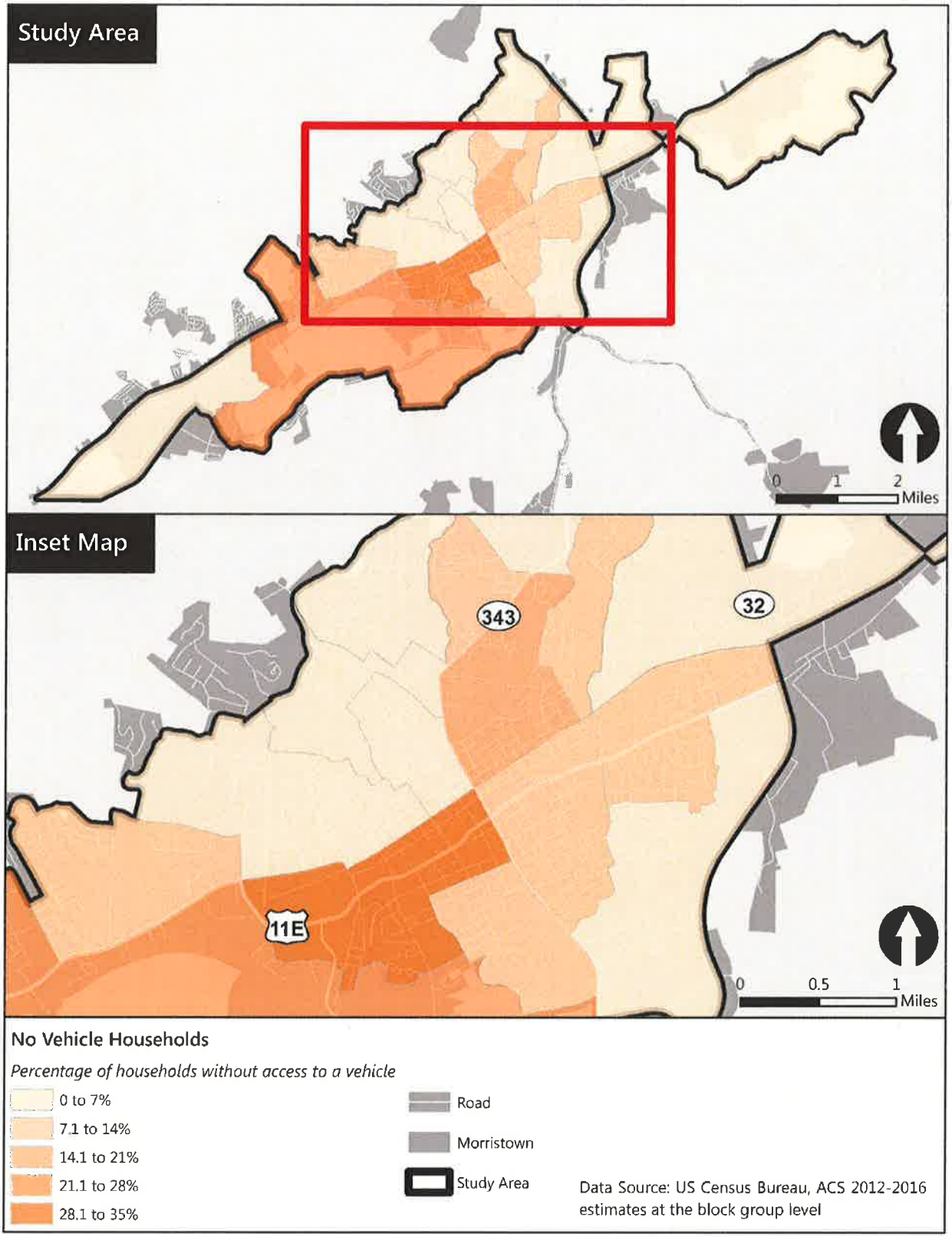


Figure 2-13: Households without Access to a Vehicle



2.6 Mobility Gaps Analysis

One methodology for assessing mobility needs within a community is to compare the number of daily trips taken by households that have access to vehicles and the number of daily trips taken by zero-vehicle households. The concept is that zero-vehicle households would take the same number of trips as households with vehicles if transit were provided. The difference in daily trip rates is referred to as the "mobility gap."

The mobility gap analysis was conducted using trip statistics from the Federal Highway Administration (FHWA)'s National Household Travel Survey (NHTS) 2017. The survey publishes the number of daily person trips by the number of vehicles available in the household for the entire country. NHTS uses the number of households from ACS data. Using these parameters, the daily trip rate can be derived by dividing the number of daily person trips by the number of households (Table 2-4).

Table 2-4: Mobility Gaps Analysis Parameters

Household Group	Households	Daily Person Trips	Daily Trip Rate
Zero-vehicle households	10,567,000	18,917,000	1.79
Households with at least one vehicle	107,642,000	352,236,000	3.27

US Department of Transportation, Federal Highway Administration, 2017 National Household Travel Survey. URL: http://nhts.ornl.gov.

As shown in the table above, the daily trip rates for zero-vehicle households is 1.79 compared to 3.27 for households with at least one vehicle. The mobility gap is calculated by subtracting the daily trip rate for zero-vehicle households (1.79) from the daily trip rate for households with at least one vehicle (3.27), resulting in 1.48 daily trips per household. To calculate the transit need for Morristown, the number of zero-vehicle households is multiplied by the mobility gap number. Therefore, the estimated transit need in Morristown is 1,339 daily trips and 2,136 daily trips in Hamblen County (Table 2-5).

Table 2-5: Mobility Gaps Analysis Results

Area	Households	Households: ≥ 1 vehicle	Households: Zero-Vehicle	Mobility Gap	Estimated Transit Need
Morristown	11,388	10,483	905	1.48	1,339
Hamblen County	24,442	22,999	1,443	1.48	2,136

US Department of Transportation, Federal Highway Administration, 2017 National Household Travel Survey. URL: http://nhts.ornl.gov. American Community Survey 2012-2016 5-year estimates.

3. Public Involvement

Providing multiple opportunities for public input is essential to the success of a new transit system. Without this, it would be impossible to develop a fixed route system that could accommodate the population in a reliable and efficient manner. These forums also give prospective riders a chance to discuss a variety of topics that give Morristown, ETHRA, and the consultants a better idea of the community's wants and needs, while helping to create a sense of ownership and pride in this new system.

To facilitate this discussion, two public meetings were offered. The first meeting was held on July 26, 2018 at the Morristown-Hamblen Public Library from 10:30 am to 12:30 pm. The second meeting was also held on July 26 from 4:00 pm to 6:00 pm at the Morristown City Center. A total of 23 people attended these meetings which included a mixture of residents and business owners – each excited to learn more about the study and willing to give constructive feedback on input on the proposed transit system.

In addition to the public meetings, online and paper surveys were distributed to meeting attendees; and also posted on the City of Morristown and ETHRA websites. As shown in Figure 3-1, these surveys attempted to solicit opinions regarding destinations, times of operation, fares, and stops.

Over 180 survey responses were received within the three weeks the survey was open and the responses are summarized in Figure 3-2.

Figure 3-1: Morristown Transit Study Public Survey

MORRISTOWN
TRANSIT STUDY PUBLIC SURVEY

1 **What is your street address?**

_____

2 **How did you get to this meeting today?**

- ❑ Walked
- ❑ Biked
- ❑ Drove Alone
- ❑ Carpool
- ❑ ETHRA bus
- ❑ Other _____

3 **Do you already have a reliable form of transportation?**

- ❑ Yes
- ❑ No

If Yes, please describe.

_____

4 **List your Top 5 destinations in Morristown**

(include address)

1. _____
2. _____
3. _____
4. _____
5. _____

5 **If transit were available in this area, what service hours would fit your needs?**

Start Time: _____ AM / PM

End Time: _____ AM / PM

6 **How often would you take a bus to the destinations you listed in Question 4?**

- ❑ I wouldn't take the bus
- ❑ 1-2 times per week
- ❑ 3-4 times per week
- ❑ Over 4 times per week

7 **How far would you be willing to travel to the nearest bus stop?**

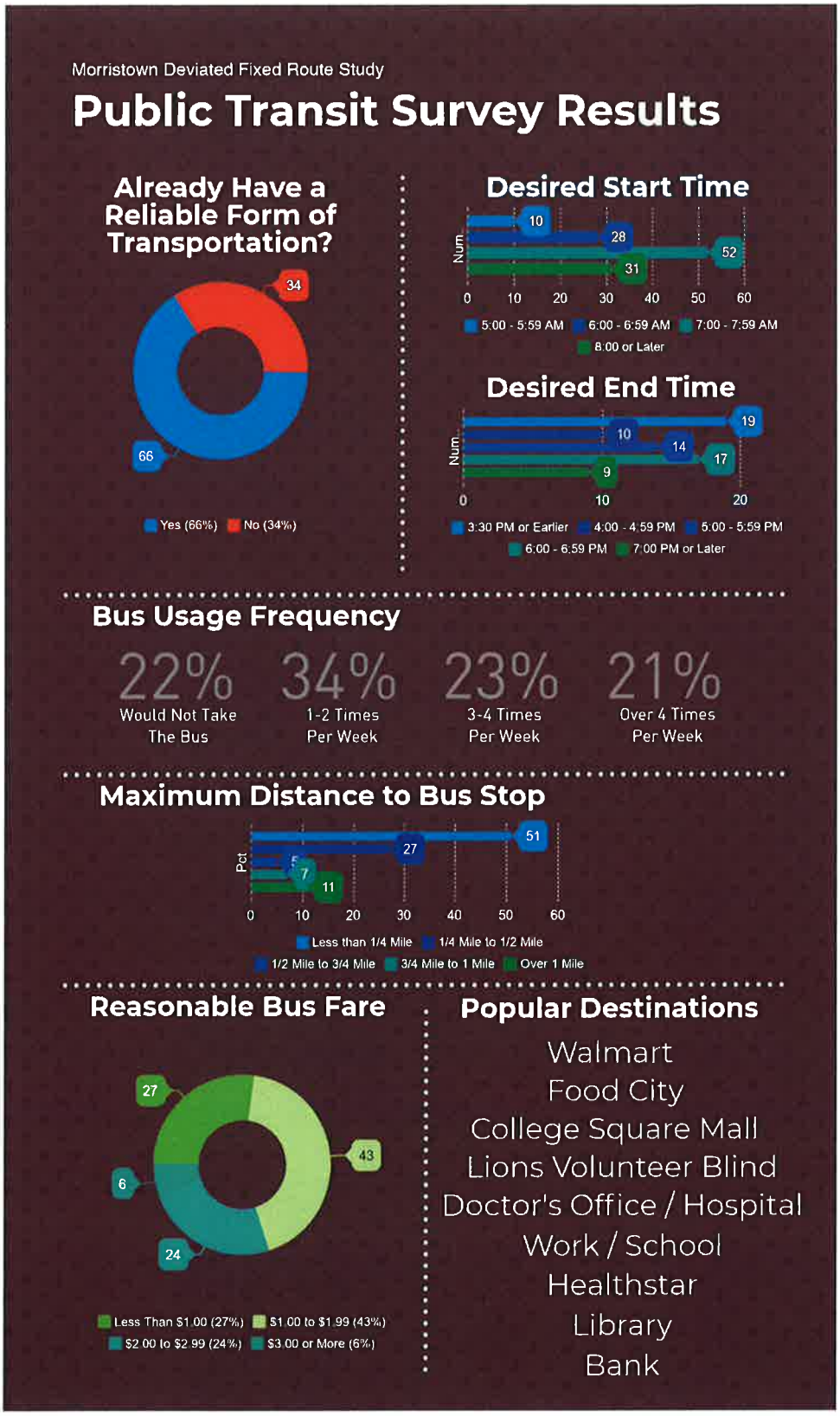
- ❑ Less than 1/4 mile
- ❑ 1/4 to 1/2 mile
- ❑ 1/2 to 3/4 mile
- ❑ 3/4 to 1 mile
- ❑ Over 1 mile

8 **What would be a reasonable bus fare for a round trip?**

- ❑ $1.00 or Less
- ❑ $1.00 to $2.00
- ❑ $2.00 to $3.00
- ❑ Over $3.00

Provide comments on reverse side

Figure 3-2: Public Survey Transit Results



4. Service Recommendations

This chapter presents the service recommendations based on the review of local and regional plans, locations of activity centers, demographic analysis, and public involvement.

4.1 Recommended Fixed-Routes

Three fixed-routes are recommended in order to improve mobility options for Morristown residents, with each one serving distinct activity centers and regions of the city. The routes are envisioned to function as a comprehensive transit system, allowing for multiple connections to residential, employment, and shopping opportunities.

All three routes would begin and end at the ETHRA transit center located at 2808 West Andrew Johnson Highway in Morristown. The routes would connect at the Morristown-Hamblen Library, thereby allowing riders to access origins and destinations located in the central and eastern portions of the city without having to transfer at the transit center. Schedules have been designed so that all three routes would arrive within five minutes of each other at the library. The cycle time for the routes from beginning to end is 60 minutes. The routes would operate Monday through Friday. The recommended fare structure is $1.50 per one-way trip, 75 cents (half fare) for eligible persons with disabilities and free transfers. A 10-ride card would be purchased for $13.50 and 20-ride card for $27.00, providing a discount for those purchasing their trips in advance. Riders age 12 or under would ride fare free. Turn-by-turn directions for each route are included in Appendix A.

Route 1

Route 1 would be an east-west route serving several major activity centers in Morristown: Morristown-Hamblen Library, College Square Mall, Walter State Community College, Food City (Berkline Drive), and the Walmart Supercenter (Davy Crockett Parkway). Route 1 would depart every half hour from the transit center, beginning at 7:00 am Monday through Friday. The last Route 1 trip would depart at 6:00 pm. Maps of the proposed Route 1 are shown in Figure 4-1 and Figure 4-2. Schedules for the outbound and inbound portions of the route are shown in Table 4-1 and Table 4-2.

Route 2

Route 2 would serve northern portions of Morristown including: Fairway Apartments, Walter Ridge Apartments, Tennova Healthcare, KC Home, and the Greyhound Station. Route 2 would connect with Route 1 and Route 3 at Morristown-Hamblen Library. Given the design of Route 2 as shown in Figure 4-3 and Figure 4-4, the route would stop twice at the library in order to facilitate more efficient connections for riders. The first library stop would occur after the Fairway Apartments, Walter Ridge Apartments, and the Tennova Healthcare timepoints. This would allow riders whose destination is College Square Mall or Walmart to connect to Route 1 without having to wait until Route 2 has gone to KC Home and the Greyhound Station. The second library stop would occur after the KC Home and Greyhound Station timepoints so that riders from these areas can efficiently connect to Route 1 as well.

Route 2 would depart every half hour from the transit center, beginning at 6:30 am Monday through Friday with the last Route 2 trip departing at 5:30 pm. Outbound and inbound schedules are included in Table 4-3 and Table 4-4.

Route 3

Route 3 would serve southern portions of Morristown, most notably the Morristown Housing Authority, Lincoln Manor Apartments, Mayfair Apartments, Laurelwood Apartments, Volunteer Blind Industries, and Food City (Sandstone Drive). Route 3 would connect with Route 1 and Route 2 at Morristown-Hamblen Library. Route 3 would depart every half hour from the transit center, beginning at 6:30 am Monday through Friday. The last Route 3 trip would depart at 5:30 pm. Maps of the proposed Route 3 are included in Figure 4-5 and Figure 4-6 accompanied by outbound and inbound schedules in Table 4-5 and Table 4-6.

4.2 Paratransit Recommendations

Public entities that operate fixed-route transit services must provide complementary paratransit as required by Americans with Disabilities Act (ADA) regulations in 49 CFR Part 37: "Except as provided in paragraph (c) of this section, each public entity operating a fixed route system shall provide paratransit or other special service to individuals with disabilities that is comparable to the level of service provided to individuals without disabilities who use the fixed route system" (§ 37.121(a)). Additional guidance may be found in FTA Circular 4710.1. General requirements for complementary paratransit service are summarized from the circular below:

- The complementary paratransit service shall be available throughout the same hours and days as the entity's fixed route service.
- The entity shall provide complementary paratransit service to origins and destinations within corridors with a width of three-fourths of a mile on each side of each fixed route.
- The entity shall schedule and provide paratransit service to any ADA paratransit eligible person at any requested time on a particular day in response to a request for service made the previous day. Reservations may be taken by reservation agents or by mechanical means.
- The fare for a trip charged to an ADA paratransit eligible user of the complementary paratransit service shall not exceed twice the fare that would be charged to an individual paying full fare (i.e., without regard to discounts) for a trip of similar length, at a similar time of day, on the entity's fixed route system.
- The entity shall not impose restrictions or priorities based on trip purpose.
- The entity shall not limit the availability of complementary paratransit service to ADA paratransit eligible individuals by any of the following:
    (1) Restrictions on the number of trips an individual will be provided;
    (2) Waiting lists for access to the service; or
    (3) Any operational pattern or practice that significantly limits the availability of service to ADA paratransit eligible persons.

The requirement for providing complementary paratransit service could be met by ETHRA's existing demand response service, which is provided in 16 East Tennessee counties, including Hamblen County where Morristown is located. ETHRA's existing service is operated Monday through Friday from 8:00 am to 4:30 pm. Given the requirement to provide complementary paratransit service during the same hours and days of the fixed-route service, ETHRA would need to need to extend service hours within the 0.75 mile area of the fixed routes Monday through Friday, 6:30 am to 7:00 pm. Figure 4-7 on page 4-15 shows a map of the complementary paratransit service area for the fixed-routes.

Figure 4-1: Proposed Route 1 – Outbound

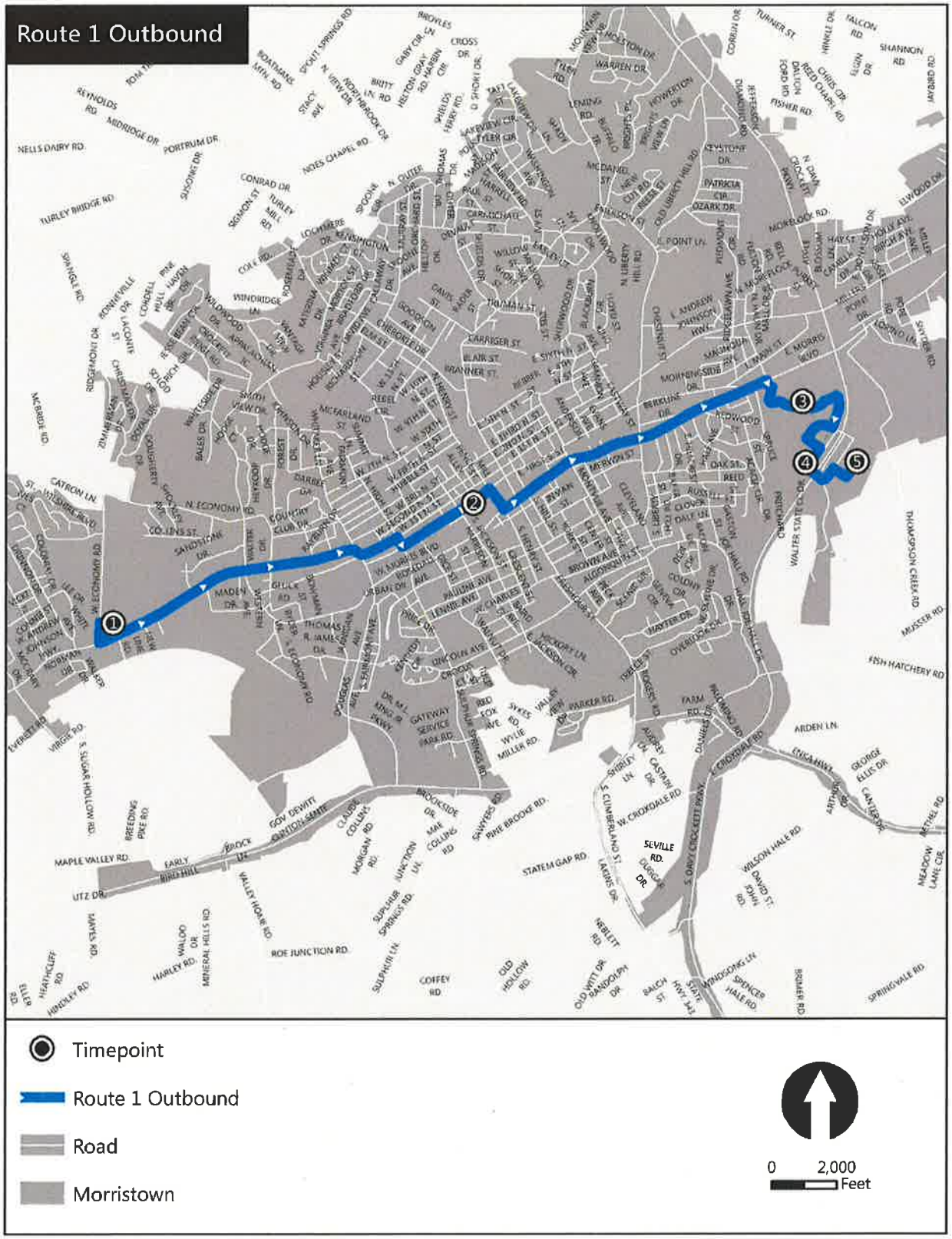


Table 4-1: Schedule for Proposed Route 1 – Outbound

① Transit Center	② Morristown-Hamblen Library	③ College Square Mall	④ Walters State Community College	⑤ Walmart Supercenter
7:00 AM	7:07 AM	7:20 AM	7:26 AM	7:28 AM
7:30 AM	7:37 AM	7:50 AM	7:56 AM	7:58 AM
8:00 AM	8:07 AM	8:20 AM	8:26 AM	8:28 AM
8:30 AM	8:37 AM	8:50 AM	8:56 AM	8:58 AM
9:00 AM	9:07 AM	9:20 AM	9:26 AM	9:28 AM
9:30 AM	9:37 AM	9:50 AM	9:56 AM	9:58 AM
10:00 AM	10:07 AM	10:20 AM	10:26 AM	10:28 AM
10:30 AM	10:37 AM	10:50 AM	10:56 AM	10:58 AM
11:00 AM	11:07 AM	11:20 AM	11:26 AM	11:28 AM
11:30 AM	11:37 AM	11:50 AM	11:56 AM	11:58 AM
12:00 PM	12:07 PM	12:20 PM	12:26 PM	12:28 PM
12:30 PM	12:37 PM	12:50 PM	12:56 PM	12:58 PM
1:00 PM	1:07 PM	1:20 PM	1:26 PM	1:28 PM
1:30 PM	1:37 PM	1:50 PM	1:56 PM	1:58 PM
2:00 PM	2:07 PM	2:20 PM	2:26 PM	2:28 PM
2:30 PM	2:37 PM	2:50 PM	2:56 PM	2:58 PM
3:00 PM	3:07 PM	3:20 PM	3:26 PM	3:28 PM
3:30 PM	3:37 PM	3:50 PM	3:56 PM	3:58 PM
4:00 PM	4:07 PM	4:20 PM	4:26 PM	4:28 PM
4:30 PM	4:37 PM	4:50 PM	4:56 PM	4:58 PM
5:00 PM	5:07 PM	5:20 PM	5:26 PM	5:28 PM
5:30 PM	5:37 PM	5:50 PM	5:56 PM	5:58 PM
6:00 PM	6:07 PM	6:20 PM	6:26 PM	6:28 PM

Figure 4-2: Proposed Route 1 – Inbound

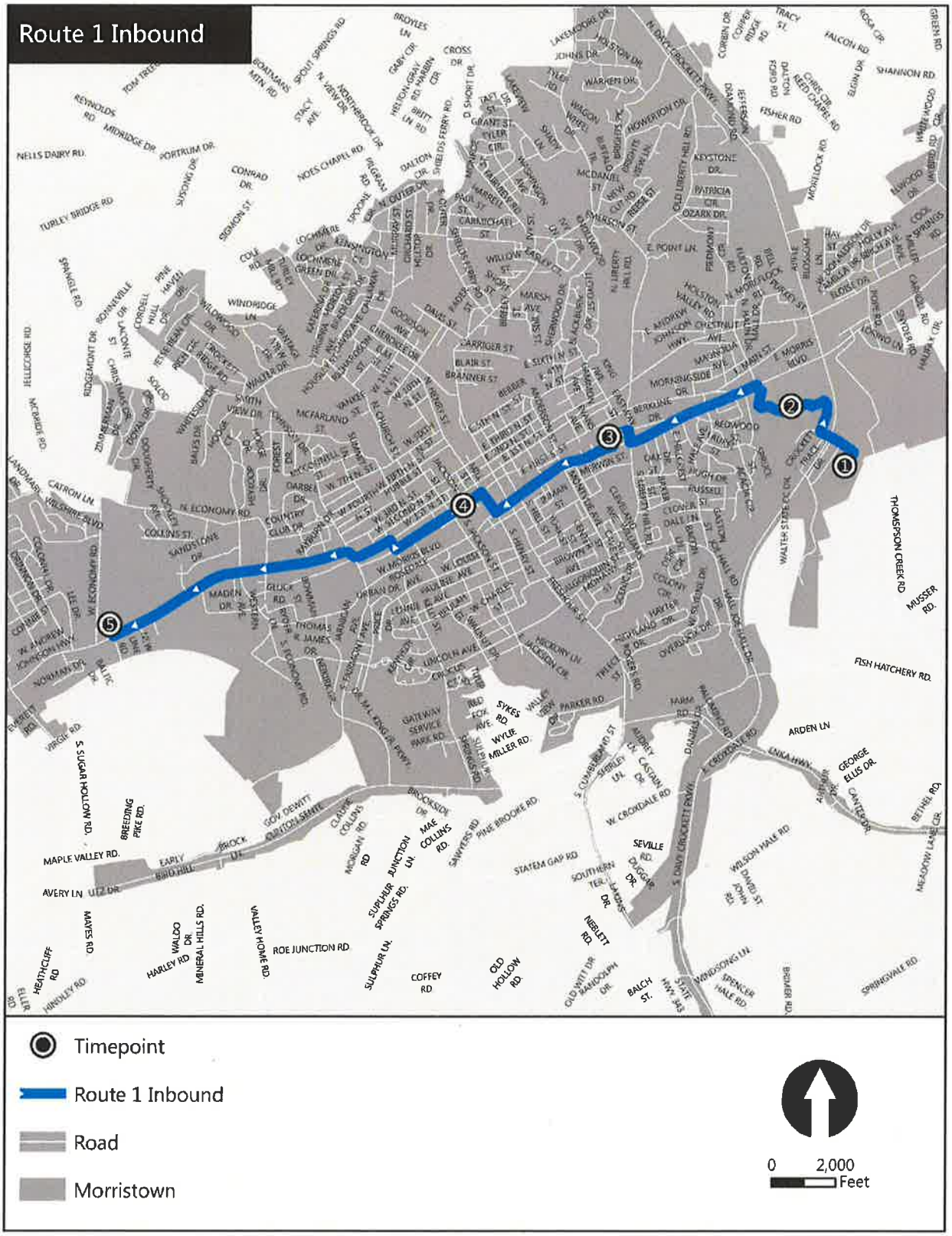


Table 4-2: Schedule for Proposed Route 1 – Inbound

① Walmart Supercenter	② College Square Mall	③ Food City	④ Morristown-Hamblen Library	⑤ Transit Center
7:30 AM	7:35 AM	7:39 AM	7:48 AM	7:55 AM
8:00 AM	8:05 AM	8:09 AM	8:18 AM	8:25 AM
8:30 AM	8:35 AM	8:39 AM	8:48 AM	8:55 AM
9:00 AM	9:05 AM	9:09 AM	9:18 AM	9:25 AM
9:30 AM	9:35 AM	9:39 AM	9:48 AM	9:55 AM
10:00 AM	10:05 AM	10:09 AM	10:18 AM	10:25 AM
10:30 AM	10:35 AM	10:39 AM	10:48 AM	10:55 AM
11:00 AM	11:05 AM	11:09 AM	11:18 AM	11:25 AM
11:30 AM	11:35 AM	11:39 AM	11:48 AM	11:55 AM
12:00 PM	12:05 PM	12:09 PM	12:18 PM	12:25 PM
12:30 PM	12:35 PM	12:39 PM	12:48 PM	12:55 PM
1:00 PM	1:05 PM	1:09 PM	1:18 PM	1:25 PM
1:30 PM	1:35 PM	1:39 PM	1:48 PM	1:55 PM
2:00 PM	2:05 PM	2:09 PM	2:18 PM	2:25 PM
2:30 PM	2:35 PM	2:39 PM	2:48 PM	2:55 PM
3:00 PM	3:05 PM	3:09 PM	3:18 PM	3:25 PM
3:30 PM	3:35 PM	3:39 PM	3:48 PM	3:55 PM
4:00 PM	4:05 PM	4:09 PM	4:18 PM	4:25 PM
4:30 PM	4:35 PM	4:39 PM	4:48 PM	4:55 PM
5:00 PM	5:05 PM	5:09 PM	5:18 PM	5:25 PM
5:30 PM	5:35 PM	5:39 PM	5:48 PM	5:55 PM
6:00 PM	6:05 PM	6:09 PM	6:18 PM	6:25 PM
6:30 PM	6:35 PM	6:39 PM	6:48 PM	6:55 PM

Figure 4-3: Proposed Route 2 – Outbound

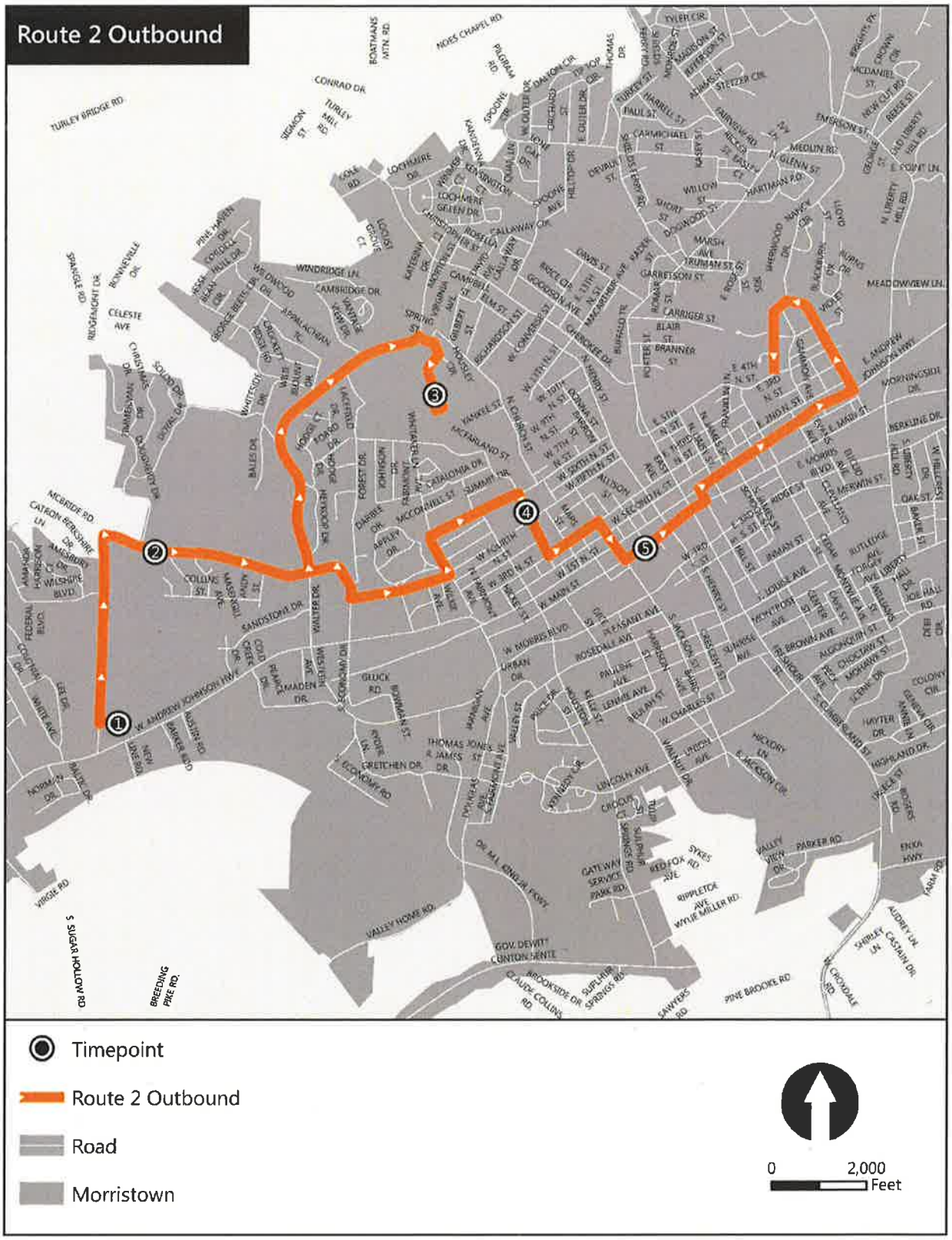


Table 4-3: Schedule for Proposed Route 2 – Outbound

① Transit Center	② Fairway Apartments	③ Walter Ridge Apartments	④ Tennova Healthcare	⑤ Morristown-Hamblen Library
6:30 AM	6:35 AM	6:38 AM	6:48 AM	6:54 AM
7:00 AM	7:05 AM	7:08 AM	7:18 AM	7:24 AM
7:30 AM	7:35 AM	7:38 AM	7:48 AM	7:54 AM
8:00 AM	8:05 AM	8:08 AM	8:18 AM	8:24 AM
8:30 AM	8:35 AM	8:38 AM	8:48 AM	8:54 AM
9:00 AM	9:05 AM	9:08 AM	9:18 AM	9:24 AM
9:30 AM	9:35 AM	9:38 AM	9:48 AM	9:54 AM
10:00 AM	10:05 AM	10:08 AM	10:18 AM	10:24 AM
10:30 AM	10:35 AM	10:38 AM	10:48 AM	10:54 AM
11:00 AM	11:05 AM	11:08 AM	11:18 AM	11:24 AM
11:30 AM	11:35 AM	11:38 AM	11:48 AM	11:54 AM
12:00 PM	12:05 PM	12:08 PM	12:18 PM	12:24 PM
12:30 PM	12:35 PM	12:38 PM	12:48 PM	12:54 PM
1:00 PM	1:05 PM	1:08 PM	1:18 PM	1:24 PM
1:30 PM	1:35 PM	1:38 PM	1:48 PM	1:54 PM
2:00 PM	2:05 PM	2:08 PM	2:18 PM	2:24 PM
2:30 PM	2:35 PM	2:38 PM	2:48 PM	2:54 PM
3:00 PM	3:05 PM	3:08 PM	3:18 PM	3:24 PM
3:30 PM	3:35 PM	3:38 PM	3:48 PM	3:54 PM
4:00 PM	4:05 PM	4:08 PM	4:18 PM	4:24 PM
4:30 PM	4:35 PM	4:38 PM	4:48 PM	4:54 PM
5:00 PM	5:05 PM	5:08 PM	5:18 PM	5:24 PM
5:30 PM	5:35 PM	5:38 PM	5:48 PM	5:54 PM

Figure 4-4: Proposed Route 2 – Inbound

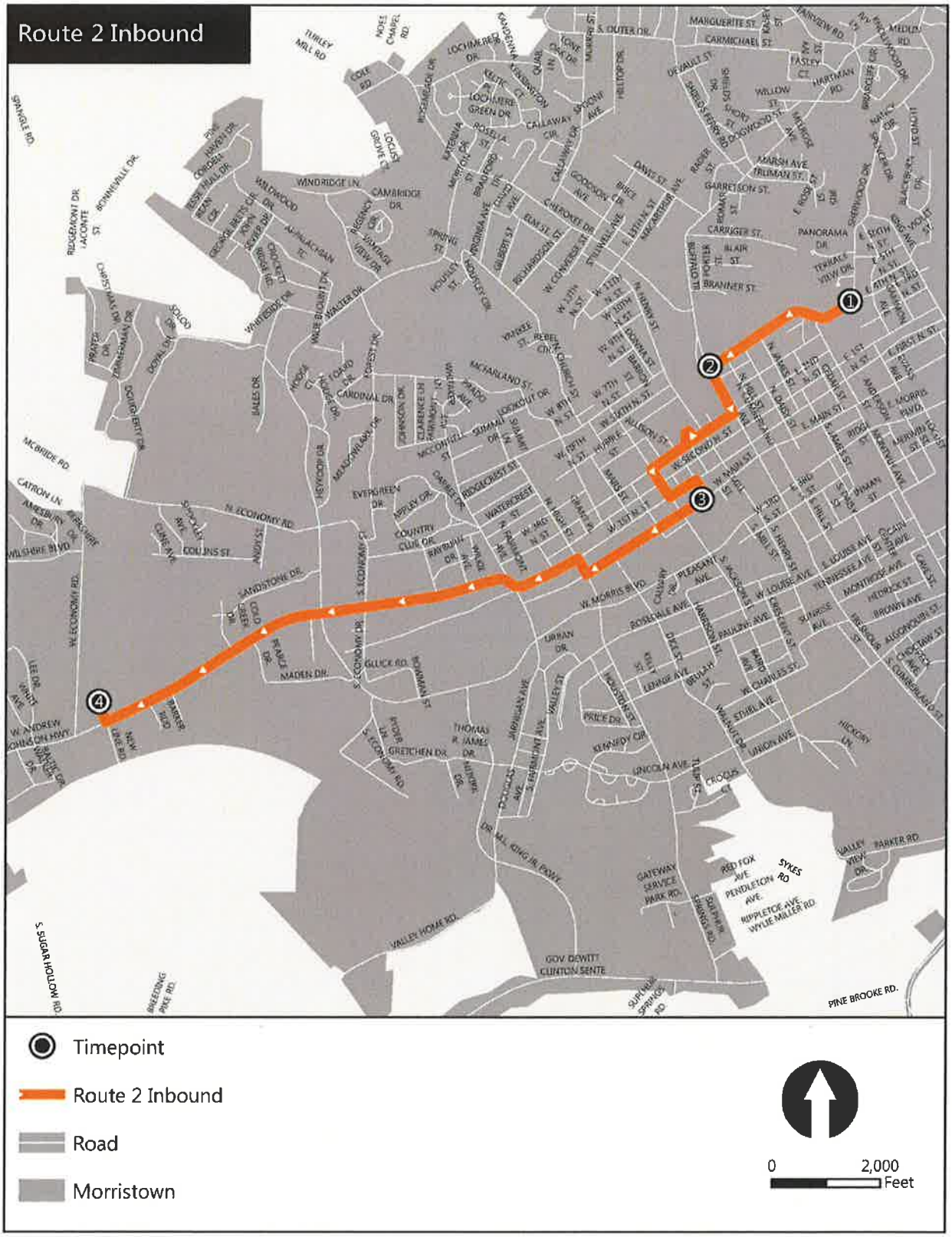


Table 4-4: Schedule for Proposed Route 2 – Inbound

① KC Home	② Greyhound Station	③ Morristown-Hamblen Library	④ Transit Center
7:02 AM	7:05 AM	7:11 AM	7:26 AM
7:32 AM	7:35 AM	7:41 AM	7:56 AM
8:02 AM	8:05 AM	8:11 AM	8:26 AM
8:32 AM	8:35 AM	8:41 AM	8:56 AM
9:02 AM	9:05 AM	9:11 AM	9:26 AM
9:32 AM	9:35 AM	9:41 AM	9:56 AM
10:02 AM	10:05 AM	10:11 AM	10:26 AM
10:32 AM	10:35 AM	10:41 AM	10:56 AM
11:02 AM	11:05 AM	11:11 AM	11:26 AM
11:32 AM	11:35 AM	11:41 AM	11:56 AM
12:02 PM	12:05 PM	12:11 PM	12:26 PM
12:32 PM	12:35 PM	12:41 PM	12:56 PM
1:02 PM	1:05 PM	1:11 PM	1:26 PM
1:32 PM	1:35 PM	1:41 PM	1:56 PM
2:02 PM	2:05 PM	2:11 PM	2:26 PM
2:32 PM	2:35 PM	2:41 PM	2:56 PM
3:02 PM	3:05 PM	3:11 PM	3:26 PM
3:32 PM	3:35 PM	3:41 PM	3:56 PM
4:02 PM	4:05 PM	4:11 PM	4:26 PM
4:32 PM	4:35 PM	4:41 PM	4:56 PM
5:02 PM	5:05 PM	5:11 PM	5:26 PM
5:32 PM	5:35 PM	5:41 PM	5:56 PM
6:02 PM	6:05 PM	6:11 PM	6:26 PM

Figure 4-5: Proposed Route 3 – Outbound

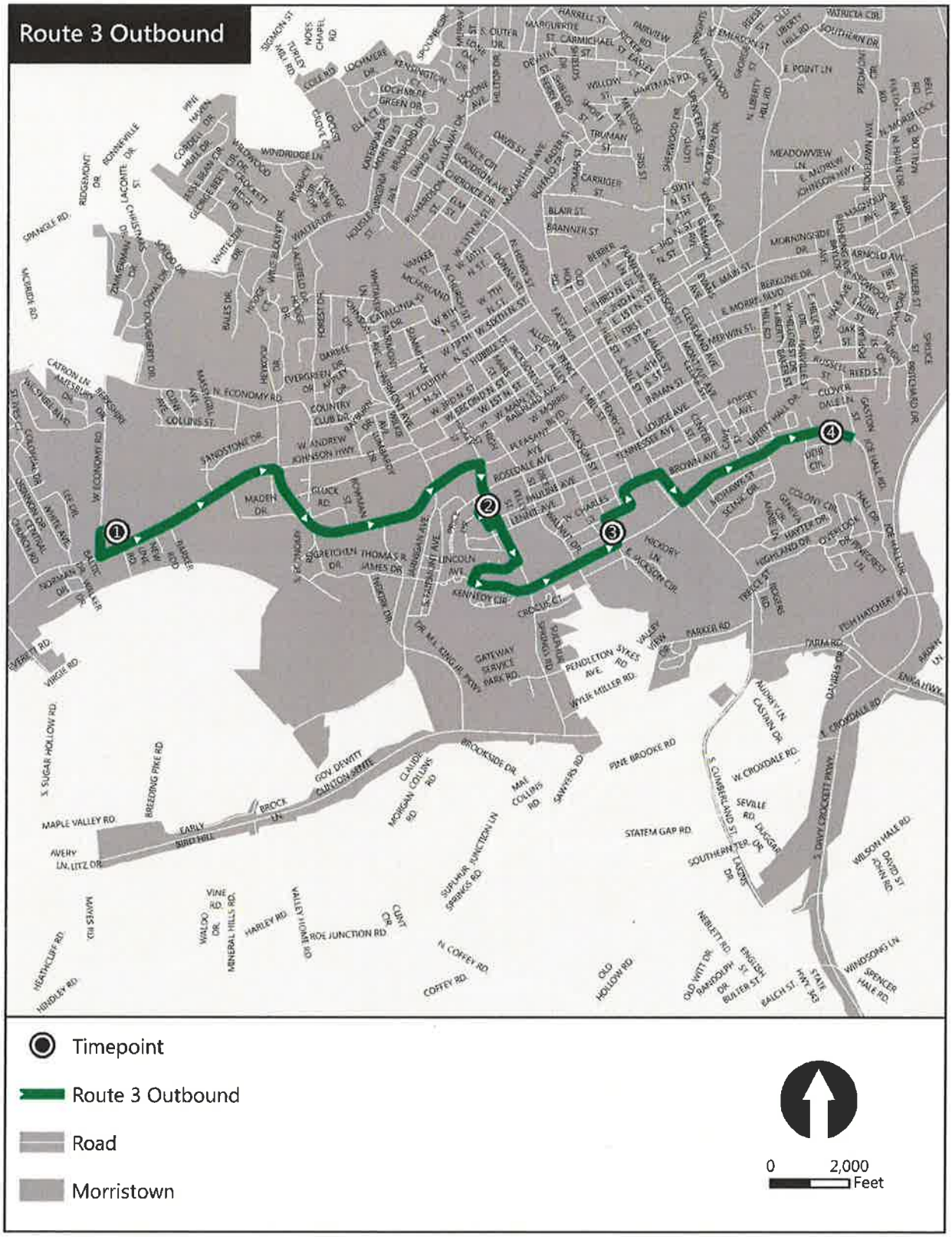


Table 4-5: Schedule for Proposed Route 3 – Outbound

❶ Transit Center	❷ Morristown Housing Authority	❸ Lincoln Manor Apartments	❹ Mayfair Apartments
6:30 AM	6:41 AM	6:49 AM	6:54 AM
7:00 AM	7:11 AM	7:19 AM	7:24 AM
7:30 AM	7:41 AM	7:49 AM	7:54 AM
8:00 AM	8:11 AM	8:19 AM	8:24 AM
8:30 AM	8:41 AM	8:49 AM	8:54 AM
9:00 AM	9:11 AM	9:19 AM	9:24 AM
9:30 AM	9:41 AM	9:49 AM	9:54 AM
10:00 AM	10:11 AM	10:19 AM	10:24 AM
10:30 AM	10:41 AM	10:49 AM	10:54 AM
11:00 AM	11:11 AM	11:19 AM	11:24 AM
11:30 AM	11:41 AM	11:49 AM	11:54 AM
12:00 PM	12:11 PM	12:19 PM	12:24 PM
12:30 PM	12:41 PM	12:49 PM	12:54 PM
1:00 PM	1:11 PM	1:19 PM	1:24 PM
1:30 PM	1:41 PM	1:49 PM	1:54 PM
2:00 PM	2:11 PM	2:19 PM	2:24 PM
2:30 PM	2:41 PM	2:49 PM	2:54 PM
3:00 PM	3:11 PM	3:19 PM	3:24 PM
3:30 PM	3:41 PM	3:49 PM	3:54 PM
4:00 PM	4:11 PM	4:19 PM	4:24 PM
4:30 PM	4:41 PM	4:49 PM	4:54 PM
5:00 PM	5:11 PM	5:19 PM	5:24 PM
5:30 PM	5:41 PM	5:49 PM	5:54 PM

Figure 4-6: Proposed Route 3 – Inbound

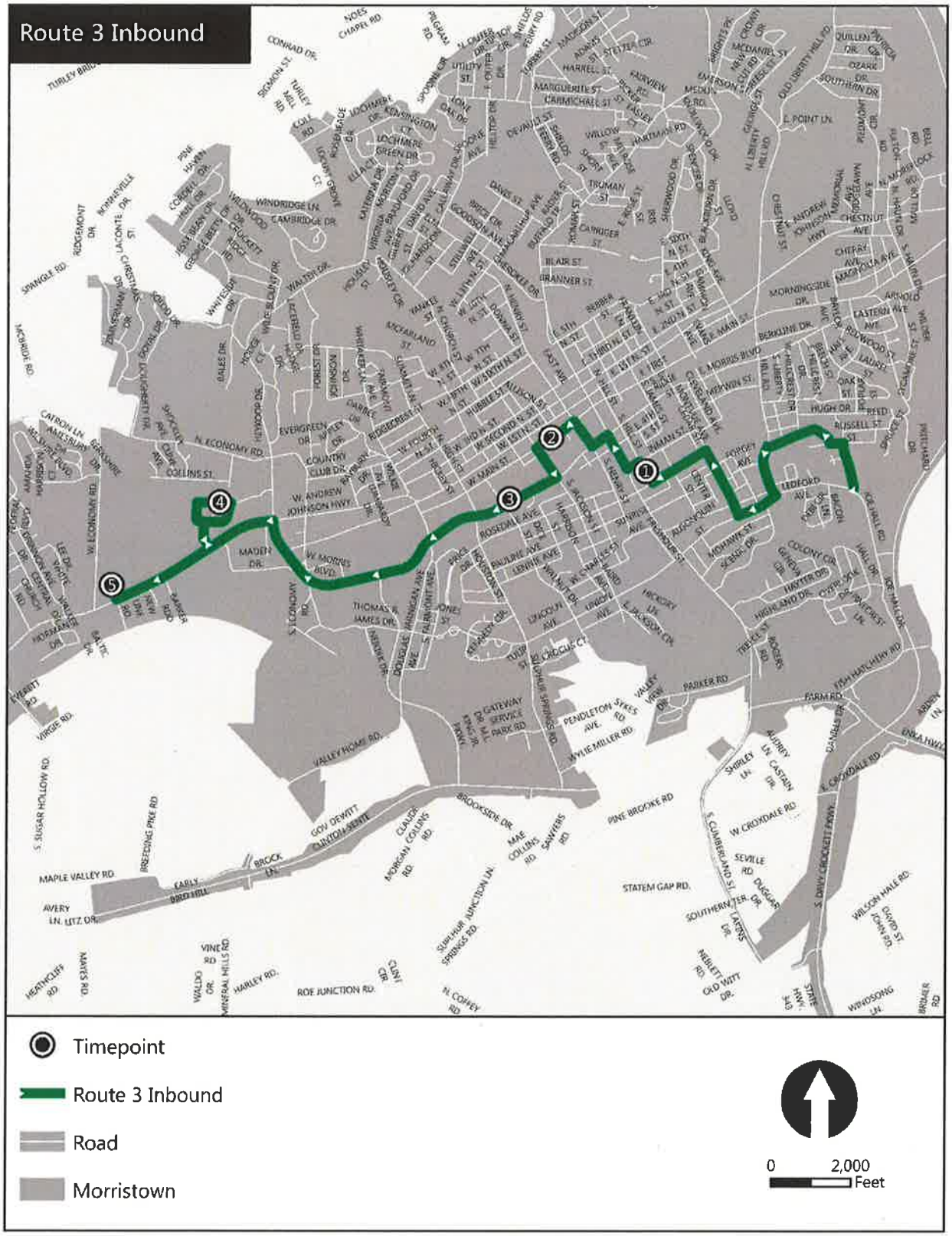
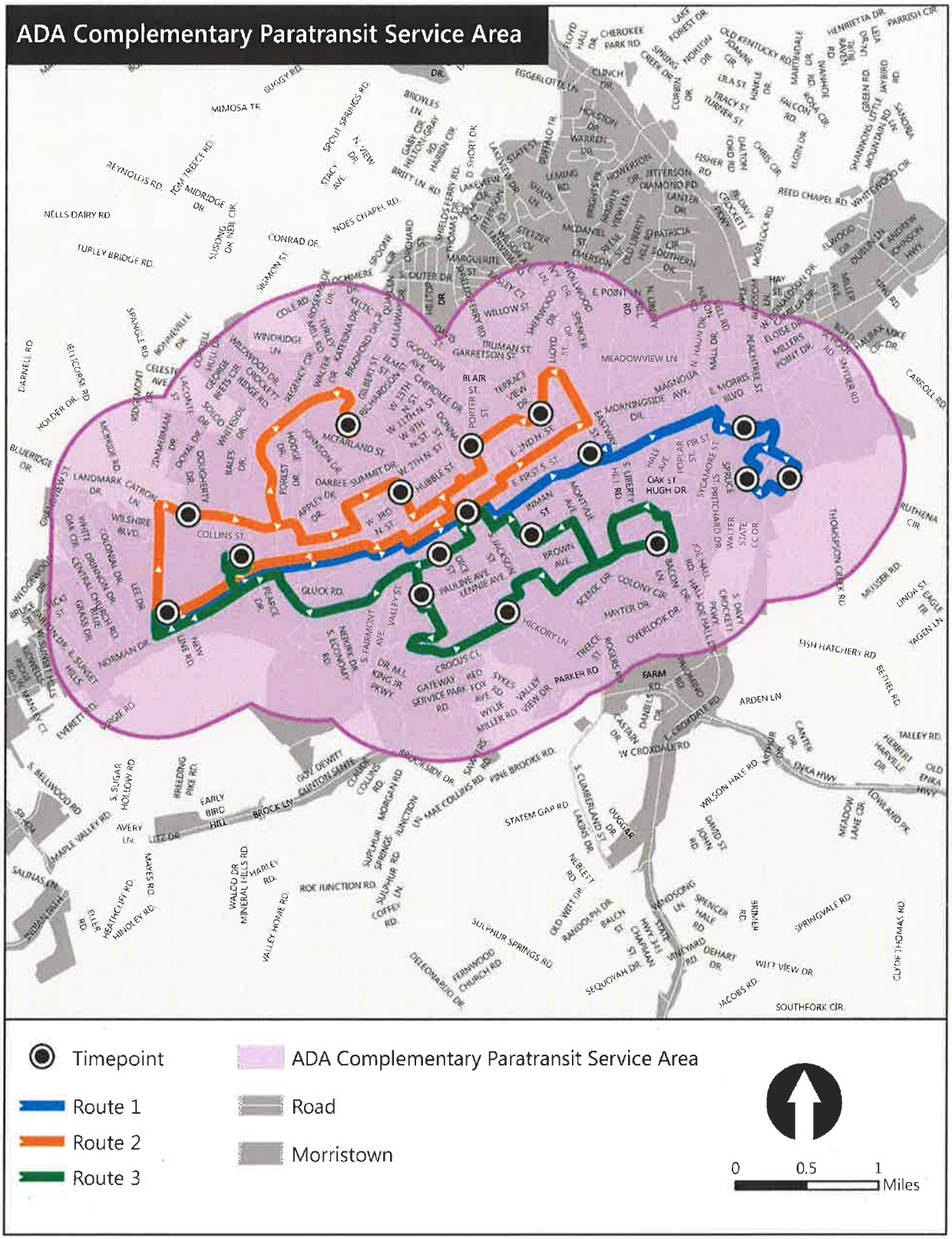


Table 4-6: Schedule for Proposed Route 3 – Inbound

❶ Laurelwood Apartments	❷ Morristown-Hamblen Library	❸ Volunteer Blind Industries	❹ Food City	❺ Transit Center
7:04 AM	7:09 AM	7:13 AM	7:20 AM	7:26 AM
7:34 AM	7:39 AM	7:43 AM	7:50 AM	7:56 AM
8:04 AM	8:09 AM	8:13 AM	8:20 AM	8:26 AM
8:34 AM	8:39 AM	8:43 AM	8:50 AM	8:56 AM
9:04 AM	9:09 AM	9:13 AM	9:20 AM	9:26 AM
9:34 AM	9:39 AM	9:43 AM	9:50 AM	9:56 AM
10:04 AM	10:09 AM	10:13 AM	10:20 AM	10:26 AM
10:34 AM	10:39 AM	10:43 AM	10:50 AM	10:56 AM
11:04 AM	11:09 AM	11:13 AM	11:20 AM	11:26 AM
11:34 AM	11:39 AM	11:43 AM	11:50 AM	11:56 AM
12:04 PM	12:09 PM	12:13 PM	12:20 PM	12:26 PM
12:34 PM	12:39 PM	12:43 PM	12:50 PM	12:56 PM
1:04 PM	1:09 PM	1:13 PM	1:20 PM	1:26 PM
1:34 PM	1:39 PM	1:43 PM	1:50 PM	1:56 PM
2:04 PM	2:09 PM	2:13 PM	2:20 PM	2:26 PM
2:34 PM	2:39 PM	2:43 PM	2:50 PM	2:56 PM
3:04 PM	3:09 PM	3:13 PM	3:20 PM	3:26 PM
3:34 PM	3:39 PM	3:43 PM	3:50 PM	3:56 PM
4:04 PM	4:09 PM	4:13 PM	4:20 PM	4:26 PM
4:34 PM	4:39 PM	4:43 PM	4:50 PM	4:56 PM
5:04 PM	5:09 PM	5:13 PM	5:20 PM	5:26 PM
5:34 PM	5:39 PM	5:43 PM	5:50 PM	5:56 PM
6:04 PM	6:09 PM	6:13 PM	6:20 PM	6:26 PM

Figure 4-7: ADA Complementary Paratransit Service Area



4.3 Bus Stops and Amenities

This study involved an existing conditions inventory of bus stop timepoints in order to support the recommended fixed-route system. The inventory helped inform the specific location of timepoints with respect to safety and ADA considerations. Guidance for prioritizing and adding amenities to bus stops is provided in this section. An initial amenities recommendation is to provide benches and route information at all timepoints. ETHRA may consider adopting a transit amenities policy in order to establish objective criteria and a methodology for installing amenities.

4.3.1 Bus Stop Inventory

Existing conditions at bus stop timepoints were inventoried as part of the route planning process. Timepoints are bus stops with established departure times that are noted in the route schedules (see Section 4.1). The inventory included criteria related to stop location, presence of nearby activity generators, ADA considerations, lighting, shade, and pedestrian infrastructure. Profiles of each timepoint based on this inventory are included in Appendix B. The inventory will assist ETHRA in determining appropriate bus stop amenities to install in the future.


Lakeway Transit ETA Bus Stop Data Collection Form

Lakeway Transit

4.3.2 Transit Amenity Policy

Amenities at bus stops are important for providing a high quality transit service that is comfortable, safe, and visible in the community. ETHRA may consider adopting a transit amenities policy for the fixed-route service in Morristown. An amenity policy would assist ETHRA in establishing objective criteria and methodology for installing amenities at bus stops within the system. Such policies are particularly useful when limited resources must be prioritized. Furthermore, they put in place an objective process for evaluating the need and feasibility of amenity requests from the community.

ETHRA may prepare and adopt an amenities policy based on the criteria presented in this section. These criteria were compiled based on *TCRP Report 19: Guidelines for the Location and Design of Bus Stops*, and were then adapted for Morristown.

Bus Stop Classification

In order to prioritize stop amenities, ETHRA may classify stops into three categories based on the number of daily boardings as shown in Table 4-7. Certain amenities would be required at all stops regardless of the number of boardings: no parking restrictions, 5-by-8 foot ADA landing pads, and bus stop signs on a separate pole. Other amenities such as benches, shelters, and lighting would be recommended based on the average number of weekday boardings.

Table 4-7: Stop Categories and Recommended Amenities

Amenity	Class I <5 daily boardings	Class II 5-15 daily boardings	Class III 15+ daily boardings
No Parking Restriction	Required at all stops		
ADA 5' x 8' Landing Pad	Required at all stops		
Bus Stop Sign on Separate Pole	Required at all stops		
Bench	Optional	Recommended	Provide
Shelter	Optional	Optional	Recommended
Lighting	Optional	Optional	Recommended
Trash Receptacle	Optional	Recommended	Provide
Rider Information Panel	Optional	Recommended	Provide

Benches and Shelters

Benches are recommended for Class II and Class III bus stops, and are optional for Class I stops. Shelters are recommended for Class III stops, and are optional for Class I and Class II stops. Shelters should be installed at transfer locations, regardless of boardings and alightings. The amenities policy should be flexible enough to allow for benches and shelters when boardings and alighting thresholds are not met, but other factors warrant them. These factors may include:

- Number of transfers at a stop
- Right-of-way to construct shelters, waiting areas, or benches
- Number of elderly or physically challenged individuals in the area
- Proximity to major activity centers
- Frequency of service
- Adjacent land use compatibility
- Harsh environmental conditions (e.g. sunlight, wind) that would necessitate a shelter

Route Information

At transfer locations and major stops, route information should be posted that includes the route schedule and map. This information should be posted in enclosed plastic schedule holders to protect them from moisture. The following recommendations should be considered based on TCRP Report 19:

- Provide updated information when changes are made to routes and schedules.
- Consider the quality and appearance of information displays. A visually poor route map conveys a negative impression of the system.
- Make information displays permanent. Temporary methods for displaying information (such as tape-mounting) create a cluttered, unsophisticated appearance at the bus stop.
- Follow ADA clearance, mobility, and visual guidelines for access of information by individuals with impairments.

Receptacles

Trash or recycling receptacles may be provided at transit stops, especially those that have higher ridership or at transfer locations where riders may spend more time waiting for the bus. Receptacles give riders an appropriate place to discard trash instead of littering the area around the stop. However, receptacles are only functional if they are maintained on a regular basis. Before installation, ETHRA should determine who would be responsible for emptying the receptacles and if there is the financial and operational capacity to do so. The following recommendations should be considered based on TCRP Report 19:

- Anchor the receptacle securely to the ground to reduce unauthorized movement.
- Locate the receptacle away from wheelchair landing pad areas and allow for at least a 3-foot separation from other street furniture.
- Locate the receptacle at least two feet from the back of the curb.
- Ensure that the receptacle, when adjacent to the roadway, does not visually obstruct nearby driveways or land uses.
- Avoid installing receptacles that have ledges or other design features that permit liquids to pool or remain near the receptacle—this may attract insects.
- Avoid locating the receptacle in direct sunlight. The heat may encourage foul odors to develop.

Lighting and Security

Lighting is important component for promoting safety and discouraging unintended activity at transit stops. Lighting should be installed at transit stops especially if the transit service is operated early in the morning or into the evening when it is dark. Priority should be given to installing lighting at stops where ridership is higher or in locations with a past history of safety or vandalism issues. In order to conserve resources and budgets, stops should be placed near existing street lights when possible to avoid the need for additional lighting.

Security at transit stops starts with design and placement. The design and placement of shelters should maximize visibility of the stop to riders, drivers, and people passing by to deter criminal activity. Shelters should be constructed with transparent panels so that visibility is not compromised. Landscaping around shelters and benches should be maintained regularly and kept at a low height so as not to obscure visibility. The following recommendations should be considered based on TCRP Report 19:

- Bus stop shelters should be constructed of materials that allow clear, unobstructed visibility of and to patrons waiting inside.
- Bus stops should be at highly visible sites that permit approaching bus drivers and passing vehicular traffic to see the bus stop clearly.
- Landscaping elements that grow to heights that would reduce visibility into and out of the bus stop should be avoided. Low-growing shrubbery and ground cover and deciduous shade trees are preferred at bus stops. Evergreen trees provide a visual barrier and should be avoided.
- Bus stops, whenever possible, should be coordinated with existing street lighting to improve visibility.

- Bus stops should be next to existing land uses, such as stores and businesses, to enhance surveillance of the site.

Transit Stop Pavement Markings

It is important to consider pavement markings at transit stops. The curb should be painted (typically yellow) and marked as a no parking zone to avoid conflicts between parked vehicles and transit vehicles. Transit vehicles may temporarily stop in fire lanes based on coordination with LAMTPO. Bus stops with fire lanes include:

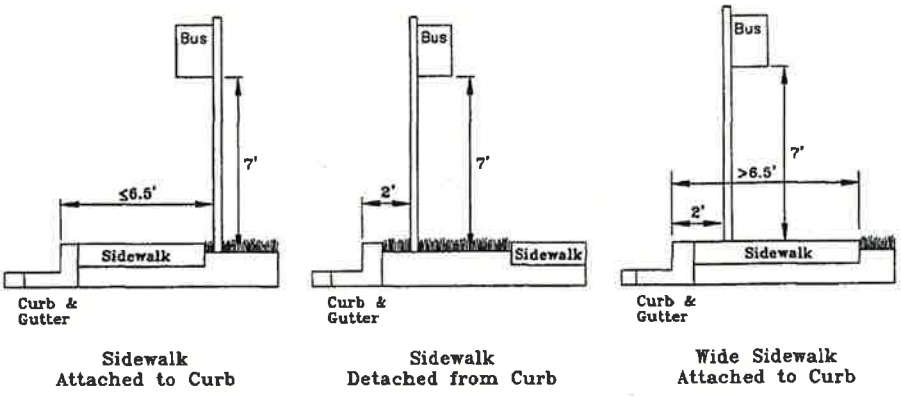
- Walmart Supercent (Davy Crockett Parkway)
- Walter State Community College
- Walmart Neighborhood Market (West Andrew Johnson Highway)
- Food City (Massengill Springs)
- ETHRA Office (in the Goodwill shopping complex)
- Morristown-Hamblen Library
- College Square Mall

Transit Bus Stop Signs

Transit bus stop signs should be placed at all designated fixed-route stops. The sign should include the stop ID, route number and direction (inbound or outbound), fixed-route logo, system name, and phone number. Each stop should have a unique ID in order for the rider to easily identify their location when communicating with ETHRA staff or in the case of an emergency, with police and fire departments. According to TCRP Report 19, the following criteria (Figure 4-8) should be followed when designing and locating signs:

- Sign should be placed at the location where riders board the bus
- Bottom of sign should be at least seven feet off the ground
- Sign should not be closer than two feet from the curb face

Figure 4-8: Sign Placement



TCRP Report 19.

4.4 Branding and Marketing

There is a great opportunity for the new fixed route bus service to develop a brand that will help advertise the public transit service that Lakeway Transit will provide. Logo examples were provided to the study steering committee for their feedback and input. A new logo design was approved that took into account the regional concept and the need to identify a new service that would present a fresh image that promotes this new public transit alternative.

The process of preparing a comprehensive branding program should include all marketing and outreach materials and be implemented as part of a strategic communications plan. Some of the features that the Morristown community should incorporate would be:

- **System branding** – logos, color schemes, vehicle designs that reflect an instant awareness of the Lakeway Transit system and service;
- **User information systems** – maps, schedules, signage;
- **Marketing campaign/Public relations** – print advertisements, notices to riders and potential riders; coordinating with local partners to sell ride passes and promote route and schedule information
- **An online presence** – website and social media outlets that are easy to access and navigate

The intent is to build visibility and a positive recognition of the transit system. A new logo can provide a certain identification and community pride, while reflecting the values of the transit system.

In the logo development process, our goal was to offer an aesthetic approach that utilized the blue and green colors with highlights of the lake and rolling hill local topography. The Lakeway name is enhanced by the sweeping water feature which denotes movement. Additionally, the hills in the background note the east Tennessee region and the charm of the Morristown community.

As noted in the proposed timeline for implementation, it would be advantageous to begin the advertisement of service process during the summer of 2019. The printing of all the maps, schedules and marketing promotional materials needs to be coordinated with the installation of the bus stop signage and potential transit amenities. A finalized design should be formatted for placement on buses, shirts, hats, bus stop signs, etc. as attention to the detail of the branded elements is important. The final logo design is noted in Figure 4-9 below:

Figure 4-9: Lakeway Transit Logo

4.5 Administration and Operations

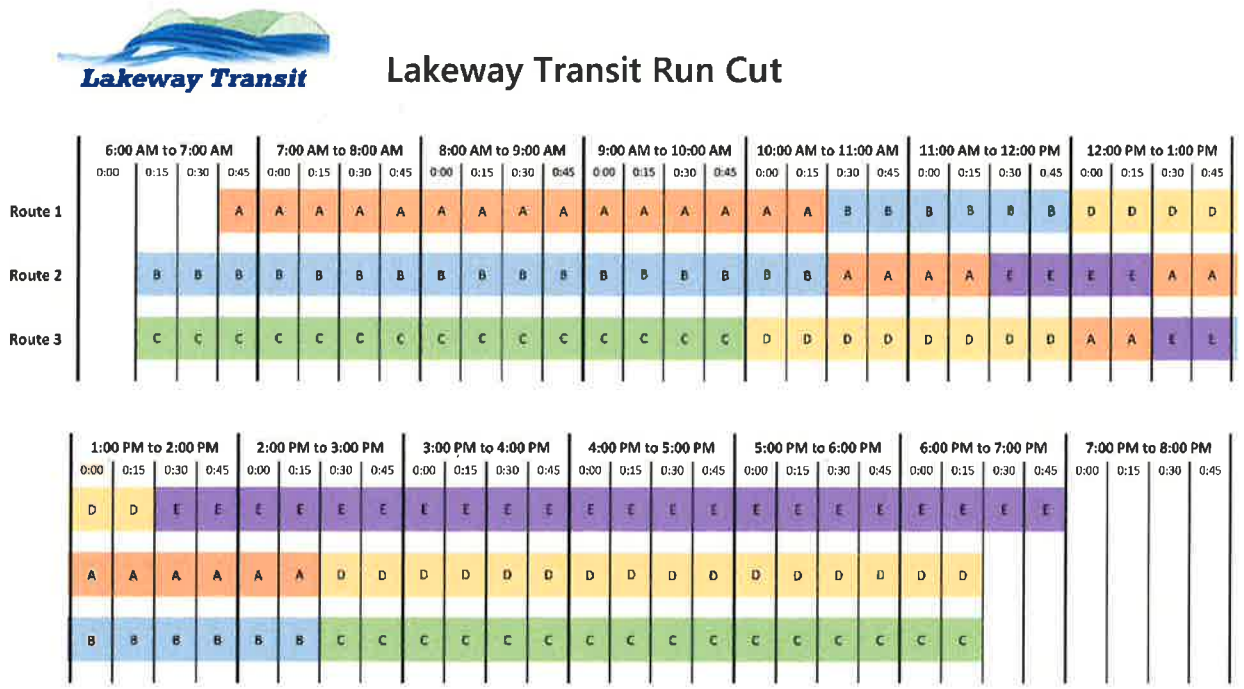
The staffing of the new service is very important. In the projected financial budget, the system is estimated to support 12 drivers to cover fixed route and complimentary ADA Demand Response services. Included in the organizational model, there is a Transit Supervisor and a Fixed Route Dispatcher included in the operational oversight. These positions would be housed at the ETHRA Transit Center in Morristown. The demand response dispatching would continue to be done at the ETHRA office in Knoxville, as this is already set up to be a regional one-call center.

The Transit Supervisor would serve as the supervising position of the fixed route drivers and the local ADA paratransit drivers. This position would include: providing necessary driver and dispatcher training, technical support, on-time route monitoring, general customer service response, coordination with local transit partners (for sales of ride passes and advertising assistance).

The AECOM team developed a sample "run-cut" for driver scheduling, regarding the staffing needed for the fixed route services. The run-cut is broken down into driver teams of two (2) for each team: A team, B team, C team, D team, and E team. The service time schedule was broken down into 30-minute increments. Each team of drivers was set up to provide service coverage between 7-8 hours per day. It was noted that lunches and breaks would need to be factored into the schedule. The offset of hours and the need to pre-trip vehicles prior to operation was included in the schedule.

There are many ways to provide run-cut schedules for fixed route systems. The example in Figure 4-10 notes ten (10) full-time drivers. However, blocks of the schedule can be set up for part-time drivers, as what would best suit the needs of ETHRA in providing this service.

Figure 4-10: Example Run Cut



5. Financial Plan

A financial plan for the Morristown fixed-route system was developed in partnership with ETHRA. The purpose of the financial plan is to estimate the approximate costs associated with operating fixed-route service and the required ADA complementary paratransit service for budget planning purposes. The costs and farebox revenues presented in this chapter are approximate and subject to change. This financial plan identifies potential sources of federal, state, and local funding as well as strategic partnerships.

5.1 Five-Year Budget Model

The five-year budget model was prepared for fiscal years (FY) 2020 through 2024 based on current ETHRA operations, administrative, and capital costs. An annual inflation rate of 3 percent was applied to account for increased administrative, fuel, and supply costs in the future. The model estimates 249 operating days per year, which represents Monday through Friday service except for ten holidays. Several cost drivers are accounted for in the model, which are listed below and equate to an overall operating cost of $52.50 per hour:

- **Fixed-Routes**
  - Drivers (full/part-time)
- **Support Staff**
  - Transit Supervisor
  - On-call drivers (full/part-time)
  - Dispatchers (full/part-time)
  - Demand response support position (full/part-time)
- **Non-Personnel**
  - Supplies
  - Rent
  - Fuel
  - Insurance
  - Communications
  - Training
  - Audit
  - Vehicle Maintenance
- **Capital**
  - Vehicle painting
  - Facility costs
  - Bus stop amenities

Farebox Recovery

Revenue from fixed-route fares was estimated for the budget model, but not subtracted from the total estimated cost of providing service due to the uncertainty in ridership at this stage of the planning process. Ridership often increases over time when a new transit service is introduced as it takes time to build a rider base. Therefore, the budget model estimates that the farebox recovery would be 3 percent initially in FY 2020 and then increase by 0.5 percent annually to 5 percent in FY 2024. The farebox recovery is the percentage of the operating cost covered by fare revenue.

Demand Response Costs

ETHRA would need to extend its demand response service hours within the ADA complementary paratransit service area to match the operating hours of the fixed-route system as required by ADA regulations and FTA requirements. As a result, an increase in demand response costs are expected at approximately $67,000 annually. However, this increase is not expected to be significant given that

the complementary paratransit service area is relatively small in comparison to the 16 county service area that ETHRA serves. This increase is factored into the budget model.

Capital Costs

This study has identified several capital needs in order to provide a safe and quality transit system. Several upgrades at the transit center are incorporated into the model, which include benches, lighting, and electrical outlets for the outdoor waiting area. Benches are recommended at timepoints to provide riders with a safe and comfortable place to sit while waiting for the bus. Shelters at the outbound and inbound library stops are recommended due to the anticipated transfer activity at this location. As ridership increases, additional benches and shelters are recommended at bus stops meeting the criteria as discussed in Section 4.3.

The costs associated with adding 14 benches at timepoints and two shelters at the library stops are included in the budget model for FY 2020 along with an allowance for 50 bus stop signs. In subsequent years, the model includes the costs for adding one shelter and four benches at stops in the system each year. A budget for $9,500 is included for the printing of schedules and fare media.

A transit supervisor position is recommended in order to provide on-street supervision of transit operations and to assist with transporting drivers to and from the transit center during breaks. The transit supervisor would need a support vehicle which is estimated at $45,000 in FY 2020. The Morristown fixed-route system is recommended to be branded as Lakeway Transit in order to distinguish it from ETHRA's other transit services as discussed in Section 4.4. The cost of painting buses with the new logo is $9,000 per vehicle, for a total of $57,000 programmed for FY 2020. The five-year budget model is presented in Table 5-1.

Table 5-1: Five-Year Budget Model

Item	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Annual Operating and Administrative Costs					
Fixed routes	$824,000	$848,000	$874,000	$900,000	$927,000
Increase in demand response costs	$67,000	$69,000	$71,000	$73,000	$75,000
Route supervisor salary and benefits	$51,000	$53,000	$54,000	$56,000	$58,000
Subtotal	*$942,000*	*$970,000*	*$999,000*	*$1,029,000*	*$1,060,000*
Annual Operating Revenue					
Estimated farebox recovery	3.00%	3.50%	4.00%	4.50%	5.00%
Subtotal	$28,300	$34,000	$40,000	$46,400	$53,000
Capital Expenses					
Vehicle – Transit Supervisor	$45,000				
Vehicle painting	$57,000				
Transit stop amenities	$46,000	$14,100	$14,200	$14,200	$14,300
Facility upgrades	$7,500				
Printing for schedules and fare media	$9,500	$9,800	$10,100	$10,400	$10,700
Subtotal	*$165,000*	*$23,900*	*$24,300*	*$24,600*	*$25,000*
Operating and Capital Total	**$1,107,000**	**$993,900**	**$1,023,300**	**$1,053,600**	**$1,085,000**

ETHRA and AECOM, 2018.

ETHRA may consider the following technologies for its vehicle fleet to enhance the rider experience and to assist with data collection and monitoring: automated passenger counters (APC), automated vehicle locators (AVL), cameras, and GFI fareboxes. These technologies may be implemented during ETHRA's vehicle procurement process.

5.2 Potential Funding Sources and Partnerships

Potential funding sources and partnerships have been identified for funding the operating, administrative, and capital costs of the Morristown fixed-route system. Partnerships may include: the City of Morristown, downtown businesses, Morristown-Hamblen Library, Tennova healthcare system Walmart Supercenter, Walter State Community College, and business park companies for future route expansions. LAMTPO would continue to provide regional coordination of services. These partners may participate in the selling of ride passes and funding of transit amenities. The partnerships outside the current service area may include future vanpool, ridesharing services.

5.2.1 Federal Funding

Table 5-2 is a summary of the federal grants available to ETHRA.

Table 5-2: Federal Grant Programs

Program	Program Description	Eligible Recipients	Matching Ratios
FTA Section 5303, 5304 and 5305 – Metropolitan and Statewide Planning formula funding	Support transit planning expenses.	• Metropolitan Planning Organizations (MPOs) • State DOTs	Up to 80% of eligible expenses
FTA Section 5307 – Urbanized Area formula funding	Supports operating and capital costs of transit operators. Used by the State DOT to fund small urban transit systems.	Funding is made available to designated recipients, which must be public bodies. Typically the State DOT is the designated recipient for urbanized areas between 50,000 and 200,000.	• Up to 50% of eligible operating expenses. • Up to 80% of eligible capital expenses.
FTA Section 5310 – Enhanced Mobility of Seniors & Individuals with Disabilities	Provides funding for states for the purpose of assisting private nonprofit groups in meeting the transportation needs of older adults and people with disabilities.	• State DOTs and designated recipients are direct recipients. • Eligible sub- recipients include private non-profit organizations, states or local government authorities, or operators of public transportation.	Up to 80% of eligible capital expenses. In the State of Tennessee this program is administered by TDOT as competitive funding for capital expenditures only.
FTA Section 5339(a) – Bus and Bus Facilities formula grant	Provides capital funding to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities.	• Designated Recipients of urbanized areas. • State DOTs that operate or allocate funding to fixed-route bus operators. • Sub-recipients include public agencies or private non-profits engaged in public transit.	Up to 80% of eligible capital expenses.
FTA Section 5339(b) – Bus and Bus Facilities discretionary grant	Provides capital funding to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities.	• Designated Recipients of urbanized areas. • State DOTs that operate or allocate funding to fixed-route bus operators.	Up to 80% of eligible capital expenses.

Program	Program Description	Eligible Recipients	Matching Ratios
		• Sub-recipients include public agencies or private non-profits engaged in public transit.	
Flexible Funding Program – Surface Transportation Program (STP) Funds	Provides funding for a wide variety of projects that support operating and capital costs of transit operators. Used by the State DOT to fund small urban transit systems.	Funding is made available to designated recipients, which must be public bodies. Typically the State DOT is the designated recipient for urbanized areas between 50,000 and 200,000.	Up to 88.5% of eligible capital expenses.

Most all transit systems in the United States receive substantial federal funding. This section provides a summary of the transit funding options available for ETHRA. All funding programs include limiting factors related to the eligible recipients and eligible costs, either planning, capital and/or operating costs.

Federal funding is established through legislative program structures and programs maintained in the Fixing America's Surface Transportation (FAST) Act. The FAST Act preserved much of the Moving Ahead for Progress in the 21st Century (MAP-21) legislative programs and funding shares. Because the horizon of the FAST Act is much longer than MAP-21, the FAST Act provides longer term funding provisions for transportation agencies. Federal funding categories that can be leveraged for transit improvement projects by ETHRA are detailed below.

A. Metropolitan and Statewide Planning and Non-Metropolitan Transportation Planning – Sections 5303, 5304 and 5305 Programs

These funds are available for planning activities that:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
- Increase the safety of the transportation system for motorized and non-motorized users;
- Increase the security of the transportation system for motorized and non-motorized users;
- Increase the accessibility and mobility of people and for freight;
- Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns;
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
- Promote efficient system management and operation; and
- Emphasize the preservation of the existing transportation system.

B. Urbanized Area Formula Grant – Section 5307 Program

The Section 5307 formula grant provides transit capital, operating and planning assistance to urbanized areas with populations of more than 50,000. This program has the most encompassing eligibility of any federal program providing funding to transit systems. Grant funds are utilized to

support the development, maintenance and improvement of public transportation in urbanized areas. Eligible projects fall into three primary categories: planning projects, capital projects and operating projects.

Planning eligible activities include, but are not limited to: studies relating to management, operations, capital requirements, and economic feasibility; work elements and related activities preliminary to and in preparation for constructing, acquiring, or improving the operation of facilities and equipment; plans and specifications; evaluation of previously funded projects; job access and reverse commute projects; and other similar or related activities before and in preparation for the construction, acquisition, or improved operation of public transportation systems, facilities, and equipment.

Capital projects eligible under the Urbanized Area Formula Program include all projects included under 49 U.S.C. 5302(3). In general, capital project expenses involve purchasing, leasing, constructing, maintaining, or repairing facilities, rolling stock, and equipment for use in a public transportation system. Capital project costs may include all direct costs and indirect costs associated with the project (provided that the grantee has an approved cost allocation plan or indirect cost proposal). It is noted that a listing of eligible projects is not shown here because of the breadth of projects. All eligibility of projects is generally determined by the FTA regional offices. Example eligible projects include engineering design and evaluation of transit projects, capital investments in bus and bus-related activities such as replacement and overhaul of buses, rebuilding of buses, crime prevention and security equipment, construction of maintenance and passenger facilities and capital investments in new and existing fixed guideway systems. All preventive maintenance and some ADA complementary paratransit service costs are considered eligible.

FTA provides funding to eligible recipients for costs incurred in the *operation of public transportation service.* In general, operating expenses are those costs necessary to operate, maintain, and manage a public transportation system. Operating expenses usually include such costs as driver salaries, fuel, and items having a useful life of less than one year. Recipients in small UZAs may use Section 5307 funds for operating assistance. There is no limitation on the amount of their apportionment that recipients in these UZAs may use for operating assistance.

Established under MAP-21 and upheld by FAST Act legislation, the Section 5307 grant program also includes eligible activities from the Job Access and Reverse Commute (JARC) Program (formerly known as Section 5316), which focuses on providing services to low-income individuals to access jobs. These activities include operating assistance with a 50 percent local match for JARC activities. In addition, the urbanized area formula for distributing funds now includes the number of low-income individuals as a factor. There is no minimum or maximum amount of funding that can be spent on JARC activities.

FTA performs a triennial review at least once every three years to evaluate the performance of each recipient of Section 5307 funds. During the triennial review, FTA ensures the recipient is governing its program in compliance with federal statutory and administrative requirements.

The local match required for the Section 5307 funding can vary from 10 percent to 50 percent depending on the type of project. The federal share for *planning and capital projects* that receive funding under the Section 5307 Program may not exceed 80 percent of the project cost. There are several notable exceptions in which the federal share may exceed 80 percent for certain projects related to ADA, Clean Air Act, and certain bicycle projects as follows:

1. Vehicles. The federal share is 85 percent for the acquisition of vehicles for purposes of complying with or maintaining compliance with the Americans with Disabilities Act of 1990 (ADA; 42 U.S.C. 12101 et seq.) or the Clean Air Act (CAA; 42 U.S.C. 7401 et seq.).
2. Vehicle-Related Equipment and Facilities. The federal share for project costs for acquiring vehicle-related equipment or facilities (including clean fuel or alternative fuel vehicle-related equipment or facilities) for purposes of complying or maintaining compliance with the CAA, or required by the ADA, is 90 percent.

The federal share for *operating expenses* may not exceed 50 percent of the net operating cost.

C. Enhanced Mobility of Seniors & Individuals with Disabilities – Section 5310 Program

The Section 5310 program provides formula funding to states for the purpose of assisting private nonprofit groups in meeting the transportation needs of older adults and people with disabilities when the transportation service provided is unavailable, insufficient, or inappropriate to meeting these needs. The program aims to improve mobility for seniors and individuals with disabilities by removing barriers to transportation service and expanding transportation mobility options. Funds are apportioned based on Tennessee's share of the population for these two groups. Formula funds are apportioned to TDOT for use in all rural and small urban areas in the state. TDOT has flexibility in determining which eligible projects receive funding. Their decision process must be clearly noted in the State Management Plan. The selection process for funding in the State of Tennessee is competitive-based and funding may be given to local government authorities, private non-profit organizations, and/or operators of public transportation. Furthermore, TDOT only allows Section 5310 funds to be spent on capital projects only. No operating projects are eligible for this funding in Tennessee.

D. Bus and Bus Facilities Grant – Section 5339 Program

The Bus and Bus Facilities is a formula grant program created by MAP-21 legislation which replaced the previous Section 5309 discretionary Bus and Bus Facilities program. This capital program provides funding to replace, rehabilitate, and purchase buses and related equipment, and to construct bus-related facilities. Distribution of this grant is formula based and requires a 20 percent local match. A portion of the total Section 5339 program has been also set aside as a discretionary pot of funding through the FAST Act. These competitive grants also provide additional federal resources to state DOTs and designated and direct recipients to replace, rehabilitate and purchase buses and related equipment and to construct facilities including technological changes or innovations to modify low or no emission vehicles or facilities. A sub-program, the Low- or No-Emission Vehicle Program, provides competitive grants for projects that support the purchase or rehabilitation of those specified vehicles.

E. Flexible Funding Program – Surface Transportation Program (STP) Funds

The STP program provides a national annual appropriation to the Federal Highway Administration (FHWA). This funding has a broad project eligibility and funding may be used for projects to preserve or improve conditions and performance on any federal-aid highway, bridge project on any public road, facilities for non-motorized transportation, transit capital projects and public bus terminals and facilities. This program funding can also be "flexed" to FTA for use by transit agencies. Once flexed to FTA, the funds generally follow the regulations and eligibility of Section 5307 funding.

5.2.2 State Funding

The State of Tennessee, through TDOT, has administrative responsibility for the federal programs related to transit operating and capital for cities with populations under 200,000. Section 5307, Section 5310, Section 5311 and Section 5339 all have programs containing administrative guides that are updated for each fiscal year and are available through the TDOT Multimodal Transportation Resources Office.

A. TDOT Urban Operating (UROP) Program Fixed Route & Paratransit in Urban Core Areas

This program provides capital and operating assistance to support fixed route and complementary paratransit service in urban core areas of Tennessee. Agencies providing fixed route and complementary paratransit public transportation service in urban core areas of Tennessee. Eligible projects include capital (i.e. rolling stock, preventative maintenance, equipment) and operating (i.e. fuel, salaries, wages, fringe benefits, travel and training). Annual program funds are approved by the state legislature and allocated to pre-determined public transportation providers by formula. The formula is based on population reported in the 2010 Census.

The match requirements are as follows:

- First $500,000 in total expenses – 80 percent state, 20 percent local
- After first $500,000 in total expenses – 50 percent state, 50 percent local

Transit agencies are required to comply with all state rules and requirements. Monthly, quarterly, and annual submission of information and reports to document compliance and measure project performance is required. Grantees may budget up to $1 million in UROP funds for capital expenses.

B. TDOT Critical Trips (CRIT) Program Demand Response in Urban Fringe Areas

This program provides operating assistance to support demand response service in urban fringe areas of Tennessee not served by the primary urban transit system. Eligible projects are limited to operating expenses (i.e. fuel, salaries, wages, fringe benefits). Annual program funds are approved by the state legislature and allocated to pre-determined public transportation providers by formula. The formula is based on population reported in the 2010 Census. Funds will be allocated statewide based on the population of urbanized areas not served by the primary urban transit system.

Program minimum local match requirements are as follows:

State – 50 percent, Local – 50 percent.

Agencies are required to comply with all state rules and requirements. Monthly, quarterly, and annual submission of information and reports to document compliance and measure project performance is required.

C. Improve Act Capital Grants

This program provides capital assistance to support public transportation services in Tennessee. Public transit providers currently receiving FTA 5307 or Section 5311 program funds are eligible. Eligible projects include:

- Transit centers, administration, maintenance, and storage facilities
- Bus rapid transit and fixed guideway stations

- Park and ride lots
- ROW acquisition for transit and transit oriented development projects
- Intelligent transportation systems and technology
- Passenger amenity projects
- Transit fueling and electric charging stations
- Rolling stock and associated equipment
- Safety and security equipment

Annual program funds are awarded based on a competitive selection process by TDOT that takes into consideration several evaluation criteria, geographic distribution, and distribution amongst rural and urban agencies. Evaluation factors include:

- Demonstrated benefits to safety, reduction of congestion, and economic development
- Impact to transit ridership or system performance
- Project readiness
- Benefit to an Economically Distressed Area
- Potential to leverage federal discretionary funds
- Strong local and MPO financial support

The match requirement is state 75 percent and local 25 percent. Agencies are required to comply with all state and applicable federal rules and requirements regarding procurement, construction, and project reimbursement. The amount of annual funding increases from now to State Fiscal Year (SFY) 2020. There is $17 million in SFY 2019, and $21 million in SFY 2020 and beyond.

D. Volkswagen Settlement

In 2015, Volkswagen publicly admitted to secretly and deliberately installing defeat devices in approximately 590,000 model year 2009 to 2016 motor vehicles containing 2.0 and 3.0 liter diesel engines. From October 2016 to May 2017, the U.S. District Court approved three partial settlements of varying amounts of money. The State of Tennessee will receive $45 million in settlement funds for a trust allocation that will be administered through the Tennessee Department of Environment and Conservation.

5.2.3 Local Funding

The local share for funding transit capital and operating expenses can come from a variety of sources, provided that they did not originate from a federal source. Local share is normally made in the form of cash; however, in some cases the local share can be made in the form of in-kind services or contributions. In-kind services are those services which may be used by the transit operation but paid for from another local source and not directly by the transit operation. For example, shared use of a garage facility may be counted as in-kind contribution because the value of the service provided by the use of the garage could be paid from another source such as the public works department. Typically, local share comes from three main sources, general fund, ad valorem taxes (property taxes), or sales taxes dedicated specifically to transit. For capital, general revenue or capital improvement bonds may be considered as a local share source.

These funding sources are briefly described below.

- Public-Private Partnerships: Large local employers could have a financial interest in the creation of various transit programs in the area. Consideration should be given to identifying these potential partners in formulating strategies to create a successful transit system.

- Local Taxes: A property tax designated specifically for transit operations and capital improvements could be assessed. A dedicated millage levy could offset local funding costs and deficits in farebox revenues. Other potential sources could include car rental or lodging taxes or special fees.

- Advertising Revenues: While transit related advertising revenues are not usually a large revenue generator, they can still be used to help with operating and maintenance cost. Advertising revenues can typically be generated from display signage applied to bus exteriors or interiors and through shelter display programs.

6. Implementation Plan

This chapter provides specific action steps and a timeline for implementing the recommended deviated fixed-routes in Morristown. In addition, this chapter provides guidance for initiating a monitoring program, determining performance measures, and setting service benchmarks and goals in order to not just implement transit, but it make it a success for the community. An important aspect of this implementation plan is recognizing that transit service, particularly new transit service, is not static—it will require monitoring and modifications in order to be successful.

6.1 Action Steps and Timeline

Based on the operational components, management/organization decisions, and procurement that all need to be discussed and finalized prior to implementation, it is recommended that the goal for implementation timeline be one to two years. This timeframe allows for further discussion, interaction with local stakeholders, organization of responsibilities, agreement on a management structure, and the finalization of agreements as necessary. This also allows time for capital procurement, installation of bus stop signage and amenities, and marketing and education of the community.

There are steps that need to be taken in order to achieve implementation by October 1, 2019. The steps are outlined in Table 6-1 and should be flagged with intermediate deadlines to gauge progress towards the goal of service implementation.

Table 6-1: Action Steps and Timeline for Implementation

Timeline	Action	Stakeholders
October 2018	Adopt the Morristown Deviated Fixed-Route Study	ETHRA, LAMTPO, TDOT Multimodal Transportation Resources Division
November 2018 – January 2019	Identify funding sources and begin the budget planning process, using the Financial Plan included in this Study as a baseline	ETHRA, LAMTPO, TDOT Multimodal Transportation Resources Division
November 2018	Begin procurement of necessary buses and support vehicles	ETHRA
December 2018 – January 2019	Confirm route alignments and identify bus stops in addition to the timepoints recommended by this Study	ETHRA, LAMTPO, City of Morristown
February 2019	Finalize the budget for the Morristown fixed-route system and ADA complementary paratransit service	ETHRA, LAMTPO
March 2019 – April 2019	Finalize the management structure for the fixed-route system and ADA complementary paratransit service, including the number of staff positions and job descriptions	ETHRA
April 2019 – May 2019	Procure bus stop signs, benches, shelters, and other amenities	ETHRA
June 2019 – July 2019	Brand buses with the Lakeway Transit logo	ETHRA
July 2019 – August 2019	Install bus stop signs, benches, shelters, and other amenities	ETHRA, LAMTPO, City of Morristown Public Works Department

Timeline	Action	Stakeholders
July 2019 – August 2019	Finalize and print route schedules and fare media	ETHRA
July 2019 – August 2019	Coordinate with the partnering agencies to sell bus passes	ETHRA, LAMTPO
July 2019 – September 2019	Advertise for the driver and support staff positions, conduct interviews, and hire staff	ETHRA
August 2019 – September 2019	Add transit service information to local and regional transportation websites	ETHRA, LAMTPO, City of Morristown
August 2019 – September 2019	Provide driver and dispatch training	ETHRA
September 2019	Finalize driver shifts	ETHRA
October 2019	Initiate fixed-route service in Morristown with a ribbon cutting ceremony	ETHRA, LAMTPO, City of Morristown, TDOT Multimodal Transportation Resources Division
July 2020	Review and assess the first nine months of the transit service and budget projects in order to make revisions as necessary for future services	ETHRA, LAMTPO

6.2 Monitoring Program

An effective monitoring program is a critical first step in evaluating the performance of the transit service plan as it gauges whether the goals of the community are being accomplished and that the service is both effective and efficient. Without specific measures, success is difficult to measure from year to year. There are a few key performance measures which help to address efficiency and effectiveness of any transit agency. The procedure to monitor service and apply and evaluate performance measures is discussed in this section.

Monitoring of service should continue on a daily basis, with some recommendations for how to change specific data collection procedures. Data collection is essential to evaluate the service performance and to determine if changes should be made in the service delivery. This section provides information on data collection, databases, and standard reports which should be prepared. Data to be collected fall into three general categories—ridership, on-time performance, and financial information.

Ridership

Passenger boarding data should be collected continually on a time-specific basis. The interval for collecting data should be determined by striking a balance between sufficient data to understand the ridership trends and too frequent collection that is burdensome and does not provide additional insight.

Passenger boardings and alightings should be recorded daily by route, fare category, and by trip. One goal to strive for is the implementation of Intelligent Transportation Systems, such as Mobile Data Terminals (MDTs) and Automatic Passenger Counters (APCs). These systems include features such as recording each passenger by fare category as they board. This capability should be programmed into the software as it is implemented. MDTs also allow both data and voice communication between operator and dispatcher. This option is similar to having an alphanumeric pager on the dashboard. Often for smaller agencies, this technology is not feasible due to the high cost. In any event, passenger data can still be collected and recorded by drivers for numerous variables.

Twice each year, a full boarding and alighting count should be completed. If passenger boardings are counted using the APCs and integrated with Automatic Vehicle Location (AVL), the data can be recorded automatically. If it must be done manually, this is a more intense effort and will require the use of additional personnel. Passenger counts are recorded for passengers boarding and alighting by stop for a full day. This information records the passenger activity at individual stops and is useful to determine if stops are appropriately placed and what amenities should be provided. If a stop has little or no activity, it would not warrant a bench or shelter and may not even be appropriate as a designated stop. This allows the transit agency to review their system on a biannual basis.

An onboard rider survey should be conducted periodically. It is recommended that a survey be conducted six months after service changes have been implemented. Following that, rider surveys should be conducted at least every two years. Survey instruments with questions appropriate for the service should collect information about rider demographics, trip characteristics, and perceptions of the transit service. These data collection efforts allow the system to get important feedback from actual consumers, as well as collecting valuable data related to their demographics and trip purpose.

On-Time Performance

With any transit system, it is important to monitor on-time performance and establish a goal. For instance, an attainable on-time goal of 90 percent for the service may be considered for system changes. Minor adjustments to routes may be needed to ensure that schedules and headway adherence can be maintained.

To record on-time performance, drivers should report actual arrival and departure times at designated bus stops along the routes and at major stops. It should be emphasized that drivers should not leave prior to a scheduled stop time to make up time along a route. Leaving early could cause riders to miss a bus.

The dispatcher should then record this information so that the number of trips running late can be determined. This effort should continue for the first three months of service. After that, on-time data should be checked randomly to ensure that performance remains acceptable. Any service changes also warrant a revised look at on-time performance.

Financial Information

Financial data are required to evaluate performance measures such as the operating cost per hour of service and the cost per passenger-trip. Financial monitoring should continue as part of the performance monitoring program. Important data to collect and report include: operating revenue by source, farebox revenue by fare category, maintenance costs, fuel expenditures, and employee-related costs (including salary and benefits).

Data Management

Several options are available for storing the data. The recommended approach is to set up databases in Microsoft Access or Excel to record passenger data. A separate database should be set up for routine passenger data and a second for the boarding and alighting counts. Passenger count data can be entered directly into the database using the capabilities of the passenger counters. Onboard survey data can be entered into a database such as Access or a spreadsheet program such as Excel.

Transit staff should provide performance reports on a schedule, typically monthly or quarterly. The report should include performance data for the current period, the same period in the previous year, year-to-date performance, and the prior year-to-date performance.

Information that should be reported includes:

- Passenger boardings by route
- Passengers per revenue-hour by route
- Total passengers by fare category
- Total passengers
- System passengers per revenue-hour
- Operating cost
- Cost per passenger

The average fare should be calculated and reported based on operating costs and passenger counts. While this may seem like a burden, proper collection and storing of the data makes this information easy to assemble and provides a great deal of use for disseminating information. Additionally, an annual report should be compiled and presented. The information for these reports can be easily generated from the databases and the accounting system.

6.3 Performance Measures

Transit performance measures serve as a guide to understand how efficiently and effectively a transit system is operating. Performance measures define the types of data to be collected and give the tools necessary to identify transit system deficiencies and opportunities. Effective performance measures exemplify the following characteristics:

- Easily measurable
- Clear and intuitive meaning so that it is understandable to those who will use it and to non-transportation professionals
- Acceptable and useful to transportation professionals
- Comparable across time and between geographical areas
- Strong functional relationship to actual system operations so that once changes occur in system operations, changes to the system can readily be measured
- Provide the most cost-effective means of data collection
- Where appropriate, be based on statistically sound measurement techniques
- Consistent with measures identified for other systems

Recommended performance measures include:

- **Passengers/Revenue-Hour:** Number of total monthly and annual passengers divided by the corresponding revenue-hours
- **Operating Cost/Revenue-Hour:** An excellent indicator of efficiency is operating cost per revenue-hour of service. Operating costs per hour should be analyzed by route and compared to overall system averages.
- **Operating Cost/Trip:** Total operating expenses divided by total annual one-way trips

- **Late Trips:** The percentage of fixed-route trips which operate late or are missed should be recorded and reported. The recommended standard for late trips is any trip that is more than five minutes behind schedule.
- **Accidents/1,000 miles:** Measure of driver safety. Accidents must be defined as a standard.
- **Service/Road Calls:** Vehicle breakdowns are inevitable. This measure tracks the distance traveled between mechanical breakdowns.

Although frequent occurrences can create disruptions in a transit system, it is important to track the frequency and type of mechanical failures of each vehicle in addition to monitoring a fleet's age. Monitoring of vehicle breakdowns is one method of reducing system disruptions and may allow an agency to improve monitoring of vehicle replacement schedules and preventative maintenance practices. Data collection efforts should include date, time of day, type of failure, age of vehicle, vehicle number, vehicle mileage, and how the situation was rectified. Monitoring of these items will allow an agency to recognize repeated types of mechanical breakdowns; breakdowns related to vehicle type, age or mileage; and assist with preventative maintenance programs. Wheelchair lift failures should also be monitored. Data should be included in the monthly report.

6.4 Service Benchmarks and Goals

Service benchmarks and goals are recommended for the transit service plan in order to monitor the quality and performance of the system in a quantifiable way. They also serve to establish a vision for how the new transit service can continue to grow and improve.

Service Benchmarks

The performance measures discussed in the previous section can be used to create benchmarks for service operation. The benchmarks will help the service provider track progress and set goals for the performance of the route. These benchmarks should be seen as short-term goals that should be re-evaluated at set intervals—at least every five years—to ensure that the expectations for the route are consistently evolving. If a specific benchmark has been greatly exceeded during the first two years of operation, the criteria should be changed to provide a progressive target for the service. The following benchmarks were determined by the base type of service, and by examining peer and national standards:

- Eight to twelve passengers per revenue-hour of service
- 90 percent on-time performance
- Less than 2.5 preventable accidents per 100,000 vehicle-miles
- Less than 0.1 reportable accidents per 100,000 vehicle-miles

Service Goals

For transportation planning purposes, a goal is defined as a purpose or need that should be attained to address a transportation issue. An objective is a specific, measurable method or activity that is designed to achieve the identified goal.

Goal 1:	Provide high-quality, customer-oriented service
Objective 1A:	Distribute a rider survey a minimum of once every two years to obtain input from system users on the quality of service.
Objective 1B:	Operate fixed-routes with a 90 percent on-time rate as defined by not leaving a scheduled stop early and being no later than five minutes behind the scheduled arrival time at each stop along the route.
Objective 1C:	Provide route schedules and information available in languages spoken by the community.
Objective 1D:	Track performance measures at least annually and adjust performance measures at least once every five years.

Goal 2:	Provide efficient, effective, and safe transit services
Objective 2A:	Provide fixed-route service with an average productivity of eight to 12 passengers per service-hour.
Objective 2B:	Ensure operations have fewer than 2.5 preventable accidents per 100,000 vehicle-miles.
Objective 2C:	Ensure operations have fewer than 0.1 reportable major incidents per 100,000 vehicle-miles (one reportable major accident every 1,000,000 vehicle miles).

Goal 3:	Promote the transit service
Objective 3A:	Work with local employers, educational institutions, and medical facilities to promote the use of the transit system, leaving educational and promotional materials with them.
Objective 3B:	Participate in marketing and promotion of services, including coordination with other organizations.
Objective 3C:	Ensure that promotional materials, schedules, and pamphlets share a similar aesthetic, creating an easily recognizable brand for the service.

Modifications

Changes to the goals and service benchmarks are inevitable, and they should be evaluated annually to make sure that they remain relevant. As the routes evolve, the purpose of them or the areas being served may be modified. The benchmarks and goals would then have to be updated to reflect the new mission of the routes or the performance measures that ETHRA wishes to achieve.

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Appendix A: Route Directions

Route 1 – Outbound

1 **Transit Center**
2808 W Andrew Johnson Hwy, Morristown, TN 37814, USA

Head west toward W Economy Rd
161 ft

Turn left onto W Economy Rd
630 ft

Turn left onto US-11E N
0.927 mi

Continue straight onto W Andrew Johnson Hwy
0.748 mi

Continue straight onto W 1st N St
1,096 ft

Turn right onto N High St
338 ft

Turn left at the 1st cross street onto W Main St
0.459 mi

2 **Morristown-Hamblen Library**
417 W Main St, Morristown, TN 37814, USA

Head northeast on W Main St toward Hamilton Ave
787 ft

Turn right onto N Henry St
778 ft

Turn left onto W Morris Blvd
1.72 mi

Turn right at S Haun Dr
295 ft

Turn right
0.300 mi

Turn left
272 ft

Turn left
79 ft

3 **College Square Mall**
2550 E Morris Blvd, Morristown, TN 37813, USA

Head south
262 ft

Turn left
1,109 ft

Turn right
1,053 ft

Turn right at the 1st cross street
988 ft

Turn left
1,191 ft

4 **Walters State Community College**
Walters State Community College Dr, Morristown, TN 37813, USA

Head southwest toward Walters State Community College Dr
39 ft

Turn left onto Walters State Community College Dr
620 ft

Turn left
518 ft

Turn right
466 ft

Turn left
377 ft

5 **Walmart Supercenter**
489 S Davy Crockett Pkwy, Morristown, TN 37813, USA

Route 1 – Inbound

1 **Walmart Supercenter**
489 S Davy Crockett Pkwy, Morristown, TN 37813, USA

Head northeast
732 ft

Turn left
1,214 ft

Turn right
1,053 ft

Turn left
407 ft

Turn right
607 ft

2 **College Square Mall**
2550 E Morris Blvd, Morristown, TN 37813, USA

Head south toward E Morris Blvd
279 ft

Turn right
0.290 mi

Turn left toward E Morris Blvd
305 ft

Turn left at the 1st cross street onto E Morris Blvd
0.823 mi

Turn right onto S Liberty Hill Rd
374 ft

Turn left onto Berkline Dr
699 ft

3 **Food City**
Berkline Dr, Morristown, TN 37813, USA

Head south on Berkline Dr toward E Morris Blvd
213 ft

Turn right onto E Morris Blvd
0.803 mi

Turn right onto N Henry St
778 ft

Turn left onto W Main St
787 ft

4 **Morristown-Hamblen Library**
417 W Main St, Morristown, TN 37814, USA

Head southwest on W Main St toward S Jackson St
0.459 mi

Turn right onto N High St
338 ft

Turn left at the 1st cross street onto W 1st N St
1,096 ft

Continue onto W Andrew Johnson Hwy
1.56 mi

Turn right at New Line Rd
768 ft

5 **Transit Center**
2808 W Andrew Johnson Hwy, Morristown, TN 37814, USA

Route 2 – Outbound

1 Transit Center
2808 W Andrew Johnson Hwy, Morristown, TN 37814, USA

Head west toward W Economy Rd
161 ft

Turn right onto W Economy Rd
0.754 mi

Turn right onto N Economy Rd
0.775 mi

2 Fairway Apartments
2022 N Economy Rd, Morristown, TN 37814, USA

Head east on N Economy Rd toward Walters Dr
364 ft

Turn left at the 1st cross street onto Walters Dr
1.27 mi

Turn right onto Spring St
358 ft

Turn right onto Housley Cir
289 ft

Turn right onto Housley St
1,070 ft

3 Walter Ridge Apartments
515 Housley St, Morristown, TN 37814, USA

Head south on Housley St
154 ft

Make a U-turn
1,220 ft

Turn left onto Housley Cir
289 ft

Turn left onto Spring St
358 ft

Turn left onto Walters Dr
1.27 mi

Turn left onto N Economy Rd
0.257 mi

Turn left onto Country Club Dr
0.408 mi

Turn left onto N Fairmont Ave
932 ft

Turn right onto W 7th N St
0.391 mi

Turn right onto McFarland St
446 ft

4 **Tennova Healthcare**
722 McFarland St, Morristown, TN 37814, USA

Head southeast on McFarland St toward W 5th N St
1,004 ft

Turn left onto W 3rd N St
1,266 ft

Turn right onto N Jackson St
984 ft

Turn left at the 3rd cross street onto W Main St
354 ft

5 **Morristown-Hamblen Library**
417 W Main St, Morristown, TN 37814, USA

Route 2 –Inbound

1 **KC Home**
823 E 4th N St, Morristown, TN 37814, USA

Head southwest on E 4th N St toward Anderson St
676 ft

Continue onto E 6th N St
0.415 mi

2 **Greyhound Station**
114 E 6th N St, Morristown, TN 37814, USA

Head southwest on E 6th N St toward N Cumberland St
108 ft

Turn left at the 1st cross street onto N Cumberland St
961 ft

Turn right onto W 3rd N St
0.344 mi

Turn left onto N Jackson St
604 ft

Turn left at the 2nd cross street onto W 1st N St
564 ft

Turn right onto Hamilton Ave
364 ft

Turn right onto W Main St
194 ft

3 **Morristown-Hamblen Library**
417 W Main St, Morristown, TN 37814, USA

Head southwest on W Main St toward S Jackson St
0.459 mi

Turn right onto N High St
338 ft

Turn left at the 1st cross street onto W 1st N St
1,096 ft

Continue onto W Andrew Johnson Hwy
1.56 mi

Turn right at New Line Rd
768 ft

4 **Transit Center**
2808 W Andrew Johnson Hwy, Morristown, TN 37814, USA

Route 3 – Outbound

1 Transit Center
2808 W Andrew Johnson Hwy, Morristown, TN 37814, USA

Head west toward W Economy Rd
161 ft

Turn left onto W Economy Rd
630 ft

Turn left onto US-11E N
0.927 mi

Turn right onto W Morris Blvd
1.25 mi

Turn right onto Sulphur Springs Rd
0.258 mi

2 Morristown Housing Authority
501 Sulphur Springs Rd, Morristown, TN 37813, USA

Head southeast on Sulphur Springs Rd toward Pauline Ave
184 ft

Turn right toward Houston St
256 ft

Turn right onto Houston St
456 ft

Turn right at the 1st cross street onto Price Dr
335 ft

Turn right onto Sulphur Springs Rd
0.304 mi

Turn right onto Kennedy Cir
0.266 mi

Turn left onto Lincoln Ave
0.755 mi

Turn left onto S Jackson St
285 ft

3 Lincoln Manor Apartments
1107 S Jackson St, Morristown, TN 37813, USA

Head northwest on S Jackson St toward Ethel Ave
417 ft

Turn right onto W Charles St
1,096 ft

W Charles St turns slightly right and becomes Sunrise Ave
1,037 ft

Turn right onto S Cumberland St
935 ft

Turn left onto Algonquin Dr
0.537 mi

Continue onto Joe Hall Rd
0.270 mi

4 Mayfair Apartments
1300 Joe Hall Rd, Morristown, TN 37813, USA

Head east on Joe Hall Rd toward Gaston St
577 ft

Turn left onto Gaston St
1,237 ft

Turn left onto Russell St
348 ft

Turn right to stay on Russell St
0.342 mi

Turn left onto S Liberty Hill Rd
0.250 mi

Turn right onto Algonquin Dr
1,076 ft

Turn right onto Montvue Ave
0.349 mi

Turn left onto E Louise Ave
0.296 mi

Turn right onto S Hill St
272 ft

Route 3 – Inbound

1 **Laurelwood Apartments**
513 S Hill St, Morristown, TN 37813, USA

Head northwest on S Hill St toward Inman St
358 ft

Turn left at the 1st cross street onto Inman St
361 ft

Turn right onto S Cumberland St
984 ft

Turn left at the 2nd cross street onto W Morris Blvd
489 ft

Turn right onto N Henry St
778 ft

Turn left onto W Main St
787 ft

2 **Morristown-Hamblen Library**
417 W Main St, Morristown, TN 37814, USA

Head southwest on W Main St toward S Jackson St
354 ft

Turn left onto S Jackson St
886 ft

Turn right onto W Morris Blvd
1,263 ft

3 **Volunteer Blind Industries**
701 US-11E, Morristown, TN 37813, USA

Head southwest on W Morris Blvd toward Dice St
1.41 mi

Turn left onto US-11E S
0.351 mi

Turn right onto Cold Creek Dr
702 ft

Turn left at Sandstone Dr
1,050 ft

4 **Food City**
2310 Sandstone Drive, Morristown, TN 37814, USA

Head east toward Sandstone Dr
446 ft

Turn right onto Sandstone Dr
1,010 ft

Turn left onto Cold Creek Dr
702 ft

Turn right onto US-11E S
0.507 mi

Turn right at New Line Rd
768 ft

5 **Transit Center**
2808 W Andrew Johnson Hwy, Morristown, TN 37814, USA

Appendix B: Bus Stop Inventory Data

This appendix contains profiles of each bus stop timepoint based on an existing conditions inventory that included the following criteria:

- Stop Location
- Latitude and Longitude
- On-Street Parking
- Posted Speed Limit
- Intersection Signal
- Activity Generator
- Stop Placement
- Stop Type
- Stop Lighting
- Stop Shade
- Pedestrian Sidewalk
- Ped Crosswalk
- ADA ROW
- Notes: ADA ROW
- ADA Pad
- ADA Ramp
- ADA Terrain
- ADA Utilities Obstacles
- Notes: ADA Utilities Obstacles
- ADA Other
- Notes: ADA Other
- Notes

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Transit Facility **Route Number:** Route 1 - Outbound , Route 1 - Inbound , Route 2 - Outbound, Route 2 - Inbound , Route 3 - Outbound, Route 3 - Inbound **Submitted:** 08/29/2018 10:12 AM	**Lat:** 36.20260107 **Lon:** -83.33367305

Street Parking	No
Street MPH	N/A
Intersection Signal	Yes
Activity Generator	Transit Station
Stop Placement	
Stop Type	Bus Pull Out
Stop Lighting	Yes
Stop Shade	Yes
Pedestrian Sidewalk	No
Ped Crosswalk	No
ADA ROW	No
Notes: ADA ROW	
ADA Pad	Yes
ADA Ramp	No
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	No
Notes: ADA Other	
Notes	Transit Station

Picture 1

Picture 2

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Fairway Apts **Route Number:** Route 2 - Outbound **Submitted:** 08/29/2018 10:27 AM	**Lat:** 36.2124262936751 **Lon:** -83.3307359834046

Street Parking	No
Street MPH	
Intersection Signal	No
Activity Generator	
Stop Placement	Midblock
Stop Type	Curb
Stop Lighting	Yes
Stop Shade	No
Pedestrian Sidewalk	No
Ped Crosswalk	No
ADA ROW	No
Notes: ADA ROW	
ADA Pad	No
ADA Ramp	No
ADA Terrain	Unlevel
ADA Utilities Obstacles	Yes
Notes: ADA Utilities Obstacles	
ADA Other	
Notes: ADA Other	
Notes	

Picture 1

Picture 2

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Tennova Healthcare (Between 5th and 7th) **Route Number:** Route 2 - Outbound **Submitted:** 08/29/2018 10:52 AM	**Lat:** 36.2141242158005 **Lon:** -83.3041153103889

Street Parking	No
Street MPH	
Intersection Signal	No
Activity Generator	Hospital
Stop Placement	Midblock
Stop Type	Curb
Stop Lighting	No
Stop Shade	No
Pedestrian Sidewalk	No
Ped Crosswalk	No
ADA ROW	No
Notes: ADA ROW	
ADA Pad	No
ADA Ramp	No
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	
Notes: ADA Other	
Notes	

Picture 1

Picture 2

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: College Square Mall **Route Number:** Route 1 - Outbound **Submitted:** 08/29/2018 10:57 AM	**Lat:** 36.21961855 **Lon:** -83.26094809

Street Parking	No
Street MPH	N/A
Intersection Signal	No
Activity Generator	Mall, Movie Theater
Stop Placement	Midblock
Stop Type	Bus Pull Out
Stop Lighting	Yes
Stop Shade	No
Pedestrian Sidewalk	Yes
Ped Crosswalk	No
ADA ROW	No
Notes: ADA ROW	
ADA Pad	Yes
ADA Ramp	No
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	Yes
Notes: ADA Other	No ramp at loading zone
Notes	Fewer interactions than front entrance

Picture 1

Picture 2

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Library **Route Number:** Route 1 - Outbound, Route 2 - Outbound **Submitted:** 08/29/2018 11:04 AM	**Lat:** 36.2118703220377 **Lon:** -83.2956803497703

Street Parking	Yes
Street MPH	25
Intersection Signal	No
Activity Generator	Library, Utility, Downtown, Church, Antique, Health Department
Stop Placement	Midblock
Stop Type	Curb
Stop Lighting	Yes
Stop Shade	No
Pedestrian Sidewalk	Yes
Ped Crosswalk	Yes
ADA ROW	No
Notes: ADA ROW	
ADA Pad	Yes
ADA Ramp	Yes
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	
Notes: ADA Other	
Notes	

Picture 1	Picture 2
	

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Walters State CC **Route Number:** Route 1 - Outbound **Submitted:** 08/29/2018 11:08 AM	**Lat:** 36.21444541 **Lon:** -83.26077874

Street Parking	Yes
Street MPH	N/A
Intersection Signal	No
Activity Generator	College
Stop Placement	Midblock
Stop Type	Curb
Stop Lighting	Yes
Stop Shade	No
Pedestrian Sidewalk	Yes
Ped Crosswalk	No
ADA ROW	No
Notes: ADA ROW	
ADA Pad	Yes
ADA Ramp	Yes
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	No
Notes: ADA Other	
Notes	

Picture 1

Picture 2

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Sherwood and 4th (KC Home) **Route Number:** Route 2 - Inbound **Submitted:** 08/29/2018 11:16 AM	**Lat:** 36.2216362450609 **Lon:** -83.2863721624792

Street Parking	No
Street MPH	
Intersection Signal	No
Activity Generator	
Stop Placement	Farside
Stop Type	Curb
Stop Lighting	No
Stop Shade	No
Pedestrian Sidewalk	Yes
Ped Crosswalk	No
ADA ROW	No
Notes: ADA ROW	
ADA Pad	No
ADA Ramp	Yes
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	
Notes: ADA Other	
Notes	Covering nearby

Picture 1	Picture 2
	

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Greyhound **Route Number:** Route 2 - Inbound **Submitted:** 08/29/2018 11:24 AM	**Lat:** 36.2185849389399 **Lon:** -83.2951900084347

Street Parking	No
Street MPH	
Intersection Signal	No
Activity Generator	Greyhound
Stop Placement	Nearside
Stop Type	Curb
Stop Lighting	No
Stop Shade	No
Pedestrian Sidewalk	Yes
Ped Crosswalk	No
ADA ROW	No
Notes: ADA ROW	
ADA Pad	No
ADA Ramp	Yes
ADA Terrain	Unlevel
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	No
Notes: ADA Other	
Notes	

Picture 1	Picture 2
	

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Library (Inbound) **Route Number:** Route 1 - Inbound, Route 2 - Inbound, Route 3 - Inbound **Submitted:** 08/29/2018 11:36 AM	**Lat:** 36.2119143270293 **Lon:** -83.2959001232714

Street Parking	Yes
Street MPH	
Intersection Signal	No
Activity Generator	Library, Health Department, Utilities
Stop Placement	Farside
Stop Type	Curb
Stop Lighting	No
Stop Shade	No
Pedestrian Sidewalk	Yes
Ped Crosswalk	No
ADA ROW	No
Notes: ADA ROW	
ADA Pad	Yes
ADA Ramp	Yes
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	No
Notes: ADA Other	
Notes	

Picture 1

Picture 2

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Food City (Berkline Drive) **Route Number:** Route 1 - Inbound **Submitted:** 08/29/2018 11:57 AM	**Lat:** 36.21743409 **Lon:** -83.28027341

Street Parking	No
Street MPH	N/A
Intersection Signal	Yes
Activity Generator	Food City, Pals, Stores
Stop Placement	Midblock
Stop Type	Curb
Stop Lighting	Yes
Stop Shade	Yes
Pedestrian Sidewalk	Yes
Ped Crosswalk	Yes
ADA ROW	No
Notes: ADA ROW	
ADA Pad	Yes
ADA Ramp	Yes
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	No
Notes: ADA Other	
Notes	Fire lane

Picture 1

Picture 2

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Walmart **Route Number:** Route 1 - Outbound , Route 1 - Inbound **Submitted:** 08/29/2018 11:57 AM	**Lat:** 36.21440847 **Lon:** -83.25541

Street Parking	No
Street MPH	N/A
Intersection Signal	No
Activity Generator	Walmart, Shops
Stop Placement	Midblock
Stop Type	Curb
Stop Lighting	No
Stop Shade	No
Pedestrian Sidewalk	Yes
Ped Crosswalk	Yes
ADA ROW	No
Notes: ADA ROW	
ADA Pad	Yes
ADA Ramp	Yes
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	
Notes: ADA Other	
Notes	Fire lane

Picture 1	Picture 2
	

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Morristown Housing Authority **Route Number:** Route 3 - Outbound **Submitted:** 08/29/2018 1:38 PM	**Lat:** 36.2037256267259 **Lon:** -83.3018481732191

Street Parking	No
Street MPH	20
Intersection Signal	No
Activity Generator	Morristown Housing Authority
Stop Placement	Nearside
Stop Type	Curb
Stop Lighting	Yes
Stop Shade	Yes
Pedestrian Sidewalk	Yes
Ped Crosswalk	No
ADA ROW	No
Notes: ADA ROW	
ADA Pad	Yes
ADA Ramp	Yes
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	No
Notes: ADA Other	
Notes	

Picture 1	Picture 2
	

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Lincoln Manor Route **Number:** Route 3 - Outbound **Submitted:** 08/29/2018 1:50 PM	**Lat:** 36.201685555313 **Lon:** -83.2911491767348

Street Parking	No
Street MPH	30
Intersection Signal	Yes
Activity Generator	Apartments
Stop Placement	Midblock
Stop Type	Curb
Stop Lighting	No
Stop Shade	Yes
Pedestrian Sidewalk	No
Ped Crosswalk	No
ADA ROW	No
Notes: ADA ROW	
ADA Pad	No
ADA Ramp	No
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	
Notes: ADA Other	
Notes	

Picture 1 	Picture 2

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Mayfair Apartments **Route Number:** Route 3 - Outbound **Submitted:** 08/29/2018 2:02 PM	**Lat:** 36.2081743637437 **Lon:** -83.2721751463444

Street Parking	No
Street MPH	30
Intersection Signal	No
Activity Generator	Apartments
Stop Placement	Farside
Stop Type	Curb
Stop Lighting	Yes
Stop Shade	Yes
Pedestrian Sidewalk	Yes
Ped Crosswalk	No
ADA ROW	No
Notes: ADA ROW	
ADA Pad	No
ADA Ramp	Yes
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	No
Notes: ADA Other	
Notes	

Picture 1

Picture 2

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Laurelwood Apartments **Route Number:** Route 3 - Inbound **Submitted:** 08/29/2018 2:09 PM	**Lat:** 36.2094303081149 **Lon:** -83.2879002672464

Street Parking	No
Street MPH	20
Intersection Signal	No
Activity Generator	Apartments, Cumberland Glass
Stop Placement	Farside
Stop Type	Curb
Stop Lighting	No
Stop Shade	No
Pedestrian Sidewalk	Yes
Ped Crosswalk	No
ADA ROW	No
Notes: ADA ROW	
ADA Pad	No
ADA Ramp	Yes
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	No
Notes: ADA Other	
Notes	

Picture 1	Picture 2
	

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: VBI **Route Number:** Route 3 - Inbound **Submitted:** 08/29/2018 2:23 PM	**Lat:** 36.2077566935087 **Lon:** -83.2995272242309

Street Parking	No
Street MPH	N/A
Intersection Signal	No
Activity Generator	Volunteer Blind Industries
Stop Placement	Midblock
Stop Type	Bus Pull Out
Stop Lighting	No
Stop Shade	No
Pedestrian Sidewalk	Yes
Ped Crosswalk	No
ADA ROW	Yes
Notes: ADA ROW	Private
ADA Pad	Yes
ADA Ramp	No
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	No
Notes: ADA Other	
Notes	

Picture 1

Picture 2

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Food City (Sandstone Drive) **Route Number:** Route 3 - Inbound **Submitted:** 08/29/2018 2:33 PM	**Lat:** 36.2080813246185 **Lon:** -83.324259370643

Street Parking	No
Street MPH	N/A
Intersection Signal	No
Activity Generator	Food City, Shops
Stop Placement	Midblock
Stop Type	Curb
Stop Lighting	Yes
Stop Shade	Yes
Pedestrian Sidewalk	Yes
Ped Crosswalk	No
ADA ROW	No
Notes: ADA ROW	
ADA Pad	Yes
ADA Ramp	Yes
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	No
Notes: ADA Other	
Notes	

Picture 1	Picture 2
	

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: Walter Ridge Apartments **Route Number:** Route 2 - Outbound **Submitted:** 08/30/2018 2:16 PM	**Lat:** 36.2210311135614 **Lon:** -83.3104484249682

Street Parking	No
Street MPH	N/A
Intersection Signal	No
Activity Generator	Apartments
Stop Placement	Midblock
Stop Type	Curb
Stop Lighting	No
Stop Shade	Yes
Pedestrian Sidewalk	No
Ped Crosswalk	No
ADA ROW	Yes
Notes: ADA ROW	Private
ADA Pad	No
ADA Ramp	No
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	No
Notes: ADA Other	
Notes	Manhole

Picture 1	Picture 2
	

Lakeway Transit RTA Bus Stop Data Collection Form

Stop Name: College Square Mall **Route Number:** Route 1 - Inbound **Submitted:** 08/31/2018 10:13 AM	**Lat:** 36.21961855 **Lon:** -83.26094809

Street Parking	No
Street MPH	N/A
Intersection Signal	No
Activity Generator	Mall, Movie Theatre
Stop Placement	Midblock
Stop Type	Bus Pull Out
Stop Lighting	Yes
Stop Shade	No
Pedestrian Sidewalk	Yes
Ped Crosswalk	No
ADA ROW	No
Notes: ADA ROW	
ADA Pad	Yes
ADA Ramp	No
ADA Terrain	Level
ADA Utilities Obstacles	No
Notes: ADA Utilities Obstacles	
ADA Other	Yes
Notes: ADA Other	No ramp at loading zone
Notes	Fewer interactions than front entrance

Picture 1

Picture 2

Order/Reservation confirmation # - 25839407
daniel cassedy

Print this page Back to your order

Amount paid to date: $0.00

Rental equipment confirmation # 25839407

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17 hours of use requested, subject to availability.

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