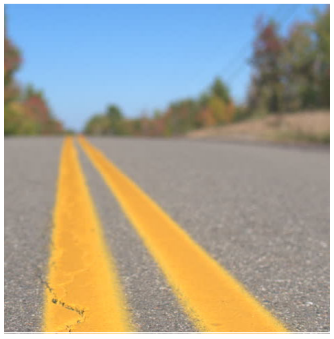

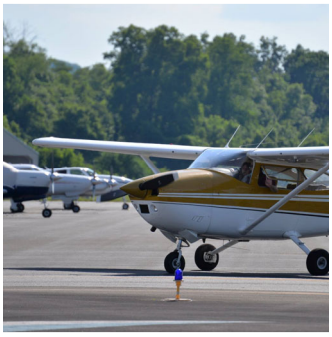

2045 MTP

Metropolitan Transportation Plan

LAKEWAY AREA

January 2021

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Chapter 1 - Introduction

The Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) 2045 Metropolitan Transportation Plan (MTP) provides an investment framework for the region's transportation system over the next 25 years. Transportation plays an important role in a region's quality of life, affecting issues such as land use, employment, economic development, human and natural environment, and housing and community development. This plan identifies regional transportation needs in the Lakeway region and the goals, objectives, and strategies for addressing those needs.

1.1 Lakeway Area Metropolitan Transportation Planning Organization

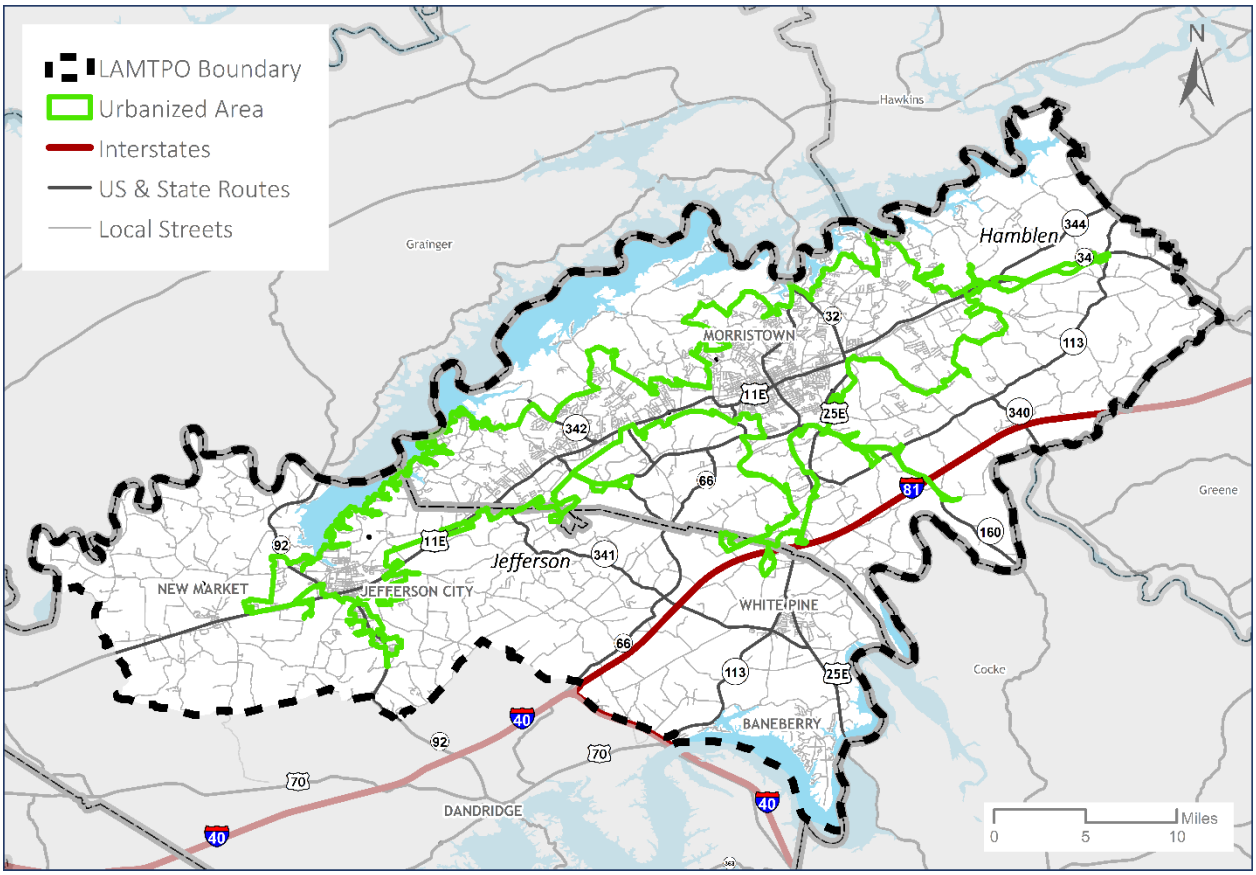
Metropolitan Planning Organizations

Federal law requires urbanized areas (UZAs) with a population of 50,000 or greater to create a Metropolitan Planning Organization, or MPO. The MPO serves as a transportation policy-making organization with representatives from local, state, and federal governments. Through its policy-making function, the MPO ensures that a continuing, cooperative, and comprehensive performance-based and multimodal planning process underpins federally funded projects and programs in the region. An executive board, made up of local elected officials, transit operators, and state and federal agency representatives, sets the overall policy direction for the organization, while a technical advisory committee, consisting of staff from member and stakeholder agencies, coordinates with LAMTPO staff to prepare transportation plans and programs. There are 11 MPOs in Tennessee.

Lakeway Area Metropolitan Transportation Planning Organization

Designated in 2002 by the U.S. Census Bureau as an urbanized area, the Lakeway Area Metropolitan Transportation Planning Organization includes portions of Hamblen and Jefferson Counties, including the cities of Morristown, Jefferson City, and White Pine, and covers 313.5 square miles in eastern Tennessee (Figure 1-1). The most recent census data shows 91,497 people living in the LAMTPO MPA boundary. Major roadways in the region include Interstate 81 (I-81), U.S. Highway 11E (Andrew Johnson Highway and Morris Boulevard), U.S. Highway 25E (Davy Crockett Parkway), Veterans Parkway, State Route 160, State Route 113, and State Route 92.

Figure 1-1. Lakeway Area Metropolitan Transportation Planning Organization



MPOs are required to prepare and update a metropolitan transportation plan every five years in air quality attainment areas and every four years in air quality non-attainment and maintenance areas. While the LAMTPO region is not currently classified as a non-attainment or maintenance area, its MTP is updated on the four-year cycle in coordination with the Knoxville Regional Transportation Planning Organization (TPO). An MTP is a fiscally constrained plan that addresses a minimum 20-year planning horizon for the regional transportation system and must contain the following federally required elements (23 CFR § 450.324):

- The current and projected transportation demand of persons and goods in the metropolitan planning area over the period of the transportation plan;
- Existing and proposed transportation facilities (including major roadways, public transportation facilities, intercity bus facilities, multimodal and intermodal facilities, nonmotorized transportation facilities, and intermodal connectors);
- A description of the performance measures and performance targets used in assessing the performance of the transportation system;
- A system performance report and subsequent updates evaluating the condition and performance of the transportation system;
- Progress achieved by the metropolitan planning organization in meeting the performance targets in comparison with system performance recorded in previous reports, including baseline data;

- Operational and management strategies to improve the performance of existing transportation facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods;
- Assessment of capital investment and other strategies to preserve the existing and projected future metropolitan transportation infrastructure, provide for multimodal capacity increases based on regional priorities and needs, and reduce the vulnerability of the existing transportation infrastructure to natural disasters;
- Transportation and transit enhancement activities, including consideration of the role that intercity buses may play in reducing congestion, pollution, and energy consumption in a cost-effective manner and strategies and investments that preserve and enhance intercity bus systems, including systems that are privately owned and operated;
- Design concept and design scope descriptions of all existing and proposed transportation facilities in enough detail to develop cost estimates;
- A discussion of types of potential environmental mitigation activities and potential areas to carry out these activities;
- A financial plan that demonstrates how the adopted transportation plan can be implemented; and
- Pedestrian walkway and bicycle transportation facilities.

The 2045 Metropolitan Transportation Plan is the most recent MTP, providing an update on regional transportation infrastructure and programs for the next 20 years. Following the elements above, the plan addresses all aspects of the existing transportation system, including major networks and their functionality. A travel demand model is used to evaluate the transportation system and provide a technical analysis of its performance. This analysis identifies locations in need of improvement and measures the effectiveness of proposed improvements. Travel demand modeling for LAMTPO is undertaken by the Knoxville Regional TPO.

Chapter 2 - Goals, Objectives, and Performance Measures

In 2015, the federal Fixing America's Surface Transportation (FAST) Act was passed, building on the previous surface transportation legislation, Moving Ahead for Progress in the 21st Century (MAP-21). Importantly, the FAST Act provided funding certainty over five years and reaffirmed the basic planning requirements defined in MAP-21, including national transportation planning goals, metropolitan transportation planning factors, and performance-based planning. The seven national planning goals (23 USC §150) serve as the basis for the federal performance management measures, and are organized around the following issues:

- Safety – Achieve a significant reduction in traffic fatalities and serious injuries on all public roads;
- Infrastructure Condition – Maintain the highway infrastructure asset system in a state of good repair;
- Congestion Reduction – Achieve a significant reduction in congestion on the National Highway System (NHS);
- System Reliability – Improve the efficiency of the surface transportation system;
- Freight Movement and Economic Vitality – Improve the National Highway Freight Network, strengthening the ability of rural communities to access national and international trade markets, and supporting regional economic development;
- Environmental Sustainability – Enhance the performance of the transportation system while protecting and enhancing the natural environment; and
- Efficient Project Delivery – Accelerate project completion by eliminating delays in the project development and delivery process.

Additionally, the FAST Act lists ten federal planning factors that must be incorporated into the metropolitan transportation planning process (Table 2-1).

Table 2-1. Federal Metropolitan Planning Factors

	Federal Metropolitan Planning Factors
1	Support economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
2	Increase the safety of the transportation system for motorized and non-motorized users.
3	Increase the security of the transportation system for motorized and non-motorized users.
4	Increase the accessibility and mobility of people and for freight.
5	Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and locally planned growth and economic development patterns.
6	Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
7	Promote efficient system management and operation.

Table 2-1. Ten Federal Metropolitan Planning Factors (cont.)

	Federal Metropolitan Planning Factors
8	Emphasize the preservation of the existing transportation system.
9	Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation.
10	Enhance travel and tourism.

Source: 23 CFR § 450.306

Consistent with the prior LAMTPO plan, the 2045 MTP includes two additional, regionally identified planning factors.

- Improve livability and sustainability
- Reduce the impacts of climate change

Both factors build on and enhance the federal planning factors, reinforcing the need to consider the local, global, and intergenerational impacts of transportation investments.

2.1 Statewide Goals and Objectives

In 2015, the Tennessee Department of Transportation (TDOT) issued the statewide 25-Year Long-Range Transportation Policy Plan. Complementing the national planning goals and planning factors, TDOT's long-range plan highlights seven guiding principles.

- Preserve and manage the existing system
- Support the state's economy
- Maximize safety and security
- Provide for the efficient movement of people and freight
- Build partnerships for sustainable and livable communities
- Protect natural, cultural, and environmental resources
- Emphasize financial responsibility

Like the national planning goals and planning factors, the state's guiding principles provide a clear framework and support for regional transportation planning. Moreover, key policy recommendations from TDOT's 25-year policy plan with direct implications for MPOs include:

- Increase efforts in working with city, county, and regional organizations relative to land use and transportation to proactively plan for and accommodate future transportation demands;
- Make available the latest planning data and tools and provide these resources to the department's many planning partners;
- Increase center-to-center communication between Traffic Management Centers (TMCs) and incident management partners to facilitate greater day-to-day coordination and cooperation;

- Enhance the sharing of safety-related data among and between all agencies including local and regional governments;
- Enhance partnerships further with local and regional agencies to better evaluate behavioral and engineering safety needs;
- Explore and implement emerging technologies (e.g., Intelligent Transportation Systems (ITS), Transportation Systems Management and Operations (TSM&O), Active Transportation and Demand Management (ATDM), etc.) that enhance safety and security for all modes of transportation;
- Promote asset management as a means of maintaining and preserving Tennessee's transportation infrastructure in a state of good repair (i.e., to desired target conditions);
- Work towards establishing policies and procedures for traffic impact analysis requirements for reviewing development proposals seeking state highway access approval;
- Move forward with the development of a Comprehensive Statewide Access Management Program for the state's highway system;
- Develop a Multimodal Access Policy and Program, which will include internal guidelines and training. To expand on the Multimodal Access Policy, TDOT will work to provide technical resources for local municipalities;
- Support a program for multimodal freight investments (e.g., first mile/last mile connections-air, water, rail; bottlenecks; safety; ITS; truck parking; etc.);
- Develop a new Statewide Strategic Transit Plan for Tennessee; and
- Adopt performance measures specific to monitoring congestion (e.g., speed, delay, throughput, travel time reliability, etc.).

Finally, the 2020 Tennessee Strategic Highway Safety Plan (SHSP) adopted a "Toward Zero Deaths" vision statement, underscoring the need to develop safety strategies through a data-driven process. Accordingly, emphasis areas in the SHSP address:

- Data collection and analysis;
- Driver behavior;
- Infrastructure improvements;
- Vulnerable road users;
- Operational improvements; and
- Motor carrier safety.

2.2 Metropolitan Transportation Planning Goals and Objectives

To meet the national transportation goals and planning factors and complement state principles and policies, the MTP carries forward the goals and objectives identified in the previous LAMTPO long-range transportation plan. details the goals and objectives that have been adopted by the LAMTPO Executive Board. The purpose of the MTP is to identify strategies and solutions to help achieve these goals and objectives and help deliver a safe, efficient, and accessible transportation system that supports growth, development, and the quality of life across the region. Table 2-3 illustrates how the MTP goals relate to the federal planning factors.

Table 2-2. 2045 Lakeway MTPO Goals and Objectives

Goals	Objectives
Provide for an Efficient Transportation System	Coordinate land use and transportation activities to ensure their compatible relationship.
	Preserve and maintain the existing transportation infrastructure.
	Cooperate with state and federal agencies to meet or exceed performance measure targets.
Improve the Safety of the Transportation System	Identify the most effective strategies for reducing crashes.
	Improve the relationship between motorized and non-motorized users by further developing the transportation network for bicycle and pedestrian uses.
	Support traffic safety education and traffic enforcement efforts.
	Cooperate with state and federal agencies to meet or exceed performance measure targets.
Promote Security within the Transportation System	Provide adequate fixed route and demand response services within the LAMTPO study area.
	Identify and prioritize critical facilities within the transportation system.
	Promote technologies, such as ITS, proper street lighting, and surveillance initiatives that increase security.
	Cooperate with state and federal agencies to meet or exceed performance measure targets.
Maintain and Improve the Quality of the Natural Environment	Implement transportation policies and programs that reduce vehicle emissions and the demand for energy.
	Increase public transportation ridership
	Cooperate with state and federal agencies to meet or exceed performance measure targets
Improve Mobility of Persons and Freight	Provide a multimodal transportation system that supports safe, efficient, and convenient travel options for the movement of people and goods.
	Reduce congestion and improve access to jobs, markets, and services.
	Increase the multimodal traffic flow by separating the rail network from the roadway, bicycle, and pedestrian transportation network.
	Cooperate with state and federal agencies to meet or exceed performance measure targets.
Effectively Manage Financial Resources for the	Consider cost (capital, operating, and maintenance) constraints in selecting the highest priority short and long-range improvements and programs.
	Utilize existing transportation facilities and rights-of-way efficiently to provide improved levels of service at minimal capital cost.

Table 2-2. 2045 Lakeway MTPO Goals and Objectives (cont.)

Goals	Objectives
Environmental Sustainability	Coordinate land use and transportation activities to ensure their compatible relationship.
	Preserve and maintain the existing transportation infrastructure.
	Utilize existing transportation facilities and rights-of-way efficiently to provide improved levels of service at minimal capital costs.
	Cooperate with state and federal agencies to meet or exceed performance measure targets.
System Reliability	Preserve and maintain the existing transportation infrastructure.
	Promote technologies, such as ITS, proper street lighting, and surveillance initiatives that increase security.
	Utilize existing transportation facilities and rights-of-way efficiently to provide improved levels of service at minimal capital costs.
	Cooperate with state and federal agencies to meet or exceed performance measure targets.
Congestion Reduction	Reduce congestion and improve access to jobs, markets, and services.
	Increase the multimodal traffic flow by separating the rail network from the roadway, bicycle, and pedestrian transportation network.
	Utilize existing transportation facilities and rights-of-way efficiently to provide improved levels of service at minimal capital costs.
	Cooperate with state and federal agencies to meet or exceed performance measure targets.
Infrastructure Conditions	Preserve and maintain the existing transportation infrastructure.
	Promote technologies, such as ITS, proper street lighting, and surveillance initiatives that increase security.
	Consider costs (capital, operation, maintenance) constraints in selecting the highest priority short- and long-range improvements and programs.
	Improve levels of service at minimal capital costs.
	Cooperate with state and federal agencies to meet or exceed performance measure targets.

Table 2-3. Relationship of 2045 MTP Goals to Federal Planning Factors

2045 MTP Planning Goals	Federal Planning Factors									
	Support Economic Vitality	Improve Safety	Increase Security	Improve Mobility Options	Conserve Energy & Environment	Promote Multimodal Integration	Enhance Management & Operations	Preserve Existing System	Improve Resiliency	Enhance Travel & Tourism
Provide for an Efficient Transportation System	✓			✓	✓	✓	✓	✓	✓	✓
Improve the Safety of the Transportation System		✓								✓
Promote Security within the Transportation System			✓						✓	✓
Maintain and Improve the Quality of the Natural Environment					✓	✓	✓	✓		✓
Improve Mobility of Persons and Freight	✓			✓		✓	✓	✓	✓	
Effectively Manage Financial Resources for the Transportation Network	✓					✓	✓	✓		
Reduce Project Delivery Delays	✓	✓	✓	✓	✓		✓	✓		✓
Freight Movement and Economic Vitality	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Environmental Sustainability		✓	✓	✓	✓	✓		✓		
System Reliability	✓	✓	✓	✓		✓	✓	✓	✓	✓
Congestion Reduction	✓			✓	✓	✓	✓	✓		✓
Infrastructure Conditions	✓	✓	✓	✓	✓	✓	✓	✓		✓

2.3 Performance-Based Planning

The federal FAST Act extends the performance management approach and performance-based planning and programming requirements established in 2012 by MAP-21. Therefore, MPO plans must also include a system performance report with subsequent updates to evaluate the condition and performance of the transportation system with respect to the established performance target goals. The Fast Act ended on September 30, 2020 and was extended another year to 2021, however, it is anticipated that the next surface transportation authorization act will continue the requirements for performance-based planning.

The performance measures are used to evaluate the goals and objectives that the MPO has developed for the MTP. Performance measures and their associated targets rely on technical analysis and data and support the comparison of alternative strategies and performance tracking. The U.S. Department of Transportation, through the Final Planning Rule, established national performance measures in 2016. The performance measures are grouped into safety, bridge and pavement conditions, reliability, emissions reduction, and transit.

- Safety
    - Number of fatalities
    - Rate of fatalities per 100 million vehicle miles traveled (VMT)
    - Number of serious injuries
    - Rate of serious injuries per 100 million VMT
    - Number of non-motorized fatalities and non-motorized serious injuries
- Bridge and Pavement Conditions
    - Percentage of pavement of the Interstate System in good condition
    - Percentage of pavement of the Interstate System in poor condition
    - Percentage of pavement of the non-Interstate NHS in good condition
    - Percentage of pavement of the non-Interstate NHS in poor condition
    - Percentage of NHS bridges classified as in good condition
    - Percentage of NHS bridges classified as in poor condition
- Reliability
    - Percentage of person-miles traveled on the Interstate that are reliable
    - Percentage of person-miles traveled on the non-Interstate NHS that are reliable
    - Truck Travel Time Reliability (TTTR) Index
- Emissions Reduction
    - Total emission reductions for applicable criteria pollutants
- Transit
    - Total number of fatalities
    - Fatality rate per total vehicle revenue miles (VRM) by mode
    - Total number of injuries
    - Injury rate per total VRM by mode
    - Total number of safety events
    - Safety event rate per total VRM by mode
    - Mean distance between major mechanical failures by mode

Establishing the required 4-year performance measure targets can be satisfied by either agreeing to plan and program projects so that they contribute toward the accomplishment of the relevant state DOT target for that performance measure or committing to a quantifiable target for that performance measure for the metropolitan planning area. LAMTPO has agreed to performance targets set by TDOT for consistency and efficiency in meeting federal requirements.

Separate from the more recent federal performance planning and programming initiatives, MPOs have long tracked performance measures in their MTPs and many include common measures such as total fatalities, total serious injuries, and hours of delay. LAMTPO's past performance measures are reported with the region's planning goals in Table 2-4.

Table 2-4. Planning Goals Measured by Current LAMTPO Performance Measures

Planning Goals	LAMTPO Performance Measures							
	Crash Data (5 Years)					Annual Hours Roadway Delay	Percent of Urban Roadways with Sidewalks	Tons of NO_x and VOCs reduced by CMAQ-funded (2- and 4-year period)
	Total Fatalities	Fatality Rate per 100M VMT	Total Serious Injuries	Serious Injury Rate per 100M VMT	Total Non-Motorized User Fatalities and Serious Injuries			
Provide for an Efficient Transportation System						✓		✓
Improve the Safety of the Transportation System	✓	✓	✓	✓	✓		✓	✓
Promote Security within the Transportation System								
Maintain and Improve the Quality of the Natural Environment							✓	
Improve Mobility of Persons and Freight						✓	✓	
Effectively Manage Financial Resources for the Transportation Network							✓	
Reduce Project Delivery Delays								
Freight Movement and Economic Vitality						✓	✓	
Environmental Sustainability								✓
System Reliability						✓	✓	✓
Congestion Reduction						✓	✓	
Infrastructure Conditions							✓	

Table 2-5 summarizes LAMTPO's current transportation system performance based on the selected measures. This data will be monitored regularly and compared in subsequent MTPs to help track the LAMTPO region's progress in meeting the goals for the region's transportation system, in conjunction with the federal performance measures and targets established by the state.

Table 2-5. LAMTPO Current Transportation System Performance Report

Performance Measure	Current Reported Value
Crash statistics for LAMTPO, based on the most recent five years of data (2015-2019)	51 fatalities
	1.16 fatalities per 100 million VMT
	302 serious injuries
	6.91 serious injuries per 100 million VMT
	5 fatalities and 19 serious injuries to persons walking, bicycling, or using another non-motorized mode of travel
Annual hours of roadway delay in the LAMTPO region, estimated by the travel demand model	6,534 annual hours of delay
Percent of federal-aid roads within urban areas that have sidewalks	14%
Tons of NO_x and VOCs reduced by CMAQ-funded projects	LAMTPO did not receive any CMAQ funds during the reporting period

Chapter 3 - Existing Conditions and System Performance

This chapter provides an overview of the existing conditions within the Lakeway region, to gain a better understanding of the current demographics and transportation system. The Lakeway Metropolitan Transportation Planning Organization will be described in two different ways within the chapter. The "Lakeway region" refers to the area that falls within the Lakeway MTPO boundary, including all of Hamblen County and a portion of Jefferson County. The "Lakeway area" refers to the entire counties of Hamblen and Jefferson. The existing conditions will evaluate the following areas:

- Existing land use;
- Trends in population;
- Trends in employment;
- Roadway network;
- Freight transportation network;
- Bicycle and pedestrian network; and
- Transit network.

3.1 Lakeway Region Growth and Development

Population and employment trends are two key factors that will impact the Lakeway region's future transportation system. As population and employment fluctuate, the demand for transportation will also change and require new policies, programs, facilities, and services. Monitoring regional population and employment growth and adjusting plans as needed ensures that the transportation system will support the community's long-range vision.

Land Use

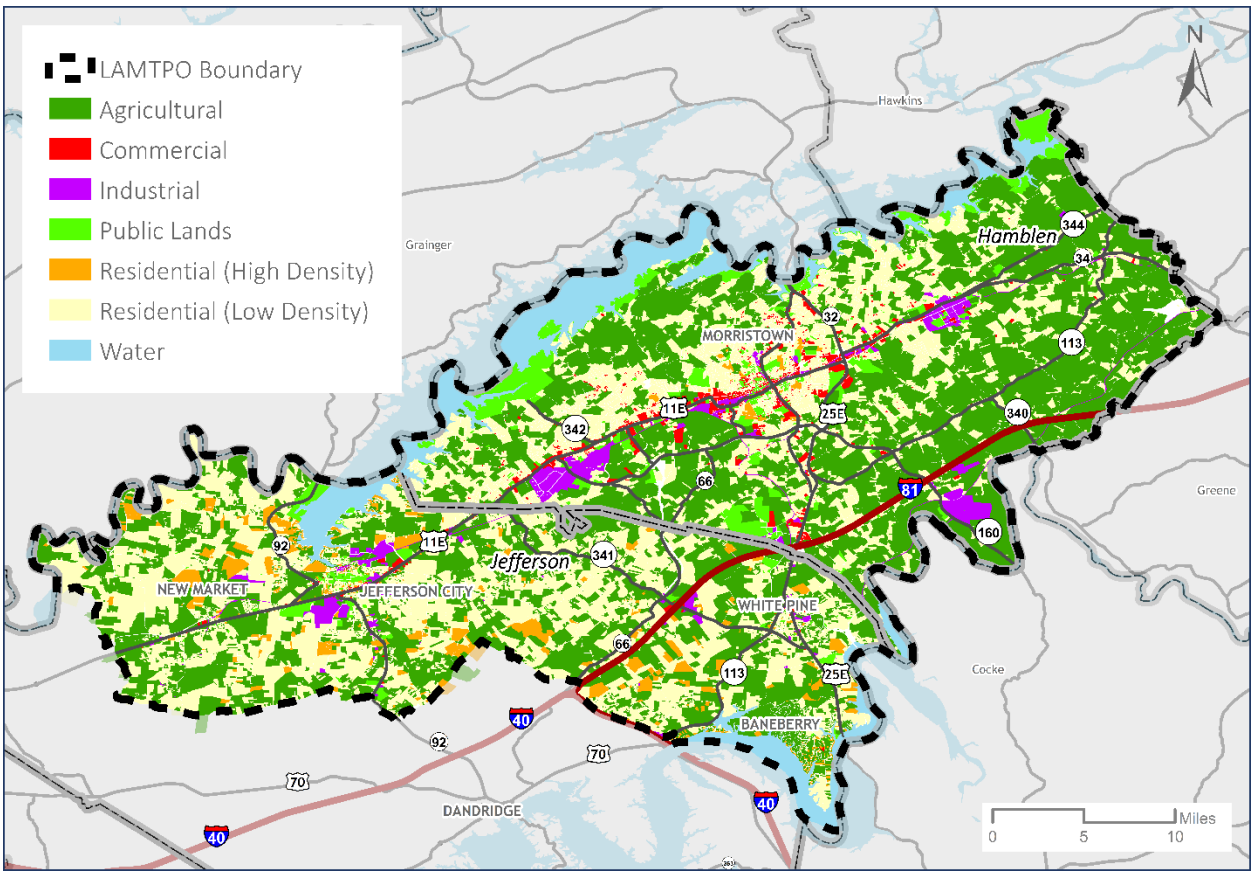
The LAMTPO 2045 MTP does not focus exclusively on the region's existing urban areas but also includes areas anticipating growth over the next 25 years. The Lakeway region contains Hamblen County and part of Jefferson County, including the urban areas of Morristown in Hamblen County and Jefferson City in Jefferson County. The Lakeway region totals 313.5 square miles, with 43.3 square miles (13.8 percent of the area) in the urbanized areas. Looking at the Lakeway region's existing land use, most property is classified as either agriculture (135.7 square miles or 43.3 percent of the total land) or low-density residential (99.8 square miles or 31.8 percent of the total land). Table 3-1 illustrates the total acreage of each land use with the Lakeway region, with Figure 3-1 illustrating the existing land use within the Lakeway region. It should be noted that some of the parcels within the Lakeway region fall both within and outside the MTPO boundary, particularly agricultural lands in Jefferson County.

Table 3-1. Lakeway Region Existing Land Use

Land Use	Hamblen (Acres)	Hamblen (Percentage)	Jefferson MTPO Portion (Acres)	Jefferson MTPO Portion (Percentage)
Agriculture	54,921.1	56.7%	34,478.1	43.7%
Commercial	2,873.4	3.0%	373.0	0.5%
Industrial	3,047.7	3.1%	1,324.2	1.7%
Public Lands	7,187.8	7.4%	1,517.8	1.9%
Residential (High-Density)	372.8	0.4%	5,442.9	6.9%
Residential (Low-Density)	28,515.9	29.4%	35,817.5	45.4%
Total	**96,918.7**	**100.0%**	**78,953.5**	**100.0%**

Source: LAMTPO, 2020

Figure 3-1. Lakeway Region Existing Land Use



Source: LAMTPO, 2020

Population

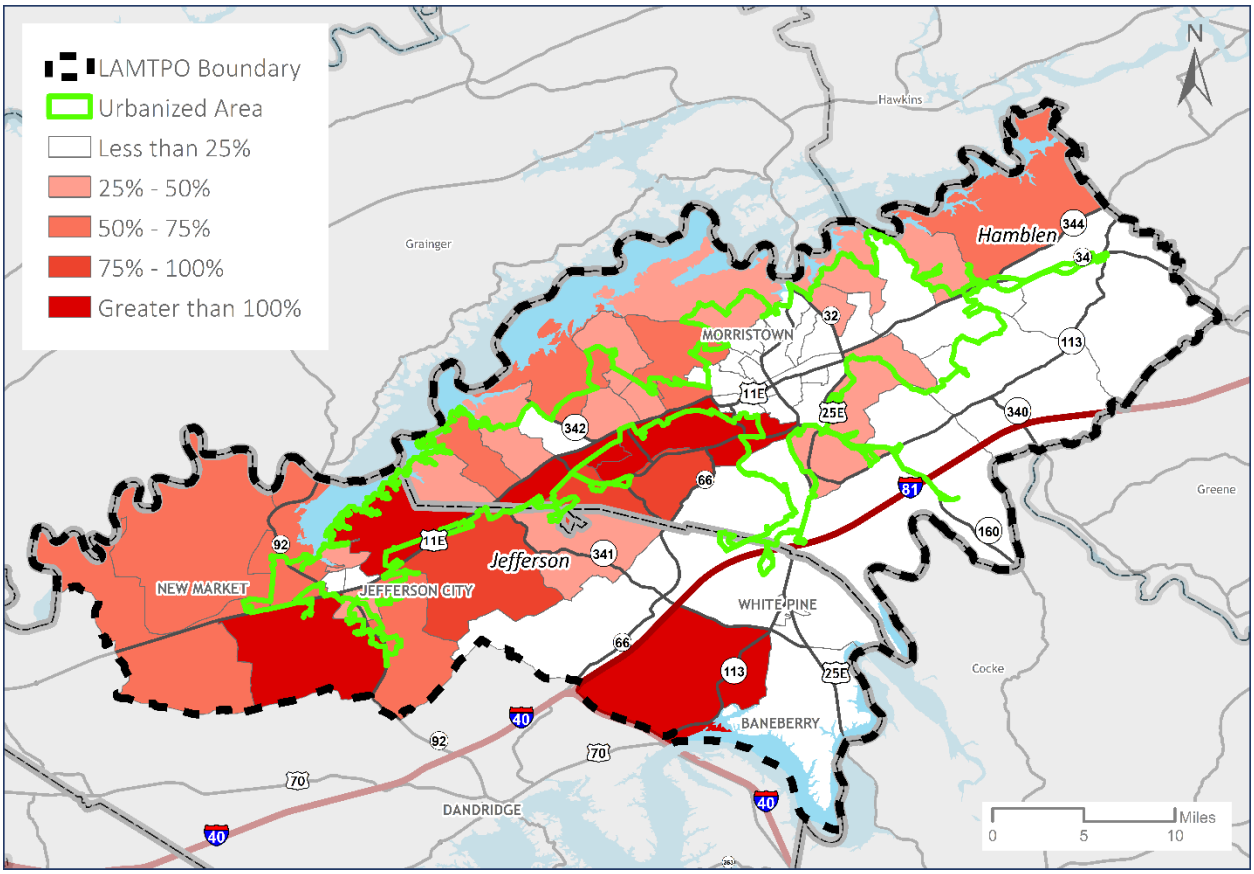
The Lakeway region has a population of 91,497, according to the U.S. Census Bureau's 2018 five-year annual population estimates. This represents a 2.2 percent increase in population since the 2010 Census (Table 3-2 and Figure 3-2). Within the Lakeway region, the largest age cohort is ages 55-59 (7.2 percent of the population), as shown in Figure 3-3. Younger and older populations can have unique transportation needs. In the Lakeway region, these individuals make up 42.6 percent of the population, with most of them (59.4 percent) under the age of 19.

Table 3-2. Lakeway Region Change in Population, 2010 to 2018

County	2010	2018	Change (2010-2018)	% Change (2010 -2018)
Hamblen	62,544	63,465	921	1.5%
Jefferson (MTPO Portion)	26,973	28,032	1,059	3.9%
Total	**89,517**	**91,497**	**1,980**	**2.2%**

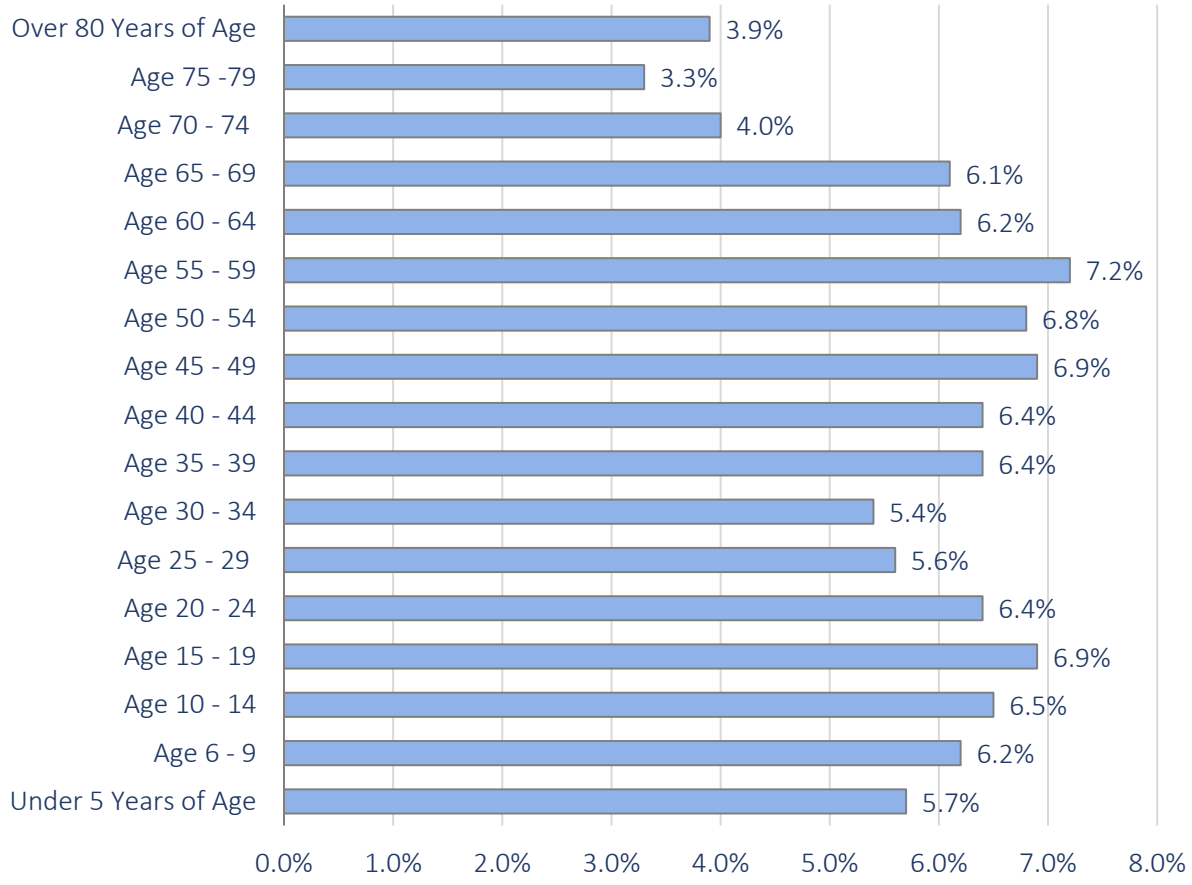
Source: American Community Survey, 2018

Figure 3-2. Lakeway Region Change in Population, 2010 to 2018



Source: American Community Survey, 2018

Figure 3-3. Lakeway Region Population by Age Distribution, 2018



Source: American Community Survey, 2018

Employment

Within the Lakeway area, there was a total of 48,190 jobs according to the 2010 Census. By 2018, employment increased to 53,466, a 10.9 percent growth rate since 2010 (Table 3-3).

Table 3-3. Lakeway Area Change in Employment, 2010 to 2018

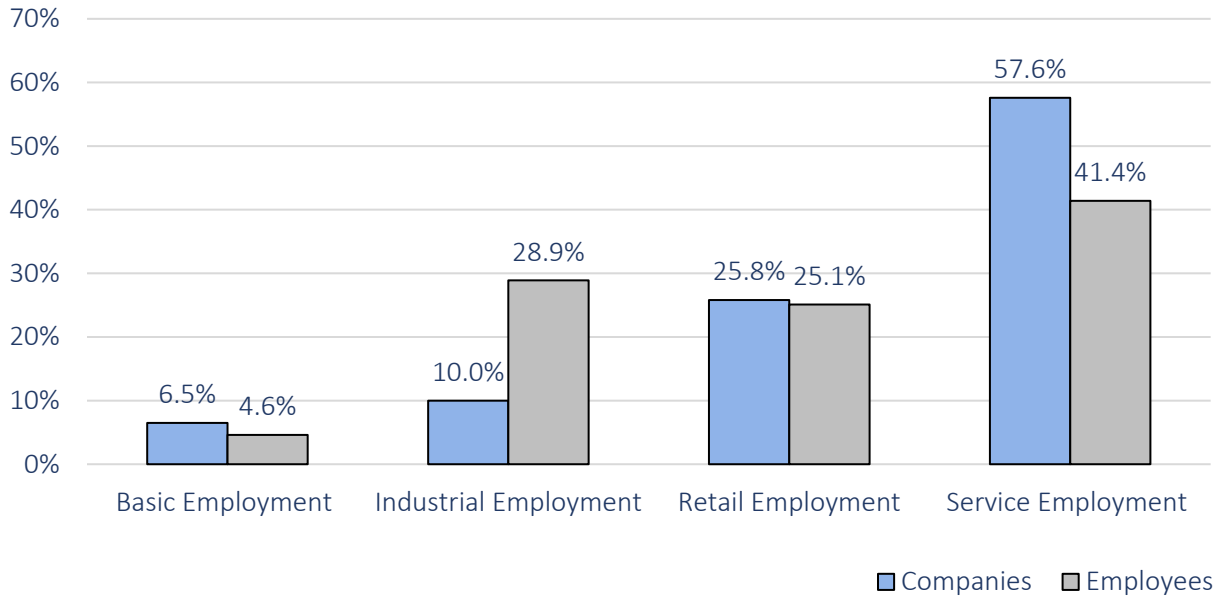
County	2010	2018	Change (2010-2018)	% Change (2010 -2018)
Hamblen	33,268	35,495	2,227	6.7%
Jefferson County	14,922	17,971	3,049	20.4%
Total	**48,190**	**53,466**	**5,276**	**10.9%**

Source: Woods & Poole, 2018

Infogroup provides data on businesses, such as location, company name, sector type, and number of employees. Within the 2018 Infogroup dataset, there are four different employment sectors: basic (forestry, fishing, mining, utilities, and construction), industrial, retail, and service. In the Lakeway region, 41.1 percent of all employment is in the service sector.

Figure 3-4 shows the percentage of companies and employees by sector.

Figure 3-4. Lakeway Region Companies and Employment by Sector, 2018



Source: Infogroup, 2018

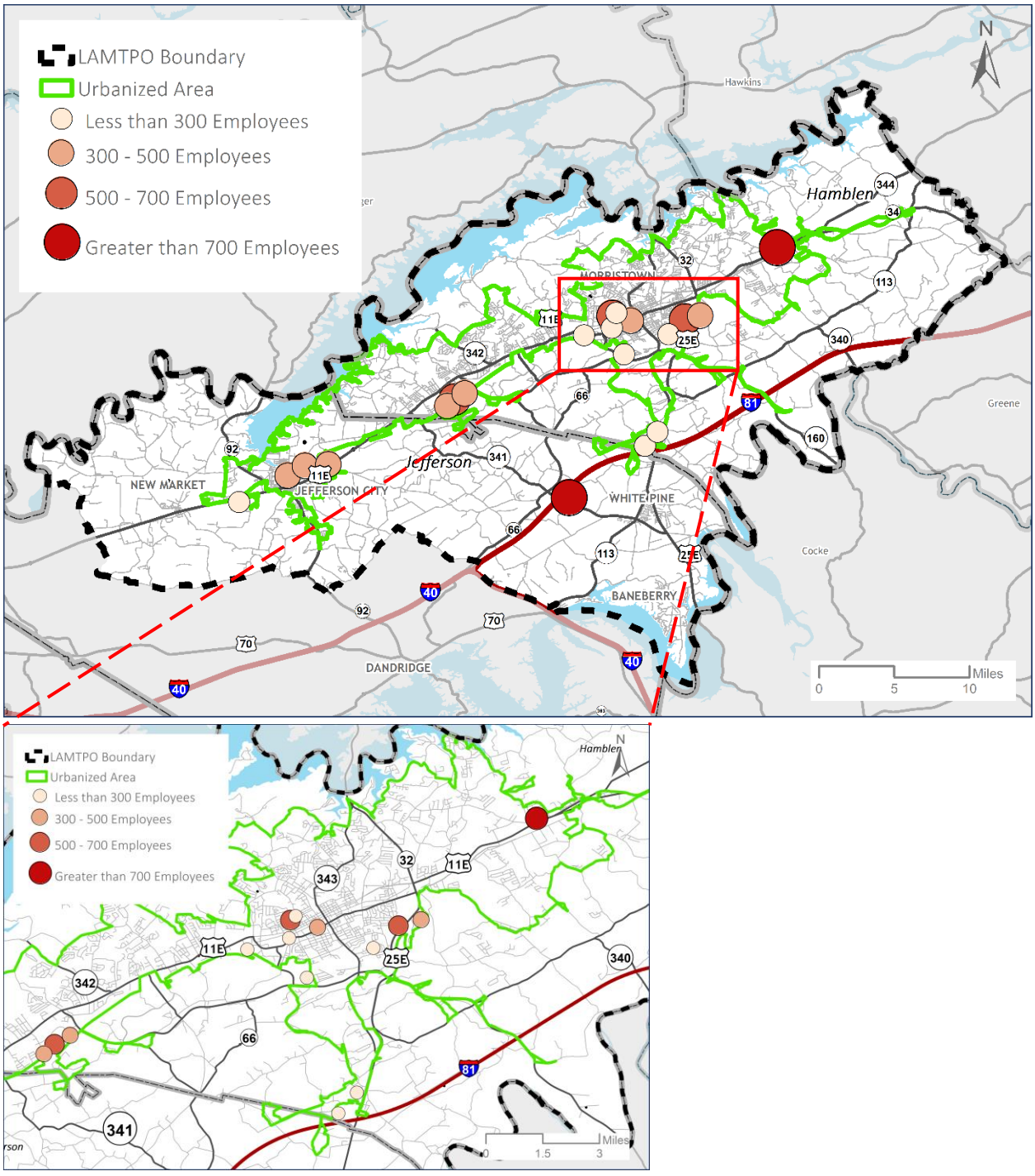
The region's top 20 largest employers are shown in Table 3-4, with their locations illustrated in Figure 3-5. Since the MTPO's last long range plan in 2017, there are five new employers in the top 20: Carson Newman University, Renold Jeffrey, Morristown Drivers SVC Inc., Wallace Hardware, and Westin.

Table 3-4. Lakeway Region Top 20 Largest Employers

Company Name	Number of Employees	Company Name	Number of Employees
Mahle Industries Inc.	1,560	Carson Newman University	320
Old Dominion Freight Line	1,001	Walmart (Jefferson City)	301
Walters State Community College	950	Jefferson Memorial Hospital	300
Nashua Corp.	593	Renold Jeffrey	300
Morristown-Hamblen Healthcare System / Covenant Health	543	Koch Food Inc.	300
J-Tekt Automotive	501	Otics USA	284
Walmart (Morristown)	500	Wallace Hardware	250
Team Technologies Inc	400	Morristown Drivers SVC Inc.	250
Rich Product Corp.	400	Wallace Hardware	250
Health Star Physicians	375	Westin	248

Source: Infogroup, 2018

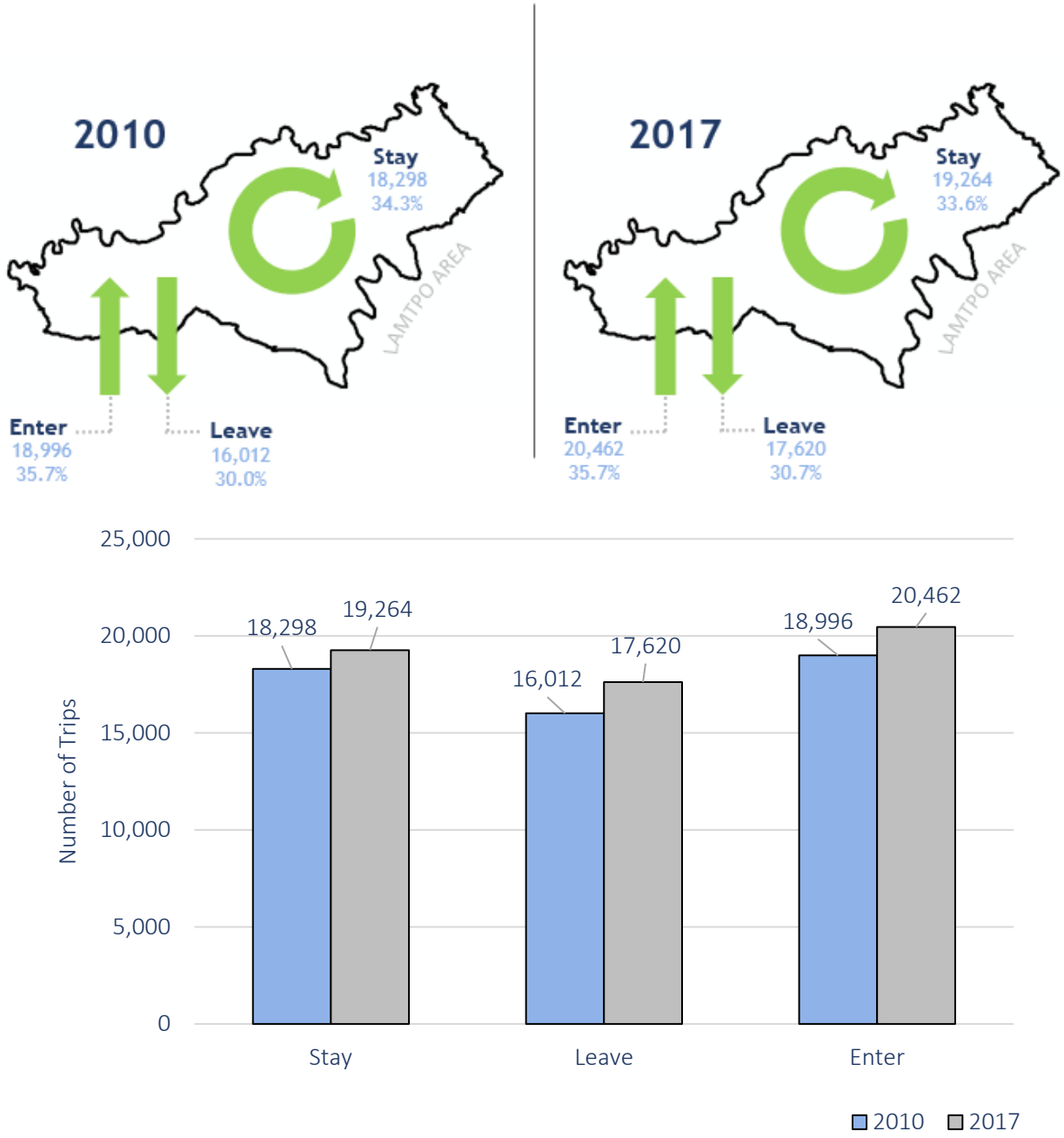
Figure 3-5. Lakeway Region Top 20 Largest Employers



Source: Infogroup, 2018

A little over 19,000 people, approximately 34percent, living in the Lakeway region also work within the region, while 17,620 people, approximately 31%, commute outside of the Lakeway region for employment. Figure 3-6 shows the commuting patterns for the Lakeway region for 2010 and 2017.

Figure 3-6. Lakeway Region Commuting Patterns, 2010 and 2017



Sources: LEHD, 2010; LEHD, 2017

3.2 Roadway Network

This section of the plan provides an overview of the existing roadway network within the Lakeway region. The network is evaluated based on the characteristics of the roadways, such as the functional classification, number of lanes, speed limit, and daily traffic volume. Along with these characteristics, this section also identifies congested roadways as well as bottleneck locations (i.e., traffic chokepoints).

The Lakeway region has approximately 1,154 miles of local streets, collector streets, arterial streets, and interstates, which includes several significant transportation routes such as I-81, U.S. Highway 11E, U.S. Highway 25E, State Route 160, State Route 113, and State Route 92. Each of these roadways plays a vital role in providing connections that allow for the movement of people and freight between urban areas such as Morristown, Jefferson City, and White Pine and destinations beyond the region.

National Highway System

The National Highway System (NHS), as identified by the Federal Highway Administration (FHWA), contains approximately 161,000 miles of roadway network nationally. These roadways consist of the Interstate Highway System and other roadways that are considered critical in supporting the country's economy, national defense, and mobility. The NHS was developed by FHWA in coordination with local, regional (including MPOs), and state officials. The NHS was most recently updated following MAP-21, which was passed by Congress in 2012.

The Lakeway region's designated NHS includes the following.

I-81 – I-81 is the only interstate that runs through the Lakeway region. It provides a vital connection between northeast states and Interstate 40 (I-40), a critical east-west Interstate that spans the entire state of Tennessee and almost the entire U.S. Major cities in Tennessee are connected by these interstates, including Knoxville, the Tri-Cities, Nashville, and Memphis. I-81 makes up 4.6% percent (17.0 miles) of the roadway system within the Lakeway region.

U.S. Highway 25E – U.S. Highway 25E, also known as S. Davy Crockett Parkway in portions, is one of the principal arterial highways that run through the Lakeway region. U.S. Highway 25E extends from Newport, through the Lakeway region, and on to U.S. Highway 11W in Grainger County. This highway provides an especially important connection between Morristown, as well as the rural communities to the north of Cherokee Lake and I-81. In addition, U.S. Highway 25E connects to I-75 in Kentucky, making it a critical detour for traffic during interstate shut downs.

U.S. Highway 11E – Another major highway that runs through the Lakeway region is U.S. Highway 11E, which ultimately provides a connection into Knox County from Morristown and Jefferson City. This highway plays a critical role in the movement of traffic through the region, connecting the communities of Whitesburg, Russellville, Morristown, Jefferson City, and New Market. Also, this highway provides a parallel connection to I-40 and I-81.

State Route 160 – State Route 160, also known as Air Park Boulevard, Governor DeWitt Clinton Senator Highway, and Enka Highway, is a four-lane divided highway that provides connections between I-81, Highway 25E, and U.S. Highway 11E.

State Route 92 – State Route 92 runs north and south through Jefferson and Grainger County. It is used as a critical corridor for connecting Jefferson City and Dandridge to I-40.

State Route 66 – State Route 66, which opened in Fall 2020, is a new 5-lane highway that provides a connection from I-81 at Exit 4 in White Pine to U.S. Highway 11E/State Route 34/W. Andrew Johnson Highway in Morristown.

Functional Classification

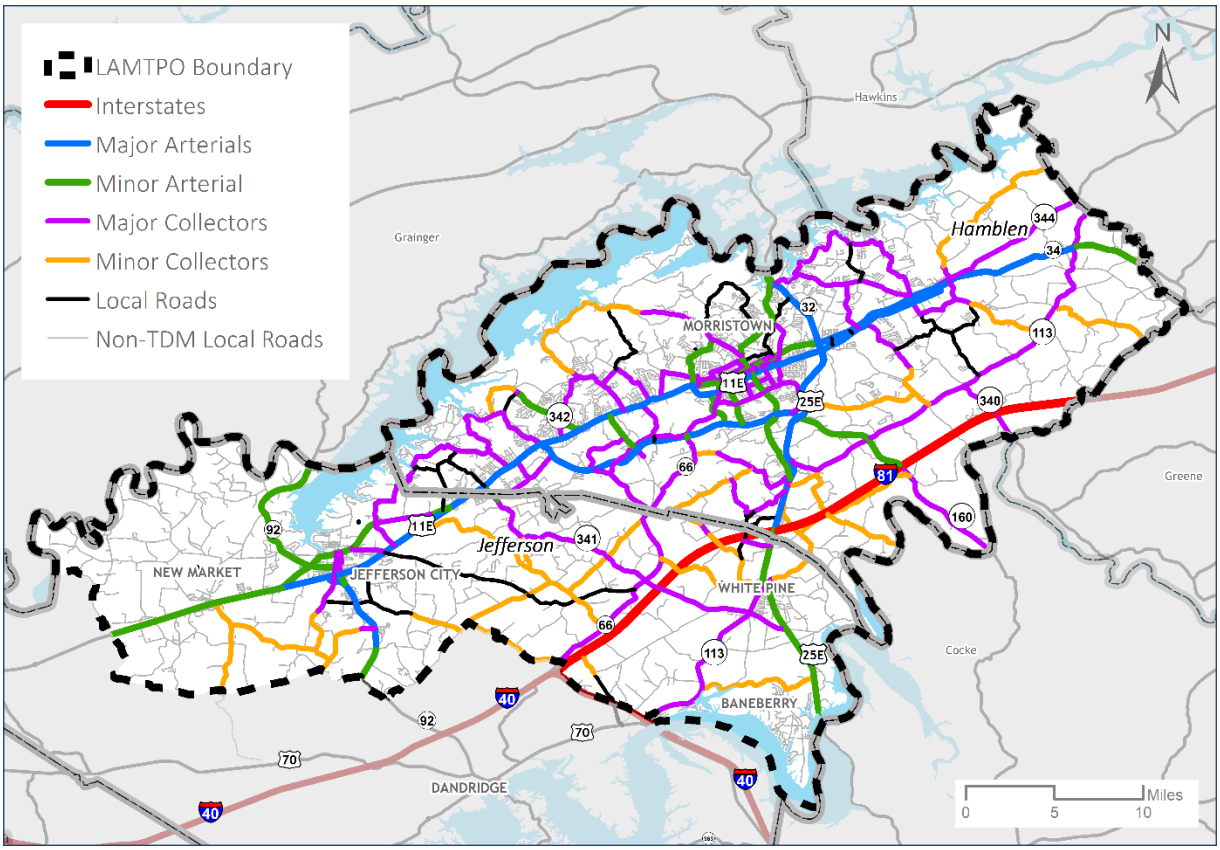
There are 370.6 miles of roadway within the Lakeway regional travel demand model (TDM) that are functionally classified depending on their overall role. Each roadway classification provides a certain level of access and mobility. Interstates provide the greatest level of mobility but the least amount of accessibility, while local roads provide the lowest amount of mobility but the greatest amount of accessibility to adjacent properties. Table 3-5 details the mileage and percent of total mileage for each of the six classifications, as well as vehicle miles traveled (VMT) as output from the regional travel demand model. Figure 3-7 illustrates the functional classifications. Within Figure 3-7, there are two sets of local roadways, the one captured by the Lakeway regional TDM (black) and the local roads that are not represented in the Lakeway regional TDM (light gray).

Table 3-5. Lakeway Region Roadways by Functional Classification

Functional Classification	Centerline Miles	% of Total Mileage	VMT (2018)	% of Total Regional VMT
Interstates	17.0	4.6%	724,970.1	29.9%
Major Arterials	52.6	14.2%	888,797.1	36.6%
Minor Arterials	50.1	13.5%	432,544.4	17.8%
Major Collectors	51.5	13.9%	168,575.7	6.9%
Minor Collectors	158.3	42.7%	183,325.6	7.6%
Local Roads	41.2	11.1%	28,357.3	1.2%
Total	**370.6**	**100.0%**	**2,426,570.2**	**100.0%**

Source: LAMTPO Travel Demand Model, 2020

Figure 3-7. Lakeway Region Roadways by Functional Classification



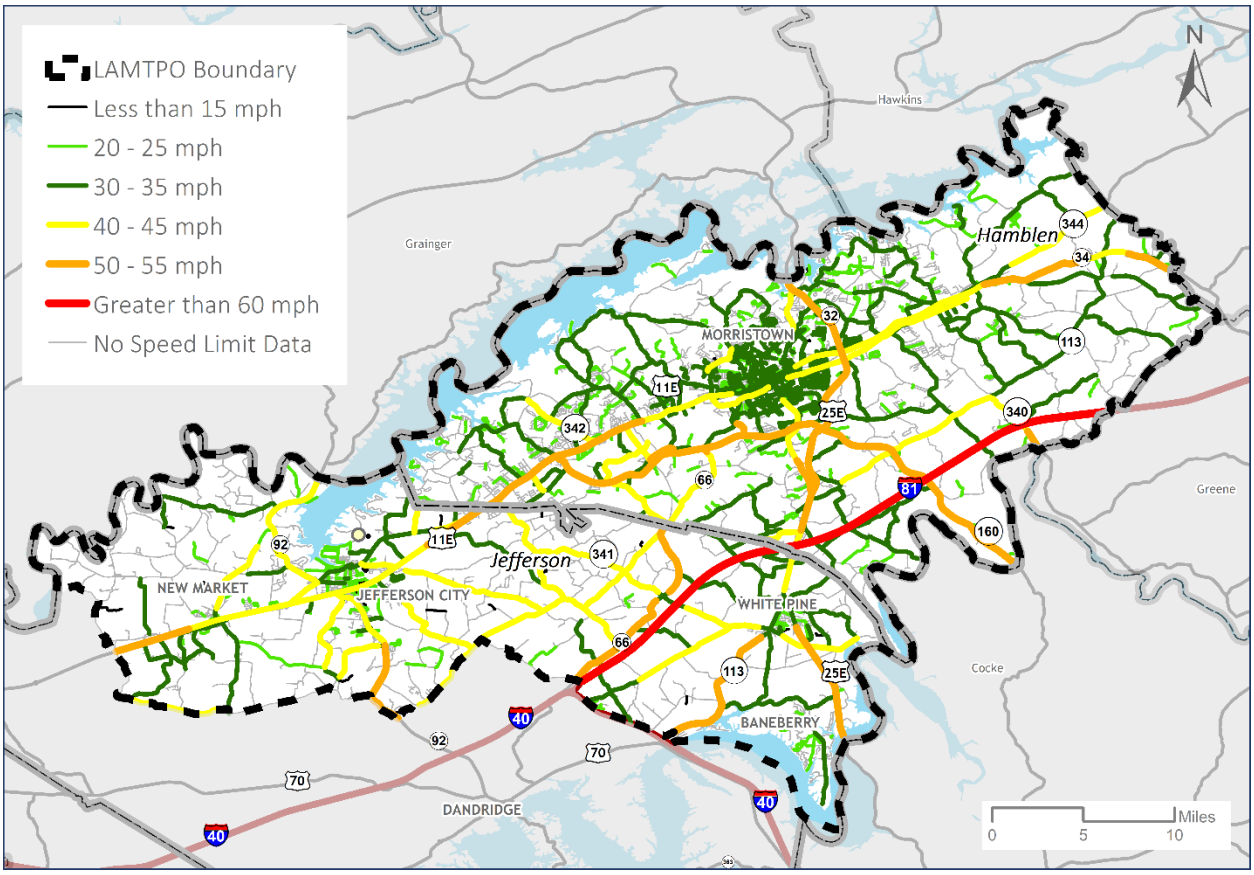
Source: LAMTPO Travel Demand Model, 2020

Roadway Characteristics

At a high level, functional classification is generally associated with a variety of roadway characteristics and design elements, including posted speed limit, the number of travel lanes, and traffic volumes. In the Lakeway region, 590.3 miles of the roadways have data available relating to a posted speed limit, while 572.5 miles do not have speed limit data available, according to TDOT's 2019 ETRIMS data[1]. Based on the roadways with speed limit information, most of the roadways have a speed limit between 30 and 35 miles per hour, as shown in Figure 3-8. Figure 3-9 shows the distribution of the speed limits throughout the Lakeway region.

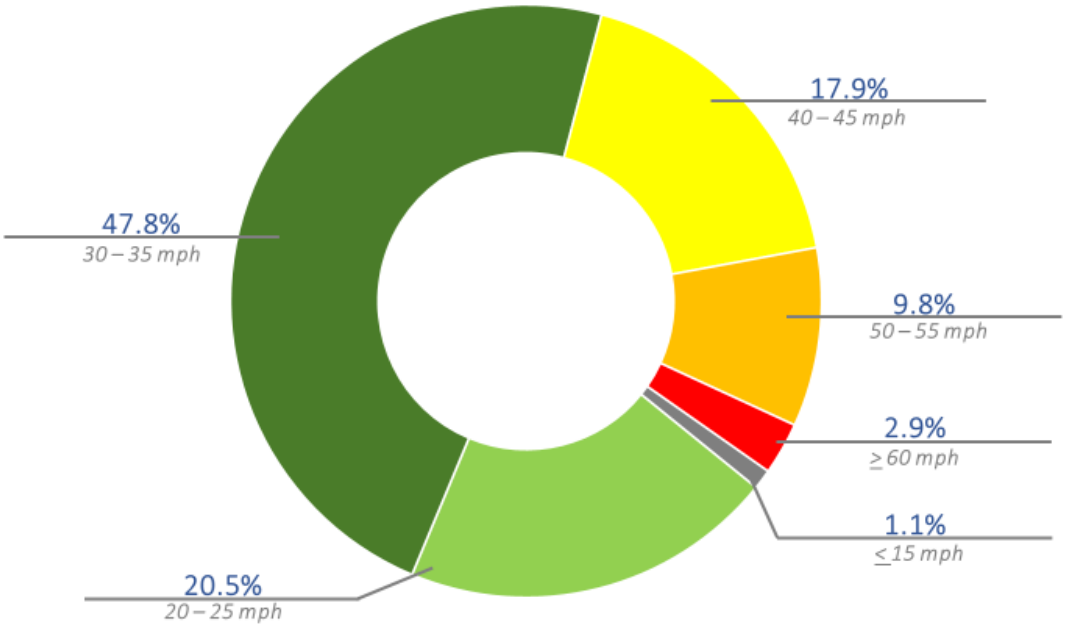
[1] ETRIMS does not collect speed limit data on local roadways.

Figure 3-8. Lakeway Region Roadways by Speed Limit



Source: TDOT ETRIMS, 2020

Figure 3-9. Lakeway Region Breakdown of Roadways by Speed Limit



Source: TDOT ETRIMS, 2020

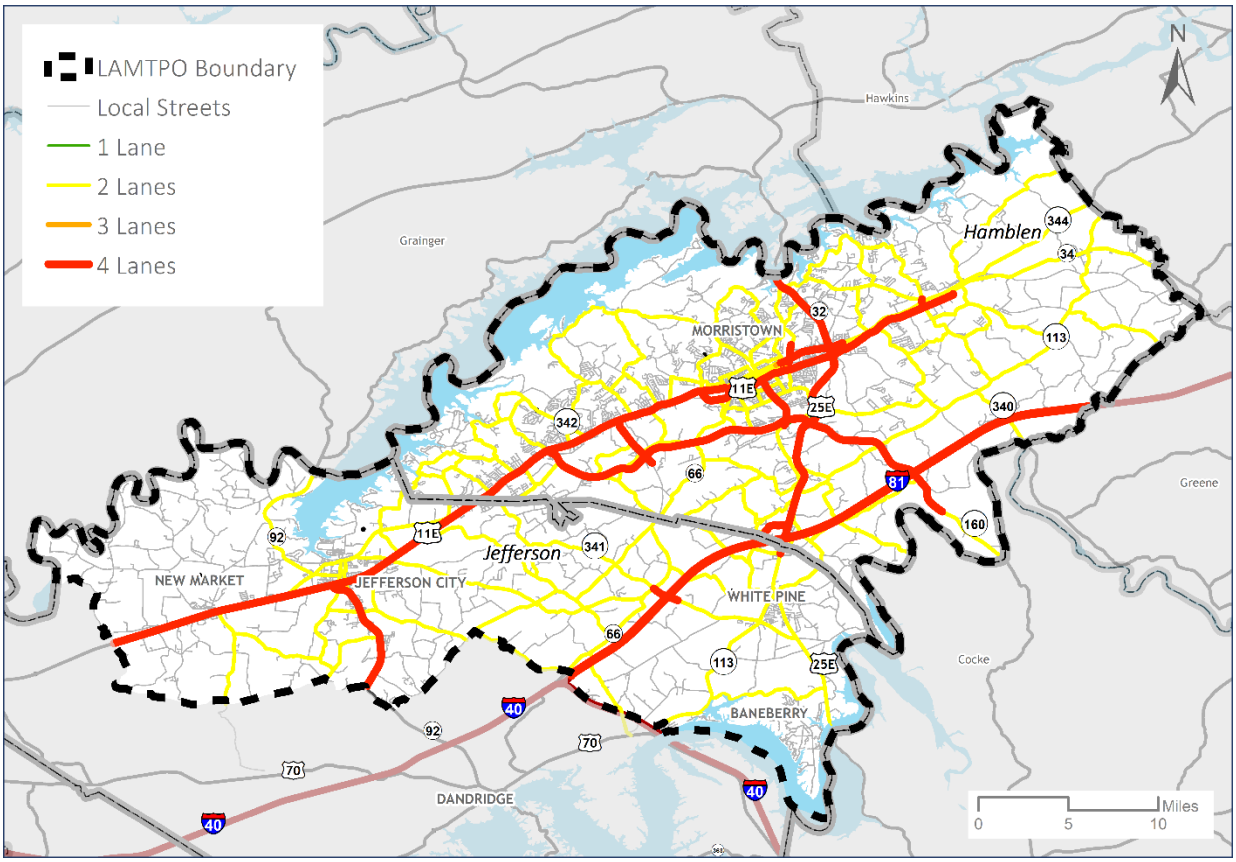
A second roadway characteristic is the miles of roadway by the number of travel lanes. In the Lakeway region, the vast majority of roadways have two lanes, totaling nearly 1,000 miles or 86.2 percent of roadways (Table 3-6) according to TDOT. Figure 3-10 shows the number of through lanes for major roadways included in the Lakeway travel demand model.

Table 3-6. Lakeway Region Roadways by Number of Lanes

Number of Lanes	Miles of Roadway	% of Total Roadway Mileage
1 Lane	77.7	6.7%
2 Lanes	992.8	86.2%
3 Lanes	3.0	0.3%
4 Lanes	73.9	6.4%
5 Lanes	2.9	0.3%
6 Lanes	0.8	0.1%
Total	**1,151.2**	**100.0%**

Source: TDOT ETRIMS, 2020

Figure 3-10. Lakeway Region Roadways by Number of Lanes



Source: LAMTPO Travel Demand Model, 2020

Traffic volume is measured by Annual Average Daily Traffic (AADT), which is the total volume of vehicle traffic on a roadway for a given year divided by the 365 days in a year. Table 3-7 illustrates traffic volumes

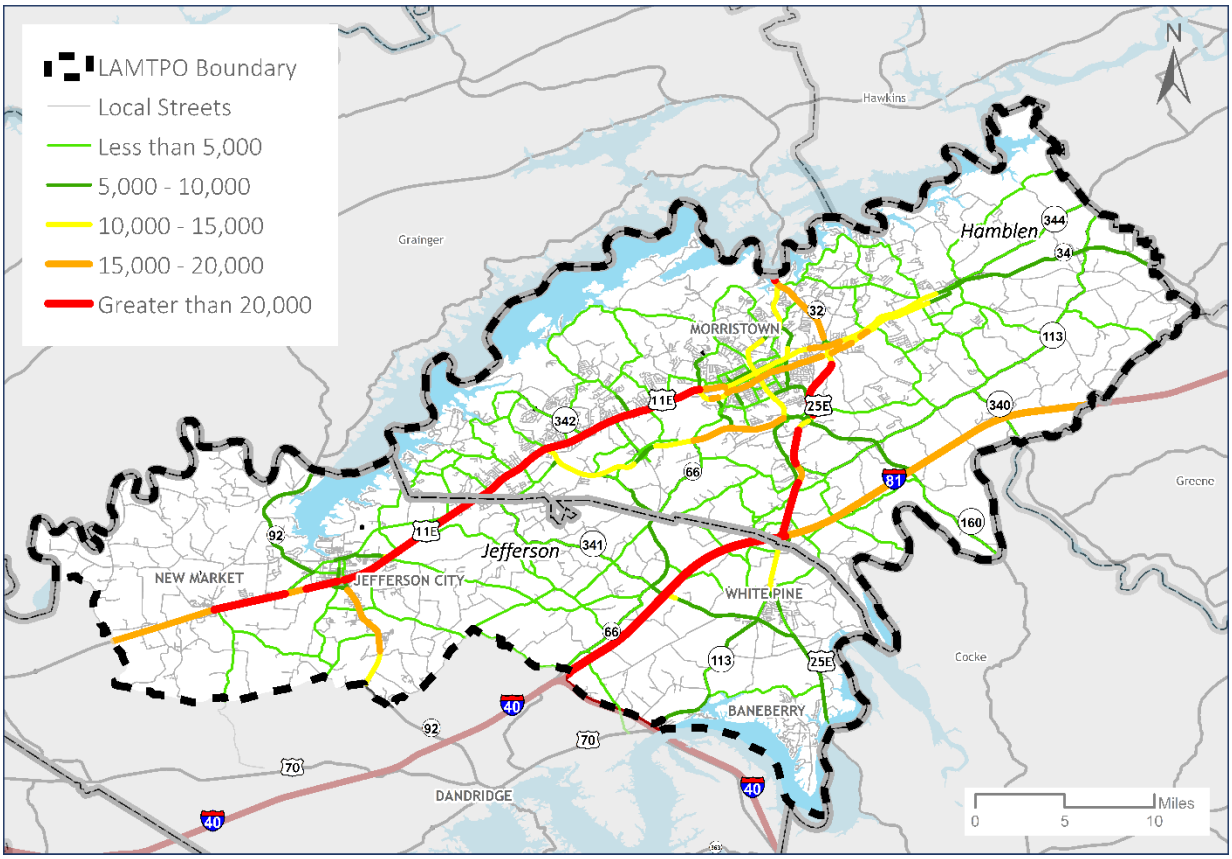
within the Lakeway region as output by the regional travel demand model, showing that most of the roadways have an AADT of less than 5,000 (245.7 miles).

Table 3-7. Lakeway Region Roadways by Traffic Volume

Volume	Miles of Roadway	% of Total Roadway Mileage
Less than 5,000	245.7	66.3%
5,000 - 10,000	48.6	13.1%
10,000 - 15,000	22.8	6.1%
15,000 - 20,000	27.1	7.3%
Greater than 20,000	26.4	7.1%
Total	**370.6**	**100.0%**

Source: LAMTPO Travel Demand Model, 2020

Figure 3-11. Lakeway Region Roadways by Traffic Volume

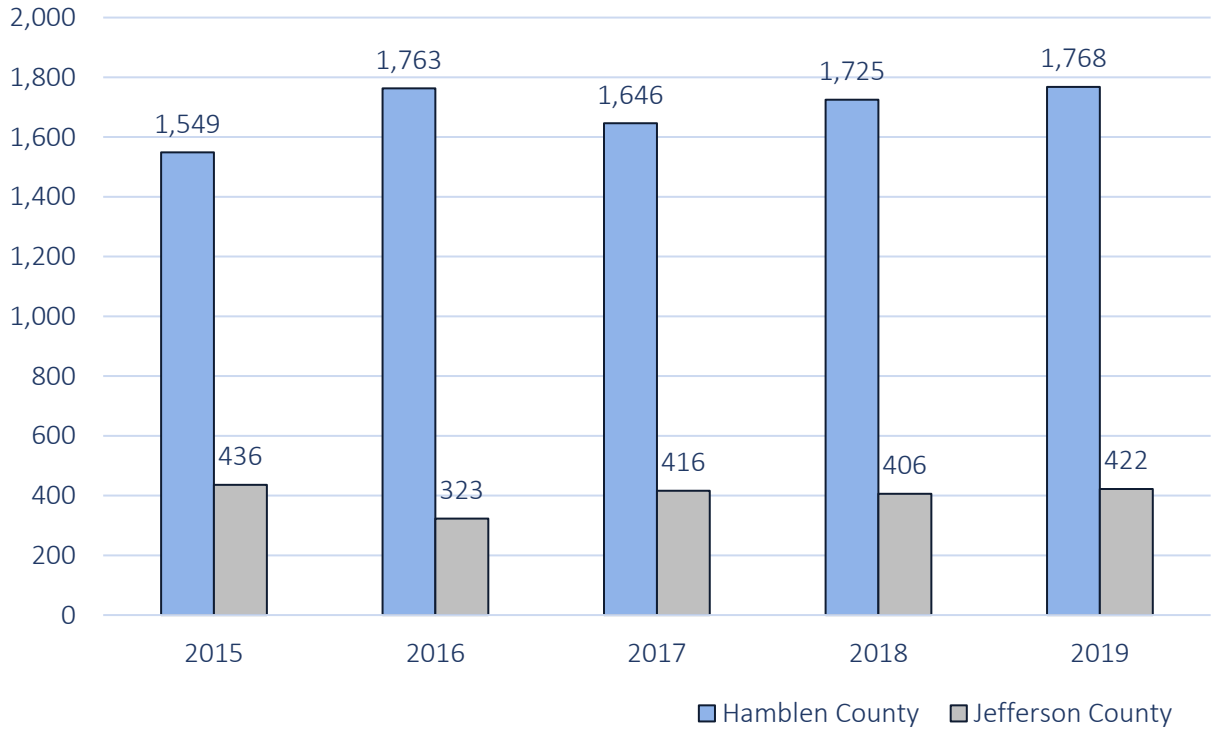


Source: LAMTPO Travel Demand Model, 2020

Roadway Safety

Roadway safety remains a high priority for communities across Tennessee. Figure 3-12 illustrates the crashes for all of Hamblen and Jefferson Counties for 2015 to 2019. Data shows that annual crashes in the two counties have remained about the same over the 5 years.

Figure 3-12. Lakeway Region Crashes by County, 2015 to 2019



Source: TDOT ETRIMS, 2020

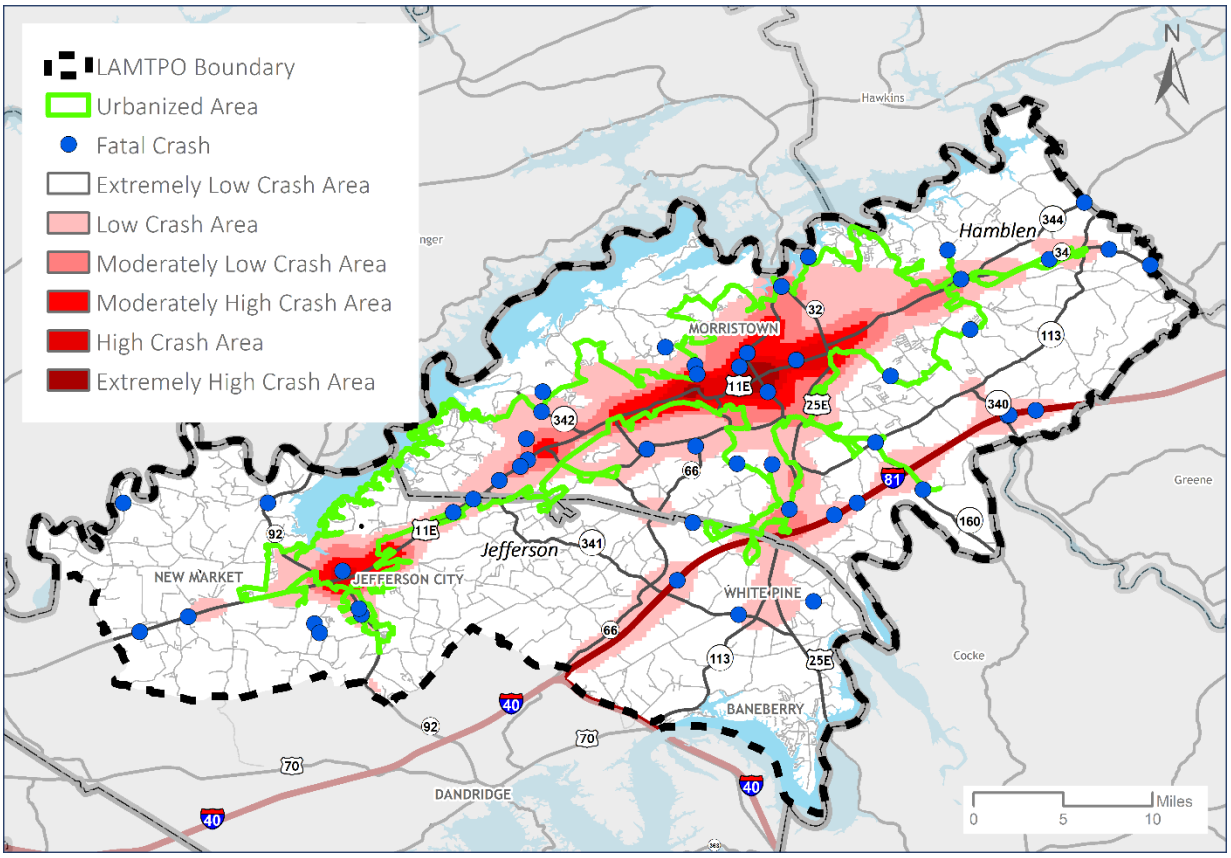
Morristown, the county seat of Hamblen County and the most populous city within the Lakeway region, accounts for 62.2 percent of all crashes in the region during the 2015-2019 time period (Table 3-8). Figure 3-13 illustrates the locations in the Lakeway region where the highest number of crashes occurred and the location of crashes that resulted in a fatality. Fatal crashes tend to occur in lower density, higher speed roadway environments such as on interstates and state highways.

Table 3-8. Lakeway Region Crashes by Jurisdiction, 2015 to 2019

Jurisdiction	2015	2016	2017	2018	2019	Total Crashes	% of Total Crashes
Morristown	1,258	1,348	1,263	1,322	1,310	6,501	62.2%
Jefferson City	254	201	254	270	253	1,232	11.8%
Hamblen County (unincorporated)	294	419	387	404	461	1,965	18.8%
Jefferson County (MTPO Portion)	179	118	158	135	166	756	7.2%
LAMTPO Total	**1,985**	**2,086**	**2,062**	**2,131**	**2,190**	**10,454**	**100.0%**

Source: TDOT ETRIMS, 2020

Figure 3-13. Lakeway Region Vehicle Crash Locations, 2015 to 2019



Source: TDOT ETRIMS, 2020

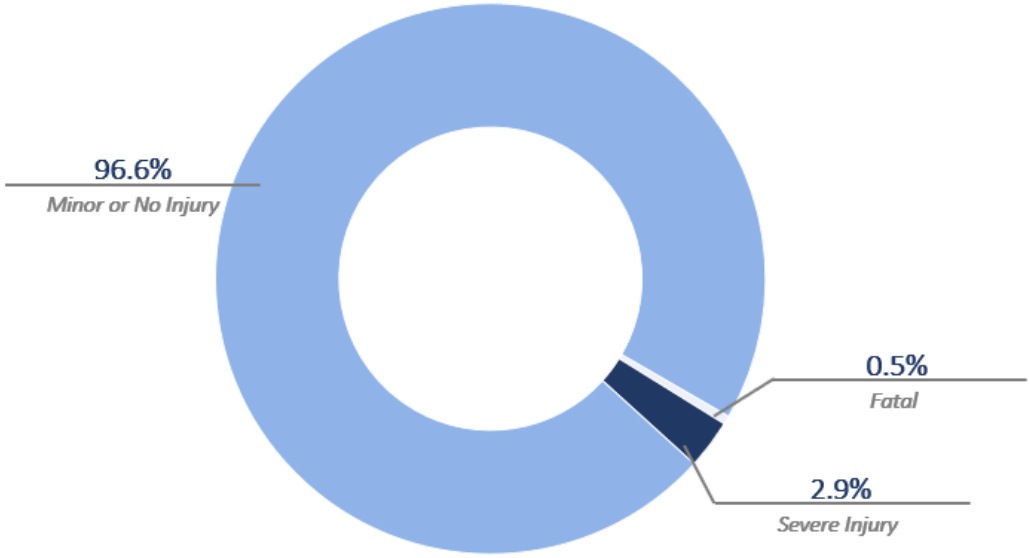
Most crashes occurred in urban areas or along high-volume routes through the Lakeway region, including I-81, U.S. Highway 25E, and Morris Boulevard. While the number of crashes is rising, traffic fatalities have decreased in both counties. Since 2015, 51 crashes resulted in 53 fatalities in Hamblen and Jefferson Counties within the Lakeway region (Table 3-9). Figure 3-14 illustrates the Lakeway region crashes by crash type (fatal, severe, and minor or no injury).

Table 3-9. Lakeway Region Fatal Crashes, 2015 to 2019

	2015	2016	2017	2018	2019	Total
Fatal Crashes	9	14	17	7	4	**51**
Total Fatalities	10	14	18	7	4	**53**
Total Injured	7	13	11	6	0	**37**

Source: TDOT ETRIMS, 2020

Figure 3-14. Vehicle Crashes by Crash Type, 2015 to 2019



Source: TDOT ETRIMS, 2020

Lakeway Region Traffic Congestion

The Lakeway regional TDM is an important tool used to identify congested roadways throughout the region. The model uses variables such as population and employment to forecast demand, providing insight on how growth and development impact the transportation system. To estimate demand, the model follows the 4-step process described below.

4-Step Travel Demand Model Process

- **Trip Generation** – Determines the number of trips produced in and attracted to each traffic analysis zone (TAZ) by trip purpose.
- **Trip Distribution** – Matches origins with destinations to determine how often trips are made to and from a destination based on the activity within the location.
- **Mode Choice** – Defines the trips made between the origin and destination based on mode of transportation (e.g., automobile, transit, walking, and bicycling).
- **Route Assignment** – Assigns trips based on routes to the destination.

As expected, the locations with the highest traffic volumes are along the major interstate and arterial systems such as I-81, U.S. Highway 11E, and U.S. Highway 25E. Traffic conditions are measured based on the volume-to-capacity (V/C) ratio and assigned a level of service (LOS) letter ranging from A (free-flowing) to F (forced or breakdown flow). Table 3-10 summarizes LOS based on V/C ratios from the 2016 Highway Capacity Manual (HCM). The V/C ratio reflects mobility and quality of travel on a section of

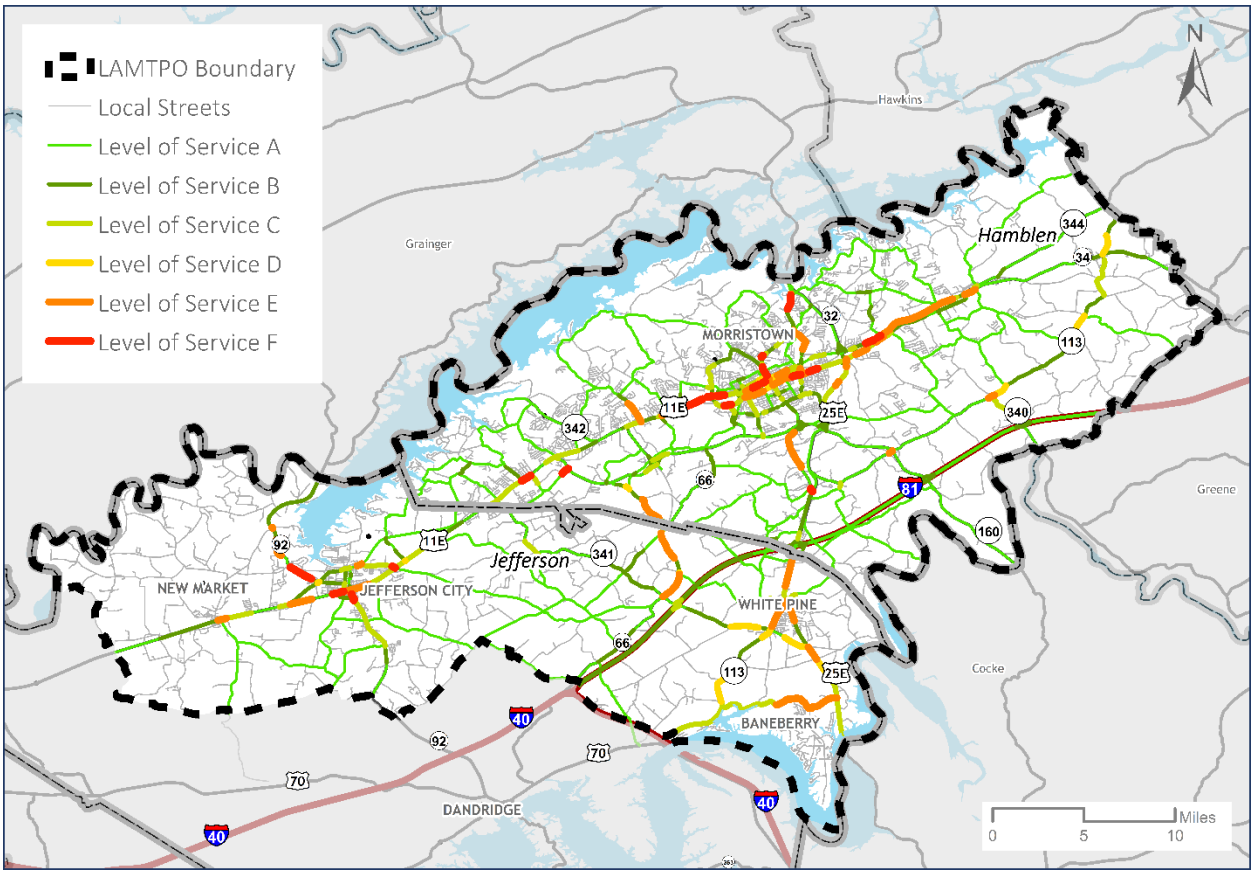
road by comparing roadway demand with roadway supply. Figure 3-15 uses the 2020 TDM output to illustrate the roadways by LOS for a model base year of 2018. Results show that over 50 percent of the roadways in the Lakeway region have a LOS A. In addition, Table 3-11 lists the major locations operating at LOS E or LOS F for the 2018 base year.

Table 3-10. Roadway Level of Service and Volume/Capacity Ratios

Level of Service	Description	Volume/Capacity Ratio	Interstate Speed (mph)	Arterial Speed (mph)
A	Traffic flows at or above the posted speed limit and all motorists have complete mobility between lanes.	≤ 0.60	> 60	> 35
B	Slightly congested, with some restriction of maneuverability. Two motorists might be forced to drive side by side, limiting lane changes.	0.61 – 0.70	57 – 60	28 – 35
C	Ability to pass or change lanes is not assured. Most experienced drivers are comfortable, and posted speed is maintained, but roads are close to capacity. This is often the target LOS for urban highways.	0.71 – 0.80	54 – 57	22 – 28
D	Typical of an urban highway during commuting hours. Speeds are somewhat reduced; motorists are hemmed in by other cars and trucks	0.81 – 0.90	46 – 54	17 – 22
E	Flow becomes irregular and speed varies rapidly, but rarely reaches the posted limit. On highways, this is consistent with a road over its designed capacity.	0.91 – 1.00	30 – 46	13 – 17
F	Flow is forced; every vehicle moves in lockstep with the vehicle in front of it, with frequent drops in speed to nearly 0 mph. A road for which the travel time cannot be predicted.	> 1.00	< 30	< 13

Source: Highway Capacity Manual (HCM) 2016

Figure 3-15. Lakeway Region Roadway Level of Service, 2018



Source: LAMTPO Travel Demand Model, 2020

Table 3-11. Lakeway Region Congested Locations, 2018

Route	Termini
State Route 139	Jefferson County Line to Deep Spring Road
U.S. Highway 25W	State Route 92 to Plainview Drive
Nina Road	Iron Gate Drive to U.S. Highway 25E
U.S. Highway 25E (State Street)	Agricultural Park Drive to Gold Finch Lane
State Route 343	Castain Drive to Wilson Hale Road
U.S. Highway 11E	Britton Drive to Commerce Blvd
U.S. Highway 11E	N. Sugar Hollow Road to Pearce Drive
U.S. Highway 11E	Liberty Hill Road to Cumberland Street
U.S. Highway 11E	Jaybird Road to Harvey Drive
State Route 34 (W. 1st North Street)	N. High Street to Henry Street
Kidwell Ridge Road	Wynn Street to U.S. Highway 11E
Buffalo Trail	State Street to Cherokee Park Road
Simpson Road	U.S. Highway 11E to Bent Creek

Source: LAMTPO Travel Demand Model, 2020

An additional source for measuring traffic congestion is INRIX data, which collects location coordinate data from smartphones and GPS devices to measure traffic flows. Bottlenecks, a localized disruption of vehicular traffic caused by reduced capacity compared to upstream roadway characteristics, can be identified using INRIX travel data. Bottlenecks can occur because of lane drops, merge and weave sections, geometric changes (e.g., horizontal and vertical curves), intersections, and access points. Typical strategies to address bottlenecks range from demand management (e.g., increased travel choices) and traveler information to alternative routes and geometric improvements.

INRIX defines a bottleneck as a roadway segment where travel speeds drop to 65 percent of the free-flow speed and cause 120 seconds of delay. The duration of a bottleneck is defined as how long it takes for the travel speeds along a roadway segment or corridor to rise above 75 percent of expected free-flow speed. The severity or ranking of a bottleneck can be measured by the prioritization factor shown below:

- *Bottleneck Prioritization Factor = Duration x Length x Number of Occurrences*

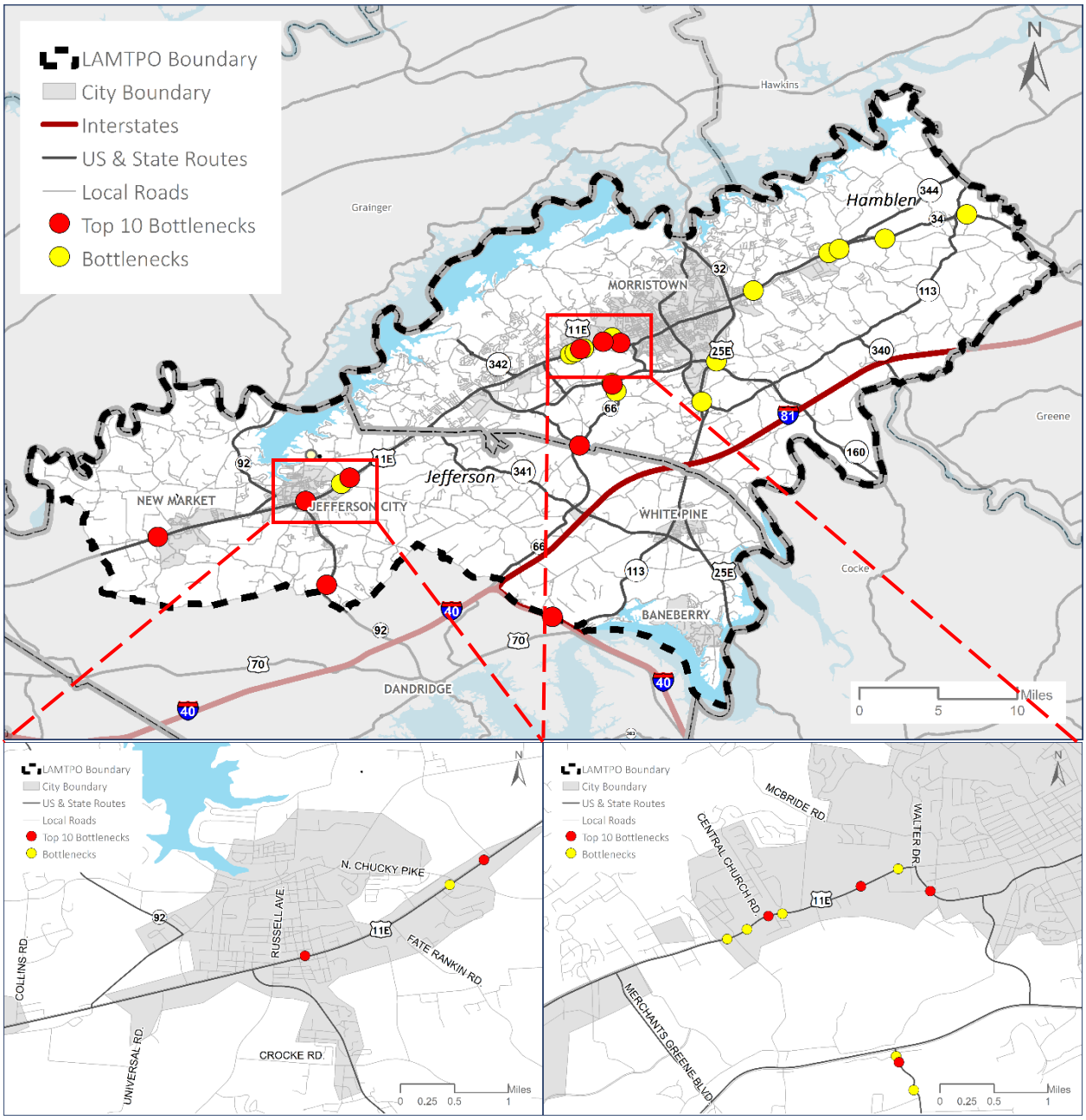
Table 3-12 reports the top 10 bottleneck locations within the Lakeway region in 2018. Figure 3-16 indicates that the bottlenecks are primarily located along the major arterials close to or within Morristown and Jefferson City. While these locations represent some of the worst bottlenecks in the LAMTPO area, there are other intersections with congestion and safety issues. For example, the intersections of State Route 160 at MLK Jr. Parkway and State Route 160 at Sulphur Springs Road are both locations where intersection improvements are being considered to address operational concerns.

Table 3-12. Lakeway Region Top Ten Traffic Bottleneck Locations, 2018

Ranking	Bottleneck Location	Jurisdiction
1	State Route 66 near Gov. Dewitt Clinton Senter Highway	Hamblen County
2	U.S. Highway 11E and Central Church Road	Morristown
3	U.S. Highway 11E and George Avenue	Jefferson City
4	State Route 92 and Sunrise Ridge Drive	Jefferson County
5	Valley Home Road and Alpha Valley Home Road	Hamblen County
6	U.S. Highway 11E and Maden Drive	Morristown
7	U.S. Highway 11E and Russell Avenue/George Avenue	Jefferson City
8	I-40 Exit 424 and State Route 113	Jefferson County
9	U.S. Highway 11E and E. Old Andrew Johnson Highway	Jefferson City
10	U.S. Highway 11E and Reed Bull Road	Jefferson County

Source: INRIX, 2018

Figure 3-16. Lakeway Region Traffic Bottleneck Locations, 2018



Source: INRIX, 2018

Operations and Management

Incorporating technology into transportation systems can increase performance, from reducing congestion to improving the safety of all roadway users. Measures like ITS provide flexibility to update or change traffic flows by time of day, day of the week, season, or in the event of a disruption – all allowing active traffic and demand management. Improving the overall flow of traffic on heavily used systems reduces the need for roadway widenings, network expansions, and other capital-intensive investments.

Intelligent transportation systems serve as the framework by which technology is integrated into local transportation networks, defining the linkages among systems and the methods for exchanging information. In order to be eligible for federal funding, metropolitan areas are required to prepare a regional ITS architecture plan that inventories existing elements, area needs, stakeholders, and implementation strategies. The current Lakeway Regional ITS Architecture Plan was updated in 2017, while the first was created in 2009. By defining the framework for the region, the plan ensures interoperability among ITS elements and identifies higher priority projects providing operational benefits.

ITS classifies technological improvements into short-, medium-, and long-range initiatives. Examples of ITS architecture include traffic signal coordination and electronic signs to communicate traffic conditions and adverse weather conditions. The current Lakeway Regional ITS Architecture Plan was developed by stakeholders including TDOT, FHWA, LAMTPO, Tennessee Highway Patrol, East Tennessee Human Resources Agency (the local transit provider), area colleges, utilities, railroad companies, and several other local and regional entities. The plan includes:

- Congestion management;
- Emergency management;
- Maintenance and construction management;
- Traveler information; and
- ITS deployment plan.

Existing ITS architecture is distributed throughout the Lakeway region. Traffic signal coordination, for example, improves traffic flow and can be used to minimize congestion after a roadway incident, which in turn improves the safety of other travelers. Per the Lakeway MTPO's 2040 plan, traffic signal coordination has been implemented along U.S. Highway 11E within Morristown and Jefferson City. Traffic conditions are also monitored along routes and at major intersections, including U.S. Highway 11E at State Route 160 and State Route 343 at Liberty Hill Road. Closed-circuit television (CCTV) cameras were installed at the interchange of I-40 and I-81, providing real-time video through TDOT's SmartWay program.

In addition to ITS signal improvements, efforts have been made to increase driver knowledge of existing conditions and ease of travel. The Lakeway MTPO's 2040 plan emphasized the need for wayfinding signage throughout the region, which would guide travelers through the area and encourage return visits. Communities throughout the Lakeway region have collaborated on wayfinding that will create a consistent brand for the area. Additionally, dynamic signs along interstates and highways provide critical real-time messages for travelers, alerting them of severe weather, travel delays, presence of construction workers, and congestion from special events.

3.3 Freight Transportation Network

The movement of freight and goods is a critical part of the Lakeway regional economy. The Lakeway area has a variety of facilities and infrastructure used to transport freight and goods, including I-81, U.S. Highway 11E, U.S. Highway 25E, Norfolk Southern Railway, and East Tennessee Natural Gas Pipeline. Together, freight facilities in the Lakeway area support the movement of more than 5 million tons of commodities each year. TRANSEARCH data, covering national freight flows, is collected on a county level,

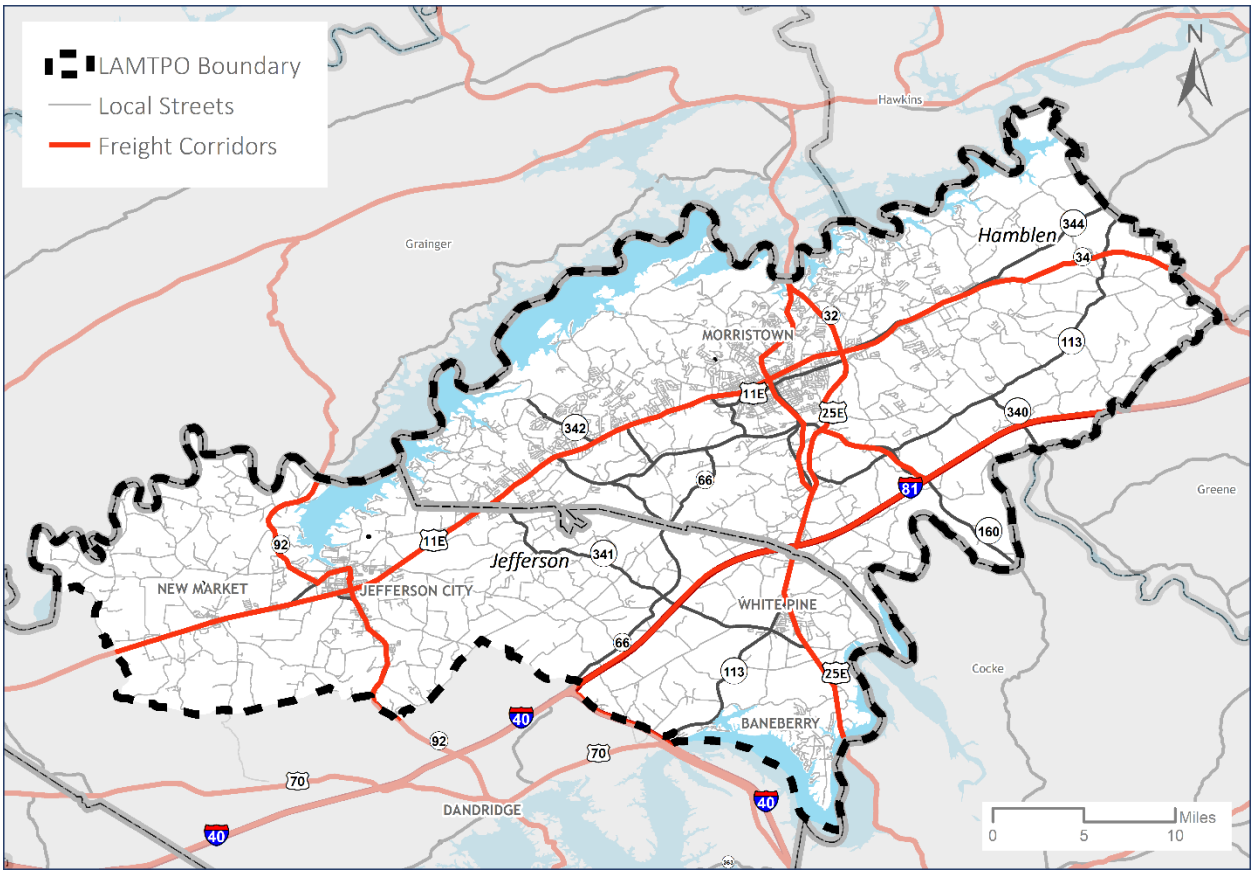
therefore the freight commodity flows will cover Hamblen County and all of Jefferson County and not just the portion that falls within the Lakeway region.

Truck Transport Facilities

The truck freight network, as defined by IHS Global Insight TRANSEARCH data, in Hamblen County and Jefferson County totals 144 miles of roadway. U.S. Highways account for 52.5 percent or 75.6 miles of the network, the interstate system makes up 24.5 percent or 35.3 miles, and state routes represent 23.0 percent or 33.1 miles. Figure 3-17 highlights the truck freight network in the Lakeway area.

An analysis of commodity flows was performed based on the 2016 TRANSEARCH data from IHS Global Insight. This data provides freight flows by weight (tons) and value (money) moving into, out of, within, and through the Lakeway area for 2016. This data is disaggregated by commodity, mode, and origin/destination pair. Based on the 2016 TRANSEARCH commodity data, 440,569 trucks annually are transporting 4,681,636 tons of commodities in and out of the counties of Hamblen and Jefferson. Truck transport represents about 79 percent of all commodities flowing in and out of the Lakeway area. Rail transport accounts for the remaining 21 percent of commodities.

Figure 3-17. Lakeway Region Truck Freight Network

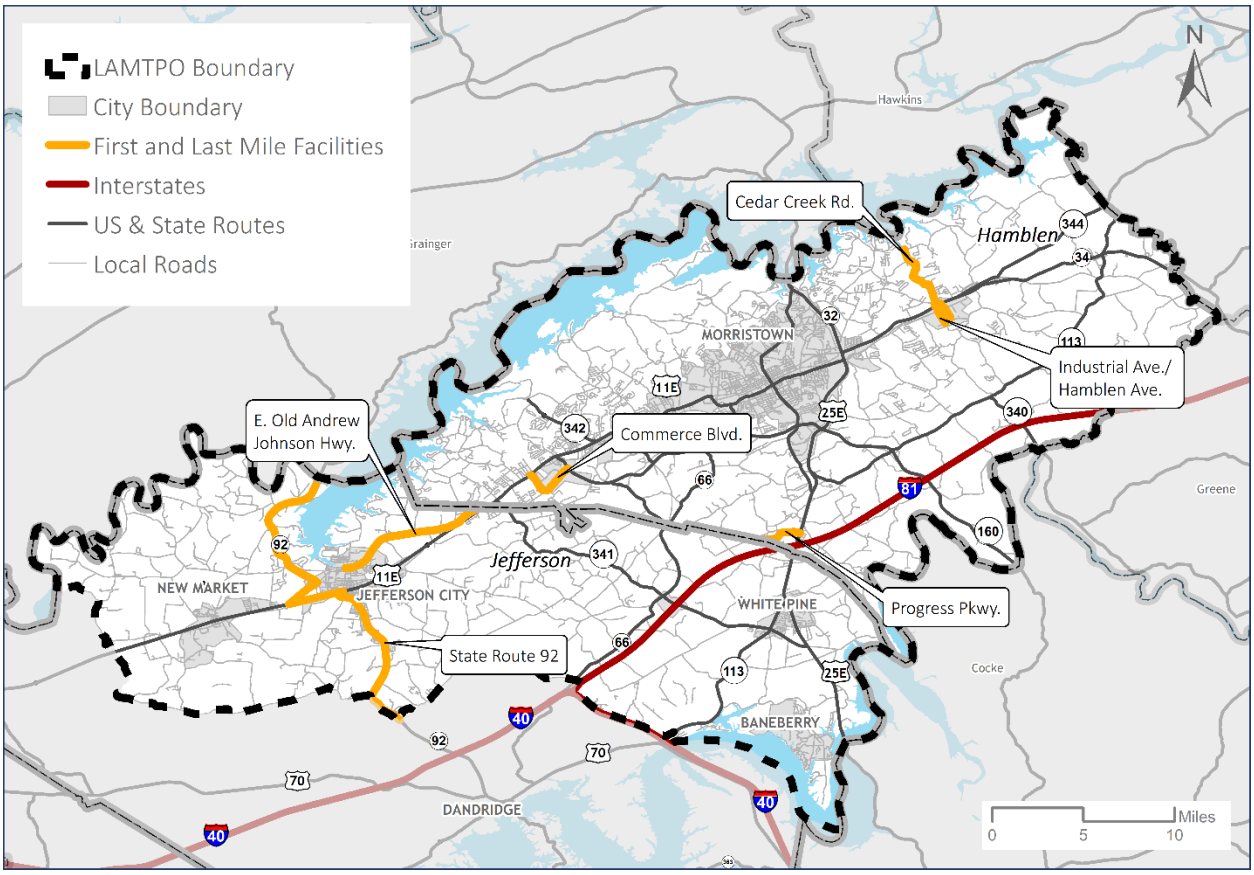


Source: IHS Global Insight TRANSEARCH, 2016

Truck Freight First and Last Mile Facilities

First and last mile facilities are an important factor for the movement of freight to the manufacturing plants for production or to be transported to the consumer. First and last mile roadways often consist of local roads and help with the efficient flow of freight to the major freight corridors. Within the Lakeway region, Cedar Creek Road, Commerce Boulevard, East Old Andrew Johnson Highway, Hamblen Avenue/Industrial Avenue, Progress Parkway, and State Route 92, are considered the trucking first and last-mile facilities. Figure 3-18 represents the first and last-mile facilities within the Lakeway region.

Figure 3-18. Lakeway Region First and Last-Mile Facilities

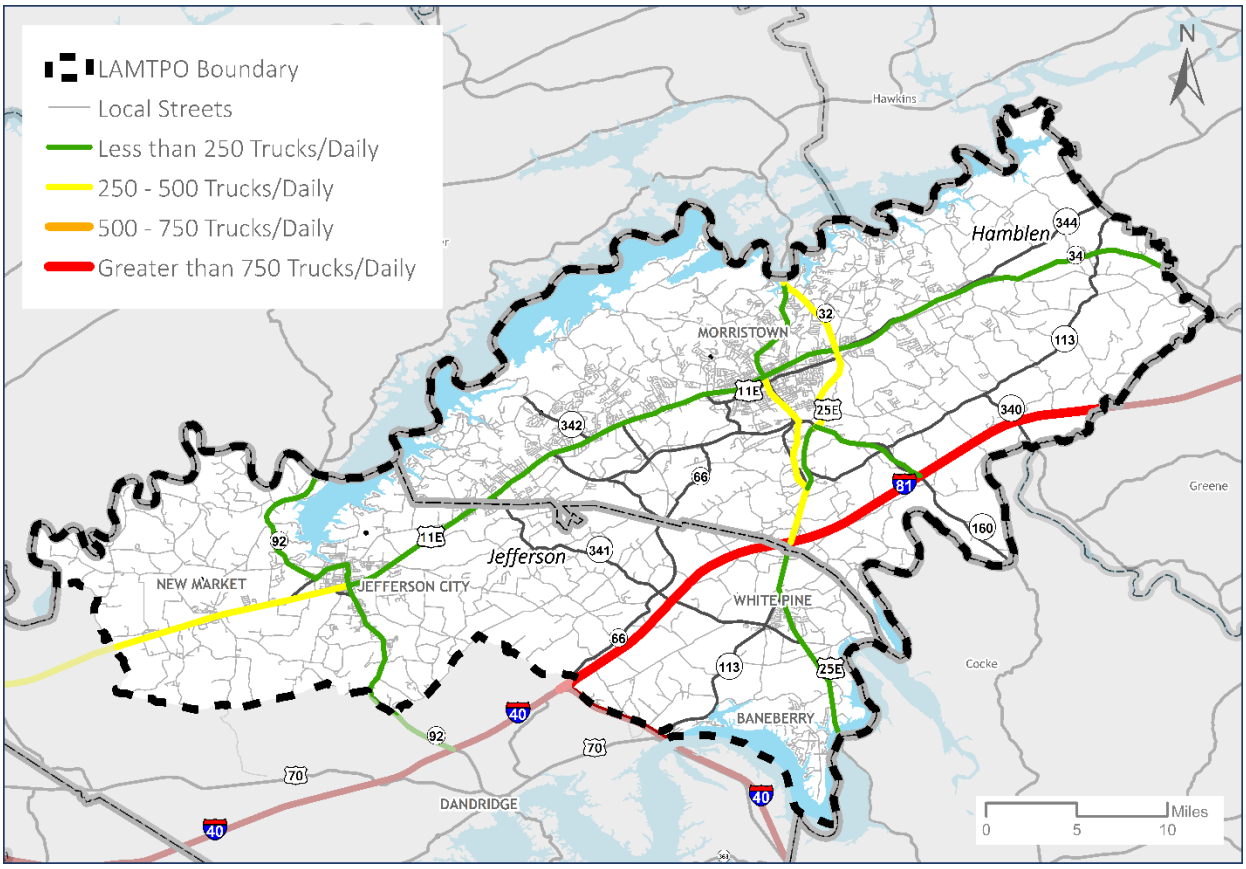


Source: LAMTPO, 2020

Truck Freight Commodity Flows

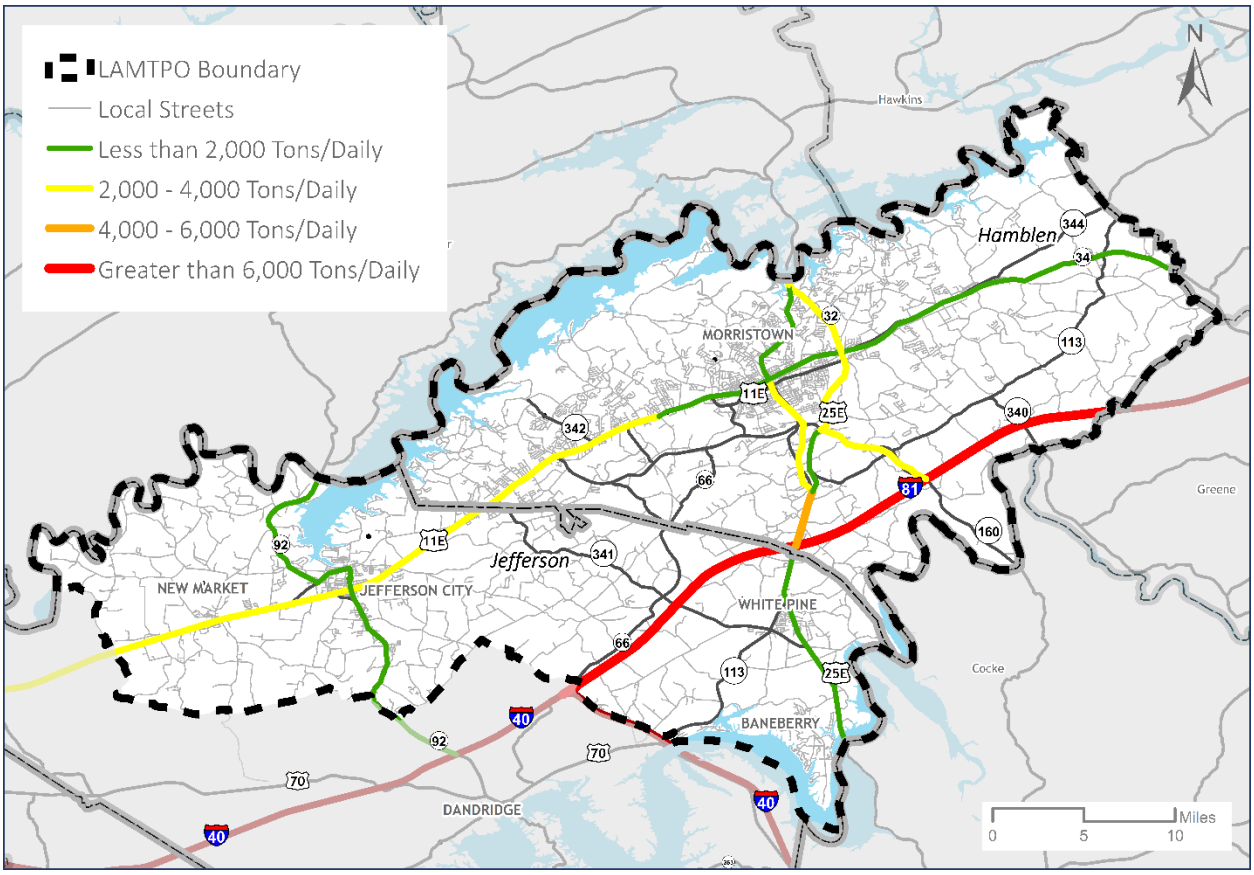
While U.S. highways support most of the freight network in the Lakeway area, they are not the most traveled routes for freight movement. The daily average for truck transport through the Lakeway area is approximately 1,207 trucks equaling about 12,826 tons of commodities. U.S. highways account for 4.1 percent of daily trucks and 2.7 percent of daily commodities in the Lakeway area. By comparison, the interstate system accounts for 95.2 percent of daily trucks and 96.8 percent of daily commodities. Figure 3-19 shows the freight flow by the daily number of trucks and Figure 3-20 shows the freight flow by daily commodity tons on the truck freight network.

Figure 3-19. Lakeway Region Daily Truck Flow by Number of Trucks



Source: IHS Global Insight TRANSEARCH, 2016

Figure 3-20. Lakeway Region Daily Truck Flow by Tonnage



Source: IHS Global Insight TRANSEARCH, 2016

Table 3-13 shows the top five imports by tonnage coming into each of the two counties via truck transport, and Table 3-14 shows the top five exports leaving each of the two counties via truck. The percentages in Table 3-13 and Table 3-14 represent the total percentage of imports and exports coming into the Lakeway area. The top ten commodities, both in terms of imports and exports, largely relate to the predominant industries found in the Lakeway area. Additionally, the top three goods imported to and exported from the Lakeway area by tonnage are:

- Nonmetallic Minerals (1,174,278 tons);
- Food or Kindred Products (638,441 tons); and
- Petroleum or Coal Products (339,690 tons).

Table 3-13. Top Five Imports by Tonnage via Truck, Hamblen and Jefferson Counties

County	STCC Code	Description	Tons	% of Commodity
Hamblen County	20	Food or Kindred Products	162,449	12.6%
	29	Petroleum or Coal Products	128,145	9.9%
	33	Primary Metal Products	118,593	9.2%
	14	Nonmetallic Minerals	107,421	8.1%
	40	Waste or Scrap Materials	104,892	8.2%
		Total	621,500	
Jefferson County	14	Nonmetallic Minerals	221,425	26.7%
	29	Petroleum or Coal Products	211,545	25.5%
	20	Food or Kindred Products	98,589	11.9%
	32	Clay, Concrete, Glass, or Stone	64,038	7.7%
	50	Warehouse	64,010	7.7%
		Total	659,607	

Source: IHS Global Insight TRANSEARCH, 2016

Table 3-14. Top Five Exports by Tonnage via Truck, Hamblen and Jefferson Counties

County	STCC Code	Description	Tons	% of Commodity
Hamblen County	14	Nonmetallic Minerals	295,173	22.9%
	24	Lumber or Wood Products	177,370	13.7%
	35	Machinery	146,184	11.3%
	20	Food or Kindred Products	144,934	11.2%
	26	Pulp, Paper, or Allied Products	130,567	10.1%
		Total	894,228	
Jefferson County	14	Nonmetallic Minerals	550,259	49.8%
	20	Food or Kindred Products	232,469	21.1%
	1	Farm Products	105,277	9.5%
	24	Lumber or Wood Products	97,448	8.8%
	26	Pulp, Paper, or Allied Products	36,248	3.3%
		Total	1,021,701	

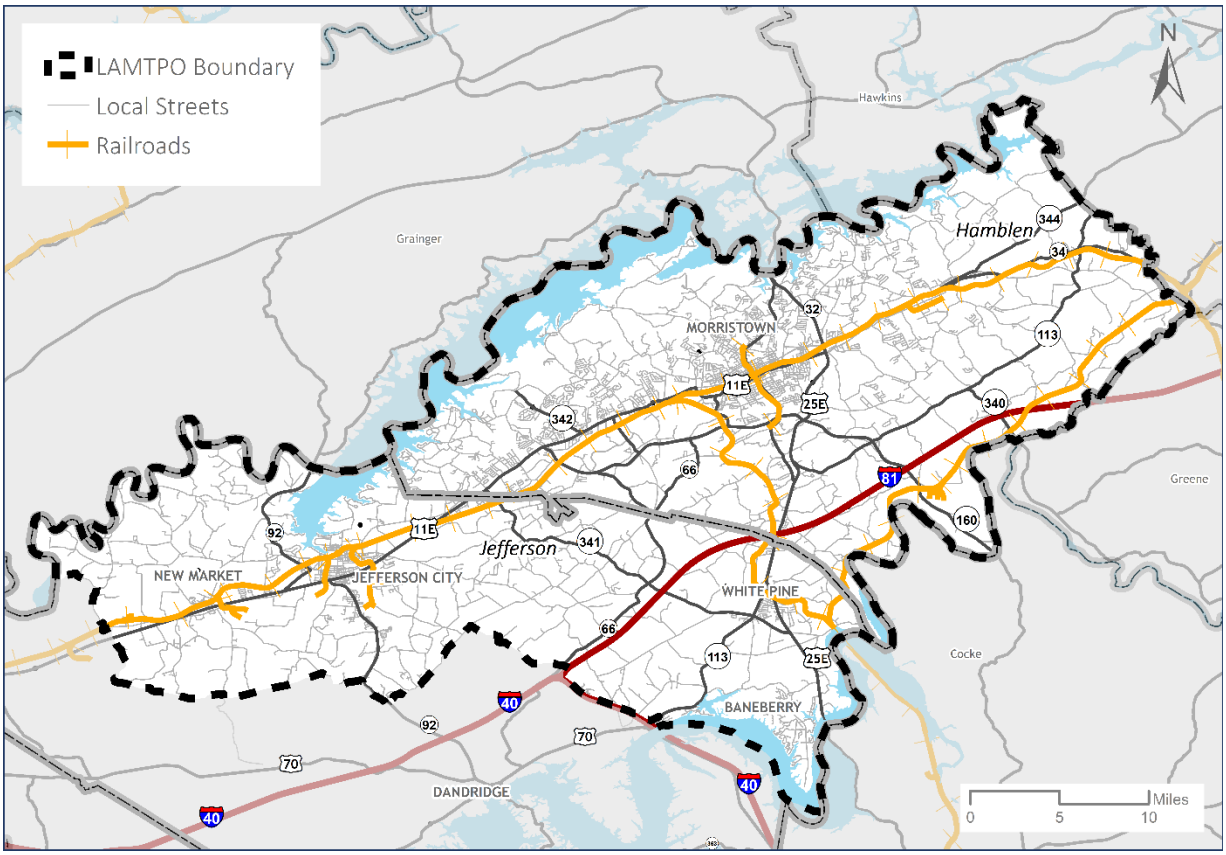
Source: IHS Global Insight TRANSEARCH, 2016

Rail Transport Facilities

The Lakeway region has one Class I rail line, Norfolk Southern Railway, operating in the area. Norfolk Southern Railway is a rail network encompassing approximately 36,119 track miles in 22 states and serves 43 ports and major markets throughout the eastern United States. The rail line through the Lakeway region forms part of the Crescent Corridor, which spans 11 states and 1,400 miles and seeks to increase the capacity of intermodal traffic along the I-81 corridor. Providing one of the fastest, most direct routes from the southeast to the northeast, the Crescent Corridor's high capacity intermodal routes are truck

competitive, fuel-efficient, and dependable. In Tennessee, the Crescent Corridor runs from Bristol to Chattanooga. Figure 3-21 displays the rail network in the Lakeway region.

Figure 3-21. Lakeway Region Rail Network



Source: IHS Global Insight TRANSEARCH, 2016

Rail Freight Commodity Flows

There are significantly fewer commodities transported by rail in the Lakeway area compared to truck transport. Table 3-15 shows the top imports by tonnage coming into each of the two counties via rail transport. Table 3-16 shows the top exports leaving each of the two counties via rail.

Table 3-15. Top Imports by Tonnage via Rail, Hamblen and Jefferson Counties

County	STCC Code	Description	Tons	% of Commodity
Hamblen County	28	Chemicals or Allied Products	377,145	54.0%
	24	Lumber of Wood Products	176,900	25.4%
	26	Pulp, Paper, or Allied Products	86,576	12.4%
	20	Food or Kindred Products	57,223	8.2%
		Total	**697,844**	
Jefferson County	11	Coal	45,818	100.0%
		Total	**45,818**	

Source: IHS Global Insight TRANSEARCH, 2016

Table 3-16. Top Exports by Tonnage via Rail, Hamblen and Jefferson Counties

County	STCC Code	Description	Tons	% of Commodity
Hamblen County	40	Waste or Scrap Materials	26,431	52.1%
	28	Chemicals or Allied Products	24,324	47.9%
		Total	**50,755**	
Jefferson County	32	Clay, Concrete, Glass, or Stone	439,069	100.0%
		Total	**439,069**	

Source: IHS Global Insight TRANSEARCH, 2016

Pipeline Transport Facilities

Pipeline is another mode of freight transportation and is often used for transporting petroleum and natural gas. Starting in Georgia, the East Tennessee Natural Gas Pipeline transports through eastern Tennessee, North Carolina, and Virginia. The pipeline, currently operated by Enbridge, Inc., is approximately 1,510 miles long and has a capacity of nearly 1.86 billion cubic feet per day. The Texas Eastern Transmission Gas Pipeline, Tennessee Gas Pipeline, Columbia Gas Pipeline, Southern Natural Gas Pipeline, and the Midwestern Gas Transmission Company Gas Pipeline all interconnect with the East Tennessee Natural Gas Pipeline.

Aviation Transport Facilities

Morristown Regional Airport is a city-owned public airport located west of downtown along the U.S. Highway 11E corridor between State Route 160 and Merchants Greene Boulevard. The general aviation facility has one asphalt runway measuring approximately 5,700 feet in length. Morristown Regional Airport is not a major source of freight movement. However, for the 12 months ending May 25, 2018, the airport had 49,500 aircraft operations, an average of 136 per day: 97 percent general aviation, 2 percent air taxi, and 1 percent military. At that time, there were 33 aircraft based at the airport: 61 percent single-engine, 21 percent multi-engine, 12 percent jet, 3 percent helicopter, and 3 percent ultralight.

3.4 Bicycle and Pedestrian Network

Having a well-developed bicycle and pedestrian network is an important part of a region's transportation system. Not only does a well-developed bicycle and pedestrian network provide transportation options for people of all ages and abilities, but it can also fuel economic development by attracting and retaining businesses and residents as well as tourism. Regional, local, and individual benefits of walkways and bikeways include the following:

- Increased Travel Choices
    - More transportation options for people of all ages and abilities
    - Reduced transportation costs
    - Increased access to local goods and services

- Personal Health Benefits
  - Increased physical activity
  - Lower risk of heart disease, stroke, and cancer
  - Improved mental health

- Social and Economic Benefits
  - Improved civic life
  - Greater support for local businesses
  - Increased tourism through placemaking

- Environmental Benefits
  - Reduced air pollution and greenhouse gas emissions
  - Improved water quality
  - Preserved natural areas and rural landscapes

Bicycle and Pedestrian Facilities

With a renewed focus on people of all ages and abilities, bicycle and pedestrian planning and design have changed substantially over the past two decades and now offer a much wider range of strategies and tools. Facilities now include:

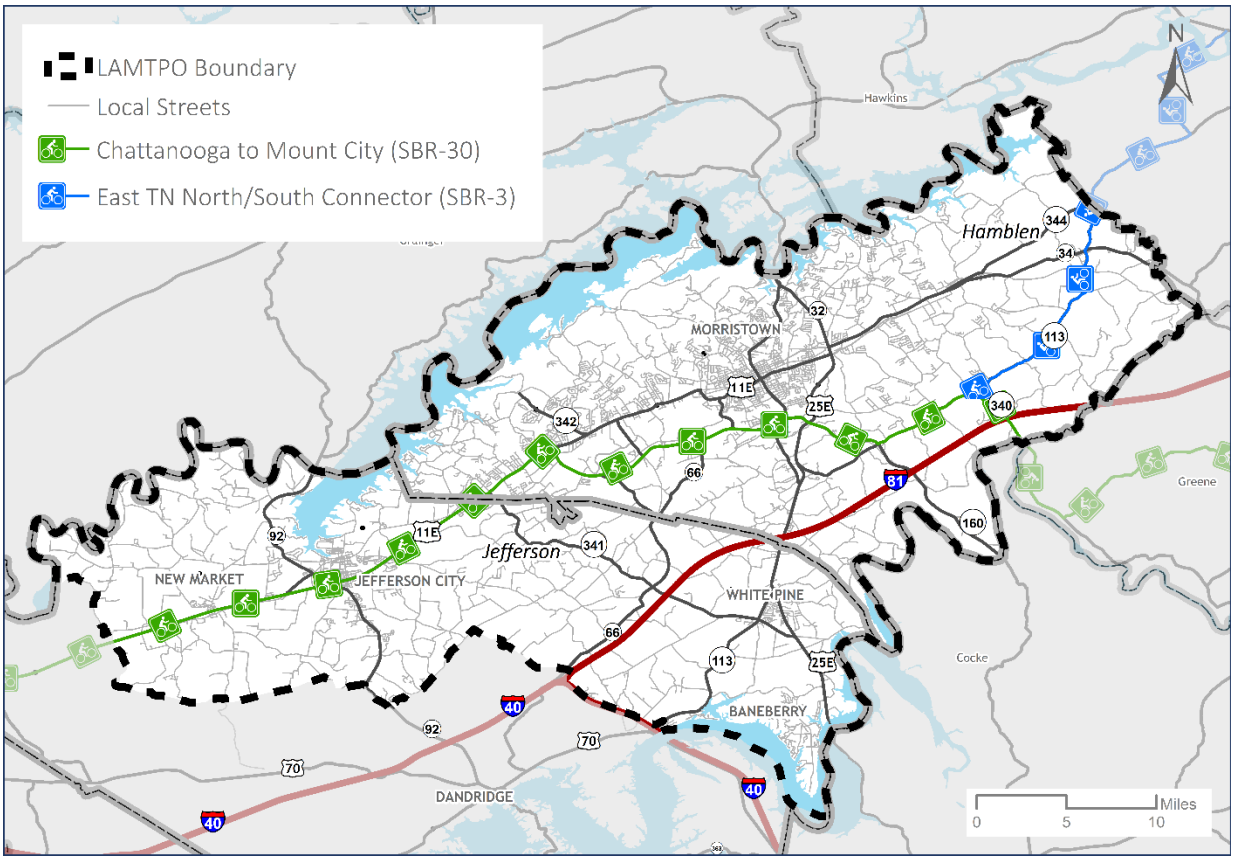
Sidewalks
Pedestrian ways
Paved shoulders
Conventional bicycle lanes
Buffered bicycle lanes
Separated bicycle lanes
Bicycle boulevards
Advisory or edge lanes
Sidepaths
Shared use paths

Like other transportation modes, improving walking and bicycling conditions requires a comprehensive systems approach. Connected networks that are safe, comfortable, and convenient, and that take people where they want to go are fundamental to support walking and bicycling. In 2019, LAMTPO adopted a bicycle and pedestrian master plan to increase walking and bicycling by providing networks that link residents and visitors to their destinations in a safe and efficient way.

Bicycle Network

Within the Lakeway region, there are two State Bike Routes (#3 and #30) on approximately 37 miles of signed roadways, (Figure 3-22). State Bike Route 30 enters the southwestern portion of the Lakeway region via U.S. Highway 11E and exits the eastern portion of the region along State Route 340, making a connection of approximately 29 miles. State Bike Route 3 begins at the intersection of State Route 113 and State Route 340 and heads north along State Route 113 for approximately seven miles to the county line.

Figure 3-22. Lakeway Region State Bicycle Routes

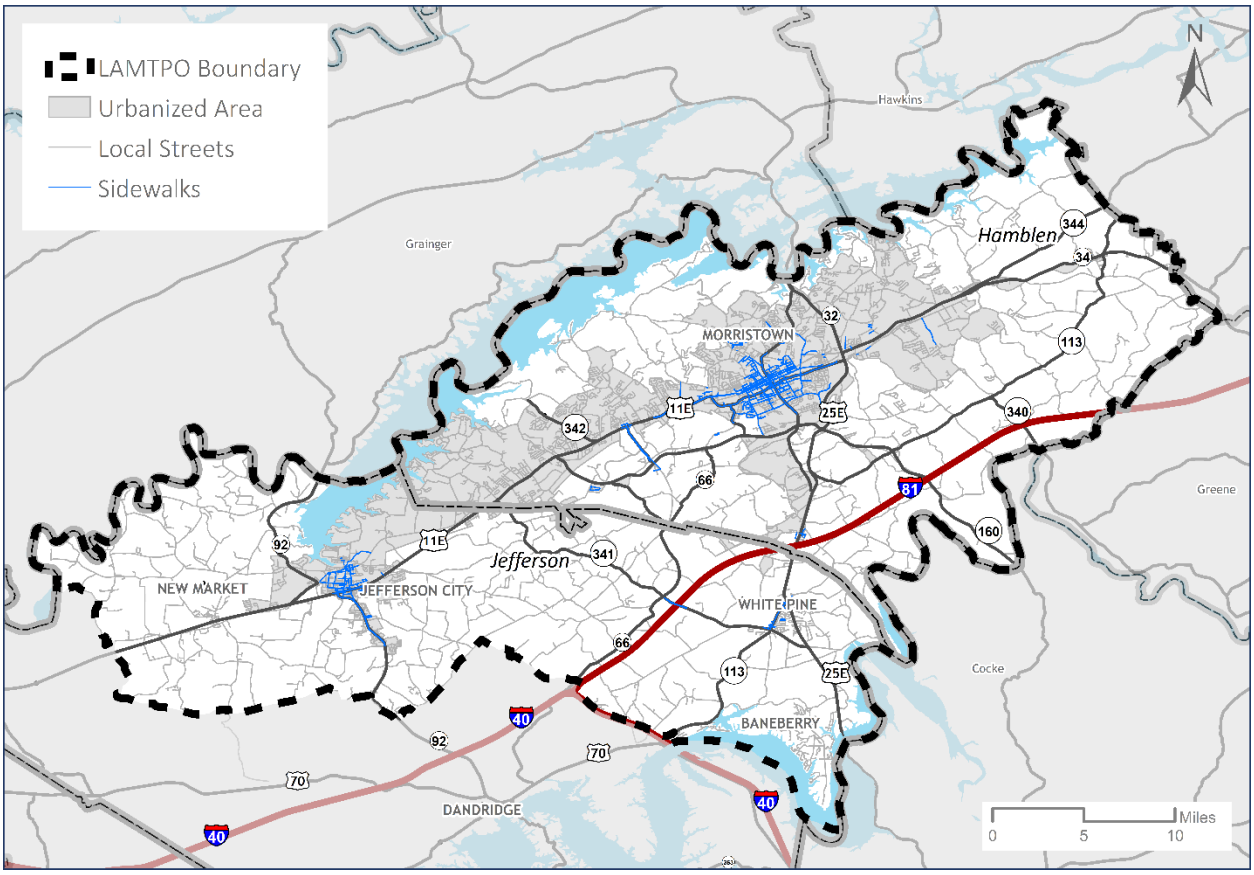


Source: TDOT

Pedestrian Network

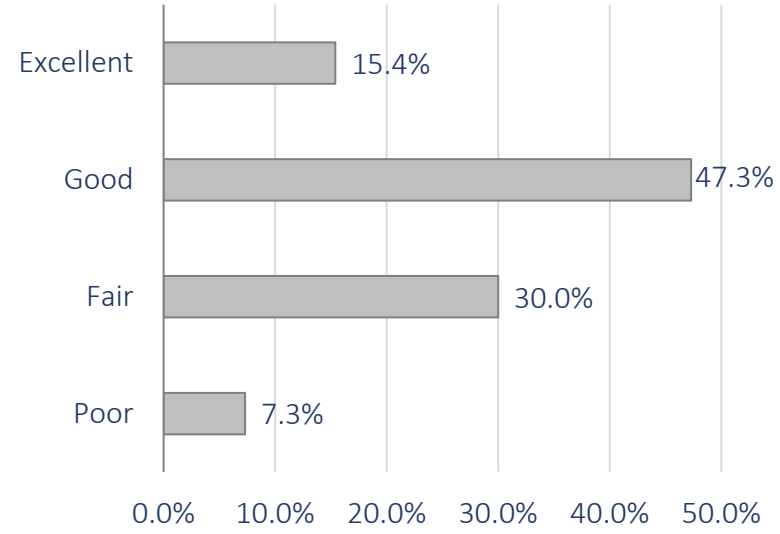
In the Lakeway region there are 116 miles of sidewalk, with 74 percent of the sidewalks in Morristown. Figure 3-23 illustrates the sidewalks throughout the Lakeway region, showing that most of the sidewalks are within Morristown city limits. Of the total sidewalk mileage, 37.3 percent of the sidewalks are either in fair or poor condition, with 15.4 percent being in excellent condition and 47.3 percent being in good condition (Figure 3-24).

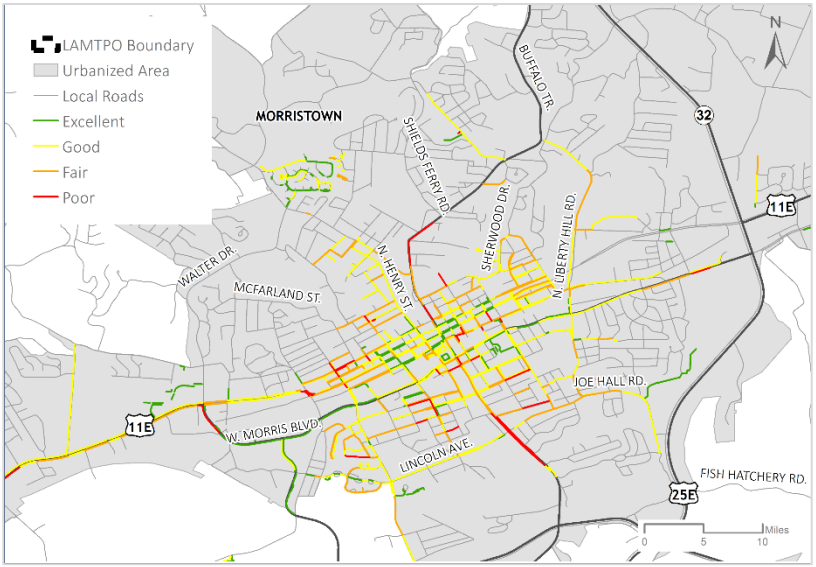
Figure 3-23. Lakeway Region Sidewalks

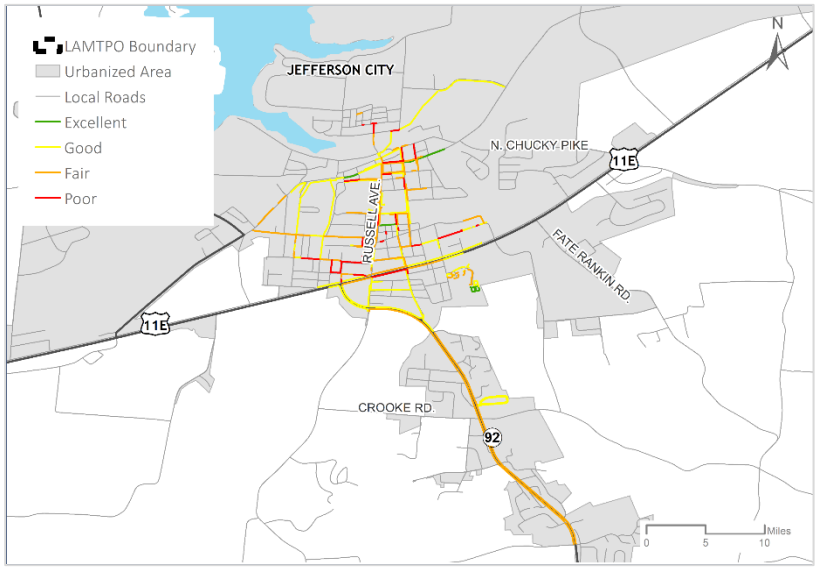


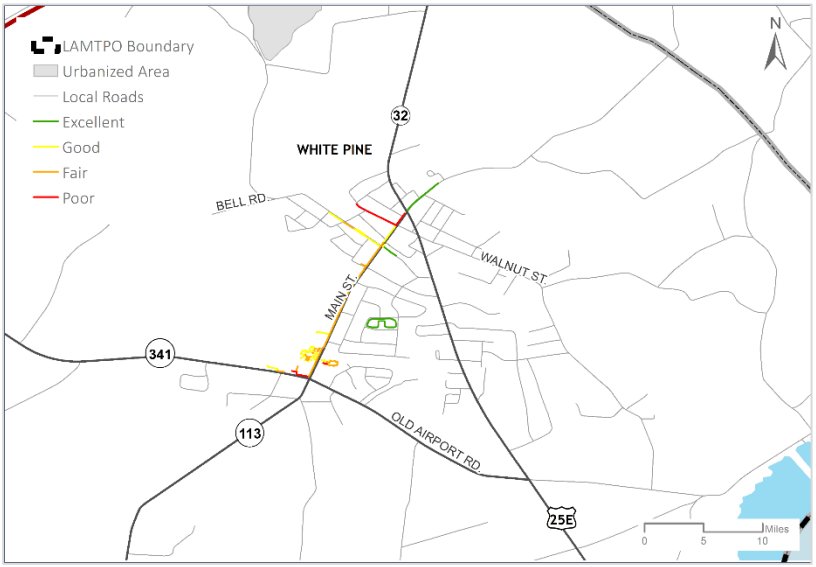
Source: LAMTPO, 2019

Figure 3-24. Lakeway Region Sidewalk Conditions by Urbanized Area









Source: LAMTPO, 2019

Shared Use Paths

Shared use path is an umbrella term for sidepaths and greenways. Sidepaths are shared use paths found within road right-of-way while greenways are shared use paths in independent corridors. As the name implies, shared use paths support multiple active transportation modes, such as walking, bicycling, people in wheelchairs, scooters, and inline skating.

A few of the potential benefits of a shared use path network include the following:

- Provides dedicated facilities for active transportation users, which are separate from motor vehicle traffic;
- Provides non-motorized access to natural and recreation areas;
- Provides an additional travel option beyond the personal vehicle;
- Provides recreational opportunities and has the potential for becoming a destination;
- Provides short connections between neighborhoods and nearby destinations; and
- Provides economic value to nearby homes and businesses.

According to the 2019 LAMTPO bike and pedestrian plan, there are approximately five miles of shared use paths within the region. Morristown contains 68.6 percent of the shared use paths (~3.5 miles), with Jefferson City having 31.4 percent of the shared use paths (~1.5 miles). The Morristown paths are part of the Turkey Creek Greenway network, which has a goal of connecting downtown Morristown to Cherokee Lake with a great opportunity for recreational biking and walking.

Bicycle and Pedestrian Safety

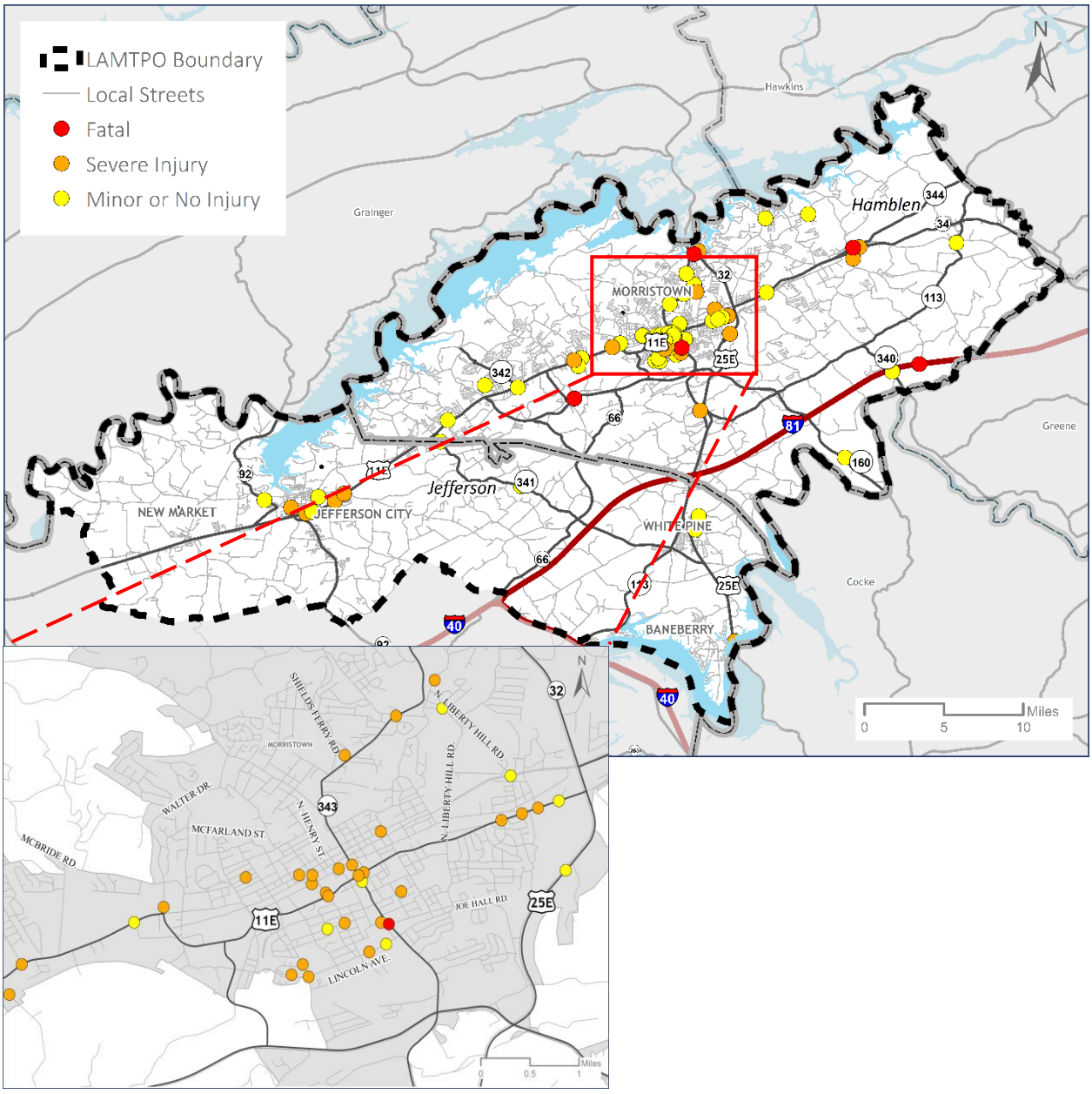
Between 2015 and 2019, there were 70 crashes involving a pedestrian or bicyclist, with 7 percent of the crashes being fatal**.** illustrates the crashes as either being fatal, severe injury, or minor or no injury for the 5-year period. Figure 3-25 shows the locations within the Lakeway region where bicycle and pedestrian crashes occurred between 2015 and 2019.

Table 3-17. Lakeway Region Bicycle and Pedestrian Crash Severity, 2015 to 2019

Crash Type	2015	2016	2017	2018	2019
Fatal	0	0	3	1	1
Severe Injury	5	3	4	5	2
Minor or No Injury	7	9	8	5	17
Total	12	12	15	11	20

Source: TDOT ETRIMS, 2020

Figure 3-25. Lakeway Region Bicycle and Pedestrian Crash Locations, 2015 to 2019



Source: TDOT ETRIMS, 2020

3.5 Lakeway Region Transit

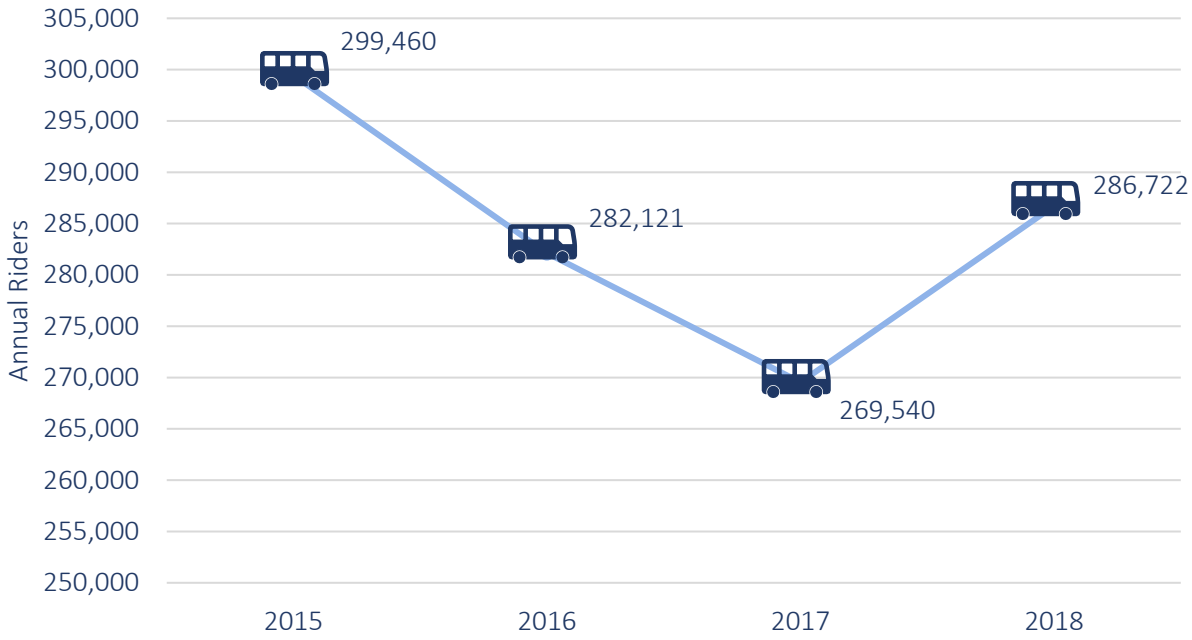
Public transportation is an important part of community's growth, providing access to major attractions for those who do not own a personal vehicle, are unable to drive a vehicle, or choose not to drive. It is important to understand the areas within the Lakeway region that will most likely benefit from transit, such as areas with higher concentrations of people that are low income, minorities, or older residents, because these individuals tend to depend upon transit service for access and mobility more so than other people. This section will evaluate the current transit services in the Lakeway region and the areas of populations who depend the most on it.

East Tennessee Human Resource Agency (ETHRA)

Transit in the Lakeway region is currently provided by the East Tennessee Human Resource Agency (ETHRA), which is a nonprofit agency that offers demand response transportation service to 16 counties in East Tennessee. A demand response service supports door-to-door trips for customers that request it, and any resident in the Lakeway region may request a ride. Based on the 2018 National Transit Database (NTD), ETHRA operates a transit fleet of 81 demand response vehicles providing over 250,000 annual trips.

While ETHRA's annual ridership declined by 10.0 percent between 2015 and 2017, it increased by 6.4 percent from 2017 to 2018. Figure 3-26 summarizes the annual ridership for ETHRA from 2014 to 2018. The cost to use ETHRA service is $3.00 per one-way trip made within the same county, with an additional $3.00 for each county line crossed. If the trip requires multiple stops between the origin and destination, there is an additional $1.00 charge for each stop. ETHRA's call center services run Monday through Friday from 8:00 AM to 4:30 PM.

Figure 3-26. ETHRA Annual Ridership, 2015 to 2018

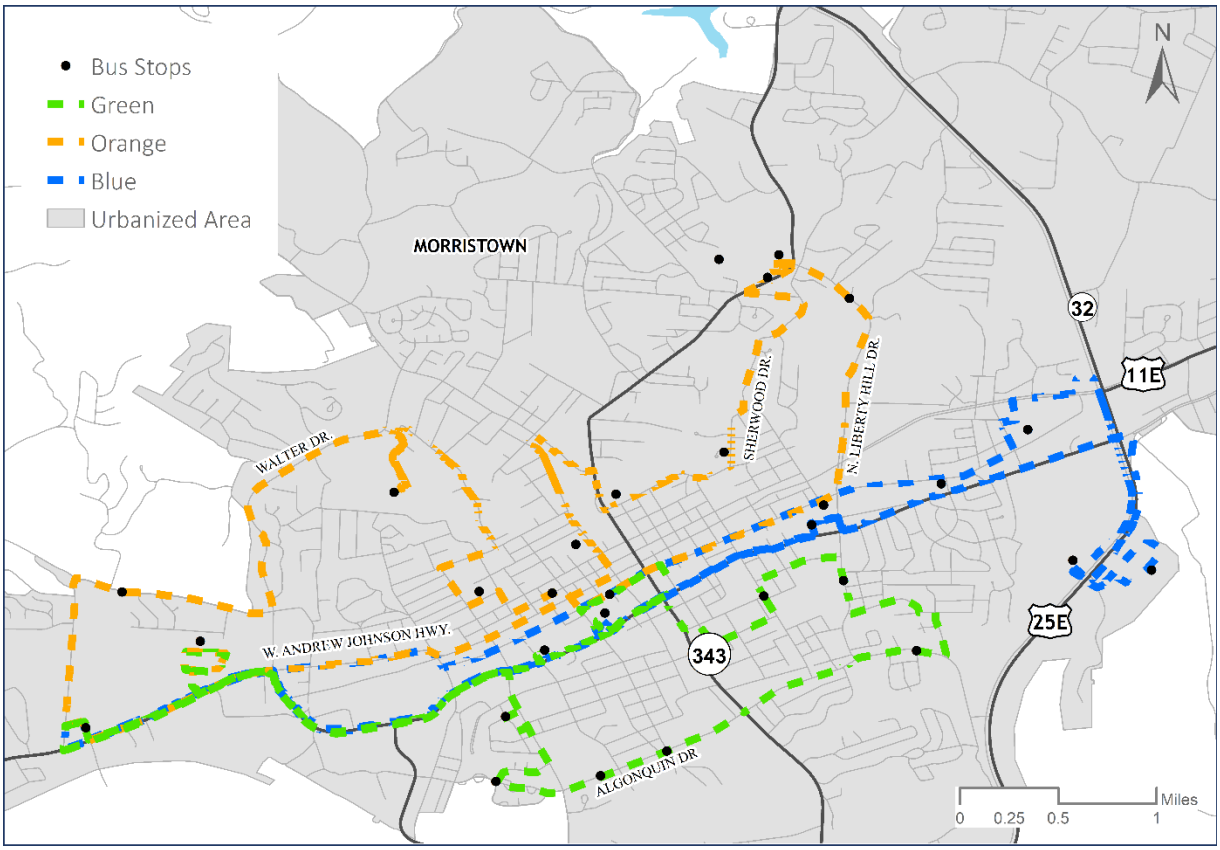


Source: National Transit Database

Lakeway Transit Fixed Route Service

The Lakeway region also has a fixed route service in Morristown. The three routes, which include connections to health-care facilities, shopping destinations, the library, and residential areas, will have at least one bus on each route, with wait times that will range from 30 to 60 minutes. The fare for the fixed route service will be $1.50, half the cost of a one-way demand-response ride, and will operate five (5) days a week from 7:00 AM to 6:00 PM. Figure 3-27 illustrates the routes as well as the stops associated with each.

Figure 3-27. Lakeway Transit Fixed Route Service Routes



Source: LAMTPO, 2020

Other Transit Services in the Lakeway Region

Along with ETHRA and the Morristown fixed route service, there are various other private service providers that can be utilized by residents within the Lakeway region. Table 3-18 documents the other transit services in the Lakeway region.

Table 3-18. Other Transit Services in the Lakeway Region

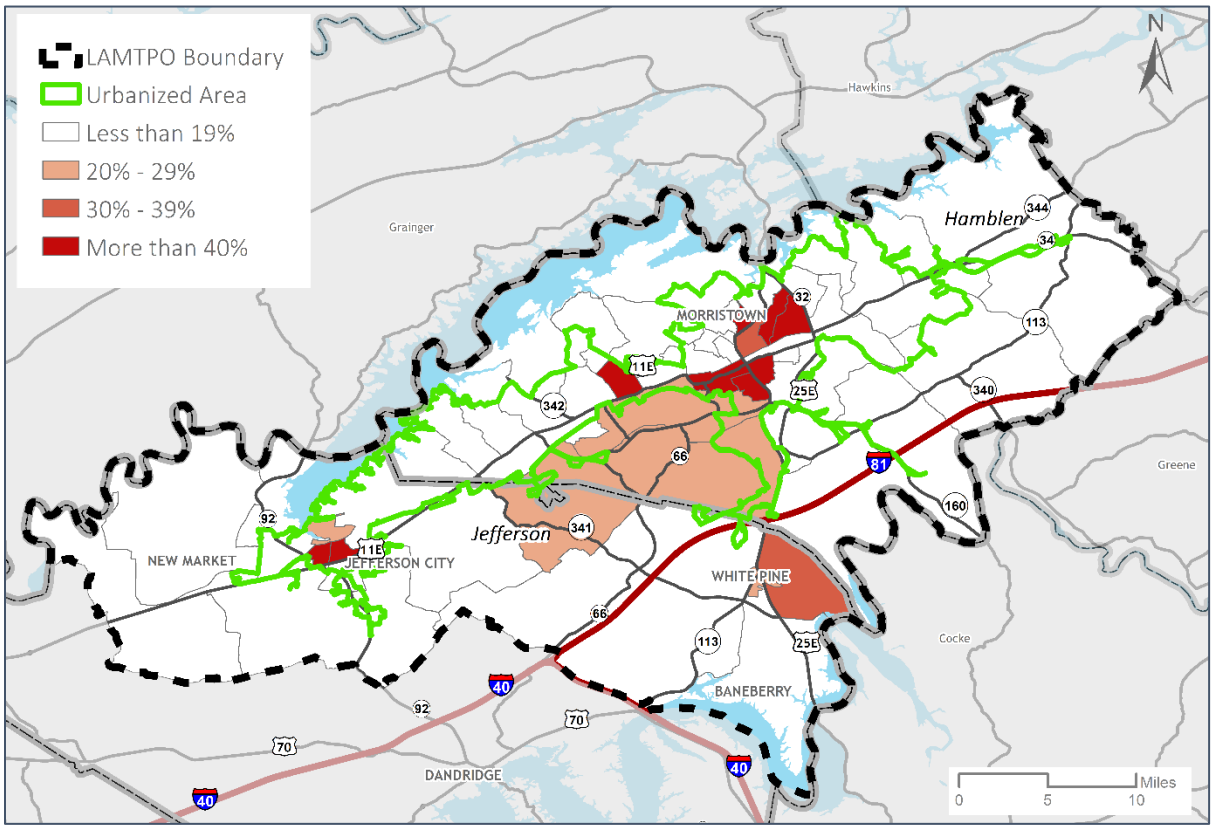
Name	Location	Contact Information	Service Type
Anderson Transportation	Sneedville, TN 37869	(423) 733-4950	Non-Emergency Medical Transportation (Hamblen County Only)
Greyhound Bus Line	Morristown, TN 37814	(423) 586-3841	Intercity Transit Service
People2Places Transportation, Inc.	Jefferson City, TN 37760	(833) 285-8262	Curb-Side-Pickup, Student Transportation, Veteran Transportation, and Non-Emergency Transportation

Source: LAMTPO

Transit Demand

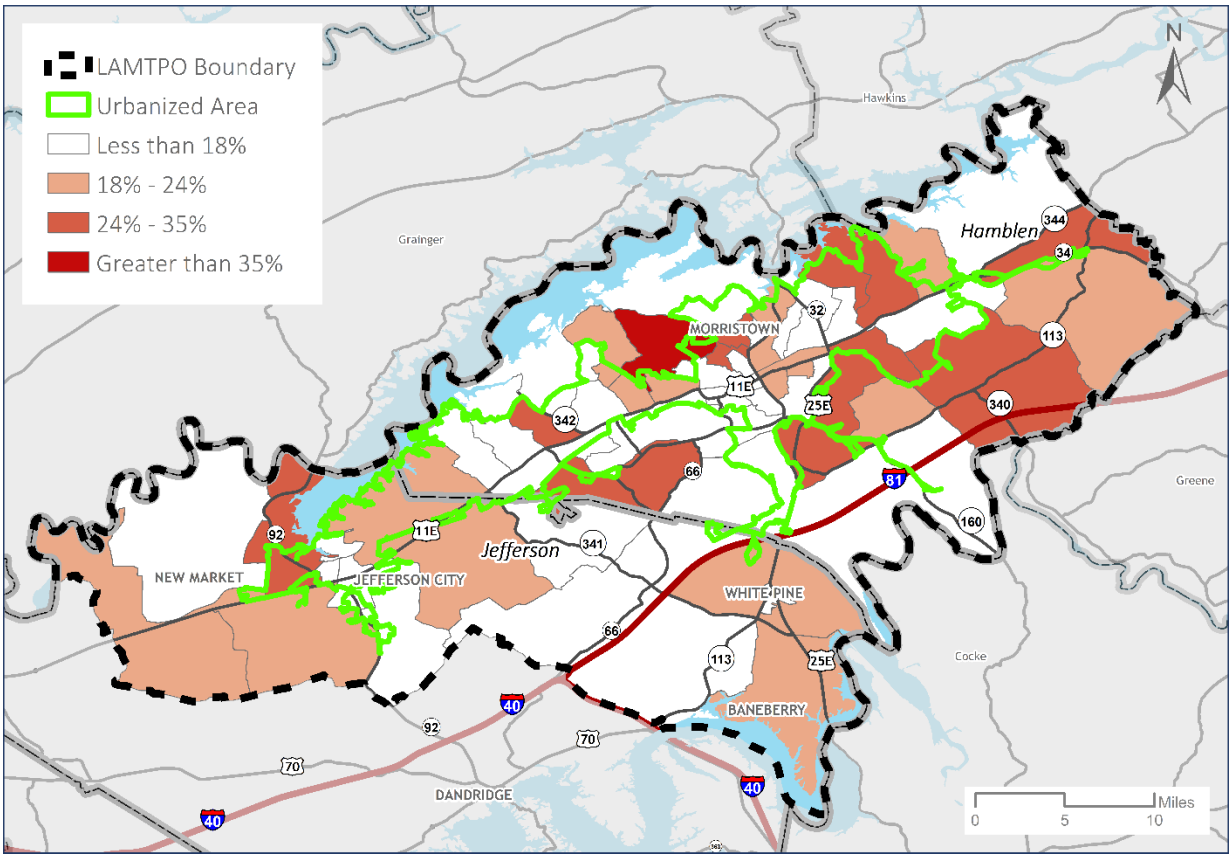
Socioeconomic data can be used to help project where there may be a particularly high need or demand for transit. For example, people who are living at or below the poverty level might not have access to a reliable personal vehicle. Older adults, especially those aged 65 and older, and persons with disabilities may also have an increased demand for transit services due to issues that make it difficult to drive. Minority persons also tend to ride public transportation in greater numbers than the population at large. Figure 3-28 through Figure 3-30 illustrate locations in the Lakeway region where there are concentrations of potential transit demand based on socioeconomic data. These maps highlight areas where percentages are higher than the average percentage for the Lakeway region for low-income persons (20 percent), adults 65 years or older (18 percent), and minority persons (13 percent).

Figure 3-28. Lakeway Region Low-Income Households by Census Block Group



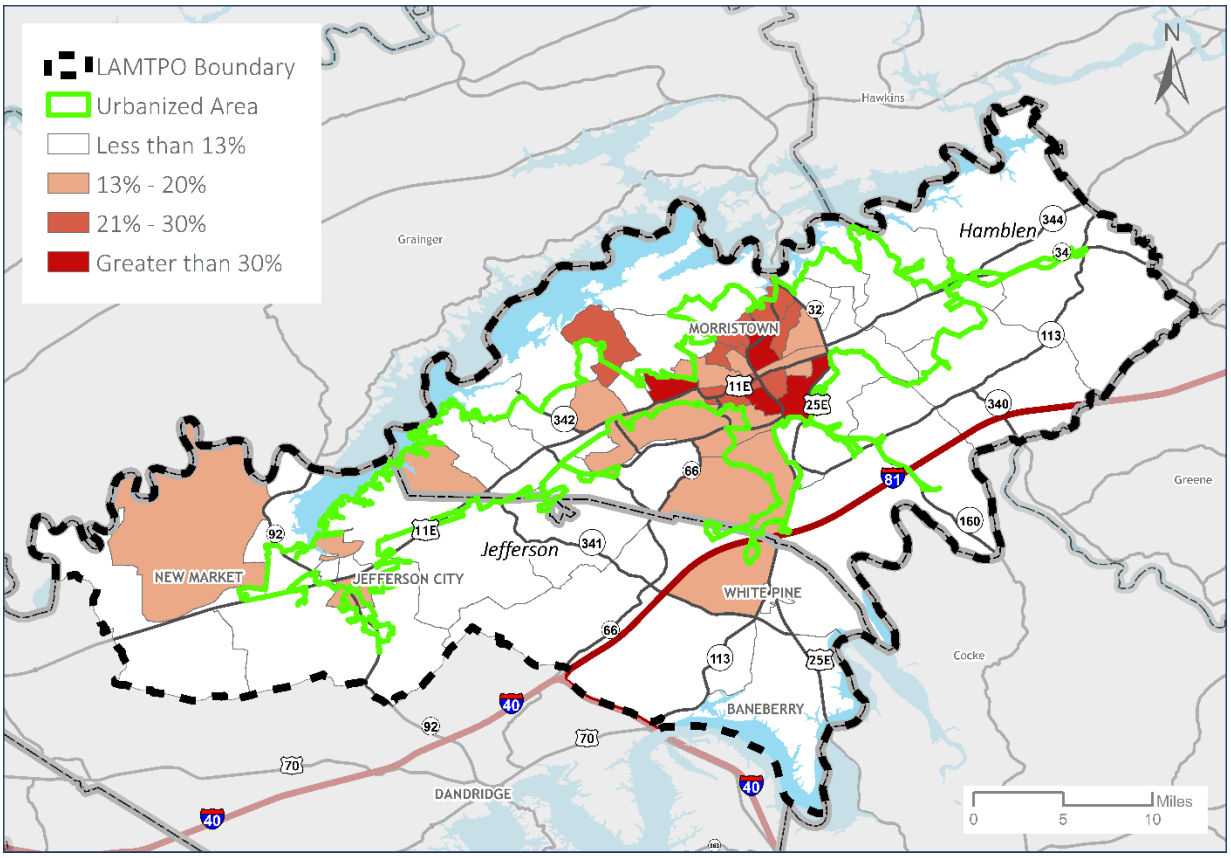
Source: American Community Survey, 2018

Figure 3-29. Lakeway Region Population Over 65 Years by Census Block Group



Source: American Community Survey, 2018

Figure 3-30. Lakeway Region Minority Population by Census Block Group



Source: American Community Survey, 2018

Human Services Transportation Coordination Plan

Lakeway's Human Services Transportation Coordination Plan identifies opportunities for improved coordination between public transit providers, human services agencies, and other nonprofits to meet the needs of individuals that depend on public transportation. By partnering with one another, fewer agencies need to invest in the creation and maintenance of a fleet by minimizing the duplication of services. For example, ETHRA partners with TennCare, the state's Medicaid program, to provide medical rides within both Jefferson and Hamblen Counties.

Chapter 4 - Safety, Security, and Sustainability

Chapter 4 describes factors impacting the transportation system that should be considered when planning for transportation improvements in the region – safety, security, and sustainability. These elements have increasingly become a critical component in the long-range planning process. LAMTPO is responsible for coordinating with federal, state, and local entities as it relates to these topics for both motorized and non-motorized transportation users. The purpose of this chapter is to highlight related concerns, plans, programs, and other efforts being coordinated to protect the transportation system and its users.

4.1 Safety

Safety for all transportation users is critical in the Lakeway region. As detailed in Chapter 2, safety measures are recorded with every update of this plan, including fatalities, serious injuries, and the overall number of those in crashes. While the number of fatal crashes has been gradually decreasing over the past five years, LAMTPO continues to strive for zero vehicular fatalities. The organization continually works with partners to monitor the performance of the transportation system as it relates to safety, as well as addressing safety issues through the implementation of a variety of programmatic approaches. This section provides an overview of these partnerships and programs.

Highway Safety Programs

The Highway Safety Improvement Program (HSIP) is a federal aid program that seeks to reduce traffic fatalities and serious injuries through projects specifically addressing safety. HSIP addresses highway safety using a comprehensive programmatic approach which includes a multifaceted team of partners approaching the topic of safety from a number of angles. To be eligible for HSIP funding, states must develop a statewide highway safety plan (SHSP) to identify roadway issues, a program of projects or strategies to reduce safety issues, and a way to evaluate statewide roadway safety strategies on a recurring basis.

Tennessee's Strategic Highway Safety Plan was updated in 2020 under the oversight of the state's Strategic Highway Safety Steering Committee, and is fully compliant with the requirements outlined in the HSIP. This plan seeks to develop a comprehensive approach to roadway safety in Tennessee based on the continued commitment to a "Toward Zero Deaths" vision, a national strategy to resolve safety issues on roadways with an ultimate goal of zero fatalities. The SHSP has six primary emphasis areas:

- Data collection and analysis;
- Driver behavior;
- Infrastructure improvements;
- Vulnerable road users;
- Operational improvements; and
- Motor carrier safety.

For each of these emphasis areas, individual goals, objectives, and strategic countermeasures were created to promote safety and reduce fatalities and serious injuries using a four-pronged approach, known as the "Four Es" of transportation safety (i.e., engineering, enforcement, education, and emergency response).

Engineering-related performance targets outlined in the SHSP are implemented, in part, through the state's HSIP. TDOT's Project Safety Office manages the following programs as part of these safety efforts:

- Road Safety Audit Review Program;
- Roadway Departure Safety Plans;
- Intersection Safety Action Plans;
- High Friction Surface Safety Initiative (HSSI);
- Ramp Queue Program;
- Low Cost Safety Improvements on Resurfacing Projects;
- Wrong Way Safety Initiative; and
- Pedestrian Road Safety Initiative.

While not funded using HSIP dollars, the Project Safety Office also manages the Spot Safety Improvement Program, which works towards improving roadway safety for all users.

To continuously monitor and evaluate roadway safety conditions, the Tennessee Governor's Highway Safety Office produces a Highway Safety Plan (HSP) annually. The HSP is directly aligned with the priorities established in the SHSP. The plan identifies data-driven safety issues throughout the state to prioritize Section 402 and 405 funding and distribution. Using the annual data, the specific issues identified as high priority for Tennessee in the FY 2020 plan included:

- Low rate of seat belt usage;
- Low rate of child passenger safety restraint usage;
- High rate of crashes with alcohol as a contributing factor;
- High rate of crashes with speeding as a contributing factor;
- High rate of crashes involving drivers under 20 years old;
- High rate of crashes involving an aggressive driver; and
- High rate of crashes resulting in serious injuries or fatalities.

Multimodal Safety Programs

Transit

Beginning in 2020, the Federal Transit Administration (FTA) requires state DOTs and public transit providers to establish performance targets to meet the safety performance measures in the National Public Transportation Safety Plan. These targets must be shared with other state agencies and MPOs. While transit providers are not required to report their performance targets to FTA at this time, they will be required to share them with FTA at a future date. Transit providers must track the seven safety

performance measures listed in Table 4-1 below. Additionally, local transit agencies in the Lakeway MTPO area must create a transit asset management plan, which includes state targets for all vehicles based on their useful life benchmark. This ensures only reliable vehicles are being used, acting as a safety measure for the agency.

Table 4-1. Federal Transit Safety Performance Measures

Category	Safety Performance Measure
Fatalities	Total Fatalities
	Fatality Rate per Total Vehicle Revenue Miles (VRM) by Mode
Injuries	Total Injuries
	Injury Rate per Total Vehicle Revenue Miles (VRM) by Mode
Safety Events	Total Number of Safety Events
	Rate of Safety Events per Total Vehicle Revenue Miles (VRM) by Mode
System Reliability	Mean Distance Between Major Mechanical Failures by Mode

Active Transportation

A variety of TDOT programs aim at increasing the safety for all roadway users, specifically those that are most vulnerable to injury and death, non-motorists. These programs are implemented through the department as well as in partnership with local and regional partners through grant opportunities, such as the Multimodal Access Grant Program and Transportation Alternatives Program (TAP).

The Pedestrian Road Safety Initiative is a new program managed by the Project Safety Office in TDOT's Strategic Investments Division (STID). Using HSIP dollars, non-motorized safety improvement projects are implemented at locations along state highway segments that are particularly unsafe for pedestrians. These improvements include the addition of crosswalks and the installation of pedestrian crossing signals. The Lakeway MTPO's 2020-2023 Transportation Improvement Program (TIP) estimates that approximately $2.4 million is expected from HSIP funds for regional safety projects.

Rail

TDOT's Office of Rail Safety and Inspection partners with the Federal Railroad Administration (FRA) to reduce dangerous and/or hazardous conditions along railways for railroad employees and the general public. Inspectors monitor the railroad track, the handling of hazardous materials, railroad signals and trail control, and railroad operating practices. TDOT inspectors are authorized to enforce Tennessee railway laws, including maintaining at-grade rail-highway crossings in good condition.

TDOT's Office of Rail Engineering manages the state's Highway-Railroad Grade Crossing Program (also known as the Section 130 Program). This program identifies and evaluates potential locations for grade crossing safety improvements, such as the installation of warning devices. Priority for these funds is given to crossings determined to have the highest risk of a train-vehicle collision, which is calculated using FHWA's crash prediction model.

4.2 Security

At a regional level, a transportation network must develop a system that allows it to continue to function in the event of an emergency. Transportation system security ensures the continuation of service and considers many types of unforeseen emergencies. Security attacks can include everything from a terrorist attack to a cyber security attack through advanced technologies. Transportation security planning is crucial for many parts of the LAMTPO system, including:

- Roadways;
- Bridges and tunnels;
- Freight facilities, including pipelines;
- Airports;
- Public transit systems; and
- Bicycle and pedestrian facilities.

The FAST Act requires MPOs to plan for both safety and security, from prevention to management to response. Within transportation security planning, there are various federal, state, and local agencies that play a role in the preparation and response to emergency conditions. Table 4-2 outlines the various agencies that are involved with system security for the Lakeway MTPO, followed by a description of each agency's role. Coordination among agencies in emergency conditions is key, and LAMTPO plays an important central role in the execution of this coordination.

Table 4-2. Security Planning Responsibilities by Agency and Sector

Agency	Transportation Security Planning by Sector			
	Roadways	Transit	Air	Cargo and Commodity
Nationwide Security Efforts				
U.S. Department of Transportation	✓	✓	✓	✓
Federal Highway Administration	✓	✓		✓
Federal Transit Administration		✓		
Federal Railroad Administration		✓		✓
Federal Aviation Administration			✓	✓
U.S. Department of Homeland Security	✓	✓	✓	✓
Federal Emergency Management Agency	✓	✓	✓`	✓

Table 4-2. Security Planning Responsibilities by Agency and Sector (cont.)

Agency	Transportation Security Planning by Sector			
	Roadways	Transit	Air	Cargo and Commodity
Statewide Security Efforts	✓	✓	✓	✓
Tennessee Department of Transportation				
Tennessee Department of Safety and Homeland Security	✓	✓	✓	✓
Tennessee Emergency Management Agency	✓	✓	✓	✓
Regional Security Efforts				
East Tennessee Human Resource Agency		✓		
Lakeway MTPO	✓	✓	✓	✓

National Security Efforts

U.S. Department of Transportation

Under the National Response Framework, the U.S. Department of Transportation (DOT) is the primary federal agency with authority to coordinate federal interagency support for a region's transportation system. Roles and responsibilities in emergency include:

- Aviation/airspace management and control;
- Transportation safety;
- Restoration/recovery of transportation infrastructure;
- Movement restrictions; and
- Damage and impact assessment.

The DOT consists of 13 agencies that promote a safe and secure transportation system across the nation. In the LAMTPO region, four agencies play a key role in security planning: FHWA, FTA, FRA, and the Federal Aviation Administration (FAA). Covering different aspects of the overall transportation system, their specific roles in preparing the region for emergency conditions allows LAMTPO to promote resiliency and efficiency of the system as a whole.

Federal Highway Administration

Federal Highway Administration (FHWA) supports state and local governments in the design, construction, and maintenance of roadways included in the NHS and the Federal Lands Highway Program. FHWA does not own the roadways directly but provides assistance in their upkeep. By providing financial and technical assistance, they ensure the nation's roadways are safe and technologically up to date.

FHWA coordinates with the U.S. Department of Defense (DOD) to identify roadways in the NHS system that would serve as primary routes in the event of a national disaster or threat to security, known as the Strategic Highway Network (STRAHNET). I-81 in the LAMTPO region is part of this national network. While

not part of STRAHNET, U.S. Highway 25E is designated as an NHS High Priority Corridor, extending from Corbin, Kentucky, to Morristown, Tennessee, via Cumberland Gap. High Priority Corridors are designated by Congress and may be eligible for additional federal funding.

Federal Transit Administration

Federal Transit Administration (FTA) provides financial and technical assistance to public transit systems. Like FHWA, FTA does not own the assets, but instead provides support to upkeep technology and implement safety measures. In their goal to modernize public transportation, FTA provides assistance for facilities, such as buses, subways, light rail, commuter rail, trolleys, and ferries. FTA investments provide local transit agencies the means to create and enhance their transit networks at a regional scale.

Federal Railroad Administration

The Federal Railroad Administration (FRA) is responsible for carrying out railroad safety laws, overseeing the movement of hazardous materials via rail, and reducing the number and severity of crashes on the nation's railway network. Railroad owners are responsible for maintaining at-grade crossings with roadways and are regularly inspected by the state. FTA has granted authority to TDOT to oversee the Rail Fixed Guideway Systems (RFGS), which includes facilities not regulated by the FRA, such as rapid transit systems, inclined planes, trolleys, and automated guideways.

The Office of Rail Safety and Inspection regularly collects and analyses rail crash data to understand trends in rail safety issues, providing data for LAMTPO officials to identify areas in need of additional safety measures. In the Lakeway region, Norfolk Southern operates a Class I rail corridor.

Federal Aviation Administration

Federnal Aviation Administration (FAA) regulates the aviation system, including pilot certification and operation of the air traffic control system. The only general use public aviation facility in the Lakeway region is the Morristown Regional Airport. FAA is responsible for programs related to airport safety, design, construction, and operation. The agency partners with the Transportation Security Administration under the Department of Homeland Security to prevent attacks on the transportation system.

U.S. Department of Homeland Security

Established in 2002 following the September 11, 2001 terrorist attacks, the U.S. Department of Homeland Security (DHS) oversees a coordinated national strategy to prevent and protect the U.S. from terrorist attacks, as well as improve the overall safety of the United States. The Department was created by merging all or parts of 22 different federal departments and agencies, promoting further coordination for the protection of the nation. The Department's work includes cybersecurity, emergency response to disasters, antiterrorism efforts, and immigration-related work. Furthermore, the Transportation Security Administration (TSA), an agency under the direction of DHS, develops broad policies relating to the transportation system; however, they are perhaps, best known for their security services relating to U.S. airports.

The Federal Emergency Management Agency (FEMA) is an agency within DHS that coordinates across the federal government to help people before, during, and after disasters. While they are the first response after a disaster, FEMA provides grants and assistance to equip the nation to prepare communities and their infrastructure for emergencies before they occur. FEMA provides several transportation specific grants, such as the Transit Security Grant Program, the Intercity Bus Security Grant Program, the Intercity Passenger Rail Program-Amtrak, and the Port Security Grant Program, which provide funds to eligible

entities to protect critical infrastructure and people from acts of terrorism, as well as increase the overall resiliency of the system

Statewide and Regional Security Efforts

At the state and regional level, Tennessee has multiple agencies that are involved with security and protection of the transportation network. The agencies described below are those that take a leadership role in planning for and evaluating the security of the transportation system in the Lakeway region.

Tennessee Department of Transportation

With the mission to provide a safe and reliable transportation system that supports economic growth and quality of life, TDOT is a multimodal state agency responsible for transportation networks in the state, including aviation, public transit, waterways, railroads, bicycling, and walking. In 2016, TDOT published its 25-year Plan, which included a strategic approach to the safety, security, and resilience of transportation systems in Tennessee. Through an agency-wide effort that included local stakeholder and public input, the department analyzed its current policies, programs, and resources available as shown in Table 4-3.

Table 4-3. TDOT Guiding Principles for Safety, Security, and Resiliency

Guiding Principles		Topic		
		Security	Safety	Resilience
Maximize Safety and Security	Reduce injuries and fatalities for all transportation modes and improve transportation security for critical infrastructure.	✓	✓	
Provide for the Efficient Movement of People and Freight	Recognize the change in system users' abilities, behavior, and attitudes towards transportation safety and security and how those may impact policies and projects.	✓	✓	
Emphasize Financial Responsibility	Strategically invest in programs and projects that improve safety and security for existing facilities, which includes the identification of programs and policies that will result in a safe, secure, and resilient transportation system.	✓		
Preserve and Manage the Existing System	Protect existing assets through programs and policies that can result in a more resilient transportation system			✓

Tennessee Department of Safety and Homeland Security

The Tennessee Department of Safety and Homeland Security (TDOS) is made up of three divisions: Tennessee Highway Patrol (THP), Tennessee Driver License Services division, and Tennessee Office of

Homeland Security. This law enforcement agency is responsible for protecting citizens from a spectrum of hazards, including terrorism.

Tennessee Emergency Management Agency

The Tennessee Emergency Management Agency (TEMA) coordinates emergency management in Tennessee, in partnership with FEMA. TEMA supports state government agencies and local jurisdictions during emergencies by assisting in the management of goods and services, coordinating critical emergency functions, and soliciting assistance from other partners. Following a disaster or emergency, TEMA coordinates assessments and federal assistance programs provided to assist in recovery. In addition, TEMA's Preparedness Division provides trainings and certification courses, as well as supports local jurisdictions in updating local Hazard Mitigation Plans.

LAMTPO and ETHRA

The Lakeway MTPO coordinates with federal, state, and other regional agencies for regional security and emergency planning efforts. The agencies listed above, local law enforcement, emergency personnel, and emergency management agencies work together to ensure a resilient region that can withstand and recover from emergencies. Within transit, ETHRA public transit drivers undergo regular training for safety requirements and emergency procedures. In the event of a local evacuation, ETHRA provides a critical service by assisting local safety agencies. Each ETHRA vehicle is equipped with the required equipment needed to ensure passenger safety in case of an emergency. ETHRA drivers can also assist to prevent emergencies and enhance community security by reporting suspicious items, vehicles, or activities they encounter while driving.

4.3 Sustainability and Resiliency

Transportation, land use, and the environment are intricately linked. Development patterns and transportation options combine either to conserve environmental resources – including air and water quality – or place undue stress on them. Additionally, communities with less efficient land use and transportation systems expose themselves to greater risks in the form of local natural disasters and global environmental changes.

The Lakeway MTPO works with state and federal agencies to promote regional sustainability and to reduce any negative effects the transportation system has on the environment. Fundamentally, sustainability balances short-term needs and long-term resources, requiring a

Figure 4-1. Relationship between Transportation, Development, and the Environment

Source: U.S. EPA

strong commitment to stewardship and equity. At a regional scale, the Lakeway MTPO can support more compact development patterns and multimodal transportation options, such as transit, walking, and bicycling, to achieve economic, social, and environmental goals outlined in Chapter 2. Of course, individual land use decisions are made at the local level, so sustainability and resiliency call for a high degree of regional coordination through organizations such as the MTPO.

At the federal level, and in particular at FHWA, many sustainability goals and objectives continue to be advanced under the broader umbrella of "livability." Promoting how multimodal transportation investments can support economic competitiveness, access to employment, and safer communities, FHWA's livability initiatives highlight the following strategies for state, regional, and local planning agencies to pursue:

- Enhance integration of multimodal transportation infrastructure and facilities;
- Expand opportunities for economic development and revitalization;
- Provide safe and adequate accommodations for all users;
- Increase community connectivity and cohesion;
- Capitalize on the value of existing (context sensitive) community amenities;
- Enhance access to jobs, schools, and other services;
- Integrate mobility services and automation to help improve overall quality of life;
- Decrease overall cost of moving people, goods, and services; and
- Capture more short trips by walking and biking and improve health.

Closely related to sustainability and the security of the transportation system is the concept of resiliency. Transportation resiliency is the ability of the system to recover from disruptions, including impacts of extreme weather events and climate change. In addition, resiliency includes the ability to anticipate and prepare for such disruptions. A major disruptive event can damage transportation infrastructure and disrupt travel, impacting the movement of goods and people within the Lakeway region. Furthermore, a lack of resiliency planning can lead to increased maintenance costs over time.

At the state level, TDOT is responsible for preserving and maintaining Tennessee's transportation system. In 2015, the agency completed a statewide analysis of major infrastructure assets and their vulnerabilities to potential extreme weather events, particularly flooding and wind events. The Lakeway MTPO participated in this effort along with several other stakeholders. In addition to participating in statewide efforts, LAMTPO considers resiliency at the planning, project, and operations and maintenance levels. The agency has specifically evaluated critical transportation assets at the corridor level through the completion of targeted studies. U.S. Highway 11E west of downtown Morristown, for example, is currently being studied with a goal "to develop and maintain a safe and secure highway that is an integral part to sustainable development."

Chapter 5 - Future Conditions

5.1 Introduction

The purpose of Chapter 5 is to evaluate the forecasted future conditions for 2045 within the Lakeway region. This information, when compared to the existing conditions described in Chapter 3, provides important insights on how the Lakeway region is anticipated to grow. In turn, the analysis informs the types of policies and improvements the region can pursue to serve the growing community. The future conditions evaluated include:

- Land use;
- Population and employment; and
- Transportation network.

Performance-Based Planning

As discussed in Chapter 2, performance-based planning is the process by which data is used to track key aspects of the transportation system through the establishment and monitoring of data-driven targets (i.e., performance measures). Ultimately, performance-based planning and performance management support efficient transportation investments to meet future goals and needs. Because LAMTO has agreed to statewide performance targets set by TDOT for consistency and efficiency in meeting federal requirements, the performance measures reported in Table 5-1 will be used to evaluate the effectiveness of the 2045 MTP as it progresses through the lifetime of the plan. It is important to note that all but the emissions reduction performance measure are for statewide performance.

Table 5-1. Lakeway Region Performance Measures

Performance Measures		5-Year Rolling Averages		2- and 4-Year Targets		
		Baseline	Target	2-Year Target	4-Year Target	4-Year Target Update*
		2015-2019	2017-2021			
Safety	Number of fatalities	1,039.8	1,078.8			
	Fatality rate (per 100M VMT)	1.3	1.4			
	Number of serious injuries	6,725.8	6,227.1			
	Serious injury rate (per 100M VMT)	8.5	8.4			
	Number of non-motorized fatalities and serious injuries	511.4	521			
Pavement and Bridge Conditions	Percentage of pavements on the interstate system in good condition	N/A		N/A	60.0%	
	Percentage of pavements on the interstate system in poor condition	N/A		N/A	0.3%	
	Percentage of pavements on the non-Interstate NHS in good condition	44.8% (Full Distress)		42.0%	40.0%	
	Percentage of pavements on the non-Interstate NHS in poor condition	3.2% (Full Distress)		4.0%	4.0%	5.0%
	Percentage of NHS bridges classified as in good condition	39.5%		36.0%	36.0%	
	Percentage of NHS bridges classified as in poor condition	4.9%		6.0%	6.0%	
System Performance	Subpart E – interstate reliability (percent of person-miles traveled on the Interstate System that are reliable)	87.7%		85.3%	83.0%	

Table 5-1. Lakeway Region Performance Measures (Continued)

Performance Measures		5-Year Rolling Averages		2- and 4- Year Targets		
		Baseline	Target	2-Year Target	4-Year Target	4-Year Target Update*
		2015-2019	2017-2021			
System Performance	Subpart E – non-interstate NHS reliability (percent of person-miles traveled on the non-Interstate NHS that are reliable)	N/A		N/A	87.5%	
	Subpart F – freight reliability (truck travel time reliability index)	1.35		1.35	1.33	1.37
	Subpart G – traffic congestion (peak hour excessive delay per capita)	N/A		N/A	18.8	
	Subpart G – traffic congestion (percent of non-single occupancy vehicle travel)	16.6%		16.5%	16.5%	
	Total emissions reductions	VOC = 230.025 CO = 530.282 NOx = 363.399 PM2.5 = 2.897		VOC = 30.698 CO = 75.000 NOx = 62.840 PM2.5 = 0.120	VOC = 61.396* CO = 150.000 NOx = 125.680* PM2.5 = 0.240*	VOC = 41.449** CO = 150.000 NOx = 181.679** PM2.5 = 7.340**

Source: LAMTPO, 2020

** These values are considered 'draft'. TDOT is currently evaluating these values for official approval.*

*** The Knoxville/Lakeway non-attainment region is only required to adopt 4-year targets and is only subject to performance measures under subpart E, F, and H for the first performance period, and only subject to emissions reductions targets for the pollutants of VOC, NOx and PM2.5, as indicated.*

Travel Demand Model

Transportation modeling is an essential component of transportation planning, helping to identify needed regional infrastructure improvements. Managed by the Knoxville Regional TPO, the Lakeway region's 2045 TDM provides the scale needed to analyze forecasted employment and population growth, understand impacts to the transportation system, and analyze the potential benefits of future transportation investments.

4-Step
Travel Demand Model Process

- **Trip Generation** – number of trips made
- **Trip Distribution** – where these trips go (i.e., destinations)
- **Mode Choice** – how people will get there (e.g., automobile, transit, walking, and bicycling)
- **Route Assignment** – what routes are taken

5.2 Future Population and Employment

Land Use

Over the 25-year planning horizon, land uses in the Lakeway region are anticipated to experience a number of changes, particularly in agricultural (regional decrease of 18.6 percent), commercial (regional increase of 34.8 percent), and residential low-density (regional increase of 22.0 percent) land, as shown in Table 5-2. Low-density residential is predicted to become the primary land use type by acreage surpassing agriculture. Jefferson County, specifically, is expected to experience a significant shift from agricultural lands to low-density residential by 2045.

Table 5-2. Lakeway Region Existing Land Use and Future Land Use Policy, 2018 to 2045

Land Use	2018 Land Use (Acres)	2045 Land Use (Acres)	Change (2018-2045)	% Change (2018-2045)
Agriculture	89,964.1	73,269.2	-16,694.8	-18.6%
Commercial	3,246.1	4,375.3	1,129.2	34.8%
Industrial	4,371.9	4,875.4	503.5	11.5%
Public Lands	8,705.5	8,705.5	0.0	0.0%
Residential (High-Density)	6,073.2	6,996.0	922.7	15.2%
Residential (Low-Density)	64,333.4	78,504.1	14,170.7	22.0%
Total	**176,694.2**	**176,725.5**	-	-

Source: LAMTPO, 2020

Population

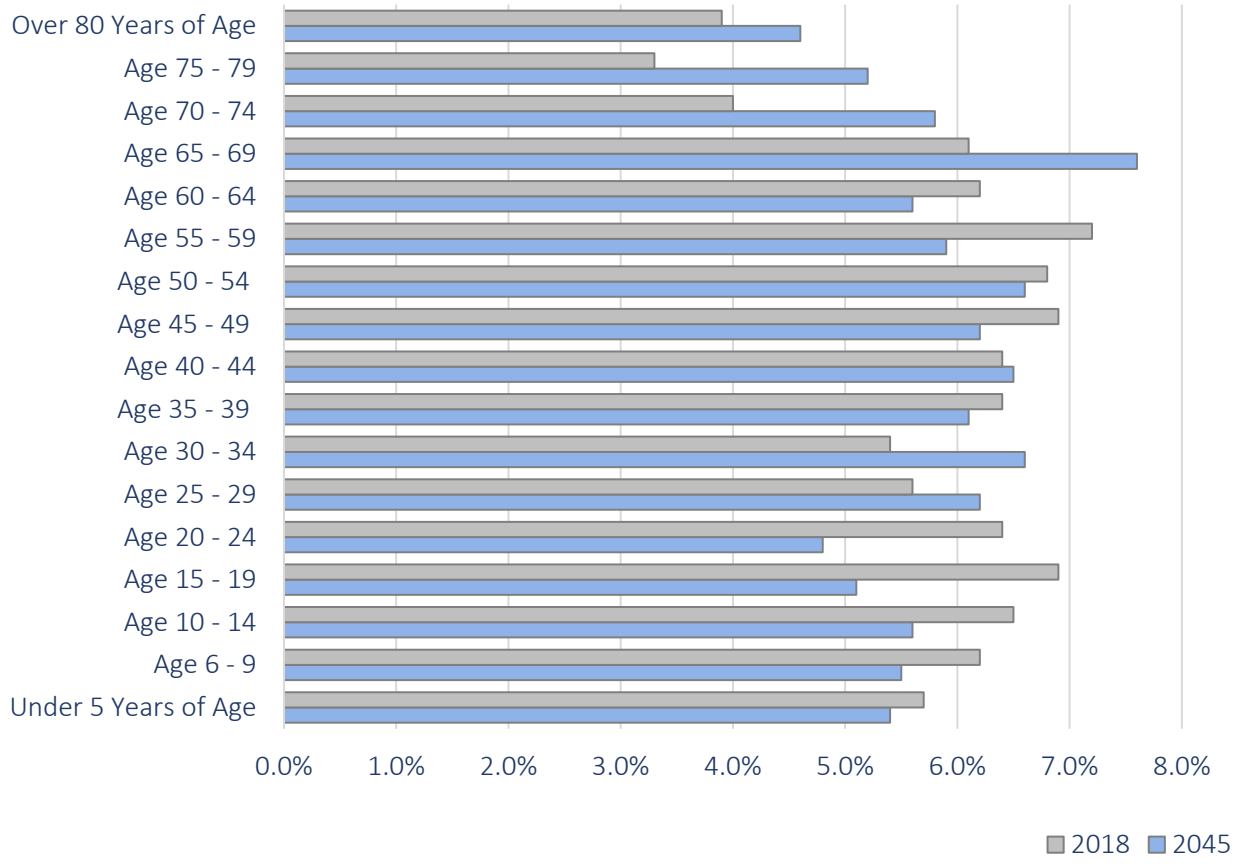
According to the regional TDM, 93,069 residents live within the Lakeway region. By 2045, the Lakeway region is projected to grow by more than 15,000 residents, a 1.3 percent increase (Table 5-3). Capturing an aging population, Figure 5-1 depicts the age distribution variation between 2018 and 2045. Additionally, population by square mile is illustrated in Figure 5-2.

Table 5-3. Lakeway Region Change in Population, 2018 to 2045

County	2018	2045	Change (2018-2045)	% Change (2018-2045)
Hamblen	64,569	72,535	7,966	12.3%
Jefferson (MTPO Portion)	28,500	35,709	7,209	25.3%
Total	**93,069**	**108,244**	**15,175**	**16.3%**

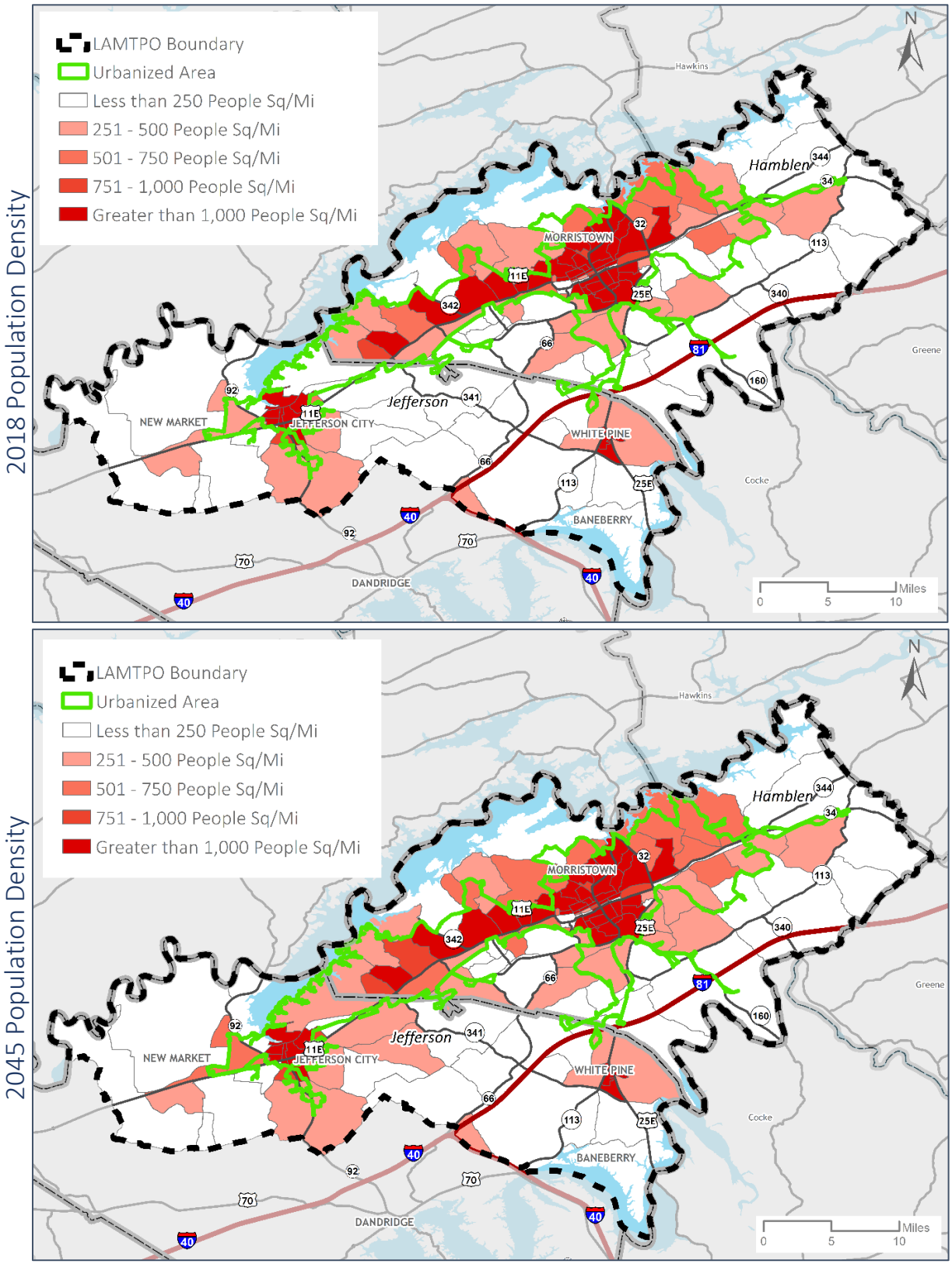
Source: LAMTPO Travel Demand Model, 2020

Figure 5-1. Lakeway Region Population by Age Distribution, 2018 to 2045



Source: American Community Survey, 2018; Woods & Poole, 2019

Figure 5-2. Lakeway Region Population Density, 2018 and 2045



Source: LAMTPO Travel Demand Model, 2020

Employment

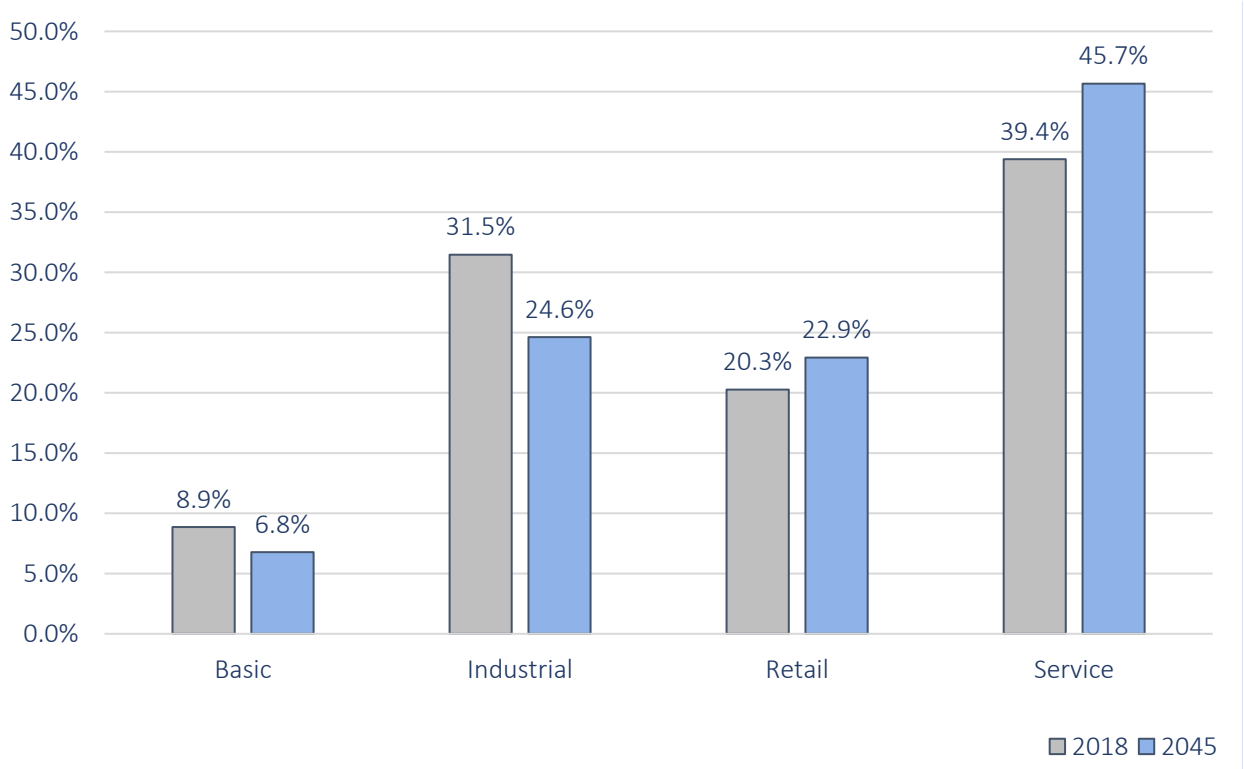
By 2045, employment in the Lakeway region is forecasted to increase by approximately 9,700 jobs, an increase of 20.9% (Table 5-4). Per Figure 5-3, the industrial sector will decrease from 2018 to 2045. While each sector is predicted to grow, the overall make-up of the Lakeway region's employment is predicted to remain relatively the same with the service sector employing the most residents. Figure 5-4 depicts the change in employment per square mile.

Table 5-4. Lakeway Region Change in Employment, 2018 to 2045

County	2018	2045	Change (2018-2045)	% Change (2018 -2045)
Hamblen	35,495	40,059	4,564	12.9%
Jefferson (MTPO Portion)	10,988	16,148	5,160	47.0%
Total	**46,483**	**56,207**	**9,724**	**20.9%**

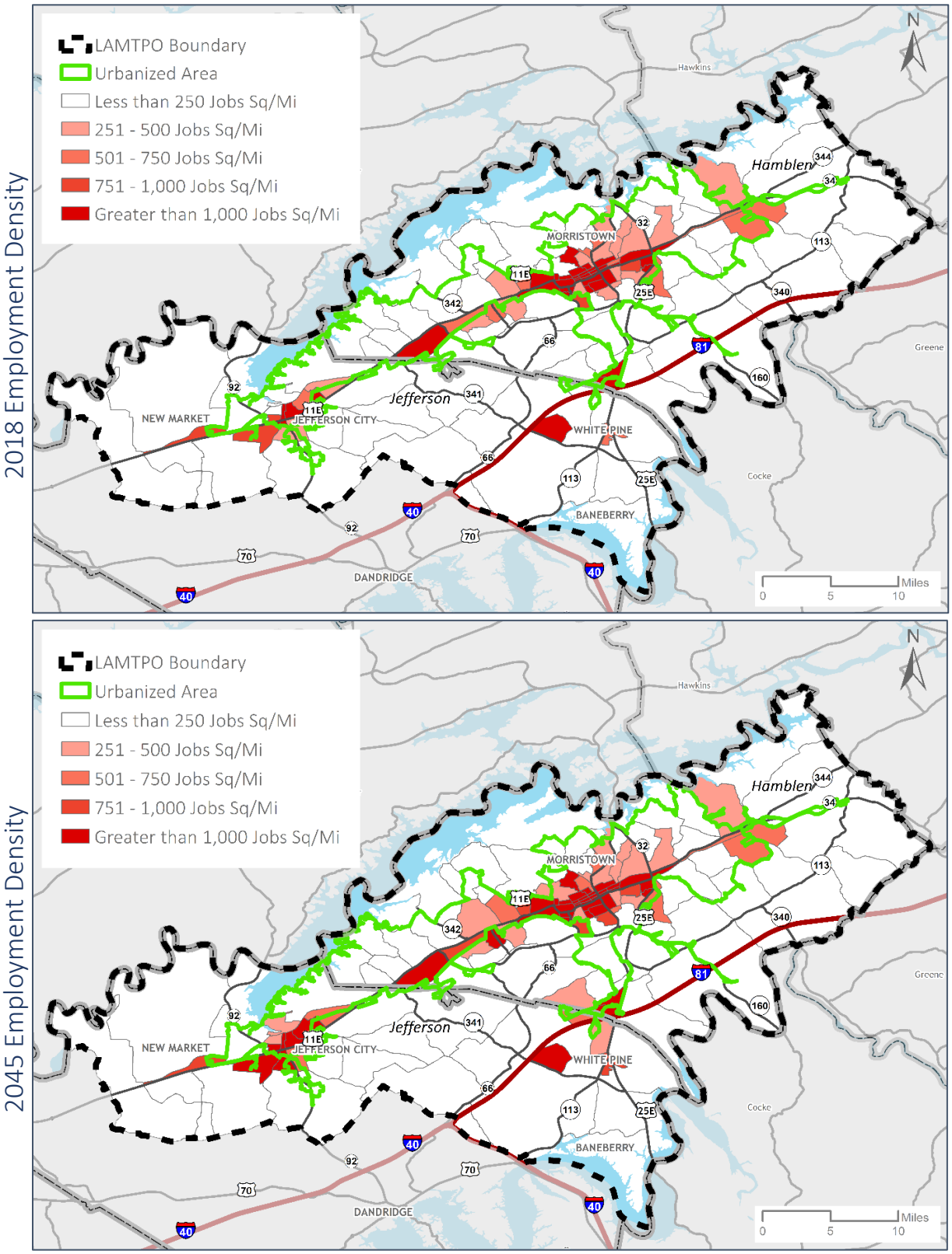
Source: LAMTPO Travel Demand Model, 2020

Figure 5-3. Lakeway Region Employment Composition by Sector, 2018 to 2045



Source: LAMTPO Travel Demand Model, 2020

Figure 5-4. Lakeway Region Employment Density, 2018 and 2045



Source: LAMTPO Travel Demand Model, 2020

5.3 Transportation Network

Roadway Network

Existing + Committed Transportation Network (E+C)

The Lakeway regional existing + committed (E+C) roadway network for the year 2045 was analyzed using the region's TDM. For this analysis, the TDM uses population, employment, and socio-economic data projections for the year 2045 to predict travel patterns and conditions in the region. The roadway network includes the existing system plus projects funded for construction in LAMTPO's 2020 – 2023 Transportation Improvement Program TIP [Table 5-5].

Table 5-5. Lakeway Region Transportation Improvement Projects, 2020 to 2023

TIP Number	Lead Agency	Route/Project Name	Length (Miles)	Total Project Cost
1002	Morristown	W. Andrew Johnson Hwy	0.55	$999,322
1003	Morristown	E. Morris Blvd	2.60	$2,819,034
1008	Morristown	E. Andrew Johnson Hwy	1.30	$1,059,355
1010	Morristown	Central Church Rd Improvements	0.20	$2,002,727
3016	Jefferson City	Old Andrew Johnson Hwy Realignment /SR 92/Overlook Rd Extension	0.45	$1,133,211

Source: LAMTPO 2020 – 2023 TIP

TDM Outputs

The Lakeway region TDM is used to simulate growth impacts upon the roadway network. Traffic volumes and congestion data for both the base year (2018) as well as the horizon year of 2045 are evaluated to monitor the changes in conditions, as well as identify where future projects might be needed based on increases in congestion. Traffic conditions are measured based on a roadway's volume-to-capacity (V/C) ratio and assigned a LOS letter ranging from A (free-flowing) to F (forced or breakdown flow) to denote relative performance.

For the base year, most roadways function at a LOS C or better, some 92.7 percent (Table 5-6). With the forecasted growth, this number is predicted to fall by 7.1 percent (Figure 5-5). LOS D is expected to experience the greatest percentage increase. As shown in Figure 5-6, most of the increases in congestion occur within or around the region's urban areas, specifically the Jefferson City area. Rural intersections operating with congestion during the base year, namely along State Route 113, are expected to continue to operate in a similar manner in 2045. Higher volumes are forecasted for the interstate with the southern portion of the LAMTPO region expected to operate at a LOS D and E. Table 5-7 lists the facilities expected to operate at LOS E and LOS F in 2045 without additional investment beyond projects that already have committed funding.

Table 5-6. Lakeway Region Roadway Level of Service, 2018 to 2045

Level of Service	Roadway Miles (2020)	Roadway Miles (2045)	Change (2020-2045)	% Change (2020-2045)
Level of Service A	261.32	245.1	-16.2	-6.2%
Level of Service B	64.8	56.1	-8.7	-13.4%
Level of Service C	35.1	34.6	-0.5	-1.4%
Level of Service D	6.0	12.9	6.9	115.0%
Level of Service E	16.2	32.8	16.6	102.5%
Level of Service F	6.1	8.1	2.0	32.8%
Total	**389.6**	**389.6**	-	-

Source: LAMTPO Travel Demand Model, 2020

Figure 5-5. Lakeway Region Roadway Level of Service, 2018 to 2045

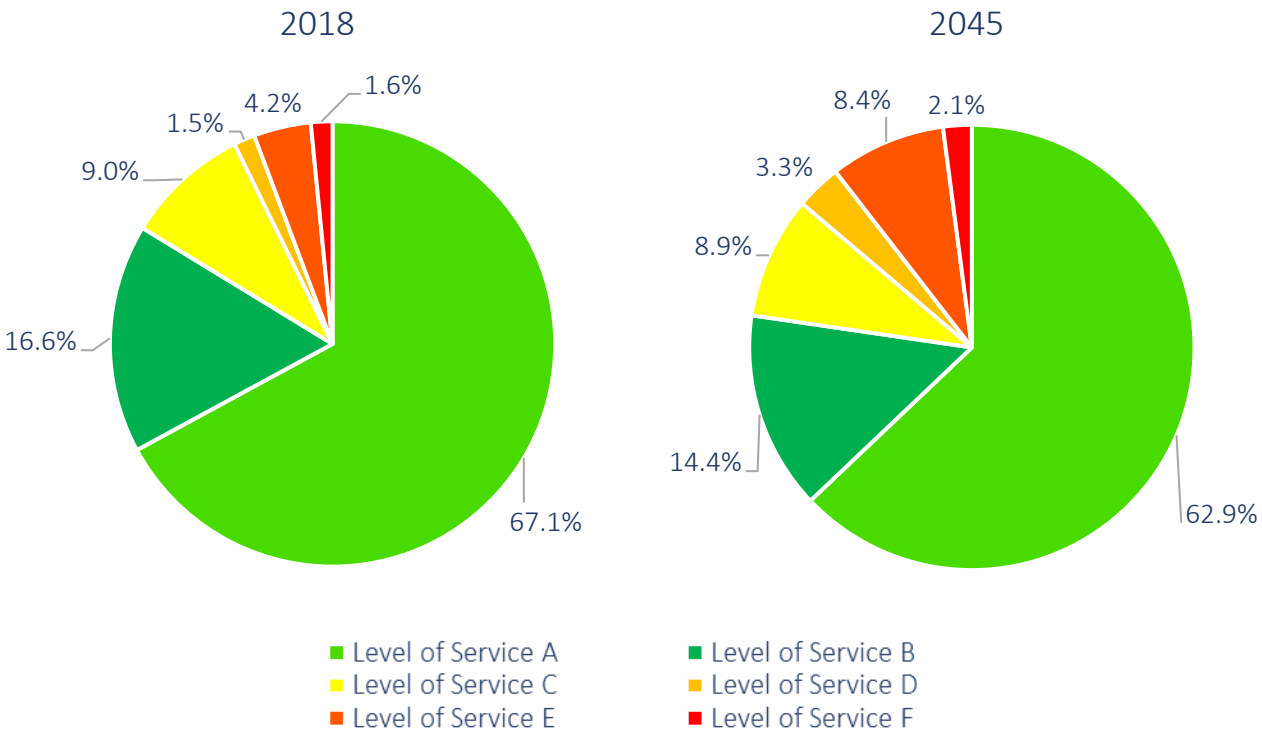
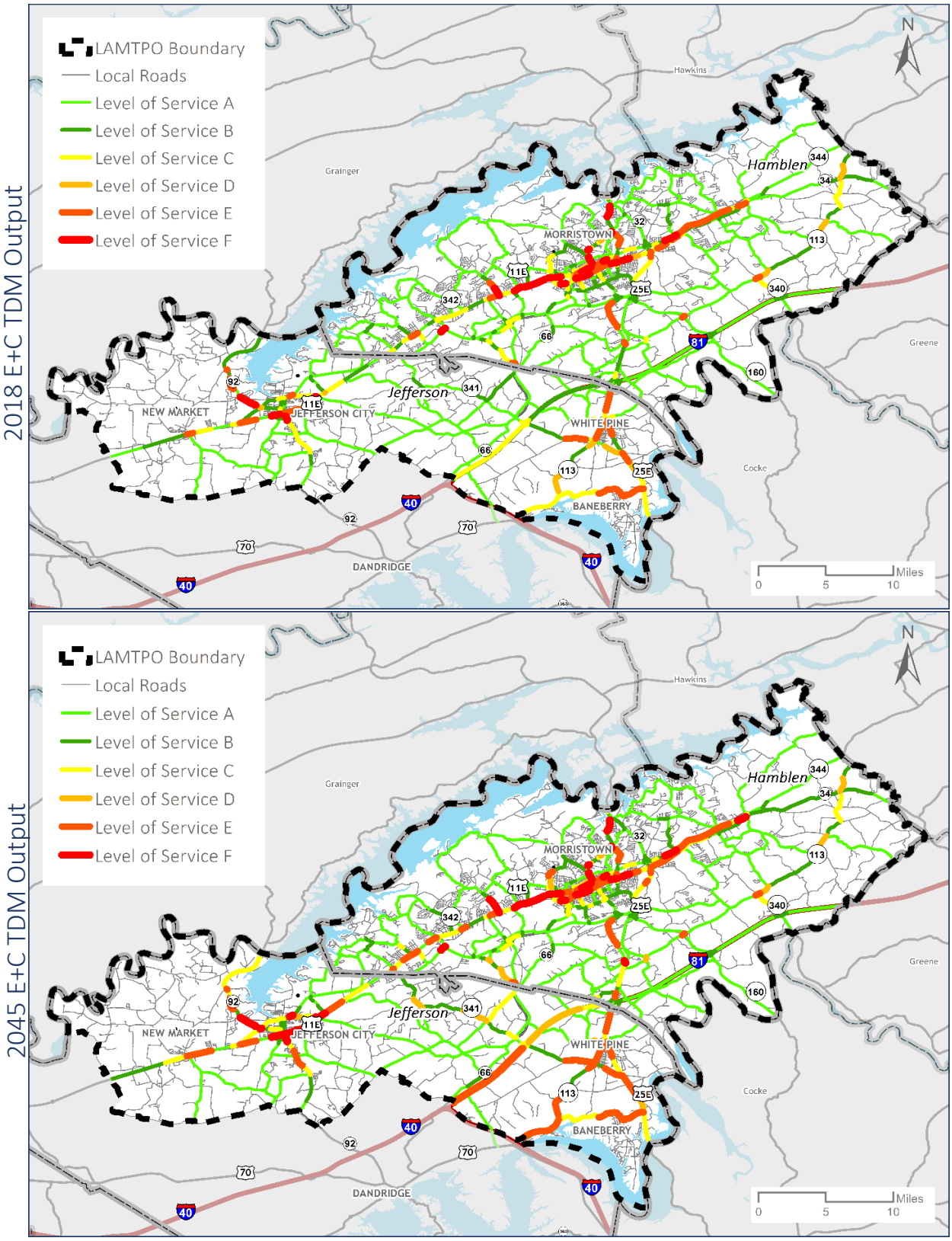


Figure 5-6. Lakeway Regional Roadway Level of Service, 2018 to 2045



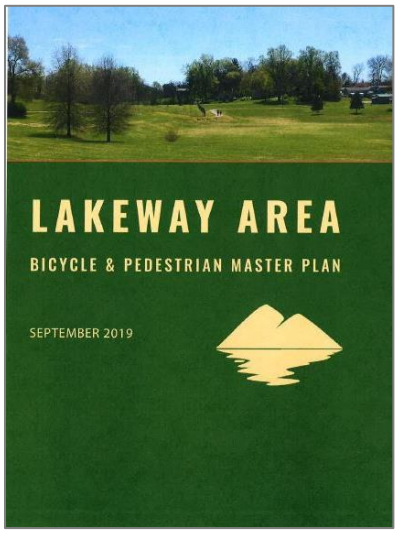
Source: LAMTPO Travel Demand Model, 2020

Table 5-7. Lakeway Region Congested Locations, 2045 E+C

Route	Termini
State Route 139	Jefferson County Line to Harold Patterson Road
State Route 139	Lakeway Drive to Green Hill Road
State Route 139	Marth Dandridge Circle to State Route 92
U.S. Highway 25W	State Route 92 to Plainview Drive
U.S. Highway 25W	Burchfield Road to Oak Grove Road
U.S. Highway 25W	Douglas Lake to Old Newport Highway
State Route 113	Buckhead Trail to Leadvale Road
State Route 113	White Pine City Limits to Cedar Street
State Route 341 (Roy Messer Hwy)	CH Rankin Road to State Route 113
State Route 92 (Chestnut Hill Road)	Indian Creek Rd to U.S. Highway 411
U.S. Highway 411	County Line to Fine Hollow Road
Nina Road	Iron Gate Drive to U.S. Highway 25E
U.S. Highway 25E (State Street)	Agricultural Park Drive to Gold Finch Lane
Interstate 81	Jefferson County Line to Morrisotwn City Limits
State Route 92	Bethel Church Road to Westview Street
U.S. Highway 11E	Park Street to Scenic Drive
U.S. Highway 11E	George Avenue to Rocktown Road
U.S. Highway 11E	Mayfield Drive to Commerce Blvd
U.S. Highway 11E	N. Sugar Hollow Road to Pearce Drive
U.S. Highway 11E	Bowman Road to S. Fairmont Avenue
U.S. Highway 11E	S. High Street to S. Jackson Street
U.S. Highway 11E	Liberty Hill Road to Cumberland Street
U.S. Highway 11E	Beech Street to Hale Avenue
U.S. Highway 11E	Jaybird Road to Harvey Drive
State Route 34 (W. Andrew Johnson Highway)	Walters Drive to Lombardy Drive
State Route 34 (W. 1st North St)	N. High Street to S. Cumberland Avenue
State Route 66 (E. Andrew Johnson Highway)	S. James Street to Evans Avenue
State Route 343	3rd North Street to Old Holt Road
Kidwell Ridge Road	Wynn Street to U.S. Highway 11E
N. Liberty Hill Road	Meadowview Lane to Reese Street

Source: LAMTPO Travel Demand Model, 2020

Bicycle and Pedestrian Network

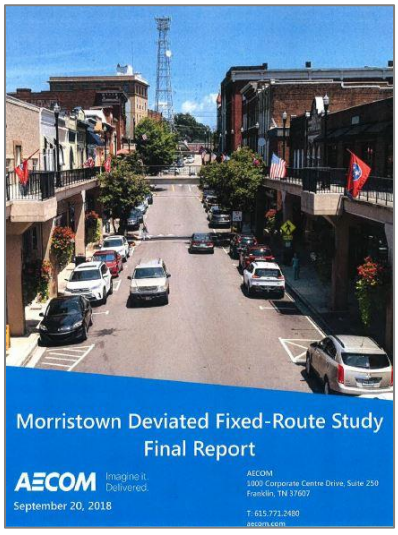


In 2019, LAMTPO developed a bicycle and pedestrian master plan for the region that seeks to increase walking and bicycling through a connected network of safe routes. The plan established a long-term vision for walking and bicycling in the region and identified the following six goals for achieving that vision:

- Focus on improving sidewalk connectivity by filling in gaps near schools and major destinations;
- Increase the percentage of trips that are made by walking and biking;
- Create synergy by fast-tracking catalyst projects that have the backing of local governments and the community;
- Increase the number of events that promote walking and biking as fun and rewarding activities;
- Generate interest and support through creative, low-cost, easy-to-implement projects that can demonstrate high-impact improvements; and
- Establish downtown Morristown and Jefferson City as walking and biking hubs to generate economic development and create a focus for improvements.

Following an existing conditions analysis and a robust public and stakeholder engagement effort,LAMTPO identified policy, program, and project recommendations. The 40 infrastructure recommendations fall into three broad categories – sidewalk and sidewalk alternatives, on-street bikeways, and shared use paths. Most projects fell within either Morristown, Jefferson City, or White Pine, with shared use paths identified for some of the region's major vehicular arteries, including U.S. Highway 11E and State Route 341. Walking and biking projects such as these, including the policy recommendations by land use in the plan, will help support the region's ability to accommodate forecasted growth.

Transit Network



In addition to walking and bicycling, public transportation also plays an important role in accommodating future growth in the region. Working in partnership with ETHRA, TDOT, and the City of Morristown, LAMTPO completed a Deviated Fixed-Route Study for Morristown in 2018 for the proposed fixed route bus service in the city. The three-route service was recommended in order to improve the mobility options for Morristown residents, with routes providing important access to activity centers, including residential, commercial, and other employment areas.

This study evaluated the existing and future (2040) conditions within the proposed service area of Morristown's three route public transportation system and made recommendations for supporting a

viable fixed route service. Furthermore, the study details a 5-year budget model for FY 2020-2024 based on ETHRA's existing costs. Finally, performance measures and service benchmarks are established in order to properly monitor the performance quality of the system. The high-level goals include:

- Provide high-quality, customer-oriented service;
- Provide efficient, effective, and safe transit services; and
- Promote the transit service.

Changes in the system are inevitable as Morristown grows and evolves. Therefore, goals and benchmarks are intended to be revisited and updated as necessary on a regular basis to ensure ETHRA's mission is achieved.

Chapter 6 – Financial Analysis and Implementation Plan

Based on a combination of technical analysis and public and stakeholder engagement, the transportation needs in the Lakeway region were assessed and prioritized for implementation. The 2045 MTP must be fiscally constrained, meaning that the projects identified for funding must be reasonably matched with expected revenues. To that end, this chapter details the various sources of transportation funding and projections of available revenues over the life of the plan followed by a summary of anticipated expenditures over the next 25 years.

6.1 Funding Sources

Federal programs are the largest funding source when it comes to transportation related projects and are typically authorized with each surface transportation bill. The current federal authorization bill is the Fixing America's Surface Transportation (FAST) Act, which outlines eligible activities under each federal funding program as well as the specific funding apportionments for each fiscal year. In addition, the state and local municipalities help fund improvements to the transportation system, typically relying on a variety of user fees and taxes. The various funding sources available to the Lakeway region for roadway and transit improvements are detailed below.

Roadway Funding

Four primary funding programs constitute the majority of federal funding for roadway improvements in the Lakeway region. The National Highway Performance Program (NHPP) is a significant funding source and provides funding for capacity, operational, or maintenance improvements to highways and bridges on the National Highway System (NHS). Within the Lakeway region, some of the major NHS roadways include I-81, U.S. Routes 11E and 25E, and State Routes 160 and 92. Approximately 90% of funding for improvements to the interstate system can be sourced using NHPP funds, with the remaining 10% coming from state or local sources. For non-interstate projects, NHPP dollars can be used to fund only 80% of project costs, requiring approximately 20% of project costs be matched with non-federal dollars.

The Surface Transportation Block Grant (STBG) Program provides funding to both states and local municipalities to fund improvements to roadways based on their functional classification as well as bridges, bicycle and pedestrian infrastructure, and capital transit projects. Each state is provided an annual apportionment of STBG funds, of which a percentage is also sub allocated to local municipalities based on population. State STBG funds (STBG-S) are typically used to fund projects prioritized and selected by TDOT. Local STBG funds (STBG-L) can be used on any eligible facility and improvement type based on priority established in the MTPO's processes. For both STBG-S and STBG-L, federal funding can be used to fund up to 80% of project costs with the remaining 20% funded through state or local matches.

As a set-aside from the STBG program, the Transportation Alternatives (TA) program is used to fund on- and off-road bicycle and pedestrian projects, safe routes to schools, recreational trails programs, and

others. The TA program requires a 20% non-federal match to accompany the maximum 80% federal funding share.

The Highway Safety Improvement Program (HSIP) is another significant source of federal funding with the primary purpose of reducing traffic-related fatalities and serious injuries on public roads. Safety projects using HSIP funds must be consistent with TDOT's Strategic Highway Safety Plan, discussed earlier, and be selected based on crash history. HSIP projects allow for up to 90% of project costs to be funded using federal funds with the remaining 10% funded through a non-federal match.

There are other, less frequent, federal funding sources available to the MTPO. The National Highway Freight Program (NHFP) can be used on the National Highway Freight Network (NHFN) for projects that improve the efficient movement of freight throughout the state. Within the Lakeway region, the NHFN includes only I-81. Funds are administered by TDOT and require a 20% non-federal match for the 80% federal funds that can be used for projects.

In addition, Jefferson County was formerly an air quality non-attainment area and is still eligible to receive funds distributed through the Congestion Mitigation and Air Quality Improvement (CMAQ) Program. CMAQ funds are administered as a statewide grant program by TDOT for projects and programs that will reduce transportation-related air pollution. These can include retrofitting old engines in vehicle fleets, commute-reduction programs, and traffic operational improvements. While some projects can be completed with federal funds, typically CMAQ projects have 80% federal and 20% non-federal match requirements.

As mentioned previously, local and state funding is an integral part of implementing transportation projects. Primarily generated through fuel tax revenues, state and local dollars are generally used to match federal funding. With the passing of the Improving Manufacturing, Public Roads, and Opportunities for a Vibrant Economy (IMPROVE Act), fuel taxes in Tennessee were increased, providing additional revenues for key highway and bridge projects. In the Lakeway region, improvements to SR 32 (US 11E) as well as minor bridge improvements will benefit from IMPROVE Act funds. In addition, TDOT uses its State Aid Program to provide funding for a specific network of local roads. In the Lakeway region, these funds are used primarily for maintenance needs. The state also administers the Multimodal Access Grant program, which provides competitive opportunities for municipalities to obtain funding for bicycle and pedestrian infrastructure projects on the state highway system. If awarded, a 5% local match is required to accompany the 95% state funds for selected projects.

Transit Funding

Similar to roadways, funding for transit projects relies heavily on federal dollars, which are apportioned by the Federal Transit Administration (FTA). Each of these funding sources have specific eligible expenses that are typically classified as either operational or capital expenditures. Federal and non-federal funding requirements vary by project type and program.

The largest federal source of transit funding is the FTA Section 5307 Urbanized Area Program. This funding source is allocated to urbanized areas with a population of at least 50,000 and can be used for

both capital projects and operating assistance. For capital projects, federal funds can comprise 80% of the project costs, necessitating a 20% non-federal match. For assistance with operating costs, the federal share of funding can only be 50%, requiring a higher non-federal match from the state or local municipalities.

The FTA Section 5310 Enhanced Mobility of Seniors & Individuals with Disabilities Program provides funding to address the mobility needs of older adults and people with disabilities, particularly where current transit services cannot adequately meet those needs. Funds are apportioned to states based on the relative percentage of those population groups. Capital expenditures such as buses and vans, wheelchair lifts, and technology systems are the most common use of these funds and require a 20% non-federal match to complement the 80% federal funding maximum.

The FTA Section 5339 Bus and Bus Facilities Program provides funding so that transit agencies can invest in bus-related facilities as well as replace and rehabilitate transit buses and equipment. While there are exceptions, federal funds generally cannot exceed 80% of project costs.

State funding for transit primarily comes through TDOT's Urban Operating Assistance Program (UROP). Allowing for both capital and operating expenses, UROP funds support both fixed route and paratransit services in urban areas. The state contribution to project costs varies based on overall use of these funds. The Lakeway region has not historically received UROP funding but will soon receive these dollars with initiation of the new fixed route transit service. In addition, the new fixed route service is expected to generate revenues with bus fares.

6.2 Projected Revenues

Based on historic funding levels, revenues for both highway and transit programs were estimated for the Lakeway region over the life of the plan in coordination with both TDOT and the East Tennessee Human Resource Agency (ETHRA). All federal, state, and local highway revenues were assumed to grow by approximately 2.5% per year. Based on TDOT's previous funding of IMPROVE Act projects in the region, these state funds were only used to supplement other federal funding on applicable projects. Due to the competitive and uncertain nature of grant awards, historic funding from the CMAQ program and TDOT's Multimodal Access Grant Program were not included in the forecasted revenues. Table 6-1 shows the total highway revenues expected in the Lakeway region by plan horizon.

Table 6-1. Projected Revenue for Roadways

Funding Program	2021-2026 Horizon	2027-2035 Horizon	2036-2045 Horizon	Total Revenues
NHPP	$35,248,913	$63,703,338	$89,537,681	$188,489,932
STBG-S	$12,576,559	$22,728,893	$31,946,402	$67,251,854
STBG-L	$5,847,650	$10,568,122	$14,853,934	$31,269,707
HSIP	$12,045,579	$21,769,284	$30,597,631	$64,412,495
TA	$1,430,857	$2,585,905	$3,634,597	$7,651,359
State Funds	$2,548,821	$4,606,338	$6,474,399	$13,629,558
IMPROVE Act	$-	$38,024,129	$-	$38,024,129
Total	**$69,698,379**	**$163,986,010**	**$177,044,644**	**$410,729,033**

To develop projections for transit funding, federal revenues were increased by 3% annually. Conservatively, state revenues from the UROP program were assumed to remain constant. Given that the Lakeway fixed route transit service is not currently in operation, farebox recovery estimates were based on data presented in the 2018 transit study as well as coordination with ETHRA. Beginning with a 3.5% farebox recovery ratio in 2021, it was assumed that this would increase by 0.5% each year until reaching a maximum of 5% in 2024, a level that is assumed to remain constant over the life of the plan. Based on these assumptions, projected revenues for transit are represented in Table 6-2 by funding source and summarized based on anticipated splits between federal and non-federal matches.

Table 6-2. Projected Revenues for Transit

Funding Program	2021-2026 Horizon	2027-2035 Horizon	2036-2045 Horizon	Total Revenues
5339	$910,058	$1,702,183	$2,499,702	$5,111,942
5310	$832,808	$1,561,802	$2,299,520	$4,694,130
5307	$10,993,063	$20,615,792	$30,353,666	$61,962,520
UROP	$1,800,000	$2,700,000	$3,000,000	$7,500,000
Fares	$361,921	$749,665	$1,103,770	$2,215,355
Total Federal	**$6,890,824**	**$12,919,084**	**$19,016,210**	**$38,826,118**
Total Non-Federal	**$8,007,025**	**$14,410,358**	**$20,240,447**	**$42,657,830**
Total	**$14,897,849**	**$27,329,442**	**$39,256,657**	**$81,483,948**

6.3 Projected Expenditures

According to federal planning regulations the 2045 MTP is required to be fiscally constrained, meaning that the MTPO must balance project needs with expected revenues over the next 25 years. The process for projecting roadway and transit expenditures and ultimately developing a fiscally constrained plan is detailed below.

Roadway Costs

To develop the list of roadway projects, jurisdictions within the MTPO area first submit projects for consideration at which point the project scopes, costs, and funding eligibility are assessed. In addition to capital projects, annual maintenance costs are derived using historic data related to roadway resurfacing schedules. Of note, roadway costs are estimated in year of expenditure (YOE) dollars to ensure that the fiscal analysis adequately accounts for inflation. Both capital and maintenance costs are inflated by 3.6% annually. Based on the assessment of revenues and costs, Table 6-3 and Figure 6-1 depict the projects included in the fiscally constrained list of roadway projects. Figure 6-2 depicts the resulting roadway operation in 2045 with the implementation of these projects, and Table 6-4 lists the specific locations expected to operate at LOS E or LOS F with implementation of the proposed project list. However, there are more project needs in the Lakeway region than funding available. With that in mind,

Table 6-5 lists the roadway projects that cannot be funded in the 2045 MTP and designated as 'illustrative'. If additional funding become available, these projects should be considered for implementation.

Table 6-3. Fiscally Constrained Project List

Project #	Project Description	Horizon Year	YOE Cost	Anticipated Funding Source
17	Realign the intersection of US 11E and SR 92/Old Andrew Johnson Hwy; extend Overlook Rd	2026	$1,293,812	STBG-L
2008	Reconstruct Chucky Pike with signal modifications at US 11E intersection	2026	$132,702	HSIP
2045	Improve intersection radii at SR 34 (W Morris Blvd) and S. Economy Rd to accommodate large trucks	2026	$132,702	STBG-L
8000-01	Widen SR 34/US 11E from 2 to 5 lanes from SR 32/US 25E in Morristown to near E. Morris Blvd	2026	$36,625,800	NHPP/STBG-S
2051	Intersection and access management improvements along SR 34/US 11E from Russell Ave to Odyssey Rd	2026	$928,915	HSIP
2052	Intersection improvements at SR 32 (State St) and SR 113 (Main St): add left turn lanes on SR 32 (State St) and a left turn lane on eastbound SR 113	2026	$265,404	STBG-S
6003	Signalize the intersection of SR 341 (Roy Messer Hwy) and SR 113 (Main St)	2026	$398,107	STBG-S
2054	Intersection improvements at SR 341 (Talbott-Kansas Rd) and Greenbriar Rd at SR 34/US 11E: realign intersection approaches and add turn lanes	2026	$1,327,022	STBG-S
2055	Widen Central Church Road from 2 to 3 lanes from SR 34/US 11E to Connie St	2026	$1,867,727	STBG-L
2060	Intersection improvements at SR 34/US 11E and George Ave: add NB right turn lane extending to Elmwood St	2026	$806,375	STBG-L
2061	Add sidewalks along SR 343 (Buffalo Trail/Cumberland Ave) from Cherokee Park Rd to Truman St	2026	$1,267,161	TA
2064	Rehabilitation of culvert/bridges over Turkey Creek at Rosedale Ave and Downtown	2026	$115,196	STBG-S
	Subtotal 2021 – 2026 Horizon		$45,160,923	
8000-02	Relocate SR 34/US 11E from west of Stagecoach Rd to Steadman Rd	2035	$45,240,730	NHPP/IMPROVE Act
8000-03	Relocate SR 34/US 11E from near E. Morris Blvd to west of Stagecoach Rd	2035	$21,759,382	NHPP/IMPROVE Act
2043	Intersection improvements at SR 34/US 11E and Russell Ave: add right turn lanes on SR 34/US 11E, pedestrian signals and sidewalks on all approaches	2035	$339,959	STBG-L
2044	Intersection improvements at SR 34/US 11E and George Ave: add right turn lanes on SR 34/US 11E, pedestrian signals and sidewalks on all approaches	2035	$339,959	STBG-L
2046	Intersection improvements along E. Morris Blvd from Larry Baker Rd to Jones-Franklin Rd including realignment of Barton Springs Rd intersection	2035	$509,938	STBG-L

Project #	Project Description	Horizon Year	YOE Cost	Anticipated Funding Source
2047	Intersection improvements at SR 34/US 11E and Kidwell Ridge Rd: add turn lane on Kidwell Ridge Rd, eliminate left turn lane from W. Manley Ct Circle, add J-turn further east	2035	$849,897	HSIP
2048	Intersection improvements at SR 34/US 11E and W. Economy Rd: add right turn lanes on SR 34/US 11E, reconfigure access	2035	$339,959	HSIP
2053	Reconstruct intersection of McBride Rd at Clearview Rd to improve sight distance	2035	$1,189,856	HSIP
2007	Intersection improvements at SR 34/US 11E and E. Old Andrew Johnson Highway: signalize the intersection	2035	$679,918	STBG-S
2009	Intersection improvements at E. Old Andrew Johnson Hwy and Municipal Dr: Add turn lanes	2035	$509,938	STBG-L
2059	Modify US 25E/SR 32 interchange at SR 160 to diamond interchange	2035	$4,079,506	HSIP
3002	Intersection improvements at SR 343 (S Cumberland St) and Inman St: signalize the intersection and add turn lanes	2035	$6,119,259	HSIP
3001	Intersection improvements at SR 343 (Buffalo Trail) at Cherokee Park Rd: signalize the intersection	2035	$339,959	STBG-S
2062	Add sidewalks, streetscaping, etc. along SR 343 (Cumberland Ave) from SR 34/US 11E to SR 160	2035	$9,858,806	TA/HSIP
2063	Intersection improvements at SR 343 (Cumberland Ave) and E. Morris Blvd: add WB left turn lane	2035	$841,070	STBG-L
2065	ITS and traffic signal coordination along SR 343 (Cumberland Ave)	2035	$2,951,123	STBG-S/STBG-L
	Subtotal 2027 - 2035 Horizon		$95,949,258	
2049	Widen I-81 from 4 to 6 lanes from I-40 (Exit 1) to SR 341 (Exit 4)	2045	$149,559,534	NHPP/STBG-S
3005	Intersection improvements at SR 343 (Buffalo Trail) at Rader St: signalize the intersection and add NB left turn lane	2045	$2,103,181	STBG-S
2012	Intersection improvements at Old Andrew Johnson Hwy and E. Main St/N Chucky Pike: realign offset intersection	2045	$1,168,434	HSIP
2066	Extend Crockett Trace Dr to Thompson Creek Rd	2045	$1,014,297	STBG-L
	Subtotal 2036 - 2045 Horizon		$153,845,446	
	TOTAL		$294,955,628	

Figure 6-1. Fiscally Constrained Projects

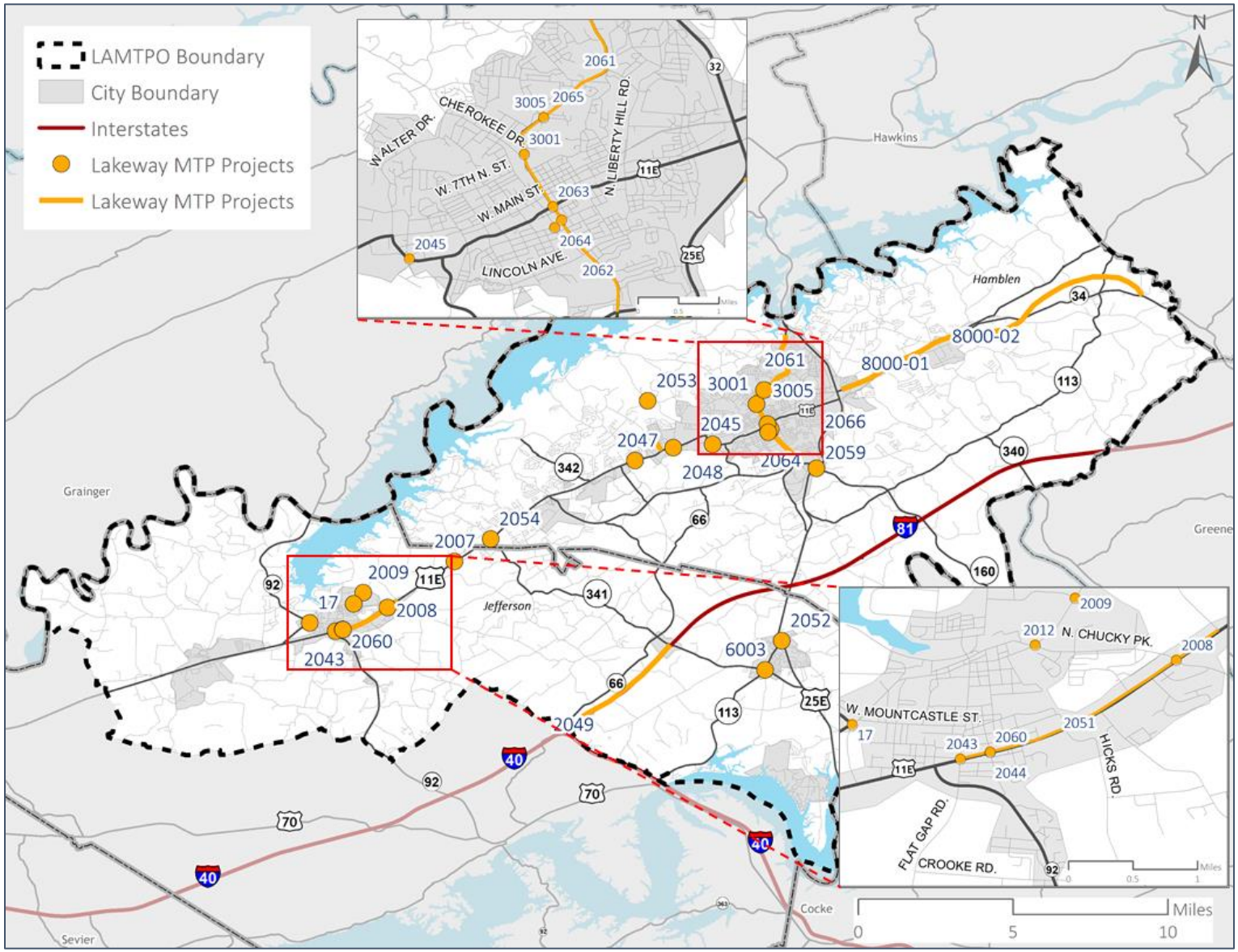


Figure 6-2. Projected LOS, 2045

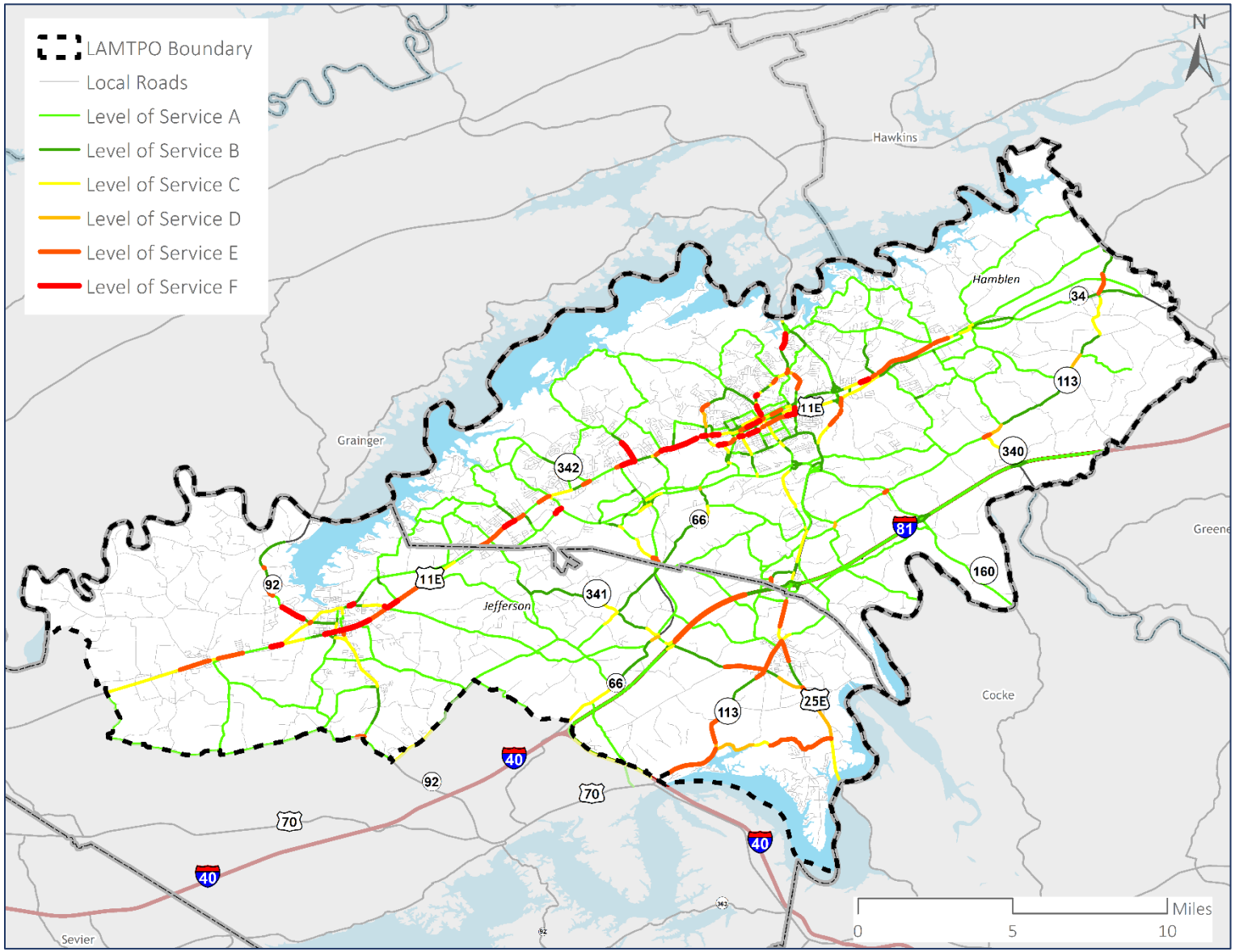


Table 6-4. Lakeway Region Congested Locations, 2045 Build

Route	Termini
State Route 139	Jefferson County Line to Harold Patterson Road
State Route 139	Lakeway Drive to Green Hill Road
State Route 139	Marth Dandridge Circle to State Route 92
U.S. Highway 25W	State Route 92 to Plainview Drive
U.S. Highway 25W	Burchfield Road to Oak Grove Road
U.S. Highway 25W	Douglas Lake to Old Newport Highway
State Route 113	Buckhead Trail to Leadvale Road
State Route 113	White Pine City limits to U.S. Highway 25E (State Street)
State Route 341 (Roy Messer Hwy)	CH Rankin Road to State Route 113
State Route 92 (Chestnut Hill Road)	Indian Creek Rd to U.S. Highway 411
U.S. Highway 411	County Line to Fine Hollow Road
Nina Road	Iron Gate Drive to U.S. Highway 25E
U.S. Highway 25E (State Street)	Maple Street to State Street
Interstate 81	Jefferson County Line to Morristown City Limits
Interstate 81	Roy Messer Highway to White Pine City Limits
U.S. Highway 11E	Reed Bull Road to Mill Springs Road
U.S. Highway 11E	Park Street to Scenic Drive
U.S. Highway 11E	George Avenue to Rocktown Road
U.S. Highway 11E	Mayfield Drive to Commerce Blvd
U.S. Highway 11E	N. Sugar Hollow Road to Walters Drive
U.S. Highway 11E	Bowman Road to State Route 66
U.S. Highway 11E	Liberty Hill Road to Cumberland Street
U.S. Highway 11E	Jaybird Road to Harvey Drive
State Route 34 (W. Andrew Johnson Highway)	Economy Road to Lombardy Drive
State Route 34 (W. 1st North St)	Mars Street to Jackson Street
State Route 34 (W. 1st North St)	Hamilton Avenue to Henry Street
State Route 343	Castain Drive to Wilson Hale Road

Source: LAMTPO Travel Demand Model, 2020

Table 6-5. Illustrative Project List

Project Description
Extend Veterans Parkway as new 4-lane road from SR 474 (Merchants Greene Rd) to S. Sugar Hollow Rd
Widen S. Sugar Hollow Rd from 2 to 3 lanes from south of Virgie Rd to SR 34/US 11E
Widen SR 32/US 25E (State St) from 2 to 4 lanes from I-81 to SR 341 (Roy Messer Hwy)
Widen SR 92 from 2 to 3 lanes from Old Andrew Johnson Hwy to Easley Rd
Widen Old Andrew Johnson Hwy from 2 to 3 lanes from Branner Ave to N. Chucky Pk
Widen Valley Home Rd from 2 to 3 lanes from SR 160 to Roe Junction Rd
Extend Progress Parkway as new 4-lane road from existing terminus westward to SR 66
Extend Dr. Martin Luther King Jr. Parkway as new 2-lane road over railroad
Widen I-81 from 4 to 6 lanes from SR 341 (Exit 4) to SR 340 (Exit 15)
Intersection improvements at Veterans Pkwy and Merchants Green Blvd/Bellwood Rd: signalize the intersection
Widen S. Bellwood Road from 2 to 3 lanes from SR 42/US 11E to Veterans Pkwy
Intersection improvements at SR 34/US 11E and Bellwood Rd: signalize the intersection

Transit Costs

To understand transit needs over the life of the plan, both capital and operating costs were projected to 2045. Capital expenditures primarily involve the replacement of transit vehicles in both the fixed route and demand response services operated by ETHRA. A vehicle replacement schedule was developed based on the current vehicle fleet for both the fixed route and demand response services, FTA guidelines for useful life benchmarks, and estimated costs for the vehicles. Historic data shows that vehicle costs are increasing by approximately 2.5% per year, which was the inflation rate used to calculate YOE costs for replacing transit vehicles. In addition to vehicles, with the initiation of the Lakeway fixed route transit service, it is also assumed that a small transit center will be constructed within the first horizon with an estimated cost of $2,000,000. Table 6-6 depicts the number of transit vehicles that need to be replaced for each service over the next 25 years as well as the YOE cost for replacement. In addition, this table also includes the anticipated cost for operating both services over the life of the plan. In coordination with ETHRA, annual operating costs were inflated by 3% each year.

Table 6-6. Transit Expenditures

Capital Expenditures	2021-2026 Horizon		2027-2035 Horizon		2036-2045 Horizon		Total	
	Vehicles	Cost	Vehicles	Cost	Vehicles	Cost	Vehicles	Cost
Lakeway Transit	3	$228,489	10	$904,304	10	$1,157,585	23	$2,290,378
ETHRA	5	$377,375	7	$637,055	8	$917,915	20	$1,932,345
Total Capital	**8**	**$605,864**	**17**	**$1,541,359**	**18**	**$2,075,500**	**43**	**$4,222,723**
Operating Expenditures	**2021-2026 Horizon**		**2027-2035 Horizon**		**2036-2045 Horizon**		**Total**	
Total Operating		**$7,994,955**		**$14,993,303**		**$22,075,393**		**$45,063,651**
Total		**$10,600,819***		**$16,534,662**		**$24,150,893**		**$49,286,374**

**Note: Total transit expenditures in the 2021-2026 horizon includes a $2,000,000 capital cost for the new Lakeway Transit center.*

6.4 Summary

As mentioned, federal regulations require the MTP to be fiscally constrained, including sufficient financial information to confirm that projects in the MTP can be successfully implemented using the available revenue. To illustrate fiscal constraint, Table 6-7 tracks the available revenues and anticipated costs for roadway improvements and maintenance through each plan horizon. Similarly, Table 6-8 demonstrates fiscal constraint with transit funding and expenditures.

Table 6-7. Roadway Fiscal Constraint Analysis

Funding Source	2021-2026 Revenues	Expenditures	Carryover Balance	2027-2035 Revenues	Expenditures	Carryover Balance	2036-2045 Revenues	Expenditures	Carryover Balance
NHPP	$35,248,913	$33,799,000	$1,449,913	$65,153,251	$28,975,983	$36,177,268	$125,714,949	$122,457,693	$3,257,256
STBG-State	$12,576,559	$9,947,205	$2,629,354	$25,358,248	$8,649,901	$16,708,347	$48,654,749	$39,040,253	$9,614,496
STBG-Local	$5,847,650	$5,772,174	$75,476	$10,643,598	$10,500,888	$142,710	$14,996,645	$13,659,594	$1,337,051
HSIP	$12,045,579	$1,061,617	$10,983,962	$32,753,246	$21,944,343	$10,808,904	$41,406,535	$1,168,434	$40,238,101
TA	$1,430,857	$1,267,161	$163,696	$2,749,601	$492,940	$2,256,661	$5,891,258	$0	$5,891,258
State Funds	$2,548,821	$1,671,558	$877,263	$5,483,601	$5,416,682	$66,919	$6,541,317	$5,620,132	$921,185
IMPROVE Act	$-	$-	$-	$38,024,129	$38,024,129	$-	$-	$-	$-
Total	**$69,698,379**	**$53,518,715**	**$16,179,664**	**$180,165,674**	**$114,004,866**	**$66,160,809**	**$243,205,453**	**$181,946,106**	**$61,259,347**

Table 6-8. Transit Fiscal Constraint Analysis

Funding		2021-2026 Horizon	2027-2035 Horizon	2036-2045 Horizon
Revenues	Federal	$6,890,824	$12,919,084	$19,016,210
	Non-Federal	$8,007,025	$14,410,358	$20,240,447
Expenditures	Operating	$7,994,955	$14,993,303	$22,075,393
	Capital	$2,605,865	$1,541,358	$2,075,500
Remaining Balance		**$4,297,029**	**$10,794,781**	**$15,105,764**

The federal requirements for performance-based planning processes were first established in 2012 through the MAP-21 surface transportation authorization bill and continued through the FAST Act. Since the passing of these bills, federal guidance has been issued through three primary rulemakings known as PM1 - Safety, PM2 - Infrastructure Condition, and PM3 - System Performance. Each rulemaking establishes the metrics to be used in assessing the operation and performance of the transportation system. In accordance with federal regulations and in consultation with the state's 11 MPOs, TDOT has established data-driven performance targets in each of these areas as documented in Chapter 5. In addition, any public transit agency that receives federal funds is required to develop transit asset management and safety plans that outline performance in the area of infrastructure asset conditions. LAMTPO and ETHRA have agreed to adopt the current targets established by TDOT and intend to adopt future targets set by the state. Table 6-9 provides examples of the 2045 MTP fiscally constrained projects in the Lakeway region that support the state with achieving its performance targets.

Table 6-9. Example Projects by Federal Performance Management Category

Federal Performance Management Category	Project Types Associated with Improved Performance	Example Projects Funded in 2045 MTP
PM1: Safety	Roadway Safety Improvements, Bicycle/Pedestrian/Complete Streets Improvements	Project 2051: Intersection and access management improvements along SR 34/US 11E
PM2: Pavement & Bridges	Roadway & Bridge Rehabilitation/Replacement	Project 2064: Rehabilitation of culvert/bridges over Turkey Creek
PM3: System Performance and Freight	Roadway Capacity, System Operation/Technology, Intersection Improvements, Transit Capital/Operations, Transit Fixed Route Services, Transit On-Demand Services	Project 8000-01: SR 34/US 11E widening Project 2045: Improve intersection radii for truck movements on SR 34/US 11E
Transit Asset Management	Transit Maintenance and Repair (Equipment, Infrastructure)	Transit vehicle replacements for ETHRA and Lakeway Transit

Chapter 7 – Project Impacts

7.1 Introduction

As a recipient of federal funds, LAMTPO is tasked with evaluating the potential impacts of planned transportation projects on the environment as well as traditionally underserved communities in the region. This chapter provides a high-level analysis of the projects selected for funding in the 2045 MTP and their potential for impacting natural and cultural resources as well as minority and low-income populations and individuals with Limited English Proficiency (LEP). The results of this analysis increase awareness of potential impacts and issues that should be considered as projects move through the development process.

7.2 Impacts to Natural and Cultural Resources

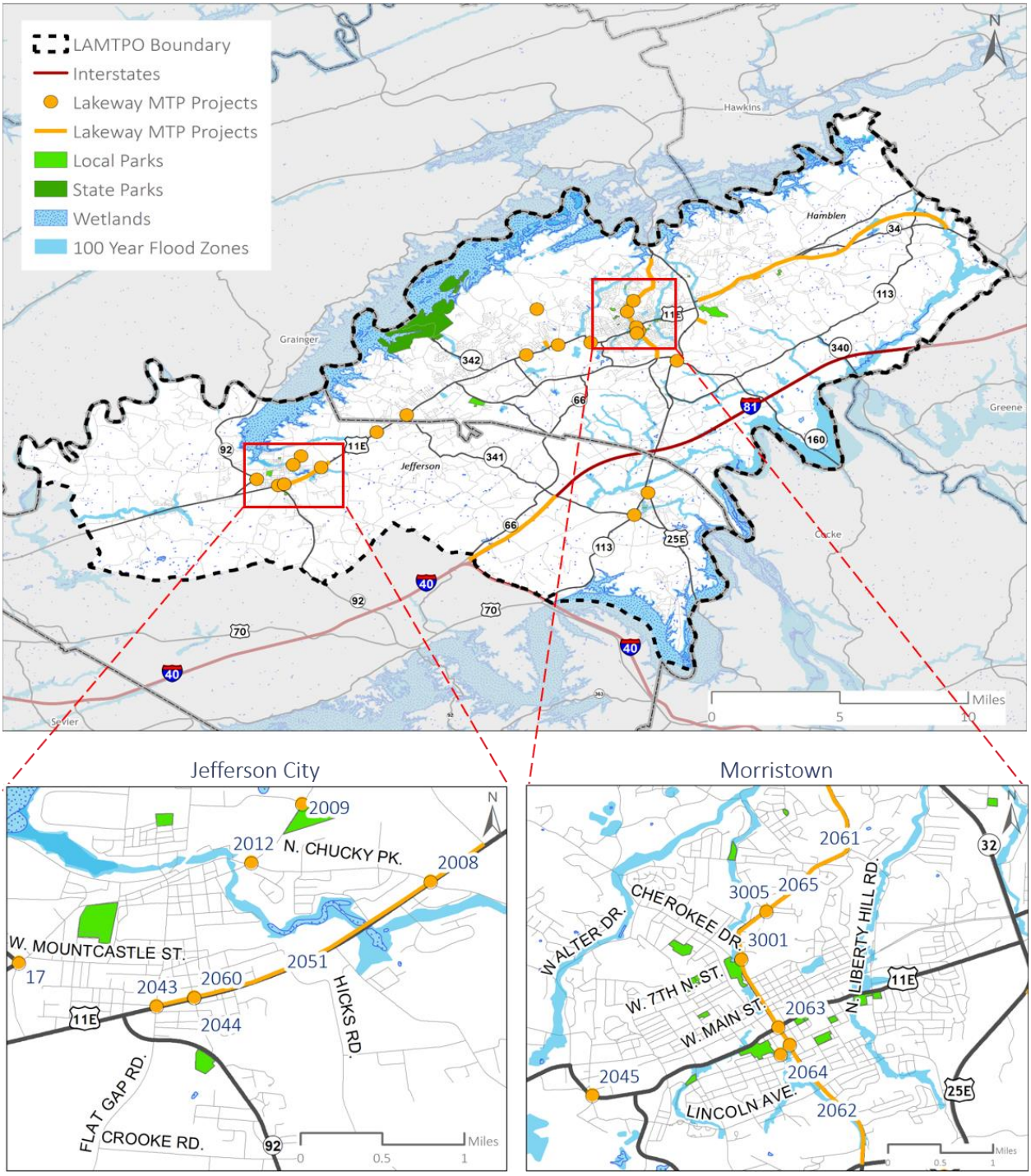
Natural Resources

Transportation projects have the potential to negatively impact some key natural resources, namely rivers and streams, floodplains, wetlands, and other conservation lands. In addition, topographical features such as hillsides, ridgelines, and mountains, which may define an area's character, can also be considered natural resources that should be preserved. Examples of key natural resources found in the Lakeway region include: the Cherokee and Douglas Lakes, Nolichucky River, and Turkey Creek. The MTP projects listed in Table 7-1 and shown in Figure 7-1 are located in close proximity to some of these resources. Though still in the planning stages, the scope of these projects should be continually refined throughout the project development process to minimize unavoidable impacts to the natural environment.

Table 7-1. MTP Projects with Potential Impacts to Natural Resources

Project ID	Project Description	Potential Impact
2009	Intersection improvements at E. Old Andrew Johnson Hwy and Municipal Dr: Add turn lanes	Johnson Ball Park
2051	Intersection and access management improvements along SR 34/US 11E from Russell Ave to Odyssey Rd	Byrd Spring Branch 100-Year Flood Zone
2062	Add sidewalks, streetscaping, etc. along SR 343 (Cumberland Ave) from SR 34/US 11E to SR 160	Thompson Creek 100-Year Flood Zone
2064	Rehabilitation of culvert/bridges over Turkey Creek at Rosedale Ave and Downtown	Turkey Creek 100-Year Flood Zone / Fred Miller Park
2066	Extend Crockett Trace Dr to Thompson Creek Rd	Thompson Creek
3001	Intersection improvements at SR 343 (Buffalo Trail) at Cherokee Park Rd: signalize the intersection	Turkey Creek 100-Year Flood Zone / Park Land
3002	Intersection improvements at SR 343 (S. Cumberland St) and Inman St: signalize the intersection and add turn lanes	Turkey Creek 100-Year Flood Zone
6003	Signalize the intersection of SR 341 (Roy Messer Hwy) and SR 113 (Main St)	Nolichucky River 100-Year Flood Zone
8000-03	Relocate SR 34/US 11E from near E. Morris Blvd to west of Stagecoach Rd	Lyons Creek 100-Year Flood Zone

Figure 7-1. MTP Projects in Relation to Natural Resources



Source: FEMA

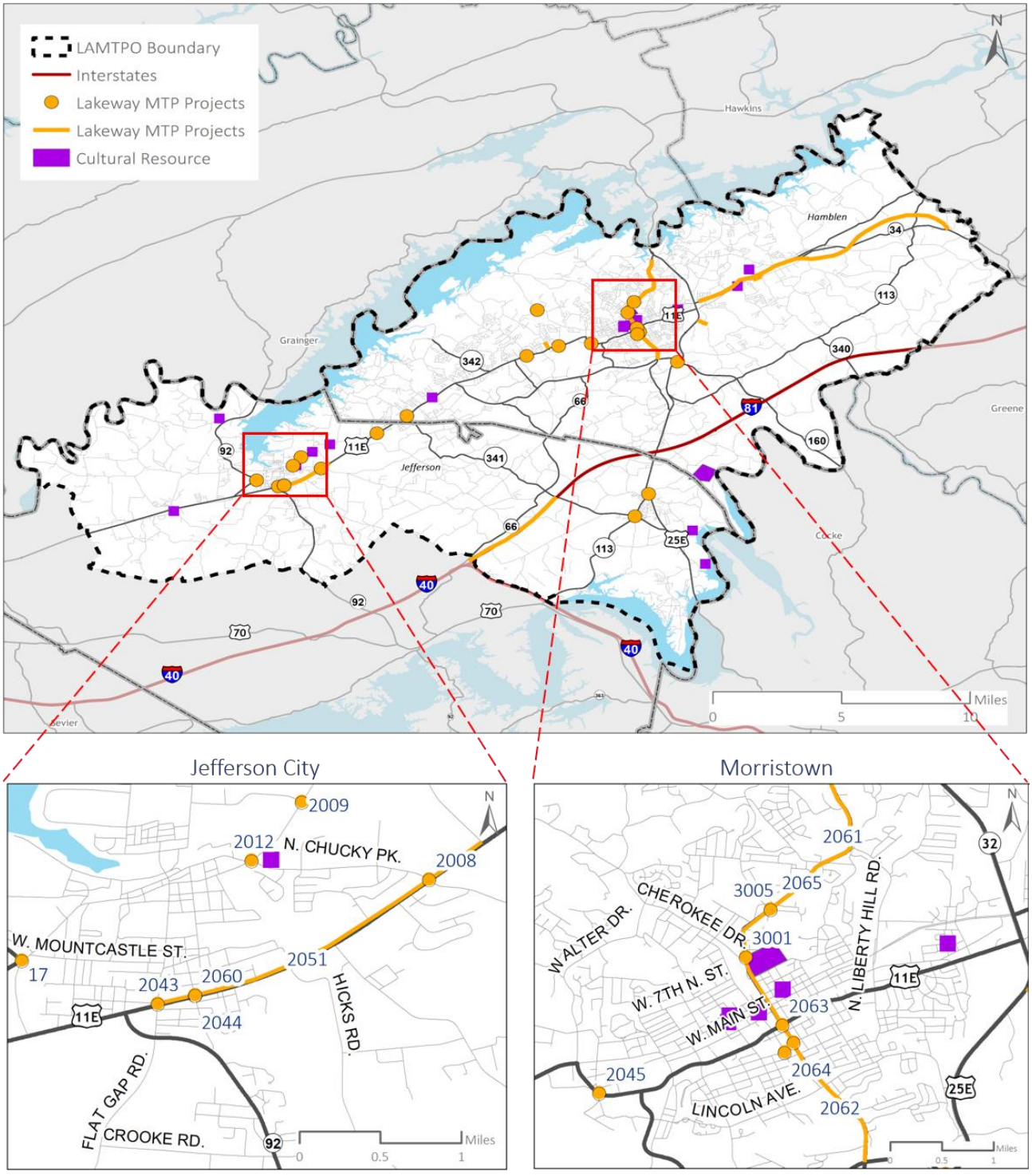
Cultural Resources

The term 'cultural resources' typically refers to physical structures or areas that have historical significance to a geography, its residents, an event, and/or a specific culture. Some of the most common examples of cultural resources are those buildings, structures, or properties that have been officially designated as historically significant. In the Lakeway region, sites such as Barton Springs, Crockett Tavern Museum, Glenmore Mansion, and Fulton-Hill Park are examples of cultural resources. Table 7-2 and Figure 7-2 depict the MTP projects that have the potential to impact cultural resources in the region.

Table 7-2. MTP Projects with Potential Cultural Resource Impacts

Project ID	Project Description	Potential Impact
2012	Intersection improvements at Old Andrew Johnson Hwy and E. Main St/N Chucky Pike: realign offset intersection	Glenmore Mansion
2065	ITS and traffic signal coordination along SR 343 (Cumberland Ave) from N. Liberty Hill Rd to Lincoln Ave	Fulton-Hill Park
3001	Intersection improvements at SR 343 (Buffalo Trail) at Cherokee Park Rd: signalize the intersection	Fulton-Hill Park
8000-01	Widen SR 34/US 11E from 2 to 5 lanes from SR 32/US 25E in Morristown to near E. Morris Blvd	Barton Springs

Figure 7-2. MTP Projects in Relation to Cultural Resources



Source: National Register of Historic Places

Environmental Mitigation Strategies

The transportation projects included in the MTP vary in size and scope and their potential impacts will also vary. As projects progress from planning, through engineering and design, and ultimately to construction, impacts to both natural and cultural resources should be avoided wherever possible, minimized where unavoidable, and mitigated to ensure compensation for any lost resources. To accompany these three steps, Table 7-3 provides details on various strategies that should be considered to ensure the negative impacts of transportation projects are addressed across the region.

Table 7-3. Potential Environmental Mitigation Strategies

Resource	Potential Mitigation Strategy
Water Resources	Promote redevelopment over new development to preserve existing permeable lands.
	Require low-impact development and strongly encourage zero-impact development.
	Adhere to "avoid, minimize, compensate" sequencing—that is, avoid impacts to a wetland or other aquatic resource, but, if that's not possible, minimize impacts and compensate for them.
	Compensate for the lost functions of the impacted aquatic resources and set measurable and enforceable ecological performance standards to ensure successful compensation.
Cultural and Historical Resources	Consult early with the state historic preservation officer and other interested persons and parties to determine what resources may exist in a specific area.
	Engage in community discussion.
	Employ relocation, marking, and other measures as appropriate.
Open Space, Parks, and Recreation	Replace lands used with lands of reasonably equivalent usefulness and location, and of at least comparable value.
	Restore and landscape disturbed areas.
	Replace facilities impacted by the project, including sidewalks, paths, benches, lights, trees, and other facilities.
Agricultural and Farmlands	Avoid and minimize the amount of agricultural lands being used for projects.
	Monitor the agricultural land area development for future environmental damage.
Air Quality	Apply an environmentally safe soil stabilizer on dirt roads.
	Sweep roadways.
	Evaluate the use of available alternative engines and diesel fuels.
Habitat and Wildlife Areas	Avoid impacts by relocating the entire project or most impactful portions of the project to a less sensitive area.
	Minimize impacts by modifying the project proposal to not cause as great an impact.
	Repair and restore an affected area to pre-disturbance conditions or mitigate adverse impacts by restoring or even improving conditions.

Environmental Consultation Process

To ensure all potential impacts of the MTP are captured in this analysis, LAMTPO engaged various state and federal agencies in the review of the 2045 MTP. Specifically, the draft plan was sent to each of the following agencies to ensure consistency with any existing or upcoming plans, the correct use of relevant data and inventories, and any unforeseen impacts of the transportation projects.

State Agencies

- Tennessee Department of Environment and Conservation (TDEC)
- Tennessee State Historic Preservation Office (SHPO)
- Tennessee Wildlife Resource Agency (TWRA)

Federal Agencies

- U.S. Environmental Protection Agency (EPA)
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- U.S. Department of Agriculture
- National Park Service (NPS)
- Tennessee Valley Authority (TVA)

7.3 Impacts to Environmental Justice and Title VI Populations

The impacts of transportation projects can extend beyond physical resources and affect the quality of life of the region's residents. History has shown that transportation projects have not benefited all populations equally, and furthermore, some population groups have borne a disproportionate amount of negative project impacts. To combat this occurrence, there are three key federal statutes that require LAMTPO to proactively assess impacts of transportation projects on traditionally underserved communities and seek input from those communities in its planning processes. As shown in Table 7-4, the key focus areas of Title VI, Environmental Justice (EJ), and Limited English Proficiency (LEP) regulations include considerations for minority, low-income, and LEP populations.

Table 7-4. Key Elements for Environmental Justice, Title VI, and LEP

	Title VI	Environmental Justice	Limited English Proficiency
Authorizing Directive	Civil Rights Act of 1964 (42 USC § 2000d et seq.)	E.O. 12898 (1994)	E.O. 13166 (2000)
Required Population	Race, color, and national origin	Minority persons and low-income persons	Individuals with a limited ability to read, write, speak, or understand English
Applicable Agencies/ Programs	Programs receiving federal assistance	Federal agencies and recipients of federal financial assistance	Federally funded programs and activities
Guidance	23 CFR Part 200 and 450; FTA Title VI Circular 4702. 1B (2012)	FTA EJ Circular 4703.1 (2012)	U.S. DOJ Guidance to Federal Financial Assistance Recipients Regarding Title VI Prohibition Against National Origin Discrimination Affecting Limited English Proficient Persons (2000)

While each of the regulations detailed in Table 7-4 have unique characteristics, their intention is clear and twofold regarding transportation planning and the MTP. First, the MTP must ensure its projects distribute benefits and burdens equally across the region's populations. This is carried out by identifying and addressing any disproportionately high and adverse effects resulting from MTP programs, policies, and projects on federally recognized population groups. Second, the MTP must provide ample and accessible opportunity for disadvantaged population groups to take part in the transportation planning and decision-making processes. This ensures that all communities receive fair consideration of both benefits and burdens of transportation investments.

The potential impact of MTP projects on minority, low-income, and LEP populations was assessed using data available at the block group level from the U.S. Census Bureau for 2018. The average percent of minority, low-income, and LEP populations within Census block groups in the Lakeway region was used to

assess potential impacts. Both the low-income and LEP variables are identified at the household level while minority population is defined at the person level.

In the Lakeway region, minority populations were identified on the basis of race and include those residents who consider themselves to be non-white. More specifically, this includes residents who identify as African American, Asian American, American Indian and Alaskan Native, Native Hawaiian or Other Pacific Islander. As shown in Figure 7-3, the highest concentration of minority populations is located in Morristown where many areas have greater than the regional average of 9% minority population. In total, there are 15 MTP projects that are located in these areas as detailed in Table 7-5.

To identify areas in the Lakeway region with low-income populations, the same data source was used to depict household income by Census block group, noting that the Census defines low-income thresholds based on household size and composition. As shown in Figure 7-4, concentrations of low-income households are located in the southern part of Morristown and the northern part of Jefferson City where many areas have greater than the regional average of 19% low-income population. In total, there are 20 MTP projects that are located in low-income areas as detailed in Table 7-5.

Concentrations of households with limited English proficiency across the Lakeway region are identified in Figure 7-5. Depicted at the Census block group level, these households are primarily located in Morristown where many areas have greater than the regional average of 2% LEP population. In total, there are 13 MTP projects that are located in areas with a significant percentage of LEP households as detailed in Table 7-5.

Table 7-5. MTP Projects with Potential Impacts on Traditionally Underserved Populations

Project ID	Project Description	Above Average Populations		
		Minority	Low-Income	LEP
2009	Intersection improvements at E. Old Andrew Johnson Hwy and Municipal Dr: Add turn lanes	✓		
2043	Intersection improvements at SR 34/US 11E and Russell Ave: add right turn lanes on SR 34/US 11E, pedestrian signals and sidewalks on all approaches		✓	✓
2044	Intersection improvements at SR 34/US 11E and George Ave: add right turn lanes on SR 34/US 11E, pedestrian signals and sidewalks on all approaches		✓	
2045	Improve intersection radii at SR 34 (W. Morris Blvd) and S. Economy Rd to accommodate large trucks		✓	✓
2047	Intersection improvements at SR 34/US 11E and Kidwell Ridge Rd: add turn lane on Kidwell Ridge Rd, eliminate left turn lane from W. Manley Ct Circle, add J-turn farther east		✓	
2048	Intersection improvements at SR 34/US 11E and W. Economy Rd: add right turn lanes on SR 34/US 11E, reconfigure access	✓	✓	✓
2051	Intersection and access management improvements along SR 34/US 11E from Russell Ave to Odyssey Rd	✓	✓	
2052	Intersection improvements at SR 32 (State St) and SR 113 (Main St): add left turn lanes on SR 32 (State St) and a left turn lane on eastbound SR 113		✓	✓
2055	Widen Central Church Rd from 2 to 3 lanes from SR 34/US 11E to Connie St	✓	✓	✓
2059	Modify US 25E/SR 32 interchange at SR 160 to diamond interchange	✓	✓	✓
2060	Intersection improvements at SR 34/US 11E and George Ave: add NB right turn lane extending to Elmwood St		✓	
2061	Add sidewalks along SR 343 (Buffalo Trail/Cumberland Ave) from Cherokee Park Rd to Truman Street	✓	✓	✓
2062	Add sidewalks, streetscaping, etc. along SR 343 (Cumberland Ave) from SR 34/US 11E to SR 160	✓	✓	✓
2063	Intersection improvements at SR 343 (Cumberland Ave) and E. Morris Blvd: add WB left turn lane	✓	✓	
2064	Rehabilitation of culvert/bridges over Turkey Creek at Rosedale Ave and Downtown	✓	✓	✓
2065	ITS and traffic signal coordination along SR 343 (Cumberland Ave) from N. Liberty Hill Rd to Lincoln Ave	✓	✓	✓
2066	Extend Crockett Trace Dr to Thompson Creek Rd	✓	✓	✓
3001	Intersection improvements at SR 343 (Buffalo Trail) at Cherokee Park Rd: signalize the intersection	✓		✓
3002	Intersection improvements at SR 343 (S. Cumberland St) and Inman St: signalize the intersection and add turn lanes	✓	✓	✓
3005	Intersection improvements at SR 343 (Buffalo Trail) and Rader St: signalize the intersection and add NB left turn lane	✓	✓	
8000-01	Widen SR 34/US 11E from 2 to 5 lanes from SR 32/US 25E in Morristown to near E. Morris Blvd	✓	✓	
8001-02	Relocate SR 34/US 11E from west of Stagecoach Rd to Steadman Rd		✓	

Figure 7-3. MTP Projects with Potential Impacts on Minority Populations

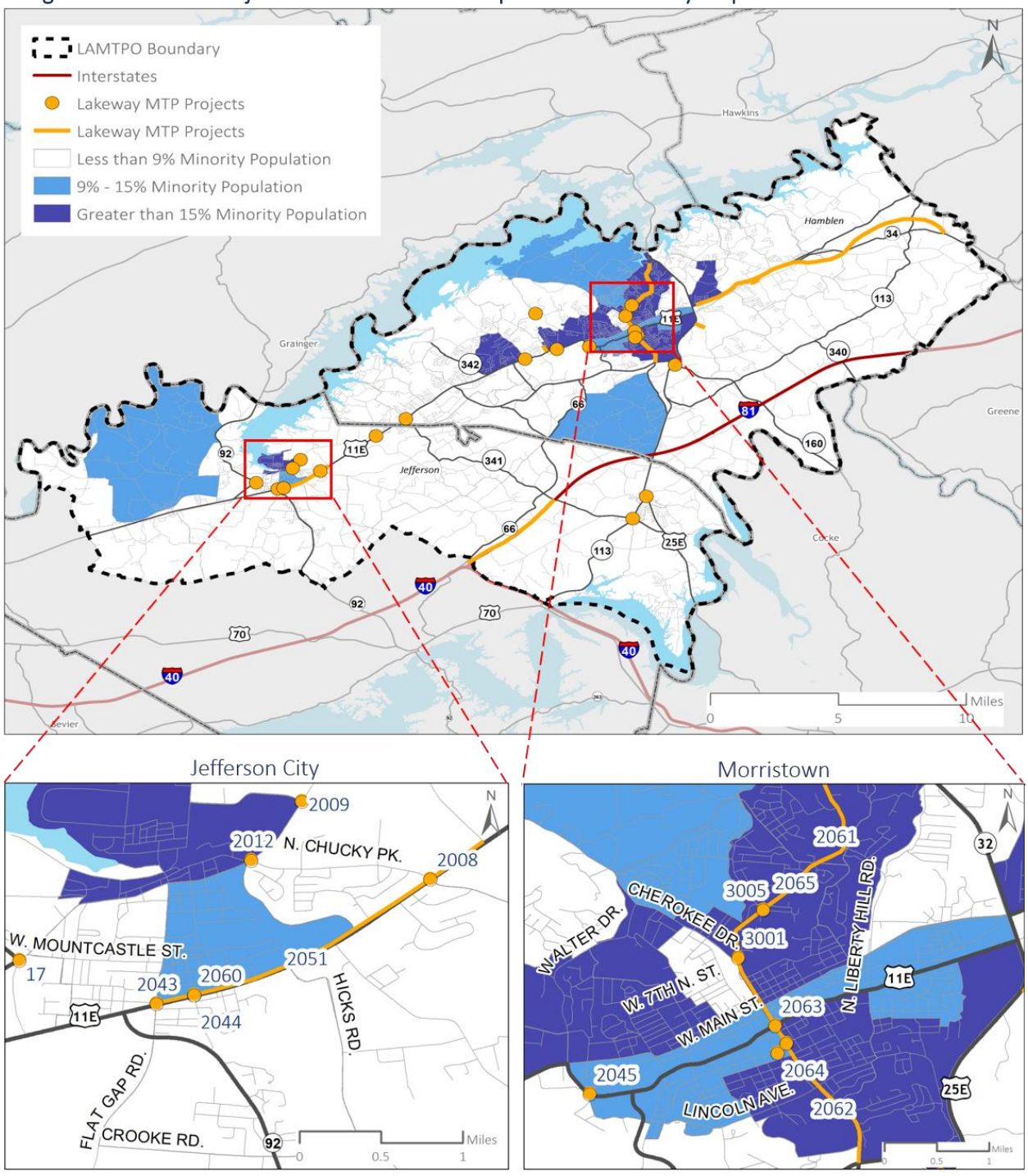


Figure 7-4. MTP Projects with Potential Impacts on Low-Income Households

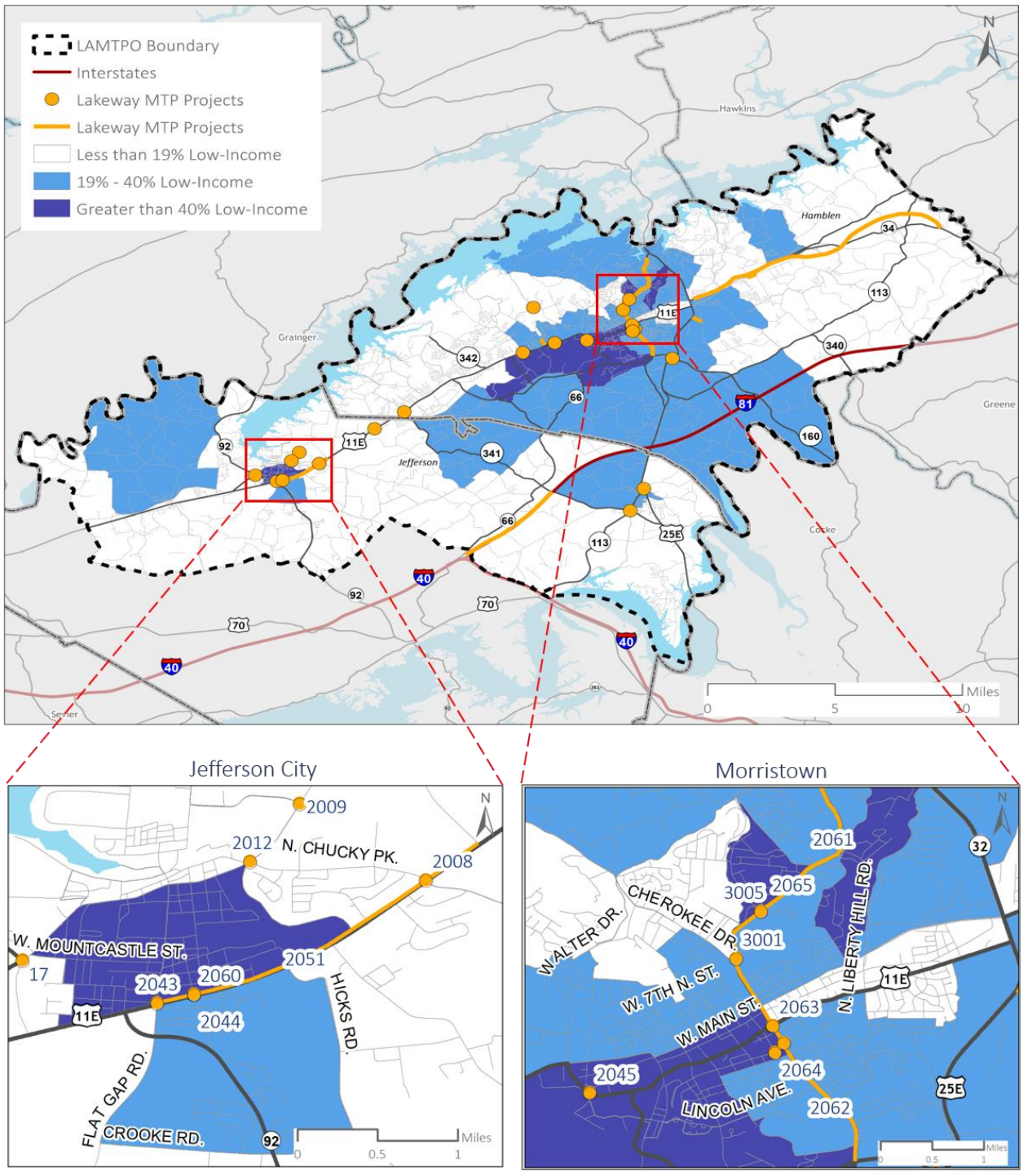
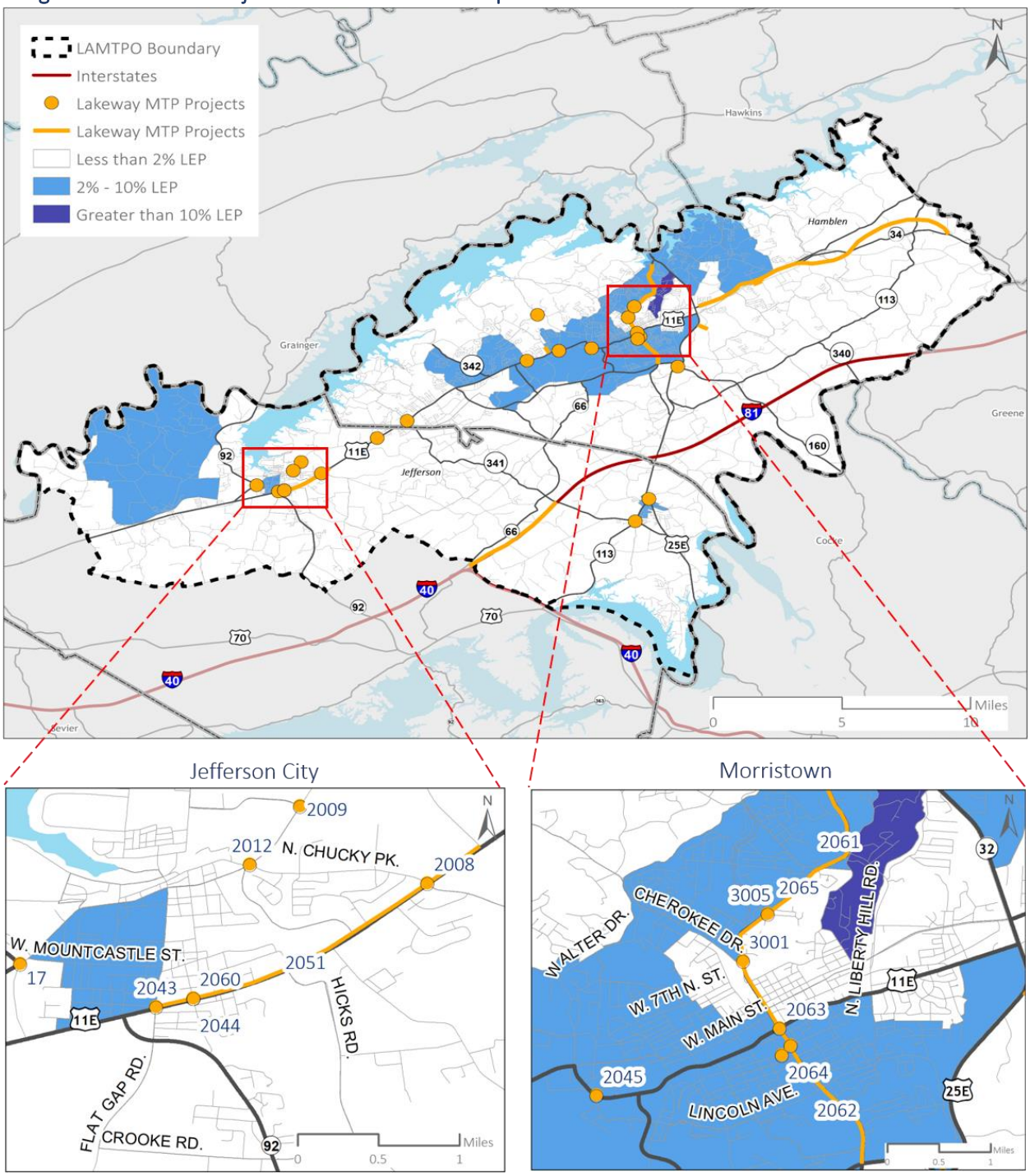


Figure 7-5. MTP Projects with Potential Impacts on LEP Households



Project Development

Assessing and mitigating impacts is an extremely important component to the transportation planning process and should be considered during all phases of project development. The 2045 MTP serves as a starting point for evaluating potential project impacts on natural and cultural resources as well as traditionally underserved populations. At this point in the process, the actual nature of any potential impacts are largely unknown as final project details have not been developed. However, as those details are refined and projects move into implementation, effort should be taken to:

- Determine impacts of transportation projects on natural and cultural resources;
- Determine benefits and burdens of transportation projects, programs, and policies on traditionally underserved populations;
- Quantify expected effects (total, positive, and negative) and disproportionately high and adverse effects on traditionally underserved populations;
- Actively engage minority, low-income, and LEP populations ensuring access to the planning process; and
- Determine the appropriate course of action, prioritizing avoidance, then minimization, and finally mitigation and compensation of all resources.

Appendix A

Appendix B

Appendix A - Commonly Used Transportation Acronyms

A	
AADT	Average Annual Daily Traffic
AASHTO	American Association of State and Highway Transportation Officials
ADA	Americans with Disabilities Act of 1990
ADT	Average Daily Traffic
AVL	Automatic Vehicle Location
B	
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BRR	Bridge Replacement and Rehabilitation Funds
C	
CAA	Clean Air Act
CAAA	Clean Air Act Amendment of 1990
CFR	Code of Federal Regulations
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CO2	Carbon Dioxide
D	
DMS	Dynamic Message Sign
DOD	Department of Defense
DOE	Department of Energy
E	
E+C	Existing + Committed Travel Demand Model Network
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	Environmental Protection Agency
ETDD	East Tennessee Development District
ETHRA	East Tennessee Human Resource Agency
F	
FAST Act	Fixing America's Surface Transportation Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FLHP	Federal Lands Highway Program
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FFY	Federal Fiscal Year
FY	Fiscal Year
G	
GHG	Greenhouse Gases
GIS	Geographic Information System

GSMNP	Great Smoky Mountains National Park
H	
HBRRP	Highway Bridge Replacement and Rehabilitation Program
HOV	High Occupancy Vehicle
HPMS	Highway Performance Monitoring System
HPP	High-Priority Program
HRRR	High Risk Rural Roads
HSIP	Highway Safety Improvement Program
HSP	Highway Safety Plan
I	
IAC	Inter-Agency Consultation
ITS	Intelligent Transportation System
L	
LAMTPO	Lakeway Area Metropolitan Transportation Planning Organization
LEP	Limited English Proficiency
LIC	Local Interstate Connector Program
LOS	Level of Service
LRTP	Long Range Transportation Plan (see also MTP)
M	
MAP-21	Moving Ahead for Progress in the 21st Century Act
MPA	Metropolitan Planning Area
MPO	Metropolitan Planning Organization (see also MTPO)
M&O	Management and Operations
MSA	Metropolitan Statistical Area
MTP	Metropolitan Transportation Plan (see also LRTP)
MTPO	Metropolitan Transportation Planning Organization
N	
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act
NHPP	National Highway Performance Program
NHS	National Highway System
NHTSA	National Highway Traffic Safety Administration
NOx	Nitrogen Oxides
NPS	National Park Service
O	
O&M	Operating and Maintenance
P	
PM2.5	Fine Particulate Matter (2.5 microns) (Air Quality)
PPP	Public Participation Plan
R	
RPO	Rural Planning Organization

S	
SGR	State of Good Repair
SHSP	Strategic Highway Safety Plan
SIA	State Industrial Access Program
SIP	State Implementation Plan
SOV	Single Occupancy Vehicle
SR	State Route
STID	Strategic Transportation Investments Division (TDOT)
STIP	Statewide Transportation Improvement Program
STBG	Surface Transportation Block Grant
STRAHNET	Strategic Highway Network
T	
TA	Transportation Alternatives
TAC	Technical Advisory Committee
TAM	Transit Asset Management
TAP	Transportation Alternatives Program
TAZ	Traffic Analysis Zone
TDEC	Tennessee Department of Environment and Conservation
TDH	Tennessee Department of Health
TDM	Travel Demand Management
TDOS	Tennessee Department of Safety
TDOT	Tennessee Department of Transportation
THC	Tennessee Historical Commission
TIP	Transportation Improvement Program
TITAN	Tennessee Integrate Traffic Analysis Network
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resource Agency
U	
UPWP	Unified Planning Work Program
USDOT	United States Department of Transportation
USGS	United States Geological Survey
UA	Urbanized Area
V	
V/C Ratio	Volume-to-Capacity Ratio
VHT	Vehicles Hours Traveled
VMS	Variable Message Sign
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound

Appendix B - Stakeholder and Public Involvement

Introduction

This appendix summarizes and documents the public and stakeholder engagement, which occurred over the course of the development of LAMTPO's 2045 MTP. Members of the public as well as stakeholders were regularly engaged throughout the process in order to provide an effective regional planning document that meets existing transportation needs and desires. This included establishing the region's long-term system goals and objectives and creating a fiscally constrained project list to provide a blueprint for future investments. The contents of this appendix demonstrate how both the public and stakeholders were involved during various stages of the plan development process.

Overview of Involvement

Stakeholder Involvement

Stakeholders engaged throughout the plan development process included representatives from LAMTPO member jurisdictions and stakeholder agencies, such as TDOT, FHWA, ETHRA, ETDD, among others. The three general groups engaged included:

- LAMTPO's Executive Board
- LAMTPO's Technical Advisory Committee (TAC)
- LAMTPO Member Jurisdictions and Area Stakeholder Groups

The Executive Board was provided progress updates on the plan's development and were responsible for reviewing and approving the MTP's goal and objectives. In addition, the Executive Board was provided an opportunity to review and comment upon the MTP's draft project list. Similarly, the TAC was provided progress updates of the MTP's development along with an opportunity to review the draft project list. The final group, member jurisdictions and other area stakeholder groups, were provided notice of the public involvement opportunities and were also provided the opportunity to nominate new transportation projects to be considered for incorporation into the plan.

Public Involvement

<u>Round 1 – Online Survey and Wikimap</u>
Public involvement was carried out virtually due to the ongoing COVID-19 pandemic. Two online platforms – a survey and mapping application – were used to gather input on transportation issues and opportunities in the LAMTPO area. These applications were made available for a 6-week period during May and June 2020. In order to garner participation from a broad range of residents, LAMTPO advertised the survey and Wikimap opportunities through traditional and social media platforms, including local newspapers, LinkedIn, and Nextdoor. LAMTPO also utilized the communication platforms of local political party groups and chambers of commerce to disseminate information on these opportunities.

A total of 44 individuals participated in the online survey. Ninety percent of the responders currently live within the LAMTPO area, with 19 of them living in Morristown. Over half have lived within either Jefferson or Hamblen County for more than 15 years. The age distribution of responders showed the majority were over the age of 45, with the largest group being between the ages of 45 and 54. Eighteen were male, while 15 were female. There were no responders of Hispanic, Spanish, or Latino descent.

The following highlights key takeaways from the online survey results:

- Approximately 87% of the survey responders said that the roadways in the LAMTPO area have become more congested over the past five years, while 47% said that development in the last 10 years has the right amount of density.
- The three components of the transportation system that scored the lowest in terms of how well they are currently functioning include the system supporting economic development/industry, traffic signals, and roadway lighting.
- Almost 60% of responders identified 'maintenance and operation' projects (such as repairing roads and updating traffic signals) as being the most important project type for the LAMTPO area.
- As it relates to the bicycle and pedestrian network, half of responders identified filling in the existing gaps as the top priority.
- If responders were to use the new fixed route transit service, 41% said it would likely be to reach recreational and/or social destinations, while 28% of the respondents said they might use it to travel to and from work. Approximately 38% said they do not plan on using the service.

The Wikimap allowed participants to identify where there are transportation issues within the LAMTPO area using an online mapping tool. Categories included congestion, maintenance, safety, bike, pedestrian and transit, or other. The tool captured 31 responses, 42% related to congestion, 39% related to safety, and 19% related to bike, pedestrian, and transit.

Commonalities in the issues identified are briefly described below for each topic:

- **Congestion:** The majority identified east-west congestion in and around, Morristown. Potential improvements to and along SR 160 were identified as a potential solution.
- **Safety:** Many of the safety comments were related to turning movements along corridors in Morristown. Others noted concerns created by the construction projects on US-11E.
- **Bike, Pedestrian, and Transit:** Most comments related to the need for bicycle and pedestrian facilities along key connections, including regional connections into Jefferson City from Dandridge and I-81 Exit 4 and SR 160 southwest of Morristown.

Round 2 – Plan Public Review Period

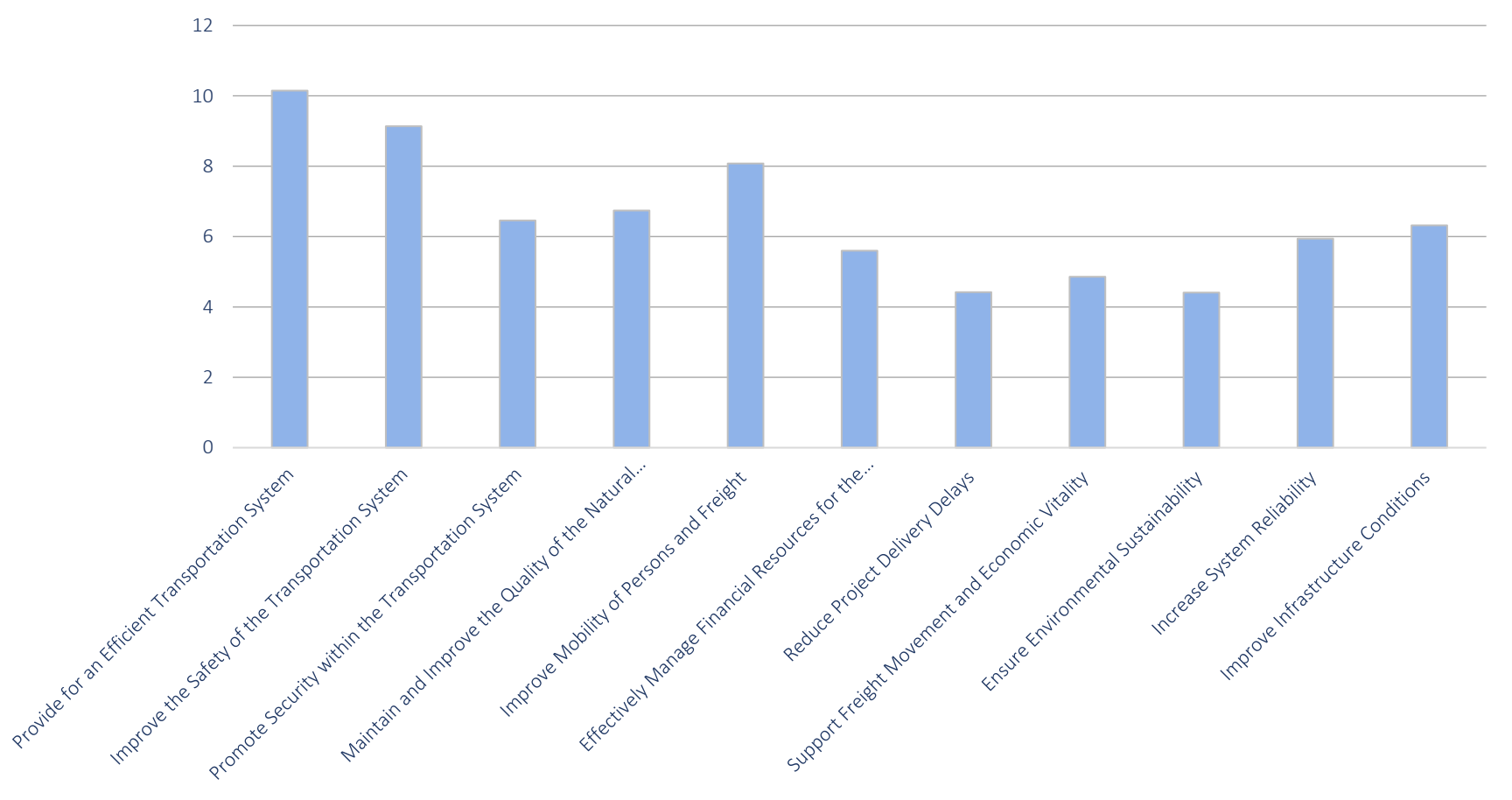
The draft 2045 MTP will be made available to the public for review and comment over 30 calendar days. Written and verbal comments on the plan document and recommended project list will be gathered for incorporation into the plan.

Documentation of Involvement

Online Survey

Question 1: Please tell us how important each of these goals is to you by placing them in rank order, with the top priority at the top of the page. You can drag and drop to place the goals in order, or choose the rank using the drop-down menu.

Answered: 42 Skipped: 2

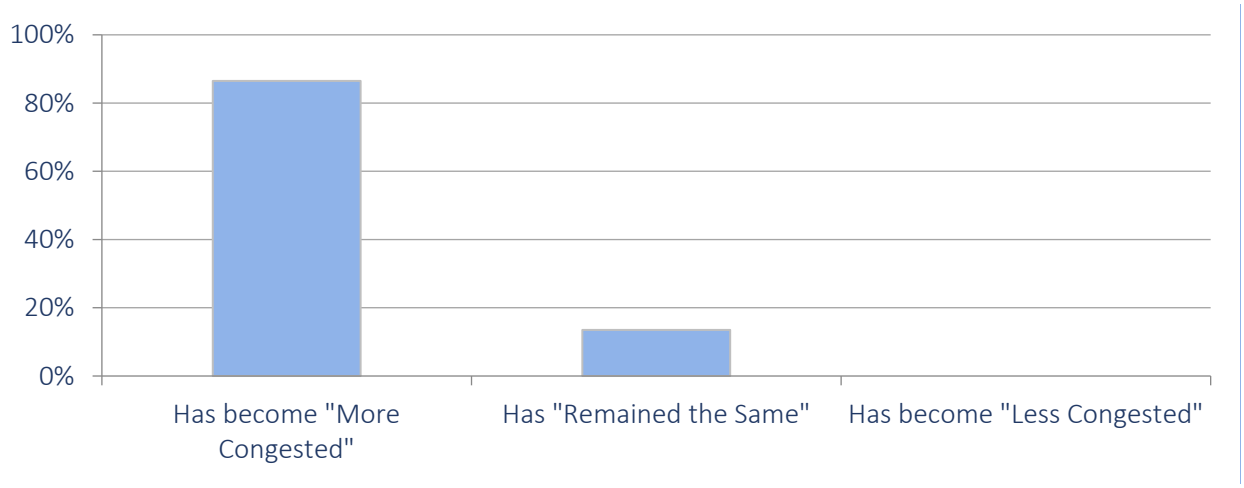


	1	2	3	4	5	6	7	8	9	10	11	12
Provide for an Efficient Transportation System - Coordinate land use development and transportation improvements and preserve and maintain existing transportation infrastructure	40.0%	25.0%	12.5%	5.0%	2.5%	5.0%	0.0%	2.5%	5.0%	0.0%	0.0%	2.5%
Improve the Safety of the Transportation System -Increase safety for all transportation system users, including pedestrians and bicyclists, through a combination of engineering, education, and enforcement activities	8.6%	31.4%	20.0%	14.3%	2.9%	5.7%	8.6%	0.0%	0.0%	5.7%	2.9%	0.0%
Promote Security within the Transportation System - Identify and prioritize critical transportation facilities and systems, including public transportation, and utilize technologies that increase security	2.9%	2.9%	20.0%	14.3%	11.4%	5.7%	2.9%	8.6%	2.9%	5.7%	8.6%	14.3%
Maintain and Improve the Quality of the Natural Environment - Support a healthy natural environment by reducing vehicle emissions and energy demand, including increasing public transportation	5.7%	2.9%	2.9%	20.0%	11.4%	17.1%	5.7%	8.6%	14.3%	2.9%	2.9%	5.7%
Improve Mobility of Persons and Freight - Provide convenient travel options for people and goods and improve access to jobs, markets, and services	13.5%	8.1%	8.1%	13.5%	21.6%	10.8%	5.4%	10.8%	0.0%	5.4%	0.0%	2.7%
Effectively Manage Financial Resources for the Transportation Network -Consider funding constraints when selecting transportation improvements and utilize existing right-of-way and facilities to minimize costs	2.9%	0.0%	2.9%	2.9%	2.9%	22.9%	22.9%	14.3%	2.9%	17.1%	8.6%	0.0%

	1	2	3	4	5	6	7	8	9	10	11	12
Reduce Project Delivery Delays - Preserve adequate public right-of-way along roadway corridors to minimize future project delays and costs	0.0%	2.8%	0.0%	0.0%	5.6%	11.1%	22.2%	2.8%	13.9%	13.9%	16.7%	11.1%
Support Freight Movement and Economic Vitality - Improve access to industry and other freight centers, including reducing conflict points between rail and other transportation modes	0.0%	2.8%	5.6%	2.8%	0.0%	5.6%	8.3%	30.6%	22.2%	5.6%	11.1%	5.6%
Ensure Environmental Sustainability - Maximize the use of the existing transportation system and conserve energy resources to support the prosperity of future generations	0.0%	5.4%	0.0%	2.7%	8.1%	2.7%	8.1%	13.5%	21.6%	10.8%	10.8%	16.2%
Increase System Reliability - Promote a reliable transportation system where travel times are consistent and predictable on a day-to-day basis	8.3%	2.8%	13.9%	2.8%	5.6%	5.6%	2.8%	11.1%	11.1%	30.6%	2.8%	2.8%
Reduce Congestion - Reduce delay experienced by travelers, including actively managing transportation conditions and incidents	7.9%	5.3%	10.5%	7.9%	18.4%	2.6%	10.5%	0.0%	2.6%	2.6%	23.7%	7.9%
Improve Infrastructure Conditions - Ensure the entire transportation system, including roadways, traffic signals, public transportation vehicles, sidewalks, and bikeways, are well-maintained and in good working order	10.3%	12.8%	5.1%	10.3%	7.7%	5.1%	0.0%	0.0%	5.1%	5.1%	7.7%	30.8%

Question 2: Travel on roadways in the LAMTPO Area (the communities of Morristown, Jefferson City, White Pine, and portions of Hamblen County and Jefferson County) over the last five years:

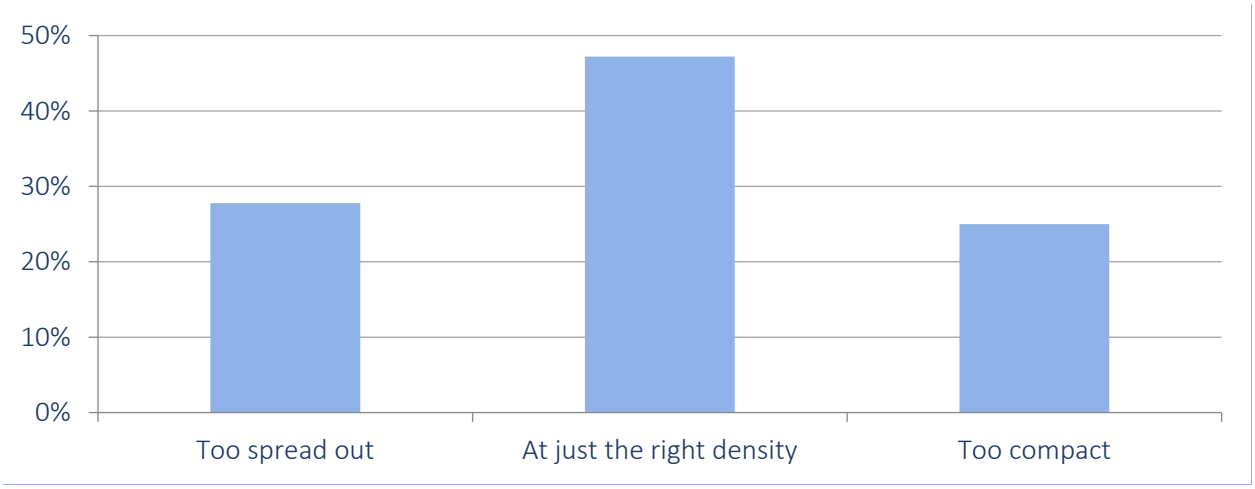
Answered: 37 Skipped: 7



Answer Choices	Responses	
Has become "More Congested"	86.5%	32
Has "Remained the Same"	13.5%	5
Has become "Less Congested"	0.0%	0

Question 3: Development in the LAMTPO Area in the last 10 years has been:

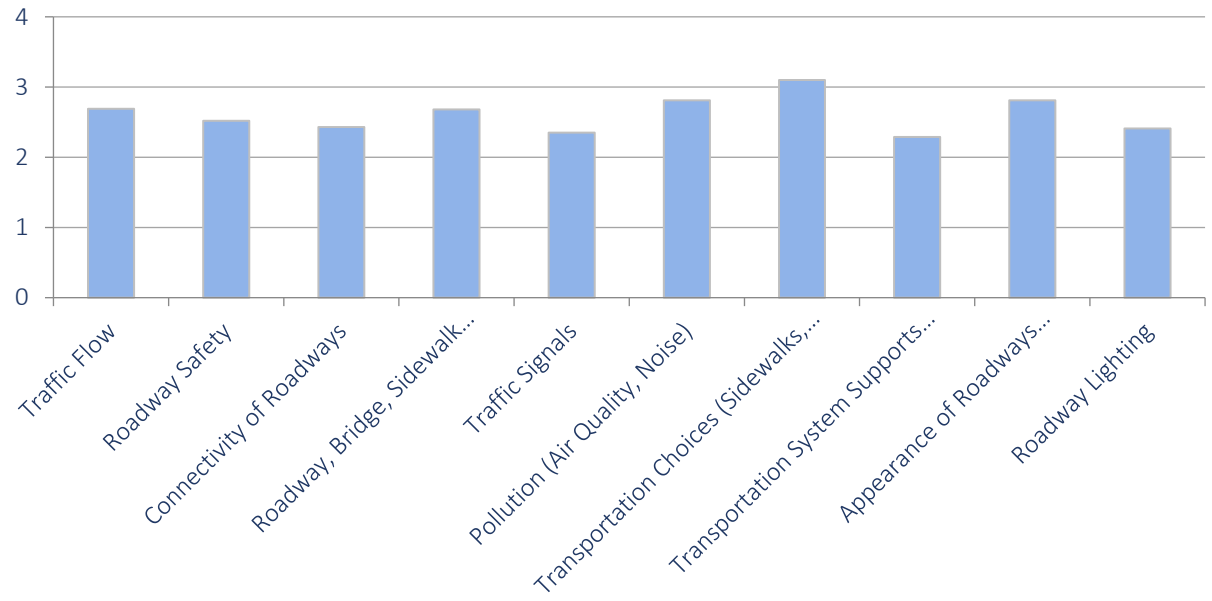
Answered: 36 Skipped: 8



Answer Choices	Responses	
Too spread out	27.8%	10
At just the right density	47.2%	17
Too compact	25.0%	9

Question 4: Please rate how well you think the LAMTPO Area's transportation system is currently functioning?

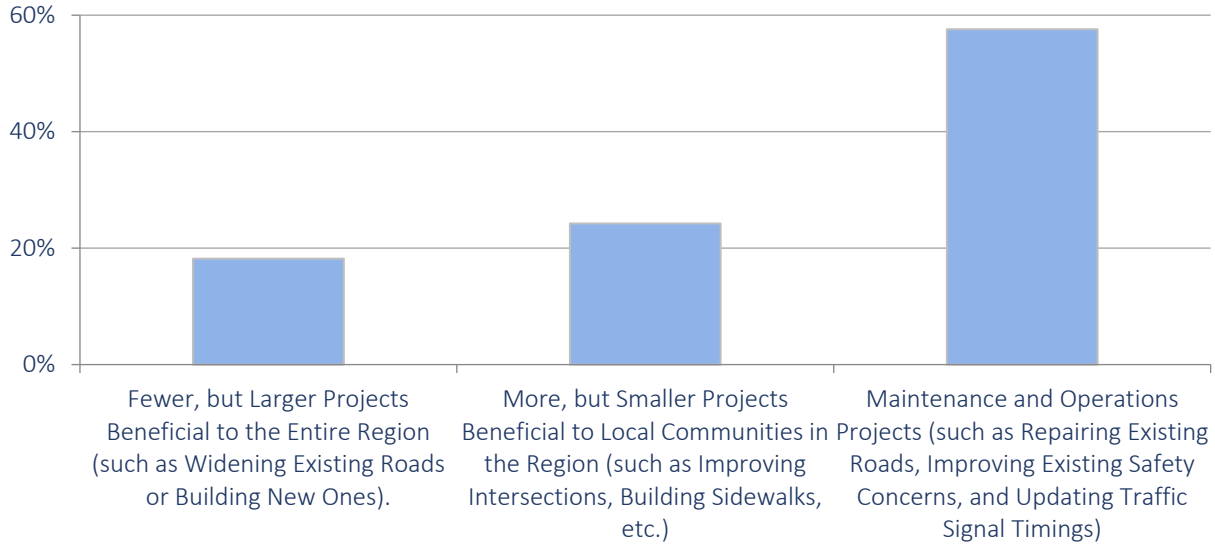
Answered: 32 Skipped: 12



	Great	Good	Fair	Poor	Unsure
Traffic Flow	0	18	8	4	2
Roadway Safety	1	19	6	4	1
Connectivity of Roadways	2	17	8	2	1
Roadway, Bridge, Sidewalk Conditions (Maintenance)	2	13	10	5	1
Traffic Signals	4	16	8	2	1
Pollution (Air Quality, Noise)	1	14	8	6	2
Transportation Choices (Sidewalks, Public Transportation, Bike Lanes)	1	10	6	13	1
Transportation System Supports Economic Development/Industry (Freight)	5	16	7	2	1
Appearance of Roadways (Plants/Trees, Art)	3	10	9	8	1
Roadway Lighting	3	14	10	1	1

Question 5: In your opinion, which of the following project types are most important to the LAMTPO Area?

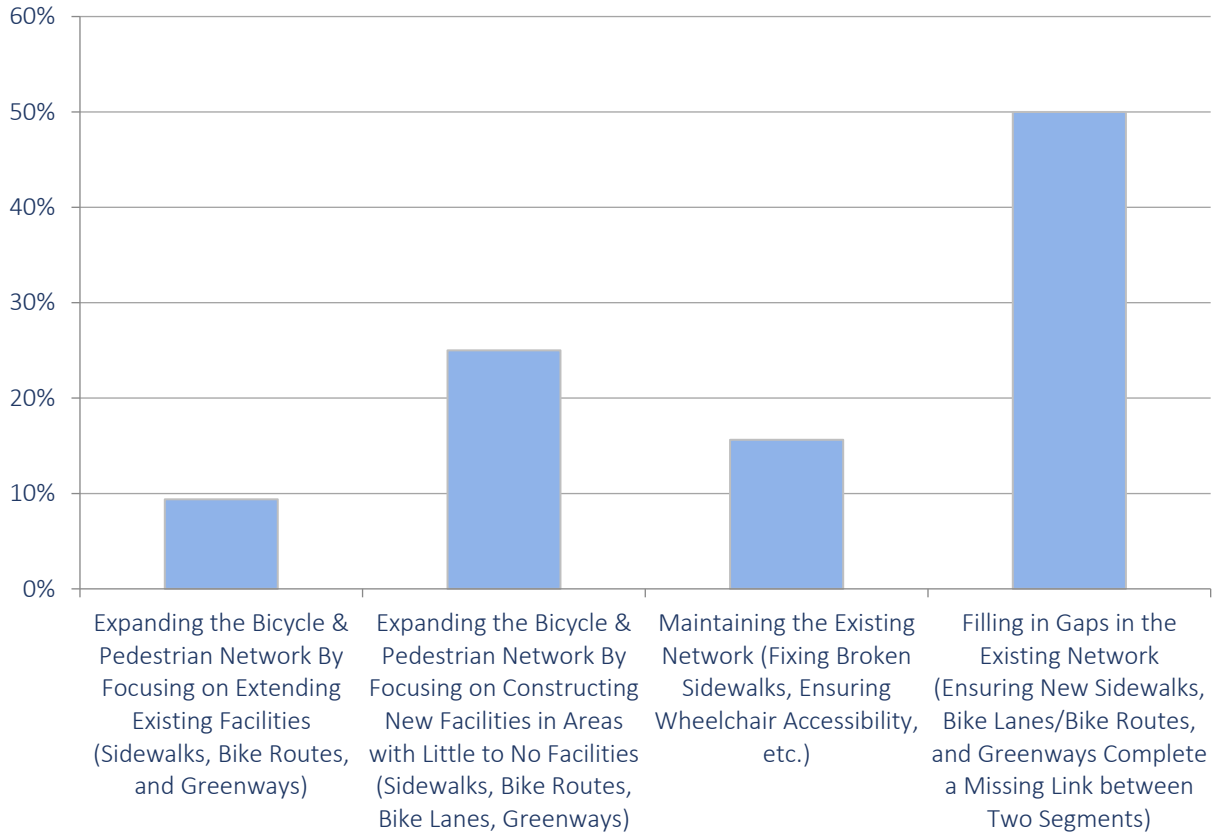
Answered: 33 Skipped: 11



Answer Choices	Responses	
Fewer, but Larger Projects Beneficial to the Entire Region (such as Widening Existing Roads or Building New Ones)	18.2%	6
More, but Smaller Projects Beneficial to Local Communities in the Region (such as Improving Intersections, Building Sidewalks, etc.)	24.2%	8
Maintenance and Operations Projects (such as Repairing Existing Roads, Improving Existing Safety Concerns, and Updating Traffic Signal Timings)	57.6%	19

Question 6: At a high-level, the LAMTPO Area should prioritize:

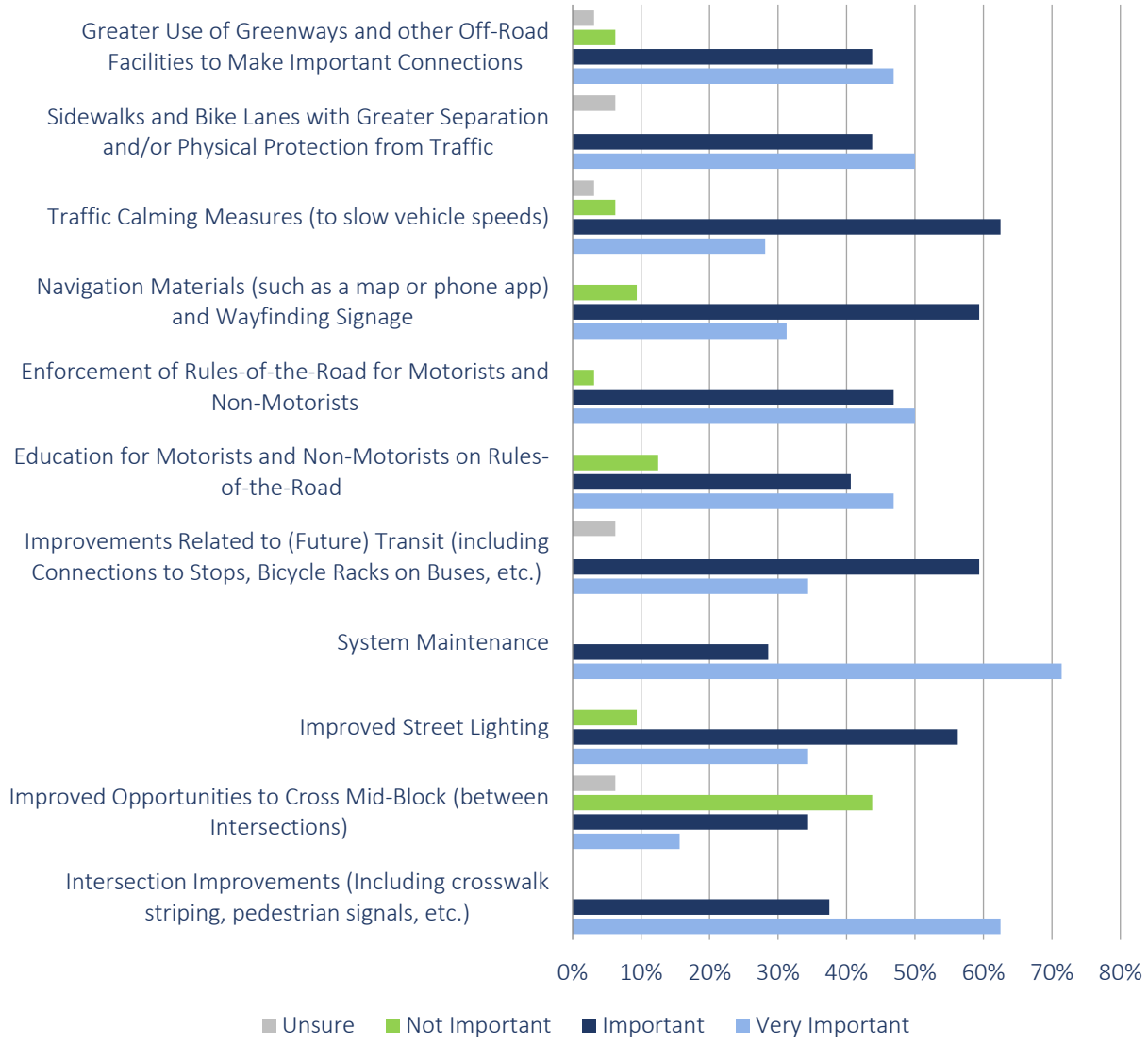
Answered: 32 Skipped: 12



Answer Choices	Responses	
Expanding the Bicycle & Pedestrian Network by Focusing on Extending Existing Facilities (Sidewalks, Bike Routes, and Greenways)	9.4%	3
Expanding the Bicycle & Pedestrian Network by Focusing on Constructing New Facilities in Areas with Little to No Facilities (Sidewalks, Bike Routes, Bike Lanes, Greenways)	25.0%	8
Maintaining the Existing Network (Fixing Broken Sidewalks, Ensuring Wheelchair Accessibility, etc.)	15.6%	5
Filling in Gaps in the Existing Network (Ensuring New Sidewalks, Bike Lanes/Bike Routes, and Greenways Complete a Missing Link between Two Segments)	50.0%	16

Question 7: How important are the following elements or improvements for accommodating existing (and encouraging future) pedestrians and bicyclists in the LAMTPO Area?

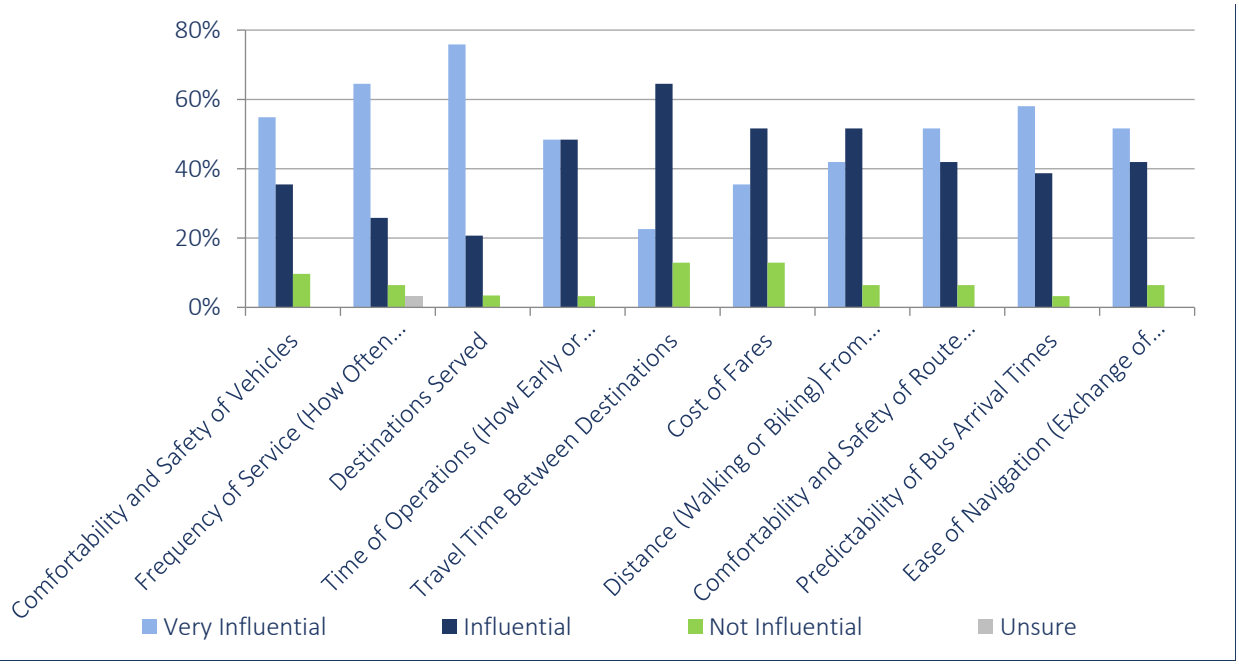
Answered: 32 Skipped: 12



	Very Important	Important	Not Important	Unsure
Greater Use of Greenways and other Off-Road Facilities to Make Important Connections	46.9%	43.8%	6.3%	3.1%
Sidewalks and Bike Lanes with Greater Separation and/or Physical Protection from Traffic	50.0%	43.8%	0.0%	6.3%
Traffic Calming Measures (to slow vehicle speeds)	28.1%	62.5%	6.3%	3.1%
Navigation Materials (such as a map or phone app) and Wayfinding Signage	31.3%	59.4%	9.4%	0.0%
Enforcement of Rules-of-the-Road for Motorists and Non-Motorists	50.0%	46.9%	3.1%	0.0%
Education for Motorists and Non-Motorists on Rules-of-the-Road	46.9%	40.6%	12.5%	0.0%
Improvements Related to (Future) Transit (including Connections to Stops, Bicycle Racks on Buses, etc.)	34.4%	59.4%	0.0%	6.3%
System Maintenance	71.4%	28.6%	0.0%	0.0%
Improved Street Lighting	34.4%	56.3%	9.4%	0.0%
Improved Opportunities to Cross Mid-Block (between Intersections)	15.6%	34.4%	43.8%	6.3%
Intersection Improvements (Including crosswalk striping, pedestrian signals, etc.)	62.5%	37.5%	0.0%	0.0%

Question 8: How important are the following issues in your choice to use the future bus system?

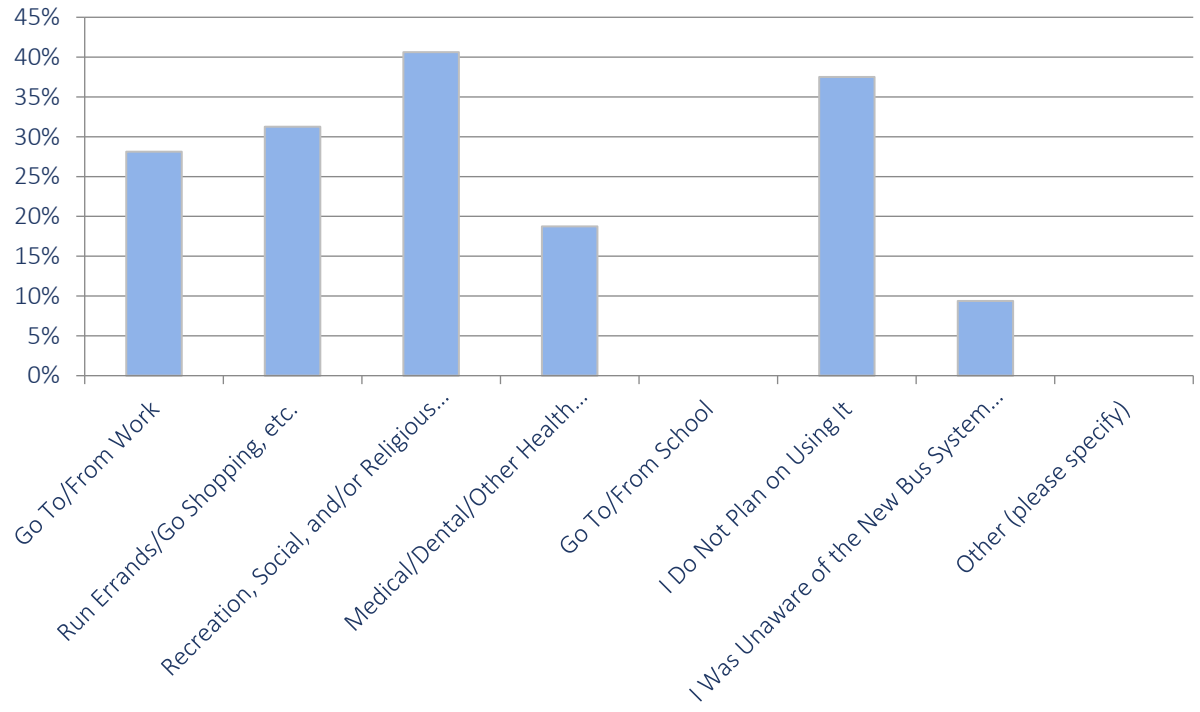
Answered: 31 Skipped: 13



	Very Influential	Influential	Not Influential	Unsure
Comfortability and Safety of Vehicles	54.8%	35.5%	9.7%	0.0%
Frequency of Service (How Often the Bus Comes)	64.5%	25.8%	6.5%	3.2%
Destinations Served	75.9%	20.7%	3.5%	0.0%
Time of Operations (How Early or Late the Bus Runs and Whether it Runs on the Weekend)	48.4%	48.4%	3.2%	0.0%
Travel Time Between Destinations	22.6%	64.5%	12.9%	0.0%
Cost of Fares	35.5%	51.6%	12.9%	0.0%
Distance (Walking or Biking) From Desired Destinations (Home, Work, School, etc.) to Bus Stops	41.9%	51.6%	6.5%	0.0%
Comfortability and Safety of Route from Desired Destinations (Home, Work, School, etc.) to Bus Stops	51.6%	41.9%	6.5%	0.0%
Predictability of Bus Arrival Times	58.1%	38.7%	3.2%	0.0%
Ease of Navigation (Exchange of Payment, Routes/Stops are Identifiable, Availability of a Phone App)	51.6%	41.9%	6.5%	0.0%

Question 9: If you were going to use the new bus system in Morristown, which of the following would be the primary reason you would use it? Please select all that apply.

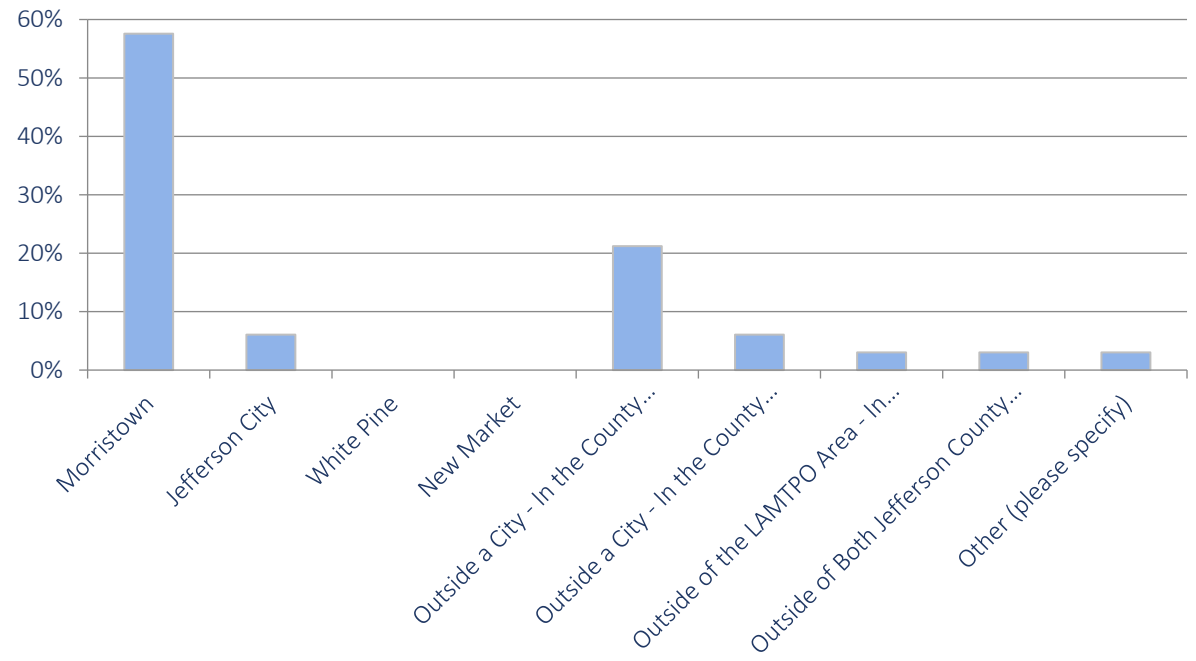
Answered: 32 Skipped: 12



Answer Choices	Responses	
Go To/From Work	28.1%	9
Run Errands/Go Shopping, etc.	31.3%	10
Recreation, Social, and/or Religious Activities	40.6%	13
Medical/Dental/Other Health Appointments	18.8%	6
Go To/From School	0.0%	0
I Do Not Plan on Using It	37.5%	12
I Was Unaware of the New Bus System and Am Unsure How I Would Use It Yet	9.4%	3
Other (please specify)	0.0%	0

Question 10: Where do you live? (If you are a college student, please identify based on your housing location)

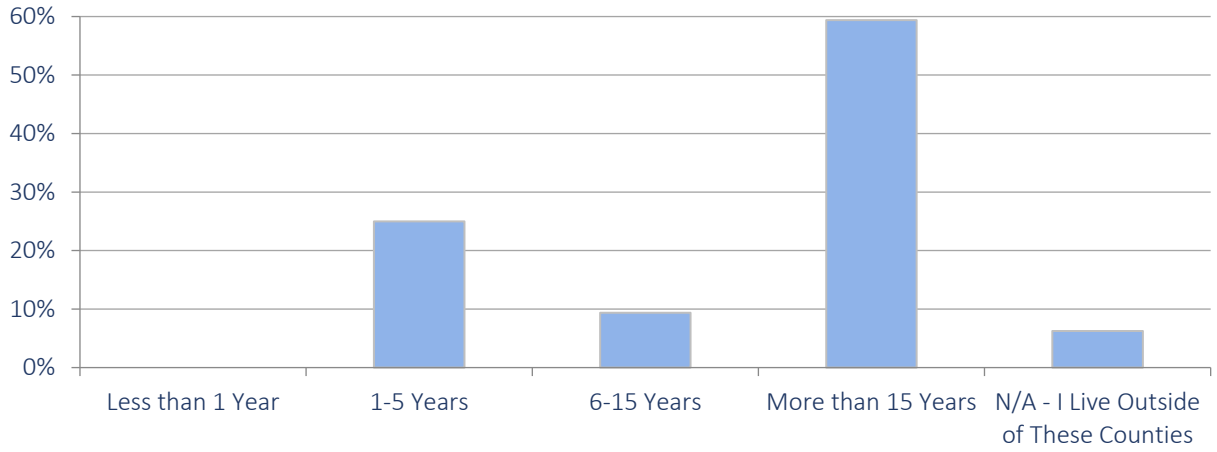
Answered: 33 Skipped: 11



Answer Choices	Responses	
Morristown	57.6%	19
Jefferson City	6.1%	2
White Pine	0.0%	0
New Market	0.0%	0
Outside a City - In the County (Hamblen County)	21.2%	7
Outside a City - In the County (Jefferson County)	6.1%	2
Outside of the LAMTPO Area - In Dandridge and/or Jefferson County	3.0%	1
Outside of Both Jefferson County and Hamblen County	3.0%	1
Other (please specify)	3.0%	1

Question 11: If you are from either Jefferson or Hamblen Counties, how long have you lived here?

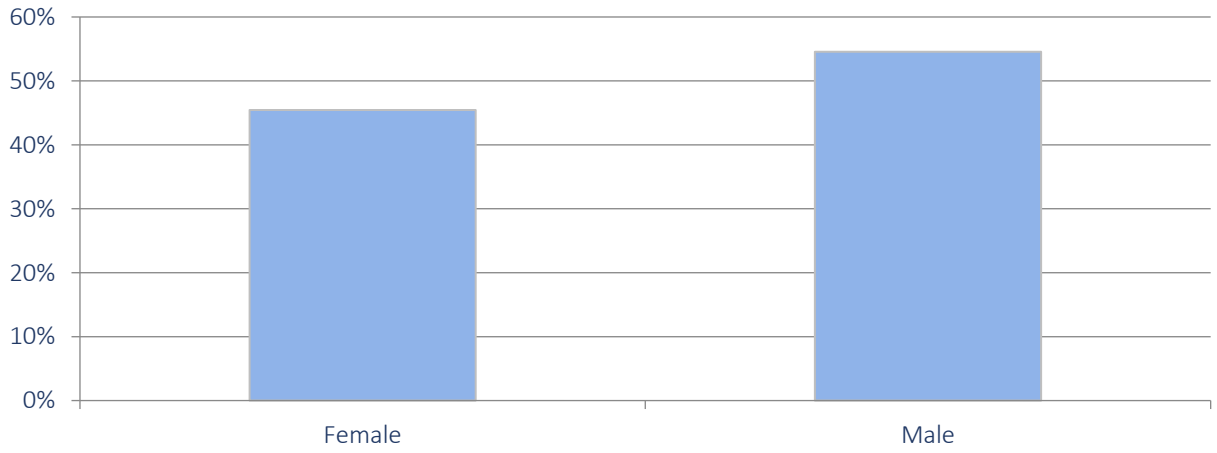
Answered: 32 Skipped: 12



Answer Choices	Responses	
Less than 1 Year	0.0%	0
1-5 Years	25.0%	8
6-15 Years	9.4%	3
More than 15 Years	59.4%	19
N/A - I Live Outside of These Counties	6.3%	2

Question 12: What is your gender?

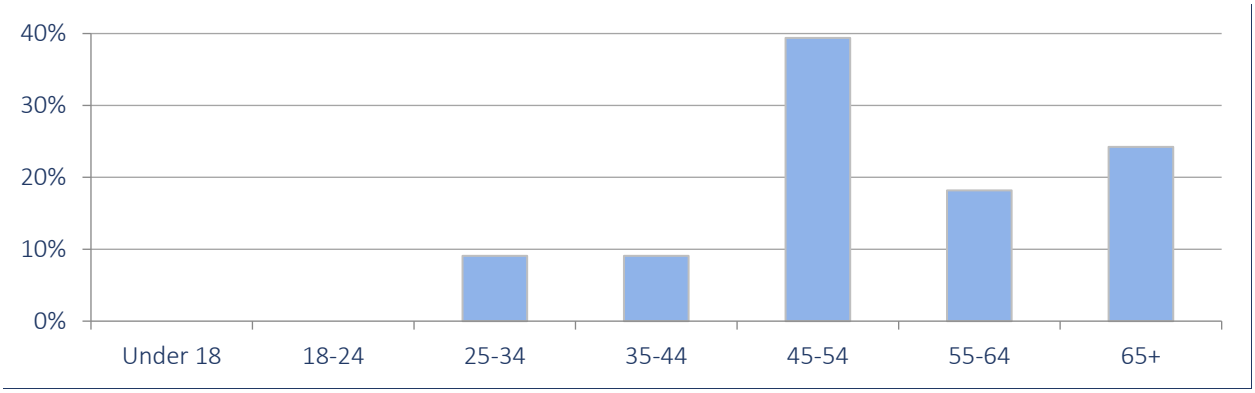
Answered: 33 Skipped: 11



Answer Choices	Responses	
Female	45.5%	15
Male	54.6%	18

Question 13: What is your age?

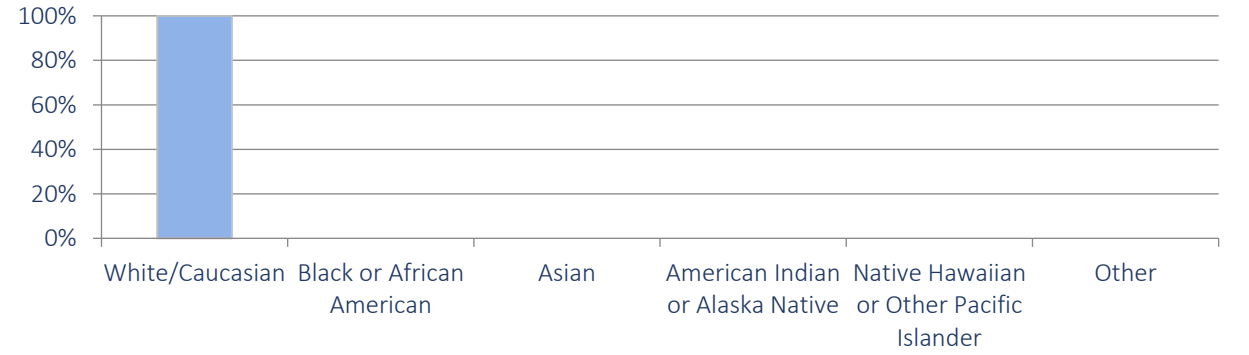
Answered: 33 Skipped: 11



Answer Choices	Responses	
Under 18	0.0%	0
18-24	0.0%	0
25-34	9.1%	3
35-44	9.1%	3
45-54	39.4%	13
55-64	18.2%	6
65+	24.2%	8

Question 14: Do you consider yourself to be:

Answered: 33 Skipped: 11



Answer Choices	Responses	
White/Caucasian	100.0%	33
Black or African American	0.0%	0
Asian	0.0%	0
American Indian or Alaska Native	0.0%	0
Native Hawaiian or Other Pacific Islander	0.0%	0
Other	0.0%	0

Question 15: Are you of Hispanic, Spanish, or Latino descent?

Answer Choices	Responses	
Yes	0.0%	0
No	100.0%	31

Wikimap

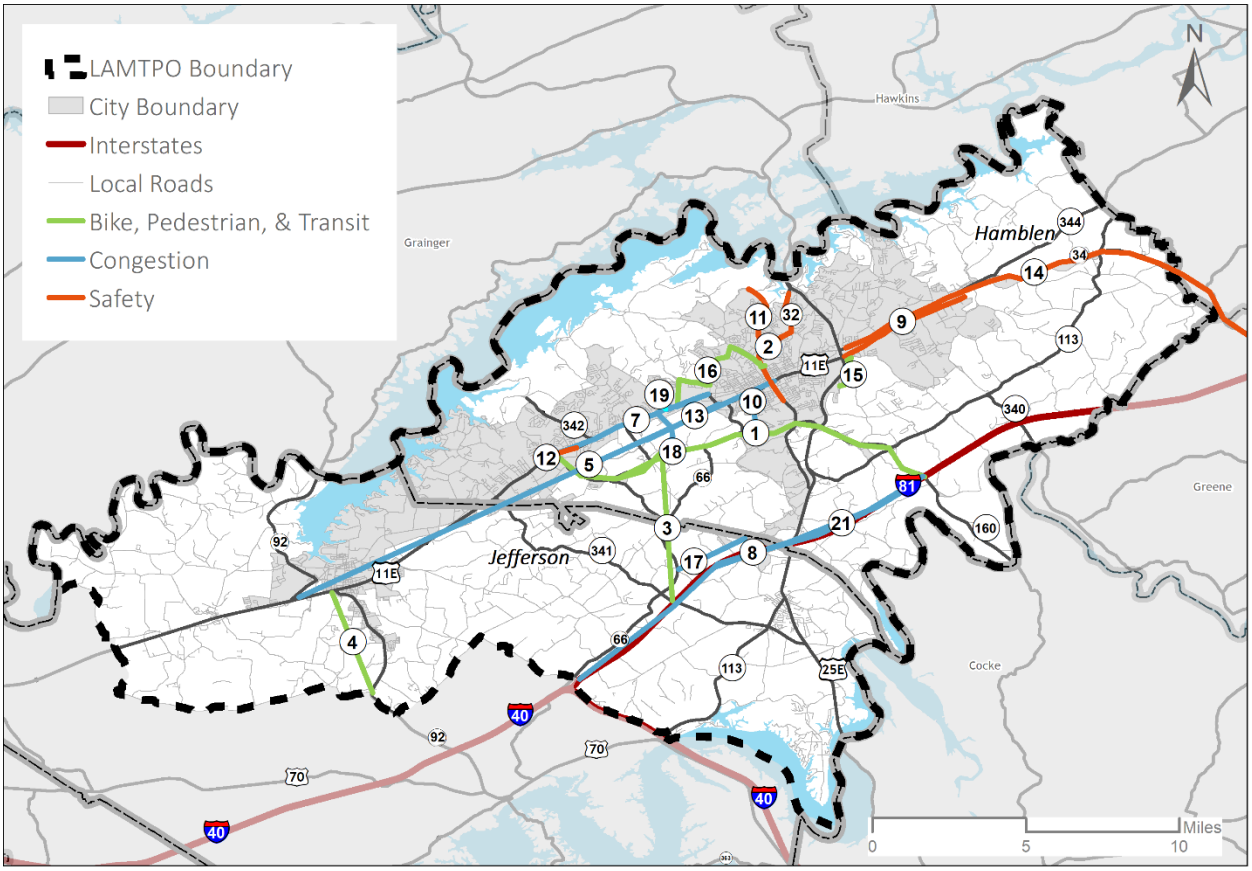
Issues Along Routes

LAKEWAY MTP 2045

Use the map below to place lines or points to identify locations with transportation issues within the Lakeway MTPO Area (outlined in blue)

Issues along Routes
- Congestion
- Maintenance
- Safety
- Bike, Pedestrian & Transit
- Other

Issues at Locations
- Congestion
- Maintenance
- Safety
- Bike, Pedestrian & Transit
- Other



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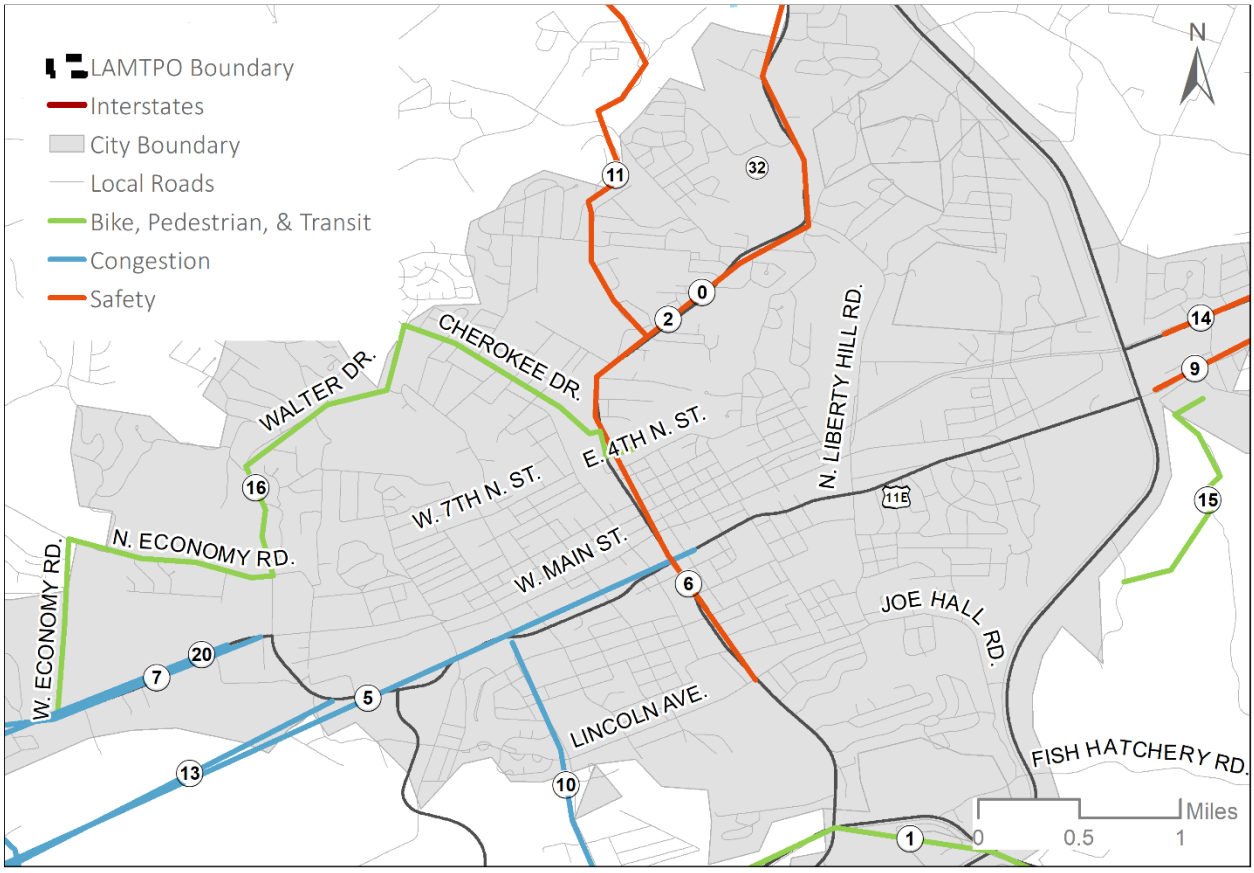


ID	Issue	Issue Description
0	Bike, Pedestrian, & Transit	need sidewalks
1	Bike, Pedestrian, & Transit	Needs bike route
2	Safety	Road diet for turning movements and pedestrian safety
3	Bike, Pedestrian, & Transit	
4	Bike, Pedestrian, & Transit	
5	Congestion	
6	Safety	Safety & congestion are concerns especially on Cumberland behind dons chevron with people crossing over Cumberland toward DQ Have seen accidents happen
7	Congestion	Corridor improvement needed to manage turning movements and through traffic congestion
8	Congestion	widen with additional lanes
9	Safety	Manage congestion created by 11E project, mange turning movements, industrial traffic and development
10	Congestion	Improved connection between 160 and Morris, improving flow and utilization of bypass
11	Safety	widen and upgrade corridor
12	Safety	Unsafe turning movements
13	Congestion	Complete extension of Veterans parkway
14	Safety	Complete 11e widening project
15	Bike, Pedestrian, & Transit	Bike path connecting WSCC trails and Frank Loring park
16	Bike, Pedestrian, & Transit	Needed Bike / Ped route
17	Congestion	Additional link between Exit 4 & 8 for industrial traffic
18	Congestion	North South connection to relieve East West congestion. Better use of 160.
19	Congestion	
20	Congestion	Traffic is badly congested in this area and poses a danger to drivers, pedestrians, and bicyclists.
21	Congestion	Consideration should be made to adding an additional lane in each direction on I-81 between the I-40 split and Exit 8. Heavy truck traffic is a burden on passenger car travel.

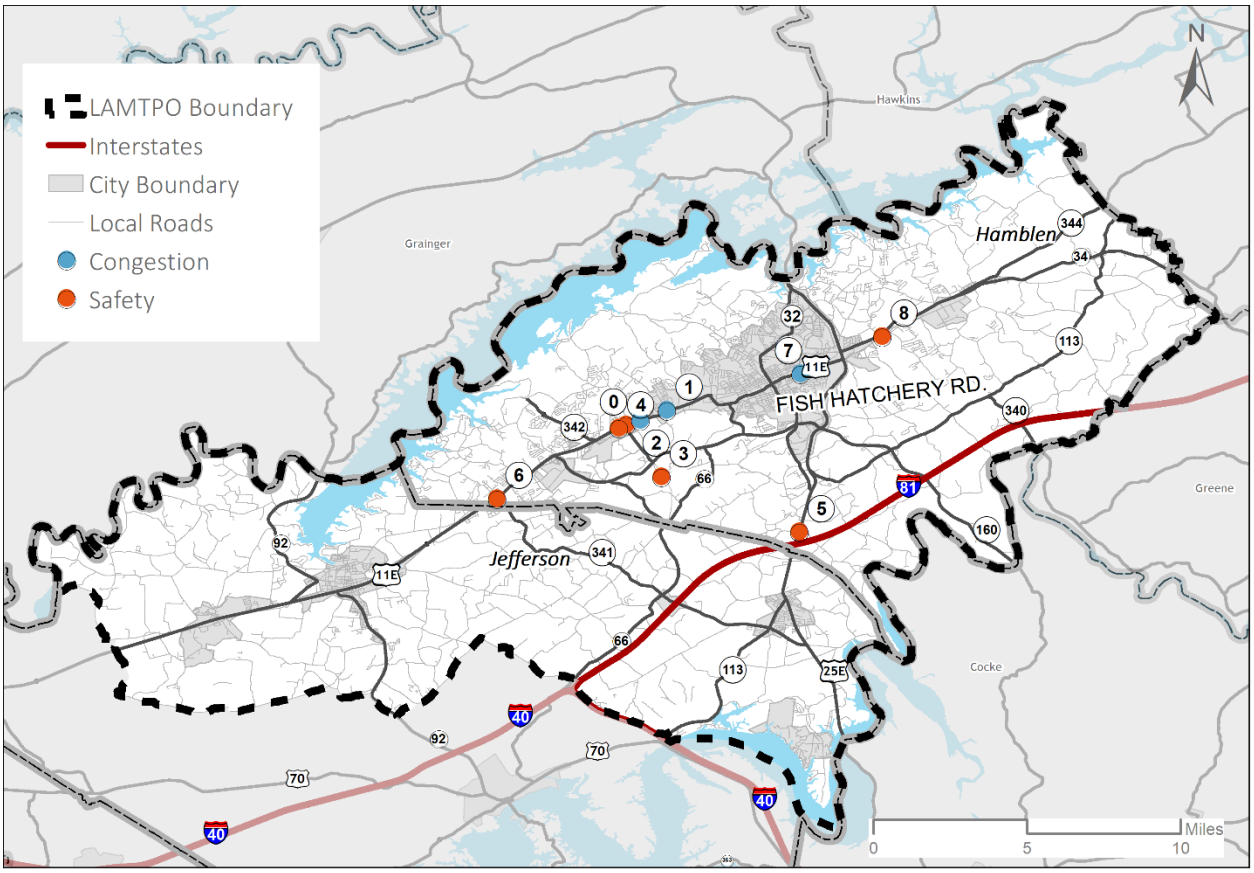
Issues at Locations

LAKEWAY MTP 2045

Use the map below to place lines or points to identify locations with transportation issues within the Lakeway MTPO Area (outlined in blue)

Issues along Routes
- Congestion
- Maintenance
- Safety
- Bike, Pedestrian & Transit
- Other

Issues at Locations
- Congestion
- Maintenance
- Safety
- Bike, Pedestrian & Transit
- Other



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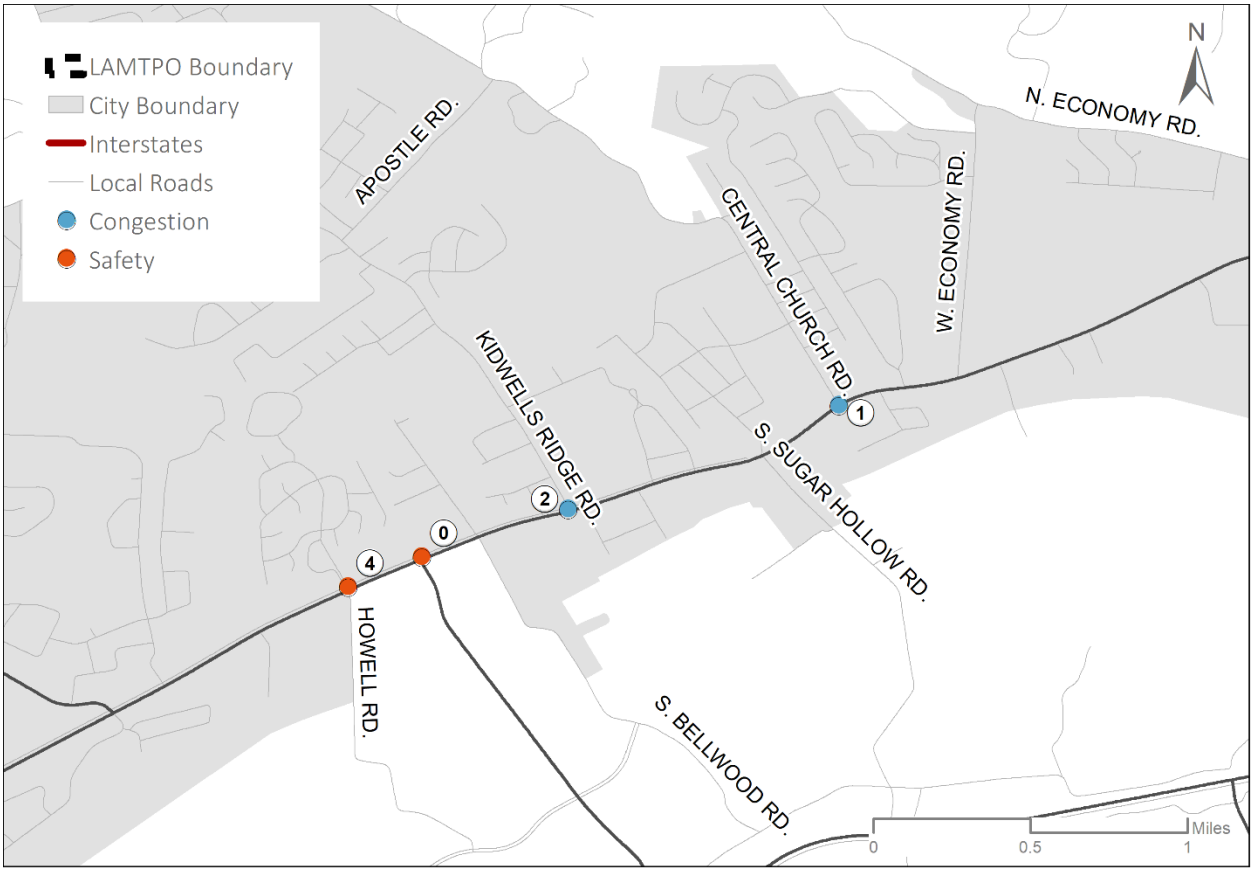

ID	Issue	Issue Description
0	Safety	Dual left turn westbound 11E to Merchants Greene needed
1	Congestion	Intersection improvement needed
2	Congestion	Intersection improvement needed
3	Safety	Complete SR66 and open to exit 4
4	Safety	Signal Needed
5	Safety	Intersection improvement for safety and flow
6	Safety	Correct road alignment
7	Congestion	
8	Safety	Intersection improvement

Plan Public Review Period

PLACEHOLDER