Kingsport 2045
Long Range Transportation Plan

Kingsport Metropolitan Transportation Planning Organization

Adopted by the Kingsport MTPO Executive Board
May 12, 2022

Kingsport 2045 Long Range Transportation Plan

Prepared for:

Kingsport Metropolitan Transportation Planning Organization

Adopted:

May 12, 2022

Prepared by:

AECOM

Statement on COVID-19

The COVID-19 pandemic has created many challenges for the transportation industry, resulting in a host of uncertainties. The long-term impacts of the pandemic on travel demand, commute patterns, residential development, and economic activity are still uncertain at the time of this LRTP update. As such, the evaluation of current conditions, for the most part, represent pre-pandemic conditions. Furthermore, due to safety/health concerns, the pandemic limited the ability to conduct in-person stakeholder and public outreach meetings during the development of this LRTP. The Kingsport MTPO, along with the project team, conducted an online outreach effort to reach a diverse group of stakeholders and the general public to ensure the LRTP reflects the views and needs of residents and businesses within the Kingsport Metropolitan Planning Area.

This plan was prepared in cooperation with the U.S. Department of Transportation, the Federal Highway Administration, the Federal Transit Administration, the Tennessee Department of Transportation, and the Virginia Department of Transportation. The development of this plan was funded in part through grants from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation. The views and opinions of the authors (or agencies) expressed herein do not necessarily reflect those of the U.S. Department of Transportation.

The Kingsport Metropolitan Transportation Planning Organization does not exclude, deny, or discriminate on the basis of race, color, national origin, gender, age, religion, disability, or any other characteristic protected under applicable federal or state law in its hiring or employment practices, or in its admission to, access to, or operation of its programs, services, or activities.

AECOM Document Reference: 60645047 - Kingsport 2045 LRTP - General\500 Deliverables\599 FINAL (MTPO Adopted) LRTP_May 2022

A RESOLUTION BY THE EXECUTIVE BOARD OF THE KINGSPORT METROPOLITAN TRANSPORTATION PLANNING ORGANIZATION (MTPO) ADOPTING THE KINGSPORT 2045 LONG RANGE TRANSPORTATION PLAN

WHEREAS, the Kingsport MTPO is the designated Metropolitan Planning Organization (MPO) for the Kingsport urbanized area in Tennessee and Virginia and is responsible for carrying out a comprehensive, cooperative, and continuing transportation planning process; and

WHEREAS, the U.S. Department of Transportation requires each MPO to have a current regional long range transportation plan that addresses all modes of transportation in the Metropolitan Planning Area (MPA); and

WHEREAS, the long range transportation plan must have a planning horizon of at least 20 years and provide the basis for future transportation planning decisions within the MPA; and

WHEREAS, various local, regional, and state agencies involved with multimodal transportation planning for the MTPO have cooperatively developed the Kingsport 2045 Long Range Transportation Plan; and

WHEREAS, the Kingsport 2045 Long Range Transportation Plan was developed in accordance with the requirements of federal guidelines for the development of the long range transportation plan (23 CFR 450.324); and

WHEREAS, the Kingsport MTPO has involved the public and interested stakeholders in a transparent and open process in accordance with the MTPO's adopted Public Participation Plan (PPP).

NOW THEREFORE BE IT RESOLVED BY THE EXECUTIVE BOARD OF THE KINGSPORT METROPOLITAN TRANSPORTATION PLANNING ORGANIZATION AS FOLLOWS:

The Kingsport MTPO does hereby approve and adopt the Kingsport 2045 Long Range Transportation Plan.

RESOLUTION APPROVED: Date: 5/12/22

Paul Montgomery, Chairman
Kingsport MTPO Executive Board

William A. Albright
Kingsport MTPO Staff

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Acronyms

AADT	Annual Average Daily Traffic
ADA	Americans with Disabilities Act (ADA) of 1990
ADT	Average Daily Traffic
APD	Appalachia Development Highway System
AVL	Automated Vehicle Locator System
BCA	Benefit Cost Analysis
BEA	Bureau of Economic Analysis Economic Areas
BLOS	Bicycle Level of Service
BRR or BR	Bridge Replacement and Rehabilitation
BIL	Bipartisan Infrastructure Law
CAA/CAAA	Clean Air Act or Clean Air Act Amendments
CBD	Central Business District
CIP	Capital Improvement Program
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CO	Carbon Monoxide
CPTHSTP	Coordinated Public Transit Human Services Transportation Plan
CRFC	Critical Rural Freight Corridors
CSS	Context Sensitive Solutions
CUFC	Critical Urban Freight Corridors
E+C	Existing Plus Committed
EJ	Environmental Justice
EPA/USEPA	United States Environmental Protection Agency
FAA	Federal Aviation Administration
FAST Act	Fixing America's Surface Transportation Act
FH/PLHP	Forest Highway/Public Lands Highway Program
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FY	Fiscal Year
GHG	Greenhouse Gas
GIS	Geographic Information System
NHFN	National Highway Freight Network
NHFP	National Highway Freight Program (NHFP), which created a formula program to fund
HOV	High-Occupancy Vehicle Lanes
HPP	High Priority Projects
HSIP	Highway Safety Improvement Program
I	Interstate
IAC	Interagency Consultation
IIJA	Infrastructure Investment and Jobs Act
IM	Interstate Maintenance
IMC	Instrument Meteorological Conditions
ITS	Intelligent Transportation Systems
JIT	Just-In-Time Delivery
KATS	Kingsport Area Transit Services
KRITS	Kingsport Regional Intelligent Transportation System
LEP	Limited English Proficiency
LOS	Level of Service
LRTP	Long Range Transportation Plan
MAP-21	Moving Ahead for Progress in the 21st Century Act
MEOC	Mountain Empire Older Citizens Agency
MET	Mountain Empire Transit
MPH	Miles Per Hour
MPA	Metropolitan Planning Area
MPO	Metropolitan Planning Organization

MSA	Metropolitan Statistical Area
MTPO	Metropolitan Transportation Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System
NCPD	National Corridor Planning and Development
ND	National Defense
NEPA	National Environmental Policy Act
NHFP	National Highway Freight Program
NHPP	National Highway Performance Program
NHS	National Highway System
NOx	Nitrogen Oxide
PGA	Planned Growth Area
PLOS	Pedestrian Level of Service
PEP	Public Engagement Plan
PHFS	Primary Highway Freight System
RA	Rural Area
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SP	State Construction Program
SPPR	State Primary Pavement Rehabilitation
SR	State Route
STB	Surface Transportation Board
STBG	Surface Transportation Block Grant Program
STIP	State Transportation Improvement Program
TAZ	Traffic Analysis Zone
TCA	Tennessee Code Annotated
TCC	Technical Coordinating Committee
TDEC	Tennessee Department of Environment and Conservation
TDM	Travel Demand Model
TDOS	Tennessee Department of Safety
TDOT	Tennessee Department of Transportation
TE	Transportation Enhancement
TEA-21	Transportation Equity Act of the 21st Century of 1998
TIP	Transportation Improvement Program
Title VI	Civil Rights Act of 1964
TN	Tennessee
TRIP	Transit Ridership Incentive Program
TSM	Transportation System Management
UGB	Urban Growth Boundary
US	United States
USC	United States Code
V/C	Volume to Capacity Ratio
VA	Virginia
VDOT	Virginia Department of Transportation
VDRPT	Virginia Department of Rail and Public Transportation
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
VTrans	Virginia Statewide LRTP
VPD	Vehicles per Day

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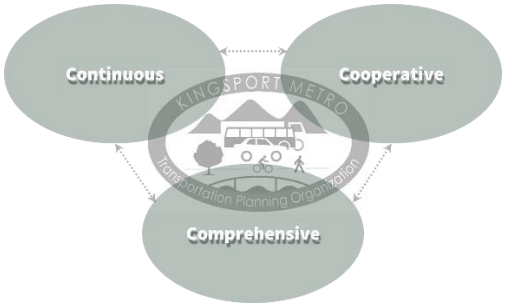
1. Overview

Pursuant to Federal law, metropolitan areas (defined as urbanized areas with a population of greater than 50,000 people, based on the latest US Census[1]) must undertake a continuous, cooperative, and comprehensive transportation planning process (**Figure 1**). The Kingsport Metropolitan Transportation Planning Organization, established in 1977, is the federally designated Metropolitan Planning Organization (MPO) that carries out the transportation planning process for the Kingsport, Tennessee Metropolitan Planning Area.

Figure 1. The "3-C" Metropolitan Transportation Planning Process



Metropolitan Transportation Planning Organization

The Kingsport Metropolitan Transportation Planning Organization (MTPO) consists of the City of Kingsport, City of Church Hill, and Town of Mount Carmel, Tennessee; Town of Weber City and Town of Gate City, Virginia; and portions of Hawkins County, Sullivan County, Greene County, and Washington County, Tennessee as well as portions of Scott County, Virginia. The MTPO is comprised of an Executive Board, Technical Coordinating Committee (TCC), and MTPO staff. The Executive Board is made up of elected officials (Mayors, County Executives, and Governors) from the jurisdictional members (**Table 1**). The MTPO Executive Board has periodic meetings to discuss and vote on various policies and products. Final responsibility for transportation planning and programming is vested with the Executive Board.

Table 1. Kingsport MTPO Member Agencies

Tennessee	Virginia
• City of Kingsport	• Town of Weber City
• Town of Mount Carmel	• Town of Gate City
• City of Church Hill	• Scott County
• Hawkins County	• Commonwealth of Virginia
• Sullivan County	
• Washington County	
• Greene County	
• State of Tennessee	

The MTPO TCC is comprised of a diverse group of transportation professionals, who advise the Executive Board members on all aspects of the planning process. The TCC includes engineers,

[1] Currently based on the 2010 US Census. 2020 US Census data was not available at the time this LRTP was updated.

transportation planners, and land use planners from federal, state, and local agencies, as well as representatives from transit operators.

The MTPO staff is part of the City of Kingsport and is responsible for all MTPO planning and administrative functions. The MTPO staff serve as a liaison between the MTPO Executive Board, Tennessee Department of Transportation (TDOT), Virginia Department of Transportation (VDOT), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), local governments, and other groups and individuals interested in transportation issues within the Kingsport MPA. The MTPO staff takes direction from, and are accountable to, the Executive Board.

Kingsport Metropolitan Planning Area

The Kingsport Metropolitan Planning Area (MPA) is situated along the border of northeastern Tennessee and southwestern Virginia in an area commonly referred to as the Tri-Cities region. The Kingsport MPA is one of three urban areas in the Tri-Cities region (Johnson City and Bristol being the other two) and comprises nearly 183,000 acres. **Figure 2** illustrates the regional context of the Kingsport MPA while **Figure 3** shows a detailed overview of the MPA and municipal boundaries.

Figure 2. Kingsport Metropolitan Planning Area – Tri-Cities Regional Context

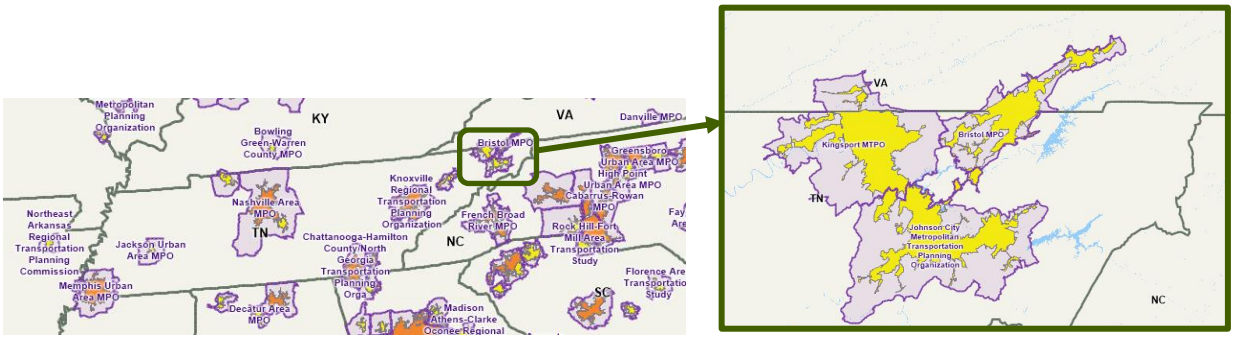
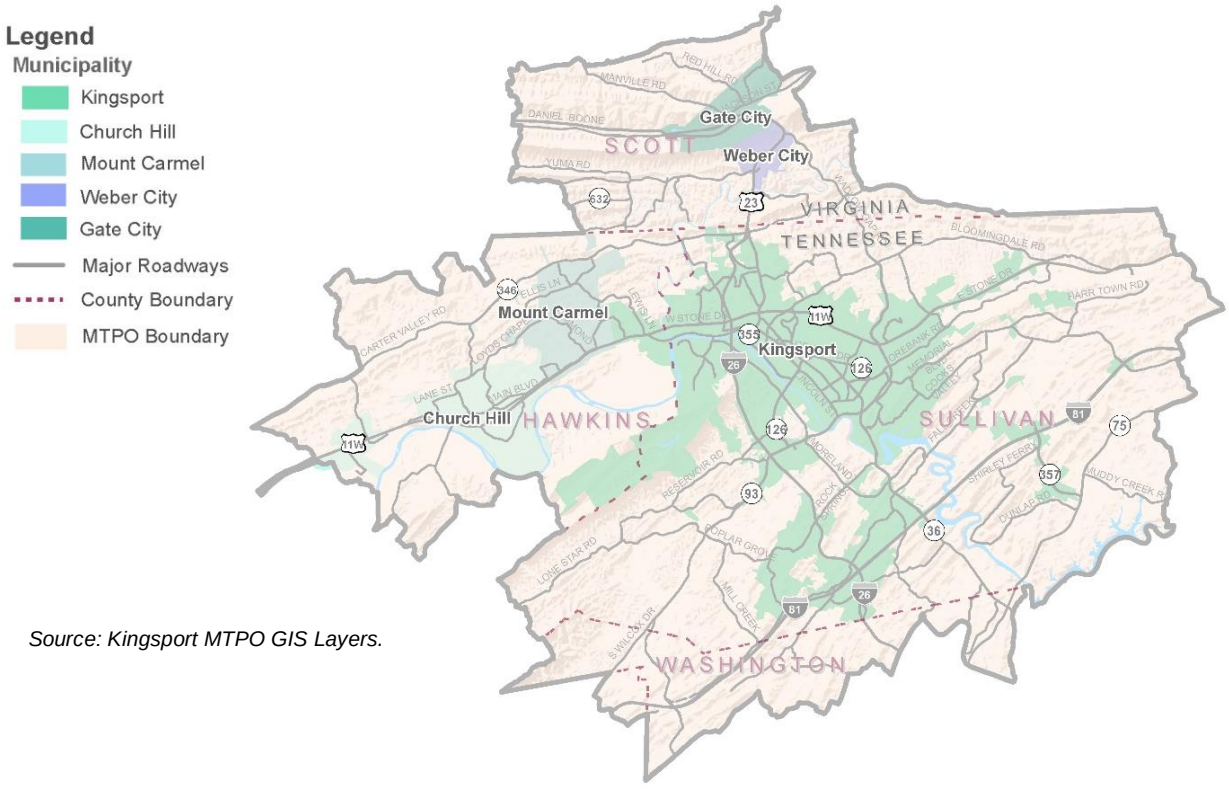


Figure 3. Kingsport Metropolitan Planning Area



Source: Kingsport MTPO GIS Layers.

Long Range Transportation Plan Update

The update of the Long Range Transportation Plan (LRTP) is one of the core responsibilities of the Kingsport MTPO. Every five years, as required by Federal law[2], the MTPO facilitates a process of evaluating the multimodal transportation system – focusing on streets and highways, bikeways and walkways, public transportation, aviation, and rail. Consideration is given to population and employment trends, land development patterns, travel characteristics, current and future transportation system performance, and other planning factors. The LRTP is developed in coordination with the state and local agencies that are responsible for transportation, roadway safety, economic development and tourism, health and physical activity, environmental protection, land use management, natural resources, and historic preservation. The recommended plan is based on a series of stated community goals, financial capability, environmental considerations, and public guidance. Furthermore, the LRTP supports statewide performance targets/measures that have been established by TDOT and VDOT.

The 2045 LRTP establishes guiding principles for the future of the Kingsport region's multimodal transportation system and provides a blueprint for how the region can achieve its goals over the next two decades. The 2045 LRTP builds on previous as well as on-going initiatives and plans, current transportation investments throughout the region, and public and stakeholder input. In short, the LRTP is intended to help the region consider the following:

- What does the future hold relative to future growth and development?
- How well is the region's multimodal transportation system currently performing, and how well is it expected to perform in the future?
- How best does the region balance these demands with the desires of existing residents and businesses when it comes to providing adequate and sound mobility options and transportation infrastructure investments?

Public Involvement

Developing, and executing, an effective public involvement program requires a variety of techniques to support the LRTP development process. Current Federal statutes and regulations derived largely from the Intermodal Surface Transportation Efficiency Act (ISTEA) and the National Environmental Policy Act (NEPA) provide general guidelines for locally developed public involvement processes and procedures. Generally speaking, the public needs to know details about the plan development in order to consider the potential costs and benefits associated with the LRTP recommendations. An on-going outreach effort assures the public has the opportunity to help shape the substance of LRTP and it helps build support for plan adoption and implementation. Furthermore, it is important the public involvement process provide different groups or individuals a variety of opportunities to participate. One of the primary goals of public involvement is to ensure that the outreach efforts help inform plan decisions, rather than simply offering the public passive opportunities to comment on predetermined recommendations.

At the beginning of the LRTP update, a Public Engagement Plan (PEP) was developed to guide the anticipated public involvement activities. The PEP outlined opportunities to engage the public and stakeholders through the process to help support the LRTP technical evaluation and inform the decision-making process. The PEP is available in **Appendix A** and specific stakeholder outreach and public involvement activities are briefly summarized in the following sections. Additional public involvement materials are included in **Appendix B**.

[2] At the time of this LRTP update, the US Congress was in the process of drafting the Infrastructure Investment and Jobs Act. As such, this LRTP was developed consistent with the Federal requirements outlined in the Fixing America's Surface Transportation Act (FAST Act). As background, the previous Kingsport MTPO LRTP (2040) was adopted by the Executive Board on June 3, 2017.

Virtual Room "On-Going Open House"

AECOM's Kingsport LRTP Virtual Room (see **Figure 4**) was the center of public engagement activities for the 2045 LRTP update. Given the restrictions for in-person meetings, as a result of COVID-19, the Virtual Room served as a continuous, or on-going, public open house option. The Virtual Room tool is an intuitive and easily navigated online portal housing study documents, input tools (surveys), and information gathering. **The Virtual Room had nearly 750 unique users during the Kingsport LRTP development process.** The following describes the key elements within the Virtual Room.

Figure 4. Kingsport MTPO Open House Virtual Room

Visit the Virtual Room at: **www.kingsport2045lrtp.com**

See **Appendix A** for the Kingsport 2045 LRTP Public Engagement Plan.

See **Appendix B** for a summary of the public engagement activities, including survey results, stakeholder meetings, and public comments.

Overview and Exhibits

The Virtual Room included a station providing an overview of the LRTP process and schedule and relevant planning background documents. The draft LRTP was also posted here for a 30-day public review and comment period.

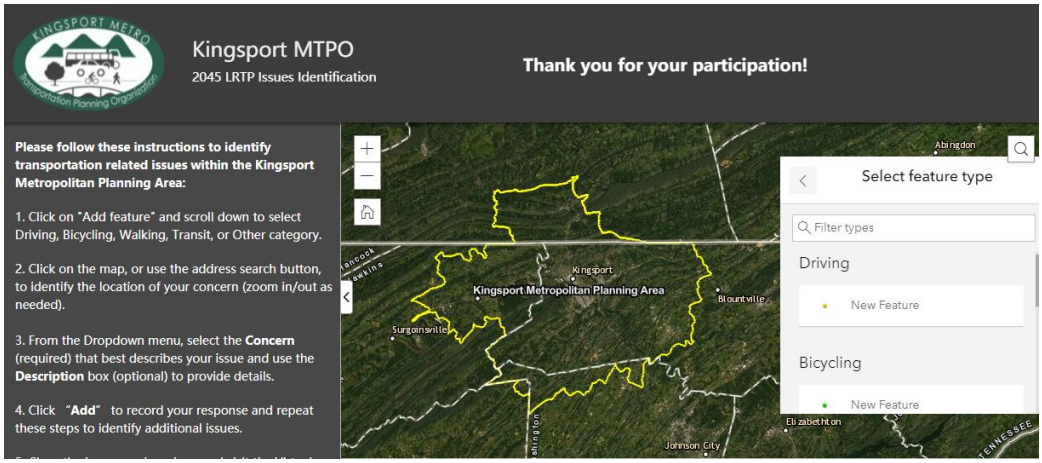
Public Surveys (Online and MetroQuest)

Two public surveys were hosted in the Virtual Room, one to support the development and refinement of the LRTP goals and objectives, and to identify existing transportation concerns. The second survey was developed using MetroQuest and was used to gain insight into potential investment tradeoffs, funding and investment preferences, and identification of priority projects. The survey results complemented the technical analysis. **The first survey had nearly 100 participants while the second survey had 200 participants.**

Interactive Mapping Tool

Transportation studies benefit from capturing local knowledge about travel behavior, transportation system conditions, and opportunities for improvement. To engage stakeholders visually and to capture spatial data, the project team utilized online GIS mapping allowing individuals to comment on regional transportation issues and locations. The mapping component (**Figure 5**) was accessed through the Virtual Room. **Visitors placed 178 markers on the virtual map, the majority of which included specific comments on various transportation modes.** Results of the public mapping exercise were used to inform the identification of existing and future year needs and to develop an understanding of desired transportation improvements in the Kingsport MPA.

Figure 5. Kingsport MTPO Online Issues Mapping



Public Open House

An open house was held on February 3, 2022, to allow the public the opportunity to review and comment on a preliminary draft LRTP. The open house was held in-person at the Kingsport City Hall, between 4:00 pm and 6:00 pm. A presentation summarizing the LRTP process and key findings was given at 5:30 pm. The presentation was also available online (via Zoom) to anyone that registered in advance of the meeting.

Eleven people signed-in for the open house. No participants registered for the online Zoom presentation and no formal comments were received. A recording of the open house presentation is available by clicking here. The video, along with the open house boards, were made available in the Kingsport LRTP virtual room. Additional open house materials are available in **Appendix B**.

Plan Review and Adoption

In January 2022, the project team submitted an initial 2045 LRTP draft to TDOT and VDOT representatives for review and comment. The project team addressed the comments in February 2022 and submitted a revised draft LRTP to Federal Highway Administration (FHWA) in March 2022. The project team addressed the federal comments and developed a final draft LRTP for public review.

According to the Kingsport MTPO *Public Participation Plan*, the draft LRTP was made available for a 30-day public review period from April 6, 2022, through May 6, 2022. The draft was posted in the LRTP Virtual Room and stakeholders, along with individuals who had previously signed-up for project notifications, were emailed to inform them that the draft was available for review. In addition, the Kingsport MTPO printed hardcopies of the draft that were made available at the following locations:

- Kingsport Public Library,
- Kingsport City Hall Lobby
- Kingsport MTPO office

No public comments were received during this review period; however, there were 121 ‘unique visits’ to the LRTP virtual room during the 30-day public review period. This means that there were 121 people who had not previously visited the virtual room that did so during the 30-day public review period. While it is not possible to track, it is likely that some of these visitors reviewed the draft LRTP, and/or other LRTP related project materials.

LRTP Plan Adoption

The Kingsport MTPO Executive Board adopted the 2045 LRTP on May 12, 2022. This occurred during one of the regularly scheduled Kingsport MTPO Executive Board meetings.

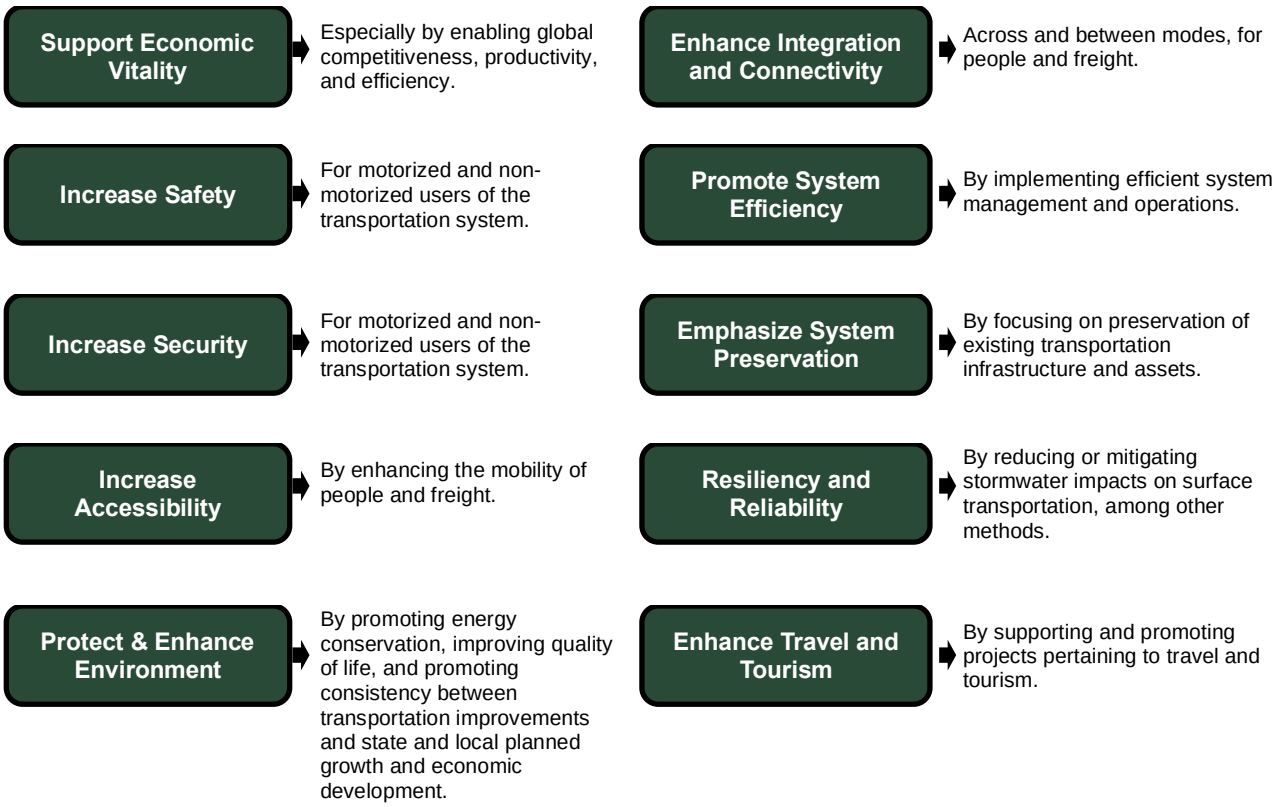
2. Goals and Objectives

This chapter summarizes the 2045 LRTP goals and objectives which establishes the future transportation vision and the foundation for performance-based planning within the Kingsport MPA. The LRTP goals and objectives reflect Federal planning requirements, TDOT statewide LRTP goals, and VDOT statewide LRTP goals.

Metropolitan Transportation Planning Requirements

Federal transportation is funded through multi-year funding bills and the current law is entitled Bipartisan Infrastructure Law (BIL)[3]. The BIL sets the course for surface transportation investments across the United States (US) and emphasizes improving mobility on America's highways, creating jobs, supporting economic growth, and accelerating project delivery, and promoting innovation. Administered by FHWA, Federal law identifies ten planning requirements for the metropolitan transportation planning process. These planning requirements play a prominent role in the development of the 2045 LRTP as they support the 3-C transportation planning process (previously displayed in **Figure 1**) that is carried out by the Kingsport MTPO. This process provides for the consideration and implementation of projects, strategies, and services throughout the Kingsport Metropolitan Planning Area (MPA). **Figure 6** summarizes the Federal metropolitan transportation planning requirements.

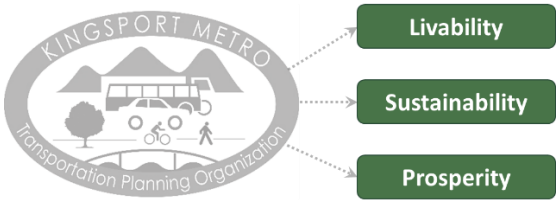
Figure 6. Overview of Federal Metropolitan Transportation Planning Requirements



[3] At the time this plan was being finalized, the United States Congress was in the process of adopting the Bipartisan Infrastructure Law (BIL). Details of the BIL, and specifically the impacts on the Metropolitan Transportation Planning process, are summarized at Metropolitan Planning Program Fact Sheet. Future amendments or plan updates will address BIL requirements.

2045 LRTP Goals and Objectives

The Kingsport MTPO 2045 LRTP goals and objectives focus on three key areas:



These goals are supported by a series of objectives that address the metropolitan transportation planning factors and coordinate regional decision-making with national transportation policy.

As part of the 2045 LRTP update, the project team, along with Kingsport MTPO staff, reviewed the previous LRTP (2040) goals and objectives to ensure they continue to reflect the region's values, and transportation vision. The project team considered the results from an online public survey to inform potential modifications to the goals and objectives (in short, the survey results continue to support the MTPO's LRTP goals/objectives). Feedback from the MTPO Executive Board was also considered in updating the goals and objectives.

While initial discussions show the 2040 LRTP goals are well-received, a few considerations for changes to the goals and objectives were presented to the MTPO Executive Board. Proposed changes to the goals and objectives were summarized in a memo that was distributed to the MTPO committee members and discussed at the May 2021 MPO meeting. Based on feedback from this meeting, the goals and objectives were revised and adopted. **Table 3** summarizes the final 2045 LRTP goals and objectives.

Addressing Federal Requirements

The Kingsport MTPO 2045 LRTP goals and objectives are consistent with and address the ten Federal planning factors. **Table 2** compares the 2045 LRTP goals against the Federal planning requirements.

Table 2. Consistency of Kingsport MTPO 2045 LRTP Goals with Federal Planning Requirements

	FAST Act Planning Factor	Kingsport 2045 LRTP Goals		
		(1) Livability	(2) Sustainability	(3) Prosperity
1	Support the **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** options available to 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 local 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.	■		■
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: FAST Act; 23 CFR § 450.306

Table 3. Adopted Kingsport MTPO 2045 LRTP Goals and Objectives

Kingsport 2045 MTPO LRTP Goals and Objectives

NOTE: Text highlighted in red indicates a change from the 2040 LRTP.

- **Goal 1. Livability** – Provide safe, secure, convenient, and active transportation choices to all citizens that strengthen the livability and health of our communities and region.
  a) Improve safety by reducing transportation-related fatalities and injuries
  b) Make streets a place for all users - "Complete Streets"
  c) Promote active transportation by increasing opportunities for short trips through improved accessibility to alternative modes
  d) **Strengthen local and regional partnerships to advance viable and affordable public transportation and mobility options**
  e) Strive to balance capacity and mobility needs for all users whereby connections to and across modes and land uses function harmoniously

- **Goal 2. Sustainability** – Promote and advance sustainable transportation choices for the greater Kingsport Region that support long-term economic, social, and environmental sustainability within and throughout the region.
  a) Maintain what we have – take a "state of good repair" approach to our community's transportation assets
  b) Seek cost-effective management solutions and new technologies as a means of addressing congestion, improving travel time reliability, reducing transportation delay, and improving system operations
  c) Seek improvement options which minimize adverse impacts of surface transportation to historical, social, cultural, and natural environments, including stormwater impacts
  d) Promote investment solutions that improve the resiliency of the transportation system and reduce transportation impacts on air-quality

- **Goal 3. Prosperity** – Promote transportation policies and investments that advance quality economic development and redevelopment, economic competitiveness, and efficient access to people, places, and goods and services within and throughout the region.
  a) Strategically target transportation investments to areas supportive and conducive to growth and redevelopment initiatives
  b) Support **equitable** transportation investments and policies that work to create jobs, efficiently move freight, and improve access to all modes and destinations while embracing access management and corridor management strategies that preserve the long-term functionality of a roadway's capacity and safety
  c) **Support multimodal investments, especially bicycle and pedestrian enhancements. Promote tourism and help contribute to the local and regional economy.**
  d) Support land use and development patterns that reduce transportation costs and expenditures and improve accessibility for all
  e) Continue to promote and foster an environment by which citizens, communities, jurisdictions, elected officials, and other stakeholders can collaboratively advance a sustainable multimodal transportation system that provides safe and secure connections throughout a livable and prosperous region

Approved by Kingsport MTPO Executive Board: 5/13/21 (Date)

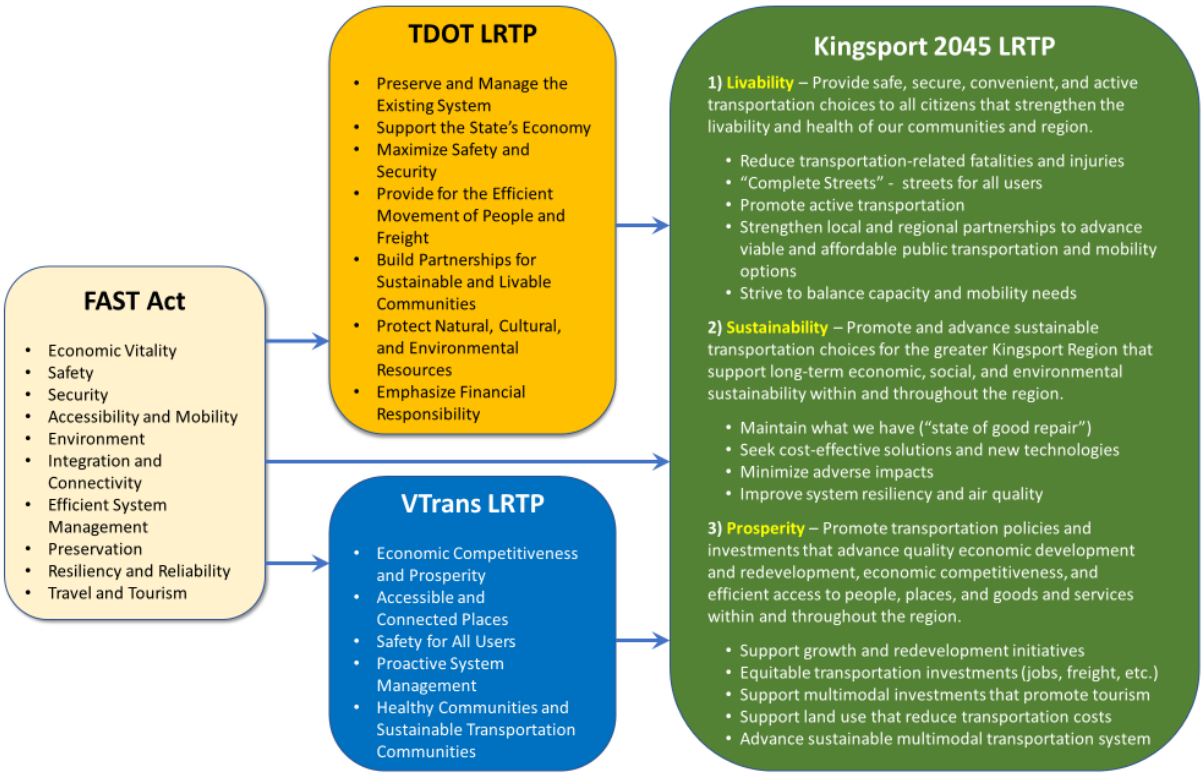
James Phillips, Chairman
Kingsport MTPO Executive Board

William A. Albright
Kingsport MTPO Staff

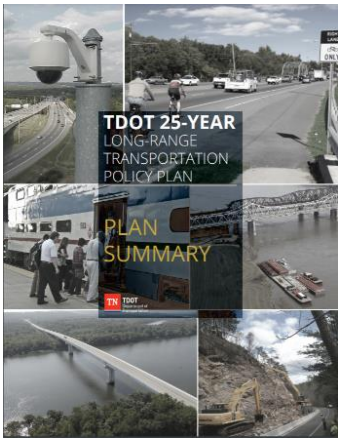
Coordination with Statewide Goals and Objectives

In addition to responding to the Federal planning requirements, the Kingsport MTPO 2045 LRTP goals and objectives are consistent with and support TDOT and VDOT statewide LRTP goals and objectives. Furthermore, the statewide LRTPs must also address the Federal planning factors, in addition to other federal requirements. **Figure 7** summarizes the coordination of the Federal requirements, the statewide LRTP goals, and the adopted Kingsport MTPO 2045 Goals and Objectives. A brief summary of the TDOT and VTrans Statewide LRTPs follows this figure.

Figure 7. Coordination of LRTP Goals/Objectives with Federal Requirements and Statewide Goals



TDOT 25-Year Long-Range Transportation Policy Plan



TDOT's 25-Year Policy Plan provides a foundation for prioritizing transportation investments across the state and helps accomplish TDOT's vision **to serve the public by providing the best multimodal transportation system in the nation.** According to the plan, the emphasis on planning for multiple travel modes represents a direct response to changes in public opinion, demographics, industry needs, funding, and travel patterns. It is also a recognition that investing in multimodal transportation is an investment in that state's future.

According to the TDOT LRTP, a comprehensive mindset guided the development of the 25-Year Policy Plan. While many competing interests were considered, three primary objectives were identified: **Promote Efficiency, Increase Effectiveness,** and **Emphasize Economic Competitiveness.**

The plan includes Guiding Principles that represent seven interrelated value statements that express the major priorities of TDOT and provide tangible actions as the Department works towards their vision. The Plan was formed using a framework of Policy Papers to review and discuss key policy topics relevant to

TDOT's vision and Guiding Principles. Through this process, each Guiding Principle was supported by a number of initiatives and policies spanning important policy paper topics. The following summarizes the guiding principles.

- **Preserve and Manage the Existing System**. Protect existing assets and maintain efficiency of the system through cost-effective management and new technologies.
- **Support the State's Economy**. Make transportation investments that support economic growth, competitiveness, and tourism; build partnerships with communities and regions to link employment, commercial/retail areas, and other key activity centers.
- **Maximize Safety and Security**. Reduce injuries and fatalities in all modes of transportation; minimize construction-related safety incidents; improve disaster preparedness and incident response.
- **Provide for the Efficient Movement of People and Freight**. Optimize the movement of people and goods by providing greater access to transportation services for all people and by building better connections among different modes of transportation.
- **Build Partnerships for Sustainable and Livable Communities**. Provide early and ongoing opportunities for broad public input on plans and programs; work closely with local public and private planning efforts; coordinate land use and transportation planning.
- **Protect Natural, Cultural, and Environmental Resources**. Maintain the integrity of communities and historical sites; minimize impacts on natural resources and conserve energy.
- **Emphasize Financial Responsibility**. Provide accountability; maximize Tennessee's share of federal transportation funding; develop alternative funding strategies; select projects based on identified regional needs; allow flexibility in local management of projects where feasible.

VTrans Statewide LRTP

VTrans, the Commonwealth's LRTP, has an established mission—**Virginia's transportation system will be Good for Business, Good for Communities, and Good to Go**—with five distinct goals supporting this vision. The goals communicate the key values driving transportation planning, policy, and investment decisions in Virginia. A suite of 39 State and Federal multimodal performance measures allows the State to evaluate performance at both the goal and individual measure level.

The VTrans Vision provides a policy framework to guide Commonwealth transportation agency investment decisions over the next 25 years. The vision, guiding principles, goals, and objectives were developed by detailed, data-driven, trend analyses and stakeholder input regarding transportation-related issues and opportunities.

The LRTP discusses potential outcomes brought on by changes in factors such as major economic generators, freight movement, generational values, aging of the population, land development patterns, transportation technology, and the natural environment. The following summarizes the VTrans goals.

- **Economic Competitiveness & Prosperity**. Invest in a transportation system that supports a robust, diverse, and competitive economy.
- **Accessible & Connected Places**. Increase the opportunities for people and businesses to efficiently access jobs, services, activity centers, and distribution hubs.

- **Safety for All Users**. Provide a safe transportation system for passengers and goods on all travel modes.
- **Proactive System Management**. Maintain the transportation system in good condition and leverage technology to optimize existing and new infrastructure.
- **Healthy & Sustainable Communities**. Support a variety of community types promoting local economies and healthy lifestyles that provide travel options, while preserving agricultural, natural, historic, and cultural resources.

Performance Measures

Federal transportation legislation emphasizes system performance and national performance management measures to guide a performance-based planning process at the metropolitan and state level. States, MPOs, and operators of public transportation services must establish/coordinate targets they set in key national performance areas, linking planning and programming to performance targets. This supports FHWA's strategic approach to utilize Transportation Performance Management to make investment and policy decisions that achieve national performance goals (**Figure 8**).

In January 2017, FHWA and FTA promulgated a remaining set of final rules on performance measures to assess performance in 12 areas of the Federal-aid highway program and for transit agencies that receive FTA Federal financial assistance (under 49 U.S.C.) to set performance targets to monitor, assess, and utilize to improve the state of good repair of their capital assets and the safety performance of their public transportation systems.

Table 4 provides a summary of the nationally established measures. The MTPO has in recent years adopted the targets established by the respective State. As such, the MPO is committed to incorporate performance measures, and performance-based planning, into the 2045 LRTP update. In particular, the LRTP process utilizes a performance-based project evaluation to help prioritize regional transportation investments that reflect the MTPO goals/objectives, support the statewide goals, and reflect the Federal Metropolitan Transportation Planning Factors.

Appendix D provides additional details on how the 2045 LRTP investments will help TDOT and VDOT achieve the Statewide performance targets. This also fulfills the requirement for MPOs to include a Transportation System Performance Report in the LRTP to document progress.

Figure 8. Transportation Performance Management Overview

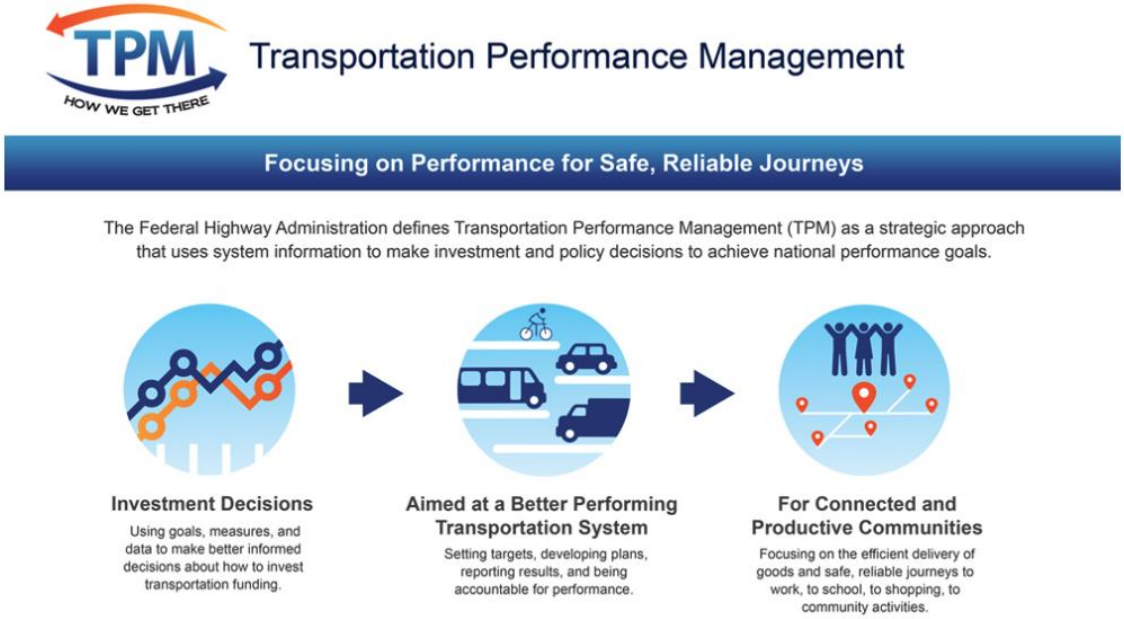


Table 4. National Transportation Performance Measures

Rulemaking	23 CFR & 49 CFR	Final Performance Measures	Measure Applicability
Safety PM Final Rule			
	Part 490.207(a)(1)	Number of fatalities	All public roads
	Part 490.207(a)(2)	Rate of fatalities	All public roads
	Part 490.207(a)(3)	Number of serious injuries	All public roads
	Part 490.207(a)(4)	Rate of serious injuries	All public roads
	Part 490.207(a)(5)	Number of non-motorized fatalities and non-motorized serious injuries	All public roads
Infrastructure PM Final Rule			
	Part 490.307(a)(1)	Percentage of pavements of the Interstate System in Good condition	The Interstate System
	Part 490.307(a)(2)	Percentage of pavements of the Interstate System in Poor condition	The Interstate System
	Part 490.307(a)(3)	Percentage of pavements of the non-Interstate NHS in Good condition	The non-Interstate NHS
	Part 490.307(a)(4)	Percentage of pavements of the non-Interstate NHS in Poor condition	The non-Interstate NHS
	Part 490.407(c)(1)	Percentage of NHS bridges classified as in Good condition	NHS
	Part 490.407(c)(2)	Percentage of NHS bridges classified as in Poor condition	NHS
System Performance PM Final Rule			
	Part 490.507(a)(1)	Percent of the Person-Miles Traveled on the Interstate that are Reliable	The Interstate System
	Part 490.507(a)(2)	Percent of the Person-Miles Traveled on the Non-Interstate NHS that are Reliable	The non-Interstate
	Part 490.507(b)	Percent Change in Tailpipe CO2 Emissions on the NHS Compared to the Calendar Year 2017 Level	NHS
	Part 490.607	Truck Travel Time Reliability (TTTR) Index	The Interstate System
	Part 490.707(a)	Annual Hours of Peak Hour Excessive Delay Per Capita	The NHS in urbanized areas with a population over 1 million for the first performance period and in urbanized areas with a population over 200,000 for the second and all other performance periods that are also in nonattainment or maintenance areas for ozone (O3), carbon mon- oxide (CO), or particulate matter (PM10 and PM2.5)
	Part 490.707(b)	Percent of Non-SOV Travel	
	Part 490.807	Total Emissions Reduction	All projects financed with funds from the 23 U.S.C. 149 CMAQ program apportioned to State DOTs in areas designated as non-attainment or maintenance for ozone (O3), carbon monoxide (CO), or particulate matter (PM10 and PM2.5)
Transit Performance PM Final Rule			
	Part 670	Public Transportation Safety Program - provides the framework for FTA to monitor, oversee, and enforce transit safety, based on the methods and principles of Safety Management Systems.	Performance targets based on the safety performance criteria
	Parts 625 and 630	Transit Asset Management - defines the term “state of good repair” and establishes minimum Federal requirements for transit asset management.	Performance measures for Equipment, Rolling Stock, Infrastructure, and Facilities

3. Trends & Socioeconomic Projections

This chapter summarizes the demographic characteristics for the Kingsport region. The demographic data apply to the Kingsport MPA, as defined by summarizing the Census Tracts that substantially overlap the MPA boundary. Demographic trends for constituent municipalities and counties, as well as state averages, are provided for comparison purposes. The Kingsport MPA trends and socioeconomic projections help inform infrastructure and/or service improvements that may be needed in the future to meet the mobility needs of area residents, businesses, and visitors.

Population

The following sections discuss population growth, density, and migration impacting the Kingsport MPA.

Historical Population Growth

Population figures from 2000 to 2019 for the MPA and comparison and constituent geographies are provided in

Table 5. According to data from the 2019 US Census American Community Survey (ACS), the MPA has a population of 141,745 residents, roughly stable from 2010 (141,797). On the other hand, the City of Kingsport saw a substantial increase of 11 percent, or over five thousand people. Overall, municipal population in the MPA (i.e., Kingsport, Church Hill, Mount Carmel, Gate City, Weber City) increased by eight percent since 2010, due in large part to the growth in Kingsport. The four-county area population (including Sullivan, Hawkins, and Washington County in Tennessee and Scott County in Virginia[4]) grew by one percent, primarily due to growth in Washington County. For comparison, the statewide average growth since 2010 is six percent for both Tennessee and Virginia.

Population growth was generally higher for most geographies between 2000 and 2010; the MPA grew by four percent during this period, and Church Hill and Mount Carmel by roughly fourteen percent. The city of Kingsport is an exception, having grown by seven percent pre-2010 and 11 percent post-2010. Gate City has seen a slight decline in population. This is believed to be in part due to declining industrial employment within the region, which were believed to be filled by a number of Gate City residents. With this said, it should be noted that the population decline has been about 100 people each decade, which overall is a relatively small loss.

[4] The Kingsport Metropolitan Planning Area includes a small portion of Greene County, TN. Given the small geographic size that falls within the MPA, the Greene County totals are not included in the summary demographic tables as it would be misleading.

Table 5. Population Change (2000-2019)

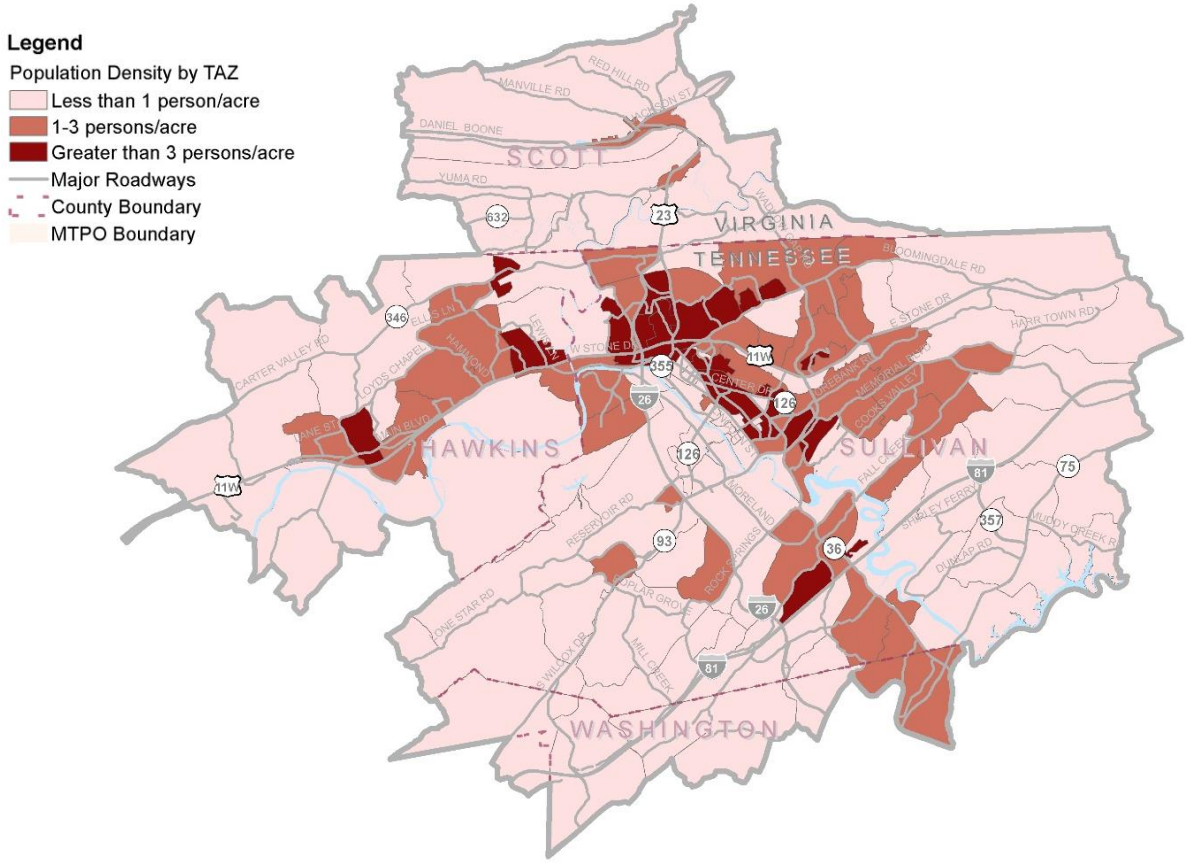
	2000	2010	2015-2019	Change 2000-2010	Change 2010-2019
Tennessee	**5,689,283**	**6,346,105**	**6,709,356**	**12%**	**6%**
Virginia	**7,078,515**	**8,001,024**	**8,454,463**	**13%**	**6%**
Kingsport MPA	**136,317**	**141,797**	**141,745**	**4%**	**0%**
Four-County Total	**337,212**	**359,812**	**363,368**	**7%**	**1%**
Sullivan County, TN	*153,048*	*156,823*	*157,050*	*2%*	*0%*
Hawkins County, TN	*53,563*	*56,833*	*56,611*	*6%*	*0%*
Washington County, TN	*107,198*	*122,979*	*127,805*	*15%*	*4%*
Scott County, VA	*23,403*	*23,177*	*21,902*	*-1%*	*-6%*
Municipal Total	**59,108**	**63,732**	**68,900**	**8%**	**8%**
Kingsport city, TN	*44,905*	*48,205*	*53,376*	*7%*	*11%*
Church Hill city, TN	*5,916*	*6,737*	*6,667*	*14%*	*-1%*
Mount Carmel town, TN	*4,795*	*5,429*	*5,293*	*13%*	*-3%*
Gate City town, VA	*2,159*	*2,034*	*1,941*	*-6%*	*-5%*
Weber City town, VA	*1,333*	*1,327*	*1,623*	*0%*	*22%*

Source: Decennial Census (2000, 2010); ACS 2015-2019 (5-year estimates), Table DP05.

Population Density

Figure 9 illustrates the number of persons per acre, or population density for the Kingsport MPA. The highest concentration of people is in the Kingsport downtown area, generally along an area that runs parallel to East Sullivan Street. North of US-11W (SR-1/Stone Drive), extending east and west of US-23, is also an area with high population density. Further west along US-11W (SR-1), Mount Carmel and Church Hill also have higher population densities, along with an area near the I-81/I-26 interchange.

Figure 9. Population Density (2018)



Source: Kingsport MTPO 2018 Socioeconomic Data; by TAZ.

Migration

The share of population that moved in the past year are represented in **Table 6.** About 87 percent of the MPA population stayed in their home in the past year, which is slightly higher than the four-county, municipal, and statewide average of 85 percent. Among the 13 percent who moved, over half moved within the same county, and about a third moved within the state, which is comparable with—though slightly lower—than other regions.

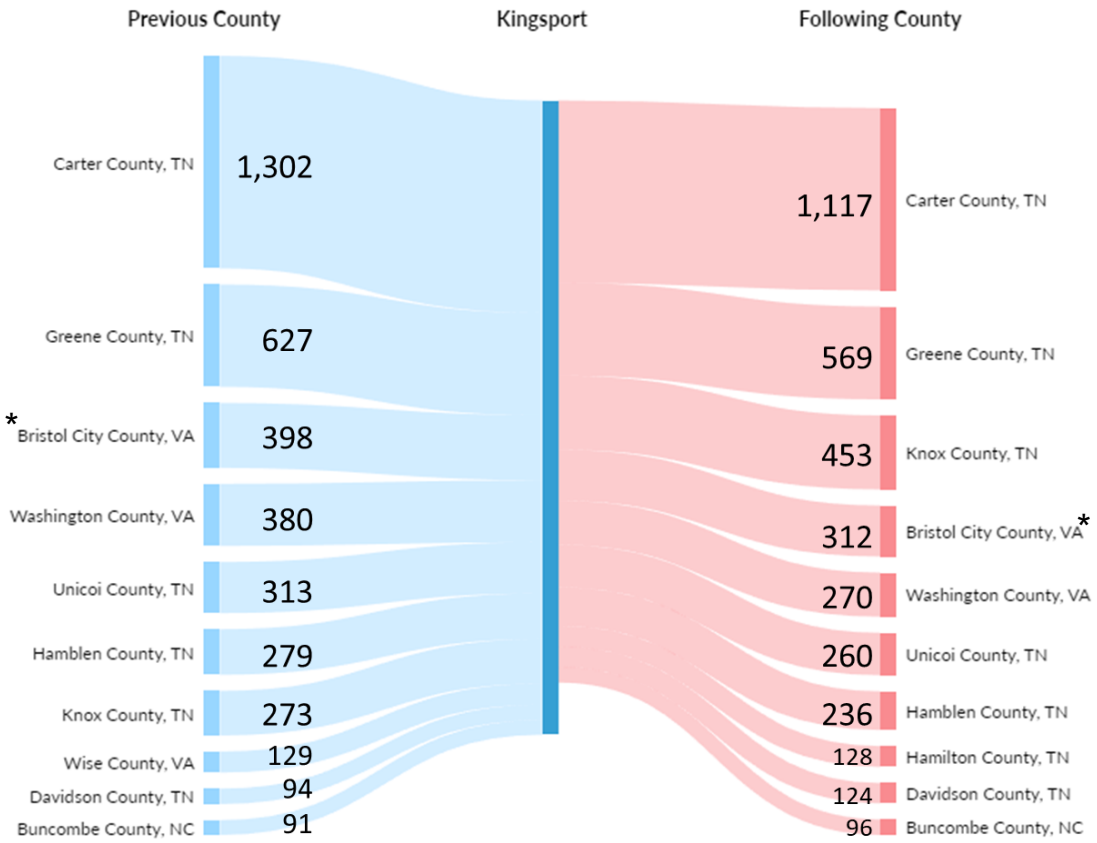
Table 6. Share of Population by Migration Status in the Past Year

	Didn't move	Total Movers	Moved within county	Moved within state	Moved from diff. state	Moved from abroad
Tennessee	85%	15%	8%	3%	3%	0%
Virginia	85%	15%	6%	5%	3%	1%
Kingsport MPA	87%	13%	7%	4%	2%	0%
Four-County Total	85%	15%	8%	4%	3%	0%
Sullivan County, TN	89%	11%	6%	4%	1%	0%
Hawkins County, TN	86%	14%	8%	3%	3%	0%
Washington County, TN	82%	18%	10%	5%	3%	1%
Scott County, VA	91%	9%	4%	3%	2%	0%
Municipal Total	85%	15%	8%	5%	2%	0%
Kingsport city, TN	91%	9%	6%	3%	1%	0%
Church Hill city, TN	84%	16%	8%	5%	3%	0%
Mount Carmel town, TN	85%	15%	3%	12%	1%	0%
Gate City town, VA	86%	14%	5%	3%	5%	1%
Weber City town, VA	79%	21%	10%	3%	8%	0%

Source: ACS 2015-2019 (5-year estimates), Table DP02.

Data from the economic modeling firm, Emsi, provides more information on where Kingsport MPA residents are moving from and to. As of 2019, there was net positive in-migration to the Kingsport MPA, as illustrated in **Figure 10**. The largest exchange of population was with Carter County and Greene County, Tennessee (note that results are based on constituent ZIP code boundaries, which do not precisely follow the MPA boundary and include some adjacent territory).

Figure 10. Migration to/from Kingsport MPA



Source: Emsi 2019 estimates.

* *In Virginia, cities are independent of counties.*

Demographic Characteristics

Analyzing demographic data helps assess transportation needs within the Kingsport MPA. Demographic characteristics and trends can influence community transportation decisions, as needs vary across population groups. Understanding the distribution and composition of population changes further enables planning for appropriate transportation infrastructure and mobility solutions.

Household Characteristics

According to ACS data, there are 60,212 households in the Kingsport MPA, including 30,103 in the various municipalities (23,640 in Kingsport itself). The average household size is 2.33 persons, which is lower than the statewide averages. Large urban areas typically have smaller household sizes, and this is true for Kingsport, with an average size of 2.22. **Table 7** summarizes the average household size.

Table 7. Household Size

	Total Households	Average HH Size
Tennessee	2,597,292	2.52
Virginia	3,151,045	2.61
Kingsport MPA	60,212	2.33
Four-County Total	152,278	2.36
Sullivan County, TN	66,511	2.32
Hawkins County, TN	23,135	2.42
Washington County, TN	53,859	2.28
Scott County, VA	8,773	2.41
Municipal Total	30,103	2.33
Kingsport city, TN	23,640	2.22
Church Hill city, TN	2,879	2.27
Mount Carmel town, TN	2,184	2.42
Gate City town, VA	801	2.42
Weber City town, VA	599	2.55

Source: ACS 2015-2019 (5-year estimates), Table DP02.

A household's vehicle availability strongly affects residents' travel behavior, both in terms of the travel mode they select as well as the number and length of trips taken. Seven percent of households in the Kingsport MPA do not have a car available, which is slightly higher than the statewide and four-county average. Within the municipalities, nine percent do not have a vehicle; it is common for a larger proportion of city-dwellers to have no car available, as the density in urban areas enables the use of other travel modes, such as walking, biking, or public transportation. Similarly, a higher share of households in the municipalities have access to only one car, in comparison with statewide and county averages. **Table 8** summarizes the availability of vehicles by household.

Table 8. Household Vehicle Status

	No vehicles available	1 vehicle available	2 vehicles available	3+ vehicles available
Tennessee	**6%**	**31%**	**38%**	**25%**
Virginia	**6%**	**30%**	**38%**	**26%**
Kingsport MPA	**7%**	**29%**	**37%**	**27%**
Four-County Total	**6%**	**30%**	**36%**	**27%**
Sullivan County, TN	*6%*	*30%*	*36%*	*27%*
Hawkins County, TN	*6%*	*29%*	*35%*	*31%*
Washington County, TN	*6%*	*32%*	*37%*	*25%*
Scott County, VA	*8%*	*27%*	*37%*	*28%*
Municipal Total	**9%**	**33%**	**35%**	**23%**
Kingsport city, TN	*10%*	*35%*	*35%*	*21%*
Church Hill city, TN	*5%*	*30%*	*36%*	*28%*
Mount Carmel town, TN	*8%*	*20%*	*33%*	*39%*
Gate City town, VA	*11%*	*39%*	*32%*	*18%*
Weber City town, VA	*13%*	*25%*	*44%*	*18%*

Source: ACS 2015-2019 (5-year estimates), Table DP04.

Age

Age is an important factor in planning for appropriate mobility solutions and transportation infrastructure. For example, younger populations in dense urban areas often have higher rates of walking, biking, or using public transportation to reach their destinations, while older populations in suburban or rural areas often rely more on private vehicles to complete trips. However, as older populations continue to age, they may no longer be able to operate an automobile safely or conveniently, forcing them to rely on outside support to meet their travel needs. Similarly, children are generally reliant on older adults to drive them where they need to go but could be expected to accompany adults making shorter trips by bike or on foot, if safe infrastructure is available. While not universal, an understanding of the needs of various age groups can help enhance the transportation facilities that meet the needs of all users.

According to ACS data, 36 percent of households within the MPA include seniors (age 65 or older), which is quite a bit higher than statewide averages of 28 or 29 percent, indicating potentially an above average level of need for services aimed at seniors, such as dial-a-ride transportation and ADA accommodations for those with limited mobility. At the other end of the age spectrum, 27 percent of households have children, which is lower than statewide averages. The trends for the City of Kingsport are similar to the overall MPA, and there is some variation higher and lower among the other municipalities.

Table 9 summarizes the percentage of households within the MPA with children and adults 65 and over. In terms of the overall population, the median age in the MPA is 44.8, which is higher than statewide averages of 38.7 (Tennessee) or 38.2 (Virginia). More details regarding the median age among geographies is provided in **Table 10**.

Table 9. Households by Minor & Senior Status

	Total Households	HH with children	HH with seniors (65+)
Tennessee	2,597,292	30%	29%
Virginia	3,151,045	32%	28%
Kingsport MPA	60,212	27%	36%
Four-County Total	152,278	26%	35%
Sullivan County, TN	66,511	26%	36%
Hawkins County, TN	23,135	30%	35%
Washington County, TN	53,859	26%	30%
Scott County, VA	8,773	23%	40%
Municipal Total	30,103	27%	37%
Kingsport city, TN	23,640	26%	37%
Church Hill city, TN	2,879	23%	40%
Mount Carmel town, TN	2,184	32%	33%
Gate City town, VA	801	27%	40%
Weber City town, VA	599	22%	42%

Source: ACS 2015-2019 (5-year estimates), Table DP02.

Table 10. Median Age

	Median age
Tennessee	**38.7**
Virginia	**38.2**
Kingsport MPA	**44.8**
Four-County Total	**43.5**
Sullivan County, TN	*45.1*
Hawkins County, TN	*44.9*
Washington County, TN	*40.2*
Scott County, VA	*47.3*
Municipal Total	**44.9**
Kingsport city, TN	*44.5*
Church Hill city, TN	*49.5*
Mount Carmel town, TN	*42.8*
Gate City town, VA	*42.8*
Weber City town, VA	*47.4*

Source: ACS 2015-2019 (5-year estimates), Table DP05.

Individuals with a disability, similar to age status, can have a vital impact on mobility needs and delivery of various transportation services. The disability status for various age groups is provided in **Table 11**. There are nearly 30,000 people with disablitiies in the MPA, which represents 21 percent of the overall population. This is a higher share than the statewide average, which is 15 percent for Tennessee and 12 percent for Virginia. Examining the totals by age group, we see that the percent disabled for seniors (age 65 and over) are somewhat higher than statewide (41 percent versus 33 percent to 38 percent). On the other hand, the disability rates for children and working-age adults are significantly higher, relatively speaking—from about one and a half to twice as high, proportionally.

Table 11. Individuals with a Disability (Status by Age Group)

	Total disabled population	%	Disabled <18 years	%	Disabled 18-64 years	%	Disabled 65+ years	%
Tennessee	1,015,603	15%	72,511	5%	540,478	13%	402,614	38%
Virginia	968,651	12%	75,519	4%	486,156	9%	406,976	33%
Kingsport MPA	29,843	21%	2,008	7%	15,501	19%	12,334	41%
Four-County Total	72,757	20%	4,407	6%	39,169	18%	29,181	41%
Sullivan County, TN	32,011	21%	2,110	7%	16,803	18%	13,098	39%
Hawkins County, TN	12,788	23%	691	6%	6,923	21%	5,174	46%
Washington County, TN	22,081	18%	1,271	5%	12,098	15%	8,712	40%
Scott County, VA	5,877	28%	335	8%	3,345	28%	2,197	44%
Municipal Total	14,696	22%	1,055	8%	7,185	19%	6,456	42%
Kingsport city, TN	11,093	21%	848	8%	5,417	18%	4,828	40%
Church Hill city, TN	1,466	22%	52	5%	667	17%	747	46%
Mount Carmel town, TN	1,156	22%	111	9%	562	18%	483	51%
Gate City town, VA	474	24%	28	5%	227	24%	219	48%
Weber City town, VA	507	33%	16	7%	312	32%	179	54%

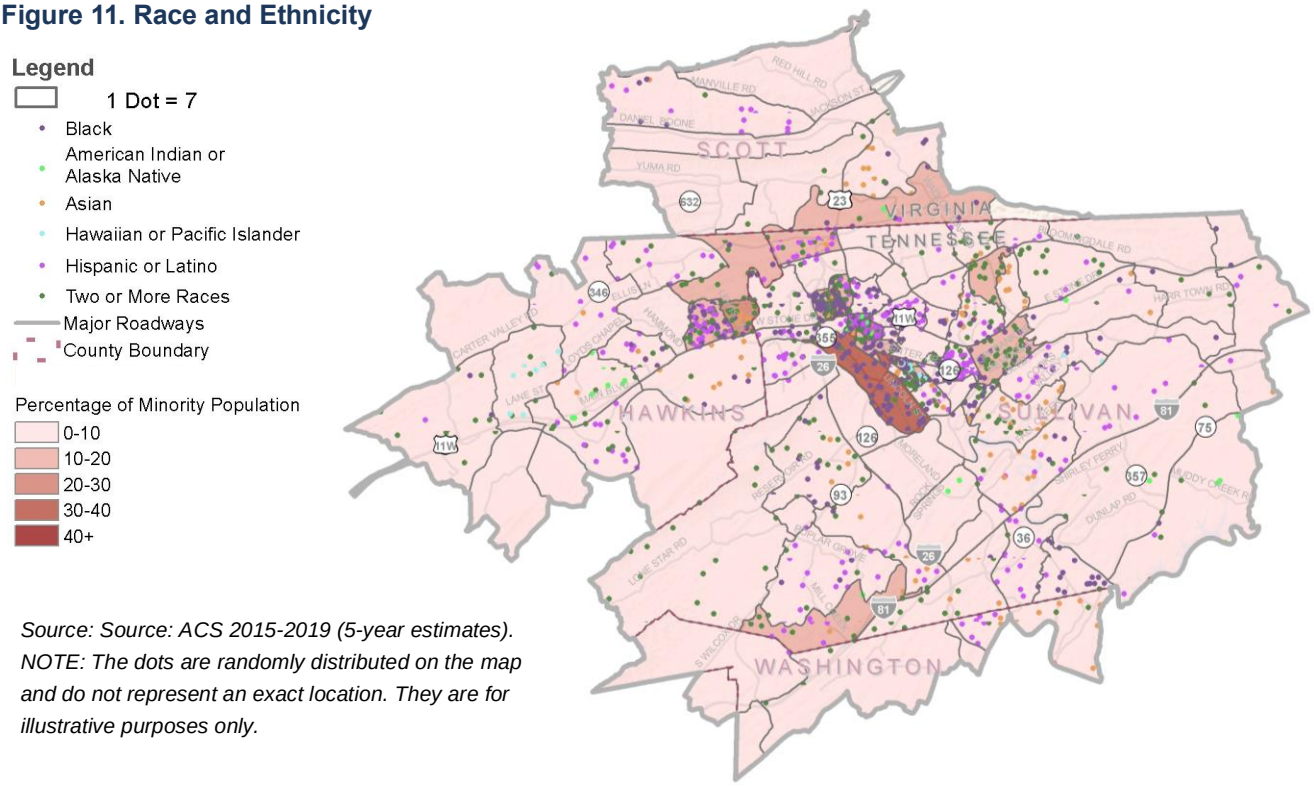
Source: ACS 2015-2019 (5-year estimates), Table DP02.

NOTE: The US Census defines six disability types: hearing difficulty, vision difficulty, cognitive difficulty, ambulatory difficulty, self-care difficulty, and independent living difficulty. Respondents who report any one of the six types are considered to have a disability.

Race and Ethnicity

The population of the Kingsport MPA is 94 percent non-Hispanic White alone and six percent minority. This is a much lower range of racial and ethnic diversity than the statewide averages of 26 percent for Tennessee and 38 percent for Virginia. The municipal areas are somewhat more diverse, with a nine percent rate overall, and ten percent within the City of Kingsport. Individuals who do identify as a nonwhite race are primarily Black (1.7 percent), Asian (0.7 percent), or a combination of two or more races (2.1 percent). Just under two percent of the population identify as Hispanic or Latino ethnicity, which may be in conjunction with any race. **Figure 11** displays the distribution of population within the Kingsport MPA by race and ethnicity. The detailed breakdown is provided in **Table 12**.

Figure 11. Race and Ethnicity



Source: Source: ACS 2015-2019 (5-year estimates).
NOTE: The dots are randomly distributed on the map and do not represent an exact location. They are for illustrative purposes only.

Table 12. Race and Ethnicity

	Race							Ethnicity	Minority Status	
	One race									
	White	Black or African American	Amer. Indian & Alaska Nat.	Asian	Nat. Hawaiian & Pac. Islndr.	Some other race	Two or more races	Hispanic or Latino (of any race)	White alone, not Hispanic or Latino	Minority pop. incl. Hispanic or Latino
Tennessee	**5,205,132**	**1,124,473**	**18,189**	**117,600**	**3,771**	**92,655**	**147,536**	**364,174**	**4,951,558**	**1,757,798**
Virginia	**5,717,617**	**1,621,592**	**23,873**	**541,133**	**6,179**	**223,794**	**320,275**	**792,001**	**5,227,569**	**3,226,894**
Kingsport MPA	**134,546**	**2,379**	**206**	**1,021**	**146**	**494**	**2,953**	**2,579**	**132,828**	**8,917**
Four-County Total	**340,456**	**9,281**	**839**	**3,457**	**187**	**1,915**	**7,233**	**8,544**	**334,930**	**28,438**
Sullivan County, TN	*148,183*	*3,067*	*203*	*953*	*121*	*1,017*	*3,506*	*2,978*	*146,687*	*10,363*
Hawkins County, TN	*54,363*	*747*	*99*	*299*	*62*	*123*	*918*	*878*	*53,811*	*2,800*
Washington County, TN	*116,464*	*5,340*	*450*	*2,137*	*4*	*756*	*2,654*	*4,386*	*113,269*	*14,536*
Scott County, VA	*21,446*	*127*	*87*	*68*	*0*	*19*	*155*	*302*	*21,163*	*739*
Municipal Total	**63,758**	**1,981**	**77**	**725**	**84**	**288**	**1,987**	**1,453**	**62,866**	**6,034**
Kingsport city, TN	*48,671*	*1,889*	*77*	*646*	*84*	*267*	*1,742*	*1,208*	*47,964*	*5,412*
Church Hill city, TN	*6,486*	*0*	*0*	*12*	*0*	*21*	*148*	*103*	*6,421*	*246*
Mount Carmel town, TN	*5,173*	*48*	*0*	*12*	*0*	*0*	*60*	*133*	*5,062*	*231*
Gate City town, VA	*1,899*	*24*	*0*	*8*	*0*	*0*	*10*	*9*	*1,890*	*51*
Weber City town, VA	*1,529*	*20*	*0*	*47*	*0*	*0*	*27*	*0*	*1,529*	*94*

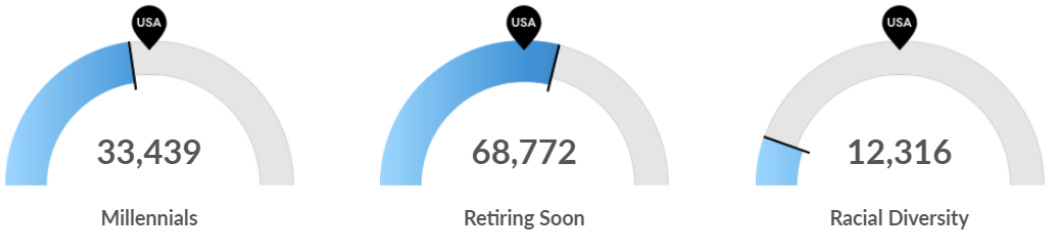
as a percent of total population

Tennessee	**78%**	**16.8%**	**0.3%**	**1.8%**	**0.1%**	**1.4%**	**2.2%**	**5%**	**74%**	**26%**
Virginia	**68%**	**19.2%**	**0.3%**	**6.4%**	**0.1%**	**2.6%**	**3.8%**	**9%**	**62%**	**38%**
Kingsport MPA	**95%**	**1.7%**	**0.1%**	**0.7%**	**0.1%**	**0.3%**	**2.1%**	**1.8%**	**94%**	**6%**
Four-County Total	**94%**	**2.6%**	**0.2%**	**1.0%**	**0.1%**	**0.5%**	**2.0%**	**2%**	**92%**	**8%**
Sullivan County, TN	*94%*	*2.0%*	*0.1%*	*0.6%*	*0.1%*	*0.6%*	*2.2%*	*2%*	*93%*	*7%*
Hawkins County, TN	*96%*	*1.3%*	*0.2%*	*0.5%*	*0.1%*	*0.2%*	*1.6%*	*2%*	*95%*	*5%*
Washington County, TN	*91%*	*4.2%*	*0.4%*	*1.7%*	*0.0%*	*0.6%*	*2.1%*	*3%*	*89%*	*11%*
Scott County, VA	*98%*	*0.6%*	*0.4%*	*0.3%*	*0.0%*	*0.1%*	*0.7%*	*1%*	*97%*	*3%*
Municipal Total	**93%**	**2.9%**	**0.1%**	**1.1%**	**0.1%**	**0.4%**	**2.9%**	**2%**	**91%**	**9%**
Kingsport city, TN	*91%*	*3.5%*	*0.1%*	*1.2%*	*0.2%*	*0.5%*	*3.3%*	*2%*	*90%*	*10%*
Church Hill city, TN	*97%*	*0.0%*	*0.0%*	*0.2%*	*0.0%*	*0.3%*	*2.2%*	*2%*	*96%*	*4%*
Mount Carmel town, TN	*98%*	*0.9%*	*0.0%*	*0.2%*	*0.0%*	*0.0%*	*1.1%*	*3%*	*96%*	*4%*
Gate City town, VA	*98%*	*1.2%*	*0.0%*	*0.4%*	*0.0%*	*0.0%*	*0.5%*	*0%*	*97%*	*3%*
Weber City town, VA	*94%*	*1.2%*	*0.0%*	*2.9%*	*0.0%*	*0.0%*	*1.7%*	*0%*	*94%*	*6%*

Source: ACS 2015-2019 (5-year estimates), Table DP05.

A high-level index of age and race diversity metrics for the MPA is provided in **Table 13**, which shows the estimated total millennials, soon-to-be retirees, and racially diverse population for an area of 14 ZIP codes approximating the MPA boundaries. The economic modeling firm that is the source for this data also provides a benchmark of typical levels of these populations for areas of the same size. This analysis indicates that there are fewer millennials, more imminent retirees, and a much smaller minority population than would normally be expected for an area of this size.

Table 13. Age and Race Comparison



Your area has 33,439 millennials (ages 25-39). The national average for an area this size is 38,242.

Retirement risk is high in your area. The national average for an area this size is 55,232 people 55 or older, while there are 68,772 here.

Racial diversity is low in your area. The national average for an area this size is 74,747 racially diverse people, while there are 12,316 here.

Source: Emsi 2020 estimates.

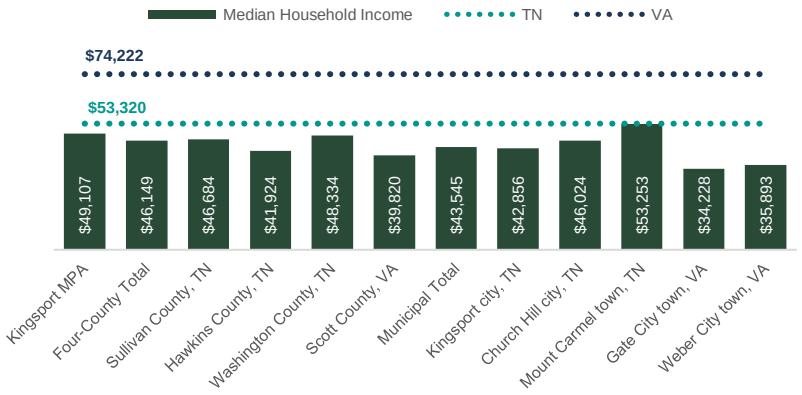
Income

Income can have a significant impact on the transportation needs and mobility options among the population, such as their ability to afford to own and maintain a private vehicle for personal travel. As shown in **Figure 12**, the median household income in the Kingsport MPA is approximately $49,000, which is just below the Tennessee state average of $53,000. Among the constituent municipalities, the highest

incomes are in Mount Carmel ($53,000), and the lowest are in Gate City and Weber City (roughly $35,000).

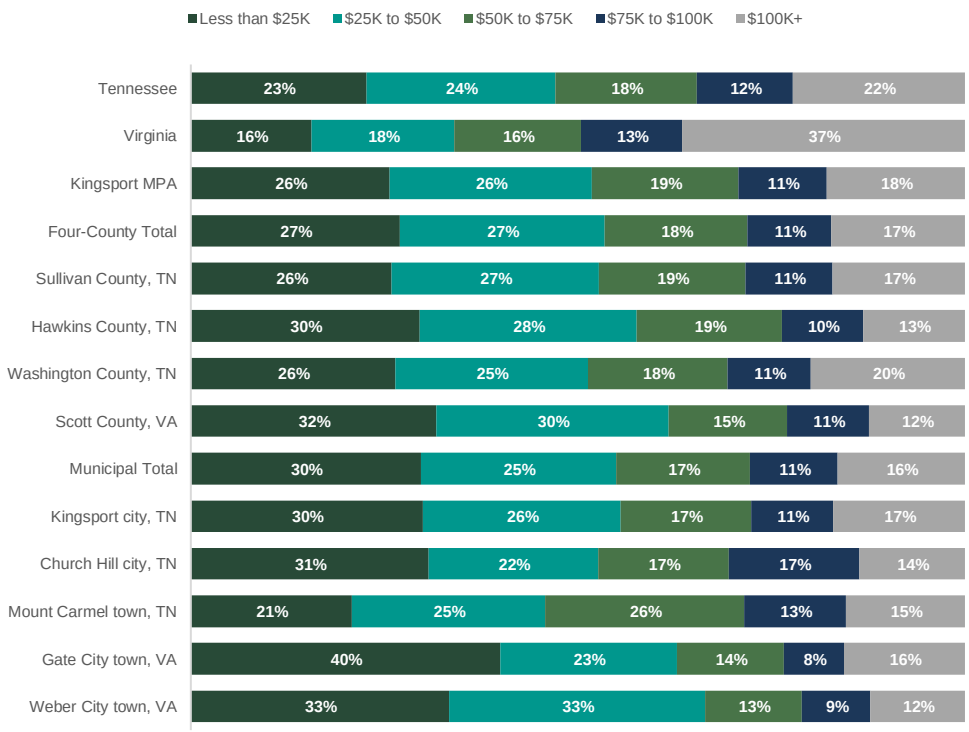
The breakdown of households by income level is provided in **Figure 13**. The Kingsport MPA has about 26 percent of households earning less than $25,000 (for reference, the federal poverty level for a four-person household in 2019 is $25,750, according to the Department of Health and Human Services, versus about $17,000 for two persons or $12,500 for one person). This 26 percent is above the Tennessee average of 23 percent. Generally, there are more low-income households in the municipalities (30%) than unincorporated areas, likely due to the importance of proximity to employment opportunities and public services when one is unable to afford the higher transportation costs associated with traveling longer distances.

Figure 12. Median Household Income



Source: ACS 2015-2019 (5-year estimates), Table DP03.

Figure 13. Share of Households by Income Level



Source: ACS 2015-2019 (5-year estimates), Table DP03.

Education and Information Resources

As a precursor to further detail about the employment profile of the MPA, this section provides information about the educational attainment and enrollment levels of the population, as well as the language status and household resources as measured by computer and internet access.

There are approximately 3,000 children in the MPA enrolled in nursery school or kindergarten, and about 19,000 in grade school; just under half of these live in one of the five municipalities (mostly in Kingsport). About 5,800 college students live in the MPA. **Table 14** provides additional details regarding enrollment status across the respective geographies.

Table 14. Enrollment Status

	Nursery, Kinder.	Grades 1-12	College/ University
Kingsport MPA	2,942	19,077	5,840
Municipal Total	1,327	9,319	2,998
Kingsport city, TN	1,011	7,294	2,387
Church Hill city, TN	146	734	384
Mount Carmel town, TN	105	850	134
Gate City town, VA	52	328	66
Weber City town, VA	13	113	27

Source: ACS 2015-2019 (5-year estimates), Table DP02.

In terms of educational attainment among the population 25 years of age or older, 88 percent are high school graduates (comparable with statewide averages), and 23 percent hold a bachelor's degree or higher, which is lower than the Tennessee average of 27 percent. There is a comparatively larger proportion of college graduates in municipal areas than the MPA overall (25 percent versus 23 percent), indicating lower rates in the unincorporated areas. **Table 15** provides additional details regarding educational attainment.

Table 15. Educational Attainment

	No H.S. diploma	H.S. graduate or higher	Bachelor's degree or higher
Tennessee	13%	87%	27%
Virginia	10%	90%	39%
Kingsport MPA	12%	88%	23%
Four-County Total	13%	87%	24%
Sullivan County, TN	13%	87%	24%
Hawkins County, TN	16%	84%	14%
Washington County, TN	11%	89%	32%
Scott County, VA	19%	81%	13%
Municipal Total	12%	88%	25%
Kingsport city, TN	12%	88%	27%
Church Hill city, TN	12%	88%	19%
Mount Carmel town, TN	7%	93%	20%
Gate City town, VA	18%	82%	20%
Weber City town, VA	23%	77%	15%

Source: ACS 2015-2019 (5-year estimates), Table DP02.

Data regarding language proficiency among the population indicates that only a very small percentage of MPA residents speak a non-English language (2.5%), and an even smaller proportion have difficulties speaking English (0.6%). This suggests that communications and outreach efforts are less likely to be inhibited by language barriers compared to some other areas of Tennessee and Virginia. **Table 16** provides additional detail regarding language proficiency.

Table 16. Language Proficiency

	Speaks non-English language	Speaks English less than very well
Tennessee	7.2%	3.0%
Virginia	16.3%	5.9%
Kingsport MPA	2.5%	0.6%
Municipal Total	2.9%	0.8%
Kingsport city, TN	3.3%	0.9%
Church Hill city, TN	1.2%	1.0%
Mount Carmel town, TN	1.9%	0.4%
Gate City town, VA	1.2%	0.4%
Weber City town, VA	3.0%	0.3%

Source: ACS 2015-2019 (5-year estimates), Table DP02.

Finally, information regarding household access to computers and the internet is provided in **Table 17**. Fourteen percent of households lack a computer and 22 percent lack broadband internet access, which is consistent with Tennessee averages. The proportions are similar for municipal averages and the city of Kingsport, but the towns of Gate City and Weber City experience much lower levels of access to computer equipment and quality internet connections, which may inhibit employment opportunities.

Table 17. Computer and Internet Resources

	HH with no computer	HH with no broadband internet
Tennessee	13%	22%
Virginia	9%	16%
Kingsport MPA	14%	22%
Municipal Total	13%	23%
Kingsport city, TN	12%	22%
Church Hill city, TN	16%	25%
Mount Carmel town, TN	8%	18%
Gate City town, VA	27%	35%
Weber City town, VA	27%	40%

Source: ACS 2015-2019 (5-year estimates), Table DP02.

Employment / Economy

The Kingsport MPA transportation network and economy are closely tied with that of Bristol and Johnson City, Tennessee (referred to as the Tri-Cities region or the Appalachian Highlands). The region, and Kingsport MPA in particular, has historically been heavily reliant on a few large industries which makes the local economy vulnerable to market disruptions. However, manufacturing was and continues to be a backbone for jobs and the local economy and must be protected and enhanced while addressing the need for economic diversification.

The need to balance supporting critical industries is particularly challenging due to the location of a key industrial node in the downtown area. For now, industrial and retail/service activities function for the large part in a harmonious fashion, but pressures with increased growth could introduce challenges. In terms of new growth markets, the region has seen a marked growth in tourism, eco-tourism, and tourist spending. Finally, the interstate corridors that run through the MPA represent untapped opportunity for economic development, especially near interchange locations.

The recent global pandemic has also had significant impacts on global supply chains and the state, regional, and local employment, and the economy. In March 2020, the COVID-19 pandemic severely impacted commuting patterns with a large proportion of the population transitioning to working/studying remotely. Economists predict that some degree of remote work will continue into the future, which will have both direct and indirect impacts on local commuting patterns. Adjustments consumers made during the global pandemic with regards to accelerating the shift of retail sales to online sources will also have far-reaching continuing impacts after the pandemic is over, including reduced traffic to and expenditures at local brick & mortar retail locations and additional network transportation trips to deliver retail goods

(McKinsey Global Institute, 2021). Additional detail regarding the regional economy is summarized in **Appendix C.** This appendix documents the findings from an Economic Development workshop conducted as part of the LRTP update process.

Labor Force Characteristics

According to the most recent ACS data, there are approximately 63,600 people in the labor force in the MPA, which represents 54.5 percent of the population age 16 and over—a labor force participation rate lower than statewide averages (61.4 percent for Tennessee and 65.9 percent for Virginia). In municipalities, the participation rate is even lower—52.6 percent on average. **Table 18** displays additional detail regarding the labor force characteristics.

Figure 14 displays employment density within the MPA, with pockets of employment concentrated in downtown Kingsport, West Kingsport/Allandale, along the I-81 corridor, and along the US-23 corridor, in Virginia.

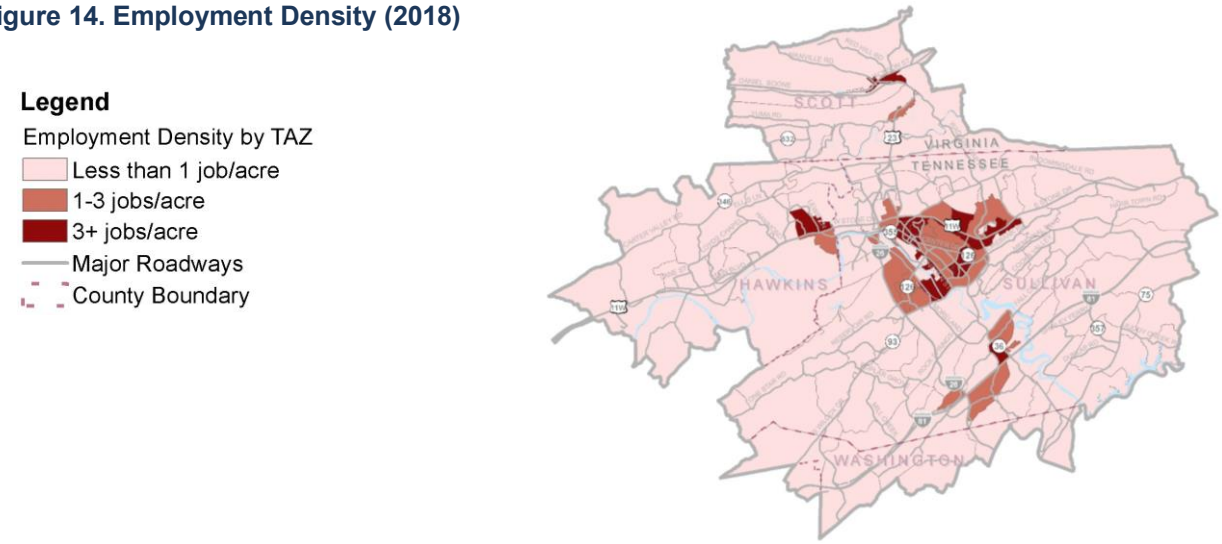
Among the 63,000 in the labor force, about 3,800 in the MPA are unemployed, which is an unemployment rate of six percent, higher than statewide averages. These figures suggest that job seekers in the MPA face greater challenges in the MPA than in other areas in the region, or that the area is home to a high number of retirees.

Table 18. Labor Force Characteristics

	Labor Force Participation	Civilian Unemploy-ment
Tennessee	61.4%	5.2%
Virginia	65.9%	4.5%
Kingsport MPA	54.5%	6.0%
Four-County Total	55.5%	5.5%
Sullivan County, TN	54.7%	6.2%
Hawkins County, TN	51.3%	6.6%
Washington County, TN	59.6%	4.5%
Scott County, VA	48.1%	5.0%
Municipal Total	52.6%	6.1%
Kingsport city, TN	53.1%	6.4%
Church Hill city, TN	50.5%	5.5%
Mount Carmel town, TN	53.5%	3.5%
Gate City town, VA	48.0%	7.6%
Weber City town, VA	49.6%	6.8%

Source: ACS 2015-2019 (5-year estimates), Table DP03.

Figure 14. Employment Density (2018)



Source: Kingsport MTPO 2018 Socioeconomic Data; by TAZ.

Occupational Profiles

The share of area residents working in each occupational category is provided in **Table 19**. The Kingsport MPA has an occupational profile that is very similar to the Tennessee and Virginia statewide average, as well as the four-county average.

Table 19. Occupational Profiles

	Mgmt., business, science, arts	Service occupations	Sales & office occupations	Natural resources, construct., maint.	Production, transport, material moving
Tennessee	35%	17%	22%	9%	17%
Virginia	44%	17%	20%	8%	11%
Kingsport MPA	35%	18%	22%	10%	15%
Four-County Total	35%	18%	22%	9%	16%
Sullivan County, TN	35%	18%	23%	10%	14%
Hawkins County, TN	25%	18%	20%	11%	25%
Washington County, TN	39%	18%	22%	8%	13%
Scott County, VA	26%	19%	21%	14%	20%
Municipal Total	36%	18%	22%	9%	15%
Kingsport city, TN	37%	19%	21%	9%	14%
Church Hill city, TN	37%	10%	25%	8%	20%
Mount Carmel town, TN	31%	16%	24%	6%	23%
Gate City town, VA	35%	26%	17%	15%	6%
Weber City town, VA	20%	23%	28%	9%	20%

Source: ACS 2015-2019 (5-year estimates), Table DP03.

Employment Profiles

The estimated employment counts for the fourteen primary ZIP codes that overlap the MPA are shown by North American Industry Classification System (NAICS) industry sector in **Figure 15**, along with the typical counts for a region of similar size nationwide. Government is the largest employment industry, followed by Manufacturing, Health Care and Social Assistance, and Retail Trade. The Kingsport MPA has an above-average share of jobs in Manufacturing and Management of Companies than is typical. This is also true, to a lesser extent, for Administrative, Support, and Waste Services, Accommodation and Food Services, Construction, and Retail Trade. In the opposite direction, there are fewer Professional Services, Educational Services, Information, Arts, Entertainment, and Recreation, and Real Estate jobs, among others.

The share of jobs by NAICS sector according to ACS 2019 data is provided in **Table 20**, which illustrates similar trends in the more detailed geographies.

Figure 15. Employment by Industry Sector (vs. US Average)

Source: ACS 2015-2019 (5-year estimates),

Table 20. Employment by Industry Sector (%)

	Agricul., forestry, fishing, hunting, mining	Constr-uction	Manufac-turing	Wholesale trade	Retail trade	Transport, ware-housing, utilities
Tennessee	**1%**	**6%**	**13%**	**3%**	**12%**	**7%**
Virginia	**1%**	**7%**	**7%**	**2%**	**10%**	**4%**
Kingsport MPA	**1%**	**7%**	**17%**	**2%**	**12%**	**4%**
Four-County Total	**1%**	**7%**	**15%**	**2%**	**13%**	**4%**
Sullivan County, TN	*1%*	*8%*	*15%*	*2%*	*13%*	*4%*
Hawkins County, TN	*1%*	*7%*	*21%*	*2%*	*14%*	*7%*
Washington County, TN	*1%*	*5%*	*12%*	*2%*	*13%*	*4%*
Scott County, VA	*2%*	*11%*	*16%*	*1%*	*12%*	*3%*
Municipal Total	**1%**	**6%**	**17%**	**1%**	**13%**	**4%**
Kingsport city, TN	*1%*	*6%*	*17%*	*2%*	*12%*	*4%*
Church Hill city, TN	*0%*	*5%*	*18%*	*1%*	*13%*	*5%*
Mount Carmel town, TN	*2%*	*8%*	*16%*	*2%*	*20%*	*5%*
Gate City town, VA	*1%*	*4%*	*20%*	*0%*	*8%*	*3%*
Weber City town, VA	*0%*	*7%*	*12%*	*2%*	*19%*	*2%*

	Inform-ation	Finance, insurance, real estate, leasing	Prof., scientific, mgmt., admin. services	Educational services, health care, social assistance	Arts, entertain., recreation, accom., food svcs.	Other services, except public admin.	Public admin.
Tennessee	**2%**	**6%**	**10%**	**22%**	**10%**	**5%**	**4%**
Virginia	**2%**	**6%**	**15%**	**22%**	**9%**	**5%**	**9%**
Kingsport MPA	**2%**	**5%**	**8%**	**25%**	**9%**	**5%**	**3%**
Four-County Total	**2%**	**5%**	**9%**	**26%**	**10%**	**5%**	**3%**
Sullivan County, TN	*2%*	*5%*	*9%*	*24%*	*10%*	*5%*	*3%*
Hawkins County, TN	*1%*	*3%*	*5%*	*24%*	*9%*	*4%*	*3%*
Washington County, TN	*2%*	*5%*	*9%*	*29%*	*11%*	*5%*	*3%*
Scott County, VA	*2%*	*3%*	*11%*	*25%*	*6%*	*2%*	*5%*
Municipal Total	**2%**	**5%**	**8%**	**25%**	**10%**	**6%**	**3%**
Kingsport city, TN	*2%*	*5%*	*8%*	*25%*	*11%*	*7%*	*2%*
Church Hill city, TN	*2%*	*4%*	*6%*	*32%*	*7%*	*2%*	*4%*
Mount Carmel town, TN	*1%*	*7%*	*9%*	*19%*	*5%*	*3%*	*5%*
Gate City town, VA	*5%*	*4%*	*7%*	*31%*	*10%*	*1%*	*6%*
Weber City town, VA	*4%*	*2%*	*16%*	*19%*	*11%*	*1%*	*4%*

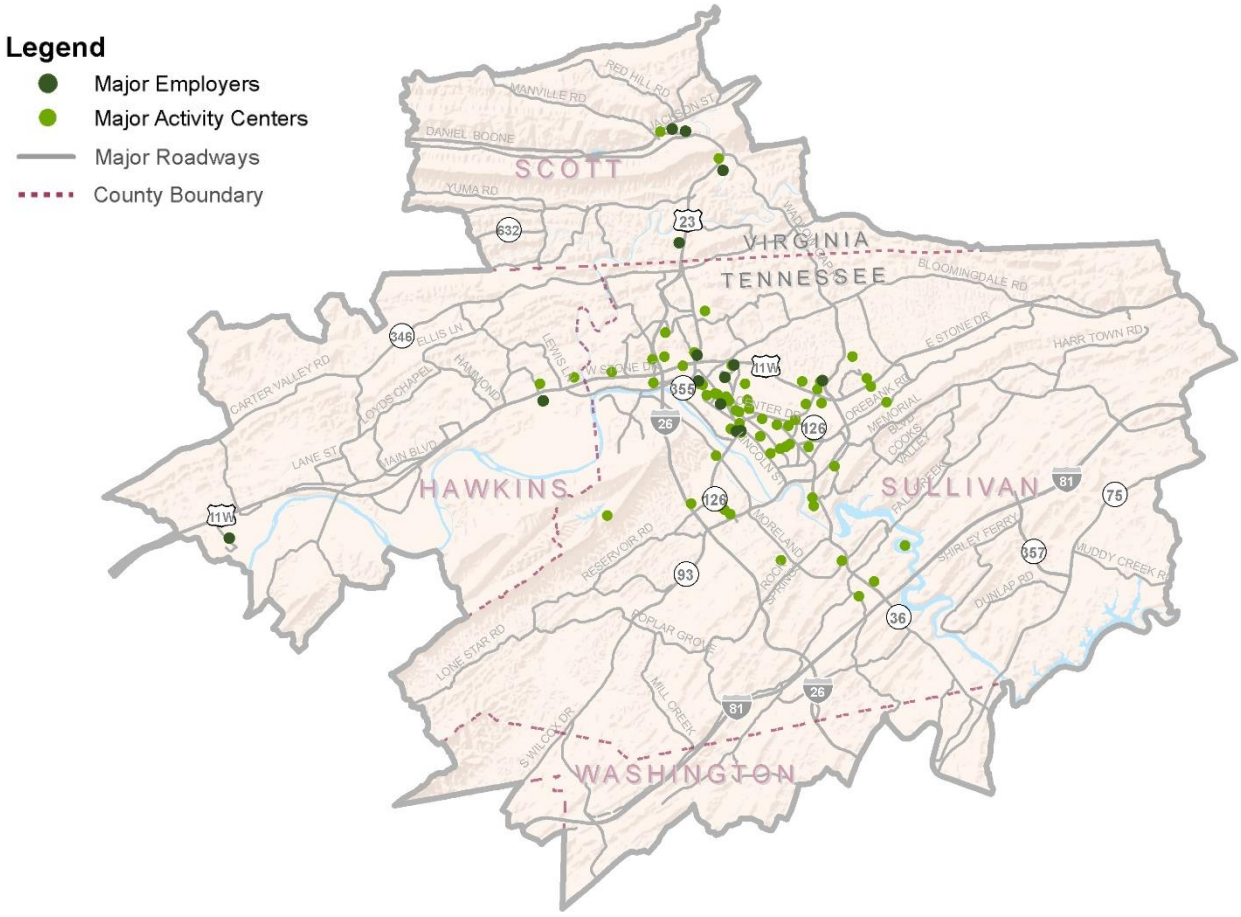
Source: ACS 2015-2019 (5-year estimates), Table DP03.

Employment Distribution and Major Employers

As shown, employment within the Kingsport MPA has largely been, and still is, dominated by manufacturing jobs. Like much of the US, the region has experienced a downturn in manufacturing employment over recent decades. While manufacturing is no longer the leading employment sector in the region, the Kingsport MPA has continued to see positive employment growth in service, retail, and office employment.

Figure 16 displays the approximate location of major employers and activity centers within the Kingsport MPA. **Table 21** identifies the largest non-government employers (in terms of number of employees) within the MPA. **Figure 17** displays the distribution of industrial, retail, and service employment within the MPA. This information was used to help inform the update of the regional travel demand model to reflect 2018 employment conditions. Additional information regarding the socioeconomic data, and future year projections, is provided in Chapter 5.

Figure 16. Location of Major Employers and Major Activity Centers



Source: AECOM; Kingsport MTPO.
NOTE: No speciic threholds were used to identify major employers or activity centers.

Table 21. Major Employers

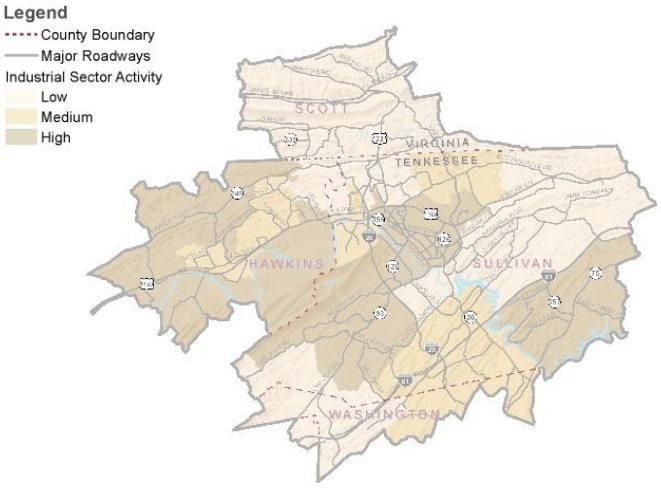
Rank	Employer	Employees
1	Eastman Chemical	8,000
2	Ballad Health	2,600
3	Partners Construction	1,500
4	Frontier Health (Administrative Offices)	1,000
5	Hutchison Sealing Systems	600
5	Holston Army Ammunition Plant *	600
6	Eastman Credit Union	500
7	Kingsport Times	480
8	Walmart	400

* Estimated that approximately 400 are BAE Systems employees.

Source: InfoUsa (2018); data reviewed by Kingsport MTPO and City Staff.

Figure 17. Industrial, Retail, and Service Sector Employment Distribution

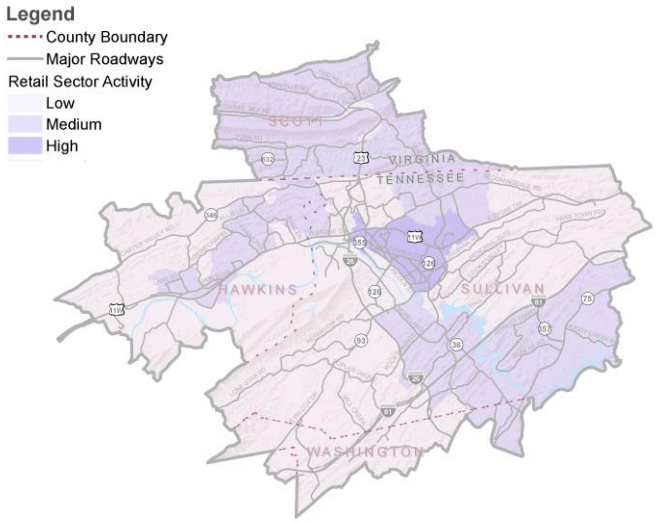
Industrial Sector



Key industrial sector growth nodes include:

- US-23 Industrial Parks
- Church Hill
- SR-357 (Airport Parkway) Corridor
- Eastman Campus
- Tri-Cities Aerospace Park

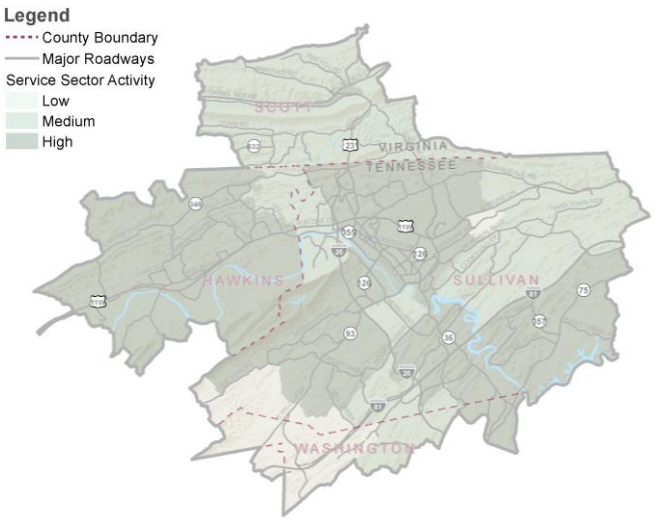
Retail Sector



Key retail sector growth nodes include:

- US-11W (SR-1/East Stone Drive)
- Church Hill/ Mount Carmel/ Allandale Area
- SR-36 (Lynn Garden Drive)
- Bloomingdale Road
- SR-93 (North John B. Dennis Highway)
- SR-93 (South John B. Dennis Highway)
- Downtown Kingsport
- Eastman Road
- Meadowview Area

Service Sector



Key service sector growth nodes include:

- US-11W (SR-1/Stone Drive)
- SR-93 (John B. Dennis Highway)
- Downtown Kingsport
- Eastman Road

4. Existing Conditions

A review of existing conditions provides a foundation for identifying transportation and mobility challenges within the Kingsport MPA. Given the 2045 LRTP was developed during the COVID-19 pandemic, the existing conditions analysis primarily reflects pre-pandemic conditions. This chapter discusses travel characteristics, land use, and key components of the Kingsport MPA multimodal transportation system including roadways, public transportation, bicyclists and pedestrians, aviation, and freight.

Travel Characteristics

US Census data was used to document travel characteristics for the Kingsport region. The Longitudinal Employer-Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES) was used to document commuter flows while the American Community Survey (ACS) 5-year estimates (2015-2019) were used to document mode choice and travel times.

Commute Flows

Employment data provide an indication of where Kingsport MPA residents travel for work, and where MPA workers are traveling from. The most recent data regarding the home and work location for primary jobs was gathered from the US Census Bureau. These commute flows were filtered to those with either a home or work location in the MPA, and with the other end of the commute located within adjacent counties/cities (defined as Sullivan, Hawkins, Scott, Washington (both TN and Virginia), Greene, Carter, Bristol, Lee, Russell, Hancock).

Among the roughly 42,100 workers who reside in the MPA, about 25,400 also work in the MPA, while 16,700 work in areas nearby as outbound commuters. Among the 44,300 workers who work in the MPA, 18,900 are inbound commuters from nearby areas. Thus, for all commuters either living or working in the MPA, 42% are intra-MPA commuters, 31% are inbound, and 27% are outbound, which indicates that the MPA is a net importer of workers. **Figure 18** summarizes the breakdown of the commute flows.

Figure 18. Internal, Inbound, and Outbound Commuters

Source: LODES 2018, Table JT01. Counties/cities included in these commuter flows include Sullivan, Hawkins, Washington, Greene, Carter, Hancock in Tennessee, and Scott, Washington, Russell, Lee in Virginia, and Bristol city in Virginia.

An illustration of the inbound and outbound commutes is provided in **Figure 19** and **Figure 20**. Counties overlapping the MPA were split into MPA and non-MPA zones for tabulation, and only the non-MPA zones are represented.

As shown in **Figure 19**, inbound commuters originate in all directions, but the largest flows are from Tennessee origins, especially Washington and Sullivan counties (6,300 and 3,700, respectively). **Figure 20** shows the outbound commute flows are even more lopsided in favor of Tennessee as opposed to Virginia, with the vast majority leaving their homes in the Kingsport MPA to work in non-MPA portions of Washington, Sullivan, and Hawkins counties in Tennessee (8,100, 4,100, and 1,700, respectively). The detailed breakdown by inbound/outbound non-MPA location is provided in **Table 22**.

Figure 19. Inbound Commute Flows

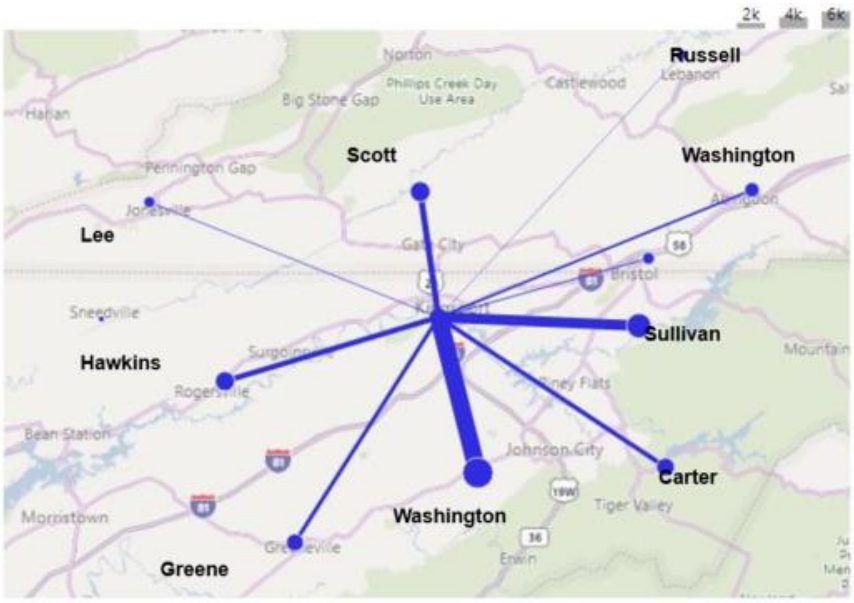


Figure 20. Outbound Commute Flows

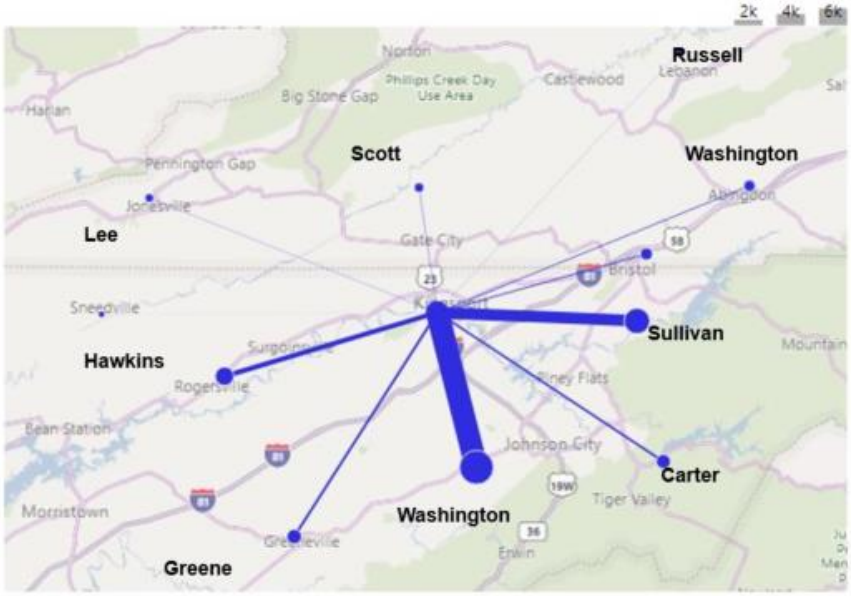


Table 22. Inbound and Outbound Commuters (Non-MPA Locations)

	Inbound	Outbound
Non-MPA Washington County (TN)	6,270	8,141
Non-MPA Sullivan County	3,646	4,085
Non-MPA Scott County	2,150	191
Non-MPA Hawkins County	1,926	1,738
Non-MPA Carter County	1,593	752
Non-MPA Greene County	1,429	824
Non-MPA Washington County (VA)	857	366
Non-MPA Bristol city	451	437
Non-MPA Lee County	354	125
Non-MPA Russell County	217	84
Non-MPA Hancock County	4	19

Source: LODES 2018, Table JT01. Counties/cities included in these commuter flows include Sullivan, Hawkins, Washington, Greene, Carter, Hancock in Tennessee, and Scott, Washington, Russell, Lee in Virginia, and Bristol city in Virginia.

Mode Choice

According to current ACS data, about 94 percent of workers residing in the Kingsport MPA commuted to work via car, truck, or van, including 86.9 percent who drove alone and 6.6 percent who carpooled. The Kingsport MPA represents a higher drive-alone rate than the Tennessee average of 83 percent and Virginia average of 77 percent. The Kingsport MPA also has a lower carpool rate at 6.6 percent versus 8.9 percent for Tennessee and 9.2 percent for Virginia. Generally, carpooling is more common in locations cited as having lower incomes, such as Gate City and Weber City, as opposed to a higher income community such as Mount Carmel.

Working from home was less common in the Kingsport MPA at 3.6 percent versus 4.7 percent for Tennessee and 5.3 percent for Virginia, while the pedestrian commute rates were similar. A negligible percentage of people (0.1 percent) indicated that they use public transit in the Kingsport MPA. **Table 23** provides additional details. Finally, it should be noted that this data reflects pre-pandemic commute patterns.

Table 23. Commute Travel Mode

	Drove alone	Car-pooled	Transit	Walked	Other	Worked from home
Kingsport MPA	50,763	3,842	43	622	984	2,128
Four-County Total	133,429	10,076	498	1,655	2,460	5,808
Sullivan County, TN	56,404	4,614	69	769	1,075	2,468
Hawkins County, TN	19,258	1,403	79	158	217	625
Washington County, TN	50,669	3,355	331	673	1,083	2,524
Scott County, VA	7,098	704	19	55	85	191
Municipal Total	23,124	2,052	8	421	604	1,014
Kingsport city, TN	17,584	1,810	8	404	537	776
Church Hill city, TN	2,506	102	0	12	8	57
Mount Carmel town, TN	1,955	57	0	0	39	127
Gate City town, VA	553	36	0	5	0	9
Weber City town, VA	526	47	0	0	20	45

% of population

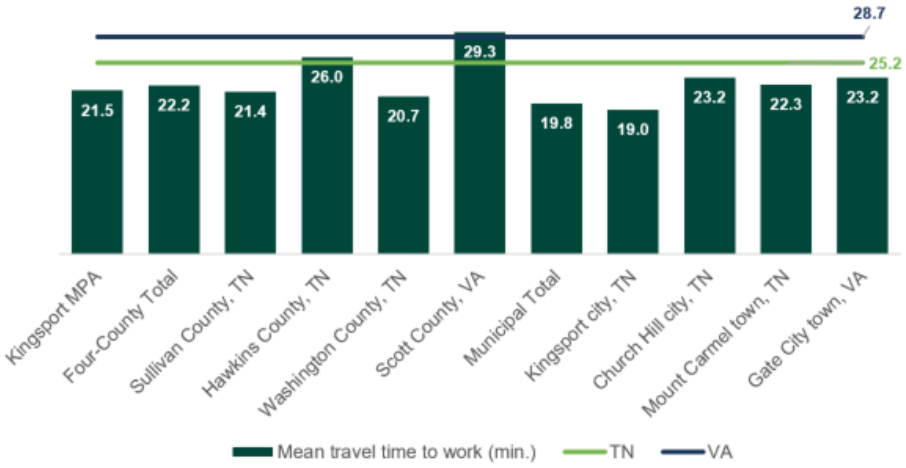
Tennessee	83.1%	8.9%	0.7%	1.3%	1.3%	4.7%
Virginia	77.0%	9.2%	4.4%	2.4%	1.8%	5.3%
Kingsport MPA	86.9%	6.6%	0.1%	1.1%	1.7%	3.6%
Four-County Total	86.7%	6.5%	0.3%	1.1%	1.6%	3.8%
Sullivan County, TN	86.2%	7.1%	0.1%	1.2%	1.6%	3.8%
Hawkins County, TN	88.6%	6.5%	0.4%	0.7%	1.0%	2.9%
Washington County, TN	86.4%	5.7%	0.6%	1.1%	1.8%	4.3%
Scott County, VA	87.1%	8.6%	0.2%	0.7%	1.0%	2.3%
Municipal Total	84.9%	7.5%	0.0%	1.5%	2.2%	3.7%
Kingsport city, TN	83.3%	8.6%	0.0%	1.9%	2.5%	3.7%
Church Hill city, TN	93.3%	3.8%	0.0%	0.4%	0.3%	2.1%
Mount Carmel town, TN	89.8%	2.6%	0.0%	0.0%	1.8%	5.8%
Gate City town, VA	91.7%	6.0%	0.0%	0.8%	0.0%	1.5%
Weber City town, VA	82.4%	7.4%	0.0%	0.0%	3.1%	7.1%

Source: ACS 2015-2019 (5-year estimates), Table DP03.

Travel Time

The mean travel time to work in minutes is illustrated in **Figure 21**. Most areas within the Kingsport MPA have a commute that is shorter than statewide averages for Tennessee and Virginia. The average travel time to work for Kingsport MPA residents is 21.5 minutes, and slightly shorter within the city of Kingsport (19.0 minutes). Residents living in Scott County, VA typically have a longer commute with the average travel time at 29.3 minutes. Hawkins County residents also had a slightly higher travel time compared to the state average. It is believed that several residents in these counties frequently travel longer distances to access employment, including to areas such as Bristol and Johnson City, TN. Again, it should be noted that this data reflects pre-pandemic conditions and it is unknown how future work commute times might be impacted by COVID-19, especially since it is unclear how many employees will continue working from home and how many will return to work/office.

Figure 21. Mean Commute Length (minutes)



Source: ACS 2015-2019 (5-year estimates), Table DP03.

Land Use

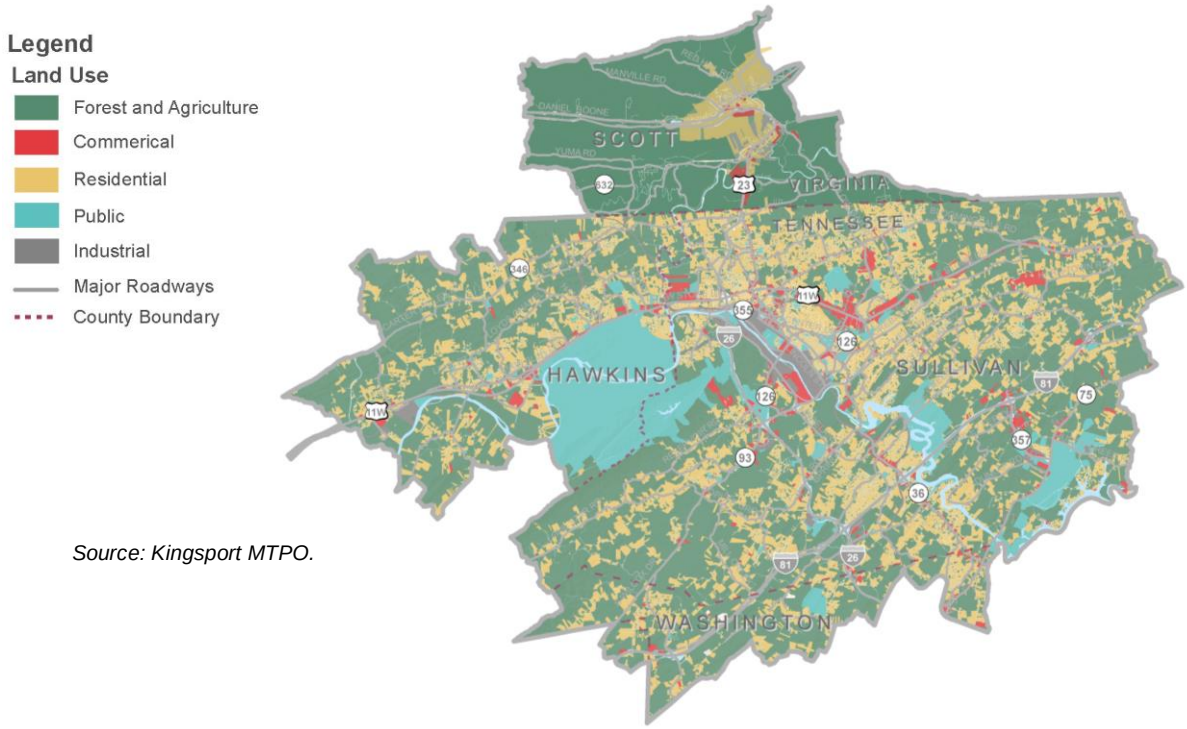
Understanding land use and residential and economic development activity is an important component of planning for future transportation infrastructure and mobility services. How a region grows, or the vision for how the region intends to grow, has a direct impact on the type and level of transportation investments that can be made over the next two plus decades.

The Kingsport region has a long history of planning dating back to 1919 with the creation of a model city plan for the City of Kingsport by the renowned city planner and landscape architect John Nolen. Over the past several decades, the region has experienced typical post-World War II development, suburban in nature and highly auto oriented. Despite this development trend, the region has attempted to direct growth into areas that are most suitable for development and to a degree contiguous to existing corporate limits as a means of cost effectively providing city services. Additionally, the region has successfully maintained a large portion of its planning area as rural in character and has preserved several large open spaces such as Bays Mountain Park and Warriors' Path State Park. **Figure 22** illustrates the current land use within the Kingsport MPA.

The largest share of land in the MPA (approximately 45%) is classified as agricultural, which includes large rural residential tracts of land that are intended to remain rural in nature, farm and forest lands. The second largest classification of land is residential, accounting for approximately 35% of the land area in the MPA. The third largest classification of land is public lands (e.g., city, county, state, and federal). The vast majority of this classification includes Bays Mountain Park, Warriors' Path State Park, and the Holston Army Ammunition Plant. Other existing land uses within the MPA include commercial activity, which is largely clustered in the downtown areas of Kingsport and Gate City and along the major corridors of US-11W (SR-1/Stone Drive) and SR-36 (Lynn Garden Drive/Center Street/Fort Henry Drive), and industrial uses that straddle the Holston River between downtown Kingsport and SR-93 (John B. Dennis Highway) and other areas of the region including SR-357 (Airport Parkway) and near the I-81/I-26 interchange.

Future plans for the MPA support continued infill of residential development and continued commercial development along major corridors including US-11W (SR-1/Stone Drive) and SR-36 (Lynn Garden Drive/Center Street/Fort Henry Drive), and near interchanges located along I-81 and I-26. In particular, commercial growth is expected in the vicinity of I-81 and Tri-Cities Crossings and I-26 and Eastern Star Road. Industrial development is planned for continued infill in current industrial locations as well as future industrial growth along SR-357 (Airport Parkway), while other areas of the MPA are intended to remain primarily rural and/or undeveloped. It is worth noting that the recent impacts of the COVID-19 pandemic have significantly impacted where people live and work and the MTPO will continue to monitor potential impacts this might have on future development patterns/trends.

Figure 22. Current Land Use



Source: Kingsport MTPO.

Urban Growth Boundary

Tennessee's Growth Policy Act (known as Public Chapter 1101) establishes a growth planning process for local governments while at the same time changing the state's annexation laws to require consent outside cities' urban growth boundaries. The purpose stated by the General Assembly for the Act is to:

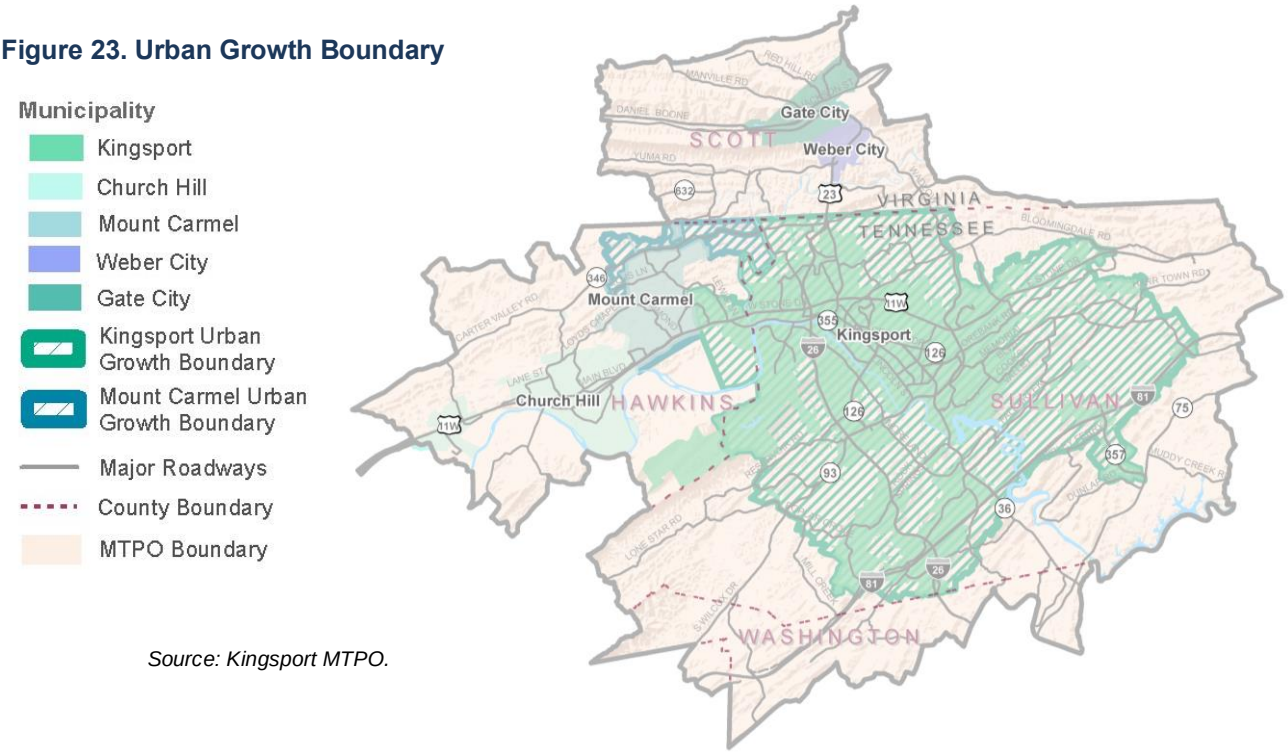
- eliminate annexation or incorporation out of fear,
- establish incentives to annex or incorporate where appropriate,
- more closely match the timing of development and the provision of public services,
- stabilize each county's education funding base and establish an incentive for each county legislative body to be more interested in education matters, and
- minimize urban sprawl.

Although cities, counties, and regions already had the ability to develop growth plans under Title 13, recommendations resulting from those plans are advisory. With the Growth Policy Act, growth plans with defined boundaries for annexation and incorporation are required in all counties without metropolitan governments. Local governments that fail to adopt growth plans would become ineligible for certain state grants.

Each plan identifies three distinct areas: an "urban growth boundary," a "planned growth area" and a "rural area." The "urban growth boundary" (UGB) territory contains the corporate limits of a municipality and the adjoining territory where growth is expected. The "planned growth area" (PGA) includes sections outside current municipalities and UGBs where growth is expected. The "rural area" (RA) includes land that is to be preserved for agriculture, recreation, forest, wildlife and uses other than high-density commercial or residential development.

Figure 23 displays the approved growth boundary areas for the Kingsport MPA. As illustrated, areas outside the UGB are intended to remain rural, to be preserved for agriculture, recreation, forest, wildlife, or uses other than high-density commercial or residential development. The UGB does not impact the Virginia portion of the Kingsport MPA.

Figure 23. Urban Growth Boundary



Source: Kingsport MTPO.

Roadways

The following sections describe components of the existing regional roadway network. It includes a discussion of functional classification, daily traffic volumes, capacity analysis, and safety.

Functional Classification

Functional classification is a process by which roadways are grouped into classes according to the service provided. This service ranges from a high degree of travel mobility (interstates and freeways) to land access functions (local roads). Federal regulations require that each state classify roadways in accordance with the Federal Highway Administration's (FHWA) Highway Functional Classification Criteria. The primary criteria for defining functional classification includes average daily traffic volumes, posted and observed travel speeds, and access control.

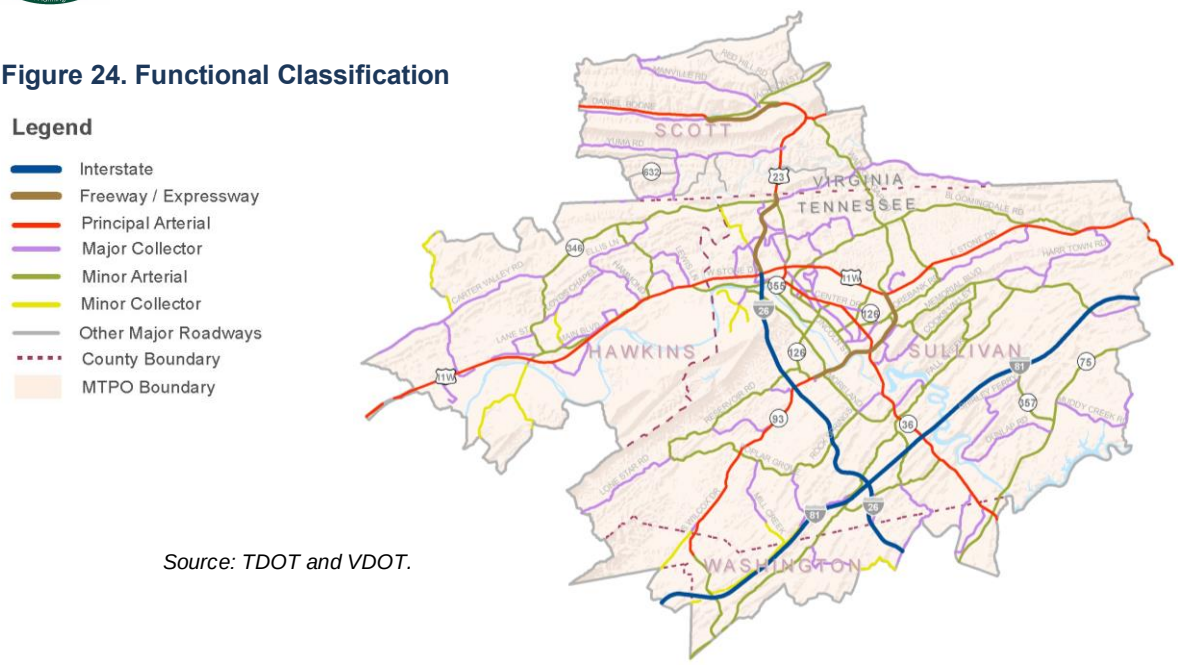
Table 24 summarizes the total miles of roadway by functional classification, not including local roads which typically include low-volume roads that provide direct frontage to residential developments. As background, there are over 1,000 miles of local roads within the Kingsport MPA. **Figure 24** illustrates the roadway functional classification for the MPA, including collector roadways and higher classifications.

Table 24. Functionally Classified Roadway Miles (2021)

Functional Classification	Miles
Interstate and Expressway	43
Principal Arterial	57
Minor Arterial	143
Collector	175
Total Miles	**418**

Source: GIS analysis of center line miles of collector roadways and higher.

Figure 24. Functional Classification



Source: TDOT and VDOT.

Interstates and expressways are full-access controlled roadways that carry the majority of through-traffic volumes entering and exiting an urban area. Expressways, to a degree, also facilitate major cross-town uninterrupted travel movements in urban areas. Within the Kingsport MPA there are two roadways classified as interstate, I-81 and I-26. In addition to providing critical regional access, both interstate corridors accommodate large percentages of through-travel within the region. These facilities are also important corridors of commerce providing commuters, shippers, and travelers access to and from the region as well as throughout the United States. SR-93 (John B. Dennis Highway) is an expressway that is partially access controlled with grade-separated interchanges at major roadway crossings. Segments of US-23 are additional examples of expressways within the MPA.

Principal arterials are roadways that serve major activity centers, such as downtown Kingsport or highly developed residential and commercial areas. Principal arterials generally carry high traffic volumes and accommodate longer trips within the region. Examples of principal arterial roadways within the MPA include US-11W (SR-1/Stone Drive), SR-36 (Fort Henry Drive), and segments of US-23 in Virginia. One noticeable concern related to the Kingsport region functional classification is the lack of a north-south arterial in the eastern portion of the MPA (east of SR-36). This is discussed further in Chapter 5.

Minor arterials interconnect with principal arterials and collectors and typically provide more frequent access to commercial development as compared to principal arterials. Minor arterials typically do not accommodate traffic volumes as high as principal arterials. Within the MPA, examples of minor arterials include SR-126 (Memorial Boulevard), SR-126 (Wilcox Drive), and SR-75 (Airport Road).

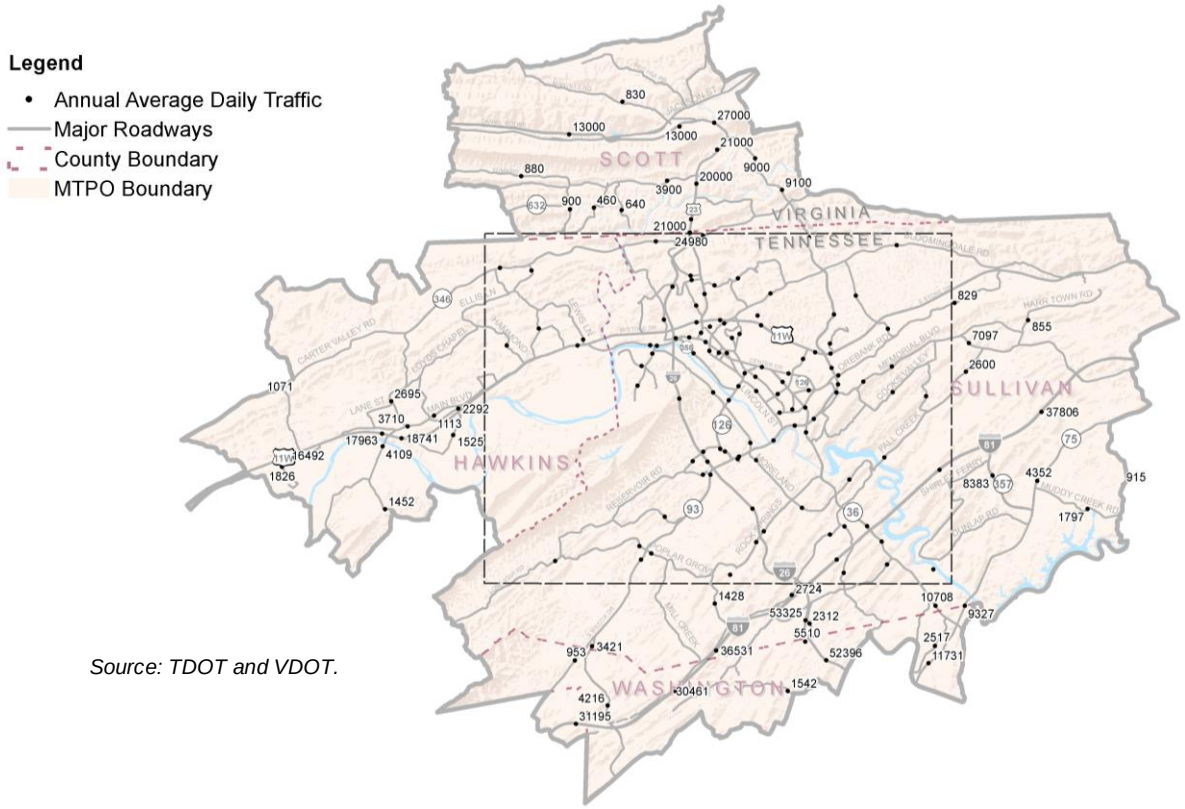
Collector roadways provide both land access and circulation within residential neighborhoods and commercial or industrial areas. Collectors typically function to connect neighborhoods and local roads with the arterial roadway network. Collector roadways generally carry lower traffic volumes and accommodate shorter trip lengths compared to arterials.

Daily Traffic Volumes

The highest daily traffic volumes, or Annual Average Daily Traffic (AADT), within the MPA are found on higher classified roadways such as US-11W (SR-1/Stone Drive), SR-93 (John B. Dennis Highway), SR-36 (Fort Henry Drive), I-26, I-81, and US-23. **Figure 25** and **Figure 26** illustrate recent (2018/2019 AADT) volumes for major corridors within the MPA.

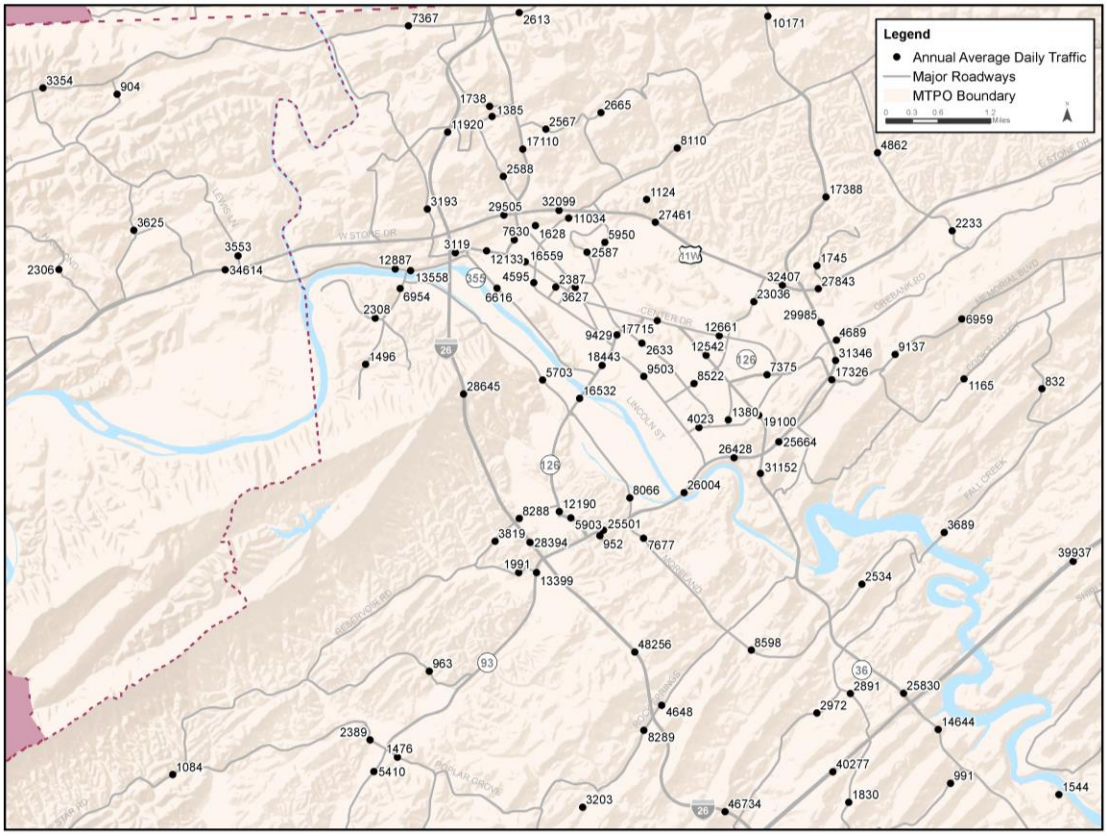
I-26, just south of I-81, has an AADT of approximately 52,400. Volumes along I-81 range from approximately 31,200 near the western portion MPA boundary to 37,800 near the eastern portion of the MPA boundary. Portions of US-23, in Virginia, have an AADT of 27,000. While not classified as an interstate, these volumes are comparable to some other interstates across the country.

Figure 25. Average Annual Daily Traffic (2018/2019) – MPA



Source: TDOT and VDOT.

Figure 26. Average Annual Daily Traffic (2018/2019) – Zoom Area



Source: TDOT and VDOT.

Capacity Analysis

An important aspect of understanding traffic operations involves comparing daily roadway volumes (or AADT) to roadway capacity. Characteristics such as number of lanes, functional classification, travel/posted speeds are important factors that influence roadway capacity. When daily volumes are compared to capacity, a volume-to-capacity (V/C) ratio is determined. The Highway Capacity Manual (HCM) sets industry standards for traffic operations and level of service (LOS) categories, along with the V/C thresholds, which are summarized in **Table 25**.

Table 25. Level of Service Descriptions

LOS	V/C Ratio	Description
A	-	**Free flow.** Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high.
B	-	**Stable flow**. The presence of others in the trafficstream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic stream compared to LOS A.
C	-	**Stable flow.** This marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.
D	>0.70	**High-density, but stable flow.** Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.
E	>0.85	**Operating conditions at or near capacity.** Freedom to maneuver within the traffic stream is extremely difficult.Comfort and convenience levels are extremely poor and driver frustration is generally high.
F	>1.00	**Forced or breakdown flow.** This condition exists when the amount of traffic approaches a point that exceeds the amount that can traverse the point.

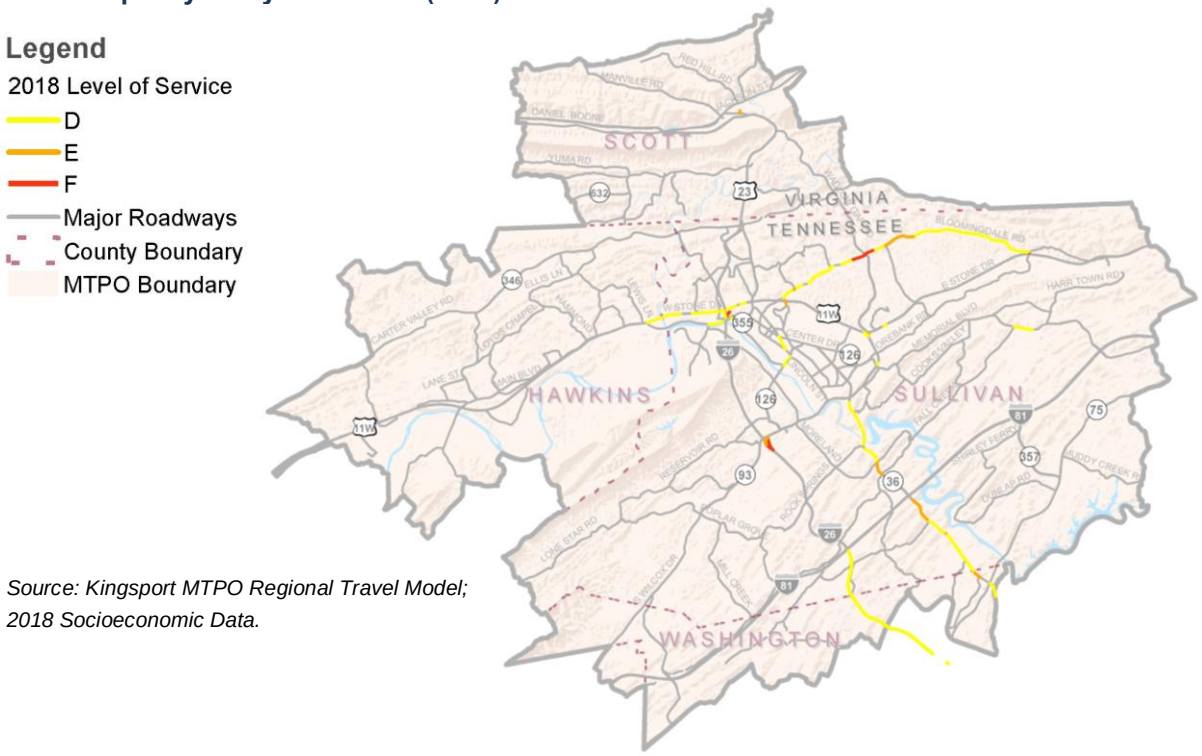
Source: Highway Capacity Manual.

In general, if the V/C ratio is equal to 1.00, then that roadway segment is considered to be operating “at-capacity.” When the V/C ratio is greater than 1.00 the roadway segment is be considered to be operating “over-capacity.” The higher the V/C ratio indicates a higher level, or degree, of traffic congestion. For planning purposes, acceptable congestion levels typically correspond to LOS D, which is considered approaching capacity.

The Kingsport regional travel demand model was reviewed and updated as part of the 2045 LRTP update. The model was updated to reflect 2018 baseline conditions, which was chosen to be consistent with the update of the TDOT statewide model which was taking place at the same time as this LRTP update.

Figure 27 displays the roadway segments within the MPA that are operating at LOS D, E, or F. The existing (2018) capacity analysis shows some corridors with LOS D conditions or worse. LOS D conditions are identified along SR-36 with LOS E conditions highlighted in the interchange area of I-81. I-26, south of I-81, is also operating at LOS D with LOS F conditions observed near the interchange with SR-93 (John B. Dennis Highway). Portions of Bloomingdale Pike and Bloomingdale Road are also showing LOS D, E, and F conditions. US-11W (SR-1/Stone Drive) also includes segments operating at or near capacity, in particular near the termination of I-26 at the interchange area.

Figure 27. Capacity Analysis Results (2018)



Source: Kingsport MTPO Regional Travel Model; 2018 Socioeconomic Data.

In some cases, even when the model is showing potential capacity concerns, these issues could be the result of poor intersection operations and may not necessarily reflect reoccurring traffic congestion along an entire corridor segment. As such, the travel demand model results should be viewed as one piece of information that is used to inform the comprehensive evaluation of the regional transportation system, and not necessarily a standalone result.

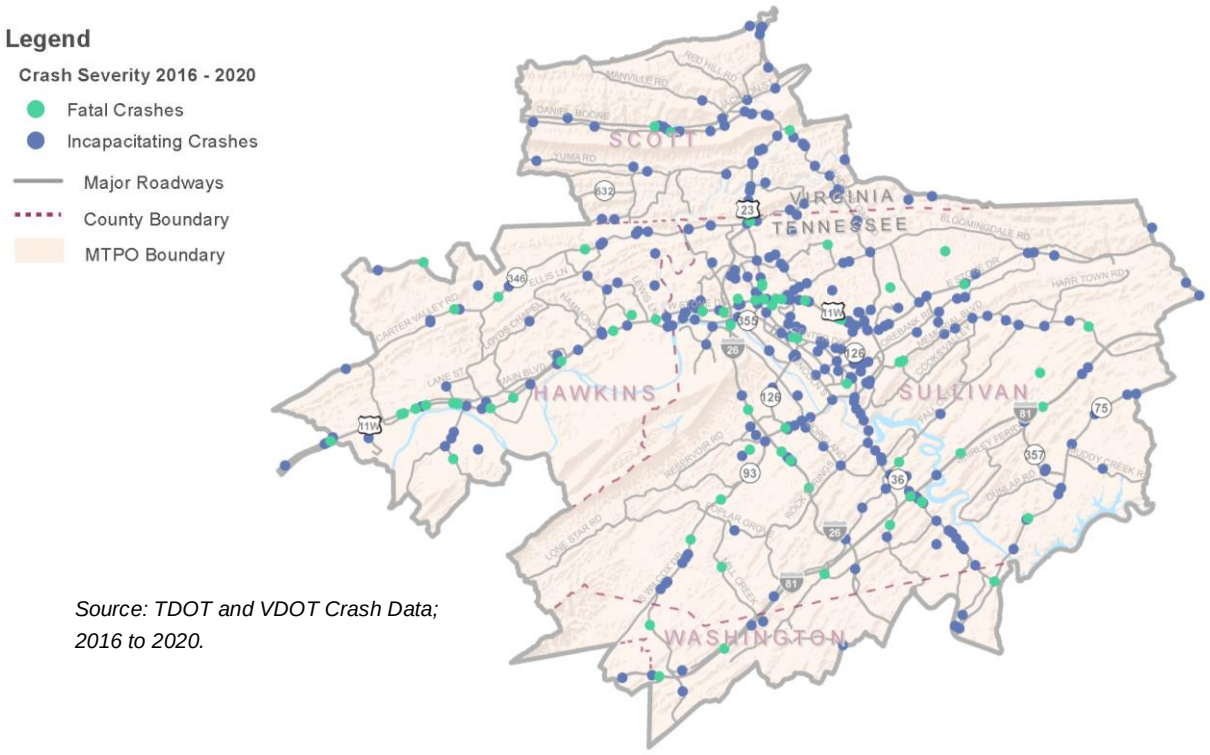
Motorist/Vehicular Safety

Safety is one of the highest priorities for the Kingsport MTPO. Motorist/Vehicular safety data (2016 to 2020) within the MPA was reviewed to identify trends and potential areas of concern. Identifying these locations can lead to identifying projects that help improve safety and enhance the overall traffic flow within the region. Federal legislation also places an increased emphasis on safety including requiring MPO's and state DOTs to track performance in reducing the number of fatalities and serious injuries. The LRTP should also incorporate priorities, goals, countermeasures, and/or projects that support the State's Strategic Highway Safety Plans. As a bi-state MPO, the Kingsport region must consider both Tennessee's and Virginia's Strategic Highway Safety Plans. The discussions in this section are provided in accordance with these requirements and are intended to enhance transportation safety for all roadway users within the Kingsport MPA.

Vehicular Crashes

Figure 28 displays the location of fatal and serious injury crashes that occurred within the Kingsport MPA between 2016 and 2020. Consistent with the 2040 LRTP, a high concentration of crashes was observed along SR-36 (Fort Henry Drive) and US-11W (SR-1/ Stone Drive), as well as areas in downtown Kingsport and along the US-23 corridor in Virginia. In addition, there were a number of crashes resulting in fatalities located in the western portion of the Kingsport MPA.

Figure 28. Crash Severity (2016 to 2020)



Source: TDOT and VDOT Crash Data; 2016 to 2020.

Table 26 summarizes the number of vehicular crashes, by severity, broken down by year and by state. The total number of crashes within the MPA dropped from 3,773 in 2016 to 3,155 in 2020. This sharp decline is due primarily to the impact COVID-19 has had on work commutes, as well as a reduction in overall trip making especially in 2020. When looking at the year prior to COVID-19, the total number of crashes in 2019 was 3,490 which reflected in a decrease in crashes compared to the three previous years.

Table 27 summarizes the total vehicular crashes, by crash type, between 2016 and 2020. According to the data, rear end collisions represent 30% of crashes that occurred within the Kingsport MPA. Angle collisions represent the second highest category at just slightly under 28%. Together, rear end and angle collisions account for nearly 58% of all crashes that occur within the MPA.

Nearly one-quarter (24%) of crashes, representing the third highest category, within the MPA are classified as “no collision (other).” Examples of this crash type include inattentive driving, texting while driving, falling asleep at the wheel, or running off the road due to weather conditions, or poor lighting and/or roadway conditions. As previously shown in **Figure 28**, a number of these non-collision crashes were observed in the rural portions of the MPA and in some cases involve motorists who are speeding, and/or reckless driving. These concerns regarding an increase in speeding and reckless driving within the MPA were reinforced by local law enforcement as part of the LRTP stakeholder outreach.

Table 26. Vehicular Crash Summary, by Severity (2016 to 2020)

	MPO Area	Fatalities	Serious Injury	Minor Injury	PDO	Total
2016	Tennessee	11	81	690	2,802	3,584
	Virginia	-	13	31	145	189
	Subtotal	11	94	721	2,947	3,773
2017	Tennessee	13	64	759	2,646	3,482
	Virginia	1	16	35	132	184
	Subtotal	14	80	794	2,778	3,666
2018	Tennessee	17	63	659	2,757	3,496
	Virginia	1	11	38	128	178
	Subtotal	18	74	697	2,885	3,674
2019	Tennessee	24	57	632	2,624	3,337
	Virginia	-	9	27	117	153
	Subtotal	24	66	659	2,741	3,490
2020	Tennessee	12	52	530	2,454	3,048
	Virginia	1	8	14	84	107
	Subtotal	13	60	544	2,538	3,155
2016 to 2020	Tennessee	77	317	3,270	13,283	16,947
	Virginia	3	57	145	606	811
	Subtotal	80	374	3,415	13,889	17,758

Source: TDOT; VDOT; Crash Data. NOTE: PDO = Property Damage Only.

Table 27. Total Vehicular Crashes, by Crash Type (2016 to 2020)

	MPO Area	Rear End	Angle	No Collision (Other)	No Collision (Animal)	Sideswipe	Other	Head On	Total
2016	Tennessee	1,091	1,004	862	264	247	70	46	3,584
	Virginia	56	39	40	24	16	7	7	189
	Subtotal	1,147	1,043	902	288	263	77	53	3,773
2017	Tennessee	1,105	941	829	261	212	82	52	3,482
	Virginia	58	44	41	15	11	9	6	184
	Subtotal	1,163	985	870	276	223	91	58	3,666
2018	Tennessee	1,054	1,010	818	242	222	87	63	3,496
	Virginia	58	39	43	10	19	7	2	178
	Subtotal	1,112	1,049	861	252	241	94	65	3,674
2019	Tennessee	999	916	781	262	226	89	64	3,337
	Virginia	39	29	38	24	10	10	3	153
	Subtotal	1,038	945	819	286	236	99	67	3,490
2020	Tennessee	791	849	789	286	211	76	46	3,048
	Virginia	23	24	30	12	10	6	2	107
	Subtotal	814	873	819	298	221	82	48	3,155
2016 to 2020	Tennessee	5,040	4,720	4,079	1,315	1,118	404	271	16,947
	Virginia	234	175	192	85	66	39	20	811
	Subtotal	5,274	4,895	4,271	1,400	1,184	443	291	17,758
	Percentage	29.7%	27.6%	24.1%	7.9%	6.7%	2.5%	1.6%	

Source: TDOT; VDOT; Crash Data.

Tennessee and Virginia Strategic Highway Safety Plans

Federal law requires that the LRTP address the safety component of the State's Strategic Highway Safety Plan (SHSP). Since the Kingsport MTPO is a bi-state MPO, the discussions in the following sections discuss the Tennessee and Virginia Strategic Highway Safety Plans. Generally speaking, both state's SHSP focuses heavily on the advancing the "4-E" principles: engineering, enforcement, emergency services, and education, to improve highway and traffic safety.

Engineering involves the built roadway and transportation infrastructure and encapsulates design standards; warrants; materials and construction practices; and signage, striping, and signalization policies. Enforcement is aimed toward modifying (enforcing) human behavior. Enforcement affects drivers in the following way: a law will be enforced, an offender will be detected, the adjudicatory process will be swift and certain, and punishment will follow conviction. Emergency services include the assemblage of ambulance companies, fire rescue services, and third-party emergency response units and emergency rooms/trauma centers. Obtaining accurate post-crash diagnosis and high-quality post-crash care is a critical factor in transportation safety. Finally, similar to the enforcement programs that modify behavior through enforcement, education programs are intended to modify behavior through knowledge. Education encompasses driver licensing programs, driver remediation programs (e.g., traffic school), advanced driving courses, educational campaigns such as "Click It or Ticket" and "Booze it & Lose It," and school education programs aimed at K-12 and college level students. Combined, the 4-Es capture the range of transportation safety related investments that are needed to improve safety within any jurisdiction.

TDOT Strategic Highway Safety Plan

The Tennessee Strategic Highway Safety Plan (2020 – 2024) is intended to help develop a comprehensive safety road map for the state, identifying concerns related to crashes resulting in fatalities and serious injuries (severe crashes) and providing strategies to mitigate or eliminate these concerns. According to the plan, the recent SHSP update builds off the foundation set forth by the State's original SHSP in 2004 and subsequent updates, and uses a data-driven approach with collaboration from various agencies and organizations statewide to:

- Determine predominant factors and trends associated with severe crashes
- Develop a comprehensive list of safety strategies to combat identified safety concerns
- Identify current programs, initiatives, and projects (actions) in line with safety strategies
- Identify potential actions and associated challenges with their implementation

The plan also reinforces TDOT's commitment to the Toward Zero Deaths (TZD) vision. TZD is the result of a national collaboration of safety professionals from various agencies and organizations using a data-driven approach to develop standard strategies focused on providing safer roadways that are regularly refined, implemented, and evaluated. The vision set forth by TZD is a surface transportation network free of fatalities through a sustained and even accelerated decline in transportation related deaths and injuries.

The TDOT SHSP is shaped through contributions from a range of safety stakeholders and includes a multifaceted set of strategies and actions that relate to the 4-E's of Transportation Safety. The plan states that multi-faceted solutions are essential to the reduction of severe crashes, as their cause can be the result of one or more factors (human, infrastructure, environmental, etc.) that may not be solved through the use of only one of the 4-E's. The current TDOT SHSP also identifies the following emphasis areas for the 2020 to 2024 time period:

- Data collection and analysis
- Driver behavior
- Infrastructure improvements
- Vulnerable road users
- Operation improvements
- Motor carrier safety

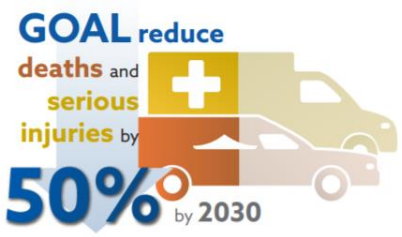
Additional dissuasion regarding progress toward achieving the safety measures/targets is included in **Appendix D.**

VDOT Strategic Highway Safety Plan

VDOT is in the process of updating the five-year SHSP, Arrive Alive!, which focuses on actions to reduce fatalities and serious injuries on Virginia's roadways to ultimately continue on a course towards zero. The SHSP update will cover the 2022 – 2026 timeframe. In the meantime, the current plan (2017 – 2021) was reviewed for coordination with the Kingsport MTPO 2045 LRTP update.

Since 2006, the Arrive Alive SHSP has been Virginia's document guiding the State Toward Zero Deaths. The plan reflects a multi-agency, comprehensive, data-driven approach to reduce fatalities and serious injuries on all public roads. Over time, the plan has evolved and matured with the advancement of safety planning techniques. The plan updates include public meetings and outreach and presents a coordinated framework for addressing the most serious traffic safety problems. It includes statewide goals and critical emphasis areas and developed in consultation with Federal, state, regional, and local stakeholders from throughout the Commonwealth who represent the 4-Es of safety.

While the purpose is to reduce fatalities and serious injuries on all public roads, the SHSP goes further by identifying and supporting behaviors and attitudes that promote a positive safety culture. Virginia's motto to achieve Toward Zero Deaths is "Arrive Alive," a goal for almost every road user when they drive, walk, or ride. The plan highlights the goal of reducing deaths and serious injuries by 50% by the year 2030. To ensure these decreases are not only achieved but surpassed, Virginia is using the SHSP as the roadmap for infrastructure improvements, behavioral changes as it relates to traffic safety and improved incident response.

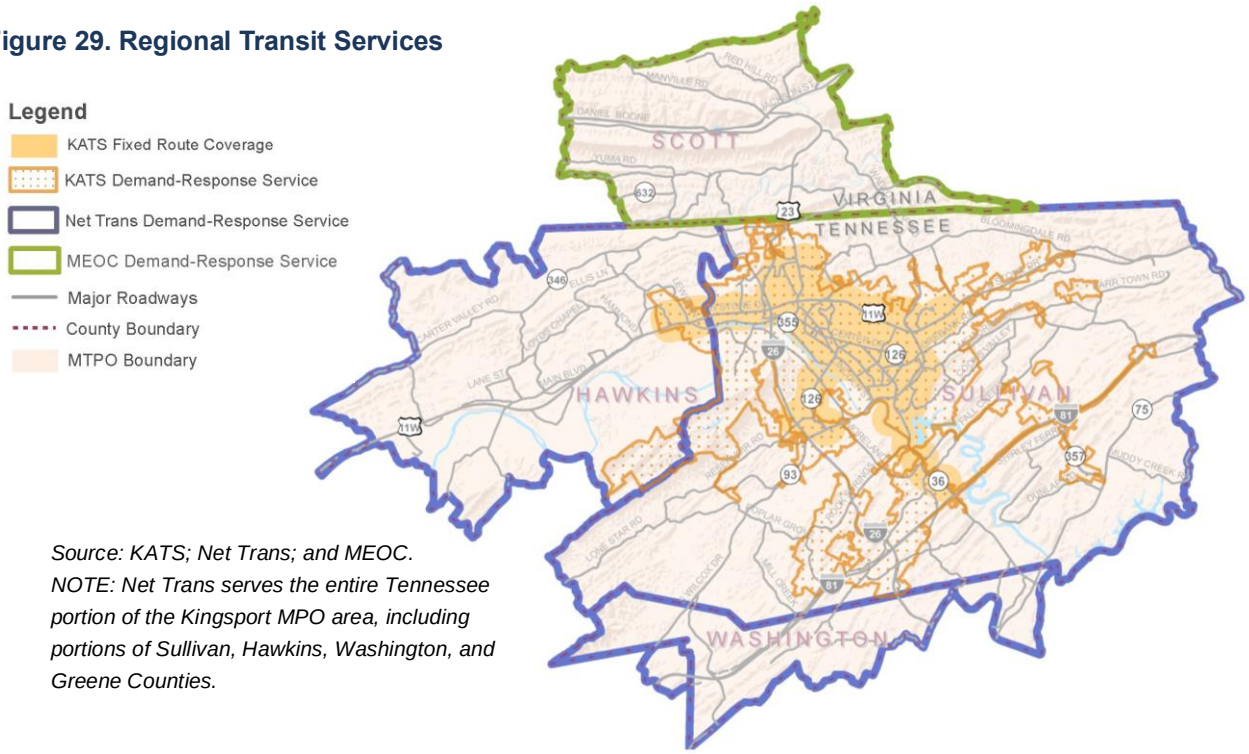


The SHSP also identifies countermeasures for addressing specific crash types. Roadway departures and intersection crashes, which are common crash types within the region, are discussed. The Kingsport MTPO is committed to working with VDOT, and TDOT, to improve safety for the traveling public throughout the Kingsport MPA for all transportation users.

Public Transportation

The Kingsport region is served by three primary public transportation providers – Kingsport Area Transportation System, Northeast Tennessee Rural Public Transit, and Mountain Empire Older Citizens Agency[5]. These services range from fixed-route/demand-response in the City of Kingsport to flexible, demand-response in the rural portions of the MPA. **Figure 29** displays the regional transit services within the Kingsport MPA. The following sections describe the respective public transportation providers/services.

Figure 29. Regional Transit Services



Source: KATS; Net Trans; and MEOC.
NOTE: Net Trans serves the entire Tennessee portion of the Kingsport MPO area, including portions of Sullivan, Hawkins, Washington, and Greene Counties.

Kingsport Area Transit Service

The Kingsport Area Transit Service (KATS) provides fixed-route and demand response services in the City of Kingsport. KATS is the only fixed-route bus service offered within in the MPA.

Fixed-Route Service

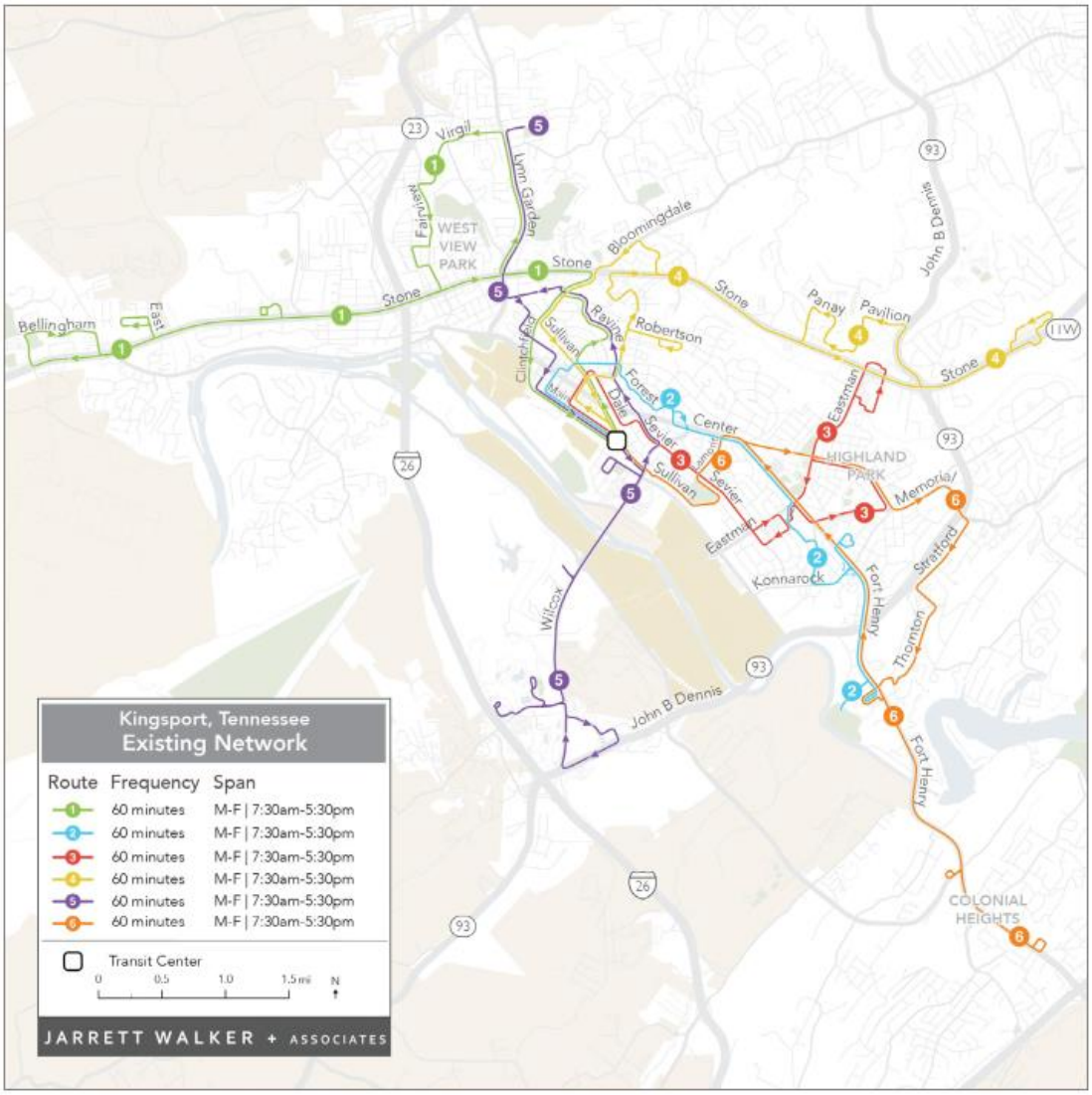
KATS began service in 1995 providing one fixed-route and one ADA/paratransit vehicle. KATS currently operates six fixed-routes, Monday through Friday from 7:30 am - 5:30 pm. The service is designed as a "pulse system" requiring all the routes to originate downtown, from KATS downtown transit facility located at 900 East Main Street. This facility opened in 2019 and provides an improved experience for the traveling public while supporting future growth, accessibility and safety within the community as well as enhancing the East side gateway appearance to the city.

The fixed-route service operates on a frequency of 60 minutes. To facilitate transfers, all buses arrive at the KATS transit facility at the same time for a timed transfer or pulse. The network includes several one-way loops and deviations. With these loops and deviations, KATS service covers many parts of the city, but provides a relatively limited service schedule on each route. While individuals have access to service every 60 minutes, the one direction only configuration can result in a rider needing to travel nearly the entire loop to access some destinations.

Figure 30 illustrates the six routes that comprise the existing service network for KATS fixed route bus service.

[5] Following a recent rebranding, the transit service under MEOC will be known as Mountain Empire Transit (MET).

Figure 30. KATS Fixed-Route Service

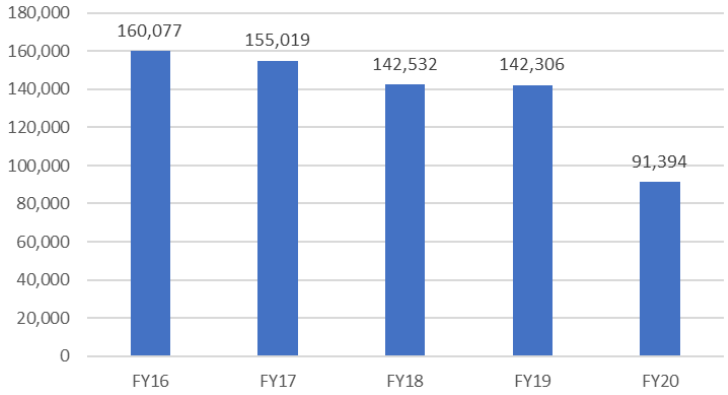


Source: Update of the Transit Network in Kingsport, TN; Final Report – July 2021.

KATS regular fare to ride the bus is $1.00. For anyone 65 or older, the fare is $0.50. Students can ride the bus for free with a valid ID card. KATS offers monthly passes that allow passengers to utilize the bus system an unrestricted number of times. Transfers to other bus routes are free at designated locations. KATS has installed benches and bus shelters at various locations throughout Kingsport for rider's convenience. All KATS bus signs are posted with the route schedule.

Figure 31 illustrates KATS annual ridership for the fixed-route bus service from fiscal year (FY) 2016 through 2020. As shown, bus ridership has decreased slightly over the past five years consistent with a national downward trend in public transportation ridership. A strong economy during the first few years of this period could be contributing in part to this trend, in addition to riders often seeking out personal vehicles when transit services are limited (hours of operation and frequency). The lowest ridership during the past five-year period was observed in FY 20. This significant ridership decline is directly attributed to COVID-19, and the resulting impacts the pandemic has had on transit service, as well as overall general travel patterns.

Figure 31. KATS Annual Fixed Route Ridership (2006-2020)



Source: KATS; 2021.

Demand Response Service

In addition to fixed-route service, KATS provides demand response service which includes paratransit service that covers the entire Kingsport City limits to persons who qualify under ADA guidelines, Dial-A-Ride 65 service to Kingsport residents age 65 or older, and a Job Assist program for City residents attempting to go to work; these services are provided within ¾ of a mile within the Dial-A-Ride zone. KATS demand response ridership was relatively stable between 2016 and 2019 but has declined approximately 20% in FY 2020, due primarily to COVID-19. The fares for these three programs as displayed in **Table 28**.

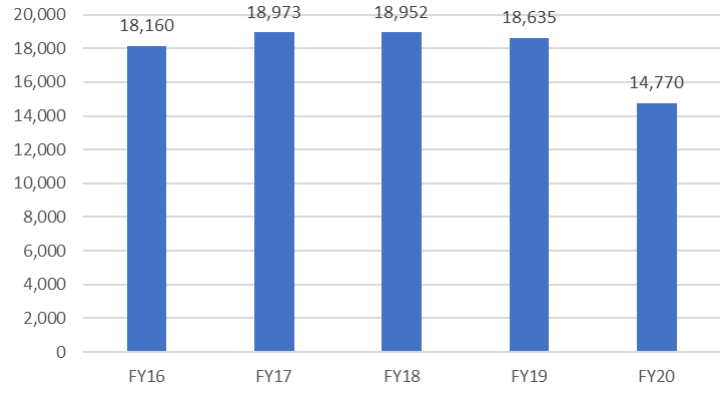
Table 28. Demand Response Fares

Service	Fare
Dial-A-Ride Paratransit	$2.00
Dial-A-Ride 65	$3.00
Dial-A-Ride Jobs Assist	$3.00

Source: KATS, 2021.

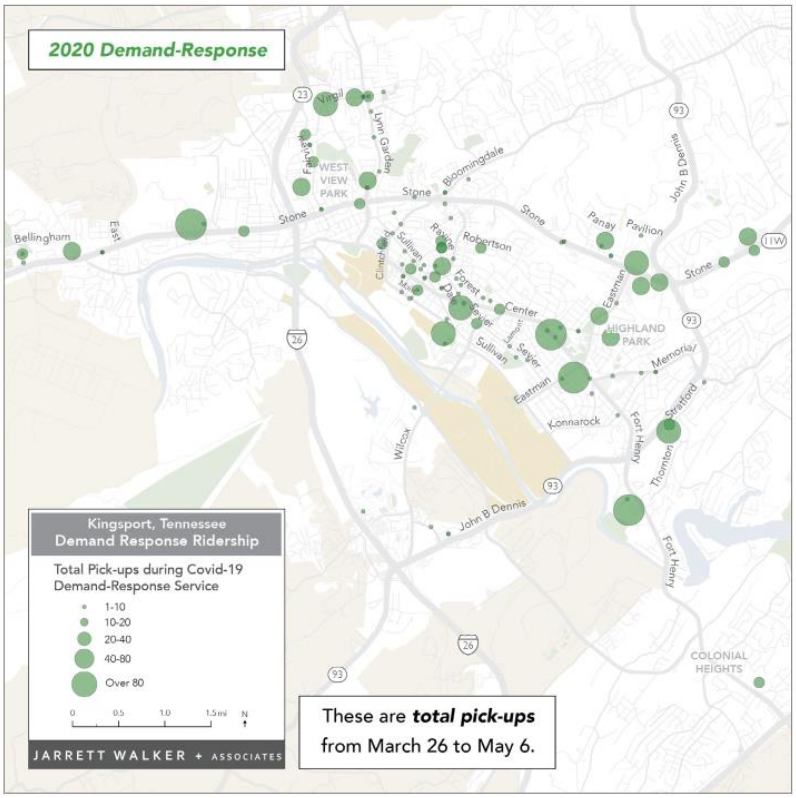
Figure 32 illustrates ridership trends of KATS's demand response services over the last five years. Ridership has generally remained consistent, in the range of approximately 18,000 to 19,000 riders per year. **Figure 33** displays the location of high demand response ridership (total pick-ups) that was recorded between March 26, 2020, and May 6, 2020. This information is useful in informing future planning and programming of projects, including roadway investments that might include enhanced pedestrian accommodations that correspond to the higher demand response areas.

Figure 32. KATS Demand Response Service Ridership (2006-2020)



Source: KATS, 2021.

Figure 33. Demand Response Ridership (March 26, 2020, to May 6, 2020)



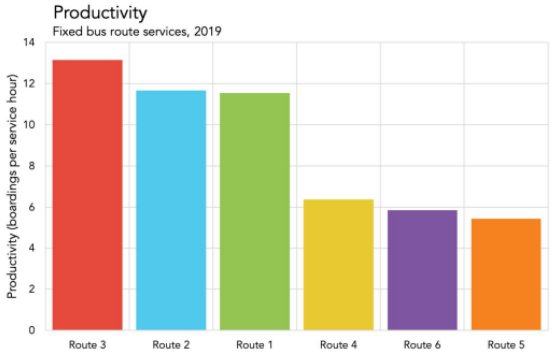
Source: Update of the Transit Network in Kingsport, TN; Final Report – July 2021.

Recent Planning Activities/Studies

KATS completed the *Update of the Transit Network in Kingsport, TN* in July 2021. The study was conducted in large part due to the impacts that COVID-19 had on the overall fixed-route and demand response services. The study indicated that KATS was reevaluating the purpose of transit in Kingsport to better understand the city's values and goals for transit.

The study included the analysis of route productivity, as shown in **Figure 34**. The study found that KATS has three routes that are clearly more productive than the other three. Routes 1, 2, and 3 were found to have a productivity of about 12 boardings per service hour. Productive routes also have a lower operating cost per boarding and routes 1, 2, and 3 average around $5 per boarding. Routes 4, 5, and 6 were found to have a productivity of about six boardings per service hour which equates to approximately $11 per boarding.

Figure 34. Fixed-Route Productivity (2019)



Source: Update of the Transit Network in Kingsport, TN; Final Report – July 2021.

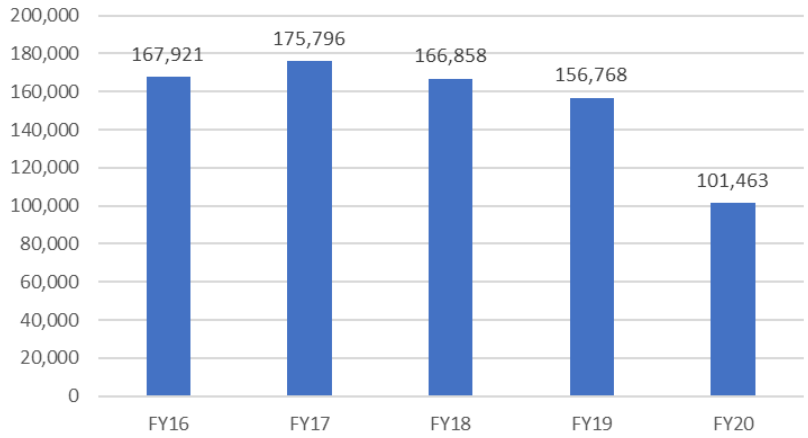
Northeast Tennessee Rural Public Transit

Northeast Tennessee Rural Public Transit (NET Trans) is the service provider of First Tennessee Human Resource Agency (FTHRA) with services to an eight-county region. Within the Kingsport MPA, NET Trans provides service to the rural areas of Sullivan, Hawkins, and Washington counties, with a focus on service to the cities of Church Hill and Mount Carmel.

As a rural transit provider, NET Trans provides service for trips with an origination or destination located beyond the Kingsport Urbanized Area. In addition, NET Trans can provide service within the Kingsport Urbanized Area (including within the Kingsport City limits) as long as a trip has an origination or destination outside the Kingsport Urbanized Area. NET Trans primarily use 15 passenger, lift-equipped vans and generally operate on routes and schedules dictated by the needs of patrons. Operating hours are Monday through Friday, between the hours of 6:00 am and 6:00 pm, excluding holidays, and fares are zone-based, ranging from $2.00 to $12.00 per one-way trip.

Based on recent ridership data, NET Trans provided a high of nearly 175,800 trips in FY 2017. That total declined slightly in FY 2018 and FY 2019. There was a dramatic decline observed in 2020, again due to the COVID-19 pandemic. **Figure 35** illustrates ridership trends of NET Trans demand response services over the last five years for the eight-county FTHRA Region.

Figure 35. NET Trans Demand Response Service Ridership (2016-2020)



Source: NET Trans, 2021

Note: Graphic depicts ridership for 8-County FTHRA Region.

Mountain Empire Older Citizens Agency/Mountain Empire Transit

Mountain Empire Older Citizens Agency (MEOC), an Area Agency on Aging, has been providing transportation services in the counties of Lee, Scott, and Wise, Virginia since its inception in 1974. Following a recent rebranding, the transit service under MEOC will be known as Mountain Empire Transit (MET). In 1983, MEOC added rural public transportation services with federal funding assistance through the Virginia Department of Rail and Public Transportation (VDRPT). Today, MEOC/MET provides coordinated transportation on a demand-response basis throughout Wise, Lee and Scott counties and the City of Norton.

MEOC/MET transit services are generally provided Monday-Friday from 7:00 am to 5:00 pm. MEOC/MET requires a 24-hour advance notice when scheduling a trip. While all the services provided are open to the general public, the majority are general public transportation trips with the minority focusing on programs. These programs include:

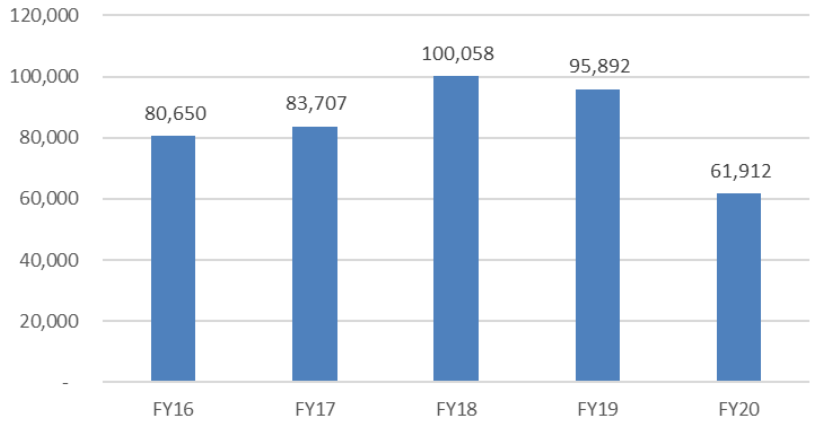
- adult daycare
- congregate meals/home delivered meals

- developmental services
- independence house
- Medicaid
- Program of All-Inclusive Care for the Elderly (PACE)

The adult fare to ride MEOC/MET Transit is $1.50 per trip. The fare is discounted to $0.75 per trip for adults ages 60 and above and for people under the age of 18. As a demand response regional transit provider, MEOC/MET provides some level of service to all the trip generators in the counties of Lee, Scott, and Wise in Virginia, but does not serve Kingsport on a regular basis. It should also be noted that MEOC/MET in December 2021 received Transit Ridership Incentive Program (TRIP) funding from the Virginia Commonwealth Transportation Board that will allow them to provide transportation services free within their service area for the next four years.

Figure 36 displays the MEOC/MET ridership for FY 2016 to FY 2020. In the past five years, MEOC/MET saw ridership reach a high of 100,000 in FY 2018. Ridership declined slightly in FY 2019 but remained strong before dropping off to 61,900 riders in FY 2020. As previously mentioned with other transit providers, COVID-19 significantly impacted ridership levels.

Figure 36. MEOC Demand Response Service Ridership (2016-2020)



Source: MEOC/MET, *2021.*

Other Transit and Travel Demand Management Activities

Greyhound service to the Kingsport MPA was discontinued in 2017; however, area residents can access Greyhound intercity bus service in Johnson City (137 W Market Street). Also, while the Tennessee portion of the Kingsport MPA does not have park-and-ride facilities, the Virginia portion of the MPA includes two park-and-ride lots, with another three lots located outside the planning area. The MTPO continues to support efforts to potentially expand park-and-ride facilities throughout the entire MPA.

Bicyclists and Pedestrians

Non-motorized travel represents a relatively small portion of work commuting trips within the Kingsport MPA; however, for some it is the only means of travel and for others walking and/or biking is an important recreational activity and part of an active/healthy lifestyle. The Kingsport region is committed to investing in non-motorized projects that expand/enhance local and regional network connections, improve safety, and support tourism and economic development activity within the region. Furthermore, investments in the bicycle and pedestrian network/facilities are consistent with the LRTP goals of supporting livability and sustainability within the region. The following summarizes the bicycle and pedestrian elements within the MPA.

Recent Planning Activities/Studies

The Kingsport MTPO actively conducts bicycle and pedestrian planning studies and pursues grant funding to construct non-motorized facilities. The following summarizes some recent non-motorized planning activities.

Regional Bicycle and Pedestrian Plan

Over the past decade, interest in active transportation solutions within the region has been growing among citizens, the business community, and local leaders across all spectrums and age genres. In response to this growing interest, the MTPO completed the *Kingsport MTPO Regional Bicycle and Pedestrian Plan* in 2012 that established a comprehensive vision for a regional bikeway and pedestrian network within the Kingsport MPA. This vision enabled regional jurisdictions to plan and implement facilities that improve safety, enhance mobility, and promote a higher quality of life throughout the region.

In February 2022, the MTPO adopted the *Kingsport MTPO Regional Bicycle and Pedestrian Plan* update. As stated in the document, this plan is intended to build upon the 2012 plan, it does not replace the 2012 plan. The recent plan identified the following reasons for completing the update:

- Progress has been made since the adoption of the 2012 plan – recommended projects have been constructed and policies have been implemented;
- The Kingsport urbanized area remains a generally unsafe place to walk or bike for many residents and improvements can continue to be made to make the region a safer place to walk or bike;
- Many low-income and vulnerable populations that rely on walking, bicycling, or transit do not have safe, convenient access to these forms of transportation; and,
- Other local agencies, in particular the City of Kingsport Parks and Recreation Department, have planned key extensions to existing local facilities, most notably the Kingsport Greenbelt.

Brickyard Park Bridge Grant

In September 2021, the City of Kingsport was awarded a $1.85 million grant through the TDOT Transportation Alternative Program (TAP). The grant will be used to support the construction of a pedestrian and bicycle bridge to increase accessibility to and connectivity between the Brickyard Park area and downtown.

Brickyard Park's current and future amenities include a four-field baseball and softball complex; Miracle Field, which is designed for youth and young adults with mental and physical disabilities; all-accessible playground; bicycle pump track; expanded Scott Adams Memorial Skate Park; public greenspace; a housing community and more. On the north end, pedestrians and bicyclists will be able to access downtown Kingsport's parks, businesses, retail shops, restaurants and residences.

The bridge's location provides convenient access to the KATS transit facility, an extensive sidewalk system connected to SR-126 (Wilcox Drive) and the Kingsport Greenbelt; a ten-mile linear park that connects residential neighborhoods, traditional parks, downtown, commercial districts, schools and activity centers.

The Brickyard Park bridge will improve pedestrian safety and connectivity within the city and will have a positive effect on the local economy by providing an essential link between neighborhoods and downtown jobs and amenities. The TAP grant is intended for the construction phase, the City is using TDOT Surface Transportation Block Grant (STBG), which is 80% funded by the federal government and 20% by local government, to cover the preliminary costs of the project. The total estimated construction cost is $3 million.

Non-Motorized Vision, Goals and Objectives

The purpose of the *Kingsport MTPO Regional Bicycle and Pedestrian Plan* 2022 plan update is to guide the development of bicycle and pedestrian improvements over the next 20 years throughout the region, consistent with the LRTP horizon year 2045. The plan includes recommended bicycle and pedestrian networks and improvements in all the cities and counties within the Kingsport MPA. Additionally, the plan includes a set of policy and program strategies that, taken together, provide important tools for implementing the plan at both the regional and local levels. Finally, the *Kingsport MTPO Regional Bicycle and Pedestrian Plan* establishes the following vision statement, and plan goals and objectives as listed in **Table 29**. The LRTP looks to coordinate with and build upon opportunities identified in the Plan to strengthen multimodal connections within the Kingsport MPA, and in doing so provide safe and convenient connections for all transportation system users.

Kingsport MTPO Regional Bicycle and Pedestrian Plan Vision Statement

The purpose of the Kingsport MTPO Regional Bicycle and Pedestrian Plan is to establish a comprehensive bikeway and pedestrian network, suitable for users of all ages and abilities, which enables regional jurisdictions to plan and implement facilities that expand multimodal connectivity, improve safety, enhance mobility, and promote a higher quality of life throughout upper east Tennessee and southwest Virginia.

Table 29. Regional Bicycle and Pedestrian Plan Goals and Objectives

Livability	Sustainability	Prosperity	Connectivity
Provide safe, secure, convenient, and active transportation choices to all citizens which strengthens the livability and health of the region	Promote and advance sustainable transportation choices for the greater Kingsport region that support long-term economic, social, and environmental sustainability within and throughout the region	Promote transportation policies and investments that advance quality economic development and redevelopment, economic competitiveness, and increased access to people, places, and goods and services within and throughout the region	Establish a regional bicycle and pedestrian network that connects people of all ages and abilities to places they want to go
• Improve safety by reducing transportation-related fatalities and injuries • Make streets a place for all users - "Complete Streets" • Increase opportunities for short trips to be made by non-motorized modes to promote active transportation • Increase transit and other transportation demand management opportunities	• Maintain what we have - take a "state of good repair" approach to our community's transportation assets • Seek improvement options which minimize adverse impacts to historical, social, cultural, and natural environments • Promote investment solutions that reduce carbon and other harmful emissions from transportation	• Strategically target transportation investments to areas supportive and conducive to growth and redevelopment opportunities • Support land use and development patterns that reduce transportation costs and expenditures for all users • Continue to promote and foster an environment by which citizens, communities, jurisdictions, elected officials, and other stakeholders can collaboratively advance a sustainable multimodal transportation system that provides safe and secure connections throughout a livable and prosperous region	• Ensure that all facilities are suitable for users of all ages and abilities, consistent with national best practices in facility planning and design • Include links to key origins and destinations, including homes, schools, major employment centers, and parks and recreational facilities, as well as areas with high development or redevelopment potential • Promote connectivity within and among jurisdictions • Coordinate components of the network with parks and recreation plans, and other relevant land use and development plans

Source: Kingsport MTPO Regional Bicycle and Pedestrian Plan; pages 5 and 6; February 2022.

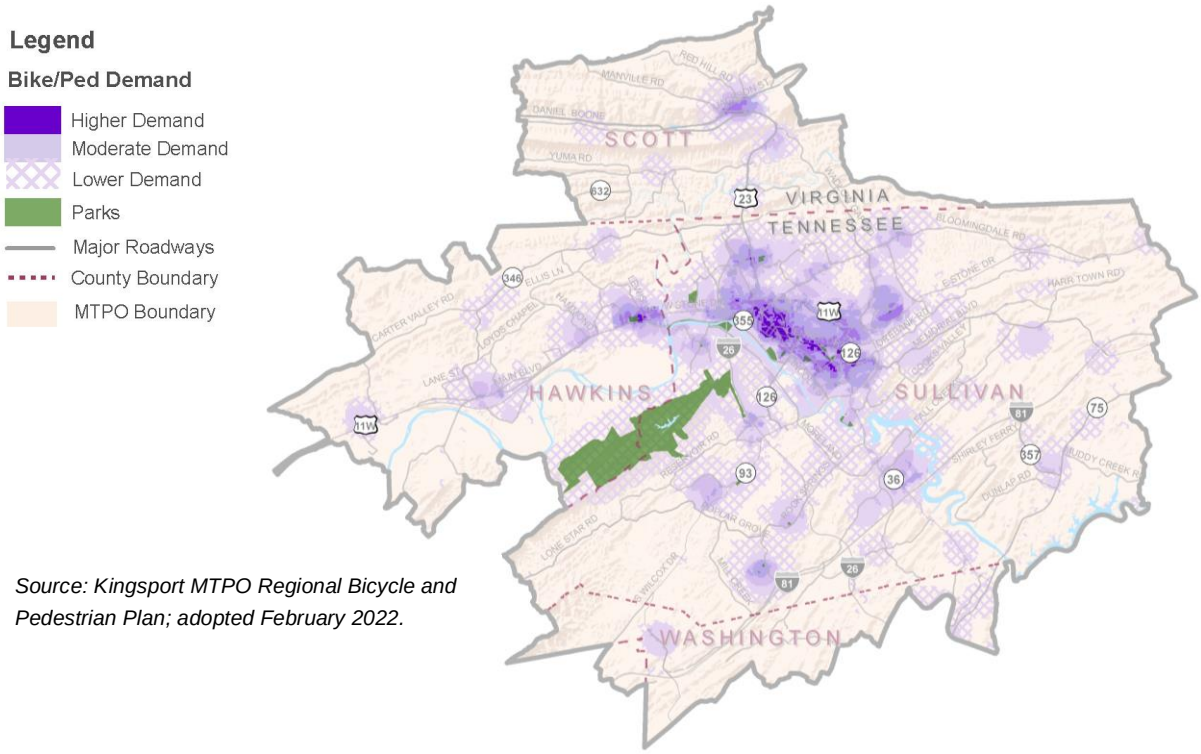
Existing Non-Motorized Facilities

Currently, approximately 46 miles of roadway with sidewalk and 30 miles of official bicycle accommodations exist within the region. Most sidewalks are located in downtown Kingsport, with other notable segments along (SR-36) Lynn Garden Drive and Orebank Road. Short segments exist in key commercial locations in Gate City, Weber City, Mount Carmel, and Church Hill. Many areas of commercial development, along roads like US-11W (SR-1/Stone Drive) and SR-36 (Fort Henry Drive), did not include sidewalk construction, which has created barriers to pedestrian travel; however, new pedestrian facilities (sidewalks) are being added on commercial segments of (SR-126) Wilcox Drive and US-11W (SR-1/Stone Drive). Furthermore, additional on-street bicycle facilities are being added within the MPA,

including bike lanes whereas in the past bicycle facilities have consisted primarily of shared lanes or paved shoulders. Other bike routes are signed in the area of Warriors' Path State Park.

The vast majority of potential walking and biking trips go unrealized for many reasons. One is the lack of adequate infrastructure. As part of the Regional Bicycle and Pedestrian Plan, the demand for walking and biking trips in the Kingsport MPA was analyzed based on existing conditions. Using a methodology developed by Gresham Smith Consultants, non-motorized trip demand within the MPA was estimated for existing and future walking and bicycle trips. Trips are primarily concentrated in areas where people reside in proximity to schools, parks, shopping areas, and other destinations. **Figure 37** shows high demand areas exist in downtown, in commercial areas like Fort Henry Mall, and adjacent neighborhoods with higher densities.

Figure 37. Existing Bicycle and Pedestrian Demand



Source: Kingsport MTPO Regional Bicycle and Pedestrian Plan; adopted February 2022.

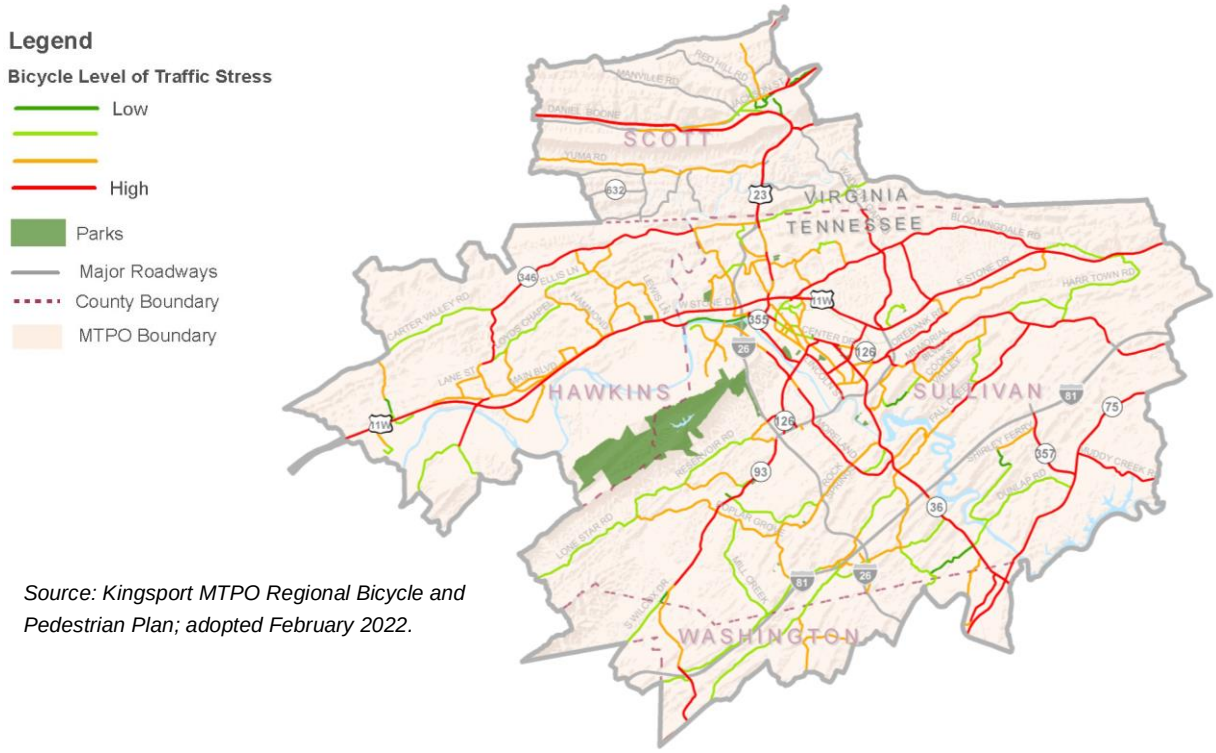
Bicycle Level of Traffic Stress

The Regional Bicycle and Pedestrian Plan includes a measurement known as Level of Traffic Stress (LTS) to help understand the perceived safety of bicycling in the region. Unlike conventional roadway LOS analyses, LTS rates streets relative to general user groups. Consistent with the data that was available, LTS was calculated primarily on functionally classified roads. As a result, local roads are generally omitted from the analysis. For bicycling, the user groups associated with LTS are:

- **LTS 1** – The level most users can tolerate including children and older adults; strong separation from all traffic except for low-speed, low-volume traffic
- **LTS 2** – The level tolerated by most adults; may require engaging with multiple vehicles at once, but only on lower-volume, lower-speed facilities
- **LTS 3** – The level tolerated by more confident adults, but those who still prefer dedicated space; involves interaction with moderate speed or multi-lane traffic or close proximity to higher speed traffic
- **LTS 4** – The level tolerated by the most experienced adults; involves mixing with moderate speed traffic or riding in close proximity to high-speed traffic

The results of the existing LTS analysis indicates difficult conditions for bicyclists traveling throughout most of the Kingsport MPA. While many roads offer wide shoulders and acceptable LTS, they are generally not contiguous and several main routes including US-11W are rated as LTS 4 despite being a marked bicycle route. Opportunities for parallel shared-use facilities, such as the Kingsport Greenbelt, offer better LTS for users along Netherland Inn Road. **Figure 38** displays the existing bicycle LTS within the MPA. Additional detail regarding the LTS analysis can be found in the Regional Bicycle and Pedestrian Plan.

Figure 38. Bicycle Level of Traffic Stress



Source: Kingsport MTPO Regional Bicycle and Pedestrian Plan; adopted February 2022.

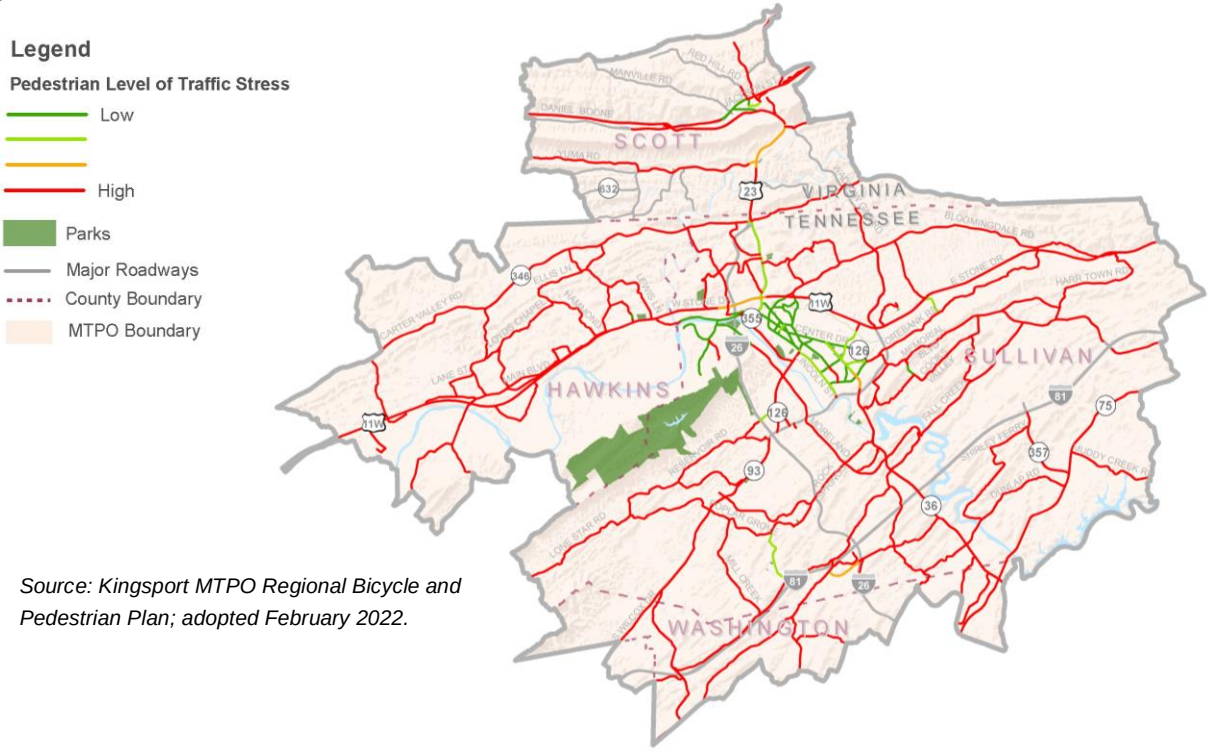
Pedestrian Level of Traffic Stress

Pedestrian LTS, while similar in concept to Bicycle LTS, is almost entirely influenced by the presence or absence of sidewalks or share-use paths. For pedestrians, the user groups associated with LTS are:

- **LTS 1** – The level most users can tolerate including children and older adults; posted speed under 45 mph with a quality sidewalk facility
- **LTS 2** – Roadway segments with substandard sidewalks, posted speeds in excess of 45 mph, and/or three or more travel lanes
- **LTS 3** – Roadway segments with substandard sidewalks, posted speeds in excess of 45 mph, and/or three or more travel lanes
- **LTS 4** – Roadway segment lacking pedestrian facility (sidewalk or shared-use path)

The results of the pedestrian LTS analysis shows that in and around downtown Kingsport provides a high level of pedestrian comfort, due in large part to a legacy sidewalk system. Gate City was also shown to have adequate pedestrian facilities in the downtown area. However, the plan states that linkages to key activity nodes are lacking among the regional pedestrian facilities. While providing pedestrian facilities along regional connections may not be practical, ensuring that pedestrian facilities are available in and around key activity nodes such as schools, shopping, and medical facilities is critical to continue developing an expanded pedestrian network. **Figure 39** displays the existing pedestrian LTS within the MPA.

Figure 39. Pedestrian Level of Traffic Stress



Source: Kingsport MTPO Regional Bicycle and Pedestrian Plan; adopted February 2022.

Bicycle and Pedestrian Safety

An analysis of bicycle and pedestrian safety within the Kingsport MPA was completed as part of the *Kingsport MTPO Regional Bicycle and Pedestrian Plan* (see Appendix D).

Aviation

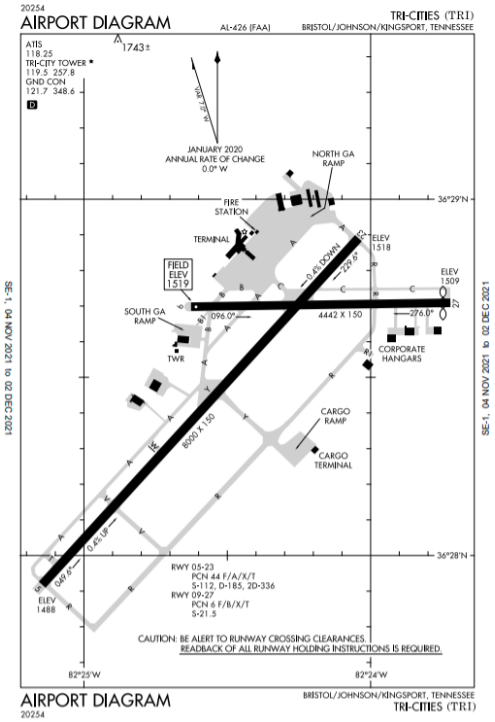
The Tri-Cities Airport (TRI) is a full-service commercial airport located in the southeast portion of the Kingsport MPA (see **Figure 44** for the location of the airport within the MPA). TRI serves northeast Tennessee, southwest Virginia, western North Carolina and Eastern Kentucky. The airport is centrally located between Kingsport, Bristol and Johnson City, just three miles south of I-81 (Exit 63). The airport property covers approximately 1,260 acres, including an 119,000 square foot terminal, a fixed based operator, corporate hangars, FAA air traffic control tower, and TRI Aerospace Park (with an Air Cargo Logistics Center). The Air Cargo Logistics Center includes US Customs Port Number 2027 and Foreign-Trade Zone Number 204. These departments facilitate cargo transportation and function as an important economic development tool for the nearby cities and counties.

The airport is governed by a 12-person Authority appointed by the Cites of Kingsport, Bristol, Johnson City, TN and Bristol, VA; Washington and Sullivan Counties, TN. **Figure 40** displays the location of TRI in relationship to other air services located in TDOT Region 1. As shown, the only other commercial service within the region is provided at McGhee Tyson Airport (TYS), near Knoxville, TN. **Figure 41** displays a diagram of TRI airport.

Figure 40. Air Service in Eastern Tennessee (Region 1)

Source: Tennessee Aviation System Plan – Executive Summary.

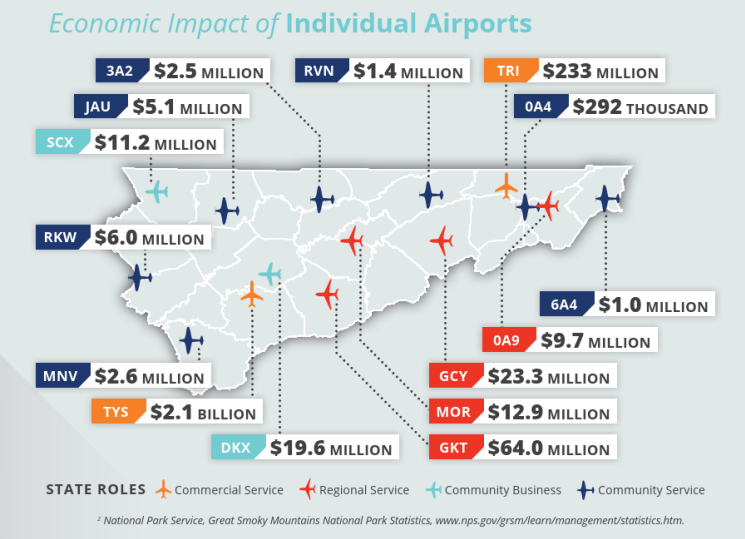
Figure 41. Tri-Cities Airport Diagram



Source: https://aeronav.faa.gov/d-tpp/2111/00426AD.PDF (current as of 11/17/2021)

According to the Tennessee Aviation System Plan (TASP), the two commercial service airports in Region 1 saw enplanements increase by over 15 percent from 2018 to 2019. TRI is estimated to generate $233 million in economic activity for the region. Outside of the TYS airport, TRI is the second highest air service economic generator in the region.

Figure 42. Economic Impact of Air Service



Source: Tennessee Aviation System Plan – Executive Summary.

Passenger Enplanements

The Bureau of Transportation Statistics publishes data related to annual passenger enplanements[6]. For the year ending July 2015, there were approximately 216,400 passenger enplanements at the Tri-Cities airport. In 2019, passenger enplanements reached a six-year high of nearly 221,000. In 2020, there was a dramatic decrease to approximately 97,000 passengers, directly attributed to the COVID-19 pandemic which negatively impacted air travel across the world. **Table 30** summarizes the annual passenger enplanements.

Table 30. Annual Passenger Enplanements (2015 - 2020)

	2015	2016	2017	2018	2019	2020
Enplanements	216,426	204,926	193,068	200,086	220,827	96,924
Change (from previous year)	-	-11,500	-11,858	7,018	20,741	-123,903
Percent Change (from previous year)	-	-5.3%	-5.8%	3.6%	10.4%	-56.1%

Source: www.faa.gov/planning_capacity/passenger_allcargo_stats/passenger/previous_years/

NOTE: 2020 enplanements were significantly impacted due to COVID-19.

[6] The term "enplaned passenger" is widely used in the aviation industry and is loosely defined as a passenger boarding plane at a particular airport.

Freight

Increasing economic competitiveness among regions within the US and the globalization of the economy has increased the importance of providing and maintaining a metropolitan area's freight transportation infrastructure. Additionally, with the passage of the FAST Act in 2015, a renewed emphasis on freight was incorporated into the long-range planning process.

National Freight Perspective

Federal law includes programs to advance critical freight projects and includes provisions focused on ensuring the safe, efficient, and reliable movement of freight including:

- Establishes a National Multimodal Freight Policy that includes national goals to guide decision-making.
- Requires the Development of a National Freight Strategic Plan to implement the goals of the new National Multimodal Freight Policy. The National Freight Strategic Plan addresses the conditions and performance of the multimodal freight system, identifies strategies and best practices to improve intermodal connectivity and performance of the national freight system, and mitigates the impacts of freight movement on communities.
- Creates a new discretionary freight-focused grant program that will invest $4.5 billion over 5 years. This new program allows States, Metropolitan Planning Organizations (MPOs), local governments, tribal governments, special purpose districts and public authorities (including port authorities), and other parties to apply for funding to complete projects that improve safety and hold the greatest promise to eliminate freight bottlenecks and improve critical freight movements.
- Establishes a National Highway Freight Program. The Act provides $6.3 billion in formula funds over five years for States to invest in freight projects on the National Highway Freight Network. Up to 10 percent of these funds may be used for intermodal projects.
- Includes new authorities and requirements to improve project delivery and facilitate innovative finance. Federal law also includes provisions intended to reduce the time it takes to break ground.

Changes in the production, purchasing, and consumption habits of consumers have changed the way freight carriers operate. In the past, manufacturers maintained large inventories in warehouses. Today, most goods are produced based on consumer demand and delivered just-in-time (JIT) for the next phase of production or consumption. This strategy seeks to minimize inventory investment by scheduling delivery of raw material or components to the point where they are needed, at the precise time they are required. Therefore, trucks (as well as rail cars and ship containers) have become "mobile warehouses" residing on the transportation system. JIT shipping practices have created a greater reliance on a transportation system that provides predictable travel times but have also made supply chains more vulnerable to disruptions by suppliers or along transportation routes. The impacts associated with disruptions to the supply chain are currently being witnessed in large part due to the impacts of COVID-19.

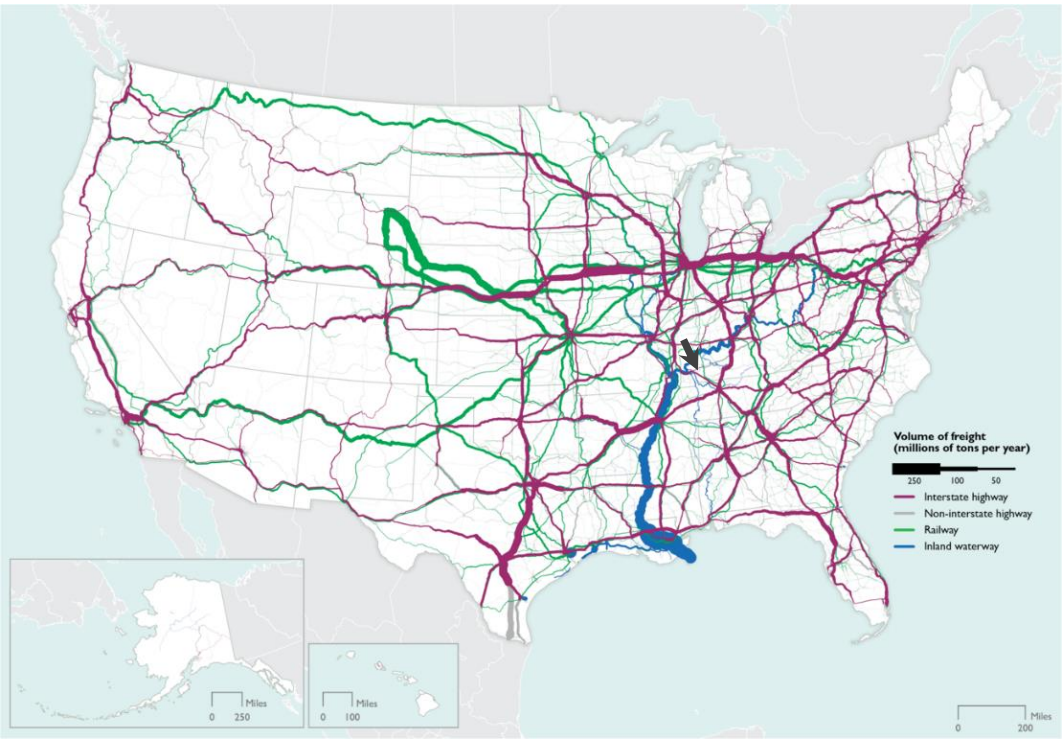
In addition, E-commerce continues to grow at a rapid pace, which has further been spurred on during the COVID-19 pandemic. E-commerce is shifting freight distribution towards more point-to-point shipments from warehouses to homes which is resulting in more short trips in urban areas via parcel trucks. In addition, some companies rely on individuals who drive their personal vehicles to deliver goods.

To meet the increasing consumer demands for quicker product delivery, nationwide distribution centers are likely to become smaller, but there will be more of them and they will be located closer to major metropolitan areas. High-quality access to the interstate system, along with sufficient roadway capacity and reliable travel times, will be important factors in where distribution facilities will choose to locate.

Increasingly, companies are demanding efficient, reliable, and safe systems to transport merchandise on a predictable timetable, and to ensure employees can access job opportunities. Distribution centers that are smaller in size and larger in number will allow for precise delivery schedules. There will continue to be

significant pressure on shippers and goods receivers to lower inventory costs. Retailers and manufacturers will continue to streamline their processes, dropping smaller amounts at more frequent intervals at stores and factories. **Figure 43** displays freight flows (highway, rail, and waterways) across the US. The arrow highlights the approximate location of the Kingsport MPA in the context of the national freight network.

Figure 43. Freight Flows by Highway, Railway, and Waterway (2017)



Source: Highway: U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics and Federal Highway Administration, Freight Analysis Framework, version 4.5, 2019. Rail: USDOT, Federal Railroad Administration, 2019. Inland Waterways: U.S. Army Corps of Engineers, Institute of Water Resources, Annual Vessel Operating Activity and Lock Performance Monitoring System data, 2018.

National Highway Freight Program

The FAST Act repealed both the Primary Freight Network and National Freight Network from Moving Ahead for Progress in the 21st Century Act (MAP-21) and directed the FHWA Administrator to establish a National Highway Freight Network (NHFN) to strategically direct Federal resources and policies toward improved performance of highway portions of the U.S. freight transportation system. The FAST Act also formed the National Highway Freight Program (NHFP), which created a formula program to fund investments on the NHFN in accordance with 23 U.S.C. 167. The NHFN includes:

- Primary Highway Freight System (PHFS)
- Critical Rural Freight Corridors (CRFC)
- Critical Urban Freight Corridors (CUFC)
- Portions of the Interstate Highway System not designated as part of the PHFS

The PHFS is designated at the federal level, while CRFCs and CUFCs are designated at the state level. Within the Kingsport MPA, SR-36 (Fort Henry Drive), from I-81 to SR-75 (Airport Road), is designated a CUFC. There are currently no CRFC designations within the Kingsport MPA.

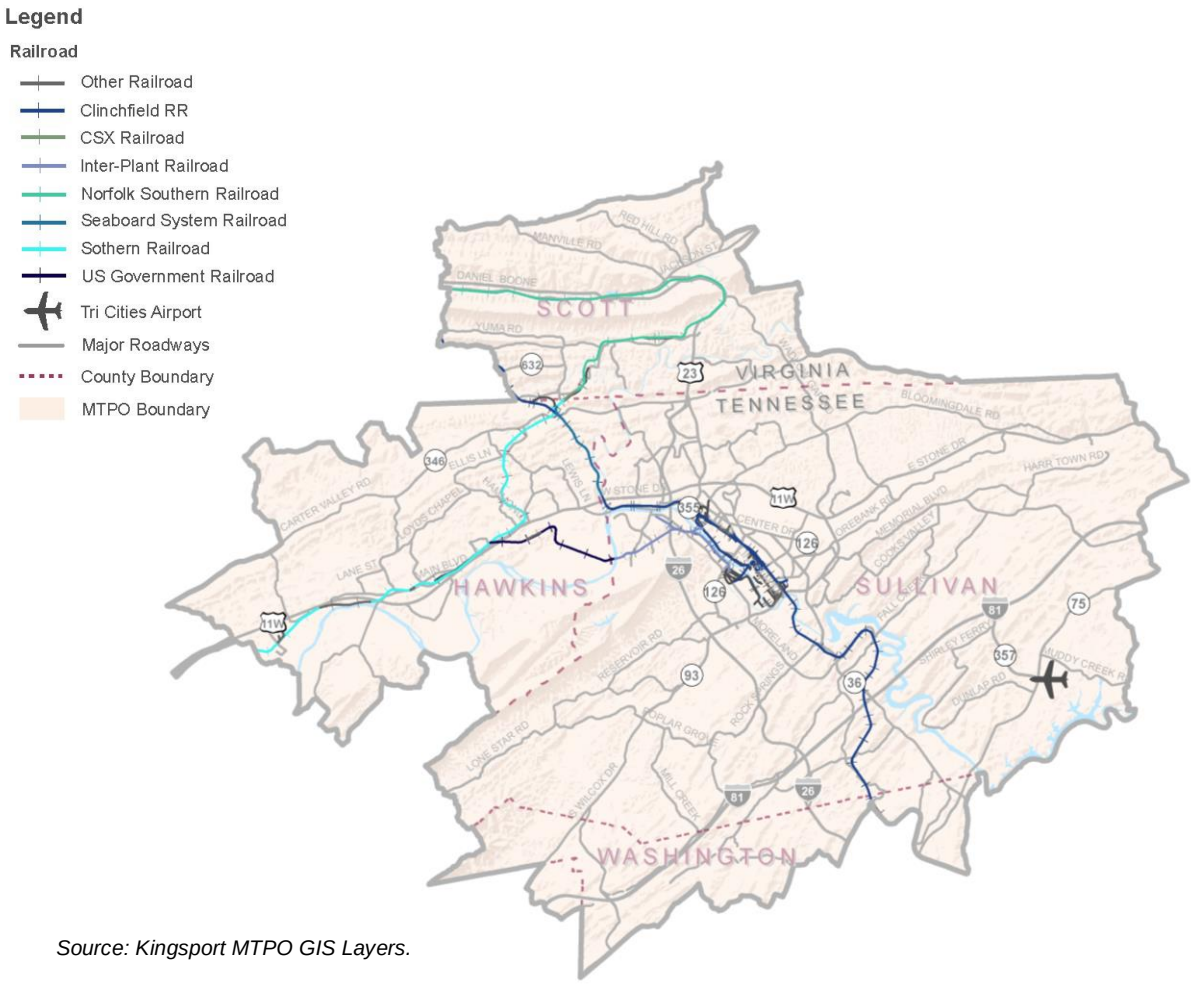
Rail

Two Class I railroads, Norfolk Southern and CSX, currently operate in the Kingsport MPA. In addition, two primary intermodal facilities, or rail yards, are located in Kingsport - one is the internal Eastman Chemical Company yard and the other is the Kingsport Yards, owned and operated by CSX Intermodal. **Figure 44** shows the locations of the rail lines and rail facilities.

At one time, the Eastman Chemical Company intermodal facility was one of the largest rail intermodal operations in east Tennessee. While intermodal operations have changed in the Kingsport area, Norfolk Southern is expanding its intermodal capabilities as part of Norfolk Southern's Crescent Corridor, a 1,400-mile rail route that will link key markets in 11 states across the Northeast and Southeast with high-quality rail intermodal services. In Tennessee, the Crescent Corridor runs from Bristol to Chattanooga and could provide direct benefit to the Kingsport area.

Despite changes by CSX and Eastman in the Kingsport area, rail investments at the national level are beginning to increase as fuel and transportation costs rise relative to over-the-road freight shipping. The Kingsport region is in a position of strength relative to rail transportation, given its proximity to I-81 and I-26, and the fact that the region is served by two Class I railroads, as well as having air cargo freight capabilities at the Tri-Cities Regional Airport.

Figure 44. Railroad Network and Airport



Source: Kingsport MTPO GIS Layers.

5. Identifying Needs and Opportunities

The consideration of future year needs and opportunities is an important component of the Kingsport MTPO 2045 LRTP. This analysis helps identify potential transportation and mobility impacts associated with future growth/development that is projected through the horizon year 2045. It considers the existing multimodal conditions analysis, technical analysis including the use of the Kingsport regional travel demand forecasting model, and input from local agencies, stakeholders, and the general public. Recent and on-going planning studies conducted by the MTPO, or by other planning partners including TDOT and VDOT, are also taken into consideration.

Accommodating Future Growth and Development

One of the primary objectives of the LRTP planning process is to project, or anticipate, future regional conditions and issues in order to ultimately identify potential transportation infrastructure and mobility solutions. In considering future year population growth and economic development activity, the Kingsport MTPO can proactively plan, prioritize, and program projects, and supporting strategies and policies, to move the region in a positive direction toward meeting the established LRTP goals and objectives – which include promoting safe travel, spurring economic growth, and enhancing qualify of life. The following summarizes the future year growth scenario, also referred to as the year 2045 socioeconomic projections, that was used as a key input in the Kingsport regional travel demand forecasting model. Additional discussion of the model and the socioeconomic data is provided in the following sections.

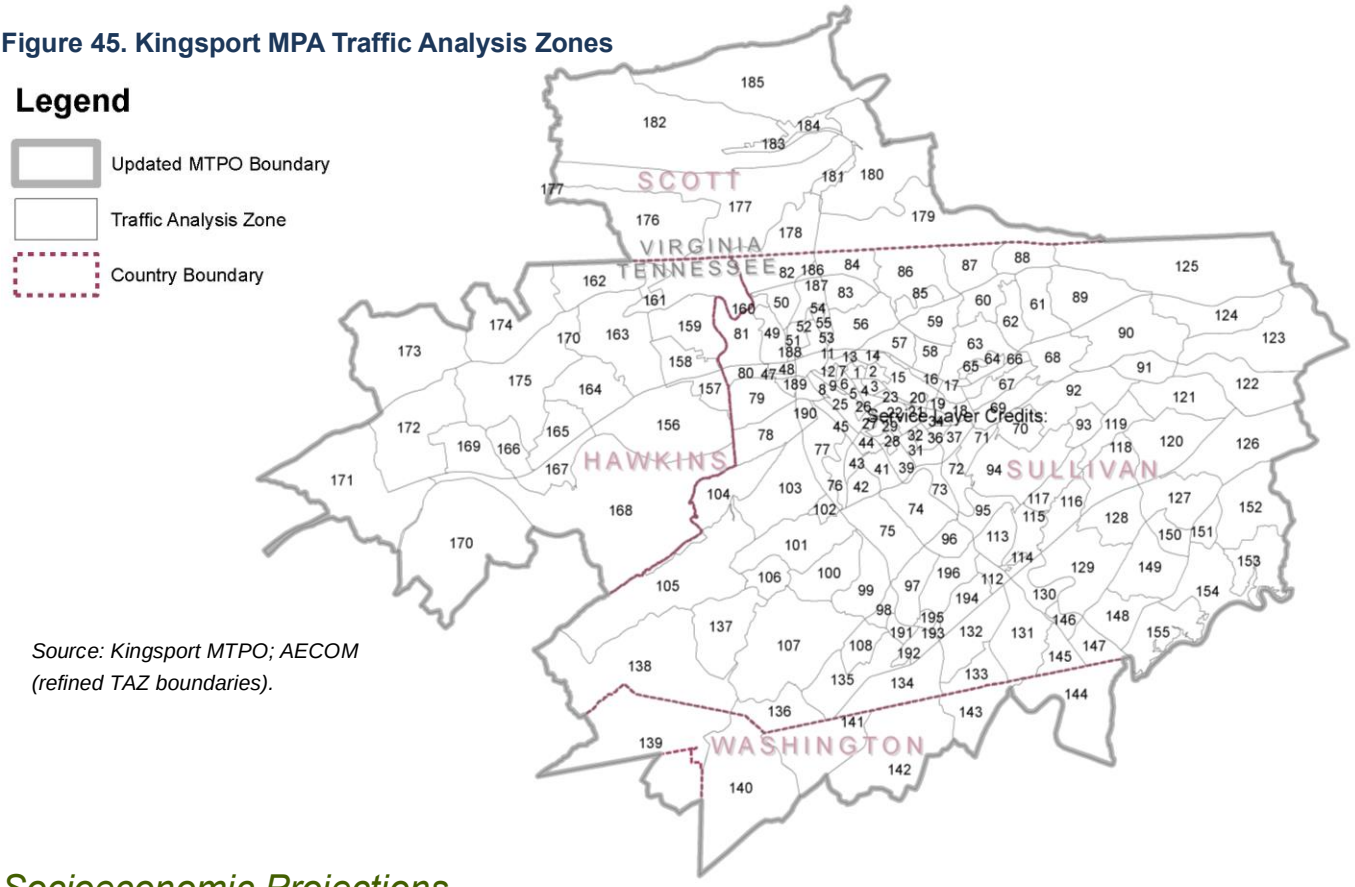
Regional Travel Demand Forecasting Model

The Kingsport regional travel demand forecasting model is the primary tool used to analyze future year traffic conditions within the Kingsport MPA. The model utilizes Traffic Analysis Zones (TAZs, or TAZ for an individual zone) which contains socioeconomic data (population and employment) that is ultimately converted into trips that are assigned to the Kingsport roadway network. As much as possible, the Kingsport MPA TAZ structure, depicted in **Figure 46** is consistent with US Census blocks, block groups, or census tracts.

Since the adoption of the 2040 LRTP the Kingsport MTPO modified the fringe area of the MPA boundary to capture an additional segment of I-81 in Greene County (in the southwest portion of the MPA). Some additional refinement of the fringe MPA boundary, in other parts of the region, was also completed as part of the recent update. The project team utilized existing traffic data, including current daily volumes and travel speeds, to update and calibrate the model to reflect 2018 baseline conditions. The model results were compared to industry standards to confirm the model was calibrated within reasonable parameters to replicate baseline travel conditions. **Appendix E** provides details regarding the model update and calibration process.

The model, along with the socioeconomic data described in the following section, was used to identify potential areas of traffic congestion in 2030 and 2045. The model was also used to test a few select future year capacity improvement projects. Additional discussion of the model scenarios, and the model results, is included in the following sections and chapters.

Figure 45. Kingsport MPA Traffic Analysis Zones



Source: Kingsport MTPO; AECOM (refined TAZ boundaries).

Socioeconomic Projections

Socioeconomic (SE) projections are critical to the LRTP planning process and are the primary input for the regional travel demand forecasting model. Generally speaking, each TAZ contains population, employment, and school enrollment data. The model, using trip generation rates consistent with industry standards, converts the SE data for each TAZ into daily trips which are assigned to the roadway network.

Based on discussions with the Kingsport MTPO and TDOT, it was determined that the SE data that would be used for the LRTP update should reflect 2018, 2030, and 2045 conditions. A 2018 baseline was established to be consistent with the Tennessee statewide model baseline year, which was being updated at the same time as the LRTP. As part of the LRTP update, the project team used the previous LRTP (2040) SE data as a starting point to establish the baseline condition. The 2015 baseline data was reviewed and compared to 2018 countywide control totals, provided by TDOT (data obtained from InfoUSA), for the counties that make-up the Kingsport MPA. **Table 31** summarizes the county totals. This information was used to inform the 2018 population projections/allocation to the Kingsport MPA TAZs.

Table 31. Population Control Totals (MPA Counties)

County	2018	2030	2045
Greene	69,084	71,770	73,284
Hawkins	56,659	58,526	59,334
Scott	21,813	21,202	20,462
Sullivan	157,574	161,048	161,122
Washington	128,580	136,877	144,091
Five-County Total	433,710	449,423	458,293

Source: InfoUSA

InfoUSA employment data was also reviewed and used by the MTPO staff to identify likely employment growth throughout the MPA through the horizon year 2045. **Table 32** summarizes general commercial areas within the MPA and the expected growth, or decline, associated with each area. The table also identifies the TAZs that correspond to the general growth areas. This information was used to help allocate employment into the final LRTP SE dataset.

Table 32. Projected Employment Growth Areas (2018 to 2045)

Commercial Area	Retail	Medical	Office/ Service	Heavy Industry	Light Industry	Institutional	Subarea	TAZs
Estimated Change: High / Moderate / Decline (2018 to 2045)								
East Stone Drive	H		M				9	16, 17, 58, 61, 64, 66, 68
Mid-Stone Drive / HVMC		M	M				8a	10, 11, 13, 14
West Stone Dr / Allandale	H		M				5, 7	81, 157, 158
Gate City Downtown			M				1	184
Weber City					M		1	181
State Line VA	M						2	178, 179
Church Hill West					M		3 , 4	169, 172
Church Hill East	M						3	165, 166, 167
Mount Carmel	M						3	163, 164
Lynn Garden South	D						7, 8a	10, 53, 55
Lynn Garden North / VA							7	83, 187
Bloomingdale / Bloomingdale Pike						D	10	60, 87
JB Dennis North to Bloomingdale Pike	M					M	9, 10	63
Downtown Kingsport (West)						M	8a	8-A
Downtown Kingsport (East)	M	M	M				8b	8-B
Eastman Rd North – DB	M					M	8, 23	15, 19, 20, 34
Eastman Rd South / FHM	M	M	M				8	30, 31, 33, 36
Riverport Rd / Industry Dr					M		23	25, 45, 46
Eastman Plant Area			M		M		23	39, 44, 41
Meadowview Area	M	H	H			M	18,22	42, 43, 76, 102
Sullivan Gardens / SR 93							22	100, 101, 106
Rocks Springs Rd Corridor							22	97, 98, 99
I-81 / I-26 Interchange	H	M	H		M		19	132, 134, 109, 111
I-81 west – Exit 56	M		M		M	H	19	135
Fall Branch							21	140
Fordtown Rd. N. Wash County	M						19	142, 143
Colonial Heights	M	M					18	112, 113, 96
Moreland Drive Corridor			M				20	74, 75
Ft Henry Drive to Washington Co.					M		1	130, 131, 146, 147
I-81 - Exit 63 – Airport Parkway	M				M		15, 16	118, 120, 128, 127
I-81 - Exit 66 – SR 126	M						15, 16	121, 126
Airport Parkway to Airport					H		16	149, 150
Indian Springs / SR 126							14	91, 92

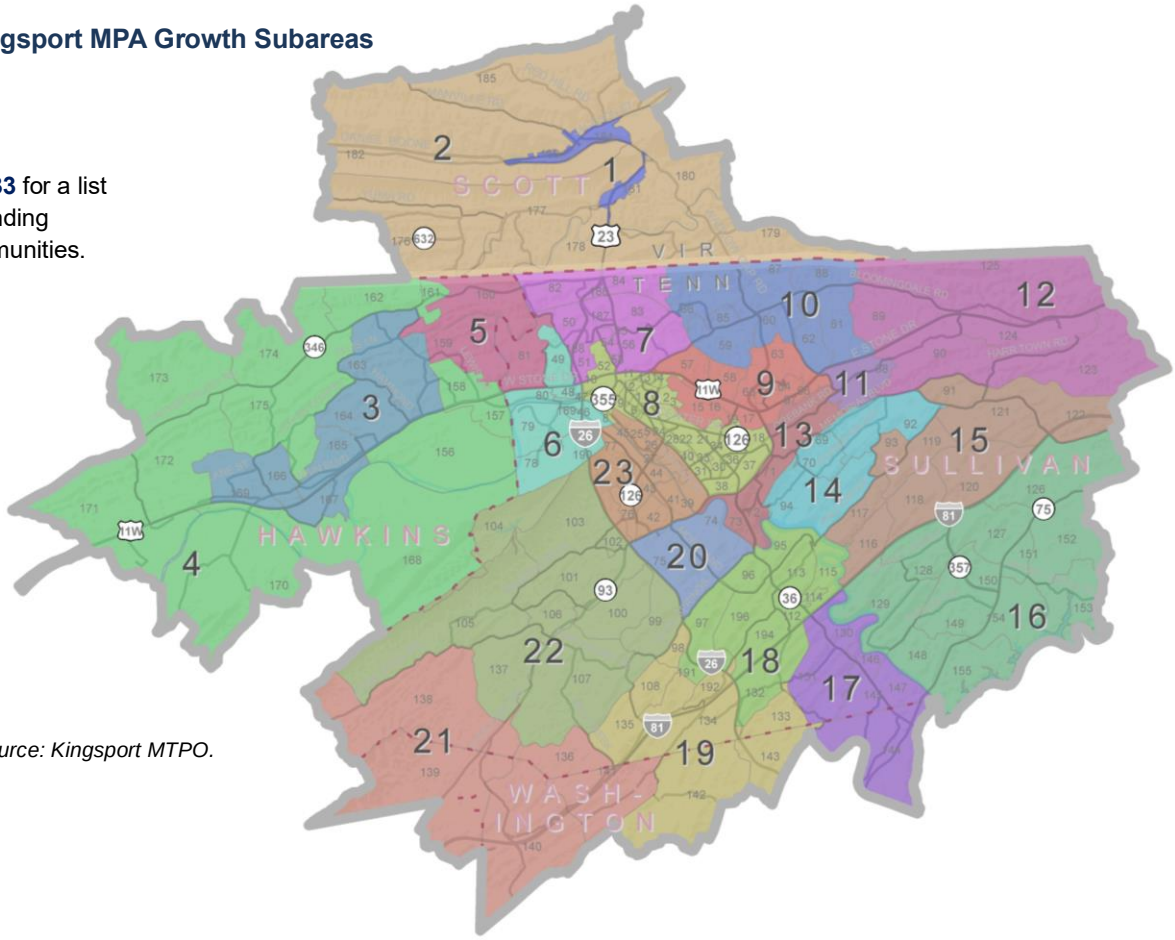
Source: Kingsport MTPO; 2021.

The SE model data, for 2018, 2030, and 2045, was reviewed and approved by the MTPO. To help display the project population and employment growth, the SE data was allocated to 23 subareas (see **Figure 46**).

The projected growth for each subarea is summarized in **Table 33**. **Appendix F** contains the 2018, 2030, and 2045 SE data used for modeling purposes, which is broken down further by individual TAZ.

Figure 46. Kingsport MPA Growth Subareas

NOTE
Refer to **Table 33** for a list of the corresponding Subareas/Communities.



Source: Kingsport MTPO.

Table 33. Kingsport MPA Population and Employment Projections (2018, 2030, and 2045)

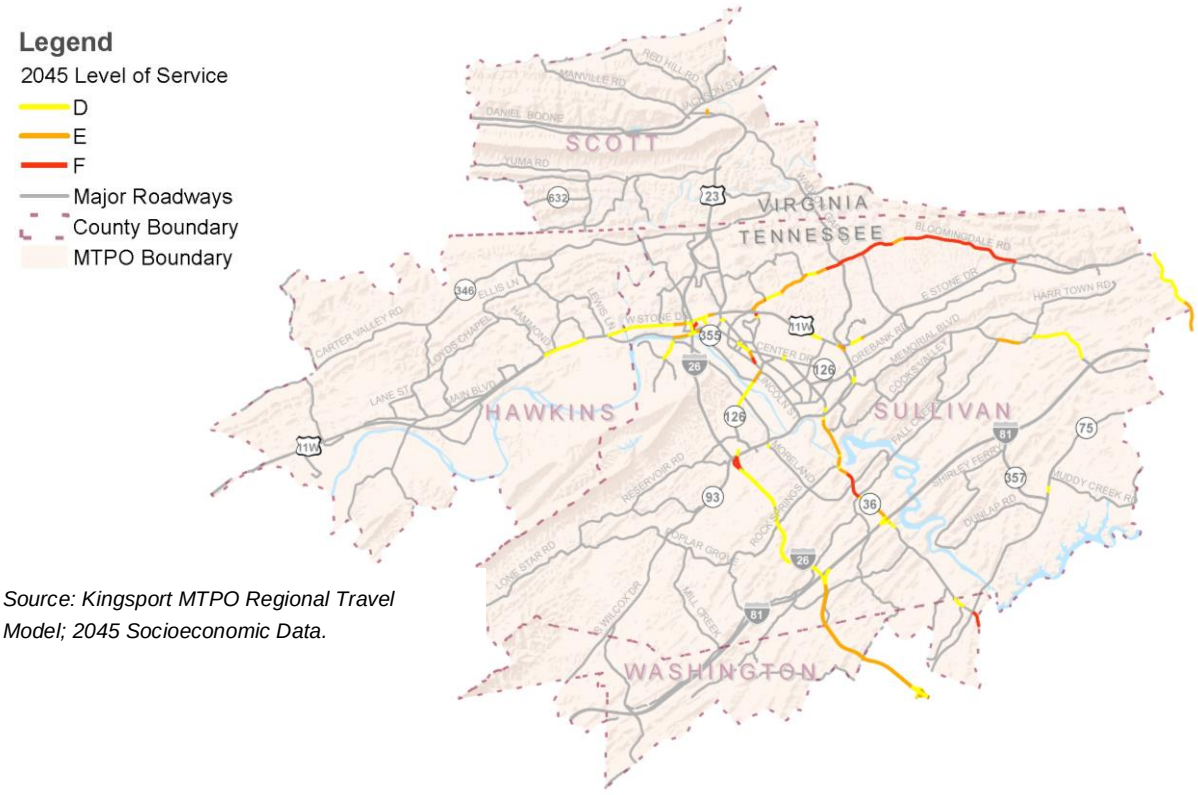
		Population			Employment		
Subarea	Community	2018	2030	2045	2018	2030	2045
1	Gate City / Weber City	1,587	1,657	1,736	2,102	2,207	2,207
2	Scott County (Remainder)	6,596	6,767	7,201	819	819	860
3	Mt. Carmel / Church Hill	10,694	11,700	12,987	1,210	1,271	1,335
4	Hawkins County (Remainder)	11,898	12,279	12,966	2,532	2,797	3,366
5	Granby / North Fork / County Line	1,586	1,697	1,815	552	607	637
6	Ridgefields / Rotherwood / Ft. Robinson Area	5,054	5,256	5,467	645	677	677
7	Lynn Garden	10,675	11,059	11,723	1,136	1,136	1,136
8	Downtown	15,818	17,558	18,963	15,010	16,511	18,988
9	East Stone Drive (Gibson Mill to New Beasonwell)	5,707	6,117	6,582	8,782	10,099	12,119
10	Bloomingdale	8,248	8,628	9,232	957	1,005	1,005
11	Orebank	1,161	1,230	1,304	98	98	98
12	Arcadia / Central Heights	4,256	4,495	4,746	484	484	532
13	Preston Forest	4,171	4,380	4,599	686	686	686
14	Chestnut Ridge / Cooks Valley	4,443	4,683	5,011	533	533	533
15	Fall Creek Indian Springs / I-81	4,708	5,319	6,032	532	585	673
16	Tri-Cities Airport / I-81	4,619	5,053	5,760	2,666	3,066	3,679
17	Fordtown / Spurgeon / Washington County	8,570	9,632	11,019	1,719	1,977	2,274
18	Colonial Heights (East and West)	8,468	8,891	9,621	2,687	2,956	3,399
19	Rock Springs / I-81 / Washington County	4,041	4,582	5,279	519	571	685
20	Pactolus / Moreland Dr.	1,084	1,138	1,229	778	817	817
21	Fall Branch and Vicinity	3,290	3,487	3,801	181	181	181
22	Sullivan Gardens / North Rock Springs	7,176	7,535	8,063	1,113	1,169	1,227
23	Eastman / Meadowview	828	880	950	10,813	11,445	12,218
	Total	**134,677**	**144,024**	**156,086**	**56,554**	**61,698**	**69,331**

Source: Kingsport MTPO and AECOM; 2021.

2045 Existing + Committed Model Results

The 2045 SE data was used to evaluate the 2045 Existing plus Committed (E+C) conditions within the Kingsport MPA. The level of service capacity analysis shows that transportation improvements, beyond those already committed, will be necessary to achieve acceptable traffic operations for the year 2045. **Figure 47** shows, a number of roadways within the Kingsport MPA are expected to experience some capacity deficiencies by 2045 should no additional roadway projects be constructed beyond those currently under construction and/or in the development process. The I-26 corridor, SR-36 (Fort Henry Drive), US-11W (SR-1/Stone Drive), and portions of Bloomingdale Pike and Bloomingdale Road were identified as having future year capacity issues. A discussion of the capacity issues/needs is included later in this chapter, as part of the *Traffic Congestion/Restricted Travel Corridors* section.

Figure 47. 2045 E+C Capacity Analysis Results



Source: Kingsport MTPO Regional Travel Model; 2045 Socioeconomic Data.

Future Year Needs and Opportunities

Identifying future year needs and opportunities involves the combination of a multimodal technical analysis, consideration of growth/development trends, and input from local agencies, stakeholders, and the public. The process builds upon the 2040 LRTP needs and recommendations and considers recent and on-going planning studies that could impact future transportation decision making and infrastructure investments. Through this process, the needs assessment helps to establish the basis for identifying potential multimodal transportation improvements/projects, which are discussed further in Chapter 6. The following sections are broken down by mode and discuss the primary needs and/or mobility challenges facing the Kingsport MPA. In some cases, opportunities are also identified to leverage transportation investments to support growth and on-going economic development activities.

Stakeholder Meetings

During development of the LRTP, the MTPO consults and coordinates, as appropriate, with agencies and officials responsible for other planning activities within the MPA. Consultation and consideration of other related planning activities that are affected by transportation includes agencies and officials representing State and local planned growth, economic development, tourism, environmental protection, airport operations, freight movers, recipients of Federal Transit Administration (FTA) funds, and other similar agencies. This consultation process, completed through stakeholder interviews, as well as one-on-one communication, helps identify transportation issues, needs, and potential transportation improvements. Six stakeholder meetings were conducted virtually in April 2021 to help identify transportation and mobility issues, needs, and potential solutions. The meetings were focused on the following themes:

1. **Safety** – focus on high crash areas (hots spots), potential causes, and potential mitigation measures/solutions.
    - Public safety officers, EMS, DPW and State transportation officials, school travel managers, ped advocates
2. **Healthy Communities** – focus on alternative transportation, complete streets, environmental issues, safe routes to schools, etc.
    - Health Departments, hospital administrators, environmental advocates, pedestrian advocates, transit system
3. **Freight Movement** – focus on issues/challenges, opportunities, intermodal potential, etc.
    - Freight generators (manufacturing, warehousing, retail), rail administrators, trucking companies, airport administrator
4. **Regional Mobility (Transit)** – focus on ways to improve transportation connections between the Kingsport MPA and nearby regions.
    - Transit providers, nearby MPOs, TDOT, VDOT, DRPT
5. **Equity / EJ Partners** – focus on mobility and transportation issues that particularly impact the EJ community
    - Social service providers (direct providers – United Way, employment organizations, welfare distribution organizations, health care providers), Senior resource providers, disabled advocacy organizations, charitable organizations
6. **Economic Development Workshop** – large employers, economic development officials, developers and real estate professionals, large retailers, tourism organizations

Table 34. Key Themes/Needs Identified from Stakeholder Meetings

Safety	Healthy Communities	Economic Development	Regional Mobility	Equity	Freight
• Improve traffic: – US-11W (SR-1/Stone Drive) – SR-36 (Fort Henry Drive) – US-23 (in Virginia) • Improve I-81/I-26 interchange. • Enhance access near West Ridge High School.	• Extend the Kingsport Greenbelt. • Increase walking opportunities. – Enhance neighborhood connections – Add more sidewalks • Increase access to medical facilities and exercise.	• Maintain existing transportation facilities. • Enhance safety and access for trucks. • Enhance roadway connectivity, especially in the southeast area. • Coordinate land use, development, and site planning.	• Expand evening bus service hours. • Extend bus routes to developing areas. • Conduct a regional (Tri-Cities) transit study. – Improve connections to Bristol and Johnson City, TN. – Improve connections to Gate City and Weber City, VA. – Enhance access to jobs, medical services, etc.	• Expand evening bus service hours. – Enhance access to jobs. – Enhance late afternoon access to medical services • Add sidewalks and provide safer road/ intersection crossings. • Improve bus stops. – Enhance access for all users	• Improve I-81/I-26 interchange area. – Improve ramps and eliminate weaving • Add truck climbing lanes. – Along I-81 and I-26 • Enhance access to/from existing industries. • Provide truck parking in region.

Source: AECOM Stakeholder Meetings; April 2021.

Roadways and Freight

The following identifies critical needs and opportunities as it relates to Kingsport MPA roadways, including regional freight movements.

Network Connectivity

Network connectivity primarily refers to the availability, or density, of travel connections within a roadway network. A well-connected network provides multiple travel/route options which reduces travel distances, creates a more accessible and resilient system, and facilitates the efficient movement of goods between the interstate system and local economic activity nodes. Network connectivity is also intertwined with the functional classification system, previously discussed in the existing conditions chapter.

A review of the Kingsport MPA network connectivity shows some areas of concern, due in large part to the region's topography. The Kingsport MPA is located in the Ridge-and-Valley Appalachians, which is a physiographic province of the larger Appalachian Mountains extending from southeastern New York through northwestern New Jersey, westward into Pennsylvania and southward into Maryland, West Virginia, Virginia, Tennessee, Georgia, and Alabama. The mountains are characterized by long, even ridges, with long, continuous valleys in between. The ridge and valley system creates an obstacle to travel with slopes ranging from less than 5% to some areas approaching 50%. Areas with greater than 20% slopes severely restrict and limit development opportunities throughout the MPA.

Karst terrain is also a significant factor in locating, designing, and constructing highways in northeastern Tennessee and southwestern Virginia. Karst topography is the name given to an area underlain by rocks such as limestone and is characterized by caves, sinkholes, and depressions.

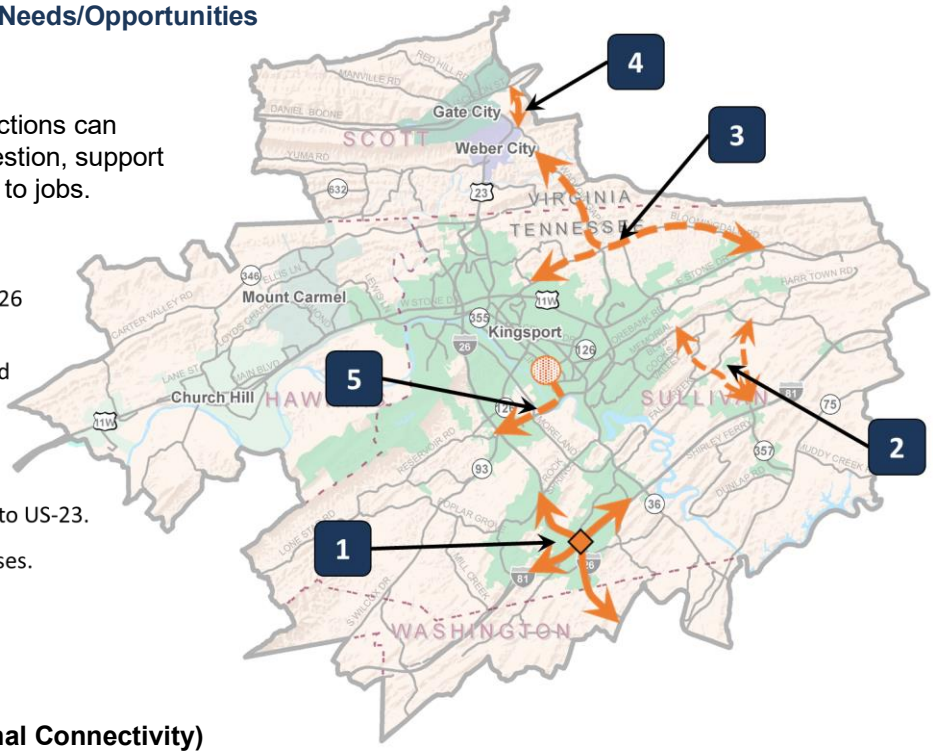
Figure 48 highlights network connectivity issues identified within the Kingsport MPA followed by a brief discussion of the issues.

Figure 48. Network Connectivity Needs/Opportunities

Key Issue

Ensuring adequate roadway connections can improve accessibility, reduce congestion, support development, and enhance access to jobs. Additional details follow this figure.

1. Improve regional connectivity (I-81/I-26 interchange area).
2. Extend SR-357 north. TDOT has looked at two conceptual alignments.
3. Enhance travel between Virginia and Tennessee (to areas such as Bristol).
4. Explore an alternative travel corridor to US-23.
5. Enhance truck access to area businesses.



1. I-81/I-26 Interchange (Regional Connectivity)

The I-81/I-26 interchange is an important regional and state connection within the Kingsport MPA and has been documented as the MTPO's top priority for several years. This interchange facilities critical system-to-system interstate movements but the current interchange/ramp configuration has geometric deficiencies which contribute to operational, congestion, and safety concerns which restricts the efficient flow/connectivity for passenger and trucks (freight movements). These geometric concerns also negatively impact traffic flow to adjacent interchanges due in large part to insufficient merge and weave areas. These concerns have been documented in previous planning studies, including the *TDOT I-55/75/26 Multimodal Corridor Study*, completed in May 2020, and the *TDOT Interstates 40 and 81 Multimodal Corridor Study* completed in January 2021.

2. SR-357 (Airport Parkway) Extension (Regional and Local Connectivity)

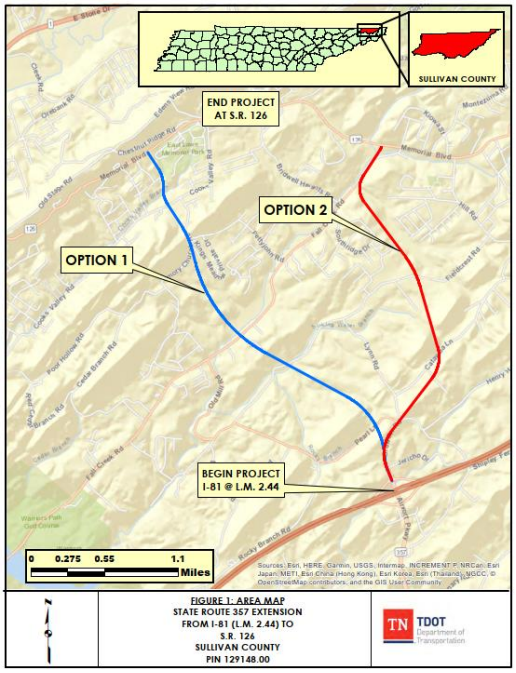
The east/southeast portion of the Kingsport MPA is growing and the proximity to the I-81 corridor makes this an attractive location for continued residential and economic development through the horizon year 2045. A recent example of this growth is the West Ridge High School which opened in August 2021 to approximately 2,000 students. Located along Lynn Road in Blountville, the high school has observed accessibility, operational and capacity challenges since opening.

Recognizing the growth potential in this area, TDOT conducted a study in Fall 2020 that evaluated a SR-357 (Airport Parkway) extension. As shown in **Figure 49**, TDOT's technical report explores two alternatives that would extend SR-357 (Airport Parkway) to SR-126 (Memorial Boulevard). These alignments are referenced as Option 1 and Option 2.

Regardless of a preferred alignment, an extension would enhance north-south regional network connectivity, open up a very desirable area of land for future economic development, enhance accessibility to the high school, enhance access to the airport, and provide an alternative route, helping relieve some traffic congestion, for some travelers who use SR-36.

As part of the economic development workshop conducted for the 2045 LRTP update, some participants indicated a desire to extend SR-357 (Airport Parkway) further north to connect to US-11W (SR-1). While this would provide even greater network connectivity, a SR-357 (Airport Parkway) extension from I-81 to US-11W (SR-1) would be challenging given the topography of the area. As such, the MTPO views the extension to SR-126 (Memorial Boulevard) as a high priority.

Figure 49. SR-357 (Airport Parkway) Extension – Conceptual Alignment Options



Source: Technical Report: State Route 357 Extension from I-81 to S.R. 126; August 2020.

3. Intercity Connections (Regional Connectivity)

The existing conditions analysis, along with discussions with the public and stakeholders, highlighted a heavy travel pattern that occurs between the northern portion of the Kingsport MPA, in Virginia, and areas east of the Kingsport MPA, including Bristol, TN. In discussions with regional stakeholders, it was revealed that area residents frequently complete this travel pattern with some using narrow, winding roads such as Bloomingdale Road. In addition, development that is occurring toward the west end of Bloomingdale Pike, west of John B. Dennis, is likely to contribute to increased traffic in the area that is reflected in the travel demand modeling results.

4. US-23 Corridor Alternate Route (Regional Connectivity and System Redundancy)

US-23 is the primary travel corridor through the Virginia portion of the Kingsport MPA and there are currently no viable alternative travel routes. Should this corridor be closed for an extended time it could have significant impact on travel flow within the northern portion of the Kingsport MPA, impacting travel for the general public as well as the movement of freight. Previous LRTP planning efforts have identified the potential for an alternative route that would enhance Moccasin Gap to provide an alternative travel route to US-23. In addition, a new connection would provide an opportunity to enhance multimodal connections. However, it should be noted that the construction of the Moccasin Gap project comes with a high price tag as well as some potential engineering/construction challenges due to the topography of the area. The MTPO supports continued investments to improve US-23 while continuing to discuss viable alternative route options.

5. Truck/Industrial Access (Freight and Intermodal Connectivity)

The Eastman Chemical Company is located near downtown Kingsport and creates network connectivity challenges for freight movements, specifically truck traffic that is traveling to/from I-26. The freight activity impacts traffic operations for the traveling public and as such opportunities to enhance the efficient flow of goods within the region is a top concern. The Kingsport region is also in a unique position to potentially leverage the CSX intermodal facility, and a portion of Lincoln Street which is designated as an intermodal connector on the National Highway System (NHS), to attract additional economic activity to the area. Furthermore, discussions with Eastman representatives suggest that truck traffic will likely remain the primary mode of travel for freight movements, at least in the short-term based on current business models.

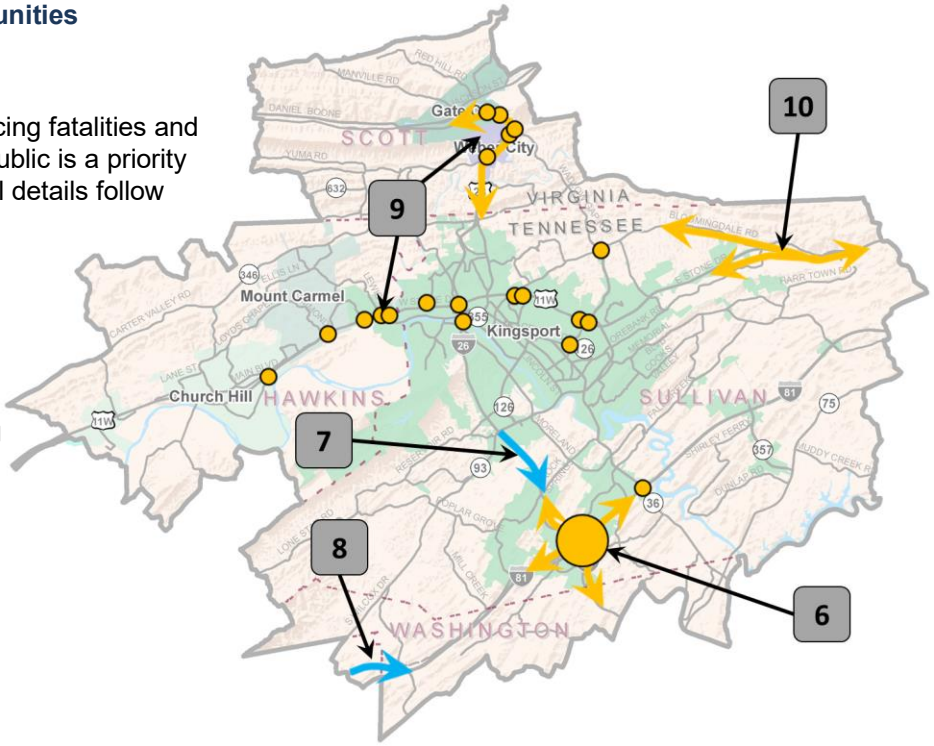
Safety

Safety is a high priority for the Kingsport MTPO as emphasized in the 2045 LRTP goals. The existing conditions analysis highlighted safety concerns within the MPA, including the identification of corridors that experience a high number of crashes resulting in serious injuries and/or fatalities. **Figure 50** highlights safety issues identified within the Kingsport MPA followed by a brief discussion of the issues.

Figure 50. Safety Needs/Opportunities

Key Issue

Enhancing safety, especially reducing fatalities and serious injuries, for the traveling public is a priority for the Kingsport region. Additional details follow this figure.



6 Improve ramp spacing and merging in the I-81/I-26 interchange area.

7 Add truck climbing lane on eastbound I-26 (improve merging).

8 Add truck climbing lane on northbound I-81 (improve merging).

9 Address high crash locations along US-11W and US-23.

10 Address high travel speeds and reckless driving (also a priority for the entire MPA).

6. I-81/I-26 Interchange Deficiencies

As documented, the I-81/I-26 interchange is an important regional and state connection within the Kingsport MPA that facilitates critical system-to-system interstate movements for the traveling public, as well as regional and statewide freight movements. Geometric deficiencies, previously discussed, directly impact safety within the area as deficient ramps and weaving areas create potential concerns. Heavy truck traffic along I-81, approaching 30%, further contributes to the safety concerns, especially given the system-to-system ramp movements and short weave/merge areas. These concerns have also been previously documented in the *I-55/75/26 Multimodal Corridor Study* and *Interstates 40 and 81 Multimodal Corridor Study*. On a larger scale, TDOT has evaluated the I-81 corridor and is considering widening it to six-lanes (three-lanes in each direction) between the I-26 interchange (Exit 57) and SR-357 (Airport Parkway) (Exit 63). In 2022 dollars, this project is estimated at approximately $100 million. In the short-term, the installation of Intelligent Transportation System (ITS) improvements on I-81 from the I-26 interchange to Exit 3 (I-381) in Virginia (approximately 23 miles) are planned to help improve traffic flow, enhance freight movements, and improve safety for the traveling public. The estimated capital cost is approximately $8.7 million for equipment, with annual maintenance and operating costs estimated at approximately $200,000 annually (for the entire length of the project, not just the Kingsport MPA). Possible ITS improvements include surveillance cameras, speed detection at half-mile intervals, dynamic message signs, HELP service vehicles, 511 and Web traveler information, and real time weather sensors.

7. 8. Heavy Truck Traffic (Truck Climbing Lanes)

Heavy interstate truck traffic along I-81 and I-26, much of which connects to the local roadway network to facilitate travel to Kingsport industries, contributes to traffic operational and safety concerns. The I-26/Wilcox Drive (SR-126)/John B. Dennis (SR-93) interchange is a heavily used regional access point for truck traffic. Truck traffic coming from downtown Kingsport, in particular

from Eastman, creates a potential safety concern as trucks enter I-26 to travel eastbound toward I-81. Furthermore, in discussions with Eastman representatives as part of the LRTP update, there has been an increase in truck traffic in recent years and this increase is likely to continue at least in the short-term.

Plans for the construction of a truck climbing lane in proximity to the I-26/Wilcox Drive (SR-126)/John B. Dennis (SR-93) interchange would greatly enhance the movement of freight/goods within the Kingsport MPA. Another truck climbing lane has been identified along I-81 to facilitate a heavy northbound truck movement.

9. High Crash Locations

High crash locations were identified within Kingsport MPA and were found to be generally clustered along US-11W (SR-1) in the Tennessee portion of the MPA, and along US-23 in the Virginia portion of the MPA. Both facilities carry high traffic volumes and provide direct access to commercial businesses and other employers along the corridors. The following discusses issues related to each corridor.

US-11W (SR-1)

US-11W (SR-1) is a corridor with a high concentration of crashes, including a number of crashes resulting in serious injuries and fatalities. The *TDOT I-55/75/26 Multimodal Corridor Study* also identified key safety concerns along I-26, including concerns around the intersection at US-11W (SR-1/Stone Drive). Areas west of I-26, including Mount Carmel and extending west to Church Hill, also show a high number of crash locations which was confirmed in discussions with stakeholders and local law enforcement. A primary factor in the safety discussion is poor access control which also contributes to traffic congestion during peak travel periods. One example is the difficulty for left-turning vehicles, both turning onto the corridor from side streets, or businesses, and for vehicles turning into businesses.

Stakeholders agree that the US-11W (SR-1) corridor holds great potential for future economic development and the vast amount of land potentially available for development provides the opportunity to proactively plan and implement an appropriately designed roadway network. Specifically, the use of a frontage road system could be used to limit direct highway access and direct traffic to key access points to improve safety and preserve roadway capacity. In large part, the ability to plan for and construct new businesses, light industry, and residential development hinges on the ability to coordinate with the US Army[7] to agree on what can and cannot be done long-term within this corridor.

US-23

The US-23 corridor is a highly traveled corridor that extends from the Stateline north to Gate City/Weber City. The corridor is a vital regional and statewide connection that provides direct access to commercial and light industrial uses in the northern portion of the Kingsport MPA.

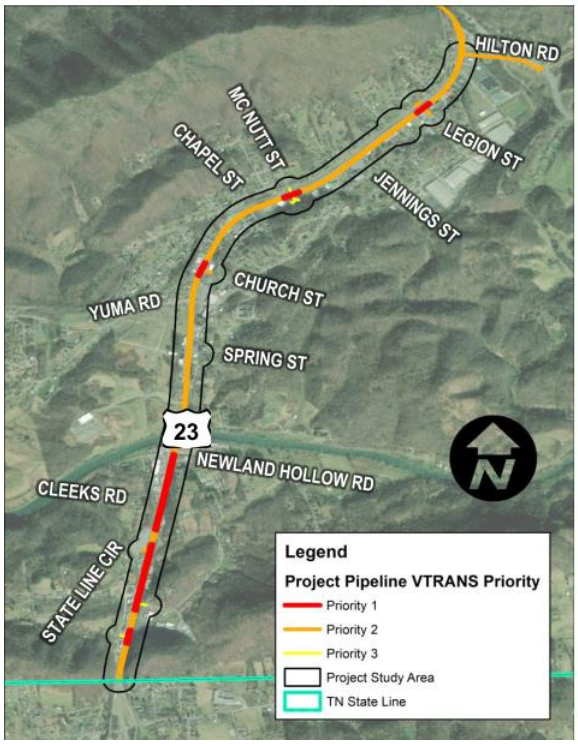
The US-23 corridor includes a long history of studies including the *US-23/Route 224 Corridor Study* completed in 2010. This study recommended several improvements, including traffic signal coordination, raised medians, curb and gutter with sidewalks, and consolidated railroad crossings. The *US-23 Roadway Safety Study*, completed in 2015, reinforced the need for access management and traffic signal improvements. A recent study as part of *Project Pipeline (https://vaprojectpipeline.org/)*, Virginia's comprehensive process to identify multimodal transportation needs, supports previous study findings and further highlights the corridor as a VDOT priority for future investment. One of the purposes of the *Project Pipeline* study is to document concerns within the US-23 corridor to help advance this project with future SMART SCALE funding opportunities.

The *Project Pipeline* study included a detailed safety analysis, including an access management review, that found over 160 total access points (29 access points / mile) along the study corridor.

[7] The Holston Army Ammunition Plant is located along the corridor. As a government-owned facility, any future planning efforts will need to be coordinated with the US Army.

Numerous angle and rear-end collisions were found due to failure to yield/stop and side street and entrances to businesses had difficulty finding appropriate gaps to complete maneuvers. Sparse dedicated turn lanes were also found to likely contribute to some angle and rear-end collisions. **Figure 51** displays the *Project Pipeline* VTRANS priority areas.

Figure 51. US-23 Corridor – *Project Pipeline* VTRANS Priority



Source: Project Pipeline – US-23 Stakeholders Meeting Presentation; October 2021.

10. Potential Area of Concern

While crash numbers may not be as high as other locations, law enforcement officials raised concerns related to crashes that occur in the eastern portion of the Kingsport MPA as they often result in serious injuries due to high travel speeds and reckless driving. As previously discussed, this corridor facilitates intercity travel and options to enhance regional travel connections, especially between the Virginia portion of the MPA and the Bristol region, should be considered in evaluating potential future year improvements. Furthermore, this could be an ideal area to increase enforcement to address excessive speeding and reckless driving.

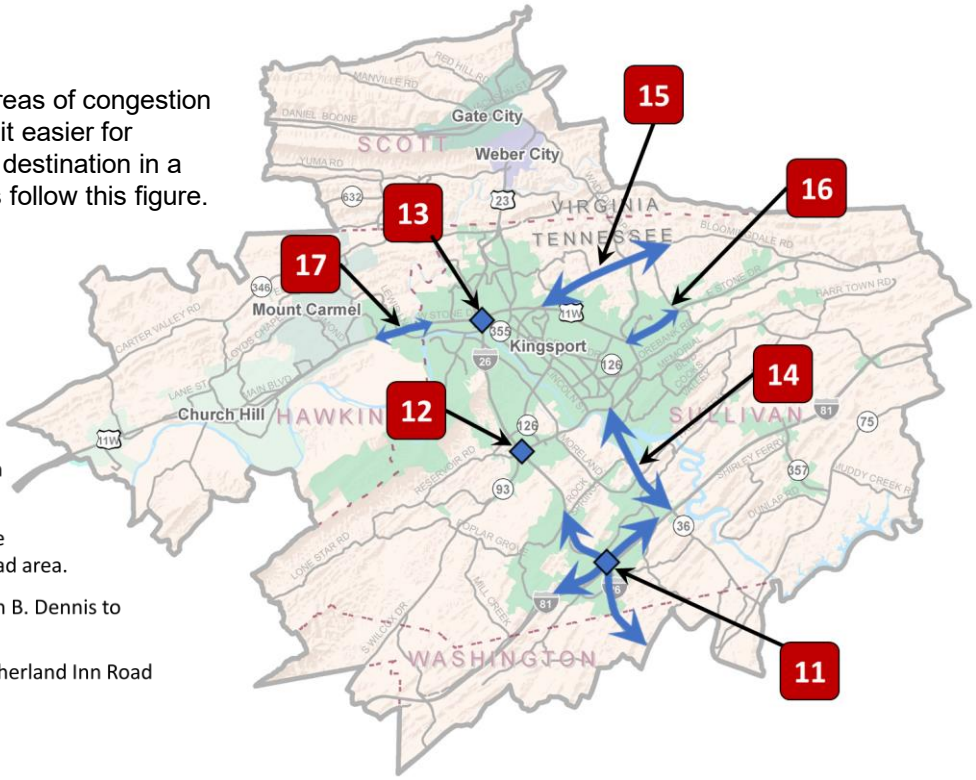
Traffic Congestion/Restricted Travel Corridors

The Kingsport regional travel demand model was used to identify potential areas of traffic congestion, or restricted travel corridors. The results of the 2045 E+C model run were previously discussed earlier in this chapter. Discussions with area stakeholders also helped to confirm/identify capacity concerns throughout the Kingsport MPA. **Figure 52** summarizes potential capacity concerns identified within the Kingsport MPA followed by a brief discussion of the issues.

Figure 52. Congested/Restricted Travel Corridors Needs/Opportunities

Key Issue

Addressing current and future areas of congestion improves traffic flow and makes it easier for people and goods to reach their destination in a timely manner. Additional details follow this figure.



11 I-81/I-26 interchange area.

12 I-26 at John B. Dennis (SR-93) interchange area.

13 I-26 at US-11W (transitioning into US-23).

14 Address congestion along SR-36 from I-81 north to John B. Dennis (SR-93).

15 Accommodate increased traffic in the Bloomingdale Pike/Bloomingdale Road area.

16 Address capacity along US-11W (John B. Dennis to New Beason Well Road/Cleek Road).

17 Address capacity along US-11W (Netherland Inn Road to Lewis Lane).

11. 12. 13. Interstate Capacity Concerns

The I-81/I-26 interchange has been previously discussed as an important regional and statewide network connection which has geometric deficiencies that contribute to safety issues, including short merging and weaving areas. These geometric deficiencies also negatively impact the interstate mainline capacity, in particular segments of I-81 and I-26 that extend out from the interchange area and impact adjacent interchange ramps.

The Kingsport Travel Demand Model (TDM) results for the 2045 E+C scenario supports the analysis that segments of I-26 are likely to experience traffic congestion. In particular, the segment of I-26, south of I-81 is shown to be operating at LOS E and the segment north of I-81, to the SR-93 (John B. Dennis Highway) interchange, is shown to be operating at LOS D, with LOS F conditions present in the immediate area of the SR-93 (John B. Dennis Highway) interchange ramps. Congestion is also forecast in the vicinity of the I-26 at US-11W (SR-1/Stone Drive), where I-26 transitions to US-23.

These findings are also consistent with the *TDOT I-55/75/26 Multimodal Corridor Study* which identified key existing deficiencies and future needs along the I-26 corridor. These included:

- Interchange congestion at US-11W (SR-1/Stone Drive), where I-26 ends and continues north as US-23.
- Interchange congestion at I-81/I-26
- Interchange congestion at SR-75 (Airport Road) (just beyond the south boundary of the Kingsport MPA but it still impacts regional travel conditions within the Kingsport area)

The study went on to highlight future employment growth that is expected to occur in the interchange areas, in particular near the I-26 interchanges at I-81 and at SR-75 (Airport Road). This continued development is reflected in the regional travel demand model and is contributing to the projected future year capacity issues observed along I-26, and within the I-81/I-26 interchange area.

14. SR-36 (North of I-81)

The 2045 E+C model run shows traffic congestion (areas of LOS E and LOS F) along SR-36 (Fort Henry Drive), extending from I-81 north to SR-93 (John B. Dennis Highway). SR-36 (Fort Henry Drive) provides an important connection to downtown Kingsport, as well as linkages to adjacent residential areas. The capacity issues along this corridor segment also make bicycle and pedestrian travel difficult, and potentially creates safety concerns. Furthermore, the segment of SR-36 (Fort Henry Drive), south of I-81, will be expanded which is likely to attract additional traffic to the I-81 interchange area, including attracting additional traffic along SR-36 (Fort Henry Drive) north of I-81.

15. Bloomingdale Pike/Bloomingdale Road

The 2045 E+C model run shows traffic congestion (areas of LOS E and LOS F) along Bloomingdale Pike/Bloomingdale Road. The congestion extends east from US-11W (SR-1/Stone Drive) to SR-93 (John B. Dennis Highway) and is likely reflecting growth that is anticipated within this area of the MPA. The model also shows congestion extending east of SR-93 (John B. Dennis Highway) but after further examination it is believed that the model is likely overrepresenting congestion in this corridor; however, the geometrics of this roadway reflect a restricted travel corridor which is likely to have some impact on the capacity of this roadway. Addressing congestion on the west end of the corridor, between US-11W (SR-1/Stone Drive) and SR-93 (John B. Dennis Highway), is an issue that should be considered in evaluating future year improvements.

16. US-11W (SR-1/Stone Drive) – from SR-93 (John B. Dennis Highway) to New Beason Well Road/ Cleek Road

Located in eastern Kingsport, this corridor has experienced significant retail development in addition to nearby residential growth. The 2045 E+C model run shows some traffic congestion along US-11W (SR-1/Stone Drive) near SR-93 (John B. Dennis Highway). In addition, discussions with local stakeholders highlighted capacity concerns that extend along US-11W (SR-1) to approximately New Beason Well Road/Cleek Road. Stakeholders went on to state that the lack of internal circulation and interconnectivity between businesses results in traffic having to frequently travel back onto US-11W (SR-1/Stone Drive) which ultimately contributes to some of the congestion concerns in the area. US-11W (SR-1) also drops from six-lanes (near Beechnut Drive/Springdale Lane) which contributes to traffic congestion, especially during peak travel times. Access management, along with enhanced land use coordination and interconnected developments, could help reduce capacity issues along the corridor.

17. US-11W (SR-1/Stone Drive) – from Netherland Inn Road to Lewis Lane

The 2045 E+C model run shows traffic congestion along US-11W (SR-1/Stone Drive). In particular, the segment between Netherland Inn Road to Lewis Lane was an area identified by stakeholders as having congestion concerns. As previously documented, US-11W (SR-1/Stone Drive) has numerous crashes and traffic congestion along with poor access control which are likely contributing factors. Stakeholders went on to confirm that traffic congestion during peak travel periods is a primary concern. One example that was noted was the difficulty for left-turning vehicles, both turning onto the corridor from side streets, or businesses, and for vehicles turning into businesses. Furthermore, this corridor was identified as a potential area for future development, in particular the Holston Army Ammunition Plant site holds great potential for future economic development which would likely generate additional trips within the corridor. As such, it is critical that future development plans consider both land use and transportation solutions to adequately accommodate future development and traffic levels.

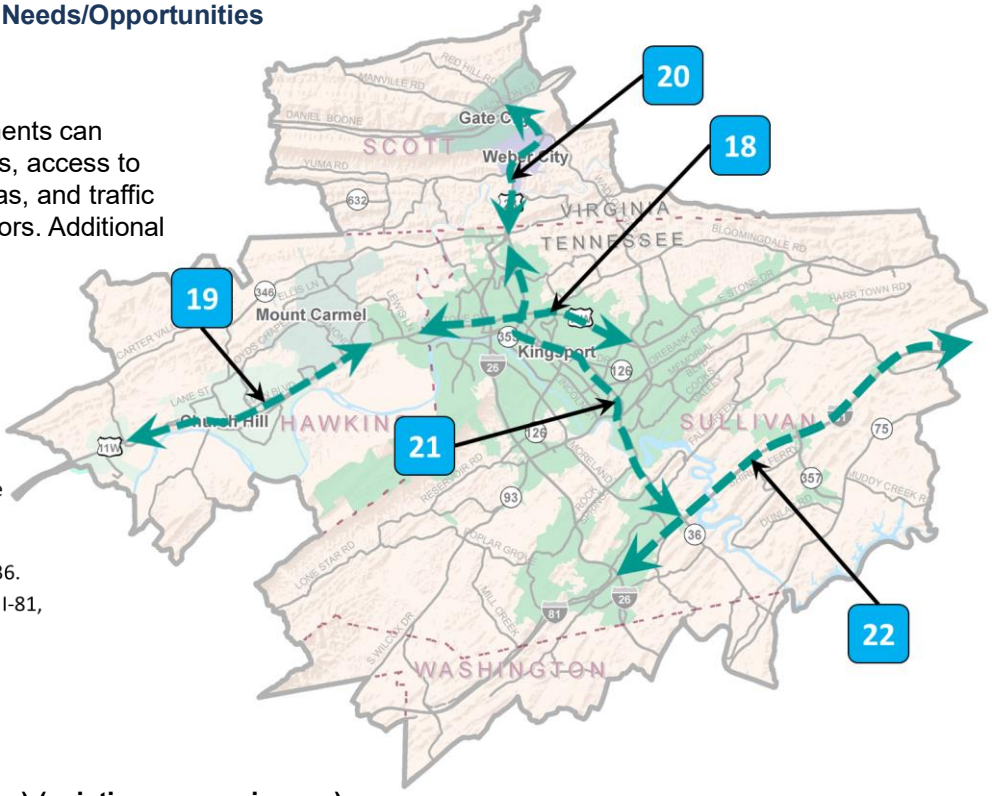
Traffic Operations

Several corridors within the Kingsport MPA were identified as having operational issues, or were areas of concern. In some cases, these corridors have already been previously discussed as they may also have safety and/or capacity concerns. **Figure 53** displays key corridors that are experiencing traffic operational concerns followed by a brief discussion of the issues.

Figure 53. Traffic Operations Needs/Opportunities

Key Issue

Making spot location improvements can enhance intersection operations, access to businesses and residential areas, and traffic flow along primary travel corridors. Additional details follow this figure.



18 Improve traffic flow and access to commercial areas along US-11W.

19 Plan for future development along US-11W (potential frontage road).

20 Implement recommendations in the US-23 study (being completed at the time of this LRTP update).

21 Improve access management and traffic signal coordination along SR-36.

22 Install technology improvements on I-81, from I-26 to I-381 in Virginia.

18. US-11W (SR-1/Stone Drive) (existing access issues)

Addressing overall access management is a concern within the US-11W (SR-1/Stone Drive) corridor. This corridor has been previously discussed as having high crash exposure which is likely caused in part due to poor access control. Additionally, congestion is also perceived as being worse during peak periods due in part to increased difficulty for vehicles accessing commercial areas and trying to access US-11W (SR-1/Stone Drive). Finding opportunities to address these issues could significantly help improve overall traffic flow along the corridor and contribute to enhanced safety conditions.

19. US-11W (SR-1) (accommodate future development; potential frontage road)

Covering the western portion of the Kingsport MPA, US-11W (SR-1) near Church Hill and Mount Carmel includes a key site for potential industrial development at the Holston Army Ammunition Plant. This site includes approximately 170 acres of land controlled by the US Army and available for approved development on a long-term lease basis. Because the development of this site is so restricted and the desired growth types are unknown, the site remains underutilized. Adjacent to this site, significant growth from BAE Systems has benefitted the region, but it was noted by stakeholders as needing improved secondary connector roadways and enhanced internal circulation to improve traffic operations and enhance safety along the corridor. A proactive approach to accommodate future development, including a comprehensive land use and access management plan, could help minimize future traffic operational issues along this corridor.

20. US-23 (VDOT District priority corridor)

US-23 is being studied by VDOT as part of *Project Pipeline* and this corridor remains a high priority for VDOT. Previous studies have documented the need for traffic signal coordination, raised medians, curb and gutter with sidewalks, and consolidated railroad crossings. Additional analysis as part of *Project Pipeline* identifies congestion at the signalized intersection at Yuma Road as well as

closely spaced intersection and commercial driveways, in particular in the area of US-23 and US-58. Norfolk-Southern freight rail tracks, located adjacent to the west side of the corridor, are also mentioned as a concern as there are at-grade rail crossings on several intersecting streets in Weber City. Addressing these operational concerns along the US-23 corridor is also viewed as a high priority by the Kingsport MTPO.

21. SR-36 (Lynn Garden Drive/Center Street/Fort Henry Drive) – from I-81 to Tennessee-Virginia Stateline)

SR-36 (Lynn Garden Drive/Center Street/Fort Henry Drive) functions as an important north-south connection within the MPA. Currently, it is the last continuous north-south segment serving the eastern portion of the area. As such, this corridor experiences heavy traffic volumes while also providing an important connection through downtown Kingsport and continuing north to connect to US-23 near the Virginia Stateline. Improving access management and enhancing traffic signal coordination could be beneficial to improving traffic operations along the corridor.

22. I-81 Technology Enhancements

I-81 Intelligent Transportation System (ITS) Expansion is a state IMPROVE Act project that is included in Fiscal Year 2022 for PE-D. The project will extend from I-26 to exit 3 (I-381) in Virginia and will add ITS elements to help improve traffic operations and enhance safety. The total project cost is $8,900,000.

Public Transportation

Public transportation is indispensable for many area residents who do not own or have access to a car. It is also an important transportation mode for younger individuals who may not have a driver's license, older adults, people with disabilities, low-income populations, those without access to a vehicle, or who prefer not to drive. Furthermore, as heard through discussions with stakeholders, transit plays a critical role in connecting Kingsport residents to vital services located beyond the MPA, including the Veterans Affairs (VA) Medical Center and other social services in Johnson City. The demand for these services has been on the rise and it is likely that the need for regional transit services will continue well into the future. If transit services are going to continue to grow to meet the growing mobility needs of the region, it will be important to address the needs and issues summarized in **Figure 54**. Following this figure is a brief discussion of the respective transit needs and issues.

Figure 54. Local and Regional Transit Needs and Opportunities

1 Monitor short- to mid-range KATS service enhancements.

a) Explore alternative transit services, including potentially transitioning to a full demand response system.

b) Add later service hours; currently ends at 5:30 pm (not on map).

2 Potential expansion areas for future transit service.

a) Developing southeast area, toward I-81/SR-357.

b) US-23 corridor, connecting to park-n-ride facilities located in Virginia.

c) US-11W corridor, to Mt. Carmel and Church Hill.

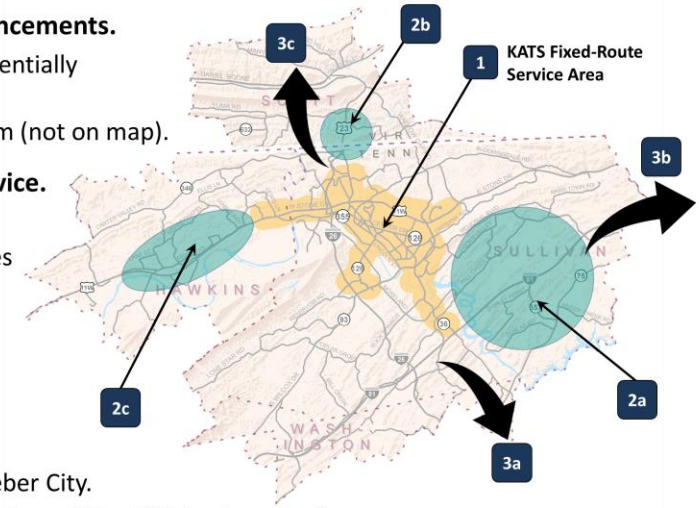
3 Enhance regional transit connections.

a) Improve service connections to Johnson City.

b) Improve service connections to Bristol.

c) Improve service connections to Gate City and Weber City.

d) Explore park-n-ride facilities in the Tennessee portion of the MPA (not on map).



1. KATS Fixed-Route Service

As previously discussed, KATS operates six fixed-routes in the Kingsport City limits (service area represented by the yellow shading in **Figure 54**). When COVID-19 interrupted and altered the delivery of service, KATS considered alternative options to providing fixed-route service, specifically the possibility of converting the system to a full demand response service. The Kingsport Comprehensive Operation Analysis (COA) 2018 also recommended, in addition to improvements to existing routes, the creation of a taxi feeder program to complement the fixed-route system and provide options for first and last mile trips. In discussion with KATS, this program has not yet been explored.

Converting the system to a full demand response service was recently evaluated as part of the recent transit study which found that three of the six routes could potentially be converted, while the other three routes had ridership levels that would make a conversion challenging. The study does not include specific recommendations regarding the conversion and at this time KATS intends to continue to operate as a fixed-route service.

One additional service-related issue that was raised by stakeholders, and as part of conversations with KATS, is a desire for extended service hours. With service currently ending at 5:30 pm it is difficult for riders to access critical medical and social services, especially in the late afternoon as catching a return trip becomes difficult. Exploring opportunities to extend service

hours is a direct correlation to available funding; however, this issue is one that should continue to be evaluated in the future planning efforts.

2. Potential Areas for Service Expansion

While most riders and stakeholders agree that KATS provides a valuable service, some have indicated a desire to extend the current fixed-route service to increase accessibility to transit. These areas, highlighted in **Figure 54**, are briefly described in the following:

2a) The southeast portion of the Kingsport MPA has been previously identified as an area that is experiencing growth and is likely to see continued residential development and economic activity. Access to the I-81/SR-357 (Airport Parkway) interchange, along with the possibility of a future extension of SR-357 (Airport Parkway), makes this a prime location for development and extending transit service to this area could potentially enhance access to the West Ridge High School and the Tri-Cities Airport. With this said, there are obvious scheduling challenges, and increased costs, as extending fixed-route service further out from the central transfer point in downtown Kingsport increases trip time and requires additional buses.

2b) KATS fixed-route service currently stops short of connecting to the Virginia portion of the MPA. In discussions with stakeholders, there is a desire to extend service to provide a seamless connection to Virginia, but challenges do exist, including operating a bi-state service. In addition, there has been previous discussion of a MEOC/MET connector route and the development of a park-and-ride facility near the Stateline that could potentially function as a transit hub, or transfer point. Opportunities to continue to explore an enhanced connection to the Virginia portion of the MPA should be considered with on-going planning efforts, including future evaluation and study of improvements to the US-23 corridor.

2c) KATS service currently stops short of connecting to Mount Carmel and Church Hill. The US-11W (SR-1) corridor serves commercial businesses that currently fall beyond the fixed-route service area. In recent years, Mount Carmel has expressed some interest in potentially having fixed-route service but to date no service has been extended to the area. Looking into the future, the corridor includes a key site for potential industrial development at the Holston Army Ammunition Plant location, which could benefit from transit to help connect area residents with job opportunities within the region. Opportunities to extend service to Mount Carmel and Church Hill should be considered in future planning activities, especially when the Holston Army Ammunition Plant location site begins to consider future economic development activities.

3. Enhanced Regional Transit Connections

As part of discussions with stakeholders and regional transit providers, it is clear that there is a need to enhance regional transit service that would extend or enhance service coverage beyond the Kingsport MPA. The discussion of enhancing regional transit service has also been previously highlighted as part of *TDOT's I-55/75/26 Multimodal Corridor Study* and *Interstates 40 and 81 Multimodal Corridor Study*. Related to regional service enhancements, the study goes on to highlight an opportunity to develop a park-and-ride facility within the Tennessee portion of the MPA.

As part of the LRTP stakeholder conversations, the regional mobility group discussed potential next steps, which included conducting a larger Tri-Cities regional transit study to determine potential ridership demand, as well as potential travel patterns to/from key regional attractions and activity centers. Representatives from both TDOT and VDOT who participated in the stakeholder discussions supported the need to conduct a regional transit study. It is important that any regional study consider connections to the Virginia portion of the Kingsport MPA, especially given the existing conditions analysis which documented a heavy travel pattern between the Virginia portion of the MPA and areas in Tennessee that are outside the Kingsport MPA.

In 2011, MEOC/MET Transit, in cooperation with VDOT, and LENOWISCO developed the MEOC/MET *Transit Development Plan* for the four-county LENOWISCO region. The MEOC/MET *Transit Development Plan* largely speaks to the service needs outside of the Kingsport MPA; however, the plan does identify service needs between the LENOWISCO region and Kingsport. The plan calls for a regional connector service to provide regional connectivity, both within the LENOWISCO region, and to Kingsport and Johnson City. This is mentioned again in the 2020 Transit Development Plan (TDP), where it stressed the importance of this regional connection.

In 2016, TDOT developed a *Coordinated Public Transit-Human Services Transportation Plan* (CPTHSTP) for the Tri-Cities region which includes the Kingsport MPA and encompasses a ten-county area including the counties of Carter, Greene, Hancock, Hawkins, Johnson, Sullivan, Unicoi, and Washington counties in Tennessee and Scott and Washington counties in Virginia. The CPTHSTP outlines current rural and urban service providers, identifies service gaps and unmet needs, and suggests short- and long-term strategies to address those needs. Among these needs is insufficient connectivity or coverage between urbanized areas, urban centers, and rural areas, and the lack of funding to expand and maintain the existing transit services.

Bicyclists and Pedestrians

The *Kingsport MTPO Regional Bicycle and Pedestrian Plan* provides a roadmap for meeting the growing demand for walking and biking within the Kingsport MPA. The plan includes recommendations and policies that will improve safety, enhance mobility, increase connectivity, and promote a higher quality of life throughout upper East Tennessee and southwest Virginia. The purpose of the *Kingsport MTPO Regional Bicycle and Pedestrian Plan* is to establish a comprehensive bikeway and pedestrian network, suitable for users of all ages and abilities, which enables regional jurisdictions to plan and implement facilities that expand multimodal connectivity, improve safety, enhance mobility, and promote a higher quality of life throughout the region. The following summarizes the key themes, or principles, from the recent *Kingsport MTPO Regional Bicycle and Pedestrian Plan*. It is important to note that the *Kingsport MTPO Regional Bicycle and Pedestrian Plan* was developed at the same time as the LRTP update and the respective project teams coordinated to ensure a seamless coordination of future bicycle and pedestrian improvements with other LRTP projects/recommendations.

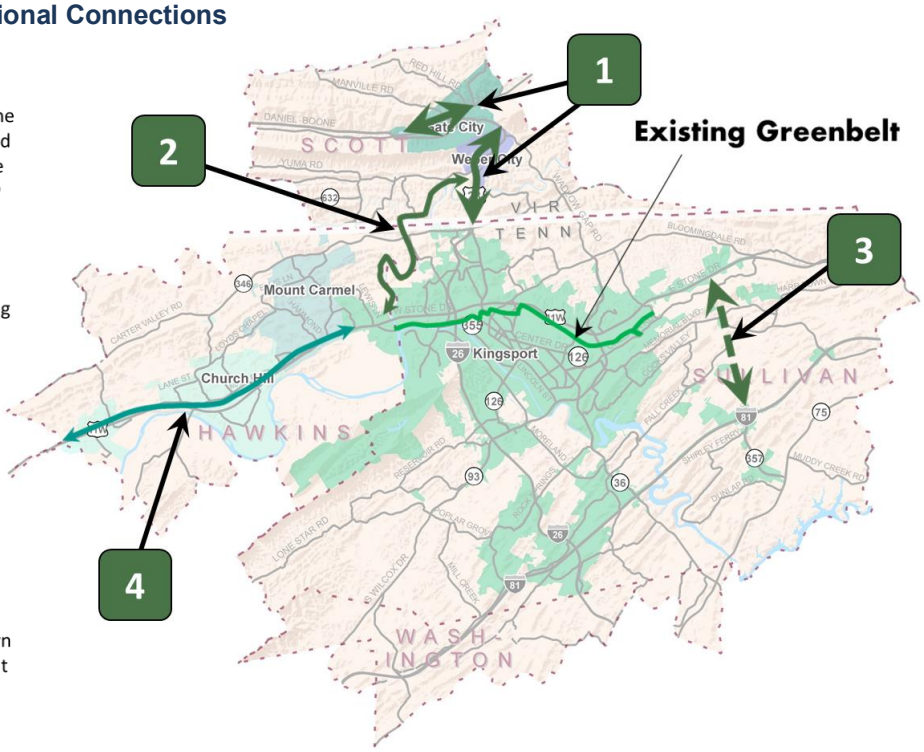
Non-Motorized Regional Connectivity

Figure 55 displays primary non-motorized regional connections within the Kingsport MPA. These improvements reflect key aspects from the *Kingsport MTPO Regional Bicycle and Pedestrian Plan*. Generally speaking, the existing Kingsport Greenbelt facility is a unique non-motorized asset that functions as the backbone of the non-motorized regional network and the MTPO promotes future expansion of this facility, as well as the development of other regional connections.

Figure 55. Non-Motorized Regional Connections

Enhance Regional Connections

1. Developing a non-motorized facility in the US-23 corridor would enhance safety and connect to the existing Lynn Garden bike lane. This supports the ***Kingsport MTPO Regional Bicycle and Pedestrian Plan*** which identifies a need to improve connections to Virginia.
2. Creating a low-stress bicycle facility along Apple Orchard Road would enhance the connection between Virginia and Tennessee and provide an alternative to the US-23 corridor.
3. Extending SR-357 would provide an opportunity to develop a north-south bicycle connection. It also expands the use of alternative travel modes in a developing part of the region.
4. Enhancing bicycle and pedestrian connections along US-11W enhances regional connectivity between downtown Kingsport, Mt. Carmel, and Church Hill. It also enhances connections to the Kingsport Greenbelt.



1) US-23 Bike Lane (connect with existing SR-36 (Lynn Garden Drive) bike lane)

One of the primary regional connections discussed in the *Kingsport MTPO Regional Bicycle and Pedestrian Plan* is the desire to create a regional connection to the Virginia portion of the Kingsport MPA. The safety concerns and access management issues that are present along US-23 highlight the importance of improving the multimodal connections along this corridor. Potential improvements to this corridor should include appropriate bicycle and pedestrian accommodations, including providing safe crossings of US-23.

2) Apple Orchard Road Greenway (low-stress facility)

Bicycle and pedestrian improvements along US-23 are important to support non-motorized travel and connections to area businesses along the corridor. The *Kingsport MTPO Regional Bicycle and Pedestrian Plan* also discusses the opportunity to create a low-stress bicycle facility that would connect from approximately the US-11W (SR-1/Stone Drive) corridor to the Virginia portion of the Kingsport MPA. The plan highlights a potential connection that could be developed along Apple Orchard Road.

3) SR-357 (Airport Parkway) Extension

The SR-357 (Airport Parkway) extension, as previously discussed from a roadway network connectivity standpoint, also presents a future opportunity to develop a multimodal connection, or specifically a future bicycle connection that would link the area around the I-81/SR-357 (Airport Parkway) interchange to SR-126 (Memorial Boulevard), or potentially continuing north to connect to US-11W (SR-1). As the SR-357 (Airport Parkway) extension is evaluated in future years, appropriate non-motorized accommodations should be considered as this improvement provides a critical opportunity to significantly expand regional bicycle connections, in particular to areas south of I-81.

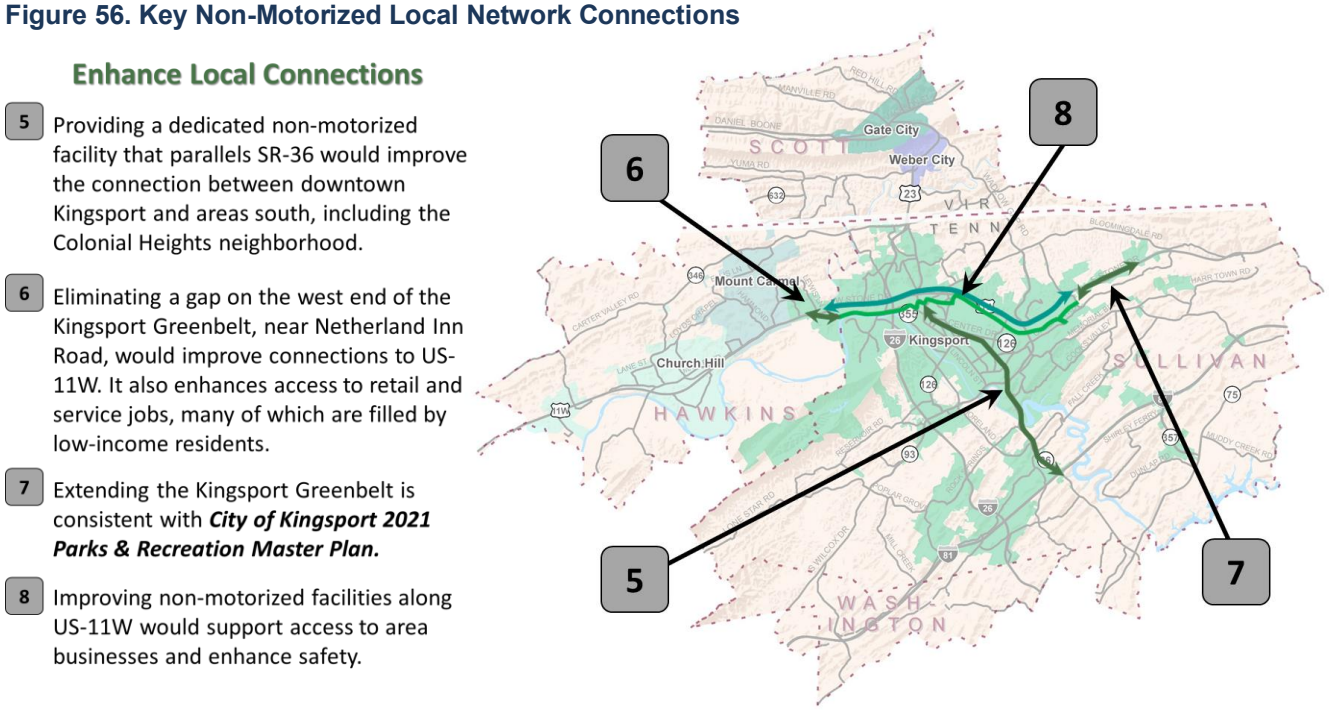
4) US-11W (SR-1) (Mount Carmel and Church Hill area)

The US-11W (SR-1) corridor, in the vicinity of Mount Carmel and Church Hill, could benefit from improved multimodal connections. These connections would significantly improve regional connectivity between the western portion of the Kingsport MPA and downtown Kingsport, as well as improving access to the existing Kingsport Greenbelt facility. According to the *Kingsport MTPO Regional Bicycle and Pedestrian Plan*, expanding the recommended bikeway network to emphasize regional connectivity is one of the three principle strategies. Enhancing non-motorized travel along US-11W (SR-1) would significantly contribute to advancing this principle.

Non-Motorized Local Connections

Figure 56 displays key non-motorized local network connections for potential improvement. These connections are consistent with the MTPO's recently completed *Kingsport MTPO Regional Bicycle and Pedestrian Plan*.

Figure 56. Key Non-Motorized Local Network Connections



5) SR-36 (Fort Henry Drive)

The SR-36 (Fort Henry Drive) corridor provides a critical linkage between downtown Kingsport and areas south toward I-81. As previously discussed, this corridor experiences traffic congestion and has access management issues which make non-motorized travel difficult. The *Kingsport MTPO Regional Bicycle and Pedestrian Plan* supports improved multimodal connections along this corridor connection, including a facility that would parallel SR-36 and provide improved connections to the Colonial Heights neighborhood.

6) Netherland Inn Road Connection (West End Greenbelt)

This relatively short gap, between the west end of the Kingsport Greenbelt and US-11W (SR-1/Stone Drive), represents an opportunity to further improve the non-motorized network connectivity by enhancing access to US-11W (SR-1/Stone Drive). Furthermore, in discussions with regional stakeholders, US-11W (SR-1/Stone Drive) was identified as an important retail and service corridor that provides job opportunities to environmental justice populations. Completing this short gap would significantly enhance local, and regional, non-motorized connectivity.

7) Kingsport Greenbelt Extension

The Kingsport Greenbelt is a significant regional asset, from both a recreational and economic perspective, and the MTPO has plans to expand the facility to the east. The City of Kingsport Parks and Recreation Department updated its Parks & Recreation Master Plan in 2021 which also included recommendations for significant expansion of the Kingsport Greenbelt. As stated in plan development documents: There are numerous opportunities for new Greenbelt connections to existing parks & recreation amenities, downtown businesses, and natural assets of Kingsport. The South Fork of the Holston River bolsters a unique experience within Kingsport and offers the opportunity for a Greenbelt loop by traversing along the waterway while offering beautiful views. The final recommendations from the Parks & Recreation Master Plan are incorporated into the *Kingsport MTPO Regional Bicycle and Pedestrian Plan*.

8) US-11W (SR-1/Stone Drive) Multimodal Improvements

Improvements along US-11W (SR-1/Stone Drive) are important to enhance the non-motorized environment within the area and support access to area businesses along the corridor. While this facility parallels the Greenbelt, many area residents still rely on non-motorized travel along US-11W (SR-1/Stone Drive) to access shopping and employment. This corridor also accommodates first and last mile transit trips and improving this facility would greatly enhance bicycle and pedestrian travel within the region.

Non-Motorized Tourism and Economic Activity Connections

Figure 57 displays key non-motorized improvements that are targeted to support tourism and economic development within the region.

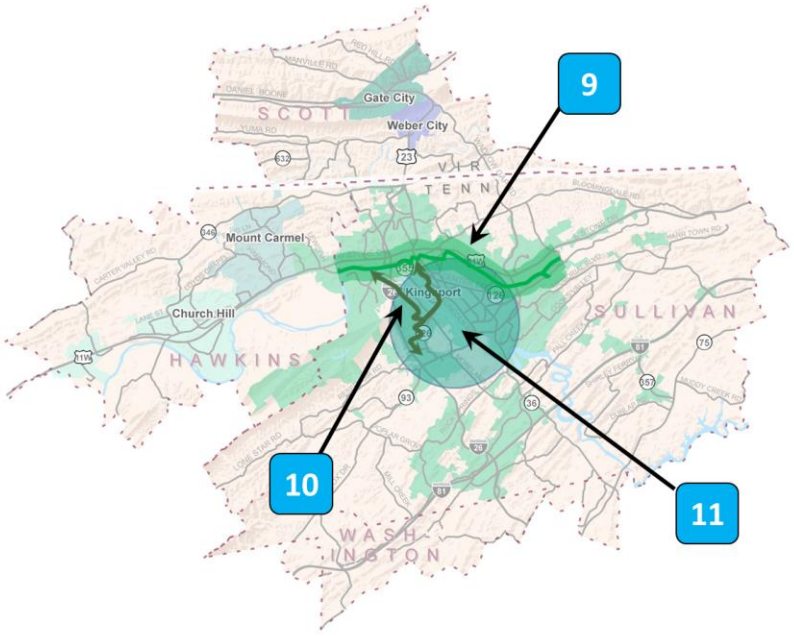
Figure 57. Key Non-Motorized Connections to Support Tourism / Economic Activity

Support Tourism / Economic Activity

9 Providing new trails and/or on-street facilities that connect to the Kingsport Greenbelt supports local businesses and tourism. This supports the ***Kingsport MTPO Regional Bicycle and Pedestrian Plan*** which looks to increase the impact of the Kingsport Greenbelt as a transportation facility.

10 Creating a greenway system (shared-use path) along Horse Creek would create a strategic connection between downtown Kingsport and the Meadowview Convention Center.

11 Improving bicycle and pedestrian access in the Eastman campus area would enhance safety and encourage some employees to use alternative travel modes. This was supported by local stakeholders.



9) Kingsport Greenbelt Connectivity (linkages to downtown / activity centers)

As stated, the Kingsport Greenbelt is an incredible regional asset and as such it should be used to encourage on-going improvements to connect from the facility to nearby residential neighborhoods, downtown Kingsport, and businesses located along US-11W (SR-1/Stone Drive). The *Kingsport MTPO Regional Bicycle and Pedestrian Plan* discusses how stakeholders have stressed the importance of increasing the impact of the Greenbelt as a transportation facility. In particular, the plan highlights how new facilities, including on-street facilities, are needed to connect to/from the Greenbelt. Future planning efforts, including roadway improvements, should consider the potential to provide direct connections to/from the Greenbelt which could significantly support tourism and economic activity within the area.

10) Meadowview Convention Center

The creation of a greenway system, through the development of shared-use path along Horse Creek, would provide a beautiful location for users to visit and form a relationship with an existing interesting feature. If developed, this path could become an additional amenity and destination for the City of Kingsport and serve as a strategic connection between the downtown and the Meadowview Convention Center. **Figure 58** displays a rendering of a potential Horse Creek Greenway shared-use path as contained in the *Kingsport MTPO Regional Bicycle and Pedestrian Plan*.

Figure 58. Conceptual Horse Creek Greenway Connection

Source: Kingsport MTPO Regional Bicycle and Pedestrian Plan; February 2022.

11) Eastman Campus Connections (enhanced non-motorized access)

In discussions with local stakeholders, including Eastman representatives, improving bicycle and pedestrian access in the campus area would be beneficial and could encourage some employees to use alternative travel modes to commute to/from work. One of the first priorities would be to consider opportunities to enhance existing intersection crossings. While specific intersection improvements are not identified, potential improvements could include but are not necessarily limited to the following: high visibility crosswalks on all intersection legs, advanced stop lines, pedestrian signal countdown heads, leading pedestrian intervals on traffic signals, curb extensions and / or reduced curb radii, pedestrian refuge islands, and improved nighttime lighting.

Technology / Intelligent Transportation Systems (ITS)

Communities across the country are undergoing a period of profound change and transition that will affect how individuals travel in the future. New technologies and mobility services are being developed and deployed that enable increased efficiency and offer more mobility options. As a result, new technologies are likely to impact the physical space of transportation networks and the increased sharing of transportation data (i.e., real time traffic information). While some technologies and services are still in the early stages of development, and have not been fully tested or proven yet, it is an important part of the on-going transportation planning process to acknowledge the changing mobility landscape and the potential impacts technology could have on the Kingsport MPA transportation system through the horizon year 2045. Some examples of technology advancements that could impact future year transportation operations and investments in the Kingsport MPA might include the following:

- **Mobility on Demand** – MoD is the ability for riders to hail/request a transportation mode to complete an end-to-end journey. MoD could be a private partnership with a company, such as transportation network companies (TNCs) or could be operated by a public agency with their own fleet. While many MoD providers have been TNCs offering private rides, there has been public-private-partnerships with TNCs to provide first/last mile journeys from transit stops, paratransit trips, or to supplement transit services during non-operational transit hours.
- **Micromobility** – Micromobility represents small mobility devices such as bicycles, tricycles, cargo bikes and trikes, scooters, mopeds, and others. Micromobility devices can be docked, with devices located and secured to a network of stations, or can be dockless, with devices available to pick up, use, and drop off within a defined service area. These devices can also be human-powered or electrically powered. There is also the potential to include adaptive bicycles or tricycles that would expand access to shared transportation services to people with special needs or disabilities.
- **Mobility as a Service (MaaS)** – MaaS integrates various types of transportation vehicles and services (e.g., transit, micromobility for point-to-point or first/last mile trips, car share, TNCs, carpooling) into a single mobility service via a smart phone platform.
- **Smart Roadway Infrastructure** – Smart Road technologies collects data that can be analyzed in real-time primarily to support traffic management, and could include speed and acoustic sensors, CCTV cameras, smart traffic lights, condition/weather monitoring systems, digital signage, and others. Smart Road infrastructure may also someday include in-road electric charging lanes, solar roadways, and other applications. The use of ITS applications are currently being programed by TDOT for the I-81 corridor, including a segment of I-81 within the Kingsport MPA.
- **Smart Transit Infrastructure** – Smart infrastructure focused on transit assets such as solar panels on the roof of bus shelters, Wi-Fi, USB charging points, real-time multimodal information, & digital local information (e.g., traffic, weather, news, and headlines). This may also include smart infrastructure that supports transit such as light-emitting treatments embedded in sidewalks, bike paths, and bus pads.
- **Autonomous vehicles (AVs)** – AVs use connected vehicle technology and sensors to sense the environment and safely operate with little to no human control. Vehicle-to-vehicle technologies allow vehicles to "talk" to each other and are used to monitor speed and position. Vehicle to infrastructure technologies are used to determine intersection geometry, detect signal phases and overhead safety messages. AV shuttles range in capacity from 4 to 16 passengers, have ramps for ADA accessibility, and are fully electric with ranges of up to 14 hours.

In conclusion, not all of the above technologies may be applicable to the Kingsport MPA; however, it is important for the Kingsport MTPO to monitor future technology advancements to determine if certain elements could help the region advance alternative travel options, and more efficiently, effectively, and safely deliver transportation and mobility services for all transportation users within the Kingsport MPA.

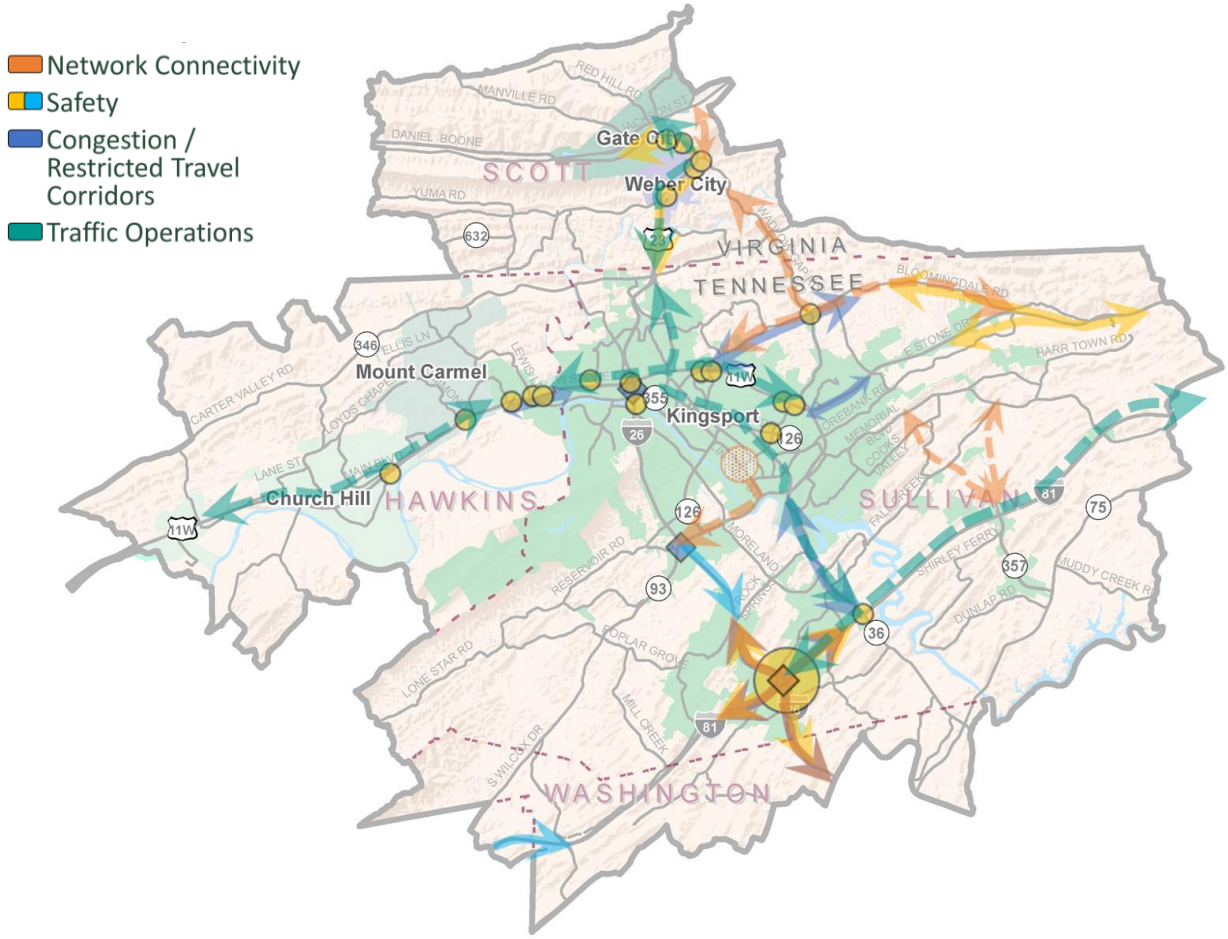
6. Potential Transportation Investments

This chapter identifies potential transportation investments, or projects, to address the needs and opportunities identified in Chapter 5, and/or issues identified as part of the existing conditions analysis documented in Chapter 4. The chapter also summarizes the performance-based project scoring methodology, which supports the Kingsport 2045 LRTP goals and objectives, that is used to help inform the project evaluation of potential roadway/freight projects.

Summary of Needs

Chapter 5 discussed the roadway/freight needs within the Kingsport MPA by specific areas of concern – network connectivity, safety, congestion, and traffic operations. These concerns are combined into one graphic (see **Figure 59**) to highlight areas with multiple issues or needs. Locations with multiple concerns provide an indication that a roadway interchange, intersection, segment, or corridor may require a transportation project, or other mobility solution, to improve conditions for the traveling public, or to improve the efficient movement of freight.

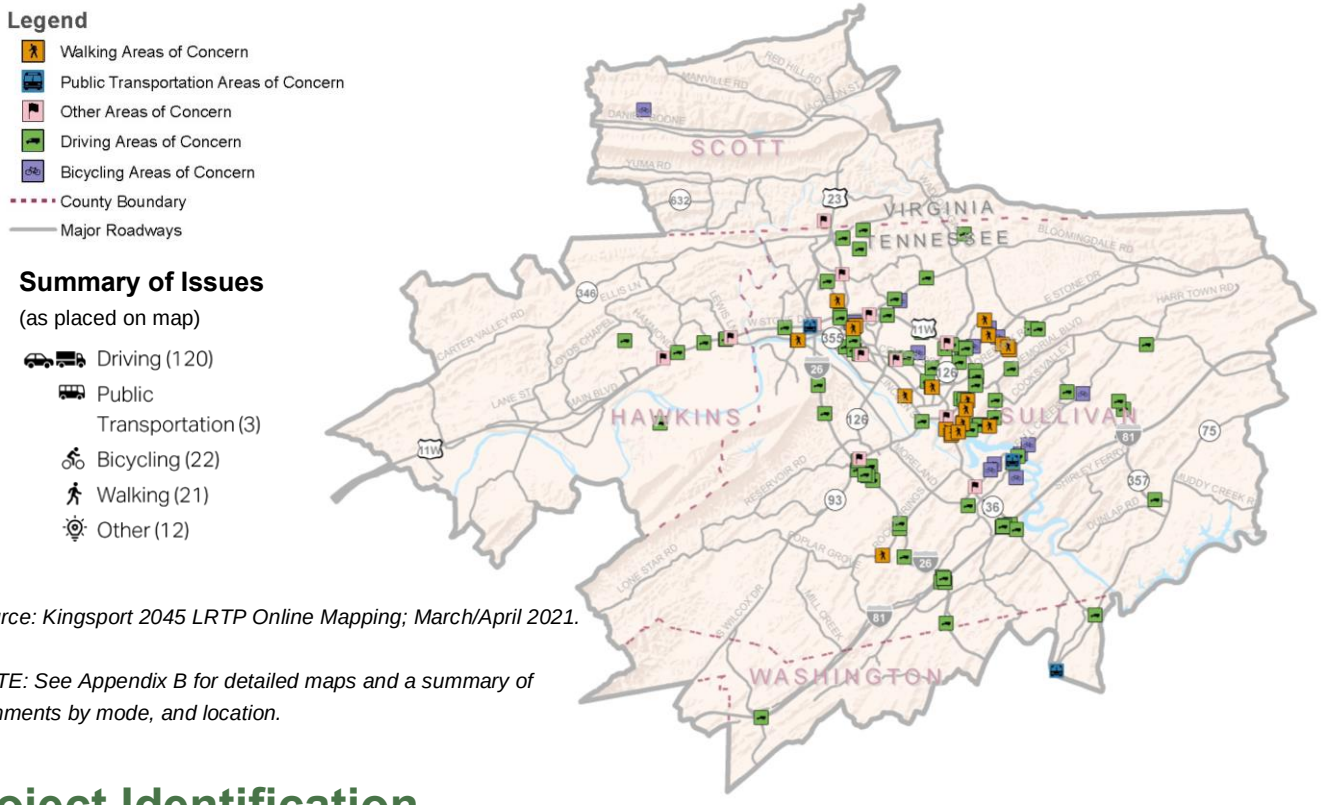
Figure 59. Combined Roadway/Freight Needs



Public Identification of Regional Needs

Public engagement and stakeholder input are critical to the LRTP development process and are extremely helpful in identifying regional transportation and mobility needs of Kingsport area residents, businesses, and visitors. **Figure 60** summarizes the location of transportation issues/needs as identified by the public through an online interactive mapping process. The identification of these issues, along with supporting comments, helps inform the development, or confirmation, of potential future year transportation projects. **Appendix B** includes a summary of the public comments that were provided with the respective map markers.

Figure 60. Public Identification of Regional Needs (Result of Interactive Mapping)



Source: Kingsport 2045 LRTP Online Mapping; March/April 2021.

NOTE: See Appendix B for detailed maps and a summary of comments by mode, and location.

Project Identification

Project identification relies on a combination of a technical analysis and public outreach to identify future year capital improvements to address mobility needs of the public, local businesses, and industries. Projects are identified in various ways, starting with a review of the 2040 LRTP fiscally constrained projects, as well as the unfunded visionary or illustrative transportation projects. The following sections provide additional details regarding the project identification process.

Committed Projects

The Transportation Improvement Program (TIP) is the primary document used to identify and program funding for all transportation projects within the Kingsport MPA.[8] The TIP identifies the region's highest priority transportation projects, develops a multi-year implementation program, and identifies necessary funding sources. The TIP is cooperatively developed at least every four years by the Kingsport MTPO staff in coordination with its member jurisdictions, TDOT, VDOT, FHWA, FTA, and public transportation providers. The current TIP, adopted November 7, 2019, includes projects for FY 2020 – 2023. The following link can be used to access the current TIP, including any TIP amendments or adjustments.

https://www.kingsporttn.gov/city-services/kmtpo/plans-and-documents/tip/

[8] Transportation projects that are funded by federal programs in Titles 23 (Highways) and 49 (Transportation) of the USC.

IMPROVE Act Projects

The Improving Manufacturing, Public Roads and Opportunities for a Vibrant Economy (IMPROVE) Act was signed into law by former Gov. Bill Haslam in 2017 and authorized the state of Tennessee to update several state taxes, including lowering the Hall tax and the sales tax on food. The law also increased some state fees and taxes, such as additional registration fees for electric vehicles and incremental increases from 2017-19 to tax rates on gasoline, diesel fuel and natural gas.

According to the Tennessee Department of Revenue, revenue collected due to changes from the IMPROVE Act is expected to go toward funding 962 road projects across the state totaling $10.5 billion. Based on original estimates, these projects were planned to be constructed within approximately ten years; however, in November 2019, TDOT officials reported that the timing for the completion of the 962 projects will likely take twenty plus years. **Table 35** summarizes the IMPROVE Act roadway projects that are located within the Kingsport MPA (this does not include additional bridge related projects).

Table 35. Kingsport MPA IMPROVE Act Projects

County	PIN	Route	Termini	Description	Fund Code	Current Phase	Current Phase Date	Proposed Letting Date	In Current TIP (FY20-23)?	In Current TDOT 3-Year Plan (FY22-24)?
Sullivan	105467.01	SR-126	Memorial Boulevard - From East Center Street in Kingsport to East of Cooks Valley Road	Widen 2 lane to 4 lane, 5 lane, and 3 lane	STBG	ROW	10/30/2017	2nd quarter of 2023	NO	NO
Sullivan	105467.02	SR-126	Memorial Boulevard - From East of Cooks Valley Road to I-81	Construct a 3 Lane section from East of Cooks Valley Road to Harr Town Road, 2 Lane section from Harr Town Road to I-81	STBG	PE	10/30/2018	4th quarter of 2025	NO	NO
Sullivan	112834.03*	SR-93	Sullivan Gardens Parkway - From South of Horse Creek to North of Derby Drive	Spot Improvements, Reconstruction, and Bridges	STBG	ROW	10/30/2014	4th quarter of 2022	NO	NO
Washington / Sullivan	112834.02*	SR-93	Sullivan Gardens Parkway - From Morgan Lane in Washington County to South of Baileyton Road in Sullivan County	Miscellaneous safety improvements	STBG	CONST		4th quarter of 2021	YES = CONST FY22	YES = CONST FY22
Washington / Sullivan	124663.00	SR-36	Fort Henry Drive - From SR-75 to I-81	Widen from 2 lanes to 5 lanes with sidewalks on both sides	STBG	PE	10/30/2021	1st quarter of 2027	YES = PE FY21	NO
Sullivan	124590.00	I-81	I-81 - From I-26 interchange to Virginia Exit 3	ITS Expansion	NHPP	PE	10/30/2020	2nd quarter of 2023	YES = CONST FY23	NO
Washington	112834.01	SR-93	Sullivan Gardens Parkway - From North of Davis Road to North of Fire Hall Road	Miscellaneous safety improvements - flatten the existing horizontal curves and improve intersection sight distance, widen from 2 to 3 lanes with curb & gutter and sidewalks	STBG	This portion of the project is complete.				

* The iTRIP information for these projects is from 10/25/21. The updated information on iTRIP shows one large project and does not show the project broken down into sections

Source: TDOT iTrips; February 2022. NOTE: See **Figure 73** *for the IMPROVE Act project locations*.

Virginia SMART SCALE (House Bill 2)

Virginia SMART SCALE (House Bill 2) was adopted in 2014 and requires the development of a prioritization and scoring process to identify project funding. The prioritization process evaluates projects as they relate to congestion mitigation, economic development, accessibility, safety, and environmental quality. Although SMART SCALE provides a quantifiable process for making project funding decisions, projects still require inclusion in the MTPO's planning process, specifically the LRTP and TIP.

At the time of the LRTP update, VDOT was conducting *Project Pipeline* which is a comprehensive process to identify multimodal transportation needs in Virginia. Through this planning process, projects and solutions may be considered for funding through programs, including SMART SCALE, revenue sharing, interstate funding and others. *Project Pipeline* aims to implement a statewide look at needs and formalize the connection with planning, funding and programming transportation solutions for Virginia. The objective of the program is to focus on the Commonwealth Transportation Board-adopted VTrans

priority locations and corridors. In March 2022, *Project Pipeline* identified two projects that have since been submitted for SMART SCALE pre-application. One will address access management/turn-lane improvements between the Virginia - Tennessee state line and Yuma Road. A second will address safety and railroad crossings, including adding southbound left- and right-turn lanes at US-23 and Chapel Street, and the elimination of two at-grade railroad crossings at Blanton Drive and Boone Street.

MTPO Priority Rankings

As part of TDOT's development of the 3-year Strategic Plan, the MTPO ranks projects every year for consideration and the Kingsport MTPO Executive Board reviews and approves the rankings. **Table 36** summarizes the 2021 Kingsport MTPO project rankings which were approved in November 2021. The projects at the top of the table were requested for ranking by TDOT while the bottom portion of the table lists projects that the MTPO has included for future consideration by TDOT. It is important to state once again that as projects are ranked on an annual basis this list can change to reflect projects that are implemented, removed, added, etc. However, these rankings represent an important element in identifying potential transportation investments within the Kingsport MPA.

Table 36. 2021 Kingsport MTPO Project Rankings (TDOT Projects Only)

County	PIN	Route	Description	Length	Phase	2020 Rank	2021 Rank
Sullivan	105467.01	SR-126	(Memorial Blvd.) From East Center Street in Kingsport to East of Cooks Valley Road (IA)	4.1	Construction	1	**1**
Sullivan	112834.03	SR-93	(Sullivan Gardens Parkway) From South of Horse Creek to North of Derby Drive (TPR Option 5, Spot Improvements) (IA)	0.8	Construction	3	**2**
Sullivan	124590.00	I-81	ITS Expansion along I-81 between I-26 (Exit 57) Interchange and Virginia Exit 3 (IA)	18.8	Construction	4	**3**
Sullivan	112965.00	SR-347	(Rock Springs Road) from Cox Hollow Rd (LM 9.52) to I-26 (US-23) (LM 10.73) (Local Programs Project, Not IA Project)	1.2	ROW	5	**4**
Sullivan	105467.02	SR-126	(Memorial Blvd.) From East of Cooks Valley Road to I-81 in Kingsport (IA)	4.5	ROW	6	**5**
Sullivan / Washington	124663.00	SR-36	(Fort Henry Dr.) From SR-75 to I-81 (IA)	3.5	ROW	7	**6**
Additional Projects Requested for TDOT Consideration							
Sullivan	N/A	I-81/I-26	Improvements to I-81/I-26 interchange	0.5	PE	10	**7**
Sullivan	N/A	SR-357	Extension of SR-357 from I-81 to SR-126 (Memorial Blvd)	3.5	PE	8	**8**
Sullivan	N/A	I-26	Truck climbing lane, I-26 Eastbound, from SR-93 to TN Welcome Center	1.3	PE	12	**9**
Sullivan	N/A	SR-1	6 lane SR-1 (Stone Drive/US 11W) from SR-93 to New Beasonwell Road	1.7	PE	11	**10**
Sullivan	N/A	I-26/US-23	Establishment of ITS along I-26/US 23 Corridor	16.0	PE	9	**11**

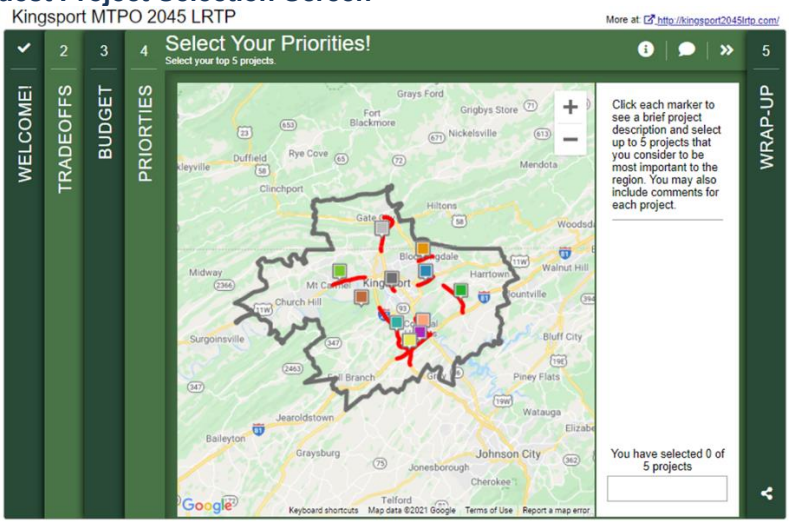
Source: Kingsport MTPO; November 2021.

Public Identification of Priority Projects

The technical evaluation, needs assessment, and public and stakeholder input (including the online mapping results) helped the project team identify a select number of potential projects that were presented to the public for additional input. **Figure 61** displays a screen shot of the MetroQuest survey that asked participants to select up to five projects that they consider to be the most important transportation improvements within the Kingsport MPA. **Table 37** summarizes the number of times that

the respective projects were identified as a priority. **Appendix B** provides additional details regarding the MetroQuest survey results.

Figure 61. MetroQuest Project Selection Screen



Source: Kingsport 2045 MetroQuest Survey; June/July 2021.

Table 37. Public Project Rankings

Rank	Project	Responses
1	Reconstruct I-81/I-26 Interchange	115
2	Improve SR-36	103
3	Improve I-26	101
4	US-11W (east of John B. Dennis)	99
5	Improve E. Sullivan Street	96
6	Improve US-23 Corridor	85
7	Extend SR-357	83
8	US-11W (Allandale/Mt. Carmel)	81
9	Improve Bloomingdale Road	75
10	Improve I-81	68
11	Wait…You Missed a Project!	40

Source: Kingsport 2045 MetroQuest Survey; June/July 2021.

In total, 200 participants completed the MetroQuest survey. Of this total, three projects were identified 100 or more times as priorities that the public would like to see implemented within the region. These projects include:

- Reconstruct the I-81/I-26 interchange (selected 115 times)
- Improve SR-36 (Fort Henry Drive) (selected 103 times)
- Improve I-26 (selected 101 times)

Potential Projects

Potential projects were identified by reviewing the previous LRTP and by identifying additional projects that address the transportation needs, as previously disused in Chapter 5. **Table 38** summarizes the potential projects that were identified for consideration as part of the 2045 LRTP update. **Figure 62** displays the approximate location of the potential projects within the Kingsport MPA.

Table 38. Potential Projects

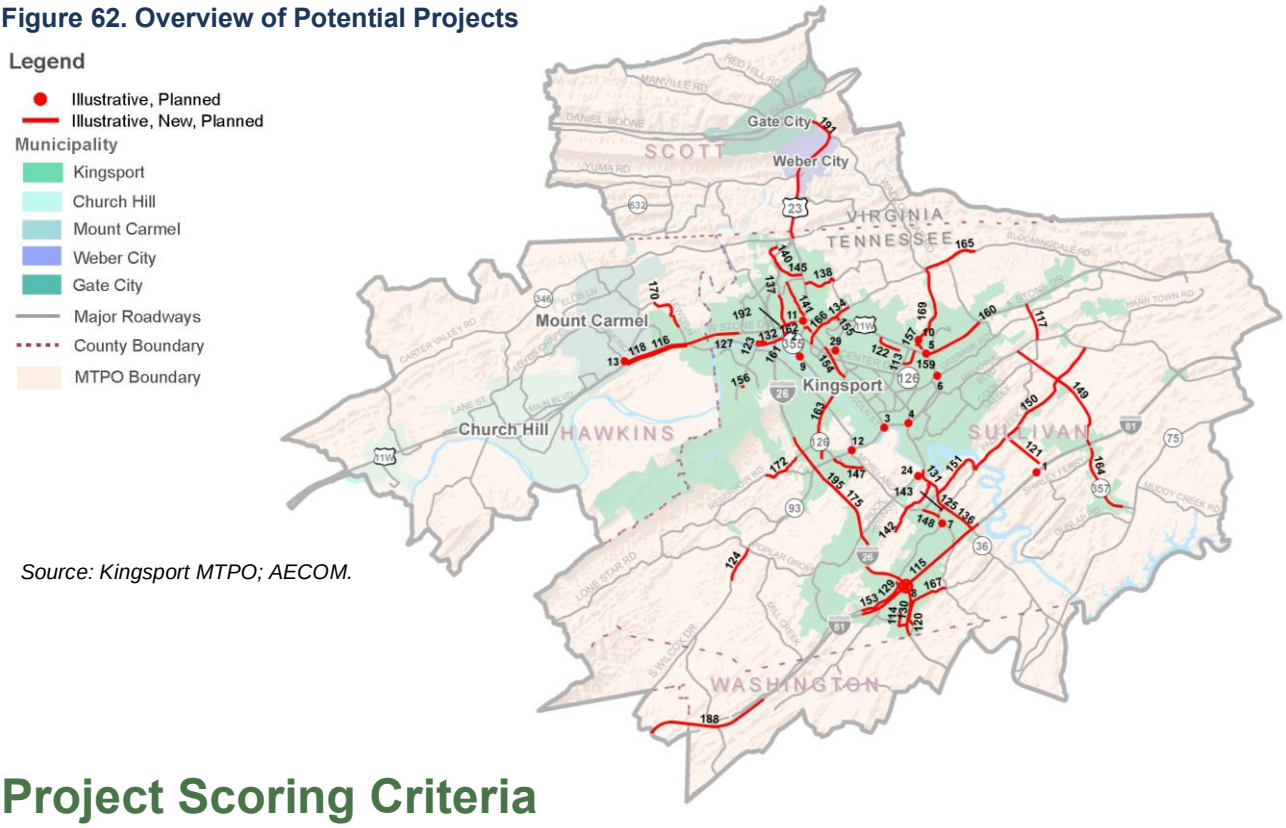
Project ID	Route	Location (From/To)	Description
1	I-81	Buttermilk Road	Construct new interchange
2	Center Street	Sullivan Street / Fairview Avenue	Reconfigure turning movements with roundabout
3	John B. Dennis (SR-93)	Lincoln Street	Upgrade intersection
4	John B. Dennis (SR-93)	Fort Henry Drive (SR-36)	Upgrade intersection
5	John B. Dennis (SR-93)	Stone Drive (US-11W)	Upgrade intersection
6	John B. Dennis (SR-93)	Orebank Road	Construct new interchange exit ramp NB
7	Lebanon Road	Kendricks Creek Road / Grove Drive	Replace signalized intersection with a roundabout
8	I-26	I-81	Improve cloverleaf geometry and add collector-distributor lanes
9	Industry Drive	At CSX Railroad Overpass	Replace/widen railroad overpass
10	John B. Dennis (SR-93)		Realign/combine commercial driveways for safety
11	Lynn Garden Drive	Stone Drive (US-11W)	Improve interchange ramps
12	John B. Dennis (SR-93)	Moreland Drive	Improve interchange ramps
13	Hammond Avenue		Replace/widen railroad overpass
24	Rock Springs Road	Railroad Tunnel	Replace/widen railroad tunnel
29	Sevier Avenue	Poplar Street / Gibson Mill Rd	Realign
113	Indian Trail Drive	N Eastman Rd / Stone Drive	Construct new 2 lane roadway to divert traffic from Eastman Road to Stone Drive
114	Mitchell Road Connector	Fordtown Road / Eastern Star Road	Construct new 3 lane roadway to link at I-26 interchange
115	I-81	Fort Henry Drive (SR-36) (MM 59) / Tri-Cities Crossing (MM 56)	Widen from 4 to 6 lanes
116	Stone Drive (US-11W)	Hammond Avenue / East Avenue	Widen from 4 to 6 lanes
117	SR-357 Extension	Memorial Boulevard (SR-126) / US-11W	Extend Roadway (New Alignment)
118	US-11W/SR-1 Frontage Road	Lewis Lane / Hammond Avenue	Develop in conjunction with economic development along US-11W/SR-1
120	I-26	MM8 / MM10	Widen from 4 to 6 lanes
121	I-81 Buttermilk Road Connection	Buttermilk Road / Fall Creek Road	New 2-lane connector to link proposed interchange at Buttermilk Road
122	Jack White Drive	Current Terminus / Stone Drive	Extend west to connect to Stone Drive at Idle Hour Road
123	Netherland Inn Road/Stone Drive Connector	Union Street / Netherland Inn Road	Realign and reconstruct Union Street to improve access to Netherland Inn Road
124	Sullivan Garden Parkway (SR-93)	Lonestar Road / Derby Drive	Widen from 2 to 4 lanes
125	Fort Henry Drive (SR-36)	Lebanon Road / Wendover Drive	Improve vertical geometry
127	Stone Drive (US-11W)	Deneen Lane / East Avenue	Widen from 4 to 6 lanes
129	Tri-Cities Crossing	Kendricks Creek Road / Fordtown Road	Widen from 2 to 3 lanes with economic development
130	Eastern Star Road	Mitchell Road / Fordtown Road	Widen from 2 to 3 lanes with economic development
131	Fort Henry Drive (SR-36)	Holston River Bridge / Hemlock Road	Safety improvements, install median, add turn lanes, widen bridge

NOTE: Table 38 continues on the following page.

Table 38 (continued). Potential Projects

Project ID	Route	Location (From/To)	Description
132	Netherland Inn Road	Center Street (SR-36) / Ridgefields Road	Widen from 2 to 3 lanes
134	Bloomingdale Pike	Stone Drive West (US-11W) / near Shipp Springs Road	Widen from 2 to 3 lanes to include center turn lane and other safety improvements
136	Fort Henry Drive (SR-36)	Moreland Drive/Hemlock Road / I-81	Improve intersections, coordinate signal timings, and evaluate driveway cuts
137	Fairview Avenue	Stone Drive (US-11W) / Virgil Avenue	Improve shoulders and geometry with spot safety improvements
138	Gravely Road	Lynn Garden Drive (SR-36) / Shipps Spring Road	Improve shoulders and geometry with spot safety improvements
140	Bell Ridge Road/Drive	May Avenue / Harrison Avenue	Improve shoulders and geometry with spot safety improvements
141	Tranbarger Drive	Lynn Garden Drive (SR-36) / Virgil Avenue	Improve shoulders and geometry with spot safety improvements
142	Summerville Road	Fort Henry Drive (SR-36) / New Summerville Road	Improve shoulders and geometry with spot safety improvements
143	Lebanon Road	Fort Henry Drive (SR-36) / Ashley Oaks Private Drive	Improve sight distance and extend left turn lanes
145	May Avenue	Wampler Street / Lynn Garden Drive (SR-36)	Improve shoulders and geometry with spot safety improvements
147	South Wilcox Drive Extension	John B. Dennis (SR-93) / Moreland Drive	Extend 4-lane roadway with economic development
148	Moreland Drive - Lebanon Road Connector	Moreland Drive / Lebanon Road	New 3-lane bypass away from Fort Henry Drive
149	SR-357 Extension	Memorial Boulevard (SR-126) / I-81	Extend SR-357 northbound with limited access 2-lane cross section with wide shoulders
150	Fall Creek Road	Hemlock Road / Memorial Boulevard (SR-126)	Improve shoulders and geometry with spot safety improvements
151	Hemlock Road	Fort Henry Drive / Fall Creek Road	Improve shoulders and geometry with spot safety improvements, add MUP
153	Cox Hollow Road	Snapps Ferry / Tri-Cities Crossing	Widen from 2 to 3 lanes with economic development
154	East Sullivan Street	Church Circle / N Wilcox Drive	Widen from 2 to 3 lanes with multimodal and aesthetic improvements
155	Gibson Mill Road	Bloomingdale Pike / Stone Drive (US-11W)	Widen 2 to 3 lanes with improved left turns with economic development
156	Huntington Hills Connector	Birchwood Road / Burke Drive	New 2-lane roadway to provide additional access
157	Indian Trail Drive North	Pulitzer Place / John B. Dennis (SR-93)	Re-alignment of existing horizontal curves and new two-lane roadway connection
159	Stone Drive (US-11W)	American Way / John B. Dennis (SR-93) NB Off-Ramp	Extend left turn lanes under John B. Dennis interchange
160	Stone Drive (US-11W)	John B. Dennis (SR-93) / New Beason Well Road	Widen to 6 lanes
161	Riverside Avenue Extension	Stone Drive (US-11W) / Center Street	New 3-lane roadway connecting Stone Drive to downtown Kingsport via Riverside Avenue
162	West Sullivan Street	Roller Street / Lynn Garden Drive (SR-36)	Widen to 3 lanes
163	Wilcox Drive (SR-126)	John B. Dennis (SR-93) / Industry Drive	Replace center turn lane with raised landscaped median providing left turn lanes
164	Airport Parkway (SR-357)	I-81 / SR-75	Access management improvements
165	Bloomingdale Road	John B. Dennis (SR-93) / Packinghouse Road	Improve shoulders and geometry with spot safety improvements
167	Fordtown Road	Eastern Star Road / Lebanon Road	Install left turn lanes at key intersections through industrial park
169	John B. Dennis (SR-93)	Stone Drive (US-11W) / Bloomingdale Road	Implement access management
170	Lewis Lane	Rearden Lane / Ripley Street	Improve shoulders and geometry with spot safety improvements
172	Reservoir Road	Saratoga Road / Hood Road	Improve shoulders and geometry with spot safety improvements
175	I-26	Wilcox Drive (MM 4) / Rock Springs Road/SR-347 (MM6)	Add EB truck climbing lane
188	I-81 NB	Moody Rd / Link Rd	I-81 NB Truck Climbing Lane
191	US-23	Kane Street / W Carters Valley Rd	Access management improvements, pedestrian accommodations, and coordination of traffic signals
192	US-11W SB	Fairmont Drive / I-26	Add a SB lane

Figure 62. Overview of Potential Projects



Source: Kingsport MTPO; AECOM.

Project Scoring Criteria

The project scoring criteria from the 2040 LRTP was reviewed and updated to help evaluate potential 2045 LRTP projects. This performance based evaluation process is intended to create a stronger link between the stated goals and objectives of the 2045 LRTP and transportation improvements that are ultimately selected for future programming. The scoring criteria consisted of six high-level categories, each containing various performance measures, that reflect the LRTP goals and objectives. The project scoring criteria, along with the measures, are summarized in **Table 39**. Scoring weights are also displayed in the yellow circles with each project, in theory, potentially receiving a maximum of 100 points.

Table 39. Scoring Criteria, Measures, and Weights

25 Safety

- Measure #1 (10 points) – Number of vehicle crashes
- Measure #2 (5 points) – Number of bike/pedestrian crashes
- Measure #3 (10 points) – Fatal and serious injury vehicle crashes

20 Operational Efficiency

- Measure #4 (5 points) – Existing LOS addressed
- Measure #5 (5 points) – Future LOS addressed
- Measure #6 (2 points) – Traffic signal project and / or incorporates new technology
- Measure #7 (5 points) – Creates parallel facility / system redundancy
- Measure #8 (3 points) – Difference between existing and projected future volumes

10 Accessibility

- Measure #9 (3 points) – Population growth surrounding project (2018 - 2045)
- Measure #10 (3 points) – Employment growth surrounding project (2018 - 2045)
- Measure #11 (4 points) – Improves connectivity of system

15 Active Transportation

- Measure #12 (5 points) – Non-motorized demand near project
- Measure #13 (5 points) – Number of above average EJ and underserved populations touched by project
- Measure #14 (5 points) – Pedestrian Level of Traffic Stress (LTS) and Bicycle LTS

10 Environmental

- Measure #15 (5 points) – Number of challenging areas the project touches (floodplains, historical areas, steep slopes, and parks)
- Measure #16 (5 points) – Project improves capacity without widening or adding new facility

20 Economic

- Measure #17 (5 points) – Percent of trucks in existing network
- Measure #18 (5 points) – Within 1/2 mile of identified economic development nodes
- Measure #19 (5 points) – Job access score
- Measure #20 (5 points) – Improves access to identified tourist destinations

The purpose of the performance-based scoring process is to inform the consideration of future investment priorities within the Kingsport MPA. The resulting score for each project is an indication of the transportation project's consistency with the MTPO's stated goals. The higher the score, the more consistent the project is with the region's vision for transportation investments. Conversely, the lower the score, the less likely the project is to support the region's vision for transportation investments, indicating that the project may not fully meet or achieve all the stated LRTP goals and objectives.

It is also important to note that the ranking process is designed to support decision-making, rather than render a decision. The scoring results are not intended to be the final ranking; meaning that lower scoring projects may still be considered for reasons beyond those described in the scoring criteria. As such, the highest scoring project is not automatically the region's top priority. The planning process provides an allowance for non-technical considerations, recognizing that there are other factors that go into the decision-making process that cannot be captured solely through a data-driven analysis. In fact, some of the measures that were identified do not lend themselves to a data-driven analysis and in this situation local knowledge of the MTPO staff was used to score select measures.

Finally, the weight allocation also closely reflects public and stakeholder feedback, as obtained through two LRTP surveys and various stakeholder interviews. The criteria and weights were also presented to the MTPO Executive Board as part of a LRTP workshop held in September 2021. The Board agreed with the evaluation methodology process and supported the scoring weights. **Appendix G** provides additional detail regarding the project scoring methodology.

Project Scoring Results

The project team utilized the established scoring criteria and measures to evaluate each potential project that was identified for consideration in the LRTP. The top scoring projects are summarized in **Figure 63** and detailed scoring results, including scores by individual category and measure, are provided in **Appendix H**.

The highest scoring project, receiving 72 points out of a possible 100, was the US 11W (Stone Drive) improvement, extending east of John B. Dennis. Additional top scoring projects were also identified as those projects which received a score of 60 points or higher. **Figure 64** displays Tier II projects which are those projects that scored below 60 points. As previously mentioned, these scores are used to help inform the evaluation process and do not reflect a final project ranking.

Figure 63. Top Scoring Projects (60 Points or Higher)

1. East Stone Drive (US-11W)
2. Fort Henry Drive (SR-36)
3. US-23 Corridor
4. West Stone Drive (US-11W)
5. Wilcox Drive (SR-126)
6. Lynn Garden Drive
7. Bloomingdale Pike
8. Fort Henry Drive (SR-36)
9. East Sullivan Street
10. John B. Dennis (SR-93)
11. John B. Dennis (SR-93)
12. I-26/I-81 Interchange
13. I-81 Mainline Improvements

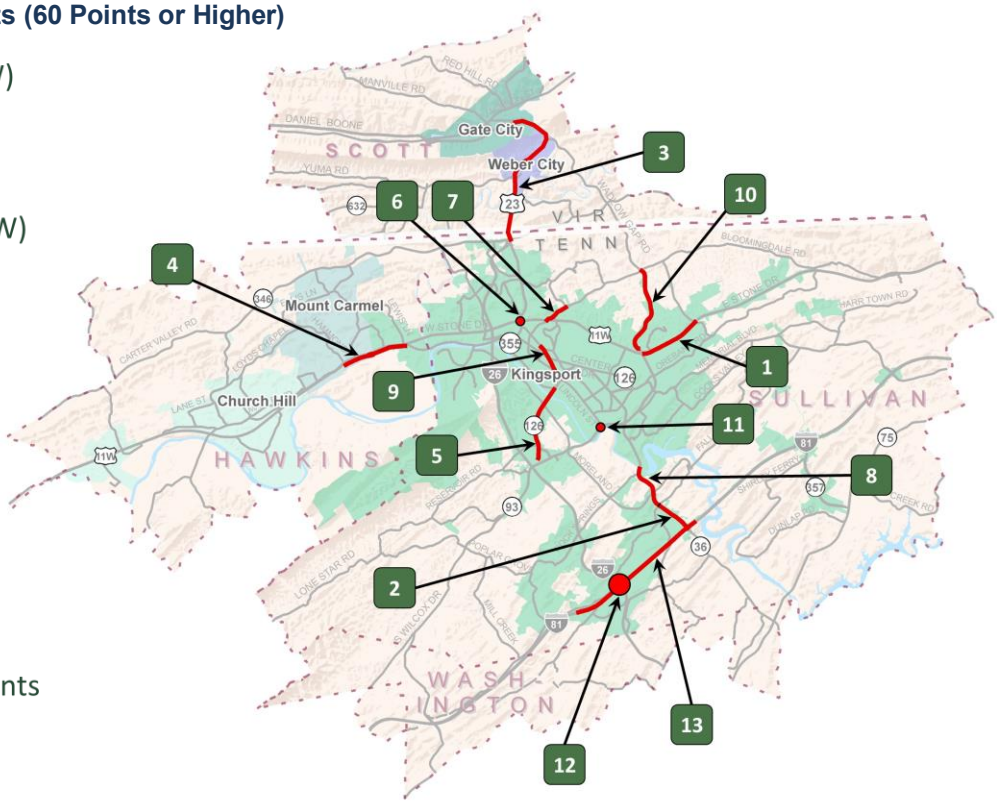
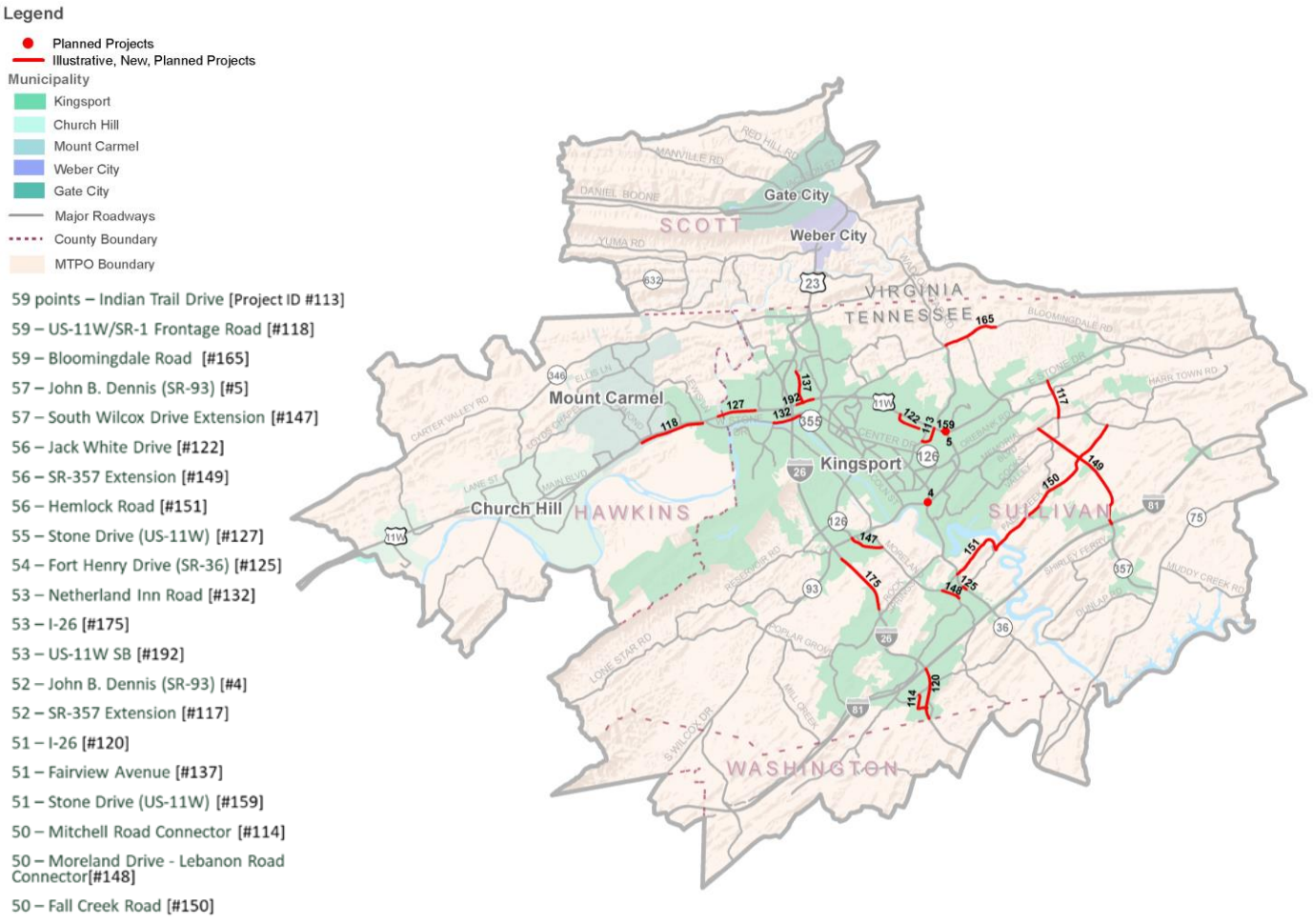


Figure 64. Tier II Projects



Additional Project Evaluation

Based on the results of the project scoring, along with the identification of needs as discussed in Chapter 5, the project team determined that it would be beneficial to use the regional travel demand model to test three additional project scenarios. The additional project scenarios focused on:

- Addressing projected capacity/LOS issues along the I-26 corridor.
- Addressing network connectivity and traffic operational issues in the southeast portion of the Kingsport MPA by extending SR-357 (Airport Parkway) north from I-81 to SR-126 (Memorial Boulevard).
- Identifying the potential benefits of completing improvements to both the I-26 corridor and extending SR-357 (Airport Parkway) north from I-81 to SR-126 (Memorial Boulevard).

The additional model runs are described below, followed by the model results displayed in terms of LOS and change in travel volumes that occur due to the coding of the respective improvement(s). It is important to note that the Kingsport MTPO modeling process does not generate additional trips in the region as a result of a transportation enhancement/improvement; however, the model may assign more traffic to a corridor with additional capacity for two reasons: 1. Minor redistribution of trips due to reduced impedance (travel time), and 2. Primarily drawing traffic away from parallel routes.

I-26 Improvements

The results of the 2045 E+C model run showed continued traffic congestion present along the I-26 corridor. As such, the project team felt it was important to test the widening of the I-26 corridor within the Kingsport MPA from four-lanes to six-lanes. **Figure 65** displays the capacity/LOS results for this model run. **Figure 66** displays the traffic volume shift on the MPA roadways that results when this improvement is analyzed in the travel demand model.

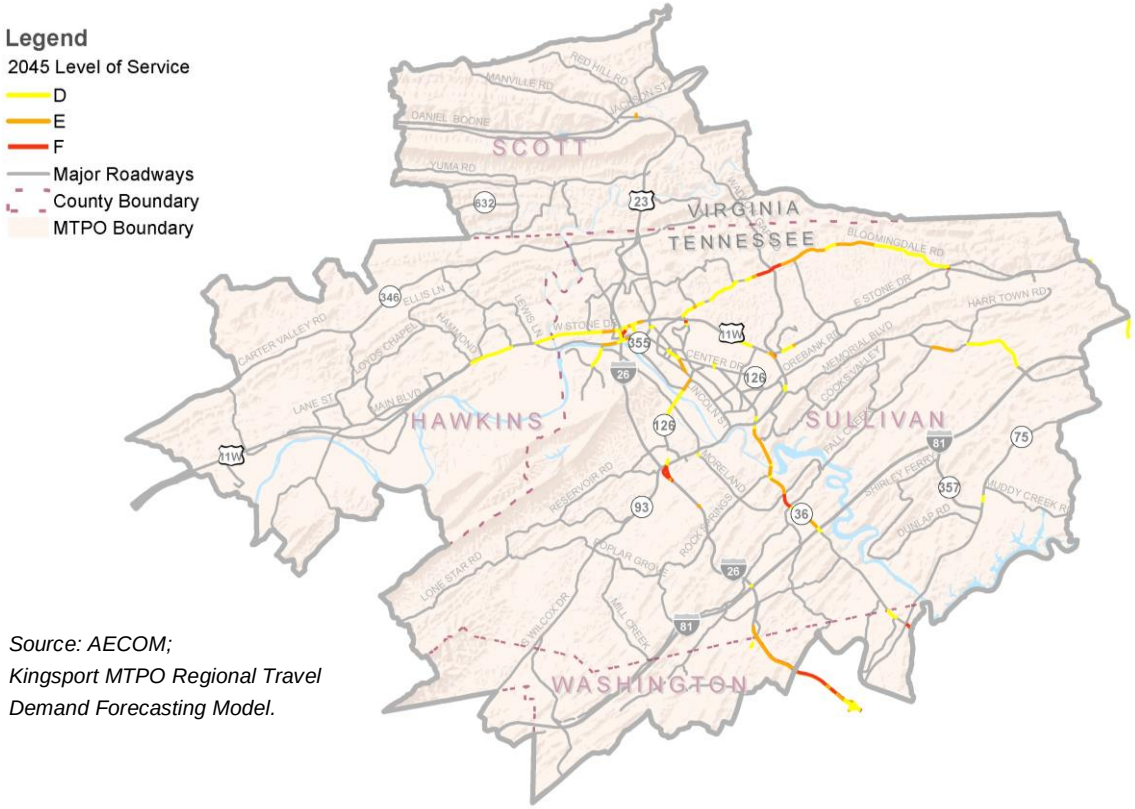
SR-357 (Airport Parkway) Extension

As previously documented, the southeast portion of the MPA is growing but currently lacks a critical north-south route that would enhance regional connectivity, as well as providing additional roadway capacity that could potentially provide some congestion relief along SR-36 (Fort Henry Drive). This scenario included coding a north-south connection that would replicate the TDOT SR-357 (Airport Parkway) study. **Figure 67** displays the capacity/LOS results for this model run. **Figure 68** displays the traffic volume shift on the MPA roadways that results when this improvement is analyzed in the travel demand model.

Combined I-26 Improvements / SR-357 (Airport Parkway)

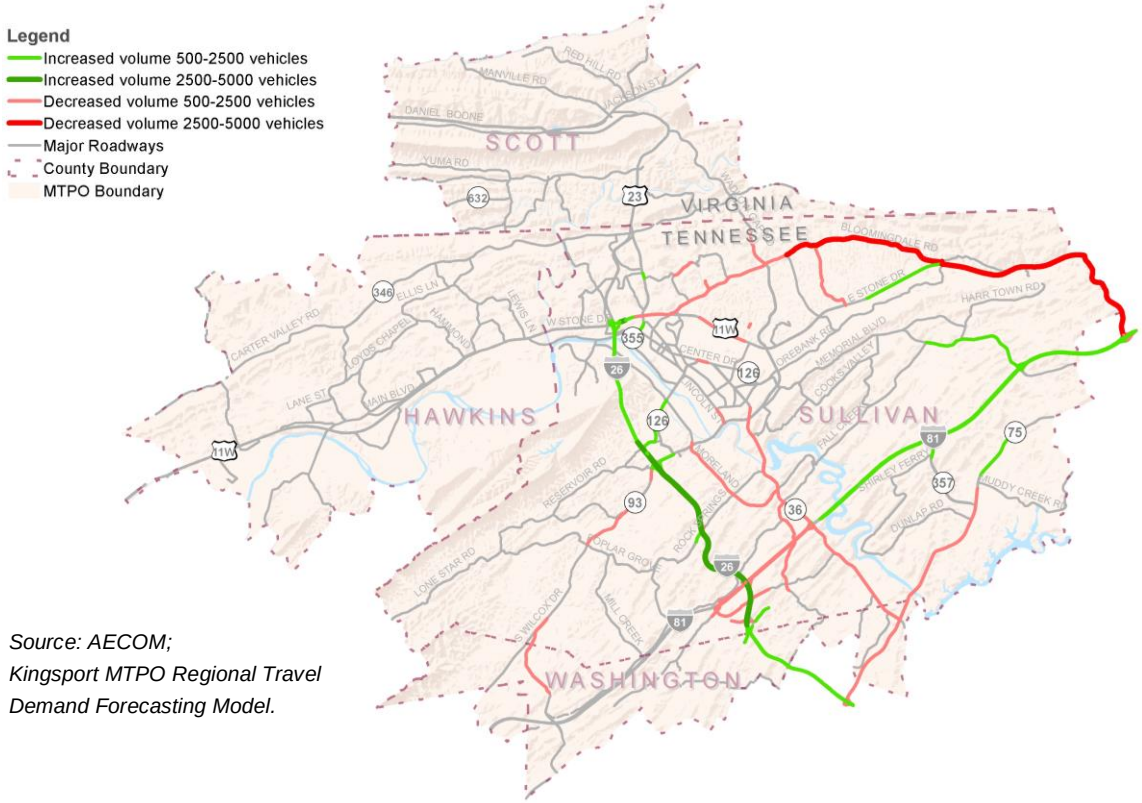
Ultimately, it is believed that the greatest potential benefit to enhance regional travel involves the combined improvements of widening I-26 and extending SR-357 (Airport Parkway) north from I-81 to SR-126 (Memorial Boulevard). **Figure 69** displays the capacity/LOS results for this model run. **Figure 70** displays the traffic volume shift on the MPA roadways that results when this improvement is analyzed in the travel demand model.

Figure 65. I-26 Capacity Enhancement – Level of Service Results



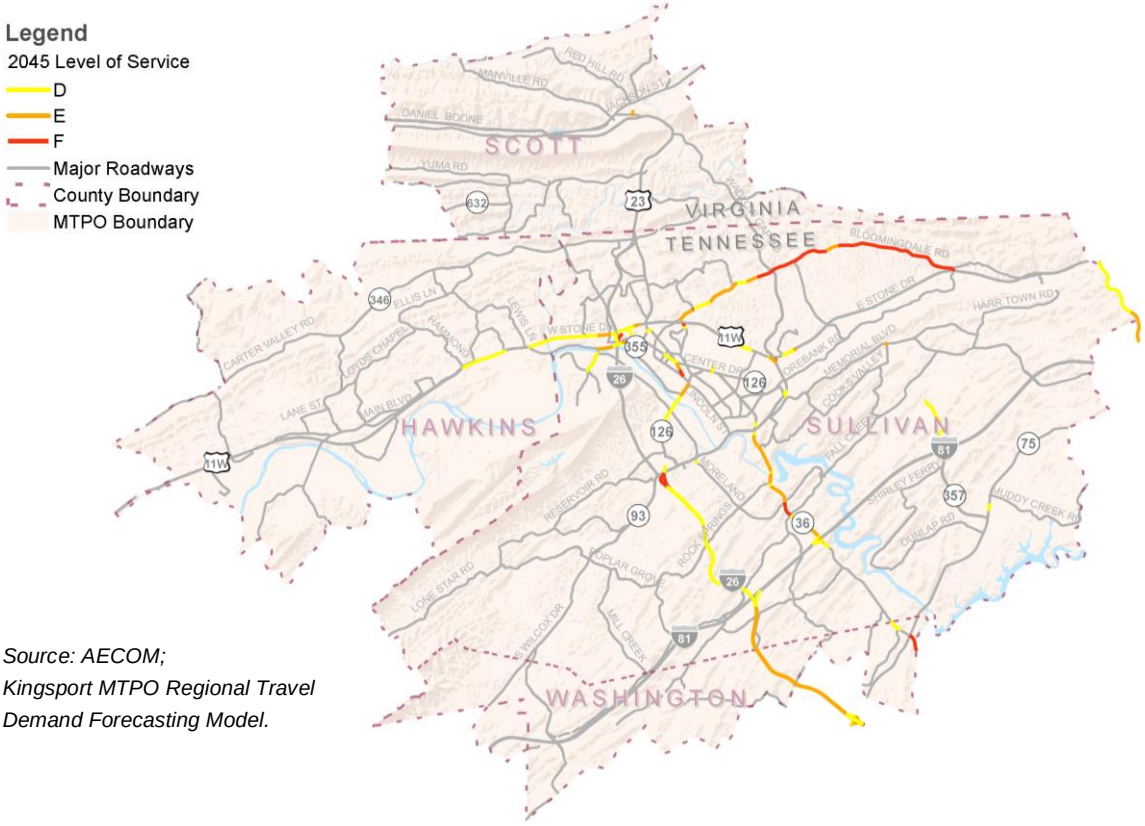
Source: AECOM; Kingsport MTPO Regional Travel Demand Forecasting Model.

Figure 66. I-26 Capacity Enhancement – Traffic Volume Change



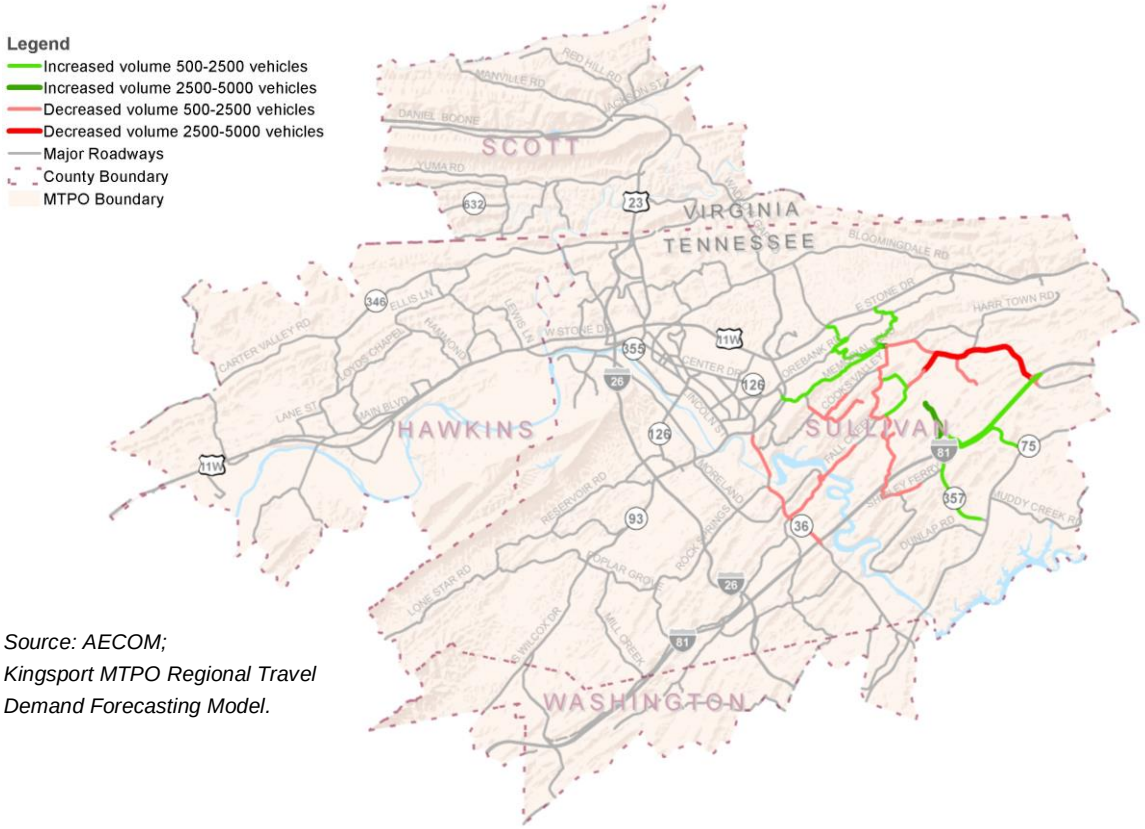
Source: AECOM; Kingsport MTPO Regional Travel Demand Forecasting Model.

Figure 67. SR-357 (Airport Parkway) Extension – Level of Service Results



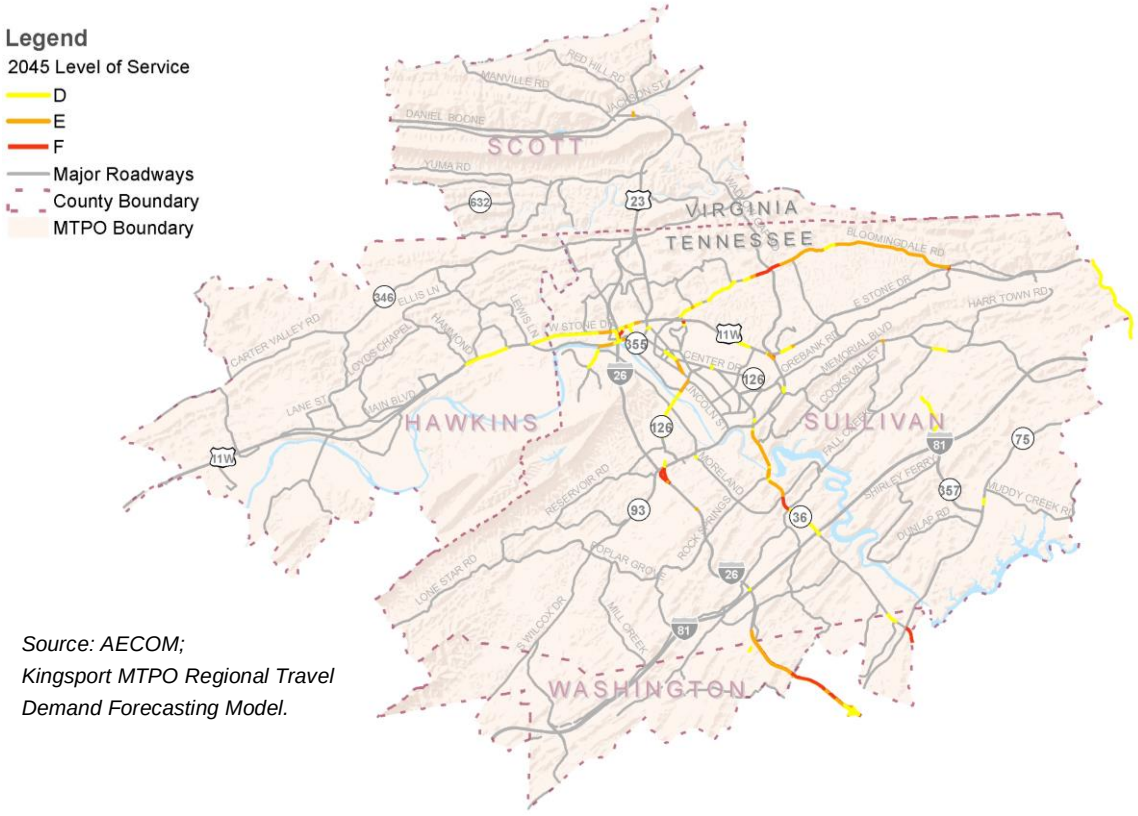
Source: AECOM; Kingsport MTPO Regional Travel Demand Forecasting Model.

Figure 68. SR-357 (Airport Parkway) Extension – Traffic Volume Change



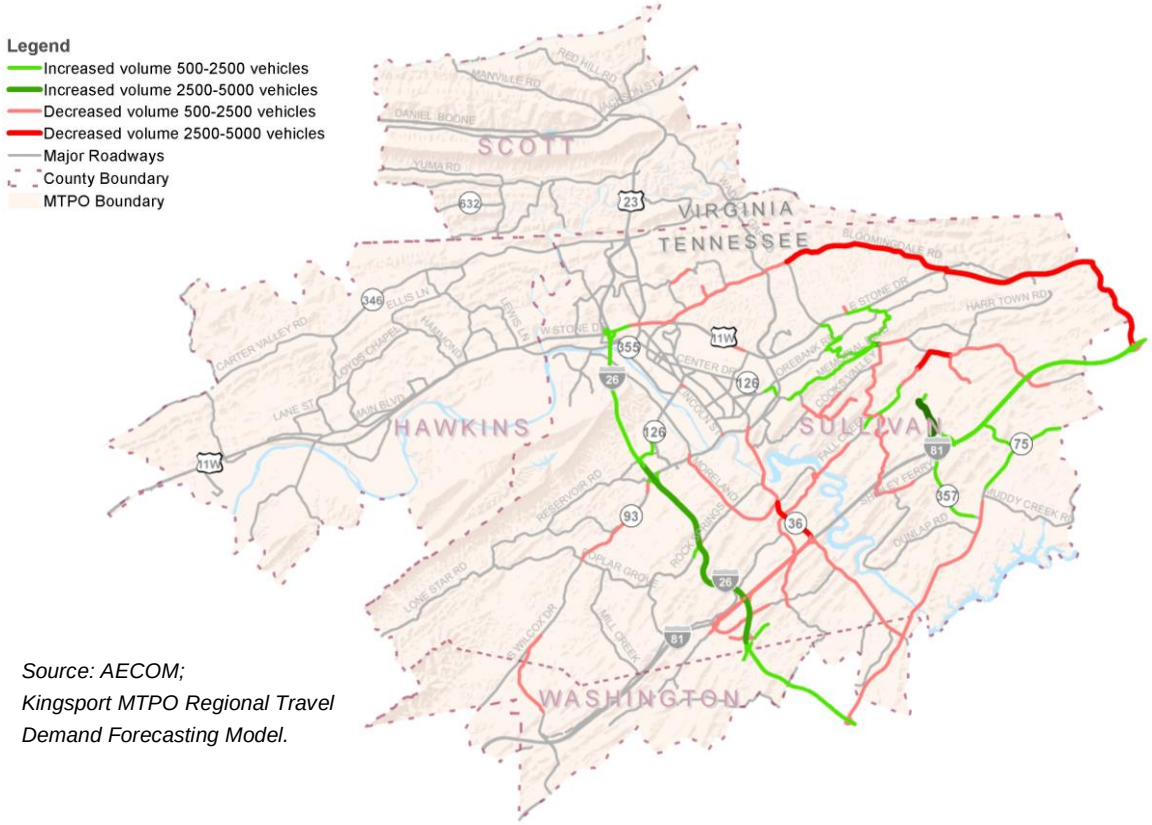
Source: AECOM; Kingsport MTPO Regional Travel Demand Forecasting Model.

Figure 69. I-26 Capacity Enhancement and SR-357 (Airport Parkway) Extension – LOS Results



Source: AECOM; Kingsport MTPO Regional Travel Demand Forecasting Model.

Figure 70. I-26 Capacity Enhancement and SR-357 (Airport Parkway) Extension –Volume Change



Source: AECOM; Kingsport MTPO Regional Travel Demand Forecasting Model.

Summary of Additional Model Runs

The following summarizes the results of the additional model runs.

I-26 Widening

Generally speaking, the widening of I-26 eliminates most of the projected congestion issues along the corridor, although some LOS E segments are still present south of I-81 potentially indicating that additional capacity enhancements could be needed along the segment of I-26 that connects to Johnson City. The volume change graphic shows benefits to adjacent roadways, including SR-36 (Fort Henry Drive), as traffic volumes decline as more traffic likely remains on I-26 due to the improvements. Furthermore, this improvement reduced east-west travel in the northeast portion of the MPA (on the Tennessee side). This could be an indication that regional travelers are more inclined to utilize the higher classified roadway facilities, including I-81 and I-26, due to the improved travel conditions. The widening of I-26 also relieves some traffic along SR-93 (John B. Dennis Highway), including the segment just north of the I-81 interchange. These results suggest that the improvements along I-26 keep some trips on the interstate, as opposed to using alternative regional and local routes, which is beneficial to reduce traffic congestion, but it could also have a positive safety benefit by keeping regional traffic on the interstate facilities.

SR-357 (Airport Parkway) Extension

A SR-357 (Airport Parkway) extension enhances north-south network connectivity, increases access to a developing area of the MPA, and helps address operational and capacity concerns around the I-81/SR 357 interchange. This project also pulls traffic off of the SR-36 (Fort Henry Drive) corridor, helping improve capacity concerns along this corridor and other adjacent local roadways.

Combined I-26 Improvements / SR-357 (Airport Parkway) Extension

The combination of improvements to I-26 and an extension of SR-357 (Airport Parkway), from I-81 to SR-126 (Memorial Boulevard), would address a number of needs previously documented in Chapter 5. Furthermore, the combination of these improvements would also have positive benefits on reducing or eliminating projected future year capacity concerns which is supported by the volume change graphic which shows a reduction in travel volumes on a number of area roadways, and an increase in traffic volumes along the improved roadway segments/projects. These model results suggest that the programming of these two projects could have significant benefits for the region. Finally, these results will be used to help inform the project prioritization, which occurs as part of the fiscal constraint analysis in Chapter 7.

7. Fiscal Constraint Analysis

This chapter summarizes the fiscal constraint analysis for the Kingsport MTPO 2045 LRTP. Developing a cost feasible LRTP is an important component of the transportation planning process and a fiscally constrained plan is a federal requirement. The fiscal constraint analysis ensures the region takes a realistic look at what can reasonably be expected to be funded, and programmed, through the 2045 planning horizon. The following discusses the analysis, assumptions, and the identification of the fiscally constrained projects.

Fiscal Constraint Requirement

Federal law requires MPOs to consider the financial implications of their planning efforts as part of the LRTP plan development process. Specific provisions in the law regarding the financial plan state the following:

- Development of a financial plan that demonstrates how the adopted transportation plan can be implemented.
- Development of funding estimates that will be available to support LRTP implementation, including all necessary financial resources from public and private sources.
- State recommendations on pursuing additional financing strategies to fund projects and programs included in the LRTP.
- Account for all projects and strategies for which federal, state, local, or private funds could be used for financing and use an inflation rate to reflect multi-year costs and revenues.

The ability to maintain, improve and enhance transportation facilities and services within the Kingsport MPA depends on adequate financial resources to program projects through the year 2045. For the purpose of the LRTP, projects are considered to be fiscally constrained when reasonable funding sources are identified (projected) to cover the proposed transportation projects at the year of expenditure (YOE). The YOE represents the fiscal year (FY), or a combined timeframe band, a project is likely to be constructed. This section summarizes key elements of the fiscal constraint analysis.

LRTP Coordination with the Transportation Improvement Program

An important aspect of the 3-C planning process involves the coordination of projects between the LRTP and the Transportation Improvement Program (TIP). The LRTP identifies priority transportation projects/investments through the 2045 planning horizon which are then programmed in the MTPO's TIP. MTPO member governments select projects for the TIP based on funding availability, schedule, priorities, and citizen input. The TIP thus reflects specific long-range plan projects that consider several factors, including needs, costs, and overall design ensuring adequate mobility in the region is maintained while taking the fiscal constraint requirement into account.

The TIP identifies projects scheduled for a four-year period and includes a detailed project cost estimate, description of the type of improvements associated with the project, the funding sources and mix of funding for each project. In some cases, the TIP project costs will match the LRTP planning cost estimates; however, the LRTP estimates often represent conceptual, or high-level planning, costs. As such, the project costs are frequently updated in the TIP to reflect more refined cost estimates that become available through the planning, engineering, and design of a specific project.

Baseline Project Cost Estimates

Baseline project cost estimates were developed as part of the 2045 LRTP update. The baseline cost estimates rely on a variety of sources including the 2040 LRTP, recent planning and/or engineering studies, SMART SCALE project descriptions for Virginia, and other relevant sources, such as grant applications. Each of the potential projects, previously identified in Chapter 6, were reviewed at a very high-level to determine if the proposed project location and improvement were still valid to address an identified transportation need, or concern, within the Kingsport MPA. A project team engineer also reviewed the potential projects to assess if the estimated project cost was reasonable for planning level purposes. It should be noted that this review was conducted at a very high-level and several of the projects represent general improvement concepts, as opposed to specific or detailed projects. The project cost estimates were adjusted, as necessary, to reflect year 2022 baseline project costs. **Appendix I** summarizes the proposed baseline project cost estimates for the potential projects.

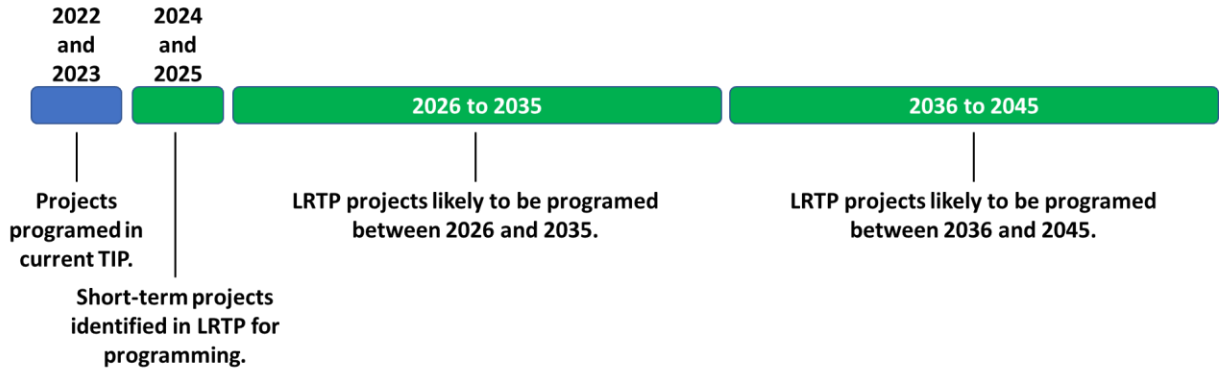
Year of Expenditure Costs

To comply with the requirement of 23 CFR 450.324 (g) (11) (iv) “year of expenditure dollars”, the baseline project cost estimates were inflated to reflect a YOE cost. For the purpose of the LRTP, the YOE uses an inflation factor to better represent the actual project cost for when the project is likely to be built. Proposed inflation factors were discussed with TDOT and VDOT and based on these conversations a 5% annual inflation factor was applied to the baseline project cost estimates. At the same time, future year revenues were increased using a 3% annual inflation factor. An observation of these inflation factors highlights one of the challenges that MTPO faces in programming future year projects. Specifically, project costs are increasing at a faster rate than revenues, which means in the outer years of the LRTP, closer to the 2045 horizon, projects will cost more while at the same time the revenues are projected to be less. Finally, the annual inflation factors used for both the project costs and revenues were presented to the Kingsport MTPO Executive Board in November 2021. The Board verbally agreed to use these factors for the 2045 LRTP update.

Future Year Project Programming Bands

As discussed, the YOE cost is used to program projects through the horizon year 2045. Rather than trying to assign a specific construction year for each project, future year project programing bands were identified. **Figure 71** displays the programming bands used to allocate potential projects and ultimately identify fiscally constrained projects.

Figure 71. Project Programming Bands (2022 – 2045)



As shown, the current TIP includes projects programmed in 2022 and 2023. These projects have detailed cost estimates and funding sources identified and are proceeding toward construction. These projects can be viewed in the current TIP which can be accessed on the MTPO’s website at www.kptmtpo.com.

A second programming band, covering years 2024 and 2025, represents the first LRTP programming band. Two additional programming bands, both spanning ten-years, were established through the 2045 horizon year. The first ten-year band covers projects anticipated to be programmed between 2026 and

2035 while the second ten-year band covers projects anticipated to be programmed between 2036 and 2045.

For each programming band, the baseline project cost estimate was inflated using the approved 5% annual inflation factor. The annual project cost for each year of a particular programming band was then averaged to arrive at an average YOE cost estimate.

Assigning Potential Projects to Future Year Programming Bands

To complete the fiscal constraint analysis, potential projects are assigned to the future year programming bands and the YOE costs are compared to projected future year revenues to determine if enough funding is reasonably expected through the horizon year 2045. Assigning potential projects to the programming bands is a process that is informed by several factors.

First, the LRTP existing conditions analysis helps inform the identification of regional transportation needs, as discussed in Chapters 3 and 4, which in turn helps inform the development of potential projects. The potential projects were scored against performance-based measures to identify the highest performing projects, which reflect projects that best support the established LRTP goals and objectives. As such, higher scoring projects are some of the first projects considered when assigning projects to the programing bands.

Secondly, the MTPO reviews potential TDOT projects on an annual basis to identify regional priorities. The MTPO's current priorities, as adopted by the MTPO in November 2021, were previously listed in **Table 36**. The identification of the regional priority projects is influenced in part by the LRTP analysis. The TDOT priority projects also include IMPROVE Act projects within the Kingsport MPA. IMPROVE Act projects are also prioritized when assigning projects to the future year programming bands.

Finally, the MTPO works closely with VDOT representatives to identify potential projects for programming in the Virginia portion of the Kingsport MPA. VDOT projects are identified primarily through the state's SMART SCALE scoring process which simply stated prioritizes projects that address a VDOT District need. At the time of this LRTP development, VDOT was conducting *Project Pipeline* which identified two projects that have since been submitted for SMART SCALE pre-application. It is possible that additional projects, after the adoption of the Kingsport 2045 LRTP, could be identified as a result of *Project Pipeline*.

Based on these principles, the project team assigned potential projects to complete the fiscal constraint analysis. Ultimately, the Kingsport MTPO Executive Board has the authority to review and confirm the projects, and the project programming/phasing. The Board also has the authority to amend projects and/or project phasing, if necessary, prior to the next scheduled LRTP update (according to current law the next LRTP would need to be completed by approximately Spring 2027). Furthermore, projects that are programmed earlier in the LRTP planning cycle, such as between FY 2024 and FY 2030, have a higher likelihood of moving into the TIP over the next few years for implementation. Projects programmed in the outer years (beyond FY 2030) are less certain and should be routinely revisited, and revaluated, as part of future LRTP planning efforts to determine if the project continues to meet a regional transportation need.

Roadways and Freight

The following summarizes the fiscal constraint analysis for roadway/freight projects within the Kingsport MPA. This analysis, and ultimately the selection of fiscally constrained projects, is informed by the existing conditions and needs analysis as documented in previous chapters.

Historical Revenues

A review of historical revenues, or recent funding trends, provides a reasonable foundation for estimating future year funding levels for the Kingsport MTPO through the horizon year 2045. Numerous revenue sources are used to fund transportation projects throughout the Kingsport MPA and for the purpose of the LRTP, the funding sources for the roadway/freight projects are grouped into the following categories:

- National Highway Performance Program (NHPP)

- Surface Transportation Block Grant Program (STBG) – State
- Highway Safety Improvement Program
- Surface Transportation Block Grant Program (STBG) – Local
- Local Funding

In recent history, these revenue sources have provided a steady stream of funding for transportation infrastructure and services in the Kingsport MPA and are anticipated to remain the primary future funding sources. For the purpose of the LRTP, projected future year revenues were derived by reviewing historic MTPO funding from the 2017 to 2022 TIP (2017 to 2021 included actual funding amounts, for 2022 the figure represents the programmed funding amount at the time of the LRTP update). Programmed NHPP funding for 2023 was also used in calculating the historic annual average. The revenues over this six-year timeframe were averaged to arrive at an annual estimated level of funding.

The annual funding estimate was then inflated using the approved 3% annual inflation factor through the year 2045 to calculate the estimated total revenue anticipated to be available to fund transportation investments throughout the Kingsport MPA. **Table 40** summarizes the estimated revenue projections available for Tennessee projects, while **Table 41** summarizes the estimated revenue projections available for Virginia projects. The estimated revenues are divided into the future year programming bands that were used for the fiscal constraint analysis. **Appendix I** provides additional documentation to support the 2045 LRTP revenue projections.

Table 40. TDOT Revenue Projections

TDOT	Historic Annual Average (2017 - 2022)	2024/2025	2026 to 2035	2036 to 2045	Total
NHPP	$5,954,767	$13,209,077	$79,137,527	$106,354,219	$198,700,824
STBG (State)	$5,398,021	$11,974,083	$71,738,501	$96,410,547	$180,123,131
HSIP	$863,247	$1,914,885	$11,472,357	$15,417,888	$28,805,129
STBG (Local)	$1,489,336	$3,303,699	$19,792,948	$26,600,066	$49,696,713
Local	$745,246	$1,653,132	$9,904,158	$13,310,361	$24,867,651
Total	**$14,450,617**	**$32,054,876**	**$192,045,491**	**$258,093,081**	**$482,193,448**

Source: MTPO 2017 to 2022 TIP; Historical funding sources averaged over the six-year period.
NOTE: Programmed NHPP funding for 2023 is also included in the historic annual average calculation.

Table 41. VDOT Revenue Projections

VDOT	Historic Annual Average	2024/2025	2026 to 2035	2036 to 2045	Total
Interstate, Primary, Secondary, Statewide	$1,237,250	$2,744,513	$16,442,782	$22,097,725	$41,285,020
HSIP	$484,760	$1,075,312	$6,442,351	$8,657,981	$16,175,643
Total		**$3,819,825**	**$22,885,133**	**$30,755,705**	**$57,460,663**

Source: VDOT Revenue data provided to the MTPO for the 2045 LRTP update.

In total, it is estimated that there is nearly $482 million in total funding for Tennessee projects through the 2045 horizon year. For the Virginia portion of the Kingsport MPA, it is estimated that there is approximately $57 million available through the year 2045; however, based on discussions with VDOT representatives it was determined that the HSIP funds ($16 million) should not be included for the fiscal constraint analysis. This was due to a recent change in the SMART SCALE scoring process which could potentially result in inaccurate HSIP funding that would be available for future funding.

Identification of Fiscally Constrained Projects

As previously discussed, the MTPO priority projects, including the IMPROVE Act projects, were reviewed to determine if the projects could be programmed within the estimated future year revenue, and

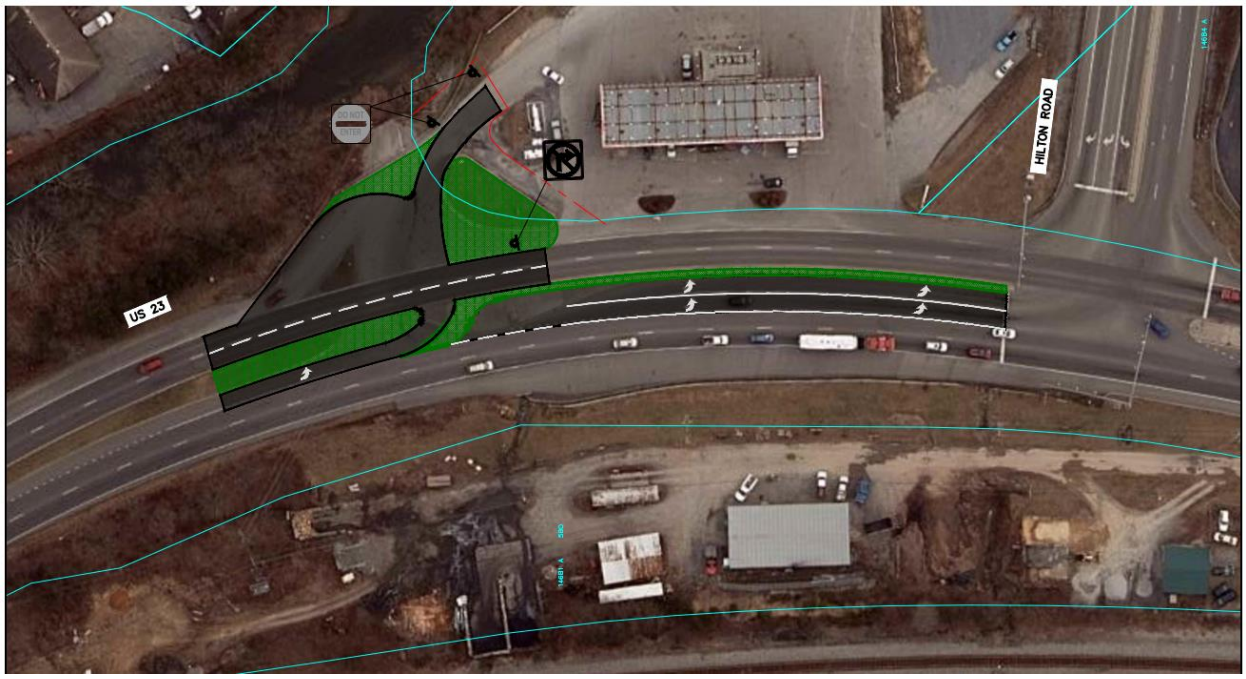
programming bands, as previously summarized. In order to achieve a fiscally constrained plan, it was necessary to split some projects into phases. For example, due to funding constraints, a percentage of a project might be included in one programming band and then completed in the following programming band. This was done when there was insufficient revenue projected to cover the entire project cost in a programming band. In these instances, the remaining project cost being carried over to the next programming band was inflated using the 5% annual inflation factor to adjust to the YOE cost. The MTPO coordinated with TDOT Programming to confirm anticipated year of construction, and project cost estimates.

In short, the LRTP financial plan assumes future year revenues that are based on recent MTPO funding. While additional funding could potentially become available, most likely through the Infrastructure Investment and Jobs Act (IIJA) that was signed into law on November 15, 2021, the specific funding details of this law are relatively unknown at the time of this LRTP update. As such, the fiscal constraint analysis relies on recent historic funding levels, previously described, to project future year revenues.

In using this approach, the MTPO determined that it would be necessary to split some of the higher cost projects (especially IMPROVE Act projects) across LRTP project programming bands to have enough funds to cover the projected costs. In doing so, the MTPO acknowledges that this approach may vary slightly from the regular TDOT Programming process (which may not include phasing or having projects cross programming bands). While slightly different, the important fact is that the LRTP fiscal constraint analysis demonstrates that these projects are still included in the LRTP fiscally constrained recommended plan. Furthermore, it should be noted that several of the IMPROVE Act projects will likely not begin construction for several years and as such there will be an opportunity to revisit the project programming and LRTP fiscal constraint analysis as part of the next LRTP update, anticipated to start approximately Fall 2025. Finally, if necessary, the MTPO can amend or modify the LRTP, and TIP, to account for any changes that might be needed to ensure consistency with TDOT Programming. Specifics on LRTP amendments and modifications are included in Chapter 9.

Table 42 summarizes the fiscally constrained TDOT projects through the horizon year 2045. Additionally, fiscally constrained projects in the Virginia portion of the MPA were discussed with VDOT. As previously mentioned, VDOT is studying the US-23 corridor, as part of *Project Pipeline*, to identify specific improvements/projects that could be prioritized for future programming. However, at the time of this LRTP update, the *Project Pipeline* projects had not been identified and therefore it was determined that only one improvement should currently be included as a fiscally constrained project. **Figure 72** displays the VDOT fiscally constrained project which is located along US-23 at Hilton Road. The cost of this project, based on current (December 2021) SMART SCALE estimates, is $3,077,901.

Figure 72. US-23 at Hilton Road Access Modifications



Source: VDOT.

The fact that only one project is currently identified as fiscally constrained for the Virginia portion of the Kingsport MPA should not be misinterpreted that there are no transportation or mobility needs. As stated throughout this LRTP, the US-23 corridor is a top priority within the MPA, as well as a top VDOT District priority. As such, the MTPO fully anticipates that specific improvements from *Project Pipeline* will eventually be incorporated to the LRTP through future amendments, modifications, and/or LRTP updates. The illustrative list of projects, included in Chapter 8, identifies the US-23 corridor for future improvements.

Figure 73 displays the fiscally constrained projects identified within the Kingsport MPA.

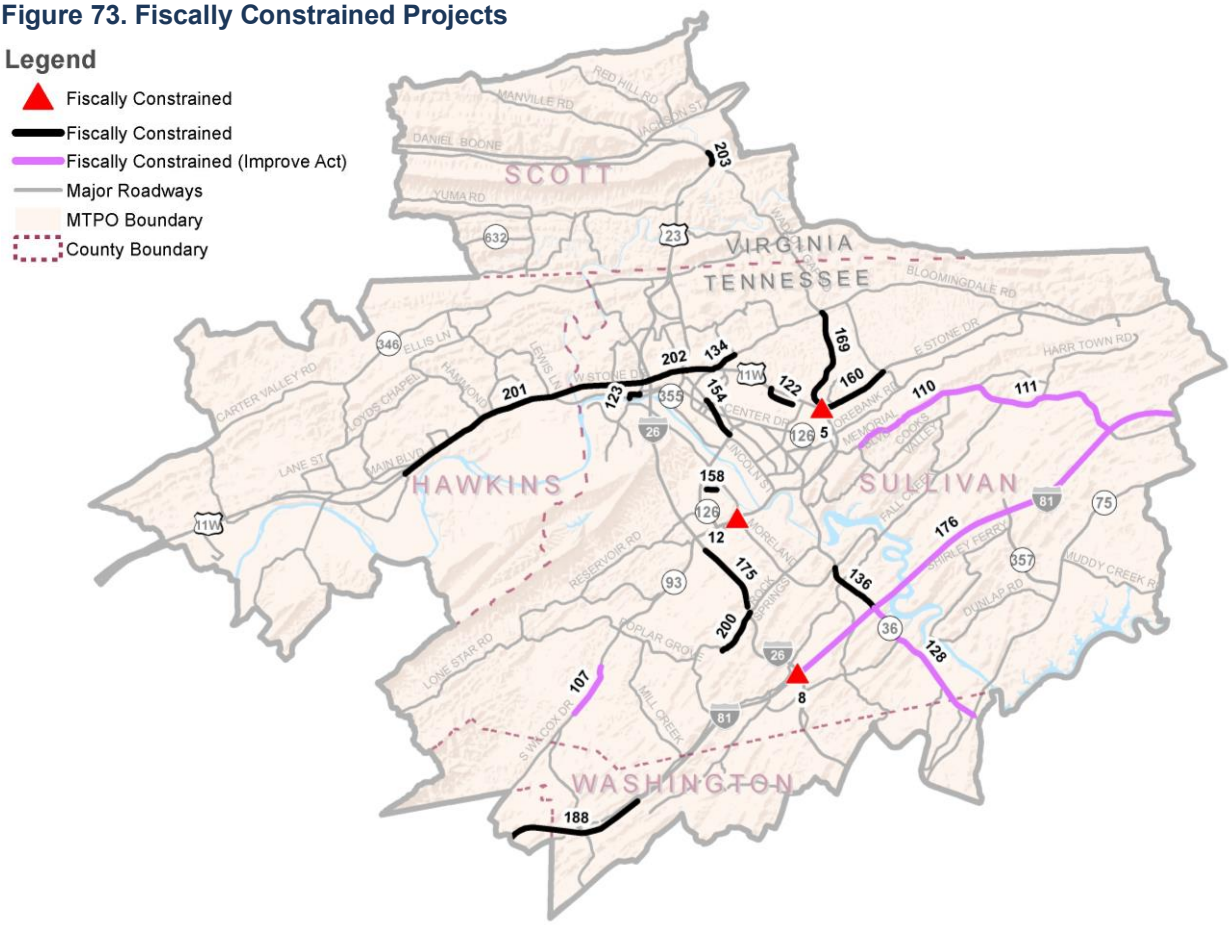
Table 42. Fiscally Constrained TDOT Projects

LRTP ID	TDOT PIN	IMPROVE Act Project	Route	From / To	Description	Percent Complete *	TDOT Total Cost Estimate	YOE Cost	Revenue Source					
									NHPP	STBG-S / State	HSIP	STBG-L	Local	Total
Year 2024 - 2025								Available Funding	$13,209,077	$11,974,083	$1,914,885	$3,303,699	$1,653,132	$32,054,876
176	124590.00	■	I-81 - ITS Expansion	I-26 / Virginia Exit 3	Technology improvements (23.3 miles)		$8,700,000	$8,700,000	$7,830,000	$870,000				$8,700,000
107	112834.03	■	SR-93 (Sullivan Gardens Parkway)	South of Horse Creek / North of Derby Drive	Spot / Safety Improvements		$12,200,000	$12,200,000	$3,280,000	$8,456,000	$464,000			$12,200,000
158	n/a		Jared Drive to Park Meadow Place	Spring Meadow Court / Riverport Road	SIA funded project to extend roadway			$28,700,000 [1]						$0
12	n/a		SR-93 (John B. Dennis)	Moreland Drive	Improve interchange ramps			$680,000	$600,000	$80,000				$680,000
202	n/a		US-11W (Stone Drive)	I-26 / Bloomingdale Pike	Safety enhancements / Improved multimodal connections to downtown			$2,171,000	$500,000	$1,318,000	$200,000		$153,000	$2,171,000
134	n/a		Bloomingdale Pike	US-11W (Stone Drive West) / Shipp Springs Road	Widen from 2 to 3 lanes to include center turn lane and other safety improvements			$5,300,000			$500,000	$3,300,000	$1,500,000	$5,300,000
169	n/a		SR-93 (John B. Dennis)	Stone Drive (US-11W) / Bloomingdale Road	Implement access management			$2,000,000		$1,250,000	$750,000			$2,000,000
								Total Costs	$12,210,000	$11,974,000	$1,914,000	$3,300,000	$1,653,000	$31,051,000
								Remining Funds	$999,077	$83	$885	$3,699	$132	$1,003,876
Year 2026 - 2035								Available Funding	$79,137,527	$71,738,501	$11,472,357	$19,792,948	$9,904,158	$192,045,491
110	105467.01	■	SR-126 (Memorial Boulevard) – Phase I	E. Center Street / East of Cooks Valley Road	Widen 2 lane to 4 lane, 5 lane, and 3 lane	50%	$88,900,000	$44,170,000		$43,670,000	$500,000			$44,170,000
200	112965.00		SR-347 (Rock Springs Road)	Cox Hollow Road / I-26	Improve roadway		$17,600,000	$17,600,000	$3,050,000	$11,830,000	$2,000,000	$720,000		$17,600,000
128	124663.00	■	SR-36 (Fort Henry Drive)	I-81 / SR-75 (Airport Road)	Widen from 2 lanes to 5 lanes with sidewalks on both sides	46%	$84,000,000	$38,555,600	$28,180,600	$8,305,000	$2,070,000			$38,555,600
160	n/a		US-11W (E. Stone Drive)	SR-93 (John B. Dennis) / New Beason Well Road	Widen to 6 lanes	60%		$20,400,000	$17,879,500	$2,520,500				$20,400,000
175	n/a		I-26	Wilcox Drive (MM 4) / Rock Springs Road/SR-347 (MM6)	Add EB truck climbing lane			$3,900,000	$3,510,000	$390,000				$3,900,000
123	n/a		Netherland Inn Road/Stone Drive Connector	Union Street / Netherland Inn Road	Realign and reconstruct Union Street to improve access to Netherland Inn Road			$8,867,334		$1,000,000	$1,000,000	$5,700,000	$1,167,334	$8,867,334
154	n/a		East Sullivan Street	Church Circle / N Wilcox Drive	Widen from 2 to 3 lanes with multimodal and aesthetic improvements			$10,380,896				$2,290,000	$8,090,896	$10,380,896
5	n/a		SR-93 (John B. Dennis)	US-11W (Stone Drive)	Upgrade intersection			$12,230,000	$7,230,000		$5,000,000			$12,230,000
136	n/a		SR-36 (Fort Henry Drive)	Moreland Drive/Hemlock Road / I-81	Improve intersections, coordinate signal timings, and evaluate driveway cuts			$2,700,000		$2,200,000	$500,000			$2,700,000
201	n/a		US-11W (W. Stone Drive)	I-26 / Silver Lake Road (Church Hill)	Safety enhancements / Access Management / Frontage Road Development			$4,245,000	$2,800,000	$600,000	$400,000	$300,000	$145,000	$4,245,000
n/a	n/a		Safety/Geometric Improvements	-	To be determined based on results of safety or other traffic study			$10,782,948				$10,782,948		$10,782,948
188	n/a		I-81	MPO Boundary / Exit 50	Add NB truck climbing lane			$12,230,000	$11,007,000	$1,223,000				$12,230,000
								Total Costs	$73,657,100	$71,738,500	$11,470,000	$19,792,948	$9,403,230	$186,061,778
								Remining Funds	$5,480,427	$1	$2,357	$0	$500,928	$5,983,713
Year 2036 - 2045								Available Funding	$106,354,219	$96,410,547	$15,417,888	$26,600,066	$13,310,361	$258,093,081
110	105467.01	■	SR-126 (Memorial Boulevard) – Phase I	E. Center Street / East of Cooks Valley Road	Widen 2 lane to 4 lane, 5 lane, and 3 lane	50%		$44,730,000 [2]		$44,730,000				$44,730,000
128	124663.00	■	SR-36 (Fort Henry Drive)	SR-75 (Airport Road) / I-81	Widen from 2 lanes to 5 lanes with sidewalks on both sides	54%		$45,444,400 [3]	$40,944,400	$4,500,000				$45,444,400
111	105467.02	■	SR-126 (Memorial Boulevard) – Phase II	East of Cooks Valley Road / I-81	Construct a 3 Lane section from East of Cooks Valley Road to Harr Town Road, 2 Lane section from Harr Town Road to I-81		$53,300,000	$53,300,000	$5,000,000	$42,000,000	$6,300,000			$53,300,000
160	n/a		US-11W (E. Stone Drive)	SR-93 (John B. Dennis) / New Beason Well Road	Widen to 6 lanes	40%		$20,000,000 [4]	$15,391,000	$1,482,000		$2,400,000	$727,000	$20,000,000
8	n/a		I-81 / I-26 Interchange	-	Improve cloverleaf geometry/ramps			$40,679,768	$36,981,668	$3,698,100				$40,679,768
n/a	n/a		Safety/Geometric Improvements	-	To be determined based on results of safety or other traffic study			$30,990,000			$8,617,000	$18,100,000	$4,273,000	$30,990,000
122	n/a		Jack White Drive	Current Terminus / Stone Drive	Extend west to connect to Stone Drive at Idle Hour Road			$14,408,297			$500,000	$6,100,000	$8,310,361	$14,910,361
								Total Costs	$98,317,068	$96,410,100	$15,417,000	$26,600,000	$13,310,361	$250,054,529
								Remining Funds	$8,037,151	$447	$888	$66	$0	$8,038,552
Total 2024 - 2045								**Estimated Available Revenue**	$198,700,824	$180,123,131	$28,805,129	$49,696,713	$24,867,651	$482,193,448
								Estimated Project Costs	$184,184,168	$180,122,600	$28,801,000	$49,692,948	$24,366,591	$467,167,307

NOTES:

*	If the 'Percent Complete' column is blank the project is considered to be 100% funded within that time band.
1	Project funded through State Industrial Access (SIA) Program grant.
2	Assumes remaining 50% funded in 2036 to 2045 band; could be programmed as one project when coordinated with TDOT Programming.
3	Assumes remaining 54% funded in 2036 to 2045 band; could be programmed as one project when coordinated with TDOT Programming.
4	Assumes remaining 40% of project funded in 2036 to 2045 band.

Figure 73. Fiscally Constrained Projects



Operations and Maintenance

The operations and maintenance (O&M) of existing infrastructure represents a significant portion of the overall transportation budget accounting for an estimated $625 million for roadway funding within the Kingsport MPA. The responsibility and expense of maintaining the current infrastructure is typically shared between state and local governments. State highway maintenance funds are provided through TDOT and VDOT to local governments and generally cover improvements such as pavement markings, signage, resurfacing, snow removal, and minor repairs.

Local governments provide a substantial amount of equipment and manpower to maintain local streets and roads, including some state routes. Local government budgets specify funding through public works departments for maintaining streets in a variety of activities, including resurfacing, cleaning, right-of-way mowing, litter control, signage, pavement markings, snow removal, and others.

Historic O&M funding, as documented in the current MTPO TIP, was used to project future year O&M revenue for the LRTP. A 3% compounded annual growth rate was applied to baseline O&M figures to estimate future year O&M expenses through the year 2045 planning horizon. **Table 43** summarizes the estimated O&M revenues that would be generated through the year 2045. For the purpose of the LRTP O&M analysis, the projected revenue is assumed to equal the O&M expenditures during the respective time bands. Additionally, the table is broken out to display the approximate O&M expense during the respective programming band.

Table 43. Operations and Maintenance Funding Forecast

Jurisdiction	2022 - 2025 Total	2022 - 2025 Annual Average	2026 - 2035 Total	2026 - 2035 Annual Average	2036 - 2045 Total	2036 - 2045 Annual Average	Total
City of Kingsport	$ 47,275,000	$ 11,818,750	$ 145,800,000	$ 14,580,000	$ 195,944,000	$ 19,594,400	$ 389,019,000
Sullivan County *	$ 13,806,000	$ 3,451,500	$ 42,579,000	$ 4,257,900	$ 57,222,000	$ 5,722,200	$ 113,607,000
Hawkins County *	$ 3,535,000	$ 883,750	$ 10,903,000	$ 1,090,300	$ 14,652,000	$ 1,465,200	$ 29,090,000
Washington County *	$ 1,945,000	$ 486,250	$ 6,000,000	$ 600,000	$ 8,063,000	$ 806,300	$ 16,008,000
Church Hill	$ 5,439,000	$ 1,359,750	$ 16,774,000	$ 1,677,400	$ 22,542,000	$ 2,254,200	$ 44,755,000
Mount Carmel	$ 1,464,000	$ 366,000	$ 4,516,000	$ 451,600	$ 6,069,000	$ 606,900	$ 12,049,000
VDOT *	$ 1,457,000	$ 364,250	$ 7,913,000	$ 791,300	$ 10,847,000	$ 1,084,700	$ 20,217,000
	$ 74,921,000	$ 18,730,250	$ 234,485,000	$ 23,448,500	$ 315,339,000	$ 31,533,900	$ 624,745,000

* Estimated for the Kingsport MPA.

The Kingsport MTPO and its member jurisdictions are committed to working closely with TDOT and VDOT to maintain the existing transportation infrastructure throughout the Kingsport MPA. Both Tennessee and Virginia provide local jurisdictions funding for the maintenance of certain highways. In Virginia, most local roads are state routes so there is very little funding included within local government budgets. The allocation of maintenance funds is on a district wide basis and is based on the number of moving lane miles of highways; therefore, it is difficult to break out specific amounts for Gate City, Weber City, and Scott County individually.

In Tennessee, state maintenance funds are distributed to local jurisdictions based on population to maintain state routes within city or county limits. At the local level, the two major sources of transportation revenue for O&M include the general fund and the issuance of bonds for major improvements or reconstruction. The interstate system is operated and maintained by TDOT. Maintenance activities are those that occur primarily in reaction to situations that have an immediate or imminent adverse impact on the safety or availability of transportation facilities. This may include tasks such as pavement resurfacing and markings, street light repair/replacement, sidewalk repair, sinkhole repair, bridge repair, guardrail and sign replacement, and signal maintenance. Operations may include more routine items such as painting and right-of-way maintenance. These activities are listed for informational purposes and to demonstrate that the jurisdictions and agencies have the resources to operate and maintain the new or improved facilities, equipment, and services through the 2045 planning horizon.

Public Transportation

The ability to provide public transportation service requires consistent, reliable funding sources to cover the operational costs (service), the on-going/routine maintenance costs, and the regular replacement of vehicles/buses (capital improvements). Federal, State, and local revenues are the primary mechanism for funding transit operations and capital improvements. Financial data was obtained from the regional/local transit providers to help inform the fiscal constraint analysis. It is important to note that this analysis assumes no significant changes in service, or funding, through the horizon year 2045. As previously documented, there are potential service improvement concepts that the LRTP discusses; however, these concepts would require additional study, including potential funding impacts, before specific recommendations are identified and included in the LRTP, and programmed in the MTPO's TIP.

When considering the public transportation fiscal constraint component, the analysis assumes that revenues and expenditures must balance on an annual basis. If at any point it appears that the transit agency costs are likely to exceed revenues then service changes, such as eliminating routes or reducing service hours, must be implemented to reduce/balance costs. Or, additional funding sources, such as what the Cares Act provided during COVID-19, must be identified in order to continue operating at the current service level.

It is also worth mentioning that the recent passage of the Infrastructure Investment and Jobs Act (IIJA), or also referred to as the Bipartisan Infrastructure Law (BIL), includes $39 billion of new investment to modernize transit, in addition to continuing the existing transit programs for five years as part of surface transportation reauthorization. In total, the new investments and reauthorization provide $89.9 billion in

guaranteed funding for public transit over the next five years — the largest Federal investment in public transit in history. Additional details are discussed in the funding section at the end of this chapter; however, this increase is a strong indication that transit funding will remain a priority, especially in the short-term. As such, it is believed that the regional transit providers within the Kingsport MPA can reasonably expect to continue to operate through the 2045 horizon year, at least at current service levels.

KATS Operating Expenses

As previously discussed, KATS operates fixed-route and demand-response services in the City of Kingsport. **Table 44** summarizes recent operating expenses, as provided by KATS, for service operations between 2017 and 2021. In 2021, KATS spent $1.64 million on operating expenses, which also represents the five-year average between 2017 and 2021.

Table 44. KATS Operating Expenses

Year	Federal	State	Local	Fares	Other	Total
2017	$ 749,826	$ 374,913	$ 374,913	$ 124,030		$ 1,623,682
2018	$ 905,551	$ 467,878	$ 286,760	$ 125,686		$ 1,785,875
2019	$ 729,160	$ 518,228	$ 210,934	$ 137,815		$ 1,596,137
2020	$ 711,276	$ 461,792	$ 273,361	$ 109,000		$ 1,555,429
2021	$ 510,833	$ 660,500	$ 362,855	$ 108,267		$ 1,642,455

Source: KATS; December 2021.

Table 45 displays the projected annual operating revenues through the LRTP horizon year 2045. These projections are based on a 2022 estimate which was consistent with the $1.64 million average annual operating expense between 2017 and 2021. As expenses and revenues are assumed to match, the expenses also represent the anticipated funding/revenue projected to be available.

Given the fluctuating operating expenses between 2017 and 2021, the project team coordinated with KATS to confirm an appropriate annual inflation rate to project the KATS operating revenue through the horizon year 2045. For planning purposes, two scenarios were developed. A 1% annual inflation rate, representing a ‘low’ revenue scenario, and a 3% annual inflation rate, representing a ‘high’ revenue scenario, were applied to the 2022 baseline estimate. In total, assuming no major service changes, KATS is projected to have between $56 million and $73 million in operating revenue through the year 2045.

Table 45. KATS Projected Operating Revenue

KATS	2022 - 2025	2026 - 2035	2036 - 2045	Total
Low	$ 6,864,142	$ 21,169,657	$ 28,450,248	$ 56,484,047
High	$ 7,071,689	$ 25,084,092	$ 40,859,343	$ 73,015,125

Source: AECOM; KATS.

KATS Capital Investments

Capital investments represent another critical funding component in providing public transportation services. The major transit capital investment is related to asset management, or simply stated the on-going financial requirement to regularly replace aging transit vehicles. Per Federal Transit Administration (FTA) rolling stock useful life policy guidelines, large, heavy-duty buses have a minimum useful life of at least 12-years or 500,000 miles. **Table 46** summarizes the KATS fleet, as of December 2021, which shows a few vehicles approaching the 12-year threshold but still well below 500,000 miles.

Table 46. KATS Fleet Summary

Year	Make / Model	Age	Mileage	Over age (12 years)	Over mileage (500,000)	KATS No.
2009	Ford E350	12	115,765	0	NA	1914
2010	Arboc Mobility LLC	11	216,035	0	NA	1938
2010	Arboc Mobility LLC	11	207,942	0	NA	1940
2011	Arboc Mobility LLC	10	197,122	0	NA	2002
2011	Arboc Mobility LLC	10	185,174	0	NA	2001
2011	Arboc Mobility LLC	10	173,909	0	NA	2000
2017	Champion LF Transport	4	81,251	0	NA	2386
2017	Champion LF Transport	4	77,271	0	NA	2387
2017	Ford T350	4	76,477	0	NA	2371
2017	Ford T350	4	75,793	0	NA	2370
2019	Ford/Champion	2	46,004	0	NA	2528
2019	Ford/Champion	2	43,341	0	NA	2529
2019	Ford/Champion	2	42,987	0	NA	2531
2019	Ford Mobility	2	33,746	0	NA	2493
2019	Ford/Champion	2	32,907	0	NA	2530
2019	Ford Mobility	2	31,289	0	NA	2492
2019	Ford Mobility	2	30,238	0	NA	2494
2019	Ford Mobility	2	29,303	0	NA	2495
2019	Ford Mobility	2	28,996	0	NA	2496

Source: KATS; December 2021.

For the LRTP analysis, it was assumed that KATS vehicles would be replaced every 12-years. This might represent an aggressive schedule, but it provides an approximate timeframe for when vehicles would be approaching time for replacement. Again, this analysis does not assume any change in service, such as adding new routes or extending existing routes, which would increase costs and require additional funding.

The project team coordinated with KATS to confirm an appropriate annual inflation rate to project the KATS capital investments through the horizon year 2045. A 3% annual inflation rate was applied to a base cost estimate to replace a transit vehicle. A cost of $150,000, representing a 'low' cost bus replacement scenario, and $200,000, representing a 'high' cost bus replacement scenario, were applied to the 2022 baseline cost estimate. In total, assuming no major service changes, KATS is projected to need between $8.6 million and $11.5 million for regular bus replacements through the year 2045 (see **Table 47**).

Table 47. Estimated Vehicle Replacement Schedule

	2022 - 2025		2026 - 2035		2036 - 2045		Total	
KATS	Vehicles Replaced	Estimated Cost	Vehicles Replaced	Estimated Cost	Vehicles Replaced	Estimated Cost	Vehicles Replaced	Estimated Cost
Low	6	$ 936,405	14	$ 2,794,629	18	$ 4,935,381	38	$ 8,666,415
High		$ 1,248,540		$ 3,726,172		$ 6,580,508		$ 11,555,220

Source: AECOM.

NOTE: The estimated vehicle replace schedule is based on age of the current fleet as of December 2021. Furthermore, the replacement schedule assumes vehicles would be replaced every 12-years.

NET Trans

NET Trans maintains a fleet of 104 vehicles, which are available for service in the eight-county First Tennessee Human Resource Agency Region.

In 2015, NET Trans implemented an alternative fuels program (gasoline + propane) which is being phased in over time. There are currently propane fueling stations in Sullivan County (Kingsport), Carter County, Greene County, and Hancock County. It is anticipated that Hawkins County (Rogersville), and

Washington County (Jonesborough) will be added in the near future. The agency has received a certified green fleet by the state of Tennessee Department of Environment and Conservation (TDEC).

Table 48 summarizes the recent NET Trans operational expenses between 2018 and 2022 (projected for year 2022). This includes additional Federal funding that was received in 2021 and 2022 from the CARES Act funds. **Table 49** summarizes the NET Trans vehicles. It is important to note that these vehicles are used for the entire NET Trans service area, and not just the Kingsport MPA.

Table 48. NET Trans Operational Costs

Year	Federal	State	Local	Fares	Total
2018	$ 92,400	$ -	$ 92,400	$ 30,710	$ 215,510
2019	$ 108,761	$ -	$108,761	$ 36,941	$ 254,463
2020	$ 40,348	$ -	$ 40,348	$ 25,978	$ 106,674
2021	$ 106,581	$ -	$ 40,348	$ 22,374	$ 169,303
2022	$ 218,725	$ -	$ 40,348		$ 259,073

Source: NET Trans; December 2021.

NOTE: 1) For 2021: $66,233 of the Federal funds are CARES Act funds

2) For 2022: $178,377 of the Federal funds are CARES Act funds

Table 49. NET Trans Vehicles

Year	Make / Model	Quantity	Average Age	Average Mileage
2008	Honda Civic	2	13	29,367
2014	Dodge Caravan	4	7	5,087
2015	Ford Transit 150	17	6	22,787
2015	Dodge Caravan	2	6	10,153
2016	Ford Transit 150	24	5	29,561
2016	Dodge Caravan	23	5	13,131
2017	Ford Transit 150	16	4	31,812
2019	Ford Transit 150	5	2	42,975
2019	Dodge Caravan	7	2	20,750
2020	Ford Transit 150	4	1	34,254

Source: NET Trans; December 2021.

MEOC/*MET Transit*

MEOC/MET Transit has a fleet of 49 vehicles, in its majority cutaway buses and some accessible minivans and raised roof vans. All the vehicles with one exception are equipped to transport people who use wheelchairs. **Table 50** summarizes the MEOC vehicles. Operating expenses were not obtained for MEOC.

Table 50. MEOC Transit Vehicle Fleet

Manufacturer	Vehicle ID	Year	Type	Odometer Reading (May 2020)	Seating Capacity (Ambulatory)	Wheelchair
Ford - Starcraft	MEOC 12	2020	Cutaway	6,466	12	4
Ford - Sta+A6:I48rcraft	MEOC 14	2020	Cutaway	4,009	12	4
Ford - Starcraft	MEOC 15	2020	Cutaway	5,634	12	4
Ford - Starcraft	MEOC 16	2020	Cutaway	4,460	12	4
Ford - Starcraft	MEOC 17	2020	Cutaway	3,318	12	4
FRD - Ford Motor Corp.	MEOC 92	2019	Cutaway	43,826	12	4
FRD - Ford Motor Corp.	MEOC 93	2019	Cutaway	47,110	12	4
FRD - Ford Motor Corp.	MEOC 94	2019	Cutaway	37,211	12	4
FRD - Ford Motor Corp.	MEOC 95	2019	Cutaway	28,806	12	4
FRD - Ford Motor Corp.	MEOC 96	2019	Cutaway	35,857	12	4
FRD - Ford Motor Corp.	MEOC 97	2018	Van	26,840	8	2
FRD - Ford Motor Corp.	MEOC 83	2018	Van	52,354	8	0
FRD - Ford Motor Corp.	MEOC 84	2018	Cutaway	84,587	12	4
FRD - Ford Motor Corp.	MEOC 85	2018	Cutaway	81,794	12	4
FRD - Ford Motor Corp.	MEOC 86	2018	Cutaway	69,240	12	4
FRD - Ford Motor Corp.	MEOC 87	2018	Cutaway	66,411	12	4
FRD - Ford Motor Corp.	MEOC 88	2018	Cutaway	73,476	12	4
FRD - Ford Motor Corp.	MEOC 89	2018	Cutaway	81,753	12	4
FRD - Ford Motor Corp.	MEOC 90	2018	Cutaway	80,859	12	4
BRA - Braun	MEOC 91	2018	Van	57,022	3	1
BRA - Braun	MEOC 82	2017	Van	87,287	5	1
FRD - Ford Motor Corp.	MEOC 77	2017	Cutaway	82,624	12	4
FRD - Ford Motor Corp.	MEOC 78	2017	Cutaway	112,025	12	4
FRD - Ford Motor Corp.	MEOC 79	2017	Cutaway	115,463	12	4
FRD - Ford Motor Corp.	MEOC 80	2017	Cutaway	130,389	12	4
FRD - Ford Motor Corp.	MEOC 81	2017	Cutaway	126,432	12	4
GMC - Chevrolet Motor Div.	MEOC 63	2016	Cutaway	177,737	15	4
GMC - Chevrolet Motor Div.	MEOC 64	2016	Cutaway	132,324	15	4
GMC - Chevrolet Motor Div.	MEOC 65	2016	Cutaway	136,620	15	4
GMC - Chevrolet Motor Div.	MEOC 66	2016	Cutaway	166,800	12	4
GMC - Chevrolet Motor Div.	MEOC 67	2016	Cutaway	149,817	15	4
GMC - Chevrolet Motor Div.	MEOC 68	2016	Cutaway	164,418	15	4
BRA - Braun	MEOC 76	2016	Van	114,924	5	1
FRD - Ford Motor Corp.	MEOC 70	2016	Cutaway	142,783	12	4
FRD - Ford Motor Corp.	MEOC 72	2016	Cutaway	158,095	12	4
FRD - Ford Motor Corp.	MEOC 73	2016	Cutaway	145,250	12	4
FRD - Ford Motor Corp.	MEOC 74	2016	Cutaway	141,699	12	4
Ford Explorer	MEOC 75	2016	SUV	57,017	6	0
Ford Explorer	MEOC 61	2015	SUV	130,080	6	0
Ford Explorer	MEOC 62	2015	SUV	77,873	6	0
GMC - Chevrolet Motor Corp.	MEOC 55	2014	Cutaway	213,592	15	4
Chevrolet Senator II	MEOC 56	2014	Cutaway	234,599	15	2
Chevrolet Senator II	MEOC 57	2014	Cutaway	197,163	15	2
Chevrolet Senator II	MEOC 58	2014	Cutaway	184,260	15	2
Chevrolet Senator II	MEOC 60	2014	Cutaway	202,647	19	2
GMC - Chevrolet Motor Corp.	MEOC 9	2014	Cutaway	223,821	19	2
GMC - Chevrolet Motor Div. *	MEOC 8	2013	Cutaway	217,072	15	2
Chevrolet Supreme	MEOC 6	2013	Cutaway	185,536	15	2
SPC - Startrans (Supreme)	MEOC 1	2012	Cutaway	244,721	12	2
Ford Supreme	MEOC 47	2011	Cutaway	278,941	12	2
Ford Supreme	MEOC 49	2011	Cutaway	233,271	19	1
Ford Supreme	MEOC 51	2011	Cutaway	234,787	15	2
SPC - Startrans (Supreme)	MEOC 53	2011	Cutaway	270,931	19	1
GMC 2500	MEOC 57	2004	Truck	58,638	2	0

***** Vehicle is out of service (all other vehicles are in service as of May 2020).

Source: MEOC Transit TDP.

Non-Motorized

Non-motorized funding, or funding targeted to improve biking and walking facilities, is critical to developing a comprehensive transportation system. Non-motorized funding has typically been used for investments in sidewalks, bicycle lanes, bicycle routes, and within the Kingsport region these funds have also been used to build and extend the Kingsport Greenbelt. Other investments support safety and facilitate convenient non-motorized travel, such as enhancing crosswalks, lighting, wayfinding signs, bike racks, etc.

Non-motorized funding is primarily obtained through competitive grants, as opposed to a guaranteed funding source that is more commonly used to fund roadways and public transportation. The Transportation Alternative Program (TAP) has been a common funding source for non-motorized improvements. TAP projects are typically funded at 80 percent federal and a 20 percent local match. While not guaranteed, the Kingsport MTPO has been successful in helping their localities obtain non-motorized funding in recent years, including receiving a $1.85 million TAP grant from TDOT in October 2021 to support the construction of the Brickyard Park pedestrian and bicycle bridge which will enhance accessibility between the Brickyard development area and downtown Kingsport. For this particular submittal, the City of Kingsport increased the local match by an additional 5% (total of 25%) to demonstrate a higher level of commitment to constructing this project.

In addition to grant funding, STBG funds are another potential revenue source that can be used for non-motorized improvements. One such example is a current proposal by the MTPO which is pursuing funding of the west end extension of the Kingsport Greenbelt. TDOT's Pedestrian Road Safety Initiative is another potential funding source. As part of this initiative, TDOT analyzes its managed roads to select approximately ten projects with a maximum budget of $1 million (projects are typically 1,000 feet or less in length). The Kingsport MTPO could explore this funding mechanism in future years, depending on how safe the area roadways are compared to the rest of Tennessee. Potential recommendations would be consistent with USDOT counter measures since this funding comes from HSIP.

TDOT and VDOT also routinely incorporate non-motorized enhancements as part of roadway improvement projects which helps the MTPO advance its vision of developing a comprehensive, connected system of bicycle and pedestrian facilities throughout the region. Finally, local jurisdictions also provide funding for non-motorized improvements. In some cases, local funds are used for on-going maintenance and/or spot improvements, or to cover the local match requirement of a grant. Together, the combined investment in the Kingsport MPA bicycle and pedestrian facilities helps advance the region's vision to expand accessibility to all users.

While non-motorized funding is generally competitive, and therefore difficult to project, the MTPO assumes for the LRTP planning process that additional non-motorized funding will be available through the 2045 horizon year. Recent revenues, including years 2017 to 2022 in the MTPO TIP, were used to establish an annual average funding for non-motorized improvements within the Kingsport MPA. The Kingsport MTPO has secured two grants within the last six years, totaling approximately $3 million, or approximately $500,000 annually.[9] **Table 51** provides a summary of projected funding levels for walkway and bikeway improvements within the Kingsport MPA through the planning horizon year 2045.

Table 51. Potential Non-Motorized Funding

	2022 - 2025		2026 - 2035		2036 - 2045		
Jurisdiction	Total	Annual Average	Total	Annual Average	Total	Annual Average	Total
Potential TAP Funding	$ 2,091,814	$ 522,953	$ 6,451,349	$ 645,135	$ 8,670,073	$ 867,007	$ 17,213,235

Source: Estimated based on the 2017 to 2022 MTPO TIP funding.

The *Kingsport MTPO Regional Bicycle and Pedestrian Plan* update, adopted February 2022, outlines priority projects that the MTPO intends to actively pursue funding and grant opportunities as it becomes available. As funding is identified, the MTPO will program non-motorized improvements in the TIP and will also coordinate these improvements with other transportation investments, such as roadway

[9] While the annual average is used for the six-year period, the grants are not generally received every year. The annual average is used to estimate an approximate funding amount that might be available through the horizon year 2045.

improvements. In doing so, the MTPO can identify potential opportunities, expand the development of the non-motorized facilities, and maximize the benefit to area residents. In support of this effort, Chapter 8 includes two figures that display the fiscally constrained roadway projects overlaid with the bicycle and pedestrian Level of Traffic Stress results. This analysis is intended to help inform future non-motorized investment decisions and strengthen short- and long-term non-motorized investment strategies.

Relevant Funding Sources

Various sources of funding are available for transportation infrastructure projects in the form of formula funds, grants, loans, and other special financing mechanisms. The typical sources of funding—existing or potential—for projects in the Kingsport region are briefly discussed in this section.

Infrastructure Investment and Jobs Act (IIJA)/ Bipartisan Infrastructure Law (BIL)

In November 2021, Congress passed the Infrastructure Investment and Jobs Act (IIJA), or Bipartisan Infrastructure Law (BIL). The Federal law focuses on rebuilding roads, bridges and rails, expanding access to clean drinking water, ensuring increased access to high-speed internet, addressing climate change, advancing environmental justice initiatives, and strengthening the supply chain through investments in ports and airports. The legislation also reauthorizes surface transportation programs for five years and invests $110 billion in additional funding to repair roads and bridges and support major, transformational projects. The legislation also includes the first ever Safe Streets and Roads for All program to support projects to reduce traffic fatalities.

Federal Highway Administration (FHWA) announced in December 2021 that the BIL would provide $52.5 billion in funding to all 50 states and the District of Columbia for FY 2022. This represents an increase of more than 20% as compared to FY 2021 for Federal-aid Highway Program apportionments. While specific amounts have not been identified at the time of this plan development, it is anticipated that the Kingsport MTPO will see some of this additional funding.

TYPICAL FUNDING SOURCES

Formula Funds
programs apportion amounts to recipients based on formulas that consider population, miles of roadway, and other metrics

Grants
programs award funding typically through a competitive application and review process

Loans
programs award funding to projects through an application and review process, and the recipient is expected to repay the funding later

Special Funding Mechanisms
other potential vehicles for funding infrastructure projects that may not be currently or fully utilized

The BIL follows the Fixing America's Surface Transportation (FAST) Act that was signed into law on December 4, 2015. It authorized $305 billion for fiscal years 2016 to 2020 for highway, safety, public transportation, motor carrier safety, hazardous materials safety, rail, research, technology, and statistics programs. The FAST Act also provided the first dedicated source of federal funding for freight projects.

Federal funding for transportation is derived in part from highway excise taxes (i.e., taxes paid when purchases are made on a specific good) on motor fuel and truck-related taxes on truck tires, sales of trucks and trailers, and heavy vehicle use. Excise taxes on gasoline and other motor fuels account for more than 85 percent of all receipts to the Federal Highway Trust Fund (HTF). Tax revenues are deposited into either the Highway Account or the Mass Transit Account of the Federal HTF and then distributed to the states. FHWA and the Federal Transit Administration (FTA) then distribute funds from the Highway and the Mass Transit Accounts, respectively, to each state through a system of formula grants and discretionary allocations. The FAST Act extended the imposition of highway-user taxes through September 30, 2022, with generally no change to the tax rates as imposed under the Moving Ahead for Progress in the 21st Century Act (MAP-21). The IIJA reauthorizes surface transportation programs for five years.

The following sections describe some federal, state, and local potential funding sources for infrastructure projects. It is important to note that these funding sources could change as the details of the IIJA develop over the next several months.

Formula Funds

The following identifies several formula fund programs that are available for funding infrastructure.[10] Funding allocations are provided for the following programs (before post-apportionment set asides, penalties, and sequestration):

National Highway Performance Program (NHPP): The NHPP provides support for the condition and performance of the National Highway System (NHS), construction of new facilities on the NHS, and ensuring that investments achieve the performance targets established by state asset management plans. Funds are apportioned based on formulas to each state, and states divide the funds among apportioned programs. Eligible activities include reconstruction, resurfacing, restoration, rehabilitation, and preservation of bridges on non-NHS highways; projects that reduce the risk of failure of NHS infrastructure; and subsidies for projects under the Transportation Infrastructure Finance and Innovation Act (TIFIA).[11]

Surface Transportation Block Grant Program: The program provides flexible spending to states based on apportionment formulas for state and local transportation needs. Eligible projects include the construction of highways, bridges, tunnels, transit capital projects, operational improvements, safety infrastructure projects, parking facilities, recreational trails, bicycle and pedestrian projects, planning and design of roadways and interstates, surface transportation planning, travel demand management strategies, congestion pricing, and numerous others as found in 23 U.S.C. 133(b)(15).[12]

Highway Safety Improvement Program (HSIP): The HSIP aims to reduce traffic fatalities and injuries on all public roads through a data-driven approach that focuses on performance. Funds are apportioned as a lump sum to the states to divide among programs. Eligible activities include safety projects that are consistent with the State's Strategic Highway Safety Plan (SHSP) and that correct or improve hazardous road locations or features. Eligible projects may include vehicle-to-infrastructure communications equipment, pedestrian hybrid beacons, roadway improvements (including medians) to separate pedestrians and motor vehicles, and other physical projects.[13]

Railway-Highway Crossings Program: The program provides funds for safety improvements that reduce fatalities, injuries, and crashes at public grade crossings. Funding is apportioned based on formulas and considers the number of public crossings by state. Eligible activities include relocation of highways to eliminate grade crossings and projects that eliminate hazards posed by idling trains on crossings.[14]

National Highway Freight Program: The program aims to improve the efficient movement of freight on the National Highway Freight Network (NHFN). A lump sum is apportioned by state and then divided among programs at the local level. Eligible activities include projects and programs that contribute to the efficient movement of freight as identified in the state's freight plan. Examples may include ramp metering, truck-only lanes, adding or widening shoulders, adding road capacity to address highway freight bottlenecks, separation of passenger vehicles and commercial vehicles, and other projects.[15]

TIFIA

Transportation Infrastructure Finance and Innovation Act (TIFIA): The program provides federal credit assistance to eligible highway, transit, intercity rail, and some freight rail, intermodal facilities, and port modification projects. Under TIFIA, states, localities, public authorities, and some private entities can

[10] Projects can be funded through more than one program.
[11] National Highway Performance Program, https://www.fhwa.dot.gov/fastact/factsheets/nhppfs.cfm
[12] Surface Transportation Block Grant Program, https://www.fhwa.dot.gov/fastact/factsheets/stbgfs.cfm
[13] Highway Safety Improvement Program, https://www.fhwa.dot.gov/fastact/factsheets/hsipfs.cfm
[14] Railway-Highway Crossings Program, https://www.fhwa.dot.gov/fastact/factsheets/railwayhwycrossingsfst.cfm
[15] National Highway Freight Program, https://www.fhwa.dot.gov/fastact/factsheets/nhfpfs.cfm

take advantage of three types of financial assistance: secured loans, loan guarantees, and lines of credit. Eligible projects include transit-oriented development projects and the capitalization of a rural projects fund within a state infrastructure bank. TIFIA has also been a useful tool for funding large, complex transportation infrastructure projects of regional or national significance. The program previously included up to a 35-year repayment period, but the recent passage of the new infrastructure law allows up to 75 years for some projects.

Competitive Grants

Rebuilding American Infrastructure with Sustainability and Equity (RAISE): The RAISE Discretionary Grant program, provides a unique opportunity for the DOT to invest in road, rail, transit, and port projects that promise to achieve national objectives. Previously known as the Better Utilizing Investments to Leverage Development (BUILD) and Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grants, Congress has dedicated nearly $8.9 billion for twelve rounds of National Infrastructure Investments to fund projects that have a significant local or regional impact.

In each competition, DOT receives hundreds of applications to build and repair critical pieces of our freight and passenger transportation networks. The RAISE program enables DOT to examine these projects on their merits to help ensure that taxpayers are getting the highest value for every dollar invested. The eligibility requirements of RAISE allow project sponsors at the State and local levels to obtain funding for multimodal, multi-jurisdictional projects that are more difficult to support through traditional DOT programs. RAISE can fund port and freight rail projects, for example, which play a critical role in our ability to move freight but have limited sources of Federal funds. RAISE can provide capital funding directly to any public entity, including municipalities, counties, port authorities, tribal governments, MPOs, or others in contrast to traditional Federal programs which provide funding to very specific groups of applicants (mostly State DOTs and transit agencies). This flexibility allows RAISE and our traditional partners at the State and local levels to work directly with a host of entities that own, operate, and maintain much of our transportation infrastructure, but otherwise cannot turn to the Federal government for support.

Infrastructure for Rebuilding America (INFRA): Like the RAISE grant program, INFRA is a competitive grant program. Established under FAST Act, it aims to fund nationally and regionally significant freight projects. The federal share of the project may not exceed 80 percent, with 60 percent maximum of INFRA grant funds. Eligible projects include highway freight projects on the NHFN, highway or bridge projects that add capacity to an interstate or a national scenic area, grade separation projects, and intermodal, rail, or port freight projects. The minimum award is $5 million for small projects and $25 million for large projects. Projects are evaluated based on selection criteria including the results of a Benefit Cost Analysis (BCA) and an application narrative. The Biden-Harris Administration intends to award $905.25 million to 24 projects in 18 states under the INFRA discretionary grant program. These grants advance the Administration’s priorities of rebuilding America’s infrastructure and creating jobs by funding highway and rail projects of regional and national economic significance that position America to win the 21st century. Further, with this recent round of investment, USDOT prioritized funding to rural areas to address historic underinvestment. Approximately 44 percent of proposed funding will be awarded to rural projects, which exceeds the statutory requirements for rural projects set by Congress at 19%.

Public Works and Economic Adjustment Assistance Programs: These grant programs administered through the Economic Development Authority (EDA), a bureau within the Department of Commerce, provide investments that support construction, non-construction, technical assistance, and revolving loan fund projects on a competitive merit basis. Eligible applicants must be public or private non-profit organizations acting in cooperation with officials of a political subdivision of a state.

Under the American Rescue Plan, EDA was allocated $3 billion in supplemental funding to assist communities nationwide in their efforts to build back better by accelerating the economic recovery from the coronavirus pandemic and building local economies that will be resilient to future economic shocks. American Rescue Plan funding enables EDA to provide larger, more transformational investments across the nation while utilizing its greatest strengths, including flexible funding to support community-led

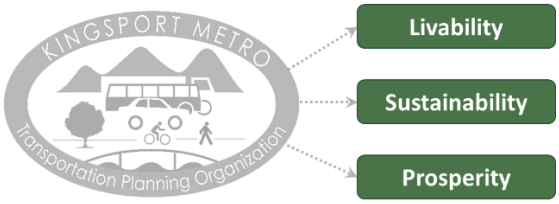
economic development. With an emphasis on equity, EDA investments made under the American Rescue Plan will directly benefit previously underserved communities impacted by COVID-19.

Bus and Bus Facilities Formula Program (49 U.S.C. 5339): The Bus and Bus Facilities Formula program provides capital assistance for new and replacement buses and related equipment and facilities. Eligible capital projects include the purchasing of buses for fleet and service expansion, bus maintenance and administrative facilities, transfer facilities, bus malls, transportation centers, intermodal terminals, park-and-ride stations, acquisition of replacement vehicles, bus rebuilds, bus preventive maintenance, passenger amenities such as passenger shelters and bus stop signs, accessory and miscellaneous equipment such as mobile radio units, supervisory vehicles, fare boxes, computers and shop and garage equipment. Funds are allocated on a discretionary basis and through competitive grants, and a minimum 20 percent non-federal match is required. The USDOT Secretary has the discretion to allocate funds, although Congress fully earmarks all available funding.

Furthermore, the IIJA significantly increases funding for transit agencies to purchase electric buses for replacement and service expansion vehicles. The IIJA recognizes the significant transit repair backlog (vehicles and infrastructure) as well as the fact that communities of color are twice as likely to take public transportation and many of these communities lack sufficient public transit options. The legislation includes $39 billion of new investment to modernize transit, in addition to continuing the existing transit programs for five years as part of surface transportation reauthorization. In total, the new investments and reauthorization provide $89.9 billion in guaranteed funding for public transit over the next five years — the largest Federal investment in public transit in history. The legislation will expand public transit options, replace thousands of deficient transit vehicles, including buses, with clean, zero emission vehicles, and improve accessibility for the elderly and people with disabilities. This funding also supports the Biden-Harris Administration ambitious goal to cut greenhouse gas emissions by 2030.

8. Recommended Plan

This chapter summarizes the recommended multimodal investments within the Kingsport MPA through the horizon year 2045. It includes a discussion of short-term and long-term actions to support project implementation to advance the Kingsport region's transportation vision and goals which focus on providing safe, secure, convenient, and active transportation choices for the traveling public (**livability**), advancing transportation choices that support economic, social and environmental **sustainability**, and promoting transportation policies and investments that support economic development and redevelopment (**prosperity**). The chapter includes additional analysis of the fiscally constrained roadway/freight investments, specifically examining potential land use/urban growth area impacts, environmental justice impacts, and environmental mitigation measures.



Priority Roadway and Freight Investments

As documented, the existing conditions analysis and identification of the regional transportation needs helped document transportation issues throughout the Kingsport MPA. The roadway and freight needs focused on improving network connectivity, enhancing safety, addressing areas of congestion, and addressing other operational issues. Potential projects to address these needs were identified and scored using a performance-based planning approach that linked measures to the LRTP goals. The highest scoring projects, along with other considerations described in Chapter 7, were then used to identify the fiscally constrained roadway/freight projects through the horizon year 2045.

The fiscally constrained roadway and freight projects are used again in this chapter to document potential impacts on land use and the urban growth boundary, potential EJ issues including impacts on low income and minority populations, and potential environmental issues which are considered as part of a high-level environmental mitigation analysis.

Overview of Short-Term Priorities

The LRTP process identifies issues, projects, and priorities through the year 2045. In addition to having a long-term focus, the LRTP must also consider short-term priorities, or strategies, that help the MTPO move in a positive direction in achieving the long-term, comprehensive vision. The following discusses the short-term priorities for the Kingsport MPA.

Safety Investments

The 2045 LRTP identified safety as a top priority throughout the Kingsport MPA and a high-level review of recent crash data supported the need to address serious injuries and fatalities. The LRTP includes projects that look to improve safety for the traveling public, as well as local industries and businesses. Improved maintenance of the existing transportation assets was identified as part of an economic development workshop that was conducted for the LRTP development in Spring 2021 (see **Appendix C**). Near the completion of the 2045 LRTP update (in December 2021), the Kingsport MTPO started a Local Road Safety Plan (LRSP) study that will identify, analyze, and prioritize roadway safety improvements on roadways within the Kingsport MPA. The purpose of the LRSP is to prioritize a list of issues, risks, actions,

and improvements that can be used to reduce fatalities and serious injuries on local roads. As part of a project kickoff meeting, the study team, which included representatives from FHWA, agreed to expand the focus of the analysis to include State roads. This effort should significantly help the MTPO address safety concerns within the region.

ITS

TDOT plans to invest in ITS enhancements along I-81 (ITS Smartway Expansion) from I-26 (Exit 57) interchange to near I-381 just across the Virginia state line. This improvement was documented in the *I-40/81 Multimodal Corridor Study* completed in July 2020. Typical ITS improvements include speed cameras, dynamic message signs (DMS), CCTV systems, and other wired and wireless communications-based and electronics technologies. TDOT's ITS program, SmartWay, uses cameras, DMS, roadway detection systems, and video to monitor interstates across the state. Traffic and other travel information is communicated to travelers through DMS, highway advisory radio, 511 phone system, and TDOT's online Smartway maps available on the web and through a mobile app. The completion of this stretch of I-81 will eliminate a significant gap that currently exists along the I-81 corridor.

Truck Climbing Lanes

Truck climbing lanes are constructed in areas where steep grades may cause heavier vehicles to travel more slowly. They provide a space for slower-moving vehicles to continue traveling while freeing the remaining travel lanes for other motorists to use at normal speeds. The LRTP identifies two areas for truck climbing lanes within the Kingsport MPA. One is located along the western edge of the Kingsport MPA on I-81 (northbound) and the second is located along I-26 (eastbound beginning at SR-93 (John B. Dennis Highway)). The implementation of these facilities would enhance safety, improve traffic flow, and better accommodate heavy truck traffic that is so critical to local industries.

Targeted Economic Development Strategies

One of the established goals for the 2045 LRTP was to support economic development within the Kingsport MPA. In support of this effort, an economic development workshop was held in Spring 2021 to discuss opportunities to advance this goal. A detailed summary of the economic workshop, and analysis, is provided in **Appendix C**. The following summarizes some of the key strategies identified.

- **Provide for Safety and Maintenance First -** While new facilities can be key drivers to encourage economic activity, stakeholder feedback and public comments repeatedly affirmed that enhancing safety and maintenance on key portions of existing infrastructure was the most critical transportation investment to be made to support economic development.
- **On-Going Evaluation of Intermodal Facility** – The regional rail system that supports Eastman provides the potential for the development of an intermodal facility. While discussions with Eastman representatives indicate that truck traffic will continue to dominate shipping of goods in the next few years, there is always the potential that future economic trends could shift back toward a greater focus on the use of rail. Furthermore, as Eastman may not be a primary user of an intermodal facility, it might be worth exploring if a facility might support other local businesses/industries.

In addition, the MTPO will also consider opportunities to improve rest areas, and hotels/motels, along the interstate corridors as this would support economic development, tourism, and promote safety. These facilities are typically located in the urban fringe, or rural areas, and could provide much needed parking and rest areas for drivers to rest, and/or use cell phones.

Illustrative Projects

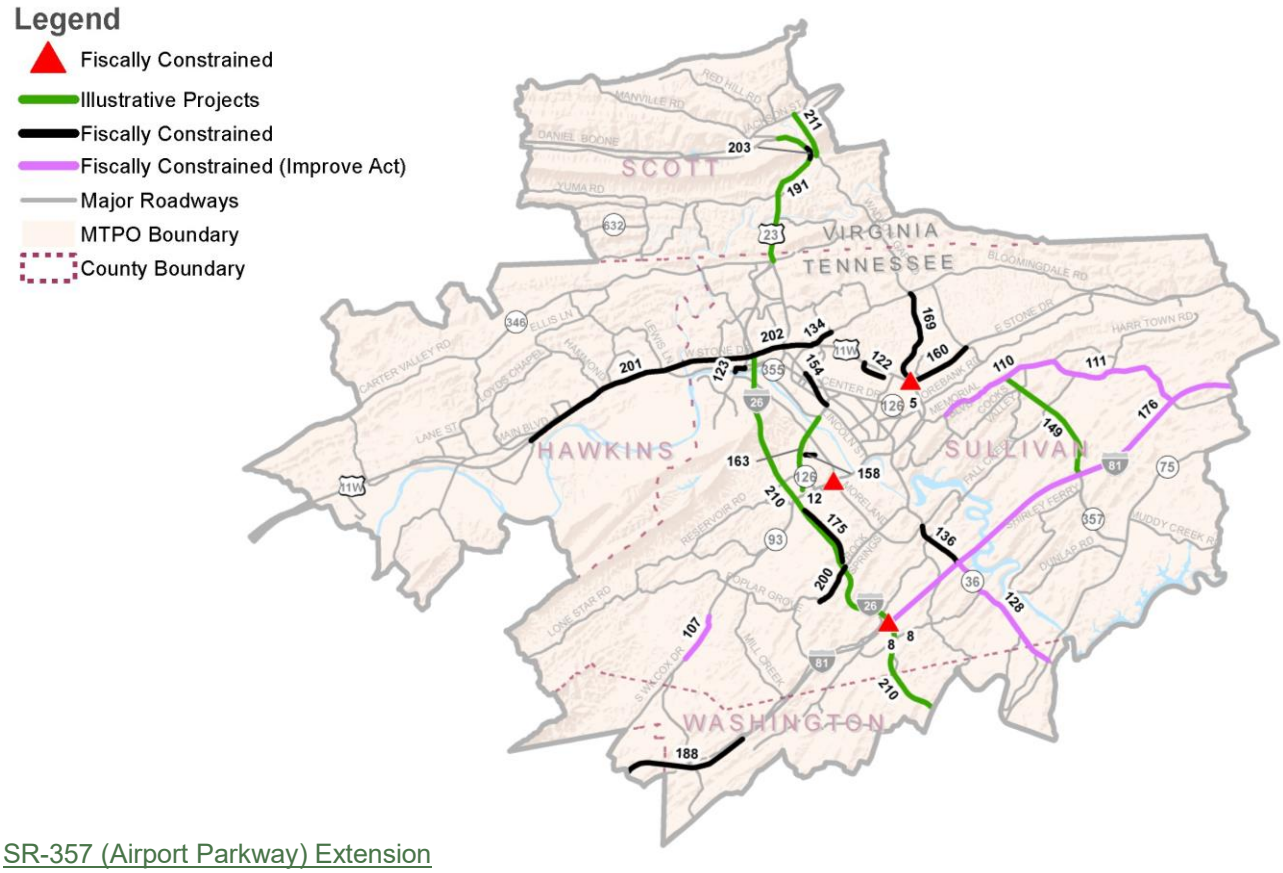
In addition to the fiscally constrained projects and short-term priorities, illustrative projects, or projects that make up the fiscally unconstrained vision, is another important element of the regional transportation planning process. Illustrative projects are those that currently do not have funding but have been identified as high-priority projects that would benefit the region. These projects are identified in case additional funding resources become available.

Illustrative projects, as displayed in **Figure 74**, represent projects for which funding has not been programmed/ identified, or for projects that are more conceptual and may not be needed before 2045.

These projects are shown along with the fiscally constrained projects to help convey a long-term, comprehensive transportation vision for the Kingsport MPA. The illustrative projects are listed below and are discussed in the following sections.

- SR-357 (Airport Parkway) Extension
- US-23 Corridor Improvements
- I-26 Enhancements
- Moccasin Gap Bypass

Figure 74. Illustrative Projects – Fiscally Unconstrained Vision



SR-357 (Airport Parkway) Extension

The LRTP analysis documented the need to enhance north-south connectivity within the Kingsport MPA and the Tri-Cities. Residents of the Kingsport region have indicated that they often take circuitous routes to travel relatively short distances due to the lack of interconnectivity amongst major transportation corridors. Similarly, important industries such as Eastman and the Tri-Cities Airport have expressed the desire for additional north-south connectivity which would open additional areas for economic development opportunities and help provide additional system redundancy for freight transportation. Finally, from a regional perspective, better north-south connectivity would allow markets to operate in a more cohesive fashion amongst the communities of the Kingsport region and the Tri-Cities region.

A recent TDOT study evaluated a north-south SR-357 (Airport Parkway) connection in the growing southeast area of the Kingsport MPA. With recent developments in the area, including a new high school, and additional development anticipated in the area and along I-81, the need for a higher classified roadway that provides an additional north-south connection is important. In addition, travel demand modeling of a SR-357 (Airport Parkway) extension showed the potential for a new roadway to carry over 10,000 vehicles per day (vpd) in addition to potentially shifting some traffic away from a congested SR-36 (Fort Henry Drive) corridor (north of I-81).

US-23 Corridor Improvements

The US-23 corridor, in Virginia, has been identified as a high priority need within the Kingsport MPA for several years. VDOT has also identified this as a high priority and the corridor was being studied, as part of *Project Pipeline,* at the time of this LRTP update. As documented, this corridor has several safety and operational concerns, and the hope is that there will be specific projects that will enter the SMART SCALE application process in the next few years, and eventually become fiscally constrained LRTP projects that are programmed in the TIP. As of March 2022, *Project Pipeline* has identified two projects that could be submitted for future SMART SCALE applications. These projects are summarized below:

- **US-23 Access Management and Turn Lane Improvements**

  This project improves safety along US-23 by implementing access management improvements between the Virginia - Tennessee state line and Yuma Road. The access management improvements include limiting parcels to one driveway where possible. This project will also upgrade ten existing substandard left-turn lanes to current VDOT standards. Additionally, the project will eliminate one existing median opening that does not provide left-turn lanes.

- **US-23 at Chapel Street Safety and Railroad Crossing Improvements**

  This project improves safety by providing southbound left- and right-turn lanes at the intersection of US-23 and Chapel Street. Additionally, this project will eliminate two at-grade railroad crossings located on Blanton Drive and Boone Street by removing these roads from accessing US-23.

I-26 Enhancements

The I-26 corridor provides an important connection to Virginia and provides important local connections to Kingsport area businesses and industries. As part of the technical analysis, the travel demand model showed areas of future year traffic congestion that is currently not addressed by the fiscally constrained projects. As such, the MTPO supports the installation of ITS applications along the corridor, which would extend south of the southern boundary of the Kingsport MPA. The MTPO has had discussion with the Johnson City MTPO who also support the installation of ITS along the I-26 corridor. Similar to the I-81 ITS application, technology improvements would be used to enhance safety for the traveling public. Ideally, the ITS enhancements would extend north and continue along US-23 in Virginia. Long-term, the MTPO may need to identify future year capacity enhancements to support projected future year traffic volumes.

Moccasin Gap Bypass

This proposed improvement would construct a new two-lane divided highway from Route 71 to Wadlow Gap Road (with connection to Filter Plant Road). The bypass would create an alternative connection to the US-23 corridor. This improvement would enhance system redundancy, especially if the US-23 corridor were to ever be closed for an incident, or for an extended period of time.

Advanced Construction Funding Strategy

The fiscal constraint analysis demonstrated the challenge of funding the current IMPROVE Act projects by 2045 within the projected revenues. The construction costs have significantly increased, and the projected 5% annual cost inflation factor highlights the challenge when revenues are inflated at only 3% annually.

One possible funding strategy to address this issue is Advanced Construction (AC). AC is a technique which allows a state to initiate a project using non-federal funds while preserving eligibility for future Federal-aid funds. Eligibility means that FHWA has determined that the project technically qualifies for Federal-aid; however, no present or future Federal funds are committed to the project. After an AC project is authorized, the state may convert the project to regular Federal-aid funding provided Federal funds are made available for the project. An AC project must meet the same requirements and be processed in the same manner as a regular Federal-aid project. All phases of a project must meet federal requirements for the National Environmental Policy Act (NEPA), Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act), etc., when any phase is implemented with Federal-aid funds. It is important to note that the use of AC funding is not increasing the MTPO's total revenues through the life of this LRTP, instead it is a potential strategy to fund and ultimately construct projects sooner.

Land Use and Urban Growth Boundary Compatibility

The coordination of transportation and land use policies are important to achieving the long-term regional transportation vision for the Kingsport region. As the LRTP spans twenty plus years it is important for the regional planning partners to be on the same page when it comes to planning, designing, and constructing future transportation investments that are compatible with future land use and growth boundaries. In accommodating future growth/development, it is important to recognize that short-term decisions can have significant long-term impacts on local/regional mobility, mode choice, and the overall success in attracting future economic activity. For example, allowing development to occur without considering/accommodating future transportation corridors, extensions, or connections (e.g., a building being placed where a roadway extension is planned or may be needed in the future) is not only shortsighted, but can hinder future growth and economic development and potentially cause network connectivity and operational issues.

Enhanced integration of land use and transportation planning requires an emphasis on regional coordination and a commitment from local agencies to strengthen this relationship. As such, land use/development decisions can support a more efficient and effective transportation system that helps improve access to employment opportunities, retail goods and services, medical facilities, and other daily activities and resources.

Future Population and Employment Growth

Plans, policies, and anticipated growth areas within the region were considered in the development of the future population and employment forecasts for the Kingsport MPA. As part of this effort, coordination with local and regional planning agencies through stakeholder meetings helped identify land use and growth issues. As documented, the Kingsport MPA is projected to experience continued population and employment growth through the 2045 horizon. Population and housing growth is planned to occur largely within the designated UGB with both infill and outward residential expansion. Areas outside the UGB will experience some residential growth but at a lower level.

As for projected employment growth, a large number of jobs are planned to occur in and around the same geographic areas of current employment activity. In addition, future employment concentrations are planned near the interchanges of I-81 and Tri-Cities Crossings and I-26 and Eastern Star Road. Other employment growth areas include the SR-357 (Airport Parkway) corridor and along the US-11W (SR-1/Stone Drive) corridor throughout the MPA.

The projected increase in population and employment will not only require the need for additional roadway capacity (both in terms of new roads and improvements to existing roads) but will also create greater demand for expanded public transportation services and bicycle and pedestrian facilities. As roadway/freight improvements are made, it will be important to consider appropriate supporting investments to accommodate all transportation users.

Land Use and Urban Growth Boundary Coordination

Figure 75 displays the fiscally constrained projects overlaid on the MPA land use map while **Figure 76** displays the fiscally constrained projects overlaid on the urban growth boundaries. Generally speaking, the LRTP fiscally constrained projects encourage development near existing city infrastructure, thus providing opportunities to better integrate with future transit, bicycle and pedestrian accommodations.

One location that offers a unique opportunity to coordinate transportation and land use is the Holston Army Ammunition site. This area sits just south of US-11W (SR-1) and it will be critical to coordinate future development, transportation access, and network connectivity to ensure the safe and efficient accommodation of all travel users. During the LRTP stakeholder meetings, it was mentioned that the US-11W (SR-1) corridor includes jobs that many individuals access by walking and biking. As such, future land use and development plans should be sure to include appropriate, convenient, and safe non-motorized accommodations to accommodate all users.

Furthermore, through stakeholder meetings, it was noted that enhanced internal circulation between developments could help preserve mainline capacity by reducing short trips, and improve safety by eliminating access points, and related turning movements.

Figure 75. Land Use Compatibility – Fiscally Constrained Projects

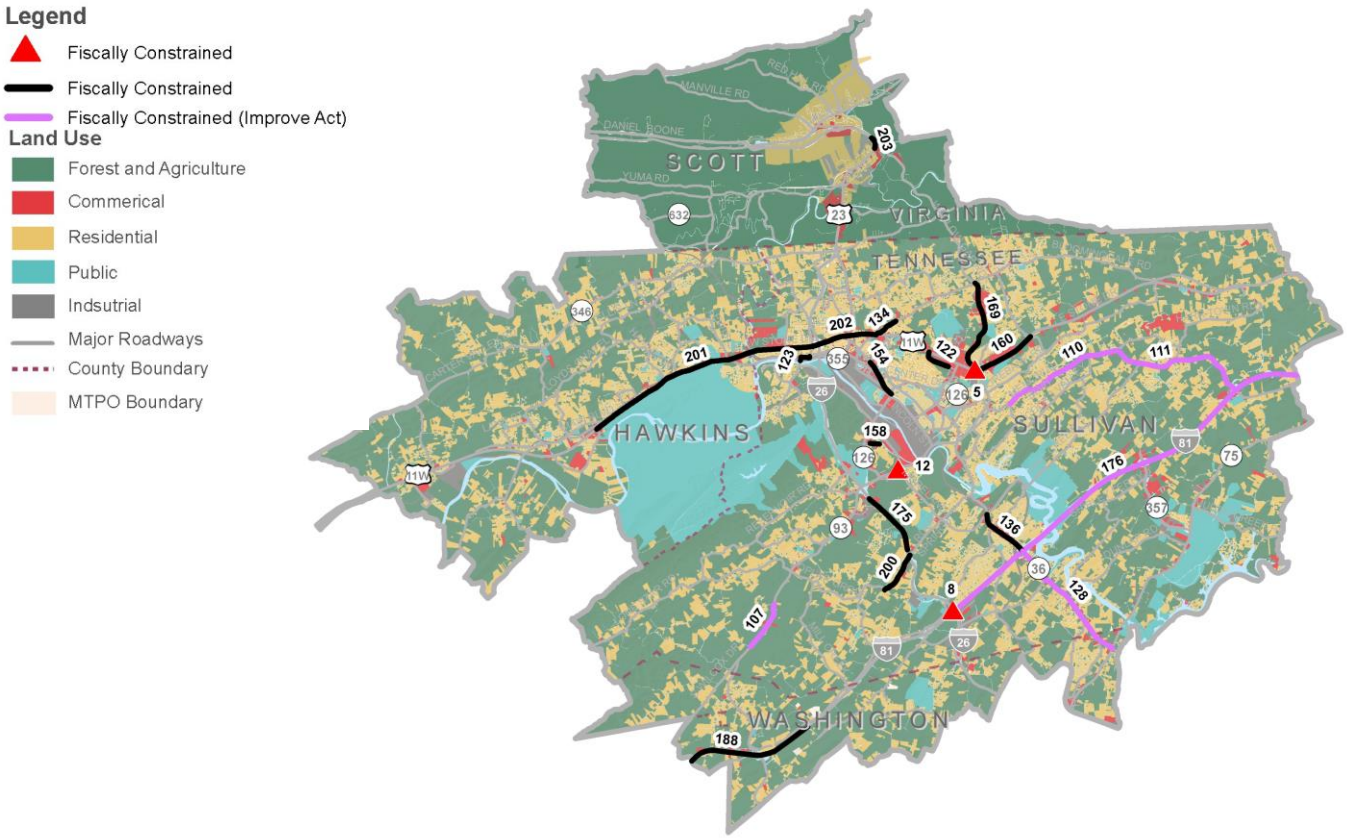
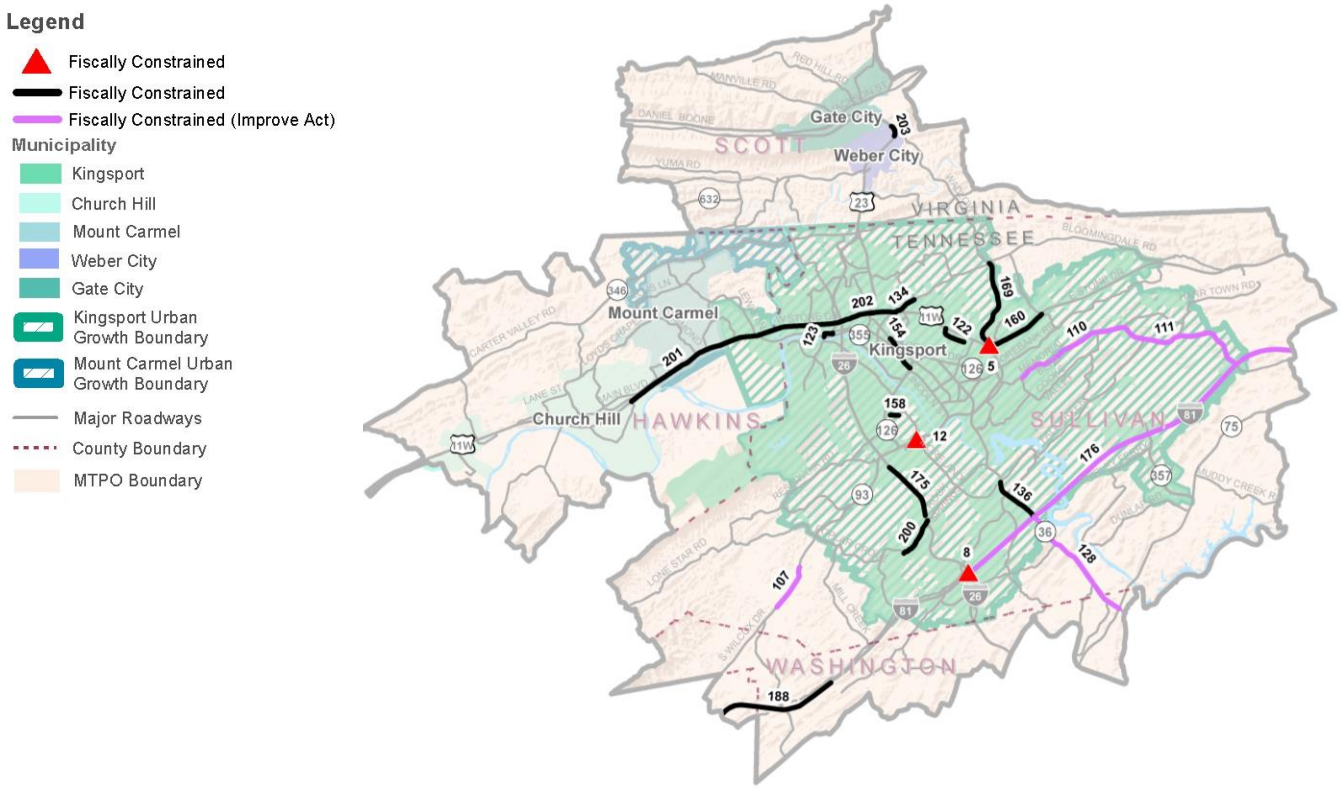


Figure 76. Urban Growth Boundary Compatibility – Fiscally Constrained Projects



Agency Consultation

In March 2022, as part of the LRTP development process, the MTPO provided the draft LRTP to the following agencies for review. Several members of these agencies are part of the MTPO Board and as such were involved in regular LRTP updates provided during Kingsport MTPO Executive Board meetings. As of April 2022, no comments were received from these agencies.

STATE

- Tennessee Department of Economic and Community Development - Northeast Tennessee

LOCAL

- NETWORKS Sullivan Partnership
- City of Kingsport Planning
- Sullivan County Planning
- First Tennessee Development District
- LENOWISCO Planning District
- University of TN Extension Office - Sullivan County

Federal Requirements

Title VI, Environmental Justice, the Americans with Disabilities Act (ADA), and Limited English Proficiency (LEP) are priorities in all processes and projects of the Kingsport MTPO. The following summarizes the Federal requirements and provides general guidance as it relates to the LRTP process.

Title VI of the Civil Rights Act of 1964

Title VI of the Civil Rights Act of 1964 states “No person in the United States shall, on the grounds of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.” The MTPO and the local transit systems maintain Title VI reporting requirements for appropriate Federal and State agencies to assess current and proposed projects in relation to the requirements of Title VI. The MTPO is currently (as of February 2022) in the process of updating its Title VI Plan.

Environmental Justice (EJ) Executive Order 12898

Environmental Justice Executive Order 12898 of 1994 affirms “Each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” Additionally, the USDOT updated Order 5610.2(a), Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which provides directives about how EJ communities are to be addressed in the planning process. An EJ analysis of the LRTP recommended projects follows this section.

Americans with Disabilities Act (ADA) of 1990

The ADA (1990) prohibits discrimination against people with disabilities. It includes several sections that address potential discrimination (Title II addresses the issue of ensuring public services and transportation facilities are accessible to people with disabilities). The Kingsport MTPO 2045 LRTP considers the potential impacts on all transportation users and project design incorporates the most current guidance related to ADA design.

Limited English Proficiency (LEP) Executive Order 13166

In accordance with the Executive Order, the MTPO takes reasonable steps to ensure meaningful access to their programs and activities by LEP persons. Primary efforts to reach LEP participants included discussions with stakeholder groups who represent LEP groups. Furthermore, as noted in Table 16, the MTPO has a relatively low LEP population. Finally, the LEP plan is part of MTPO’s Title VI Plan, which is currently being updated.

Environmental Justice Analysis

The Kingsport MTPO proactively takes steps to minimize disproportionately adverse effects on minority populations and low-income groups in the planning, development and implementation of future year transportation investments. **Figure 77** displays the impacts of the fiscally constrained projects overlaid with low-income populations within the Kingsport MPA. **Figure 78** displays the impacts of the fiscally constrained projects overlaid with minority populations within the Kingsport MPA.

An EJ review of the fiscally constrained projects was conducted as part of the 2045 LRTP update. This analysis demonstrates that there are no anticipated EJ concerns associated with the proposed roadway/freight projects. In fact, the fiscally constrained projects strongly benefit the EJ communities, respond directly to items of concern raised by minority and low-income populations, and support the 2045 LRTP transportation goals. Furthermore, outreach conducted during the 2045 LRTP showed strong public support for these projects.

It is important to note that the potential EJ impacts of projects were considered at a very high level as the LRTP often contains conceptual projects. As projects advance through the planning and design phases and they become more specific, the TIP documents the region's prioritization of limited transportation resources available among the various needs of the region. TIP projects are also reviewed by the MTPO staff for potential EJ and equity impacts. Together, it is through the LRTP and its implementing program (the TIP) that investments to the transportation system can be examined for any disparate impacts to EJ communities. As such, the EJ process does not end with the LRTP, instead it is an on-going effort that the Kingsport MTPO is committed to as part of the continuing, comprehensive, and coordinated transportation planning activities.

Figure 77. EJ Analysis (Low Income) – Fiscally Constrained Projects

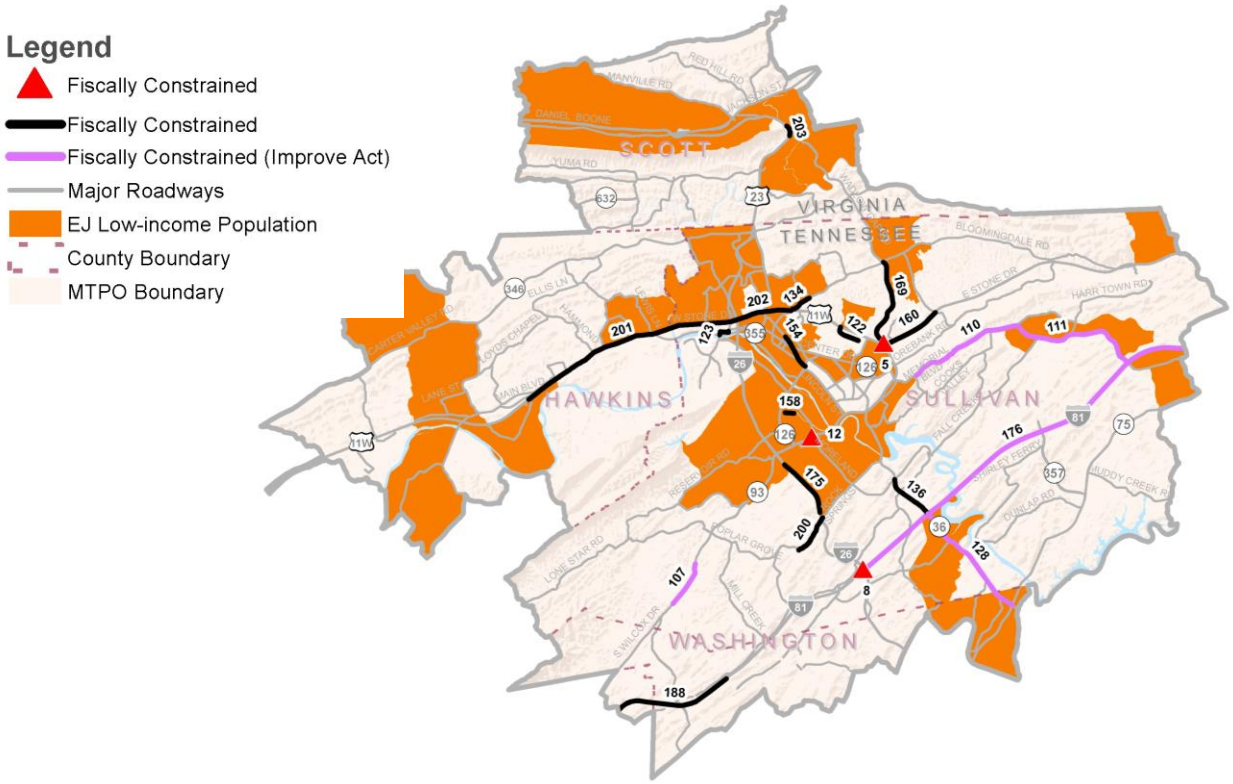
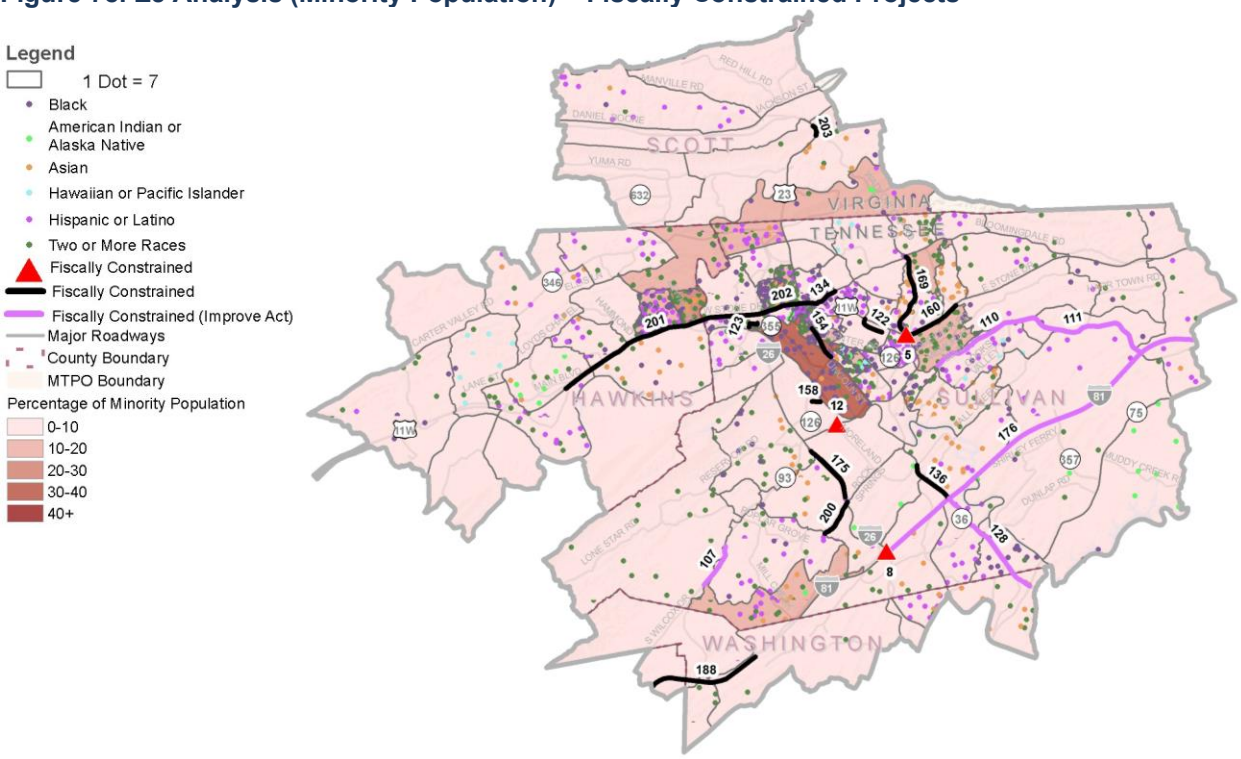


Figure 78. EJ Analysis (Minority Population) – Fiscally Constrained Projects



Environmental Mitigation Analysis

A high-level environmental mitigation analysis of the fiscally constrained projects was conducted as part of the 2045 LRTP update. This analysis is intended to identify potential fatal flaws, or significant challenges, associated with the fiscally constrained projects early in the planning process. If issues are identified, it does not immediately eliminate a project from further consideration. It does however provide an opportunity to take a more detailed look at the potential issues, and if appropriate consider alternative solutions, or at a minimum highlight a project/corridor that should be examined further as more detailed planning, engineering, and design occurs. Finally, the environmental mitigation analysis is not intended to be a detailed environmental study.

Overview of the Kingsport MPA

The topography within the Kingsport MPA is among the most varied in the United States. The region is located in the Ridge-and-Valley Appalachians, which is a physiographic province of the larger Appalachian Mountains extending from southeastern New York through northwestern New Jersey, westward into Pennsylvania and southward into Maryland, West Virginia, Virginia, Tennessee, Georgia, and Alabama.

These mountains are characterized by long, even ridges, with long, continuous valleys in between. From a very high altitude, they almost look like corduroy, except that the widths of the valleys are somewhat variable, and ridges sometimes meet in a vee. The ridge and valley system present a significant challenge to east-west travel through the Kingsport MPA. Elevations within the region range from 1,200 feet along the Holston River to 2,400 feet on Bays Mountain. Slopes in the region range from below 5% to nearly 50%. Generally speaking, areas with greater than a 20% slope will significantly limit development.

The Tennessee portion of the Kingsport MPA is also almost entirely covered by karst terrain, whereas the Virginia portion of the Kingsport MPA is mostly free of karst terrain, except for a small east-west section running immediately along the northern portion of the MPA. Karst topography can best be described as an area underlain by rocks, such as limestone, gypsum, or dolomite, that is easily dissolved. As such, caves, sinkholes, fissures, and underground streams can form which is very problematic in locating, designing, and constructing area roadways, as well as impacting overall development patterns. The following highlights additional issues within the Kingsport MPA.

Watersheds and Tributaries

As a result of the mountainous region, the drainage patterns in the Kingsport area are well established. A major portion of the watershed is drained by the Holston River, which flows through the central portion of Sullivan and Hawkins counties and the North Fork of the Clinch River, which flows through Scott County, Virginia into Tennessee. Both waterways represent major river systems in southwestern Virginia and east Tennessee. In the 1800s, these waterways were used for transportation and commerce; however, today, neither is navigable for freight transportation.

The three major forks of the Holston River (North, Middle and South) rise in southwestern Virginia and have their confluence in Kingsport. From there, the main stem of the Holston River flows 136 miles roughly southwest, just north of Bays Mountain, until it reaches its confluence with the French Broad River just east of downtown Knoxville, Tennessee (which is considered to be the start of the Tennessee River). The Clinch River rises in southwest Virginia near Tazewell, Virginia and flows southwest through the Great Appalachian Valley, gathering various tributaries including the Powell River before joining the Tennessee River west of Knoxville. Other streams, creeks, and branches in the region include Gaines Branch, Gravelly Branch, Horse Creek, Miller Branch, Cooks Valley Branch, Reedy Creek, Clark Branch, Slate Branch, Copper Creek, and Cowan Branch.

While these rivers, creeks and branches accommodate most of the drainage, subterranean drainage and stream piracy is common. **Figure 79** illustrates the floodplains associated with the rivers and tributaries located within the Kingsport MPA. As the region continues to develop, and transportation investments are made, it is important that transportation projects consider potential watershed impacts and as much as possible avoid, or minimize, the impacts.

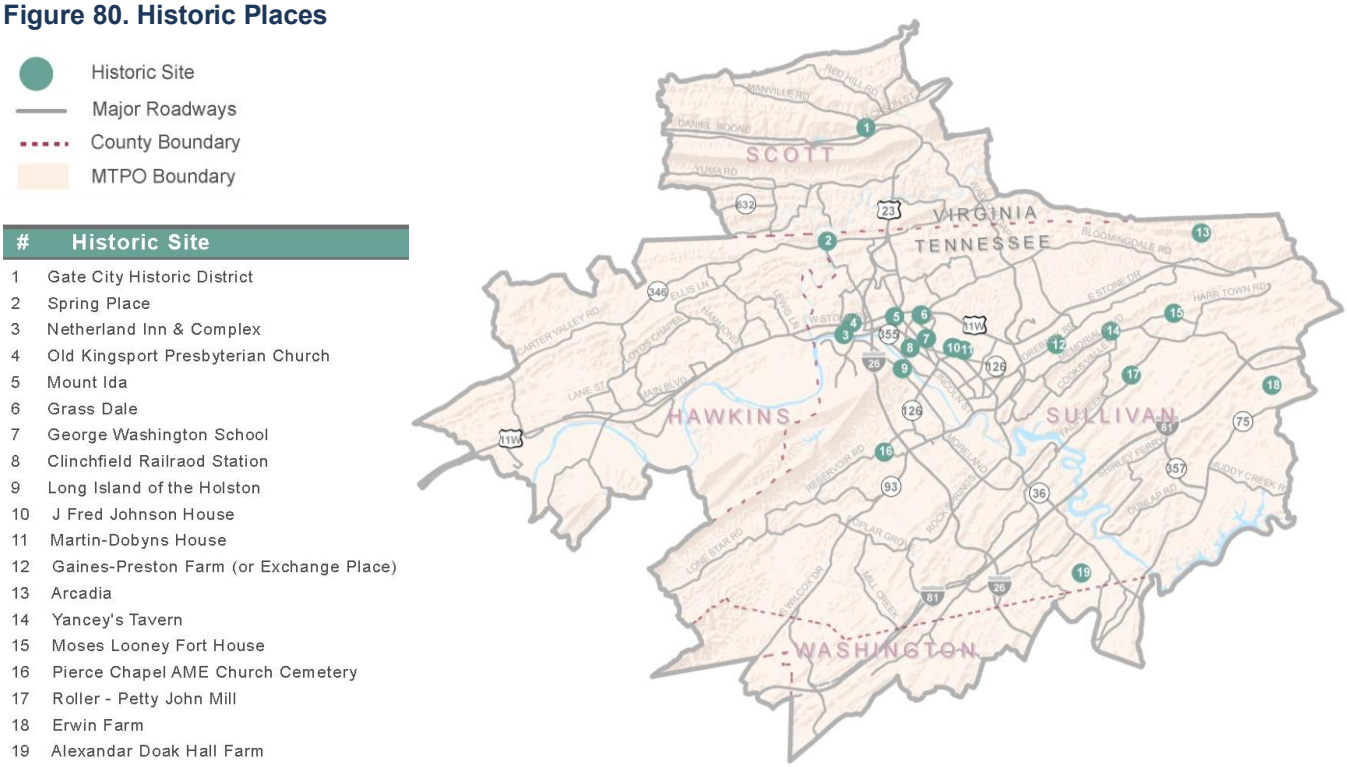
Figure 79. 100-Year Floodplain

Cultural and Historical Features

In addition to the natural environment, there is a long and rich history of cultural and historical environment in the Kingsport MPA. This history of the area includes Cherokee Indians, early colonial pioneers, Revolutionary war heroes, Civil War battles, and beneficial government planning. This area of northeast Tennessee and southwest Virginia had been of strategic value as the railroad provided a vital link between the upper Confederacy of Virginia and the States of the lower south. The area is rich in history ranging back to the 1700s. Historic districts, homes, inns, churches, cemeteries, and living museums can be found throughout the Kingsport MPA.

Numerous laws and regulations call for preservation and/or enhancement of cultural resources through various local, state, and federal agencies. Historic preservation has become a major factor in the community and economic development of towns and cities throughout Tennessee and Virginia. Historic preservation is now incorporated in most city and county planning efforts. As the Kingsport area grows and needed transportation facilities are planned, it is important that these improvements avoid and/or minimize impacts to these cultural resources. **Figure 80** depicts the locations of historic resources within the Kingsport MPA.

Figure 80. Historic Places



#	Historic Site
1	Gate City Historic District
2	Spring Place
3	Netherland Inn & Complex
4	Old Kingsport Presbyterian Church
5	Mount Ida
6	Grass Dale
7	George Washington School
8	Clinchfield Railraod Station
9	Long Island of the Holston
10	J Fred Johnson House
11	Martin-Dobyns House
12	Gaines-Preston Farm (or Exchange Place)
13	Arcadia
14	Yancey's Tavern
15	Moses Looney Fort House
16	Pierce Chapel AME Church Cemetery
17	Roller - Petty John Mill
18	Erwin Farm
19	Alexandar Doak Hall Farm

Summary of Environmental Mitigation Analysis

The transportation system affects and is affected by the natural environment. As part of the 2045 LRTP development process, federal regulations require a discussion of potential mitigation activities and locations that will have the greatest potential to restore and maintain environmental functions affected by fiscally constrained LRTP projects.

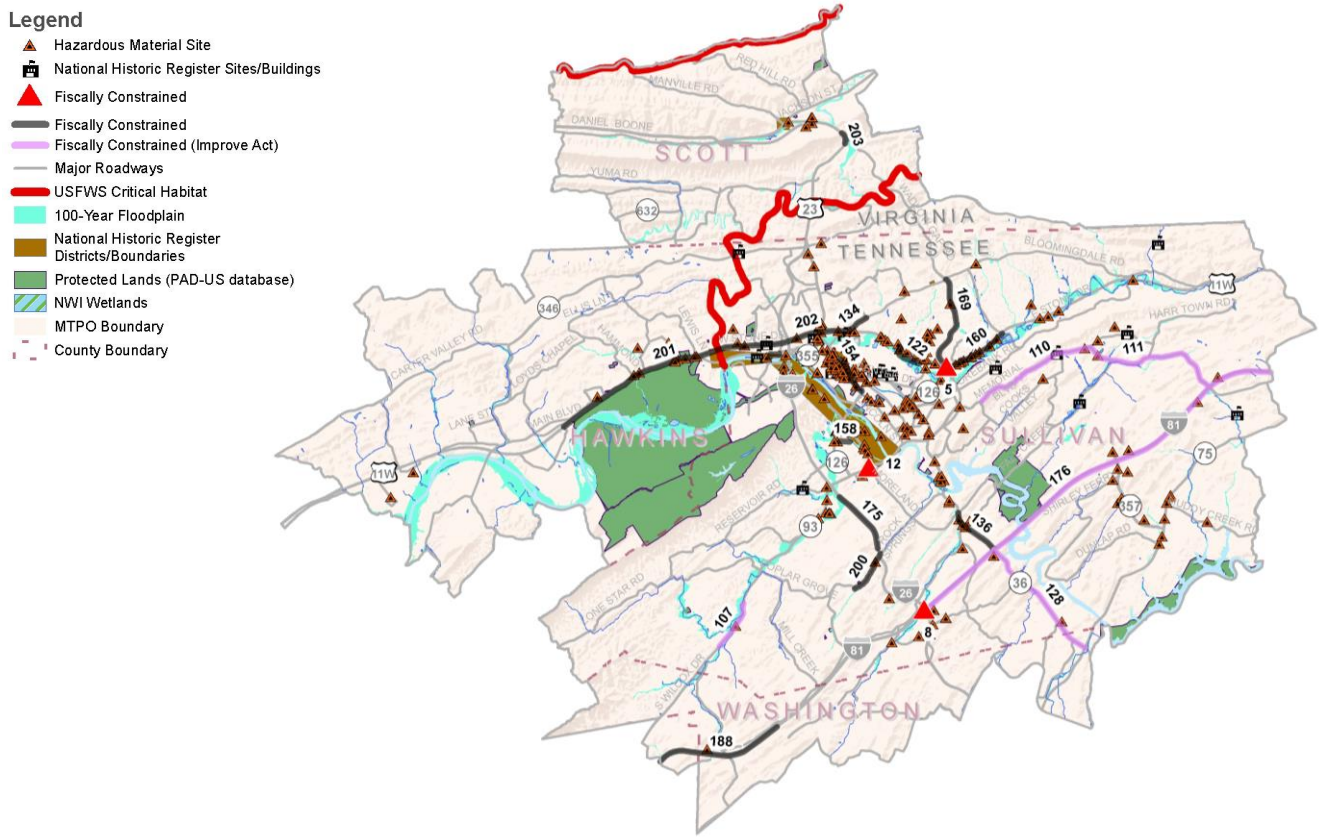
The purpose of this effort is to identify possible impacts of proposed “improve and expand projects” on environmentally sensitive resources, list useful guidelines for mitigating these impacts, and share information with implementing agencies. **Figure 81** displays the fiscally constrained projects overlaid with the environmental and/or historic/cultural features.

The approximate limits of the fiscally constrained 2045 LRTP projects were overlaid on top of the environmental and/or historic/cultural resources to identify potential impacts. As stated previously, this is conducted at a high-level and is not intended to provide a solution if a potential impact is identified. The primary focus of this high-level analysis is to identify any potential fatal flaws, as well as identifying potential concerns early in the planning process so issues can be studied in greater detail as projects advance through the programming, design, and construction phases.

Following a review of the 2045 LRTP fiscally constrained roadway/freight projects, the MTPO believes there are no significant environmental concerns associated with the recommended improvements. There are a few projects located near 100-year floodplains but at this point in time these are not any concerns that would prohibit a project from moving forward. Furthermore, it is worth noting that the majority of the recommended fiscally constrained projects occur within the existing roadway right-of-way and do not

include capacity improvements (i.e., such as widening an existing roadway). As such, these projects are less likely to negatively impact the surrounding area and the environment.

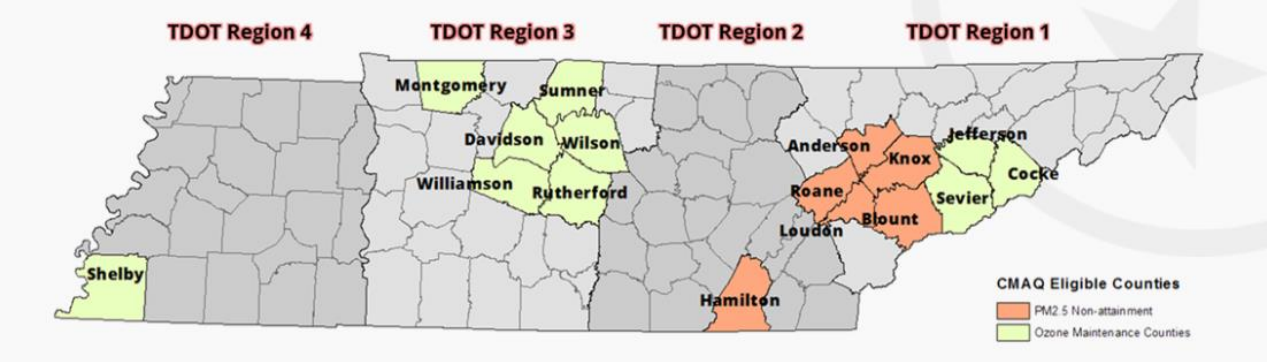
Figure 81. Environmental Mitigation Analysis – Fiscally Constrained Projects



Air Quality

The Kingsport MPA is located in a non-classified area as defined by the Environmental Protection Agency through the Clean Air Act. This means that the area complies with the National Ambient Air Quality Standards and an air quality analysis is not required as part of the 2045 LRTP update. **Figure 82** displays CMAQ eligible counties within Tennessee. Furthermore, the MTPO participates in a Tennessee Statewide Interagency Consultation (IAC) call every other month with Federal, State, and regional partners.

Figure 82. TDOT Congestion Mitigation and Air Quality Eligible Counties



Source: https://www.tn.gov/tdot/long-range-planning-home/air-quality-planning/cmaq-pm-2_5-program.html

Climate Change

Addressing climate change is warranted as part of the LRTP environmental discussion. Generally speaking, the transportation sector is recognized as a major contributor of greenhouse gas (GHG) emissions which directly influences climate change. Carbon dioxide (CO2) and nitrous oxide (NO2) are emissions that are consistent with increased fossil fuel use for generating electricity and transportation. It is generally acknowledged that one of the most effective approaches to reduce CO2 and NO2 emissions is reduce automobile travel, and in particular single occupancy vehicle trips. In order for this to occur, the regional transportation system must have the appropriate infrastructure to support alternative transportation modes – namely public transit service, bicycle facilities, and pedestrian facilities.

The discussion of GHG emissions also crosses over into a health concern as poor air quality can have impacts on the region's quality of life. According to the United States Environmental Protection Agency, climate change is expected to have negative impacts on human health.

The Kingsport MTPO recognizes that the 2045 LRTP can have a positive impact on reducing GHG emissions within the region. The MTPO is committed to investing in alternative transportation to support the reduction of automobile travel in the region. Any action that enhances bicycle connections, and improves safety, potentially encourages the increased use of alternative modes and reduces vehicular travel. While the impact from this type of mode shift may be small, it still has a positive impact on addressing climate change. In addition, the MTPO supports the development of park-and-ride facilities within the Kingsport MPA. The Virginia portion of the Kingsport MPA already has park-and-ride facilities, but the Tennessee side currently does not.

Resiliency

Related to the climate change discussion is the concept of resiliency. Federal law identifies the need to consider resiliency during the transportation planning process. Specifically, the LRTP should consider potential opportunities to improve the resilience and reliability of the transportation system, especially given the essential link to supporting economic prosperity and quality of life of communities. Generally defined, resilience is the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.

For example, rainfall, and rain intensity, have been increasing in recent years and there are some cases. where stormwater runoff can wash away portions of the roadway structure or create rockslides. It is important to have alternative travel options available should weather events cause potential roadway closures. This is part of the reasoning behind supporting the enhancement of north-south regional connectivity within the Kingsport MPA.

Finally, this issue also emphasizes the need to preserve open space and natural amenities. In doing so, this can help accommodate stormwater runoff which is an issue that needs to be considered under Federal law. Furthermore, stormwater runoff considerations should be incorporated in more detailed planning, design and engineering activities that take place after the LRTP high-level planning discussion.

Agency Consultation

In March 2022, as part of the LRTP development process, the MTPO provided the draft LRTP to the following Federal, State, and Local agencies that provide oversight regarding environmental issues. As of April 2022, no comments regarding the draft LRTP were received from these agencies.

FEDERAL

- Environmental Protection Agency - Region 4 (TN) - NEPA Office
- Environmental Protection Agency - Region 3 (VA) - NEPA Office
- US Fish & Wildlife Service - TN Office
- US Army Corps of Engineers - Nashville District
- US Army Corps of Engineers - Norfolk District (Virginia Highlands Field Office)
- USDA/US Forest Service - Urban Forestry South

STATE

- TN Department of Environment and Conservation - Johnson City Office
- TN Department of Environment and Conservation - Johnson City Office - Air Pollution Control
- TN Department of Environment and Conservation - Johnson City Office - Division of Water Resources
- TN Wildlife Resource Agency - Morristown Office
- TN Department of Agriculture/Forestry
- TN State Historic Preservation Officer
- VA Department of Wildlife Resources - Region 3 Office (Marion Office)
- VA Department of Conservation and Recreation - West Area (Abingdon Office)
- VA Department of Historic Resources - Western Region (Salem Office)
- VA Department of Forestry - Western Region (Abingdon Office)
- VA Department of Environmental Quality - Southwest Regional Office (Abingdon office)

LOCAL

- Keep Kingsport Beautiful
- University of TN Extension Office - Sullivan County
- Scott County Soil and Water Conservation District

Environmental Mitigation Planning Guidance

The identification of a potential impact does not mean that a LRTP project cannot advance for further study, or eventually be implemented. Having identified potential impacts, planning guidelines can be introduced for agency consideration during all phases of project planning, design, construction, and maintenance.

From a high-level perspective, the 2045 LRTP projects should be analyzed more closely as they move further into the stages of project development to determine whether negative environmental impacts will be realized by the surrounding area. The Kingsport MTPO will use the environmental mitigation analysis information as a guide to consult with the appropriate local, state, and federal agencies to minimize the impact the transportation projects may have on the environment.

The guidelines for evaluating potential impacts to sensitive resources establish a three-step approach, commonly called sequencing. The first step is to avoid the resource whenever or wherever possible. If a sensitive resource cannot be avoided, then the second step is to minimize the impact to the greatest extent possible. The third step is to consider compensatory mitigation to offset harm to the resource from those impacts that remain after steps one and two.

Regardless of the type of project or the resource that may be impacted, the guidelines deserve consideration during the planning, design, construction, and maintenance of the recommended projects. Finally, it is important to note that the MTPO can only recommend these guidelines be followed by the implementing agencies during the project planning and development process. These “best practice” guidelines are provided for reference and will help ensure good planning practices that will assist in the overall quality of the area’s environment.

Planning & Design Guidelines

1. Utilize Context Sensitive Solutions (CSS) throughout the planning and project development process. CSS identifies the physical, visual, and social context in which a project is situated while involving all stakeholders in a collaborative process in developing transportation projects.

2. Identify the area of potential impact as it relates to each transportation project, including the immediate project area as well as related project development areas.
3. Continue to update the environmental sensitive inventory to determine if any of the identified resources may be impacted by proposed projects.
4. Coordinate with appropriate Local and County Hazard Mitigation Plans as appropriate.
5. Coordinate the transportation projects with local comprehensive and master plans, watershed management plans, recreation and non-motorized plans, etc.
6. Prior to project construction, collaborate with local community officials, contractors, and other relevant stakeholders to review and discuss environmental issues and goals.
7. If it all possible, avoid impacts to environmental resources through project design and/or through the implementation of all possible mitigation measures.
8. Incorporate stormwater and erosion control management into the project design.
9. Upgrade to current Americans with Disabilities Act of 1990 (ADA) standards for any sidewalks that are within right of way and the project construction limits.
10. Federal law requires agencies consider resiliency during transportation planning processes. As a result, the MTPO should consider ways to protect, preserve, and improve their assets in the face of increasing climate change and extreme weather events. As an example, agencies may want to approach development within floodplains from a different perspective to address more frequent flooding events. Additional guidance can be found on the FHWA Office of Planning, Environment, and Realty website or by clicking here.

Construction & Maintenance Guidelines

11. Include all special requirements that address environmentally sensitive resources into plans and estimates used by contractors and subcontractors. Specifically identify/highlight the types of activities that are not appropriate in environmentally sensitive areas.
12. Minimize the size of the construction and staging area with clearly marked boundaries using fencing or flagging around sensitive areas as necessary to prevent intrusions.
13. Use the least intrusive construction materials and techniques.
14. Avoid disturbing the construction site as much as possible by:

    - Protecting established vegetation and natural habitat. If disruption is unavoidable, replace with native species as soon as possible.
    - Implementing sediment and soil erosion control measures as required.
    - Not stockpiling materials in sensitive areas.
    - Protecting water quality by controlling direct runoff, sweeping streets to reduce sediment, implement salt management techniques, and control storm water drains from construction debris.
    - Protecting cultural and historic resources.
    - Minimizing noise and vibration.
    - Providing for solid waste disposal.
    - Conducting on-site monitoring during and after construction to ensure protection of environmental resources as planned.
    - Maintaining equipment in good working condition and avoid fueling or maintenance near environmentally sensitive areas.
    - Reducing land disturbances through the efficient organization of construction activities.

Priority Public Transportation Investments

Public transportation is an important component of the Kingsport regional transportation system. The combination of urban and rural transit services provides critical mobility options for many individuals living within the Kingsport MPA. For some, transit is the only viable mode of transportation, including some individuals who are low income and/or minorities and have no other travel options. For others, transit could potentially be a viable mobility option if enhancements (i.e., later service hours, route coverage, etc.) were implemented. As such, the Kingsport MTPO recognizes the importance of maintaining, and if possible, expanding, transit options throughout the region.

The 2045 LRTP update has documented the challenges associated with public transportation within the Kingsport MPA. Many of the issues have been discussed in recent transit studies including the *KATS Comprehensive Operations Analysis* in April 2018 and an *Update of the Transit Network* in July 2021. Both studies discuss potential improvements, but the COVID-19 pandemic has had significant impacts on transit operations across the country and the long-term impacts are still unknown at this time. The following summarizes the priority public transportation investments and strategies for the Kingsport MPA.

Determine Demand for Regional Transit Service

Throughout the development of the 2045 LRTP, there was a consistent theme from stakeholders and the public regarding a desire to enhance regional transit service. As part of this LRTP update, a Regional Mobility Stakeholder meeting was conducted to discuss regional transit service/mobility needs. One of the key findings from this discussion was the need to conduct a comprehensive regional transit study. This study would focus on, 1) determining the demand for regional transit ridership within the Tri-Cities, including the Virginia portion of the Kingsport MPA, and 2) the potential feasibility of enhancing, or expanding, regional transit services. Both TDOT and VDOT representatives agreed that this would be an important study to help identify potential regional mobility solutions.

Another important aspect of enhancing regional transit service is the need for regular, on-going coordination between KATS, NET Trans, MEOC/MET, and other regional transit providers beyond the Kingsport MPA (Johnson City and Bristol). Planning, and implementing, a coordinated regional transit system is complex, especially for a bi-state MPO. The Kingsport MTPO is committed to working with the area transit providers to support potential service enhancements that would expand transit mobility options to area residents and provide fast, convenient, and reliable service that will increase access to employment opportunities, medical services, educational opportunities, and other activities.

In conclusion, the Kingsport MTPO supports conducting a regional transit study in the short-term to identify potential regional service improvements.

Monitor KATS Service Delivery

During COVID-19, KATS conducted the *Update of the Transit Network* study (July 2021). The study was conducted in large part due to the impacts that COVID-19 had on the decline in fixed-route and demand response ridership. The study reevaluated the purpose of transit in Kingsport to better understand the city's values and goals for transit. Ultimately, the study was somewhat inconclusive in that three of the six fixed-routes were found to be potential candidates to convert to full demand response, while the other three routes had ridership that would likely keep it operating as fixed-route service.

Recent ridership numbers remain below pre-pandemic levels and it is still to be determined how transit systems across the country will recover over the next two to three years. An overarching issue is related to how COVID-19 has changed commuting, and increased work at home options. As such, it is recommended that KATS continue to monitor the recent service improvements over the next few years and to implement service modifications as needed.

One option KATS may want to explore is microtransit, a form of on-demand transportation. The service includes defining zones (often in locations where providing frequent fixed-route service is difficult) where riders can request a trip through a smartphone application. The flexible routing and scheduling allow

riders to request a trip when needed, as opposed to adhering to the fixed-route schedule. In many cases, riders are picked-up within 10 to 15 minutes of requesting a ride (depending on the zone size). The service can be combined with fixed-route service, meaning a fixed-route still might operate within a zone, thus allowing riders to make transfers if desired. Ultimately, the use of technology for scheduling trips, and the flexibility of identifying a pick-up location, make this a convenient, desirable mobility option. Furthermore, while many transit agencies choose to operate smaller vehicles to serve the on-demand zones, some agencies operate regular size buses for the on-demand service.

Aging Population

As previously documented in the demographic trends in Chapter 3, the Kingsport region is seeing an increase in people who want to age in place. As this occurs, it places increased pressure on local and regional transit providers to find mobility solutions that accommodate this trend. This should be considered when revaluating potential future system enhancements.

Prepare for Future Transit Technology

Emerging technology will have a significant impact on the delivery of future transportation and mobility services. As the LRTP spans twenty plus years, it is likely that emerging technologies will continue to be deployed to enhance the delivery of transit services across the country. As such, the Kingsport MTPO should monitor potential opportunities that could be applied within the Kingsport MPA, or the broader Tri-Cities region.

Bus Electrification

Looking into the future, some estimates suggest that over 80% of all transit bus sales worldwide in 2030 are expected to be electric. Furthermore, new advancements in developing higher-capacity batteries now offer greater range and reliability than even a few years ago. Also, new chargers can now replenish batteries faster making electric buses an even more attractive option.

Finally, the *Infrastructure Investment and Jobs Act, or BIL, s*upports the transition to electric buses with additional funding over the next five-years. This also includes developing a transition plan that demonstrates a long-term fleet management strategy, and work force transition, for use of the current application with future acquisitions. While electric buses may not necessarily be an immediate priority for the region, the Kingsport MTPO supports the continued review of emerging technologies to determine if new applications could help deliver more efficient and effective service throughout the Kingsport MPA.

Priority Non-Motorized Investments

The Kingsport 2045 LRTP supports continued investment in the region's non-motorized transportation system to expand multimodal travel options. Throughout the development of the 2045 LRTP, stakeholders and the public identified the need to create a safer walking and biking environment throughout the Kingsport MPA.

The *Kingsport MTPO Regional Bicycle and Pedestrian Plan*, also referred to as the Bike/Ped Plan, sets forth the overall non-motorized system vision for the Kingsport MPA. The Bike/Ped Plan includes numerous recommendations/projects that identify opportunities to improve existing walkways and create regionally significant routes. The Bike/Ped Plan also identifies priority projects for the region (highlighted later in this section), or for detailed information regarding these projects, or additional bicycle and pedestrian related recommendations, refer to the *Kingsport MTPO Regional Bicycle and Pedestrian Plan* which can be accessed on the MTPO's website at www.kptmtpo.com or by clicking here.

The following summarizes key elements of the *Kingsport MTPO Regional Bicycle and Pedestrian Plan*, as well as opportunities for the LRTP to support the continued development of walking and biking facilities throughout the Kingsport MPA.

Expand the Kingsport Greenbelt, including Enhanced Local Connections

The Kingsport Greenbelt is the top non-motorized asset within the Kingsport region. This facility provides area residents, as well as visitors and tourists, a unique opportunity to walk and bike through the central portion of Kingsport. The Kingsport MTPO envisions the continued expansion of the Greenbelt and the LRTP encourages enhanced local connections that would link to area businesses, schools, and other activity centers. Recently, an extension to the east end of the Greenbelt was completed. An expansion to the west end of the Greenbelt is currently underway using STBG funds. In addition to extending the main trail, the LRTP encourages enhanced local connections to increase access between the trail and local businesses, schools, and other activity centers. These improved local connections would be consistent with the LRTP goals to support increased tourism within the Kingsport MPA.

Coordinate Non-Motorized and Roadway Improvements

For some Kingsport MPA residents, bicycling and walking represent the primary form of transportation to access employment, medical services, educational opportunities, and other activity centers. Providing dedicated bike facilities and sidewalks are critical to safely accommodate non-motorized users, including persons with disabilities. Furthermore, most transit riders start their trip as pedestrians before boarding a bus and thus by investing in sidewalk improvements along transit routes can also help support and encourage transit ridership.

The *Kingsport MTPO Regional Bicycle and Pedestrian Plan* identifies key opportunities and challenges towards creating more walkable and bicycle-friendly connections. The Bike/Ped Plan reviewed safety, demand, equity, along with current street characteristics, such as traffic volume, speed, and lane width to develop a comprehensive regional walking and bicycling network. Public comments were also an important element that was considered in the Bike/Ped Plan development.

The Bike/Ped Plan utilized existing data to develop a Level of Traffic Stress (LTS) for both biking and walking within the Kingsport MPA. **Figure 83** displays the bicycle LTS along with the fiscally constrained roadway/freight projects. **Figure 84** displays the pedestrian LTS along with the fiscally constrained roadway/freight projects. These graphics are intended to help inform future planning efforts. In particular, fiscally constrained roadway projects should be reviewed to determine if there are opportunities to incorporate non-motorized improvements. In doing so, the MTPO will leverage these opportunities to eliminate gaps in the non-motorized system, thus increasing network connectivity and enhancing safety for all users.

Figure 83. Bicycle LTS Analysis – Fiscally Constrained Projects

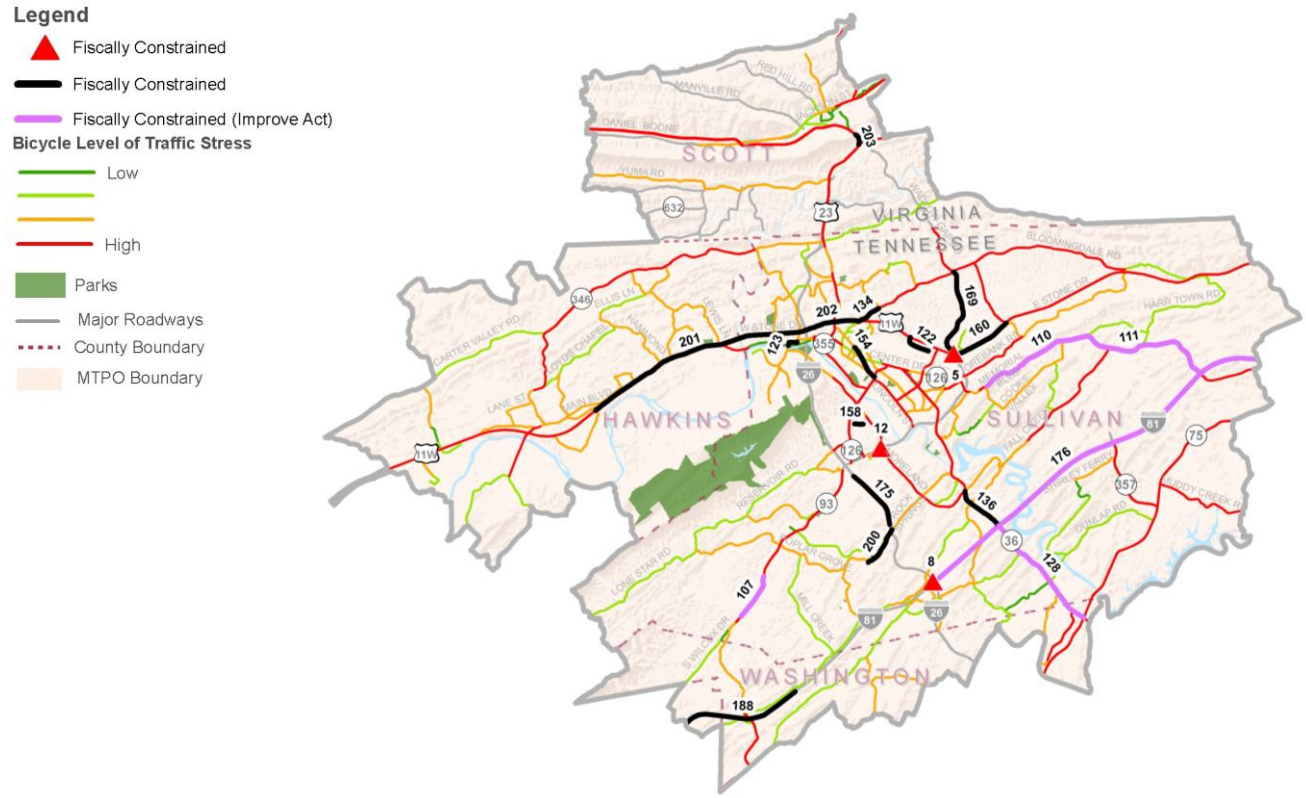
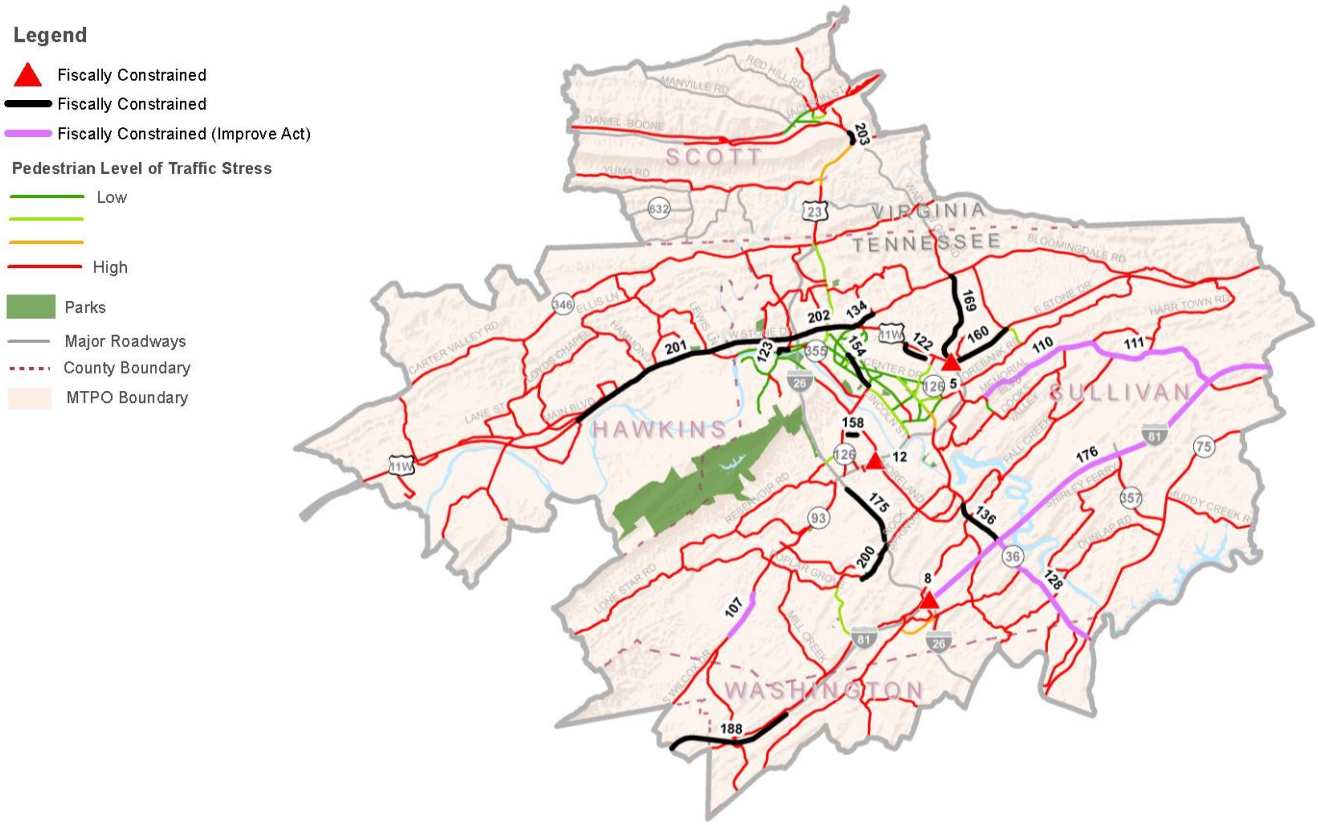


Figure 84. Pedestrian LTS Analysis – Fiscally Constrained Projects



Typical Non-Motorized Facilities

The *Kingsport MTPO Regional Bicycle and Pedestrian Plan* sets forth the overall vision for the Kingsport MPA. The plan includes numerous recommendations to improve existing walkways and create safer, more connected bicycle connections within the region. **Figure 85** displays examples of typical non-motorized facility enhancements that are envisioned within the Kingsport MPA (as identified in the *Kingsport MTPO Regional Bicycle and Pedestrian Plan)*.

Figure 85. Typical Non-Motorized Facilities

Paved Shoulders

Paved shoulders are typical of highways and roads in rural areas, and provide important safety benefits to minimize run-off-the-road crashes, especially on higher speed (greater than 40 mph) roads. While paved shoulders are not dedicated bikeways, for bicyclists, paved shoulders provide important operating space. Adequate width (4' minimum) and bike friendly rumble strips are important design considerations.

Shared Lanes / Bike Boulevards

Shared lanes and bike boulevards are lower volume, lower speed local streets that offer a safe and comfortable option for bicycling compared to major streets. Traditional shared lane treatments such as shared lane pavement markings (sharrows), or bike boulevard treatments such as signage and mini-traffic circles, represent relatively low cost improvements that reinforce local streets as safe and comfortable places to bicycle and discourage motor vehicle through traffic in neighborhoods.

Bike Lanes

Bike lanes provide dedicated operating space for bicyclists, and with paved shoulders, have traditionally served as the foundation for bike networks for more experienced bicyclists. While bike lanes remain a good option for urban streets with moderate traffic volumes and speeds, creating more lateral distance between bicyclists and motor vehicles either with buffers or physically separated facilities is important for people of all ages and abilities.

Shared-Use Paths / Sidepaths

Unlike the various bike lane types, shared-use paths and sidepaths are designed for use by both pedestrians and bicyclists. Sidepaths are located within the street or road right-of-way, while shared use paths are located within an independent right-of-way. Shared-use paths / sidepaths have become increasingly popular with the growing demand for walking and bicycling, and can provide important connections for longer distance trips.

Source: Kingsport MTPO Regional Bicycle and Pedestrian Plan.

According to the *Kingsport MTPO Regional Bicycle and Pedestrian Plan* (page 27), the key features of the recommended pedestrian network include:

- A primary pedestrian network focused on state and federal aid roads, functionally classified as arterials and major collectors, located within existing municipal boundaries or growth areas;
- A secondary pedestrian network consisting of primarily local streets within existing municipal boundaries that provide enhanced connectivity to key origin and destination zones; and
- A nine-mile unpaved trail along Reedy Creek within the Kingsport MPA with potential connection to the Bristol urbanized area.

While individual intersection safety improvements were not considered in this regional-level plan, it is recommended that individual project implementation include intersection safety treatments, where appropriate. These could include, but are not necessarily limited to:

- High visibility crosswalks on all intersection legs;
- Advanced stop lines;
- Pedestrian signal countdown heads;
- Leading pedestrian intervals on traffic signals;
- Curb extensions and / or reduced curb radii;
- Pedestrian refuge islands; and
- Improved nighttime lighting

Implement Priority Bicycle and Pedestrian Improvements

Consistent with the *Kingsport MTPO Regional Bicycle and Pedestrian Plan*'s focus on project implementation, eight high impact, high-priority projects were chosen for detailed concept renderings to better illustrate what project implementation would look like in practice. The priority projects include the following. Additional detail regarding each project can be found in the *Kingsport MTPO Regional Bicycle and Pedestrian Plan*.

West and East Jackson Street – Bike Lanes

The implementation of a bike lane along West Jackson Street from Solon St. to Fir St./Water St. would allow for an alternative means of transportation and engagement. To allow for the proposed bike lane to achieve the necessary width, it is proposed that parallel parking could be provided along Water Street.

The implementation of a bike lane along East Jackson Street from Jones St. to Solon St. would allow for an alternative means of transportation that would increase mobility of residents and visitors resulting in a connectivity to the downtown area. To allow for the proposed bike lane to achieve the necessary width, portions of Water Street will be utilized for additional parking.

US-11W (SR-1/Stone Drive) / Netherland Inn Road – Shared Use Path

The addition of a shared use path from Independence Avenue to Big Elm Road would allow for connectivity with the North Fork Holston River. The path would allow pedestrians and bikers to travel alongside a highly traveled road safely while offering opportunities to visit local businesses. The inclusion of the greenway extension along US-11W (SR-1/Stone Drive) could add momentum and value to the MTPO's pursuit of the Netherland Inn connection.

SR-93 (John B. Dennis Highway) – Bike Lanes and Sidewalks or Shared-Use Path

The addition of a shared use path from Bloomingdale Road to Pavilion Drive would allow users to travel alongside a highly trafficked road safely while offering opportunities to visit local businesses. The presence of apartments, subdivisions, and a future middle school along this path indicate the large number of potential users that could utilize this pathway addition.

SR-36 (Fort Henry Drive) – Bike Lane and Sidewalks

With potential grant funding, the installation of a bike lane and sidewalks from Colonial Heights Road to Wilmont Drive would allow users to travel alongside a highly trafficked road safely while offering opportunities to visit local businesses. Surrounding subdivisions indicate potential high levels of usage by local pedestrians and bicyclists.

Warm Springs Road / Apple Orchard Road – Shared Lane and Shared-Use Path

The addition of a shared lane and shared use path from Yuma Road to Carters Valley Road offers the user beautiful views and the ability to interact with the North Fork Holston River. The path crosses the Tennessee and Virginia border and could become a potential recreational connection to Weber City.

Watauga Street – Bike Boulevard

With existing infrastructure in place, the addition of a bike boulevard from Broad Street to East Center Street would require minimal effort and would utilize the existing sidewalks located on site. Located within a neighborhood, this facility would allow for users to easily travel without impacting the experience of the pedestrian or vehicular user. In addition, this project has been identified as a key neighborhood connection in Central Kingsport.

US-11W (SR-1/Stone Drive) – Sidewalks

The addition of sidewalks from Beechnut Drive to Kingsport Pavilion Access Road would provide an ability for users to utilize alternative means of transportation and would enhance network connectivity.

Horse Creek Greenway – Shared-Use Path

The creation of a greenway system would provide a beautiful location for users to visit and form a relationship with an existing interesting feature. Through this process and installation, this path could become an additional amenity and destination for the city of Kingsport and a strategic connection between the downtown and the convention center.

Safety and Security

Federal law requires the LRTP address the safety and security of the transportation system. Safety has been addressed throughout this LRTP in numerous locations and as such this section focuses specifically on security issues within the Kingsport MPA. Federal requirements include security as a factor to be considered in transportation planning processes at both the metropolitan and statewide levels, stating that the planning process should provide for consideration and implementation of projects, strategies, and services that will increase the security of the transportation system for motorized and non-motorized users.

Awareness of both man-made and natural security concerns has increased in the last few decades in large part due to events such as international and domestic terrorist activities, civil unrest, and natural disasters (i.e., hurricanes, rockslides in east Tennessee, etc.). The vulnerability of the transportation system is of critical importance especially as it relates to emergency response and evacuations.

Transportation system security can be defined as the freedom from intentional harm and tampering that affects both motorized and non-motorized travelers, as well as natural disasters. Security goes beyond safety and includes the planning to prevent, manage, or respond to threats of a region and its transportation system and users. Though the MTPO is often not involved in specific security or emergency planning activities, the MTPO does communicate with state and local emergency management and law enforcement agencies, local engineering officials, and emergency personnel on major transportation plans and projects with the intention of developing a transportation system that is as secure as possible.

One such example is the MTPO's coordination with TDOT to implement ITS technologies along the I-81 corridor within the Kingsport MPA (from the I-26 interchange to I-381 in Virginia). In addition, the MTPO's Regional ITS architecture helps to ensure that the planned ITS projects will be implemented with specific protocols and standards that allow for complete ITS interoperability. The architecture ensures that all agencies involved in transportation (emergency responders, law enforcement, transit agencies, local and regional transportation agencies) have the ability to share resources and information to better manage the overall daily operations of the transportation system.

ITS Applications

Additionally, the implementation of ITS technologies is more than an ability to reduce congestion or respond to a traffic incident. ITS technologies provide enhanced management and operations of transportation facilities and often include surveillance equipment to monitor roadways for congestion and incidents; variable message signs that display traffic information to motorists; vehicle detection devices that report traffic counts, speed, and travel time; and motorist service patrols that respond to incidents in a timely manner. These technologies are equally important in providing a secure transportation system.

At many levels, ITS elements can have significant benefits in the event of an emergency. For example, both Tennessee and Virginia have a "511" traveler information system. The 511 traveler information system allows travelers to dial "511" on their cell phone and get real-time travel information for most of the major roadways in Tennessee and Virginia. These systems can be used in the event of an emergency to disperse road closure and detour information as well as alternate route information to travelers, thus helping avoid further incident-related congestion.

Transit Providers

Local transit agencies have always placed an emphasis on providing a safe, secure, and reliable service for its passengers and employees. These efforts are continuing and are an integral part of providing transit service. While transit must be concerned about safety and security as it relates to the provision of service, transit itself can be a valuable resource to a community in providing rescue or evacuation services. Local transit providers can participate as part of the larger community emergency preparedness efforts. Furthermore, the Federal performance measures also require regular reporting of safety incidents which further demonstrates the increased focus on providing a safe and secure transportation system.

Hazard Mitigation Planning

Lastly, each jurisdiction within the MTPO has an emergency operation plan and/or equivalent hazard mitigation plan that includes measures for homeland security factors for the region. These documents identify various potential man-made and natural hazards that could occur in the region and identify agency responsibilities in the event of an incident. Locally, the MTPO has attended meetings and provided input in the development of mitigation plans. Typically, the content of a hazard mitigation plan provides a risk and vulnerability assessment and establishes mitigation strategies. Both TDOT and VDOT have developed I-81 incident response plans, which define alternate routes if sections of the interstate are closed. Emergency preparedness and hazard mitigation planning are important elements in providing a safe and secure transportation system. The MTPO is committed to continued participation in these efforts whereby transportation infrastructure and transportation decisions play an important role in protecting human life.

At-Grade Rail Crossings

At-grade rail crossings are also a concern from a safety and security standpoint. At-grade crossings create potential conflict points between trains, passenger vehicles, and trucks and as such it is important to maintain crossings in good condition. This includes maintaining adequate sight distance; acceptable road surface quality; and safety devices such as signs, pavement markings, gates, bells, and warning lights. Furthermore, at-grade crossings also create the potential for a hazardous materials incident (depending on the materials being shipped) which could have significant long-term impacts on the traveling public, as well as creating potentially life-threatening situations. As such, it is desirable to close at-grade crossings to eliminate potential conflicts, or in some instances the creation of a grade separated structure could be warranted.

The Tennessee portion of the Kingsport MPA has several grade separated structures which offer the highest available safety and security for transportation goods. *Project Pipeline*, a study being conducted by VDOT for US-23 in Virginia, has identified some potential at-grade rail crossing closures that closely parallel the US-23 corridor. As previously stated, these closures would significantly help improve both the safety and security of the transportation network within the Kingsport MPA. Specific recommendations from *Project Pipeline* are anticipated in Summer 2022. As projects are identified, the Kingsport MTPO is committed to working with the appropriate stakeholders to pursue funding and program projects for implementation.

9. Conclusion

The Kingsport MTPO 2045 LRTP outlines a blueprint to leverage future transportation investments to advance regional goals including growing the economy and tourism, expanding access to jobs, enhancing safety for the traveling public, expanding mobility options, and improving the efficient movement of freight. This blueprint is intended to support the region in a manner that is consistent with a cohesive vision that also protects the environment, supports equitable multimodal investments, and enhances quality of life.

The Kingsport MTPO staff acknowledges that this blueprint is not set in stone for the next twenty plus years. The MTPO staff frequently reviews, and as necessary modifies or amends, the LRTP to respond to changing transportation priorities, policies, and other unforeseen events that arise, particularly over the next five years. The LRTP also represents one step of the transportation planning process with the TIP also playing a vital role in programming/implementing projects. The next comprehensive LRTP update, according to current Federal law, must be completed five years from the plan adoption date, which is May 12, 2027.

Finally, it is important to acknowledge that at the time this LRTP was being finalized, the BIL, became one of the largest infrastructure investment laws in history. The BIL could significantly jump-start infrastructure projects across the United States over the next five years and could result in increased funding for the Kingsport region. As such, the completion of the 2045 LRTP update does not end the transportation planning process but instead it provides the Kingsport MTPO the opportunity to pursue additional funding and resources to advance the LRTP vision from concept into reality.

LRTP Adoption Process

The development of the Kingsport MTPO 2045 LRTP has occurred over an approximately 18-month timeframe. This process has involved both a technical analysis of existing and future year conditions, trends, etc. and has included opportunities for public and stakeholder input. The combination of these activities has helped the Kingsport MTPO identify regional transportation needs and priorities, which have been documented throughout this plan. **Appendices A** and **B** provide details on the outreach and involvement processes used in the development of the 2045 LRTP, including input received.

Plan Review Process

A draft LRTP was developed in January 2022 and submitted to TDOT and VDOT. This marked the start of the formal review process that is required of the draft LRTP. This process included an initial review by state (TDOT and VDOT) agencies to ensure compliance with federal transportation planning requirements. The state review process was completed in February 2022 and revisions were incorporated into a draft plan that was submitted to FHWA in March 2022. The project team addressed the federal comments and developed a revised draft that was made available for public review in April 2022.

The public comment period for the final LRTP draft occurred between April 6, 2022, and May 6, 2022. No public comments were received during this review period. The final LRTP was approved by the Kingsport MTPO Executive Board on May 12, 2022.

LRTP Administrative Modifications and Amendments

Under Federal law, the LRTP must be updated at least every five years. Between updates, the need may arise for revisions to the adopted LRTP. These revisions will be carried out in the form of Administrative Modifications and Amendments. To determine which level of revision is necessary, the Kingsport MTPO will follow Federal definitions of Administrative Modification and Amendment found in 23 CFR 450.104:

> **Administrative Modification** *means a* ***minor revision*** *to a long-range statewide or metropolitan transportation plan, Transportation Improvement Program (TIP), or Statewide Transportation Improvement Program (STIP) that includes* ***minor changes to project/project phase costs, minor changes to funding sources of previously included projects, and minor changes to project/project phase initiation dates****. An administrative modification is a revision that does not require public review and comment, a redemonstration of fiscal constraint, or a conformity determination (in nonattainment and maintenance areas).*
>
> **Amendment** *means a revision to a long-range statewide or metropolitan transportation plan, TIP, or STIP that involves* ***a major change to a project*** *included in a metropolitan transportation plan, TIP, or STIP,* ***including the addition or deletion of a project*** *or* ***a major change in project cost, project/project phase initiation dates, or a major change in design concept or design scope*** *(e.g., changing project termini or the number of through traffic lanes or changing the number of stations in the case of fixed guideway transit projects). Changes to projects that are included only for illustrative purposes do not require an amendment. An amendment is a revision that requires public review and comment and a redemonstration of fiscal constraint. If an amendment involves "non-exempt" projects in nonattainment and maintenance areas, a conformity determination is required.*

Amendments to the LRTP will follow the public review procedures outlined in the most current adopted Kingsport MTPO *Public Participation Plan*. In addition, the MTPO is committed to working TDOT, VDOT, and FHWA/FTA to address future changes to the Metropolitan Transportation Planning process as defined in the BIL. FHWA's **Metropolitan Planning Program Fact Sheet** summarizes initial items that may need to be considered with future amendments or updates.