REGIONAL INTERGOVERNMENTAL COUNCIL

METROPOLITAN TRANSPORTATION PLAN

Regional Intergovernmental Council

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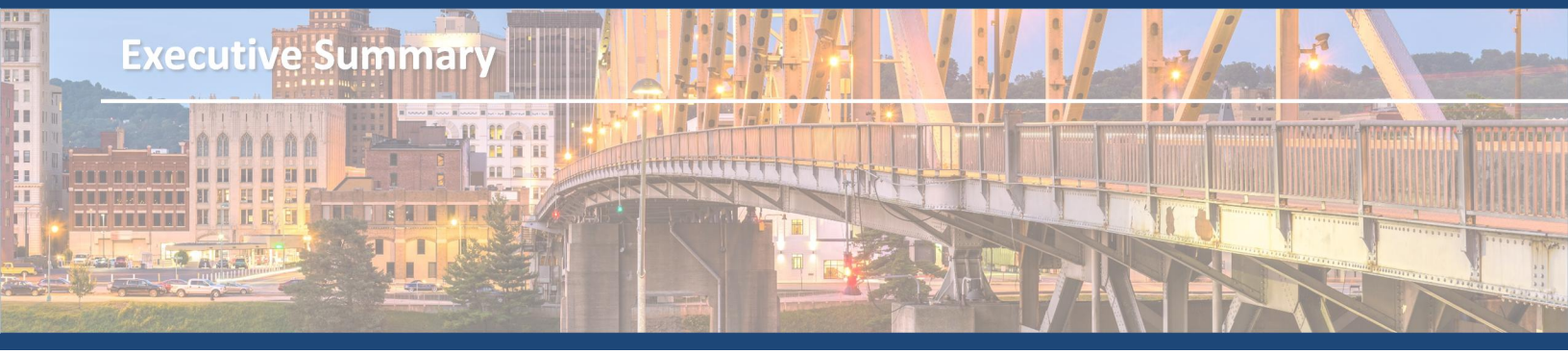


Executive Summary

Introduction

Transportation is an everyday component of life that has lasting impacts on people everywhere. It represents a critical component of an area's built infrastructure and social environment. The *Regional Intergovernmental Council's Metropolitan Transportation Plan* intends to establish a roadmap for the region that can result in a transportation system that contributes to the overall well-being of the region and its residents while also meeting federal requirements. The Regional Intergovernmental Council—or RIC—is responsible for updating the regional transportation plan every four years. The MTP addresses all modes of transportation including automobiles, bicycles, pedestrians, transit, and trucks.

The *Regional Intergovernmental Council's Metropolitan Transportation Plan (RIC MTP)* is shaped by several elements including federal legislation and the direction of both state and local agencies. Federal transportation legislation, including Moving Ahead for Progress in the 21st Century (MAP-21) and the subsequent Fixing America's Surface Transportation (FAST) Act, outline funding and procedural requirements for multimodal transportation planning in metropolitan areas and states. They require MPOs and states to develop transportation plans and transportation improvement programs through a performance-driven, outcome-based approach, which is reflected in this MTP.

Plan Structure

A long-range transportation plan consists of two parts: a description of the vision for the region and a detailed list of projects, policies, and operational strategies to achieve the vision. The *RIC MTP* integrates these two components by discussing the elements dedicated to a variety of modes. The analysis and recommendations for each element has been created to achieve an integrated multimodal transportation system that efficiently moves people and goods throughout the region. The following section below corresponds to and provides a brief description of each chapter.

Chapter 1: Plan Development

The *RIC MTP* is the result of ongoing collaborations between local, state, and federal representatives in addition to input from a Steering Committee, the public, and targeted stakeholders. The planning process was designed to facilitate an open dialogue about existing and future concerns for transportation access, congestion, connectivity, and safety for all modes of transportation. Chapter 1 details the planning process starting with an introduction to the relationship between the plan and federal regulations. The chapter includes a summary of

public outreach and the previous plans reviewed prior to recommendation development. Chapter 1 concludes with the plans vision and a series of goals and guiding statements.

Guiding Statements

Establishing guiding statements at the onset of the planning effort provides direction throughout the process. The plan's Steering Committee developed the guiding statements. With the guidance provided through the Fixing America's Surface Transportation (FAST) Act, the guiding statements were refined to reflect the community's vision. The guiding statements serve as a tool for prioritizing recommendations which is crucial, given the limited funding opportunities and magnitude of identified transportation needs.

Culture & Environment

Preserve and sustain the natural and built environment

Economic Vitality

Promote economic development through targeted transportation investment

Land Use & Transportation

Improve the integration of land use and transportation

Mobility & Accessibility

Promote an efficient, interconnected, and accessible transportation network

Safety & Security

Improve the travel safety and security in the Greater Kanawha Valley

System Preservation

Support and strengthen the current transportation network

Chapter 2: Regional Profile

The Regional Profile provides an overview of the current characteristics and trends of the Kanawha-Putnam region. The chapter analyzes information on population, housing characteristics, employment, economic development, commuting patterns, and socioeconomic trends as they pertain to transportation planning.

Chapter 3: Travel Demand Model

The travel demand model (TDM) holds the ability to forecast future traffic conditions based on certain transportation attributes and socioeconomic data. The information outlined in Chapter 3 plays a vital role in the project selection and prioritization process. Similar to prior long-range plans, the RIC MPO utilizes the regional TDM to understand important linkages between transportation, land use, and growth. This chapter describes the key components of the travel demand model and crucial demographic data used to project future highway congestion and travel.

Chapter 4: Highway

The Highway chapter is the beginning of the modal recommendations outlined in the *RIC MTP*. As the framework for improving the vehicular transportation network throughout the region, the chapter assesses the existing and future transportation conditions and provides a set of recommendations to relieve congestion and enhance safety. The recommendations are then prioritized based on evaluation metrics related to the plan's goals and guiding statements.

Chapter 5: Bicycle and Pedestrian

Building on the previous planning efforts and current initiatives, the Bicycle and Pedestrian chapter evaluates the recommendations and policies throughout the region. With specific evaluation criteria, bicycle and pedestrian facilities were prioritized to address regional connectivity, access local facilities, connect to low-income communities, prioritize user safety, consider all users, determine the condition of the facility, and incorporate feedback from the RIC Bicycle & Pedestrian Advisory Committee and community input.

Chapter 6: Transit

Chapter 6 identifies the existing fixed routes provided by the Kanawha Valley Regional Transportation Authority (KVRTA), rail service provided by Amtrak, and air transit provided through Yeager Airport. This chapter summarizes the KVRTA systems analysis and transit asset management process. The project recommendations that provide access to transit are identified in this chapter.

Chapter 7: Freight

The Freight chapter examines the regional freight network in the context of truck, rail, water, and air freight movement. Chapter 7 also reviews the West Virginia State Freight Plan, highlights anticipated changes, and concludes with a series of recommendations. While most of the discussion focuses on goods movement – trends in recreation, as well as tourism can affect these transportation modes. As with goods movement, tourism trips are impacted by trends originating outside the Kanawha-Putnam region, but affect transportation needs within the region.

Chapter 8: Safety and Security

Chapter 8 evaluates safety and security by analyzing vehicular, pedestrian, bicyclist, freight and rail transportation statistics and considerations. The analysis includes maps that provide a geographic overview of crashes throughout the region and identify high accident locations. The chapter concludes with recommended safety and security improvements for all modes of transportation.

Chapter 9: Financial Element

The Financial Element outlines the region's long-range transportation strategies. The chapter outlines the financially constrained methodology and results in accordance with both state and federal requirements. The intent of a long-range transportation plan is to demonstrate how projects that have been prioritized can realistically be funded by the plan's horizon year of 2050. It is essential to understand the expected levels of future funding, estimated planning-level project costs, and to have consistent assumptions that address all modes of transportation. A financially constrained plan allows the RIC MPO, member jurisdictions, and supporting agencies to focus on near-term opportunities and to identify strategies that support plan implementation.

In addition to roadway projects, revenues have been estimated for bicycle and pedestrian projects. These projects have not been individually financially constrained to allow for flexible and opportunistic implementation. The transit recommendations outline in Chapter 9 are also unique. The costs and revenues are maintained by KVRTA and are not prioritized within the MTP.

The figures and tables on the following pages identify the financially constrained roadway projects for the *RIC MTP*. The projects are moved forward for anticipated funding based on the results of the project prioritization as well as their estimated year of expenditure cost. Anticipated projects to be funded during the MTP are organized into a series of interim years: 2021-2025 (Committed Projects), 2026-2030, 2031-2040, and 2041-2050. The projects that cannot be funded given the project available revenues are part of the unconstrained vision plan. The unconstrained vision projects are also outlined below.

Committed Roadway STIP Projects

Financially constrained projects include those projects that already have funding allocated through the 2021-2025 Statewide Transportation Improvement Program (STIP) as well as those projects where the full funding amount is estimated to be available through the 2050 horizon year.

FACILITY	PROJECT DESCRIPTION
Interstate 64 – Nitro to US 35	Upgrade to 6 lanes
WV 622 – Cross Lanes	Widen roadway
US 119 Oakwood Area Improvements	Construct RCUT
RHL Boulevard Connection	Construct new roadway

2025-2030 Financially Constrained Projects

ID	FACILITY	FROM	TO	PROJECT DESCRIPTION	ANTICIPATED COSTS
RSA-1	Patrick Street	4th Ave	Patrick Street Plaza	Intersection modifications	$406,898
SH-1	MacCorkle Ave	Rock Lake Drive	Jefferson Road	Multiple (restripe, signal optimization, sidewalk enhancements, etc.)	$6,242,273
KC-5	US 119 (Corridor G)	I-64 Connector	Lucado Road (generally)	Widening, Cantley Flyover	$49,915,000
KC-4	US 119 (Corridor G)	MacCorkle Avenue	Lucado Road	Widening	$16,581,120
RSA-3	US 60 (Dupont Ave)	Hull Ave	William Street	Intersection improvements	$709,009
RSA-2	WV 34	I-64	Great Teays Blvd	Roundabout corridor	$4,926,320

2031-2040 Financially Constrained Projects

ID	FACILITY	FROM	TO	PROJECT DESCRIPTION	ANTICIPATED COSTS
PC-U1	Interstate 64	Cow Creek Road	Cabell County Line	Upgrade to 6 lanes	$163,756,181
PC-3	Interstate 64	Cow Creek Road	WV 34	Upgrade to 6 lanes	$89,321,553
KC-8D	US 60	Old Town Road	Browns Mountain Road	Widening	$18,527,159

2041-2050 Financially Constrained Projects

ID	FACILITY	FROM	TO	PROJECT DESCRIPTION	ANTICIPATED COSTS
PC-6A	Teays Valley Road (CR 33)	WV 34	Thomas Drive	Widening	$46,195,692
KC-8A	US 60 (Dupont Ave)	Kellys Creek Road (CR 81)	Chelyan Bridge	Access Management	$135,316,681
PC-2	WV 817	Winfield Bridge	Planters Road	Widening	$43,115,980
KC-6	US 119 (Corridor G)	Jefferson Road Interchange	Emerald Road	Widening	$107,648,651
PC-8A	WV 62	WV 25	Dairy Road	Widening	$5,459,522
KC-1	3rd Street Underpass	-	-	Widening	$36,825,588
TV-4	Mt. Vernon Road (CR 34)	WV 34	WV 34 (Teays Valley Road)	Modernization	$20,298,704
PC-4	Hurricane Improvements	-	-	Access Management	$4,442,032

Unconstrained Vision Plan Projects

ID	FACILITY	FROM	TO	PROJECT DESCRIPTION	ANTICIPATED COSTS
KC-U1	Institute Connector	Institute Interchange	WV 622	New Alignment	$247,475,641
KC-9	WV 114 (Greenbrier Street)	Airport Road	Rutledge Road (CR 46)	Widening	$65,191,429
KC-8C	US 60	Sycamore Road	Britt Hollow	Widening	$78,229,715
KC-U2	Northern Connector	I-64	I-77	New Alignment	$1,564,548,508
KC-7	WV 94 (Lens Creek Road)	Six Mile Hollow Road	I-64	Widening	$184,165,786
PC-8B	WV 62	Heizer Creek Road	Poca City Limits (southside)	Widening	$55,412,714
TV-5	Sleepy Hollow Road	Teays Valley Road	Cow Creek Road	Widening	$62,457,595

Chapter 10: Air Quality

Chapter 11 outlines the National Ambient Air Quality Standards (NAAQS) as well as provides the background information of the region's previous nonattainment and maintenance status. The chapter also addresses climate change and resiliency within the context of transportation planning.

Appendix

The *RIC MTP* is supplemented by a series of items within the Appendix including the following sections.

Plan Performance

Plan Performance describes the dynamic approach utilizing system-wide information to make strategic investments to achieve the goals outlined for the planning area. To be consistent with federal regulations—MAP-21 and the FAST Act—the RIC MPO has chosen to adopt the statewide performance measures and targets. The document describes these performance measures and evaluation criteria to help guide transportation decision-making while also monitoring the network's performance in years to come.

Public Outreach Summary

The public outreach summary contains a compilation of agendas and materials from the MTP outreach efforts.

Travel Demand Model Documentation

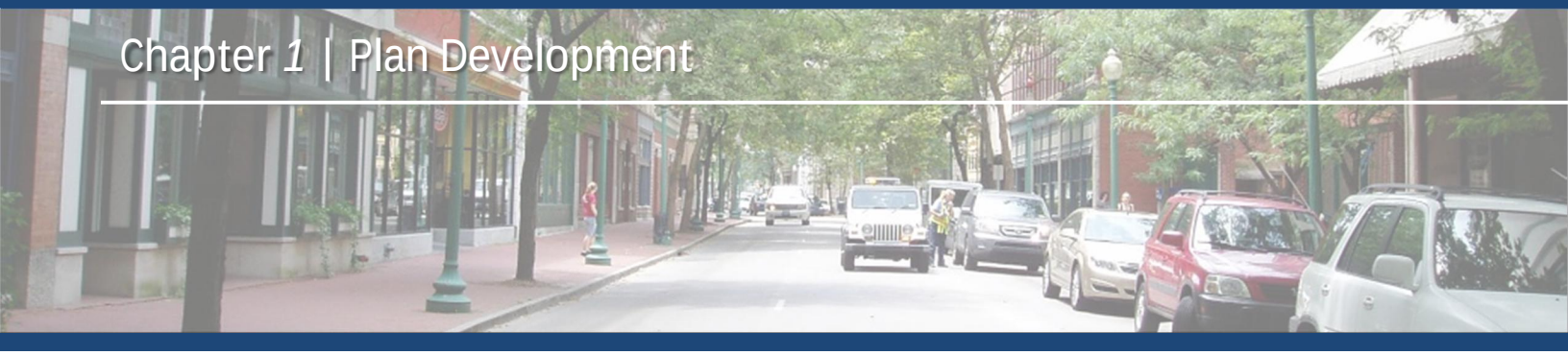
The documentation on the travel demand model provides a technical review of the assumptions and methodology used in the completion of the travel demand model.

Performance Measures

The performance measures outlined in this section adhere to federal requirements for MPOs to establish a performance-based approach to planning and programming.

Conclusion

The *RIC MTP* provides the vision for multimodal transportation recommendations that considers the existing and future needs of the region. By working with the public and key stakeholders, the creation of a financially constrained plan helps ensure that projects can reasonably be funded during the lifetime of the MTP. While the region has identified numerous transportation needs, not all of them will be funded given the current revenue projections. As projects are implemented, RIC should work collaboratively with the West Virginia Department of Transportation (WVDOT) and the Federal Highway Administration (FHWA) to determine how to best advance projects.



Chapter 1 | Plan Development

Introduction

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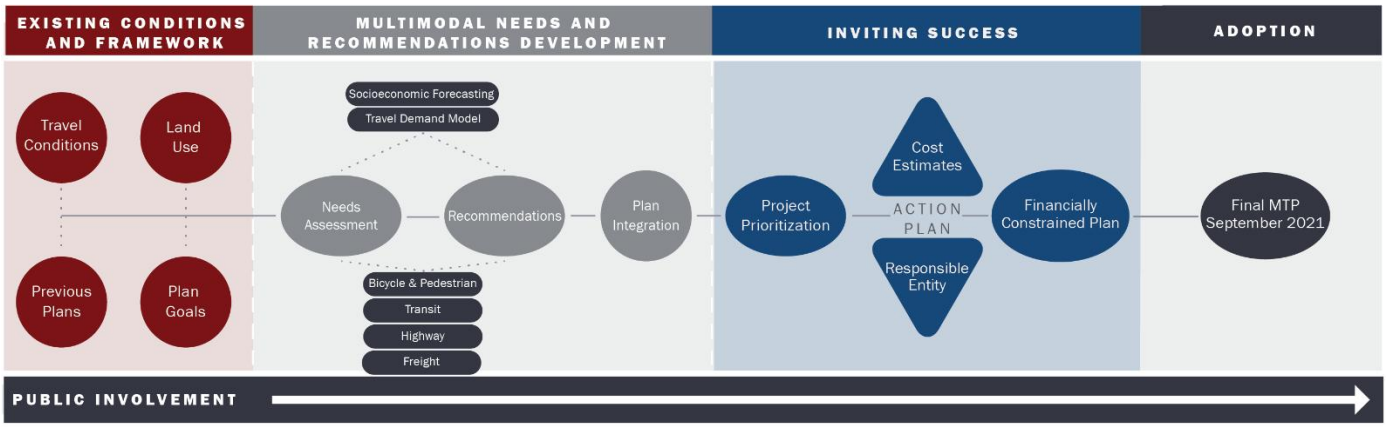
West Virginia Capitol Building

The Planning Process

The *RIC MTP* is the product of ongoing partnerships between local, state, and federal representatives, in addition to a committed Steering Committee, the public, and key stakeholders. The planning process was crafted to help facilitate an open dialogue about the existing and anticipated congestion concerns, safety issues, accessibility concerns, and connectivity gaps for all modes of transportation. The planning process below outlines the MTP approach and timeline.

Figure 1-1: MTP Timeline



Public Outreach

Steering Committee

The *RIC MTP* Steering Committee was formed by a group of RIC staff, local officials, and citizen advocates with a cultivated understanding of the needs and opportunities of the two-county region. On August 26, 2020, the Steering Committee met for the first time. During that meeting, the Steering Committee was presented with an overview of the MTP planning process, the project work plan, the roles and responsibilities of a Steering Committee member, and an initial discussion about how to facilitate public outreach.

The Committee's duties included acting as a soundboard for the project team, providing input on existing conditions, aiding in the development and vetting of recommendations, and establishing the prioritization criteria. In total, the Steering Committee met six times throughout the planning process, as shown in Table 1-1 on the following page.

Table 1-1: MTP Steering Committee Meeting

MEETING	TOPICS COVERED
Steering Committee Meeting #1 August 26, 2020	Plan Goals Plan Visioning Social PinPoint Launch
Steering Committee Meeting #2 November 18, 2020	State of the Region Travel Demand Model Overview Public Outreach Summary I
Steering Committee Meeting #3 January 27, 2021	Recommendations Development Prioritization Methodology
Steering Committee Meeting #4 April 28, 2021	Public Outreach Summary II Prioritized Project Review
Steering Committee Meeting #5 July 13, 2021	Financial Constraint Public Outreach Summary II
Steering Committee Meeting #6 August 4, 2021	Draft Plan Review

Stakeholder Interviews

At the onset of the public outreach process, the project team identified several stakeholder groups including staff from county and municipal planning departments, representatives from the freight community, transit advocates, bicycle and pedestrian advocates, and local government representatives. These stakeholder groups were interviewed to gain insight into transportation, economic, social, and political issues in Kanawha and Putnam counties. The feedback received was used to verify information from the 2045 plan, validate existing conditions information, and generate preliminary recommendations.

Public Workshops

Collecting input from the public throughout the planning process is essential to understanding the local needs, identifying the importance of projects, and creating public trust in the planning process. Residents recognize the strengths and limitations of their transportation system and how transportation decisions impact their daily lives. To leverage the knowledge of the Kanawha-Putnam residents, the project team—with the assistance of the Steering Committee—conducted two public workshop series.

Since the majority of the plan's development took place during the COVID-19 pandemic, gathering in-person was not possible. Public meetings were facilitated through an online platform at critical points of the plan's development. This online presence was especially vital to keep the community involved throughout the planning process.

Public Workshop Series #1

The first public workshop series occurred on October 26 and 27, 2020. The activities helped generate information that aided the initial phases of the planning process. This input was used in the creation of the goals and objectives as well as understanding existing conditions.

Since the public workshop could not be held in-person, a narrated presentation was created by the project team. This allowed attendees who were not able to attend a session to still have access to information about the MTP. The attendees were also informed of how they could engage in the MTP process vis-à-vis the project website.

Public Workshop Series #2

The second public workshop series was held on February 24 and 25, 2021. The workshop allowed attendees to review multimodal recommendations and weigh in on project prioritization.

Project Website

The project website was used as a communication tool throughout the development of the MTP. The plan used Social PinPoint to communicate various plan updates with the public at critical points in the planning process. This included posting public workshop agendas, building a document library with previously adopted plans, and re-directing members of the public to surveys or mapping activities. As a dynamic, web-based platform, Social PinPoint acted as a repository of information throughout the planning process.

Online Surveys

To reach a wide variety of public participants, two interactive web-based questionnaires were launched. The first survey focused on goal and vision setting had over 70 members of the public participate between October 25, 2020 and December 1, 2020. The online survey was advertised using handouts and flyers, email blasts, media posts, word of mouth, and the RIC website. This advertisement strategy yielded many survey responses and added valuable insight into community preferences, opinions, and issues. Ultimately, the public input was used to inform the development of transportation recommendations and project prioritization.

8,100
Total Website Visits

151
Total Survey Responses

90
Total Survey Comments

65
Total Map Comments

1,333
Total Unique Users

33
Total Document Downloads

Priority Ranking of Planning Themes

Survey respondents were presented with six planning themes and asked to rank them in order of importance. The planning themes in order of priority and top theme associated with each are summarized below.

#1 *Economic Vitality*

Promote economic development through targeted transportation investment

#2 *Mobility & Accessibility*

Promote an efficient, interconnected, and accessible transportation network

#3 *Land Use & Transportation*

Improve the integration of land use and transportation

#4 *Safety & Security*

Improve the travel safety and security in the Greater Kanawha Valley

#5 *Culture & Environment*

Preserve and sustain the natural and built environment

#6 *System Preservation*

Support and strengthen the current transportation network

The second survey was open from February 1, 2021 to May 31, 2021. With over 70 survey responses and 942 total site visits, survey participants were asked to identify their priority projects for roadway and intersection projects. The full public outreach summary can be found in the Appendix.

Previous Planning Efforts

The *RIC MTP* is coordinated closely with other local, state, county, and regional plans that impact planning efforts around the area. The MTP makes effort to acknowledge the planning process and outcomes of the previous plans and incorporate them when relevant to ensure consistency. Table 1-2 summarizes the transportation plans prepared within the region that were reviewed and utilized during the data collection phase.

Table 1-2: Previous Plan Review

DOCUMENT TITLE	ISSUING AGENCY	YEAR
Montrose Drive and MacCorkle Avenue Road Safety Audit	RIC	2020
Patrick Street and Patrick Street Plaza/Kanawha Boulevard West Road Safety Audit	RIC	2020
Pennsylvania Avenue North and South Road Safety Audit	RIC	2020
US 60 between Mile Branch Rd and Hull Ave Road Safety Audit	RIC	2020
West Virginia State Rail Plan Update	WVSRA, WVDOT	2020
WV 34 from I-64 to Great Teays Boulevard Road Safety Audit	RIC	2020
Coordinated Public Transit-Human Services Transportation Plan	Boone, Clay, Kanawha, and Putnam Counties	2019
Kanawha-Putnam Bicycle and Pedestrian Plan	RIC	2019
Multimodal Economic Impact Study for Huntington Tri-State Airport	KYOVA	2018
West Virginia State Freight Plan	WVDOT	2018
Regional Transportation Plan 2045	RIC	2017
Transportation Improvement Program (TIP)	WVDOT	2017
Tri-State Airport Access Road Study	KYOVA	2017
Goff Mountain Road and Big Tyler Road (WV 622) Corridor Study	RIC	2016
KRT System Analysis Plan	KVRTA	2016
Third Street Corridor Study	RIC	2016
WV 601, Jefferson Road, US 119 to US 60 Environmental Assessment	FHA, WVDOT	2016
Multi-Jurisdictional Hazard Mitigation Plan	Kanawha County	2015
Regional Development Plan Region III	RIC	2015
Spring Hill Corridor Study	RIC	2015

DOCUMENT TITLE	ISSUING AGENCY	YEAR
Congestion Management Process for Huntington, WV-KY-OH Urbanized Area	KYOVA	2014
Imagine Charleston	City of Charleston	2013
Metro Mobility 2040	RIC	2013

Performance-Based Planning

Performance-based planning describes the dynamic approach utilizing system-wide information to make strategic investments to achieve the goals outlined for the planning area. To be consistent with federal regulations—MAP-21 and the FAST Act—the RIC MPO has chosen to adopt the statewide performance measures and targets. These performance measures and evaluation criteria to help guide transportation decision-making while also monitoring the network's performance in years to come, are outlined in the Appendix.

Guiding Statements

One of the first steps of creating a long-range transportation plan is to develop guiding statements that will provide direction for the entirety of the planning process. The guiding statements also serve as an important tool during the prioritization process as the Kanawha-Putnam area has a finite amount of transportation dollars to fund the identified needs.

The guiding statements were developed through collaboration with the Steering Committee and reflect the community's vision for the future of the transportation network. The statements combine the emphasis provided by the FAST Act with localized context to provide the framework for a regional transportation strategy. Table 1-3 outlines the goals and guiding statements for the *RIC MTP*.

FAST Act and the previous MAP-21 legislation requires MPOs to undertake a planning process that establishes and uses a performance-based approach to transportation decision-making that considers projects and strategies that address and support ten federal goals. All of these federal planning goals, shown in Table 1-4, are accommodated within the plan goals set forth in the *RIC MTP*. Eight of these ten were part of the federal legislation during the previous MTP development. Resiliency and travel and tourism were added as new goal areas through the FAST Act.

Table 1-3: MTP Guiding Statements and Goals

CULTURE & ENVIRONMENT
Preserve and sustain the natural and built environments
• Develop strategies to decrease single-occupancy vehicle trips and vehicle miles traveled • Encourage use of alternative transportation modes and energy sources that reduce air pollution, fuel consumption, and other environmental impacts • Improve access to areas of historical, cultural, and recreational significance • Minimize development impacts in areas of cultural and historic significance • Reduce development impacts on environmentally sensitive areas

ECONOMIC VITALITY
Promote economic development through targeted transportation investments
• Encourage the concentration of employment and activity sites within established transit corridors to maximize transportation efficiency • Focus transportation system improvements to support and promote tourism • Improve the access to key economic needs and areas of planned development • Promote multimodal access to encourage economic growth in areas of need • Support transportation investments and policies that work to create jobs and improve access to people, places, and goods

LAND USE & TRANSPORTATION
Improve the integration of land use and transportation
• Encourage efficient infill and redevelopment to maximize use of the existing transportation system • Enhance communication and coordination between various transportation planning and land use planning agencies • Increase coordination between roadway design and land use development to improve transportation system performance • Maximize effectiveness of parking infrastructure and regulations

MOBILITY & ACCESSIBILITY

Promote an efficient, interconnected, multimodal, and accessible transportation network

- Develop strategies to manage travel demand
- Identify and recommend alternative traffic control and system optimization measures
- Increase intermodal connectivity to allow system users greater mode and route choices
- Increase transit accessibility and availability to transit-dependent users and persons with special needs
- Promote efficient regional routes and internal connectivity for freight and goods movement
- Reduce peak-hour congestion by promoting flexible working hours and innovative workforce policies for regional employers
- Utilize Complete Streets initiatives to improve pedestrian mobility and expand a safe bicycle lane network

SAFETY & SECURITY

Improve the travel safety and security in the Greater Kanawha Valley

- Facilitate coordination for emergency preparedness
- Implement incident management strategies to quickly reestablish traffic flow and increase the safety of motorists and emergency personnel
- Minimize intersection conflicts, increase pedestrian safety, and enhance safety by refining access management policies
- Mitigate potential conflicts and delays at rail crossing sites
- Promote long-term resiliency of the transportation network to prevent interruptions, endure damages, and quickly recover from disturbances
- Reduce the number of high incident-accident locations
- Reduce the number of injuries, fatalities, and hazardous spills

SYSTEM PRESERVATION

Support and strengthen the current transportation network

- Develop strategies and implement measures to extend the functional life of transportation facilities
- Increase the use of innovative transportation technology to enhance the efficiency of the existing transportation system and to be better prepared for emerging vehicle technologies
- Reduce the number of potential conflicts between various transportation modes

Table 1-4: RIC MTP Goal Alignment with Federal Transportation Goals

	RIC MTP GUIDING STATEMENT					
Federal Goals	*Culture & Environment*	*Economic Vitality*	*Land Use & Transportation*	*Mobility & Accessibility*	*Safety & Security*	*System Preservation*
Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency		●		●		
Increase the safety of the transportation system for motorized and nonmotorized users					●	
Increase the security of the transportation system for motorized and nonmotorized users					●	
Increase the accessibility and mobility of people and for freight				●		
Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns	●		●			
Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight				●		
Promote efficient system management and operation				●		
Emphasize the preservation of the existing transportation system						●
Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation						●
Enhance travel and tourism	●	●				

Chapter 2 | Regional Profile

Introduction

A regional transportation plan starts with a comprehensive analysis of regional characteristics and trends. Population and employment dynamics influence existing and future transportation needs, such as freight movement, public transportation demand, and commuting patterns. This chapter includes an assessment of socioeconomic trends and characteristics while also discussing the importance of environmental justice as it relates to the development of the *RIC Metropolitan Transportation Plan* (MTP).

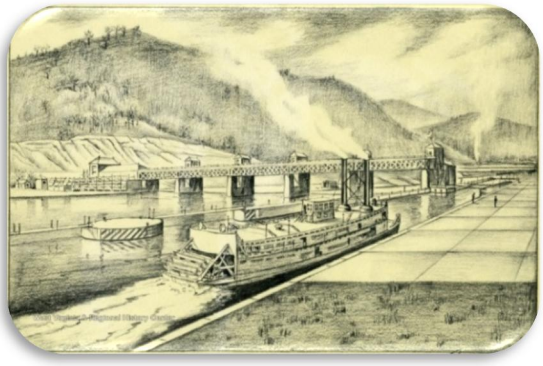
In this chapter, the *RIC MTP* provides relevant demographic information from the latest data available during the plan's development. The MTP illustrates both a historic and policy context for past and future development in the Kanawha Valley. This chapter serves as a resource to the region's intragency partners and constituents in their steering of this plan and future decision-making.

Kanawha Valley – A Brief History

The region's transportation and land uses were shaped by Kanawha Valley's first inhabitants. These indigenous groups farmed, hunted, and fished throughout the Kanawha Valley. Some of the earliest existing evidence of indigenous people in the Kanawha Valley were a system of territorial burial mounds.[1]

By the start of the 17th century, West Virginia's rivers were used to access the fertile valley farmland near the confluence of the Elk and Kanawha Rivers. When the European explorers arrived in the late 17th century, decades of conflict ensued as the colonizers and indigenous people attempted to establish territory.

The majority of the Kanawha Valley's history is centered on the most populous city, in West Virginia, Charleston. Established in the late 1700s, Charleston remained no more than a rural outpost. In 1813, after William Dickinson heard people were boiling brine from springs for the resulting salt in Appalachia, he invested in "salt properties" along the Kanawha River. These salt properties began



Drawing of steamboat at Marmet Lock

[1] Knollinger, Corey, 2019; Exploring West Virginia's Native American History, West Virginia Public

production in 1817 and flourished. The town of Malden became "the salt making capital of the east".[2] Ultimately, when the British salt supplies diminished, new market opportunities allowed wealth to flow into the Valley.

The Kanawha Valley's industrial and transportation boom was largely credited to coal development post-Civil War. Despite the observation of abundant natural resources documented by William Barton Rogers in the Old South's most thorough geological survey, minimal economic development occurred in the region.[3] Due to limited reliable transportation networks, industries in the Kanawha Valley could not compete in the national market. The only outlet to export coal from the valley was the Kanawha River. Unfortunately, the river proved to have enormous constraints. It was only navigable six months out of the year and littered with natural debris.[4] The Kanawha Valley contained some of the state's most abundant bituminous coal fields yet had no service by barge or rail.[5] The lack of transportation infrastructure led to the near collapse of the region's coal-oil production as mining operations struggled to produce profit.

At the end of the Civil War, the combination of federally constructed locks and dams along the Kanawha River, the private interests that built the Chesapeake and Ohio (C&O) Railroad, and an infant state government that had a "highly benevolent attitude toward the coal industry," led to an influx of capital and a new wave of immigrants. Only then did the energy industry achieve dominance in the economic portfolio of the Kanawha Valley, which now competes in the nation's market.[4]

C&O Station

The C&O Railway through Charleston was completed in 1873 and connected Richmond, Virginia to Huntington, West Virginia.[6] The Kanawha River—which separated the city and the railroad—remained a major obstacle to development in Charleston. Prior to the construction of the South Side Bridge, a system of ferries was necessary to transfer goods from railcars to the city. Through the arrival of the railroad and construction of the South Side Bridge, more supplies and goods could arrive to the Kanawha Valley via rail.

The second major railroad, the Ohio Central Railroad, arrived in the region around 1883 and linked Charleston with Toledo, Ohio. In 1893, the Kanawha and Michigan Railroad took over the rail line and a series of extensions eventually connected the coalfields of West Virginia with the Great Lakes. Today, Norfolk Southern manages the railroad.

One of the earliest American examples of brick-paving roadway experiments occurred on Summers St. in Downtown Charleston. Mordecai Levi patented a system of layering stone, tar, sand, and brick.[7] While it was not the first brick-paved roadway, it was a notable and early implementation of an innovative road surfacing method.

By 1960, the new Eisenhower Interstate System had expanded to more than 20,000 miles of federal highway. By 1959, only a ten-mile section of highway in Wheeling and a fifty-mile section connecting Huntington with Charleston

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[2] J.Q. Dickinson Saltworks, Our History, Retrieved 2020, https://www.jqdsalt.com/timeline/ Broadcasting As, retrieved October 2020.
[3] Charles S. Sydnor, "State Geological Surveys in the Old South," in David Kelly Jackson (ed.), American Studies in Honor of William Kenneth Boyd (Durham, 1940), 93.
[4] Coal Mining in the Kanawha Valley to 1861: A View of Industrialization in the Old South Otis K. Rice
[5] Eavenson, First Century and a Quarter of American Coal Industry, 270-71, 427-28.
[6] Charleston Courier, January 28, 1873.
[7] U.S. Patent No. 401,752. (1889). Washington, DC: U.S. Patent and Trademark Office.

had been built. The central and southern region of the state had been left behind by new investment in the federal highway system. Due to challenging topography, it would be costly and challenging to construct a highway system in this area of the state.[8]

Other opportunities to invest in the state's infrastructure would soon come. The governors of Alabama, Kentucky, Maryland, North Carolina, Pennsylvania, Tennessee, Virginia, and West Virginia established the Conference of Appalachia Governors (CAG) to explore federal investment opportunities in 1961. The Conference concluded that they could identify regions that had high growth potential outside of areas where federally funded road projects could be built.[9]

Bob McDonough (right) looking over a map of West Virginia with JFK and others.

President Kennedy formally convened the President's Appalachian Regional Commission (PARC). PARC was a group of state governors and Cabinet-level officials tasked with addressing persistent economic disparities in the region. PARC's mission was to draw up "a comprehensive program for the economic development of the Appalachian Region."[10] Thanks to these efforts, the federal government allocated more than $600 million for the construction of I-81 and the final stretch of I-79, which connects Charleston with Pittsburgh, Pennsylvania.

PARC's work informed the Appalachian Regional Development Act (ARDA) which was signed by President Lyndon B. Johnson into public law on March 9, 1965. This led to the inception of the Appalachian Development Highway System (ADHS), which is a 3,090-mile network of highways linking the region to national Interstates.[11]This highway system has generated economic development across Appalachia with over 30 corridors providing access to regional and national markets, contributing to growth opportunities and improving access in Appalachia.

Population Trends

Between 1880 and 1920, the population of Charleston grew dramatically from 4,192 to 39,608 while Kanawha County increased from 32,466 to 199,650. The growth of urban jobs, increase in population, and growth of traffic continued throughout the Great Depression and World War II.

In 1956, the National Interstate and Defense Highways Act brought a newfound emphasis on the automobile and increased mobility. Road construction began in 1954 with the completion of the West Virginia Turnpike between Princeton and Charleston. Eventually, three major interstates—I-64, I-77, and I-79—would converge in the heart of Charleston and provide access to the Midwest, Northeast, and South.

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[8] Bureau of the Census, Eighteenth Summary of the Census, 1960, I-419.
[9] West Virginia Department of Transportation Planning and Research Division: Intermodal Special Projects Division. West Virginia National Highway System Report. Charleston, West Virginia.
[10] Fleming, Kennedy vs Humphrey, 165-170
[11] About the Appalachian Regional Commission. (2020, August 18). Retrieved December 12, 2020, from https://www.arc.gov/about-the-appalachian-regional-commission

Downtown Charleston, circa 1900

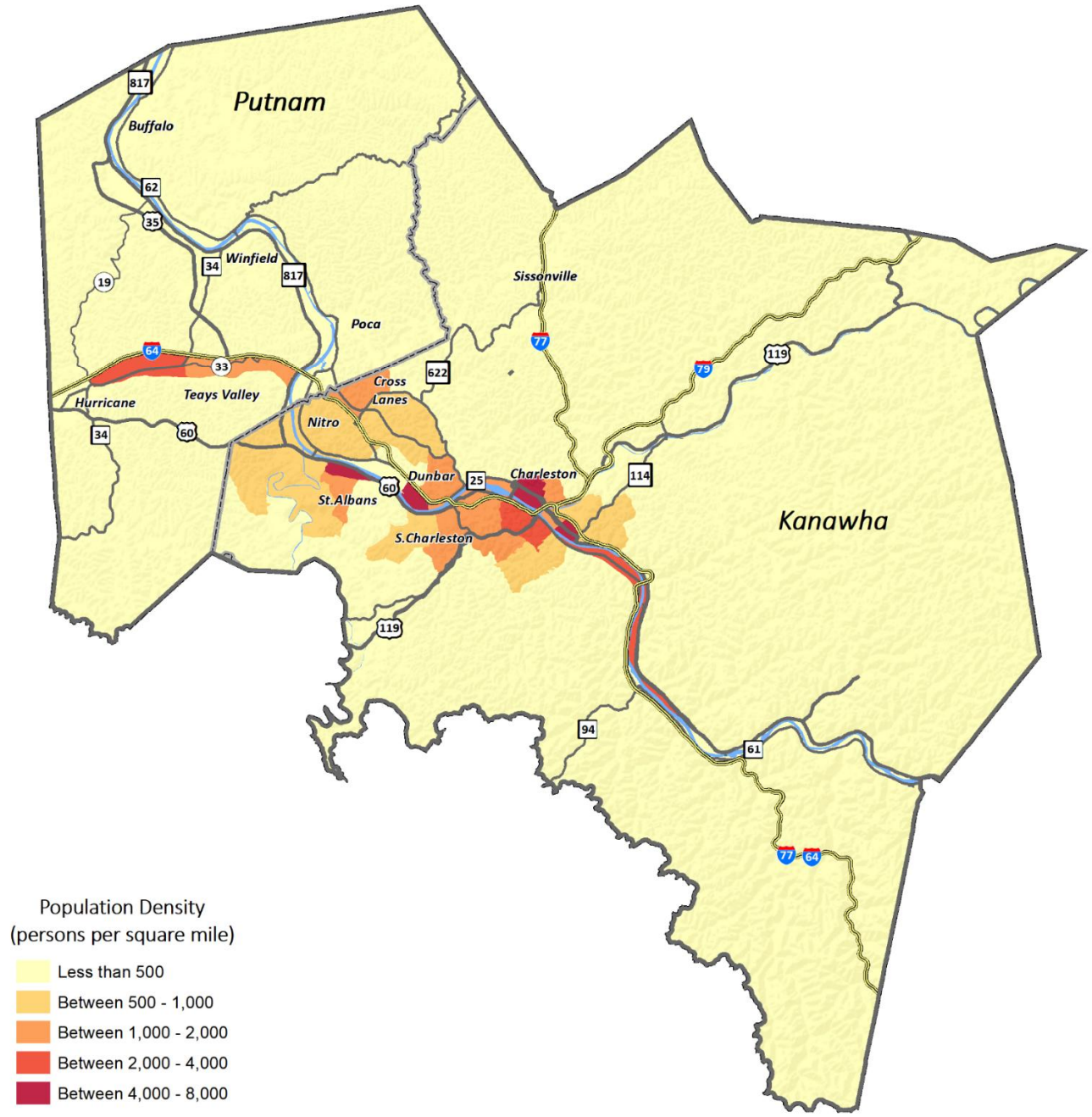
The combination of enhanced mobility provided by the automobile and suburban-oriented development led to the decline of the region's population. After more than a hundred years of continuous growth, Kanawha County entered a 50-year era of decline. Two dramatic drops occurred in the 1960s and 1980s, when the county's population shrank by more than 2,300 people per year. After 1990, the rate of decline slowed considerably; the average annual loss between 2000 and 2010 was about 700 people. The majority of loss was from the central city of Charleston, which declined by 11.0% (a reduction of 5,887 people).

During Kanawha County's population decline, Putnam County's population continued to grow. Putnam County was the only county in West Virginia to have grown continuously over the past 50 years, doubling from 27,625 people in 1960 to 55,486 in 2010 (an average of 560 additional people every year).

The 2014 American Community Survey (ACS) showed 191,765 people in Kanawha. Putnam County's 2014 population of 56,356 shows a gain of 870 residents since 2010. Although increasing, Putnam County's population growth rate has slowed. Error! Reference source not found.Figure 2-1 shows the density of population in Kanawha and Putnam counties.

In 2018, Putnam County's population growth began to slow, adding only 56 residents on average from 2015 to 2018 with a population 56,652. Kanawha County lost another 5,000 residents during the 3-year time period, with 2018 ACS data showing a population of 185,710. (U.S. Census Bureau; 2015 & 2018 American Community Survey, Table DP05).

Figure 2-1: Population Density



Housing and Household Characteristics

When the 2014 ACS was conducted, it was estimated that there are 103,984 households within Kanawha and Putnam counties. Similarly distributed to the regional population, nearly 80% (82,531) of the households were in Kanawha County. Putnam County contained about 20% (21,453) of the region's households. Four years later, 2018 data shows a similar distribution, but with the number of households in the region increasing by approximately 12,572, a 12% increase in four years.

The average household size across the region is 2.53 persons per household. The median household income increased to $52,531 per year. The median household since the previous long-range plan has increased across the region. Approximately 75% of households are owner-occupied while 24% are renter-occupied. The percent-owner occupied has increased slightly since the last long-range plan by more than 2%. Table 2-1 summarizes the household characteristics of the counties and provides regional estimates based on the data.

Table 2-1: 2018 Household Characteristics

COUNTY	NUMBER OF HOUSEHOLDS	AVERAGE HOUSEHOLD SIZE	MEDIAN HOUSEHOLD INCOME	PERCENT OWNER-OCCUPIED	PERCENT RENTER-OCCUPIED
Kanawha	92,463	2.38	$45,426	68.8%	31.2%
Putnam	24,093	2.68	$59,636	82.3%	17.7%
Regional	116,556	2.53	$52,531	75.5%	24.5%

U.S. Census Bureau; 2018 American Community selected housing characteristics, Table DP04

U.S. Census Bureau; 2014 American Community Survey 5-year Estimates, Tables S1101 & B19013

Employment

U.S. Census data estimates that in 2017, Kanawha and Putnam counties had 129,537 primary jobs with only 103,749 working residents. This means that Kanawha and Putnam counties have more jobs than available workers.

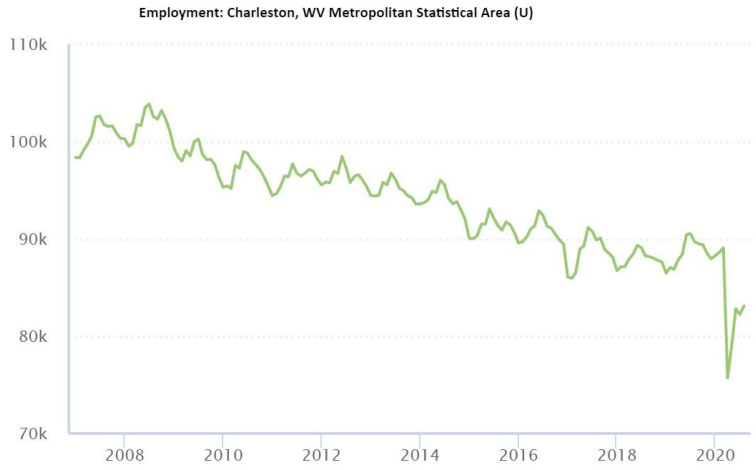
The City of Charleston holds the largest share of regional employment, which is approximately 37.4%. South Charleston has the next greatest share with 7.5%. Approximately 43.2% (35,227) of Kanawha County's employees commute to the City of Charleston for work. Since 2004, the number and share of employees both living and working in the City of Charleston has decreased nearly 26.0% from 15,912 in 2004 to 12,557 in 2014; however, by 2017 the decline began to flatten with the share of employees reaching 12,195 in 2017. The major employers in Kanawha County include the State of West Virginia, health care providers such as Charleston Area Medical Center (CAMC), the Kanawha County Board of Education, West Virginia State University, and the University of Charleston.

Teays Valley is the primary job center in Putnam County, holding the third largest share of regional employment. Teays Valley accounts for over one-quarter (6,333) of Putnam County's total employment. Other major employers in Putnam County include:

- The Putnam County Board of Education
- Toyota Motor Manufacturing
- Teays Valley Hospital in Hurricane

Approximately 11% of Teays Valley residents work locally. Around 24.2% commute to work in Charleston, while 7.2% commute to Huntington and 6% to South Charleston.

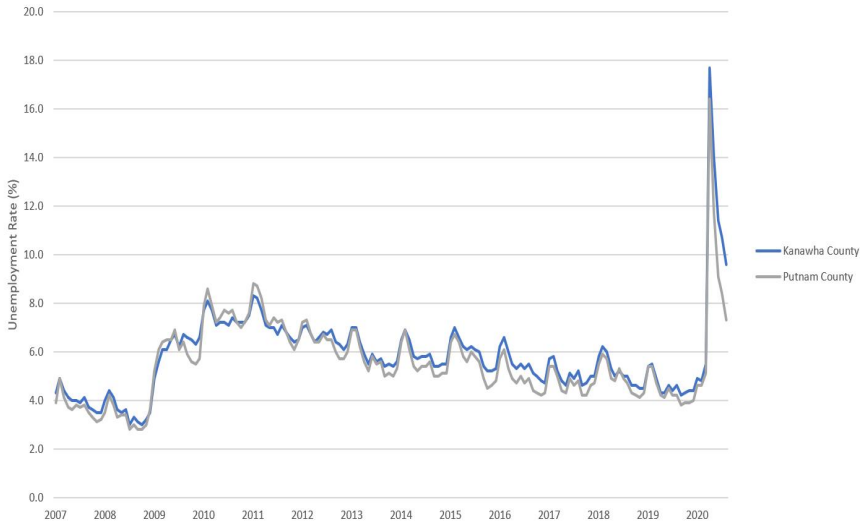
Figure 2-1: Employment: Charleston, WV Metropolitan Statistical Area



Unemployment

The Bureau of Labor Statistics indicates that unemployment rates have fallen at regional, state, and national levels since the Great Recession. The Great Recession—which lasted from December 2007 to June 2009—had significant impacts on Kanawha and Putnam counties. The recession resulted in significant job loss followed by a slow economic recovery. Unemployment had fallen nearly to pre-2008 levels prior to the COVID-19 pandemic. Recent reports indicate the region is slowly recovering. By September 2019, the unemployment rates for Kanawha County and Putnam County had reached 4.2% and 3.8% respectively. If this pace of recovery continues, the region could see a sustained pre-2008 unemployment rate or better.

Figure 2-3: Employment: Charleston, WV Metropolitan Statistical Area



Bureau of Labor Statistics; Local Area Unemployment Statistics

Economic Development Initiatives

Formerly known as the Charleston Civic Center, the $110 million renovation and expansion of the Charleston Coliseum & Convention Center was completed in October 2018. The new Convention Center serves as the premiere event venue for people from all over the state and nation.

The State recently approved the first 13-acre phase of the Elkview Commons project, a 44-acre commercial and retail development site located off Frame Road, near the Elkview exit off Interstate 79. The project will be funded privately by a new TIF district in Elkview. [12]

[12] Hamilton, Charleston Gazette-Mail. State approves Kanawha's plan for Elkview Commons development project, 21 Oct. 2020.

The City of South Charleston plans to use funding from the proposed tax increment funding (TIF) district to initiate phases two and three of the West Virginia Regional Technology Park's Master Plan. This will expand the developable land by 50 acres and create an entrance by the Jefferson Road Seven-Eleven following the Jefferson Road renovations. The City of South Charleston is currently building the new Park Place Mall which includes a new retail, restaurant, and grocery shopping complex across from Riverwalk Mall.[13]

Yeager Airport recently announced it will receive $1.2 million from the U.S. Economic Development Administration. The funds will be used to build a sewer line on Eagle Mountain Road and to build an aircraft parking apron for its new flight school.[14] This is on top of the tens of millions of dollars the FAA has continued to invest in Yeager Airport for safety and capacity improvements. In November 2019, Spirit Airlines announced it would offer non-stop two-way flights to and from Orlando, FL.[15] The airport generates nearly $175 million in total economic output annually and creates 1,876 full-time jobs. The airport also brings in 95,000 out-of-state visitors who spend $37 million statewide on food, lodging, entertainment, and shopping, according to a study by Marshall University's Center for Business and Economic Research.[16]

Travel Characteristics

Regional Linkages

Regional access in the Kanawha Valley is provided by three major Interstate facilities and three major US facilities: I-64, I-77, I-79, US 35, US 60, and US 119. These routes serve to connect Kanawha and Putnam counties to Huntington, Morgantown, Parkersburg, and Beckley in West Virginia; Dayton, Columbus, and Cleveland in Ohio; Lexington, Kentucky; Roanoke and Richmond, Virginia; and Winston-Salem, North Carolina.

Interstate 64 is an east-west Interstate freeway with current west termini in Lake Wentzville, Missouri and Chesapeake, Virginia in the east. There are 184 miles of Interstate 64 within the state of West Virginia, connecting Huntington, Charleston, Beckley, and Lewisburg.

Interstates 64 and 77 follow the same alignment between Charleston and Beckley. Between the easternmost crossing of the Kanawha River and their split, the facility is operated as part of the West Virginia Turnpike, and vehicular movements are tolled.

Interstate 77 is a north-south Interstate freeway with current termini in Columbia, South Carolina in the south and Cleveland, Ohio in the north. The facility is a toll road for 88 miles of its 186 miles within the state of West Virginia

[13] Garland, Charleston Gazette-Mail. South Charleston tech park to acquire land, new entrance, 21 Feb. 2017
[14] WCHS, Three W.Va. airports, including Yeager, Tri-State, to receive federal grant improvements, 13 Oct 2020
[15] U.S. News, Associated Press, 19 Nov 2019
[16] Steelhammer, Gazette-Mail

and shares its alignment with Interstate 64 between Beckley and Charleston. I-77 connects Beckley, Charleston, Princeton, Bluefield, and Parkersburg.

Interstate 79 is a north-south Interstate freeway with current termini in Charleston, West Virginia to the south and Erie, Pennsylvania to the north. Approximately 160 miles of this facility traverses West Virginia, and it connects Charleston to Clarksburg, Fairmont, and Morgantown and Pittsburgh, Pennsylvania outside the state.

US 35 is a north-south US highway connecting Charleston and Michigan City, Indiana. The route is being relocated in Putnam and Mason counties to a new four-lane facility, which should provide congestion relief for motorists traveling between Scott Depot, Teays Valley, Fraziers Bottom, and Pliny.

US 60 is a major east-west US highway, stretching over 2,600 miles between Quartzsite, Arizona and Virginia Beach, Virginia. Within the state of West Virginia, the route connects Huntington, Charleston, and Lewisburg.

US 119 is a spur of US Highway 19, connecting Pikeville, Kentucky to Sandy Township, Pennsylvania. Within the Kanawha-Putnam planning area, the facility is known primarily as Corridor G and serves as a major connection between the residential suburbs south of Charleston and the downtown area. Appalachian Corridor G begins in Williamson, on the Kentucky State line, and ends at MacCorkle Avenue.

Commuting Patterns

An estimated 81,506 residents both live and work in the two-county region, while 23,497 leave the area for work. Those leaving are primarily traveling west to Huntington and southeast to Beckley.

U.S. Census data indicates that approximately 16% (9,881) of all Charleston employees travel over 50 miles to work in the city. Conversely, 72% of working Charleston residents travel less than ten miles to get to work. In Putnam County, the mean travel time to work in 2018 was 26 minutes. Figure 2-4 shows the distribution of commute times for the two-county region.

From Teays Valley, most commuters travel eastbound rather than westbound. For example, 24.2% (1,584) down from 27.0% (1,683) of workers who live in Teays Valley commute daily to Charleston; 7.2% (470) up from 6.5% (406) commute west to Huntington. Meanwhile, 7.8% (517) commute east to Nitro or South Charleston.

As population growth transitions to low density residential and commercial development areas, the dependence on motor vehicles increases, accompanied by increased traffic congestion. The suburban population growth accounts for greater and lengthier vehicle trips from Teays Valley to Charleston. In addition, more cars and school buses make twice-daily rounds to fast-growing suburban schools. On average, workers in Putnam County spend nearly an hour a day driving to and from work with a 24.9-minute average one-way travel time.

Figure 2-4: Distribution of Commute Times

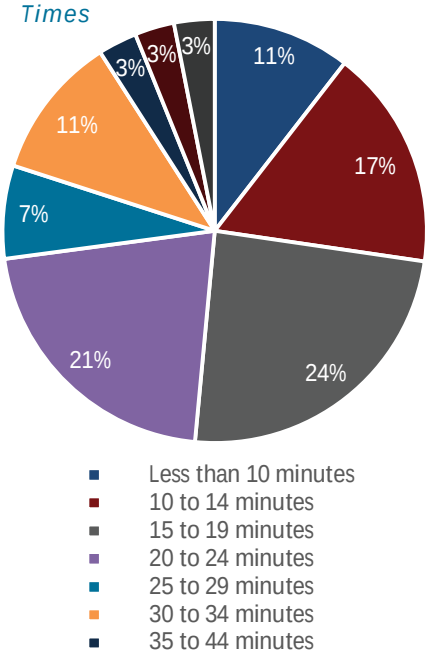
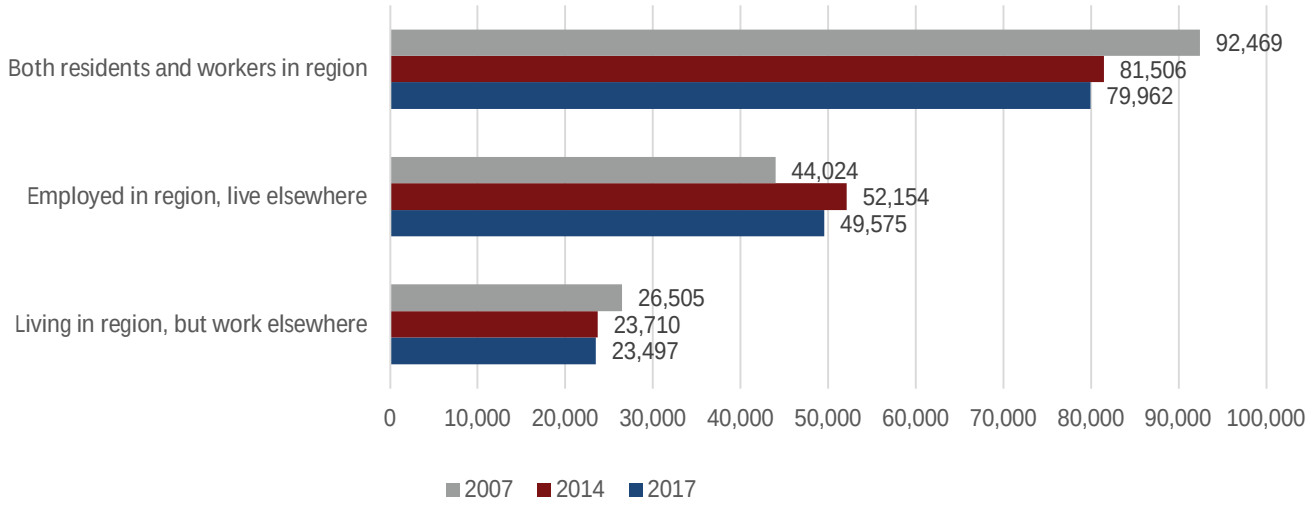


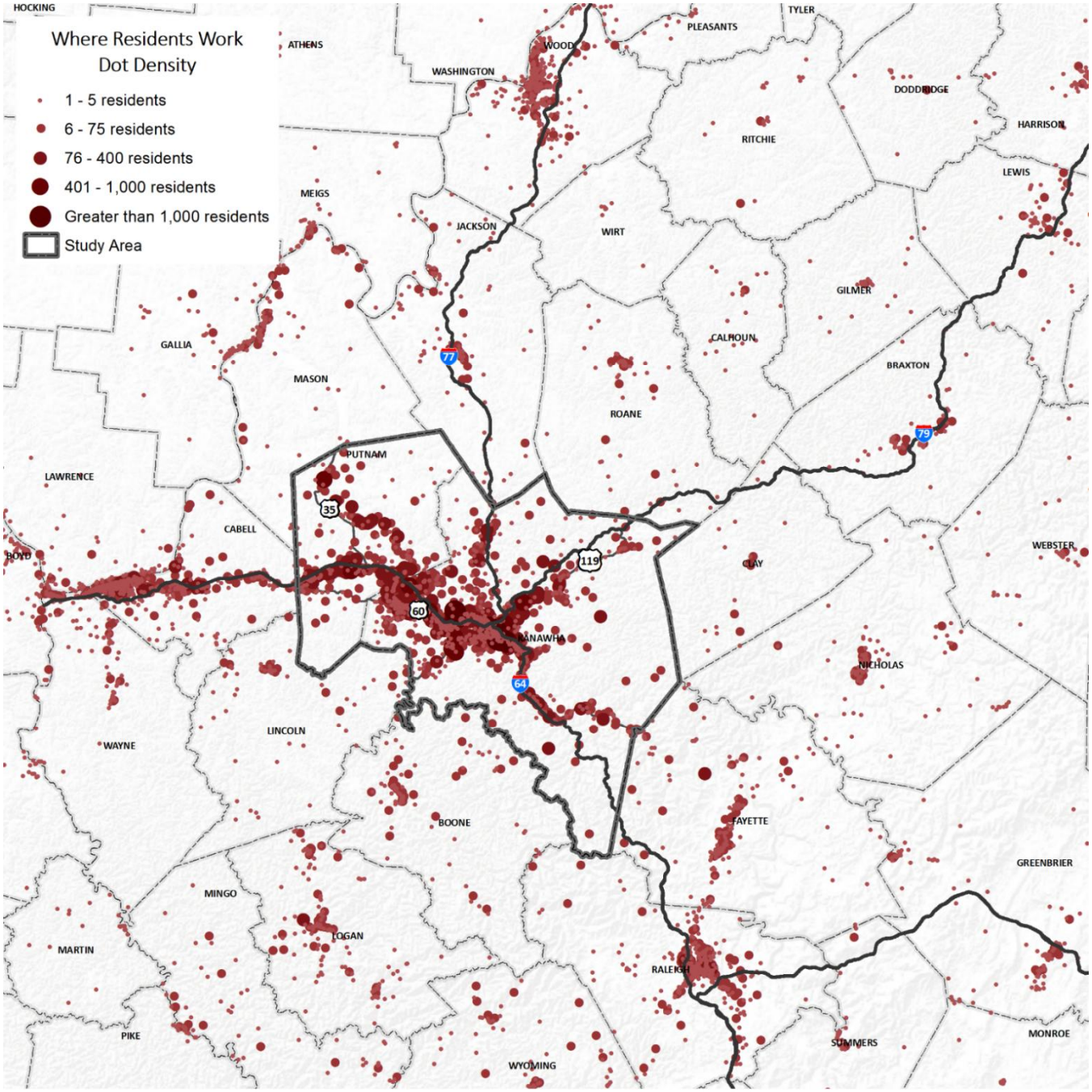
Figure 2-5 below summarizes the inflow and outflow of commutes in Kanawha and Putnam counties. Population losses in Kanawha County account for much of the decline. Most notably, the number of those living in the region, but working elsewhere has the least sharp decline. The sharpest decline flow category was with those who are employed in the Kanawha-Putnam region but live elsewhere. Figures 2-6 and 2-7 further display commute patterns.

Figure 2-5: 2017 In-flow and Out-flow of Commutes for Kanawha and Putnam Counties



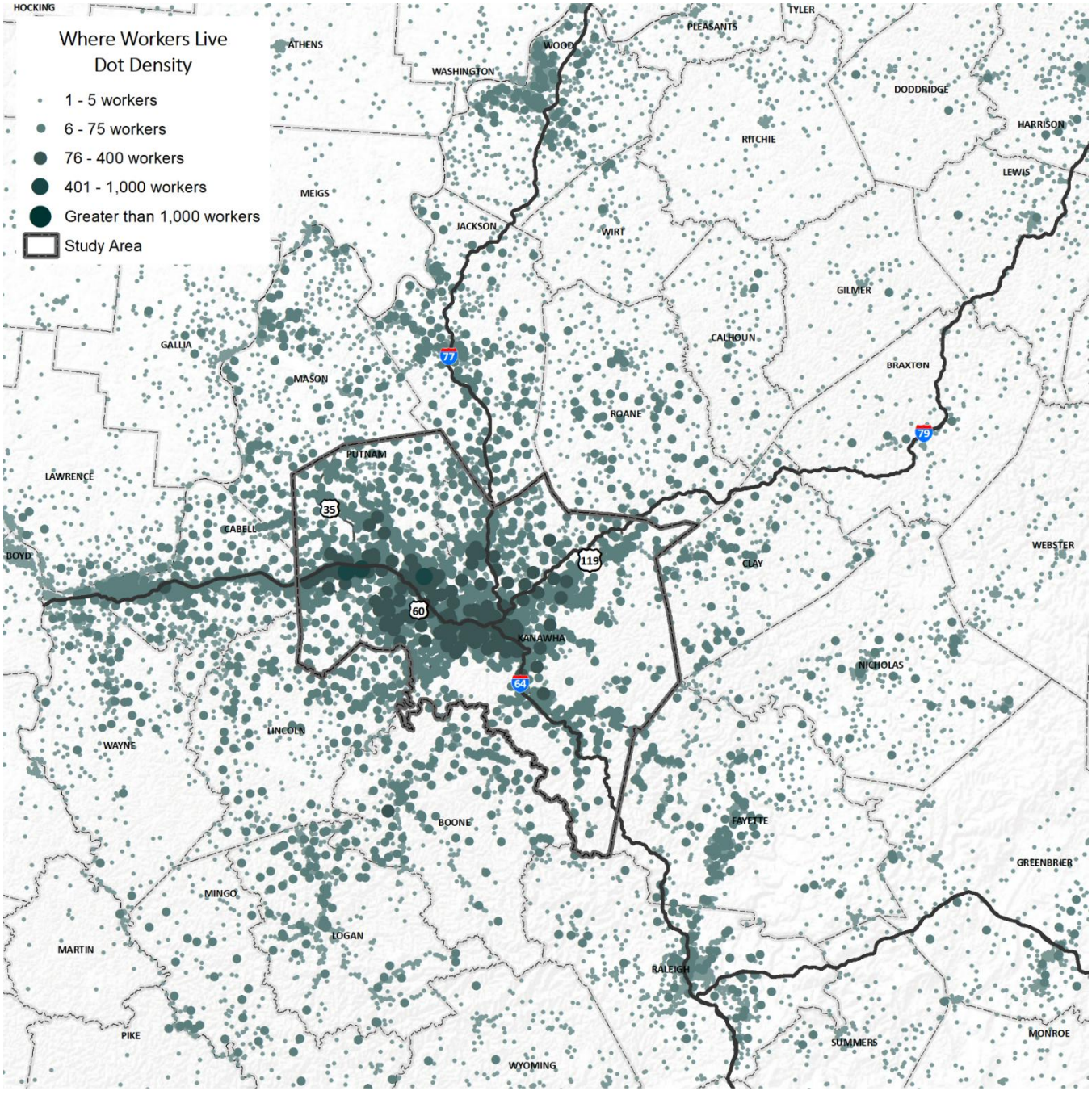
U.S. Census Bureau; 2018 American Community Survey 5-Year Estimates, Table S0801
U.S. Census Bureau; OnTheMap Application and LEHD Origin-Destination Employment Statistics

Figure 2-6: Where Kanawha and Putnam Residents Work



U.S. Census Bureau; OnTheMap Application and LEHD Origin-Destination Employment Statistics

Figure 2-7: Where Kanawha and Putnam Residents Live

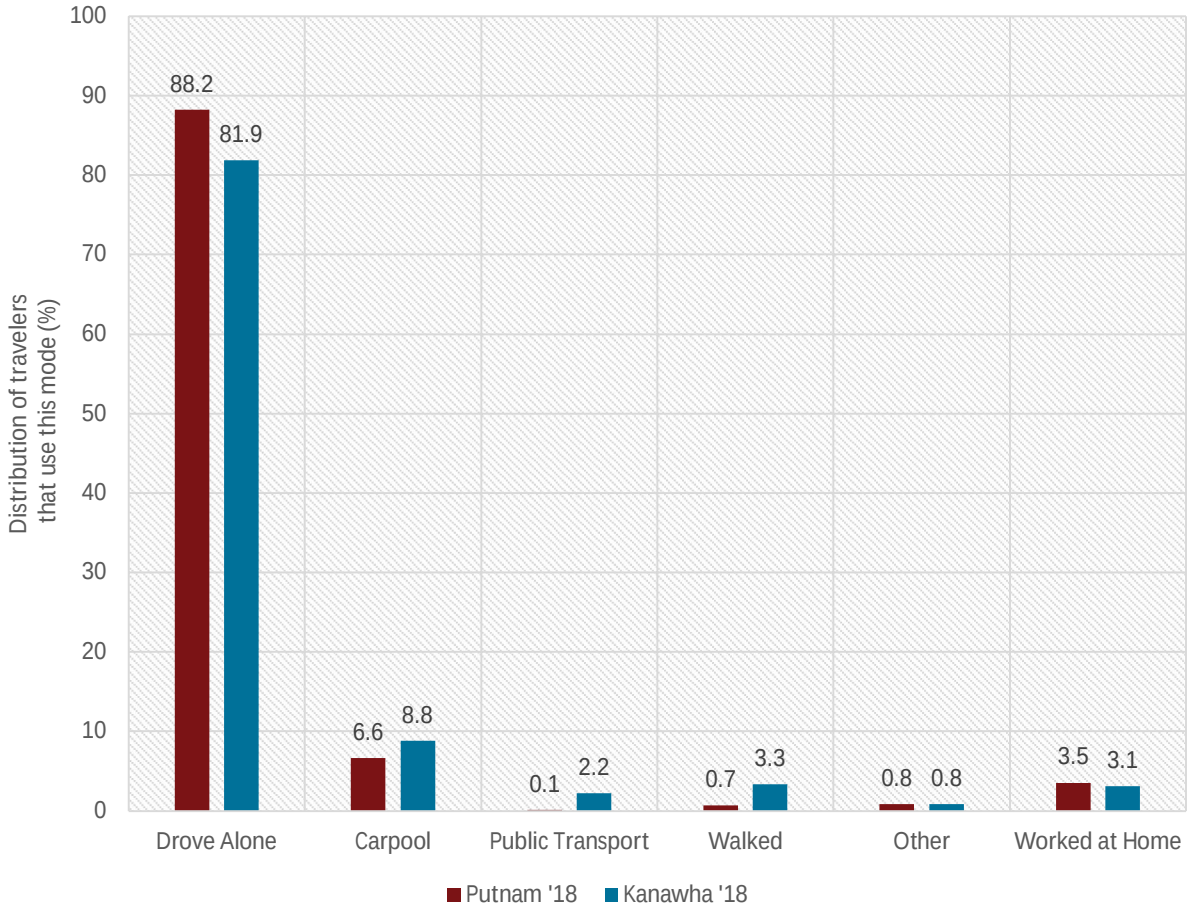


U.S. Census Bureau; OnTheMap Application and LEHD Origin-Destination Employment Statistics

Mode Choice

In both counties, most workers drive alone to work (see Figure 2-8). A greater portion of workers in Putnam County (88.2%) drive alone to work than those in Kanawha County (81.9%), however Kanawha County had the greater increase in share of single occupancy motor vehicle users. Carpooling accounted for the next most common mode of commuting. Approximately 8.8% of workers in Kanawha County carpool, down from 13.4% in 2018, while only 6.6% of workers in Putnam County carpool. In both Kanawha and Putnam counties, 3% of commuters work from home. By 2018, public transportation increased its share of mode choice in Kanawha County, while walking and other (bicycle, taxi, etc.) declined. Meanwhile, in Putnam County, almost no commuters use public transportation or other modes, while 1% of commuters walk to work. There is no public transit agency that provides service to Putnam County.

Figure 2-8: Means of Transportation to Work



Environmental Justice

The Environmental Protection Agency (EPA) defines environmental justice as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.”

This effort is consistent with Title VI of the Civil Rights Act of 1964 and a 1994 Presidential Executive Order requiring all federal agencies to make environmental justice part of their missions. Environmental justice was enacted to avoid the use of federal funds for projects, programs, and activities that would have disproportionately high and adverse effects on low-income and minority populations; environmental justice helps to ensure an equitable distribution of benefits and burdens. The U.S. Department of Transportation (USDOT) promotes environmental justice as a vital part of the transportation planning process as well as individual project planning and design. The environmental justice assessment incorporated into the *RIC MTP* is based on three fundamental principles derived from guidance issued by the USDOT:

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations
- Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process
- Prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations

As part of the *RIC MTP*, the geographic distribution of minority and low-income populations was identified so that the positive and negative effects of various transportation investments could be evaluated. RIC also pursued a robust public involvement process, ensuring opportunities for public input in the decision-making process. RIC seeks to develop programming that ensures that collection, analysis, mapping, and publication of data that will analyze the distribution of benefits and costs of the Transportation Improvement Program (TIP) and MTP.

The environmental justice screening conducted for this plan is not intended to quantify specific impacts. The screening is intended to guide the development of a plan that is equitable in terms of both costs and benefits. A critical purpose of this screening is to provide a framework to gauge the relative impacts of these projects in the community. As individual projects progress to planning and programming, each project will require further and more detailed analyses to identify and minimize specific community impacts on a project-by-project basis. The National Environmental Policy Act (NEPA) provides a framework to foster effective, efficient, and consistent consideration of environmental justice for decision-making on federal actions that affect the environment and human health.

The following thematic maps use 2018 American Community Survey 5-year estimates data to show the distribution of traditionally disadvantaged population groups by census tracts. Figure 2-9 highlights minority populations, Figure 2-10 shows populations living below the poverty line, Figure 2-11 identifies elderly populations, and Figure 2-12 looks at zero-car households. When overlaid with proposed roadway projects, the maps provide a useful tool for analyzing and communicating potential impacts. The results of the plan recommendations with respect to environmental justice and the identified transportation-disadvantaged groups are discussed in the Appendix.

Figure 2-9: Percent Minority Population

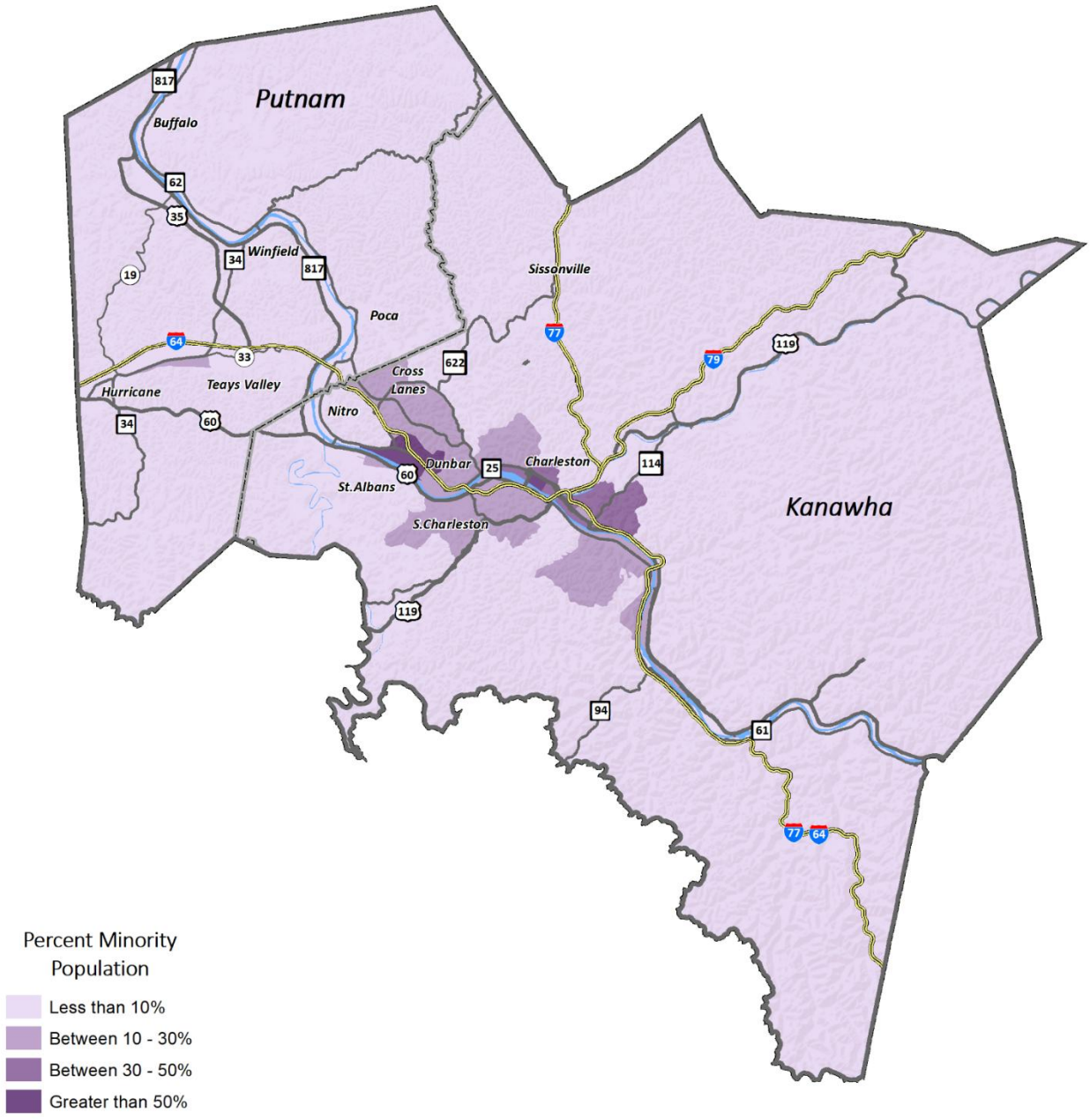


Figure 2-10: Percent Living Below Poverty Line

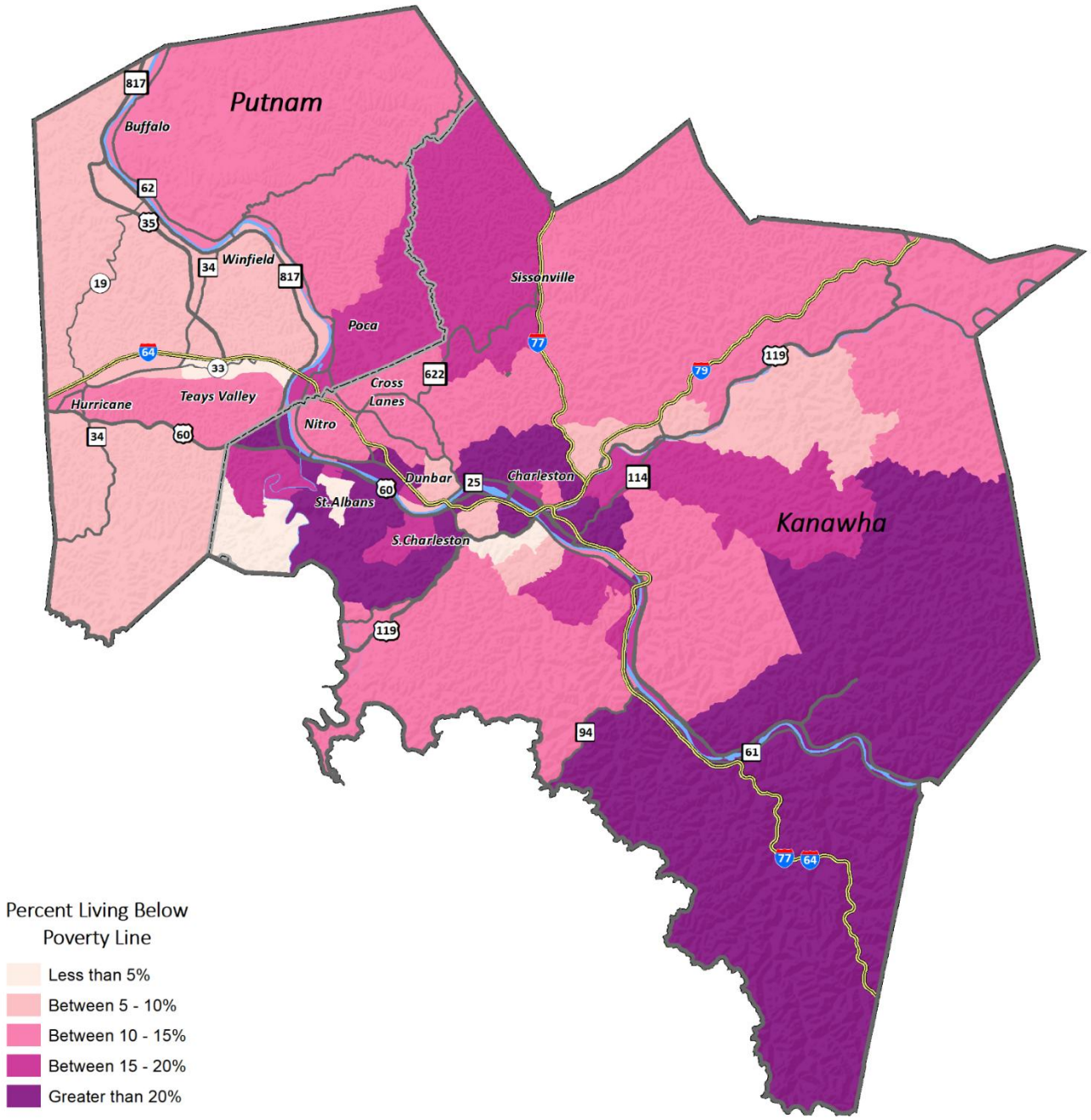


Figure 2-11: Percent Elderly

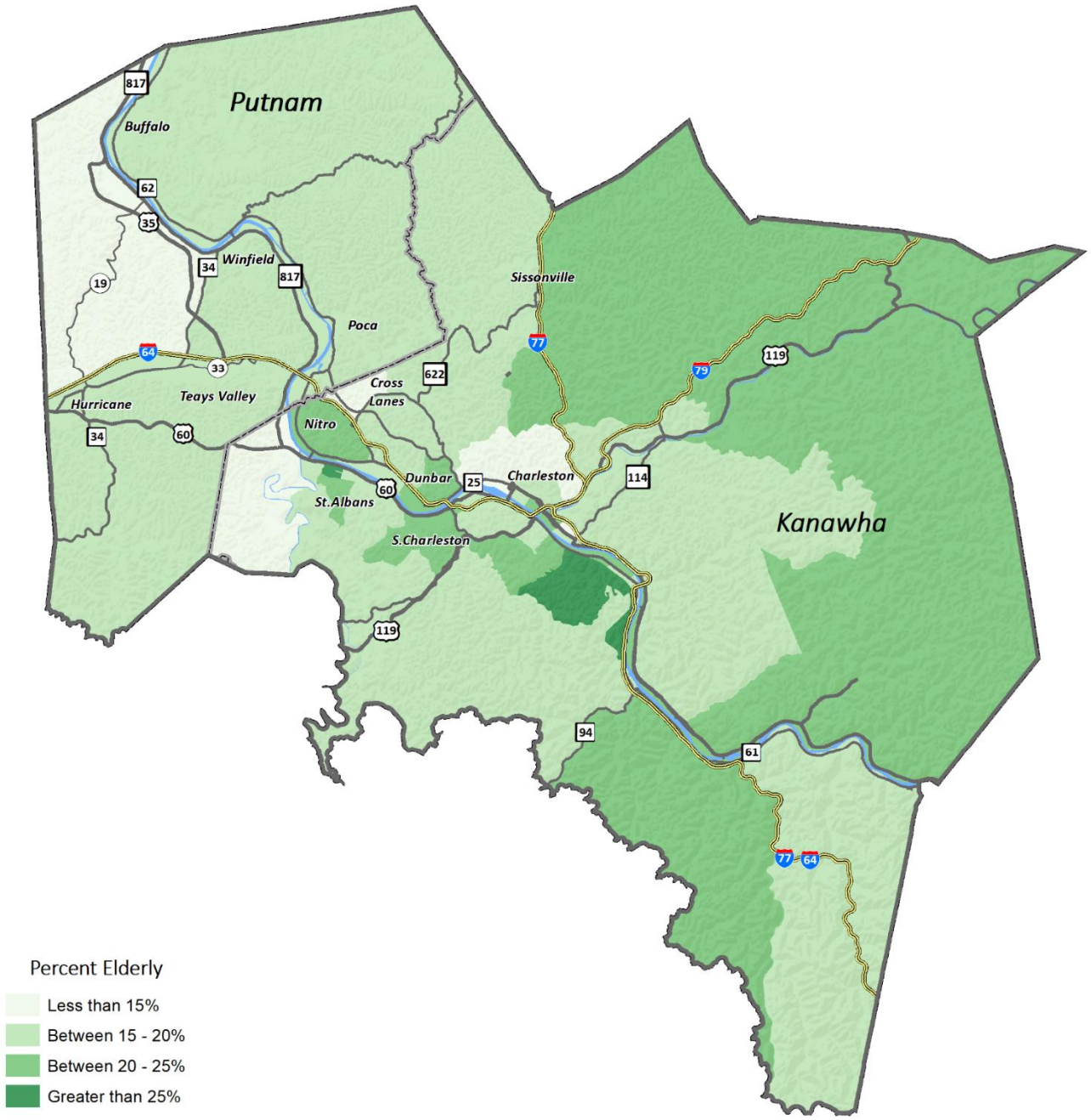
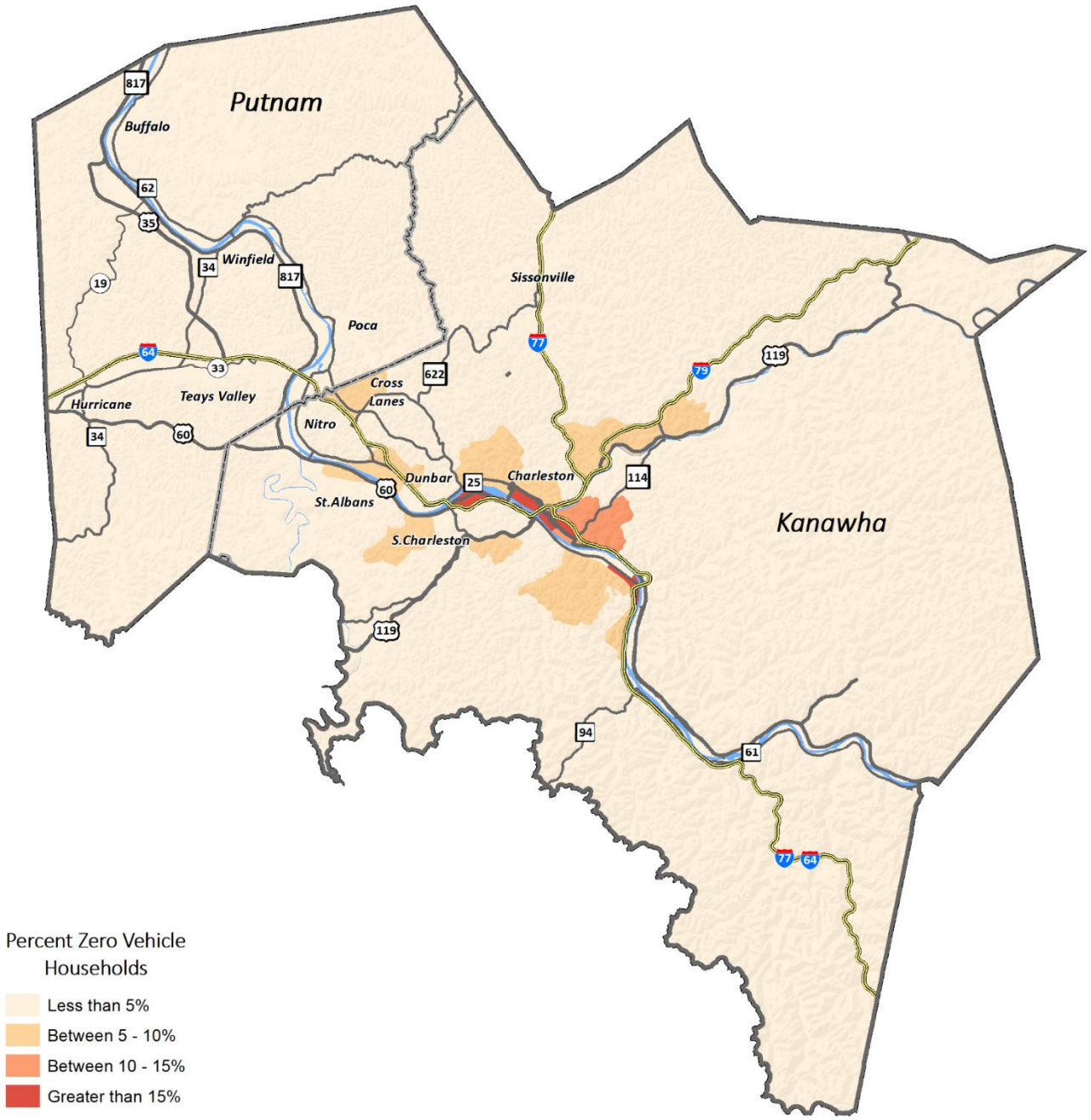
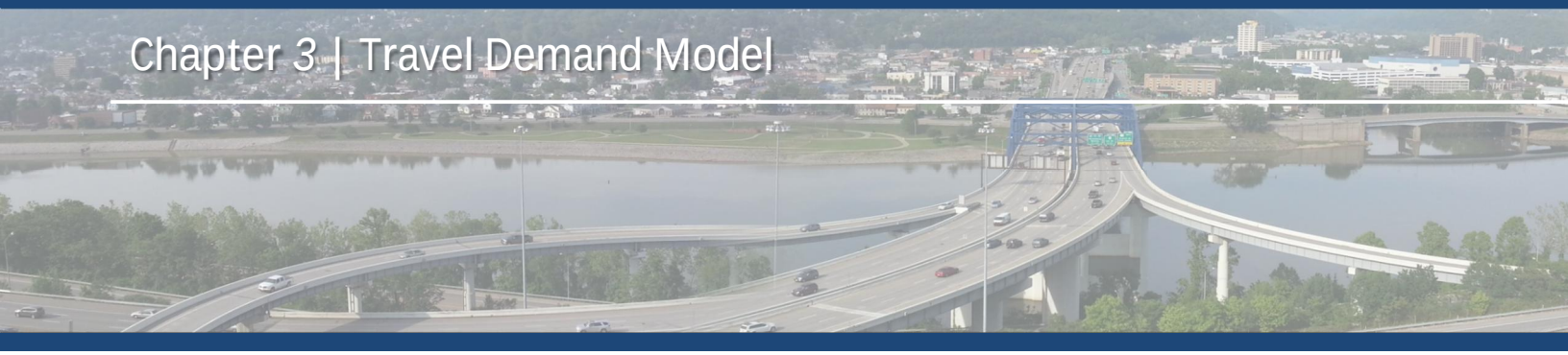


Figure 2-12: Percent Zero Vehicle Households



Chapter 3 | Travel Demand Model



Introduction

The *RIC Metropolitan Transportation Plan* extends far into the future, requiring a methodology that predicts future transportation needs. A travel demand model (TDM) allows the MTP to forecast future traffic conditions based on socioeconomic data and other transportation attributes. The future condition analysis plays a crucial role in project selection and project prioritization.

As in past long-range plan updates, RIC used a regional travel demand model to support the analysis and highlight important linkages between land uses and transportation. This chapter provides an overview of the travel demand model and the key demographic data that was used to estimate future highway congestion and travel.

Regional Travel Demand Model

The project team used the regional travel demand model to assist in the identification and evaluation of future traffic conditions. The travel demand model is advantageous for this type of analysis because it:

- Estimates diversions related to transportation investments including new roadway construction and capacity-enhancing projects (e.g. widening projects)
- Estimates the impact of congestion on regional trip-making behavior and route choices
- Provides relationships between demographics (e.g. household, employment) and travel

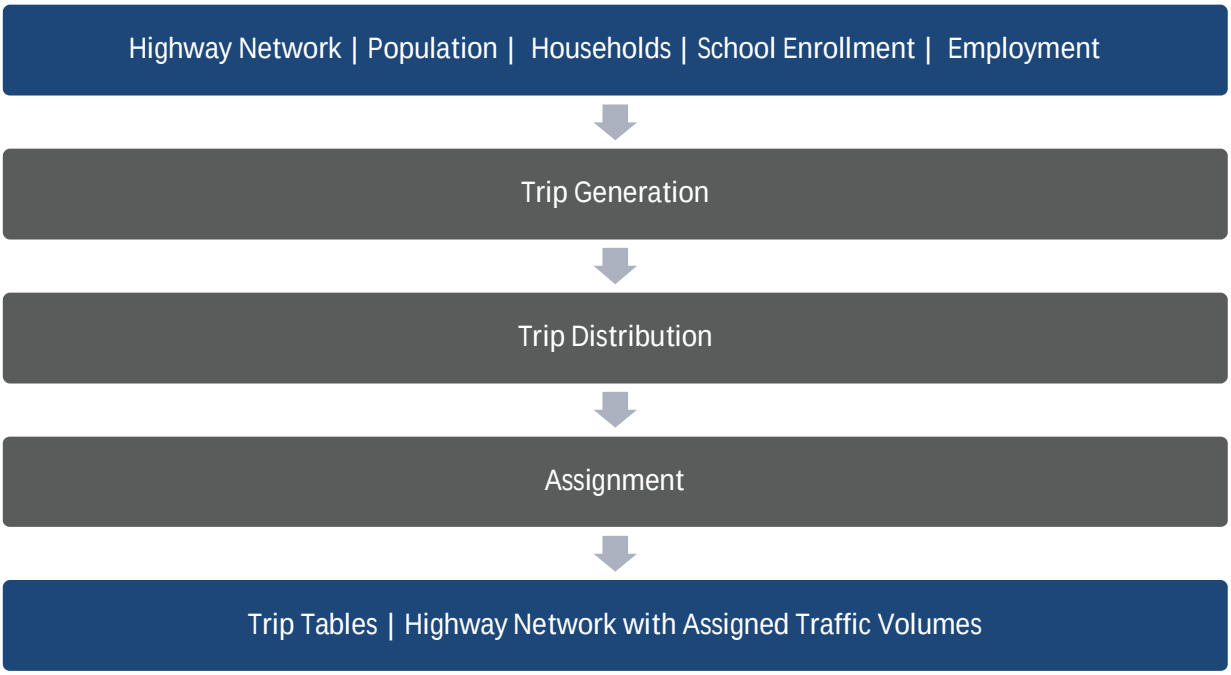
The project team used the regional travel demand model to estimate future roadway deficiencies for the end year of the MTP, 2050. The regional travel demand model was also used to evaluate the individual impacts of proposed capacity-increasing projects, which provided an important performance measure for the project prioritization process. The travel demand modeling process offers “planning-level” assessment. Although the model analyzes individual links of the highway network, it does not explicitly account for every intersection or specific details of intersection traffic signal timing.

The RIC regional travel demand model was originally developed in the early 1990s to support regional planning efforts. The model encompasses both Kanawha and Putnam counties and includes the primary roadways within each county.

The highway network database contains attributes for each individual highway segment including information on the roadway functional classification—the grouping of streets according to the land use served, number of lanes, and speed limits. The "trips" are generated across 411 traffic analysis zones (TAZs) and are loaded onto the roadway network using generalized links that represent the local roadway system.

The model incorporates trip generation, trip distribution, and traffic assignment. Given the small portion of daily travel carried by the mass transit system in the Charleston region, no separate mode choice for transit model is included. Instead, person trips are factored to vehicle trips using auto occupancy information and a transit/walk/bike factor derived from distance.

The model can categorize results according to functional classification. For the purposes of the MTP, the model analyzes Expressways and Freeways, Arterials, Collectors, and Local streets. The model output includes the volume information for trucks and automobiles along with vehicle miles traveled (VMT) and vehicle hours traveled (VHT) by link and by time period.



Model Update and Validation

The regional travel demand model was revalidated and updated to consider socioeconomic and network data consistent with a 2019 base year and 2050 horizon year. The process of updating the model includes revisiting the socioeconomic data, refining the parameters of the model, and reviewing the network attributes.

Travel demand model validation refers to the process of testing a model's ability to replicate base year conditions. For this update, 2019 represented the model's base year. The project team evaluated individual components of the travel demand model process against available data sources including:

- WVDOT traffic counts
- Average work travel times from the American Community Survey (ACS)
- U.S. Census Longitudinal Employer-Household Dynamics (LEHD) workflow data

The model validation effort consisted of an iterative procedure to adjust model parameters to produce reasonable base year (2019) traffic volume assumptions as compared to available traffic count data.

The project team evaluated the performance of the model at each of the count locations. The most common variables used are count deviation and root means square error (RMSE). The RMSE measures the overall absolute difference between traffic volume and count data. To address count deviation, the Federal Highway Administration (FHWA) provides recommendations for model validation in its 1990 report title *Calibration and Adjustment of System Planning Models*. Generally, the model volumes should be within 5.0% of the traffic counts. Table 3-1 summarizes the validation statistics for the 2019 base year. The results indicate the travel demand model sufficiently replicates 2019 daily traffic volumes and is suitable for areawide system and air quality planning purposes.

Table 3-1: Travel Demand Model Validation & Difference for Daily Travel by Facility Type

FACILITY TYPE	TARGET (+/-)	MODEL
Freeway	5%	-4.4%
Principal Arterial	10%	-1.7%
Minor Arterial	20%	18.2
Collector	25%	-3.6
Total	5%	1.8%

CATEGORY	MODEL	FHWA TARGET (+/-)
RMSE	31.4%	< 35%
R^2	0.924	> 0.88

Travel Demand Model Input Data

The primary role of the travel demand model within the MTP planning process is to assist with the evaluation of the transportation system and understand the impacts of transportation investments for the 2050 planning horizon. Demographic and traffic growth forecasts are essential to model future transportation improvement scenarios. The demographics reflect the changes in land use in terms of population, households, and employment. The model's highway network also incorporates transportation projects or investments. The model results must be interpreted and applied to evaluate the impact on key performance measures.

Demographic Forecasts

The demographic forecast identifies the future development patterns that will generate traffic throughout the region. RIC staff provided forecast data by zone for the travel demand model, which was then reviewed and incorporated into the model. By 2050, the estimates indicate the region will experience a net reduction in population, but a net increase in employment.

Table 3-2: Population Projections (2019 and 2050)

COUNTY	2019 POPULATION	2050 POPULATION	PERCENT CHANGE
Kanawha	188,704	173,114	-9.01%
Putnam	59,364	67,034	11.44%

Table 3-3: Employment Projections (2019 and 2050)

COUNTY	2019 EMPLOYMENT	2050 EMPLOYMENT	PERCENT CHANGE
Kanawha	131,785	159,303	17.27%
Putnam	24,003	33,639	28.65%

The project team relied on stakeholder and staff input, economic development insights, and professional judgement to help refine these projections. The population and employment projections attempt to reflect local growth while considering new potential areas and growing employment centers. The distribution of demographic information helped further refine the TAZ-level inputs—unit of geography most commonly utilized in transportation planning models—within the regional travel demand model. These regional growth and employment projections provide estimates not absolutist predictions. Figures 3-1 and 3-2 identify the change between 2019 and 2050 by TAZ for population and employment (respectively) in Putnam and Kanawha counties.

Figure 3-1: Projected Population Change by TAZ

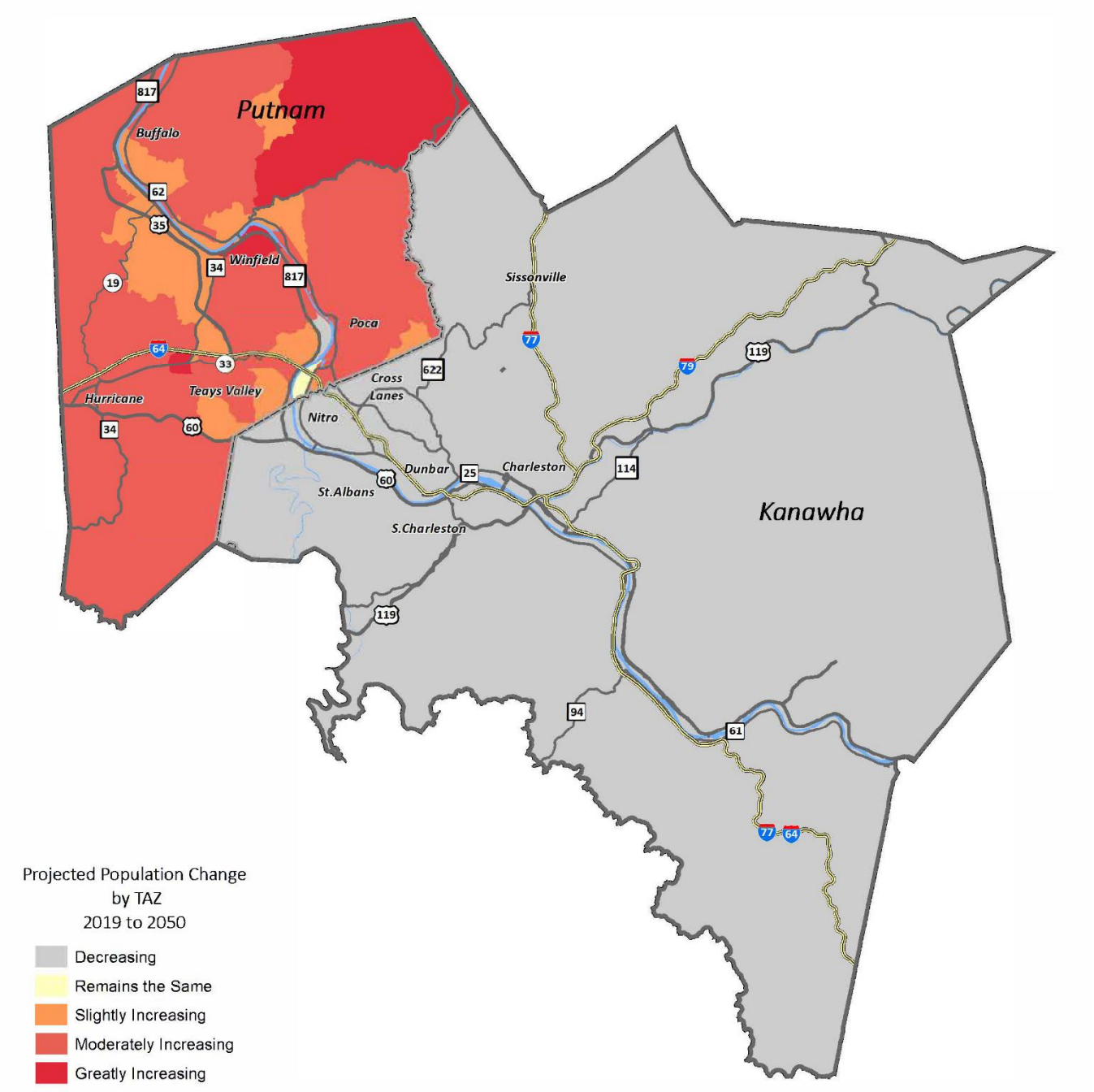
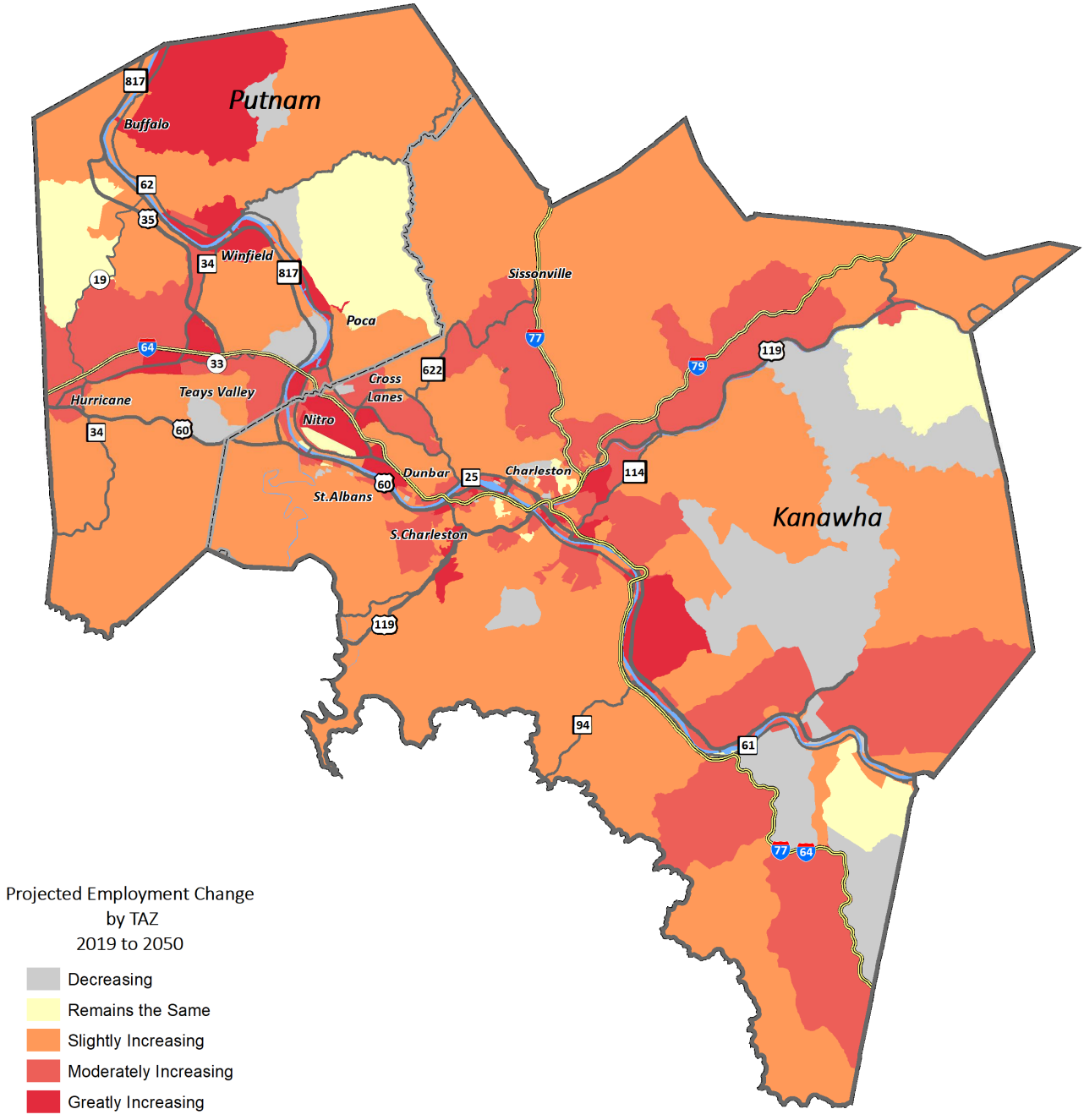


Figure 3-2: Projected Employment Change by TAZ



Highway Networks

The regional travel demand model assigns vehicle trips to the highway network for each scenario. The base year model was prepared to support the model validation effort described earlier in this section. Future year highway networks are required to support the assessment of the 2050 horizon year and to develop interim year networks as required for transportation air quality conformity analysis.

The E+C Network

To evaluate the future transportation needs, the project team identified the future network of roads, which included projects that are already committed for construction. As a result, the modeling analysis assumes completion of these projects and focuses on identifying additional transportation needs. This network is called the “existing plus committed” or E+C network.

2050 Project Scenario Networks

The RIC travel demand model was used to evaluate the impact of identified MTP projects on the highway network. The scenario networks account for projects by changing existing roadway link attributes or by adding new roadway projects to the network. The project team initiated several iterations of networks including all projects identified through the planning process. The network served as an integral part of developing project-level performance measures within the prioritization process.

The project team developed a highway network with only the fiscally constrained projects. The results support the development of the overall plan performance measures.

Chapter 4 | Highway

Existing Roadway Conditions

The primary challenge facing the future of the transportation network in Kanawha and Putnam counties is the collective reliance on single-occupancy vehicles. With a scarcity of transportation funding, identifying the needs of the existing transportation network will provide valuable insight for the planning process. The overview of the existing roadway conditions are organized into the following subsections:

- Transportation Activity Centers and Corridors
- Roadway Functional Classification
- Traffic Safety and Crash History
- Corridor Operations and System Deficiencies
- Public Perception and Insight

Transportation Activity Centers and Corridors

There is an unmistakable link between transportation and land use. As development grows and passenger trips increase, improvements to reduce traffic congestion are needed. These specific roadway improvements often enhance access to major activity centers or provide multimodal opportunities, thus attracting more development and raising land values.

The relationship between activity centers and transportation corridors is essential in providing mobility choices to and from key destinations. Typically, neighborhoods and activity centers rely on a limited number of transportation corridors to provide crucial links between home, employment, school, shopping, and recreational destinations. The extent to which these origins and destinations blend into multiuse activity centers has a drastic effect on mode choice. By providing a range of mode choices—walking, biking, driving or taking transit—the perception of a community can change to appear and become more connected. Table 4-1 summarizes the three types of activity centers and provides local examples.

The level of success for corridors between and within activity centers largely depends on the intended function of the street. With limited funding resources, balancing the area's mobility needs will be a

challenge. Vehicular mobility is often given priority with little regard for other functions of a street, the relationship to land use, urban design, and to promote alternative modes of transportation.

A unique challenge of creating a successful transportation network is blending access and connectivity while leveraging the natural features special to Kanawha and Putnam counties. Smaller communities within the region may have different priorities or needs. Understanding the different needs of each community will improve the overall connectivity. This concept is particularly relevant as it relates to people's desires to make safe and efficient trips not only by driving, but also by other means of transportation. The discussion of complete streets sets the stage for the region to balance access and mobility functions of a roadway.

Table 4-1: Activity Centers

CENTER TYPE	TRANSPORTATION CORRIDOR	CHARACTERISTICS
Regional Activity Center		
Local Example: Downtown Central Business District	Washington Street or Lee Street	• Accesses interstates and freeways, major arterials, and public transportation • Balances residential and non-residential land uses • Encourages higher residential densities • Encourages transit supportive center of employee-intensive land uses • Serves residents with municipal water and sewer • Supports core areas that contain large-scale and high intensity urban land uses
Community Activity Center		
Local Example: Charleston Town Center Mall	MacCorkle Avenue	• Accesses major arterials and public transportation • Balances residential and non-residential land uses with a 60/40 split • Encourages medium density residential areas • Includes a combination of retail, personal services, civic, educational, and social uses • Serves residents with municipal water and sewer • Supports medium-scale development in core areas that serve the day-to-day needs and activities
Neighborhood Activity Center		
Local Example: East End Neighborhood	Quarrier Street	• Accesses major and minor arterials with connection to collector streets • Contains mostly residential land uses with a mixed-use element that provides retail and services to neighborhoods • Encourages low and medium density residential areas • Provides transit service connections

Functional Classification

A functional classification is the process by which streets of different characteristics and usage are grouped into broad categories. These categories are based on the intended service they aim to provide. The roadway characteristics and traffic operation of streets define these categories. The roadway functional classifications include:

- Interstates
- Freeway and Expressways
- Other Principal Arterials
- Minor Arterials
- Collectors
- Local Roads

The Kanawha-Putnam region is home to several miles of National Highway System (NHS). The NHS includes the interstate highway system in addition to other roads important for the nation's crucial functions. These critical functions include the economy, defense, and mobility of people and goods. There are approximately 192 miles of the NHS in the study area.

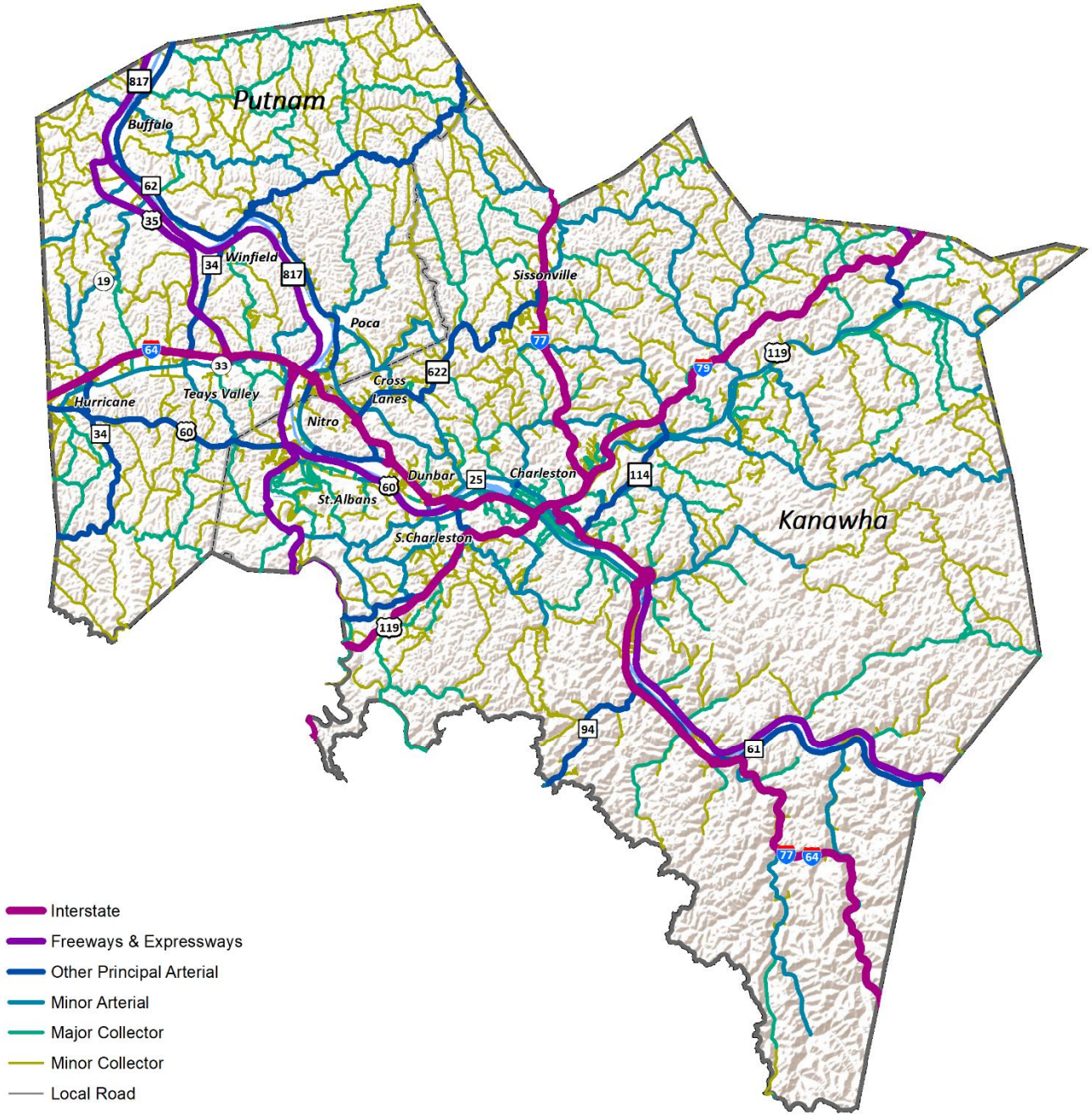
The two major considerations for classifying arterials for neighborhood streets are mobility and access. The primary function of local or neighborhood streets is to provide access; these streets are intended to serve neighborhoods or localized areas including mixed-use or commercial land uses with low speeds, low volumes, and typically for short distance trips.

The primary function of an arterial is to provide mobility. By limiting access points such as intersections and/or driveways, arterials enhance traffic flow and movement. While enhancing the movement is beneficial, too much mobility at high speeds discourages pedestrian and bicycle access. Typically, arterials are designed to carry more traffic than is generated within the corridor with higher speeds, higher volumes, and traveling longer distances.

Table 4-2: Functional Classification Definitions and Examples

FUNCTIONAL CLASSIFICATION	DEFINITION
Arterials	Arterials operate at high speeds, provide high mobility, and provide significant roadway capacity, have a great degree of access control, and serve longer distance travel. Arterials can be further subdivided into categories that include facilities with full access control—freeways and expressways—in addition to major and minor arterials. Typically, arterials connect to one another. Arterials rarely connect to local streets.
Expressway & Freeways	Interstate 64, I-77, and I-79
Major Arterials	MacCorkle Avenue (US 60, WV-61), US 35, US 119 (Corridor G), WV 34, and WV 25
Minor Arterials	Dupont Avenue, Kanawha Terrace, Big Tyler Road, WV 61, and WV 62
Collectors	Collectors typically operate at lower speeds, provide less overall mobility, have more frequent and greater access flexibility, and serve shorter trips and distance than arterials. Collector streets provide critical connections in the roadway network by acting as the nexus between arterials and local roadways. Most collectors connect other collector streets and local streets.
	Cow Creek Road, Five Mile Road, Poca River Road, Sissonville Drive, and Superior Avenue
Local	Local streets provide greater access and the least amount of mobility. These facilities typically connect to one another and provide a high level of access to adjacent land uses or developments. Local roadways serve short distance travel and typically have low speed limits. The majority of roadways in the Kanawha-Putnam area are classified as local.

Figure 4-2: 2019 Congested Corridors



Traffic Safety and Crash History

Safety is a fundamental component of any successful transportation plan. By examining the crash history and identifying traffic patterns, locations where improvements can be made will benefit the community. The compilation of safety data that was considered in the development of the Kanawha-Putnam is summarized in Chapter 8.

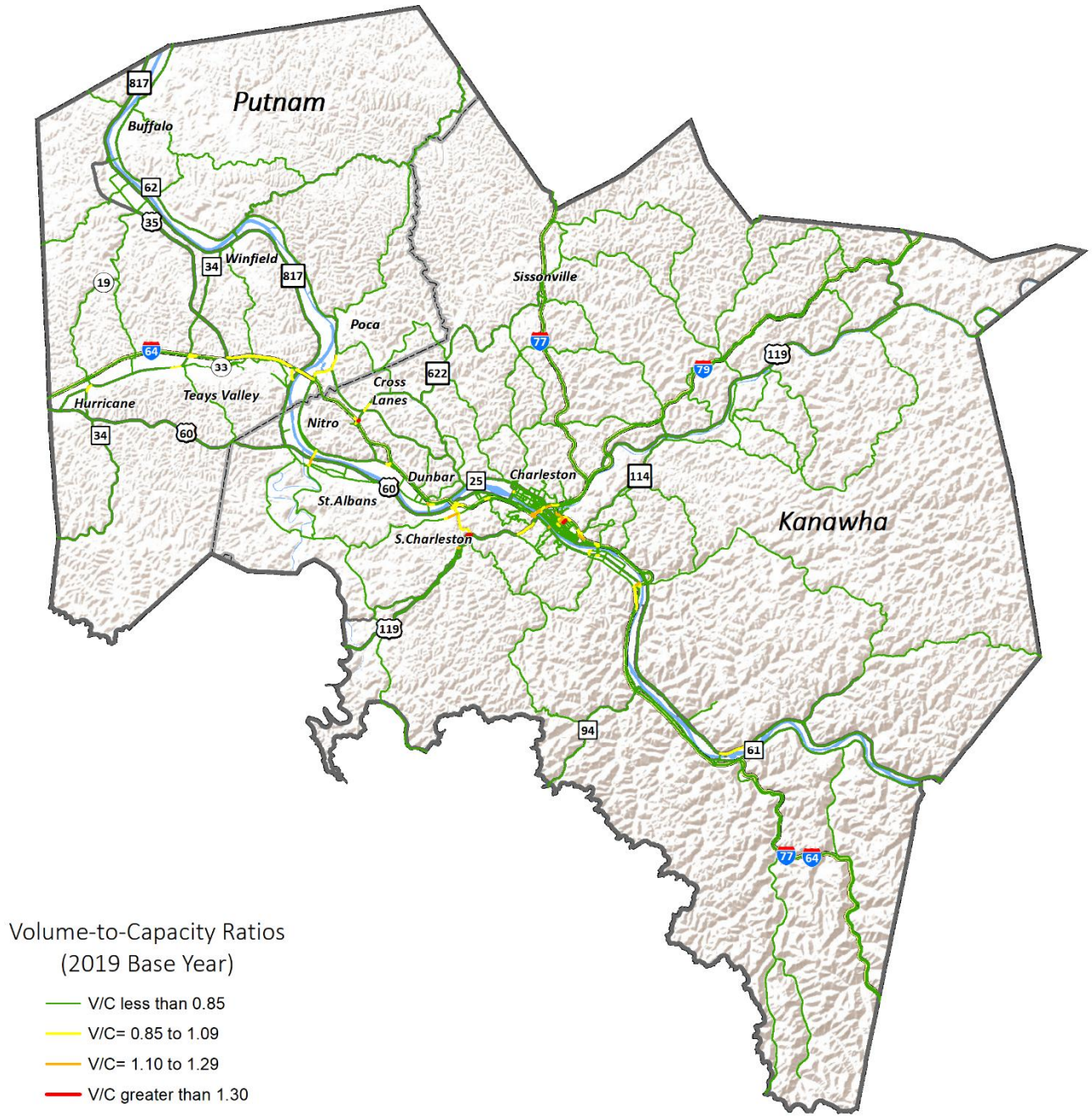
Corridor Operations and System Deficiencies

Corridor congestion is related to several factions; however, it is often the result of bottlenecks along the corridor or at intersections. Aside from individual bottleneck locations, congestions frequently result from too many people trying to use a route that is already at or over capacity. Volume-to-capacity (V/C) ratios were used to identify congested corridors. V/C ratios are calculated by dividing the traffic volume of a roadway segment by the theoretical capacity of a roadway. While V/C can be tied to level of service (LOS), volume-to-capacity allows for more specific analysis. Table 4-3 describes the V/C ratio categories that were used to analyze roadways for the MTP. Figure 4-2 was used to determine future improvements needed to alleviate congestion and improve the overall transportation network.

Table 4-3: Volume-to-Capacity Ratio Categories

CATEGORY	DESCRIPTION
V/C < 0.85	A roadway with a V/C less than 0.85 typically operates with efficiency and is not considered congested
0.85 ≤ V/C < 1.09 Approaching Capacity	A V/C that approaches 1.0 indicates a roadway is becoming more congested. This kind of roadway may operate effectively during non-peak hours but not during peak periods
1.10 ≤ V/C < 1.29	Roadways that operate slightly above capacity are heavily congested during peak periods. A change in capacity will greatly impact the travel flow on corridors operating between 1.10 and 1.29.
V/C > 1.30	The roadways that fall into this category represent the most congested corridors in the study area. These roadways are congested during non-peak hours and most likely operate in gridlock conditions during peak periods.

Figure 4-2: 2019 Congested Corridors

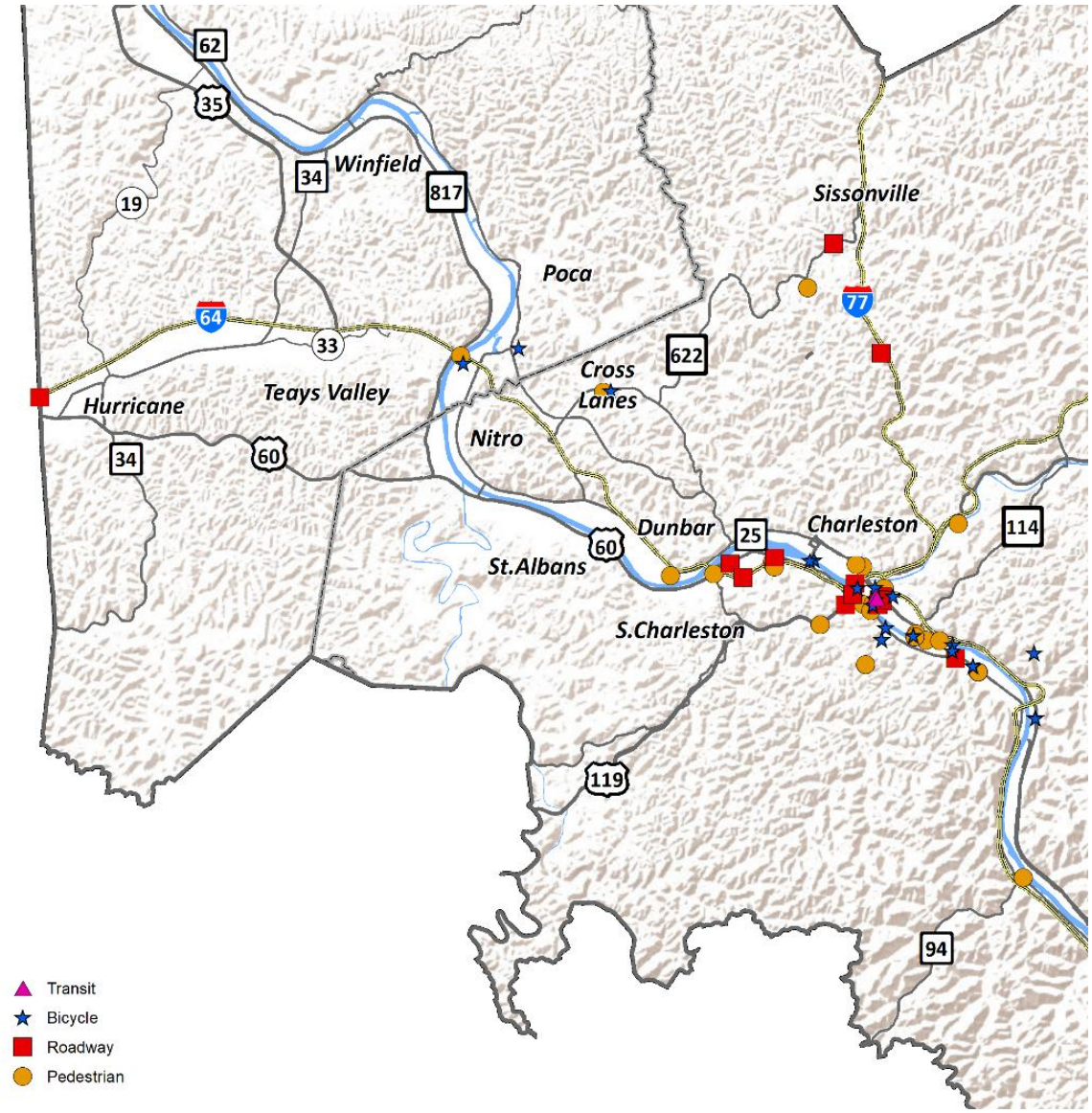


Public Perception and Insight

Sometimes traffic problems are not always the product of congestion. Problems could be created by providing a lack of alternative routes, confusing roadway configuration, or frustrating commutes during peak hours. While these problems cannot be measured with traditional, quantitative traffic analysis methods, the public can provide valuable insight into the planning process.

A component of public outreach was collecting information during an online survey. The survey gathered information on the public's perception of transportation problems in the existing transportation system and gauged the community's appetite for potential transportation solutions. The following figure shows roadway issues identified by online participants.

Figure 4-3: Online Public Input – Participant-Identified Issues



Future Roadway Conditions

The challenges facing the future of the transportation network in the Kanawha-Putnam region are the culmination of project employment growth, dependence on the automobile, and the competition for scarce transportation resources and funds. Using the socioeconomic forecast data developed for the RIC Travel Demand Model, the general population in Kanawha County is anticipated to decrease, but the employment is anticipated to increase. In Putnam County, both population and employment are expected to increase.

This section considers the dynamics that were examined in the future transportation network. The RIC Travel Demand Model was used to assess both the existing and future travel conditions. The TransCAD model tested the operation of the future highway network under various scenarios. Two scenarios were developed for 2050 travel conditions using the model, including the construction of E+C (existing and committed) projects and the construction of all fiscally constrained projects.

This section begins with an overview of the E+C scenario, which considers the impact that committed projects will have on future travel conditions. A set of recommendations were developed to alleviate any existing and/or future congestion problems. These recommendations were vetted through discussions with the Steering Committee and planning staff. Recommendations were eventually prioritized based on identified evaluation criteria, which is discussed later in this section.

This section concludes with strategies for connectivity, access management, complete streets, and intelligent transportation system (ITS) improvements.

Committed Conditions

The preliminary step for identifying projects for the Kanawha-Putnam 2050 MTP was to analyze how the existing transportation network overlaid with the committed projects would perform in 2050. The state's Dynamic Statewide Transportation Improvement Program, which provides a financially constrained list of priority projects, includes the evaluation of existing and committed conditions by horizon year shown on Table 4-4.

Table 4-4: Committed Projects

FACILITY	PROJECT DESCRIPTION
Interstate 64	Interstate 64 will be widened from four to six lanes between WV 34 and east of the Nitro Interchange. The project would enhance capacity and ease travel at one of the region's highly traveled corridors.
RHL Boulevard	The RHL Boulevard project constructs a new three-lane roadway facility with two-way left-turn lanes between the existing RHL Boulevard and Jefferson Road (WV 601).
WV 62 Cross Lanes	This new E+C project makes improvements to WV 622 Cross Lanes between Jain Drive and Dewitt Road. The improvements include widening to a combination of four to five lanes.
US 119/ Oakwood Area	The US 119 improvements between MacCorkle Avenue and Emerald Drive include intersection upgrades to improve corridor safety and reduce delay along the corridor.

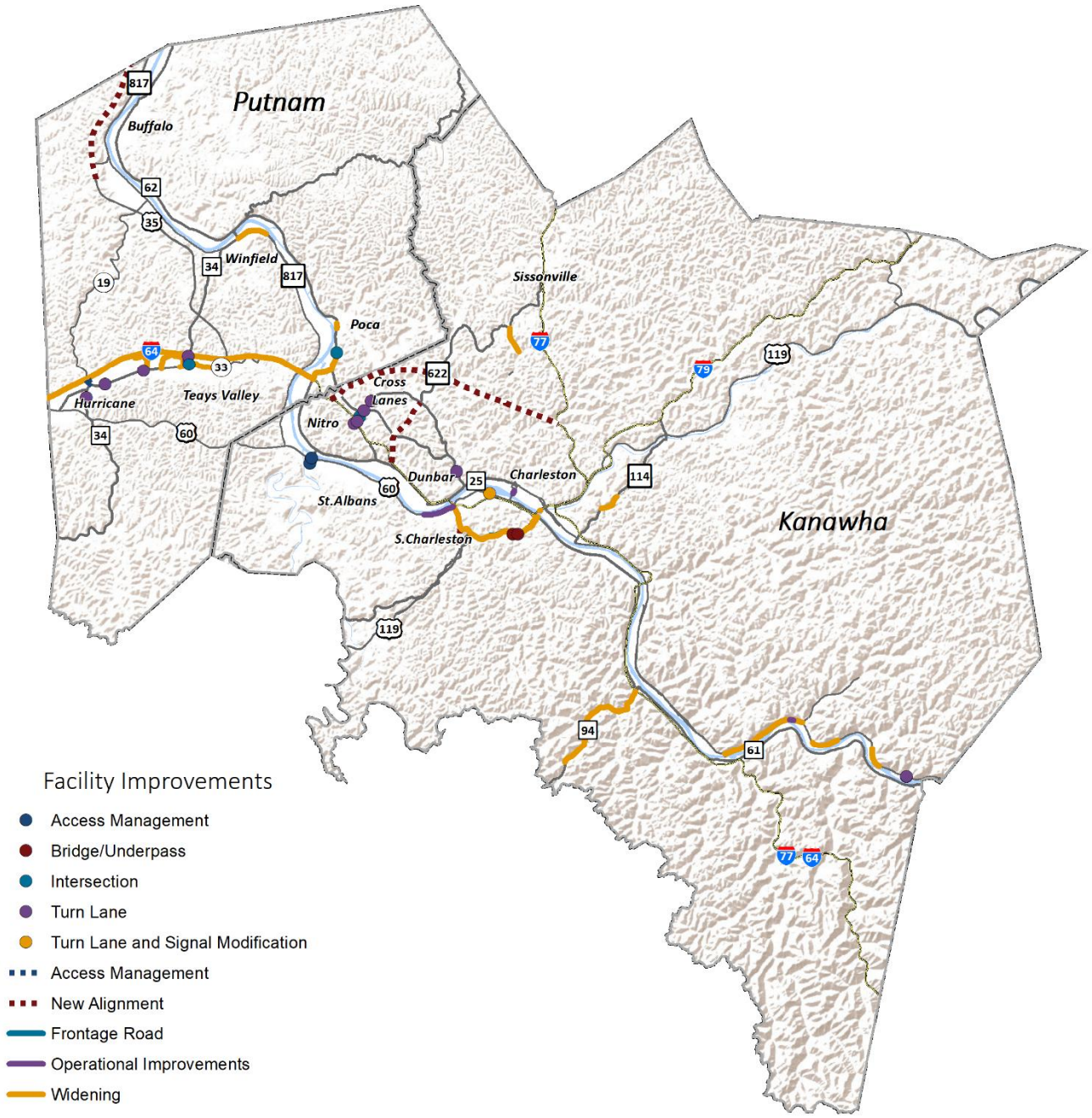
Recommendation Development

The evaluation of the transportation system over the next thirty years shows that there will be an increased demand on the existing network. Protecting and maintaining the integrity of the roadway system without adversely affecting the natural or existing network will be imperative. The Kanawha-Putnam 2050 MTP provides a list of proposed improvements specific to key corridors throughout the study area. The list includes projects that were developed with input from stakeholders, local officials, and the Steering Committee.

The Kanawha-Putnam 2050 MTP acknowledges that there will be remaining congestion issues after the completion of the existing and committed projects described in previous sections. These areas are considered high priority. Through extensive analysis of these congested corridors—along with environmental and socioeconomic considerations—a set of roadway recommendations was developed. The projects were prioritized based on the balance between the assessed benefits and associated barriers of implementation. Notably, these projects were assessed with the evaluation criteria in mind before the final prioritization and financial constraint.

The recommendations are placed into several categories including new location, widening, access management, and operational improvements. Recommendations emphasized preserving the existing roadway to meet the goal of fiscal responsibility and system preservation. The recommendations that follow aim to alleviate system-wide congestion in a cost-effective manner. Similarly, the multimodal solutions presented in Chapters 5 and 6 provide further detail about bicycle, pedestrian, and transit recommendations. The following section discusses the proposed projects for the Kanawha-Putnam 2050 MTP. On the following page, Figure 4-4 displays the recommendations for the Kanawha-Putnam region.

Figure 4-4: Facility Improvements



Project Prioritization

The evaluation of roadway projects for the 2050 MTP includes both qualitative and quantitative metrics. The metrics were defined in coordination with the Steering Committee and RIC staff. In addition to defining the metric, the Steering Committee and RIC staff also considered the importance of each metrics and how much weight each metric should carry during the prioritization process. Table 4-5 defines each metric used in the prioritization process and the guiding principle it supports.

Prioritization as a Planning Tool

The consideration of socioeconomic, environmental, cultural, and congestion factors during the development of the MTP served as a tool to ensure the plan is comprehensive and responsive to multifaceted issues. As a tool, prioritization is an effective way to guide the allocation of future resources in a dynamic way. Notably, the projects shown in Table 4-6 are not financially constrained; the following table shows projects independent of potential revenues and should be used as a guide to advocate for future funding sources.

The guiding statement definitions and supporting goal descriptions can be found in Chapter 1. The financially constrained projects are shown in Chapter 9. These financially constrained projects are further supported by project sheets provided in the Appendix.

Culture & Environment

Economic Vitality

Land Use & Transportation

Mobility & Accessibility

Safety & Security

System Preservation

Table 4-5: Prioritization Measures, Criteria, and Relevant Guiding Principles

MEASURE	CRITERIA	GUDING PRINCIPLE
Access to Schools	Improves access to schools	
Access to Social Services	Improves access to providers of social services and healthcare	
Alignment with Online Survey Feedback	Number of times project identified as a priority project	
Alignment with Social PinPoint Feedback	Number of comments and points along a project segment	
Anticipated Employment Growth	Serves high growth area(s)	
Anticipated Population Growth	Serves high growth area(s)	
Commuting/Economic Development	Serves work locations (jobs per mile)	
Connects with active transportation	New connection to existing bicycle and pedestrian network	
Current Freight Mobility	Serves high percentage of trucks in current conditions	
Current Level of Service (LOS) Deficiency	Identifies poor quality of traffic flow based on speed and density	
Future Freight Mobility	Serves high percentage of trucks in future conditions	
Peak Period Delays	Project serves locations with high peak hour congestion	
Proximity to Community Resources	Serves libraries, parks, historic features	
Reduction in Delay	Impact on regional hours of delay	

MEASURE	CRITERIA	GUDING PRINCIPLE
Regional Freight Shippers and Receivers	Improves mobility to key shipping and receiving centers	
Safety Enhancements	Address high-accident locations for vehicles and bicycles and pedestrians	
Statewide Prioritization	Supports statewide goals	
Transit Service Improvements	Overlaps with transit route(s)	

Table 4-6: Prioritized Project List

ID	PROJECT ROAD	FROM	TO	PROJECT TYPE	RANK
RSA-1	Patrick Street	4th Ave	Patrick Street Plaza	Intersection Modification	1
SH-1	MacCorkle Ave	Rock Lake Drive	Jefferson Road	Multiple	2
KC-5	US 119 (Corridor G) Comprehensive	I-64 Connector	Lucado Road (generally)	Multiple	3
KC-4	US 119 (Corridor G)	MacCorkle Avenue	Lucado Road	Widening	4
PC-U1	Interstate 64	Cow Creek Road	Cabell County Line	Widening	5
PC-3	Interstate 64	Cow Creek Road	WV 34	Widening	6
PC-6A	Teays Valley Road (CR 33)	WV 34	Thomas Drive	Widening	7
KC-8A	US 60 (Dupont Avenue)	Kellys Creek Road (CR 81)	Chelyan Bridge	Access Management	9
PC-2	WV 817	Winfield Bridge	Planters Road	Widening	10
RSA-3	US 60 (Dupont Ave)	Hull Ave	William Street	Safety Improvements	11
KC-6	US 119 (Corridor G) Comprehensive	Jefferson Road Interchange	Emerald Road	Multiple	12
KC-8D	US 60	Old Town Road	Browns Mountain Road	Widening	13

ID	PROJECT ROAD	FROM	TO	PROJECT TYPE	RANK
RSA-2	WV 34	I-64	Great Teays Blvd	Roundabout Corridor	14
PC-8A	WV 62	WV 25	Dairy Road	Widening	15
KC-1 (SA-2)	3rd Street Underpass	-	-	Widening	16
TV-4	Mt. Vernon Road (CR 34)	WV 34	WV 34 (Teays Valley Road)	Modernization	17
KC-U1	Institute Connector, ALL PHASES	Institute Interchange	WV 622	New Alignment	18
KC-9	WV 114 (Greenbrier Street)	Airport Road	Rutledge Road (CR 46)	Widening	19
KC-8C	US 60	Sycamore Road	Britt Hollow	Widening	20
KC-U2	Northern Connector, ALL PHASES	I-64	I-77	New Alignment	21
PC-4	Hurricane Improvements	-	-	Access Management	22
KC-7	WV 94 (Lens Creek Road)	Six Mile Hollow Road	I-64	Widening	23
PC-8B	WV 62	Heizer Creek Road	Poca City Limits (southside)	Widening	24
TV-5	Sleepy Hollow Road	Teays Valley Road	Cow Creek Road	Widening	25

Chapter 5 | Bicycle and Pedestrian Element

Introduction

Transportation by way of cycling or walking—commonly referred to as non-motorized or active transportation—is utilized for more than just recreation or exercise. Community members of all ages have become more reliant on using active modes of transportaiton to travel between their homes and commercial shopping locations, as well as other important destinations such as workplaces or educational institutions. This chapter includes current initiatives, future recommendations, and the overall planning process for bicycle and pedestrian projects and improvements throughout the region.

Although planning for bicycle and pedestrian facilities is required by federal law, there are numerous benefits that active transportation provides. Not only does active transportation encourage a healthier lifestyle, it is also better for the natural environment. Planning for bicycle and pedestrian facilities is multifacited. The improvements for active transportation can extend beyond conventional sidewalks or bicycle lane projects. Studies show that bicycle and pedestrian traffic can increase by up to 6% and 3% annually, respectfully.[1] Regional planning efforts must consider the growing desire for active transportation. Other studies show that bicycle and pedestrian infrastructure increase the quality of life. One study demonstrated that for every $1 dollar spent on these types of improvements, regional economies see an additional $8.41 in sales outputs and $2.65 in personal incomes.[2] This

Courtesy of the City of Charleston

[1] Huyen T.K., Buehler R., Hankey, S. Have walking and bicycling increased in the USA? 13-year longitudinal analysis of traffic counts from 13 metropolitan areas. Transportation Research Part D 2019;329-345

[2] Baerg, R. (2016). Active Transportation Health and Economic Impact Study (p. 7) (United States, Urban Design 4 Health). Los Angeles, CA: Southern California Association of Governments.

highlights not only economic benefits of bicycle and pedestrian facilities, but also could contribute to benefits associated with reduced traffic and enhanced quality of life.

Except highways like I-64, all new road facilities should consider cyclist and pedestrian mobility . The construction of new roadways provide opportunities to intentionally incorporate alternative modes of transportation along a corridor. New facility improvements should also consider ADA guidelines. These guidelines ensure that improvements are accessible to all types of people regardless of age or ability. In addition to mobility considerations on new roadway facilities, safety improvements on existing facilities should also be considered. Typically, safety improvements—particularly at intersections—could be low-cost and high-benefit. In order to promote active modes of transportation, providing a variety of facility types based on the existing context is crucial. Examples of these improvements could be wayfinding, dedicated facilities, high-visibility crossings, or traffic signal retiming.

Goals and Objectives

The long-term goals of the *RIC Metropolitan Transportation Plan* are consistent with previous planning efforts, including the *Kanawha-Putnam Bicycle and Pedestrian Plan*. The goals are:

- Increase bicycle and pedestrian connectivity between population centers, educational institutions, public recreational areas, and retail/entertainment activity centers in Kanawha and Putnam counties.
- Improve safety and user comfort levels on all bicycle and pedestrian facilities.
- Increase public awareness of bicycle and pedestrian facility locations.
- Promote education of bicycle safety among both motorized and non-motorized users.
- Promote the adoption and implementation of Complete Streets concepts within each community in Kanawha and Putnam counties.
- Incorporate bicycle and pedestrian improvements into the transportation network and development projects.
- Institutionalize bicycle and walking friendliness as a core value of County and Municipal projects, policies, and programs.

Federal Requirements

Bicycle and pedestrian legislation is contained in Sec. 217 (g) of the United States Code (U.S.C.). This legislation includes a provision titled “Planning and Design,” which states:

“(1) In general. - Bicyclists and pedestrians shall be given due consideration in the comprehensive transportation plans developed by each metropolitan planning organization and State in accordance with sections 134 and 135, respectively. Bicycle transportation facilities and pedestrian walkways shall be considered, where appropriate, in conjunction with all new construction and reconstruction of transportation facilities, except where bicycle and pedestrian use are not permitted.

(2) Safety considerations. - Transportation plans and projects shall provide due consideration for safety and contiguous routes for bicyclists and pedestrians. Safety considerations shall include the installation, where appropriate, and maintenance of audible traffic signals and audible signs at street crossings.”

Current Initiatives

Bicycle Pedestrian Advisory Committee

The Bicycle Pedestrian Advisory Committee was formed in 2016. The committee was relaunched following RIC's adoption of the Kanawha Putnam Bicycle Pedestrian Plan in 2019. The committee is comprised of representatives from the City of Charleston, the Kanawha Valley Regional Transportation Authority, the Kanawha County Commission, the Putnam County Commission, the West Virginia Local Technical Assistance Program, and bicycle-pedestrian citizen advocates. The Bicycle Pedestrian Advisory Committee aims to strategically advance the recommendations for the Kanawha-Putnam Bicycle and Pedestrian Plan as well as advocating for Complete Street policy considerations for new roadway projects.

Complete Street Policy

The Complete Streets concept promotes safer, more-livable street designs to serve all citizens. Complete Streets considers the needs of cyclists, pedestrians, and those with varying abilities to ensure the appropriate facility accommodations are included in the design. Several states and municipalities have already passed legislation for and adopted Complete Streets concepts. During the 2013 legislative session, with the passage of Senate Bill 158, West Virginia became the 28th state to adopt the Complete Streets policy. When complete street policies are in place, all users of the roadways experience a safer roadway network. The implementation of Complete Streets can reduce vehicle-related crashes, pedestrian risk, and bicyclist risk.[3] The policy can also promote walking and bicycling by providing safe and dedicated facilities. One study found that 43% of people reporting a place to walk were significantly more likely to meet current recommendations for regular physical activity than were those reporting no place to walk.[4]

Kanawha Boulevard Improvement Project

The City of Charleston completed the Kanawha Boulevard Bicycle and Pedestrian Improvement project in late 2017. The project constructed a shared use path, suitable for cyclist and pedestrians to use while also being separated from vehicular traffic. The project spans for 1.3 miles from Patrick Street to Magic Island. The space for the path was created using a road diet technique which included removing the median lane and reducing the width of the existing lanes.

Construction for the City of Charleston's Kanawha Boulevard shared use path was recently made complete.

[3] Reynolds CC, Harris MA, Teschke K, Cripton PA, Winters M. The impact of transportation infrastructure on bicycling injuries and crashes: a review of the literature. Environmental Health 2009;8:47.
[4] Powell KE, Martin L, Chowdhury PP. Places to walk: convenience and regular physical activity. American Journal of Public Health 2003;93:1519-1521.

Bicycle and Pedestrian Survey

An online survey was administered in conjunction with the development of the *Regional Intergovernmental Council's Kanawha-Putnam Bicycle and Pedestrian Plan*. The survey was made available to residents of Kanawha and Putnam counties as part of the public outreach initiatives of the plan. The survey was distributed via social media, RIC's website, and email. A Facebook advertisement was created for the Kanawha Valley area to promote the survey. The Facebook advertisement reached a total of 30,593 users and made 41,082 impressions. There were 84 link clicks as a result of the Facebook advertisement. Information sought by the survey included location, demographics, bicycling experience, purpose, destinations, challenges, and recommendations. One hundred (100) people started or partially completed the survey. Sixty-eight (68) people completed the full survey. Appendix E of the *Regional Intergovernmental Council's Kanawha -Putnam Bicycle and Pedestrian Plan* includes a summary of the survey results, which can be viewed on RIC's website at www.wvregion3.org.

Americans with Disabilities Act Transition Plan Audit Program

With the guidance of West Virginia University's West Virginia Local Technical Assistance Program (WVLTAP), the Regional Intergovernmental Council (RIC) can enroll new and ongoing participants for its American with Disabilities Act (ADA) Transition Plan Assistance Program. This member-only program is designed to provide tools that a regional municipal government may need to ensure compliance with the latest surface transportation infrastructure accessibility guidance. Listed below, are the ways to leverage these resources.

- Virtual classroom training:
  - Equip municipal staff with the knowledge from WVLTAP to be aware of existing surface transportation accessibility and safety deficiencies.
- On-site self-evaluations:
  - Enlist RIC staff to audit transportation infrastructure of any existing surface transportation accessibility or safety deficiencies.
- ADA Transition Plan drafting:
  - Enlist RIC staff to assist in drafting an ADA Transition Plan from outline to resolution.
- ADA Transition Plan auditing:
  - Enlist RIC staff to conduct an internal review of an existing ADA Transition Plan for quality, compliance, and adherence.

Non-motorist Related Crash Incident Analysis

RIC is continuing to make use of traffic data compiled by the West Virginia Division of Highways (WVDOH) by analyzing crash hot spots, especially those with fatalities or serious injuries. RIC has made special effort to continue to reconfigure crash data, so it specifies to non-motorist related incidents. The data allows us to identify fatality and injury hot spots and create maps of the results. This ongoing effort will be updated annually. The purpose of this analysis is to keep interagency partners and constituents informed about the safety of the region's bicycle-pedestrian infrastructure, or lack thereof.

Existing Planning Efforts

Kanawha-Putnam Bicycle and Pedestrian Plan

RIC adopted the *Kanawha-Putnam Bicycle and Pedestrian Plan* in 2019. The planning process included extensive public involvement outreach events in both Kanawha and Putnam counties, stakeholder interview meetings, survey administration, and consideration of existing municipal plans. Following the results of the initial analysis and recommendations, the projects were ranked in a priority matrix based on feasibility, costs, regional connectivity impact, and safety. A final priority list was produced to serve as a guide for regional planning efforts. The Bicycle and Pedestrian Advisory Committee will continue to analyze and update this plan as needed.

Kanawha County 2020 Vision Plan

The Kanawha County 2020 Vision Plan, developed by the Kanawha County Commission, is a comprehensive and multi-faceted plan that includes recommendations for bicycle and pedestrian improvements. A complete list of recommendations can be found in the plan. The recommendations include ensuring wheelchair access on the Dunbar Toll Bridge, creating a bridge from US-119 to Coonskin Park over the Elk River, and many more.

City of South Charleston Bike Plan

The city of South Charleston completed the *Master Plan for Pedestrian and Bicycle Trail Corridors* in 2011. The plan focuses on recreation and connectivity improvements along key corridors such as the Kanawha Turnpike and MacCorkle Avenue. The plan recommends locations for bike lanes, "share the road" signage, sidewalk improvements, and connector trails. The study recommends an additional connector trail from the South Charleston Memorial Ice Arena to Little Creek Park and the golf course.

Imagine Charleston

Prior to the City of Charleston's development of the *Bike & Trail Master Plan*, a plan titled *Imagine Charleston* (2013) came to fruition. Imagine Charleston is a comprehensive, citywide, downtown redevelopment plan for the city that recommends various bicycle and pedestrian improvements. The focus of the plan was to provide connections between key destinations, such as schools, parks, cultural institutions, and existing non-motorized facilities inside the city.

An excerpt from the Action Plan portion states: "Charleston's Comprehensive Plan was developed through a highly interactive process that engaged the community in defining a preferred future. Through this collaborative effort, the City, community leaders, and the public have contributed both resources and personal time to formulate a useful, exciting, and visionary blueprint for the future. This level and breadth of participation signals Charleston's commitment as a community to seek creative solutions to its many challenges. The plan will position Charleston to manage future development,

redevelopment, capital improvements, collaborative partnerships, and programs on a solid foundation of fiscal, social, and environmental sustainability."

City of Charleston's Bike & Trail Master Plan

In 2016, the City of Charleston released the *Bike & Trail Master Plan,* the city's first all-inclusive bike and trail master plan. This plan's project vision is to expand network of bikeways and trails connecting all parts of the community. People of all ages and abilities will enjoy access to safe, comfortable, and convenient bicycling routes and benefit from enhanced quality of life and economic opportunity. The plan includes a list of ten "priority" projects, listed in the table below.

Table 5-1: City of Charleston's Priority Projects

CORRIDOR	FROM	TO	RECOMMENDATION	COST ESTIMATES
Virginia St. W	Tennessee Ave.	Park Ave.	Two-Way Cycle Track	$99,000-$150,000
Quarrier St.	Elk River Trail at Civic Center	Elizabeth St.	Two-Way Cycle Track (riverfront trail to Summers Street) Shared Lane Markings (Summer St. to Morris St.) Bicycle Boulevard (Morris St. to Elizabeth St.)	$88,600-$139,500
Kanawha Ave. Bike Route; Kanawha Landing; Lancaster Ave.	—	—	Bicycle Boulevard upgrade to existing bike route Bicycle boulevard through Kanawha Landing Shared-Use Path on Lancaster Ave. with bicycle boulevard spurs	$993,200-$1,214,900
MacCorkle Ave.	Frontage Rd.	Thayer St.	Shoulder Maintenance Improvements	—
Kanawha Blvd.	Leon Sullivan Way	Magic Island	Cycle Track/Side path	$2,020,900
South Side Bridge	Ferry St.	Virginia St.	Priority Shared Bike Lanes ("Green-Backed Sharrows" and signage)	$2,700-$5,200
Capitol St./Summers St.	Kanawha Blvd.	Smith St.	Bicycle Boulevard	$23,400-$40,900
Piedmont Rd. and Court St.	Capitol St.	Slack St.	Two-Way Cycle Track	$58,100-$88,000
Kanawha Blvd. – Patrick St.	North Ford in Roadway	5th Ave.	Separated Two-Way Cycle Track	$115,500-$175,100

Planning Process

Bicycle and pedestrian improvements require extensive planning if they are to be successfully implemented. In order to achieve funding, projects must move from the *RIC Metropolitan Transportation Plan* into the Transportation Improvement Program (TIP).

This chapter was developed in collaboration with local municipal constituents, members of the public, the RIC Bicycle and Pedestrian Advisory Committee, the Transportation Technical Advisory Committee (TTAC), and interagency partners including the Federal Highways Administration and WVDOH. Much like the planning process for all roadway projects, changes to the Kanawha-Putnam Bicycle and Pedestrian Plan must be approved by the TTAC and the RIC Policy Board, with the one exception being new project recommendations for the Bicycle-Pedestrian plan may begin with the BPAC committee. The planning process for bicycle and pedestrian improvement projects takes specific considerations that are exclusive to bicycle and pedestrian travel versus those of motorized travel.

The Bicycle and Pedestrian Advisory Committee and RIC Staff developed measurable criteria—specific to bicycle and pedestrian mobility—as part of the planning prioritization process. Ultimately, these factors are weighted to determine which projects will be included in the TIP. The following are descriptions of the prioritization criteria:

- *Regional Connectivity* – This criterion how connectivity is improved within the Kanawha-Putnam transportation planning area for non-motorized users.
- *Access to Local Facilities* – The capability and ease of accessibility for non-motorized users is important for travel to local community facilities, government resources, essential services, and transit routes.
- *Emphasis on Low-Income Communities* – Utilizing data from the United States Census Bureau, this measurement focuses on the transportation planning area's local communities that possess a higher volume of low-income households, specifically zero-vehicle households that are dependent on transit as well as the bicycle and pedestrian infrastructure.
- *User Safety* – This measurement highly emphasizes the variable of safety for motorized and non-motorized users alike for recommended projects or improvements.
- *User Population/Demographics* – Criteria for this measurement include inclusivity of all users, regardless of factors such as age or rider skill level.
- *Condition of Facility Type* – This measurement relates to the existing surface conditions or land terrain of the project or improvement.
- *Bicycle & Pedestrian Advisory Committee and Public Feedback* – The final measurement is exclusive to project or improvement feedback provided by members of the RIC Bicycle and Pedestrian Advisory Committee as well as comments made by the public that are discussed within the committee.

Potential Funding Sources

For bicycle and pedestrian projects and improvements, funding sources typically stem from federal, State, and local contributions. Available federal funds for these projects have generally increased due to the growing demand for multimodal facilities.

Notably, the location of projects and/or improvements has a direct impact on potential project funding and fiscal responsibilities. For example, fiscal obligation for a project or improvement would be the primary responsibility of the entity that owns the affected facilities or roadway(s). Several project recommendations from this plan are located on roads or facilities that are non-State owned. This means that the financial responsibility of the project would be obliged to the owning entity. WVDOH does *not* own nor maintain all roads within the transportation planning area.

The narrative below details eligibility criteria under the federal guidance.

According to the FHWA Fiscal Management Information System $925 million went to Bicycle and Pedestrian Projects.[5]

- TA funded 38% of projects.
- CMAQ funded 18% of projects.
- HSIP funded 5% of improvements.
- STBG funded 3% of improvements.
- RTP funded 2% of projects. [5]

West Virginia Transportation Alternatives (TA) Grant Process

On an annual basis, WVDOH opens the federally funded Transportation Alternative Grants, which are available to public organizations. Typically, these grants provide funding for 80 percent of the project costs and require a 20 percent match by the recipient. RIC staff members are available to assist agencies within the region in completing TA grant applications.

Recreational Trails Program

The Recreational Trails Program falls under the Transportation Alternatives (TA) Set-Aside and distributes funding to each state to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses.

Additional Information:
https://www.fhwa.dot.gov/Environment/recreational_trails/

Surface Transportation Block Grant (STBG Program)

With the enactment of the Fixing America's Surface Transportation Act (FAST), the Surface Transportation Block Grant (STBG) Program was created. The STBG Program includes set-aside funding for a variety of bicycle and pedestrian improvement projects in addition to projects that were eligible under the Transportation Alternatives (TA) program). The Federal Highway Administration (FHWA) references these funds as the Transportation

[5] FHWA. (2021). Federal-Aid highway program funding for pedestrian and bicycle facilities and programs. Retrieved April 01, 2021, from https://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/bipedfund.cfm

Alternatives Set-Aside or TA Set-Aside. These set-aside funds include all projects and activities that were previously eligible under TA and subsume several types of smaller-scale transportation projects. These projects include bicycle and pedestrian facilities, recreational trails, safe routes to school projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to stormwater and habitat connectivity.

Additional Information:
https://safety.fhwa.dot.gov/hsip/

Congestion Mitigation and Air Quality (CMAQ) Improvement Program

CMAQ is a federal program designed to provide funding for transportation projects that improve air quality and alleviate traffic congestion. Transportation projects that receive CMAQ funds must be in areas that are not considered to meet air quality standards. CMAQ is administered by FHWA and has provided more than $30 billion to fund over 30,000 transportation related environmental projects for state DOTs, MPOs, and other sponsors throughout the U.S.

Additional Information:
https://www.fhwa.dot.gov/environment/air_quality/cmaq/

Highway Safety Improvement Program (HSIP)

The Highway Safety Improvement Program (HSIP) is a federal program aimed at achieving a significant reduction in fatalities and serious injuries on roadways. Funding by HSIP is a data-driven process that apportions funds to each state. Each state is responsible for administering HSIP funds to address their individual safety needs. Projects that receive HSIP funds must also be consistent with each state's Strategic Highway Safety Plan (SHSP).

Additional Information:
https://safety.fhwa.dot.gov/hsip/

Alternative Funding Sources

Many public organizations may seek funding projects, but struggle to come up with the required twenty percent match. With the guidance of the Bicycle and Pedestrian Advisory Committee, RIC has created an inventory of alternative funding sources that could be paired with a transportation alternative grant to help ease the burden of the funding match requirement on public organizations. Other potential funding sources include the Congestion Mitigation and Air Quality funding from the federal government and the Greater Kanawha Valley Foundation. RIC will continue to extend invitations to collaborate and take advantage of funding opportunities, while receiving technical assistance from RIC staff.

Nationwide Spending Analysis by State

Is West Virginia spending enough on Bicycle and Pedestrian infrastructure? The following table contains data retrieved from the FHWA Fiscal Management Information System. It compares spending on bicycle and pedestrian related projects against total highway spending for the year 2017. It also provides a rank for each state. West Virginia, which ranks 17th in the nation for total highway spending, ranked 20th on this list.

Table 5-2: Nationwide Spending Analysis by State

STATE	TOTAL HIGHWAY SPENDING PER CAPITA6	BIKE PED SPENDING PER CAPITA	PCT OF TOTAL	PCT OF TOTAL RANK	TOTAL SPENDING RANK
Indiana	$366.91	$5.70	1.55%	1	48
Montana	$802.04	$11.05	1.38%	2	11
Delaware	$877.70	$11.81	1.35%	3	7
Vermont	$996.77	$10.29	1.03%	4	5
Rhode Island	$448.02	$3.98	0.89%	5	41
California	$394.23	$3.37	0.85%	6	46
New Mexico	$431.70	$3.64	0.84%	7	42
Colorado	$582.10	$4.71	0.81%	8	24
North Carolina	$473.84	$3.71	0.78%	9	39
Tennessee	$333.71	$2.49	0.75%	10	50
Illinois	$731.05	$5.39	0.74%	11	14
Alaska	$1,909.40	$12.95	0.68%	12	2
Washington	$591.54	$4.01	0.68%	13	22
Missouri	$387.71	$2.47	0.64%	14	47
Hawaii	$423.07	$2.68	0.63%	15	44
New York	$623.77	$3.92	0.63%	16	21
Florida	$537.31	$3.25	0.60%	17	32
Ohio	$519.97	$3.11	0.60%	18	34
Virginia	$582.00	$3.43	0.59%	19	25
West Virginia	$675.76	$3.74	0.55%	20	17
Alabama	$519.59	$2.87	0.55%	21	35
Mississippi	$578.47	$3.11	0.54%	22	26
New Hampshire	$561.11	$2.88	0.51%	23	28
Kansas	$660.82	$3.35	0.51%	24	18
Georgia	$418.04	$2.07	0.50%	25	45

[6] Tax Policy Center. (2020, June 18). State and local general expenditures, per capita. Retrieved April 01, 2021, from https://www.taxpolicycenter.org/statistics/state-and-local-general-expenditures-capita

South Carolina	$456.64	$2.24	0.49%	26	40
Arizona	$357.11	$1.73	0.48%	27	49
Minnesota	$863.92	$4.17	0.48%	28	9
Arkansas	$690.93	$3.33	0.48%	29	15
Pennsylvania	$765.13	$3.68	0.48%	30	12
Louisiana	$514.83	$2.26	0.44%	31	36
Iowa	$874.57	$3.53	0.40%	32	8
Kentucky	$528.81	$2.04	0.39%	33	33
Oregon	$511.74	$1.89	0.37%	34	38
Michigan	$429.12	$1.58	0.37%	35	43
Texas	$554.17	$1.96	0.35%	36	31
Wyoming	$1,173.28	$4.04	0.34%	37	3
Massachusetts	$557.85	$1.85	0.33%	38	30
Oklahoma	$660.05	$2.17	0.33%	39	19
Connecticut	$636.85	$2.00	0.31%	40	20
Nevada	$682.82	$2.09	0.31%	41	16
Idaho	$514.33	$1.07	0.21%	42	37
Maryland	$559.57	$0.82	0.15%	43	29
Wisconsin	$948.80	$1.35	0.14%	44	6
South Dakota	$1,148.34	$1.62	0.14%	45	4
North Dakota	$2,296.50	$3.15	0.14%	46	1
Maine	$740.27	$0.87	0.12%	47	13
Nebraska	$820.77	$0.45	0.06%	48	10
New Jersey	$561.45	$0.23	0.04%	49	27
Utah	$589.51	$0.08	0.01%	50	23

Recommendations

Please note that the listing order of the following bicycle and pedestrian project recommendations is not indicative of priority. Additionally, several of the below-listed project recommendations are intended to be completed in conjunction with roadway improvement projects listed previously in Chapter 4.

Table 5-3: High Priority Bicycle Projects

ID	PROJECT TYPE	PROJECT ROAD	EXTENT FROM	EXTENT TO	DESCRIPTION
1	Bicycle and Pedestrian	WV-64	Winfield Bridge	Eleanor	Shoulder improvements, sidewalk, and bicycle path
2	Bicycle and Pedestrian	Teays Valley Road	CR 33	Scott Depot	Road widening, shoulder improvements, and sidewalks
3	Bicycle	Jefferson Road; at Davis Creek Interchange	-	-	Install traffic signal, shared lane marking, and pavement striping
4	Bicycle	Tennessee Avenue	Kanawha Blvd.	Washington Street West	Bicycle lanes and signs
5	Bicycle	Virginia Street West	Tennessee Ave.	Delaware Ave.	Bicycle lanes and signs
6	Bicycle	Quarrier Street	Capitol St.	Clendenin	Two-way cycle track and shared road markings
7	Bicycle	Kanawha Boulevard	Tennessee Ave.	Capitol St.	Cycle Track
8	Bicycle	Barlow Drive	Slack St.	Coonskin Park	Bicycle path, widen shoulders, and signs
9	Bicycle	MacCorkle Avenue	Kanawha City	Marmet	Shoulder improvements and signs
10	Bicycle	Corridor G	Davis Creek Interchange	South Ridge	Bicycle path
11	Bicycle	US 60	4th Ave.	MacCorkle Ave.	Intersection improvements, shared road markings, signs
12	Bicycle	WV 817	Winfield	Hurricane Creek Rd	Shoulder improvements and signs
13	Bicycle	Kanawha Boulevard	Capitol St.	Chesapeake Ave.	Cycle track
14	Bicycle	Kanawha Boulevard	Chesapeake Ave.	35th St. Bridge	Cycle track
15	Bicycle	WV 817	I-64	Winfield	Shoulder improvements, bicycle lanes, and signs
16	Bicycle	WV 25	Iowa St.	Washington St. West	Shoulder improvements
17	Bicycle	Stockton Street	Kanawha Blvd.	7th Ave.	Bicycle lanes and signs
18	Bicycle	Former B&O railroad; Elk Ri Trail	Coonskin Park	WV 114	Bicycle trail
19	Bicycle	Elk River (NC) Railroad bridge	Pennsylvania Ave.	Bullitt St.	Bicycle path
20	Bicycle	Teays Valley Bike Trail – Poplar Fork	St. Albans	Teays Valley	Bicycle path
21	Bicycle	Kanawha River Trestle Trail	Kanawha Blvd.	6th St.	Bicycle path

Table 5-4: Medium Priority Bicycle Projects

ID	PROJECT TYPE	PROJECT ROAD	EXTENT FROM	EXTENT TO	DESCRIPTION
22	Bicycle	Former B&O Railroad	Elk River Trail connecting WV 114 Bridge	Elkview	Bicycle Trail
23	Bicycle	Former B&O Railroad	Elk River Trail connecting Elkview	Clendenin	Bicycle Trail
24	Bicycle	35th Street Bridge; at Kanawha Blvd	-	-	Improve approaches, shared road markings, and signs
25	Bicycle	Buffalo Bridge	WV 817	WV 62	Signs
26	Bicycle	US 60	Campbells Creek	Malden	Repave shoulders and signs
27	Bicycle	Piedmont Road	Court St.	Leon Sullivan Way	Bicycle route with shared road markings and signs
28	Bicycle	Kanawha Boulevard	35th St.	Daniel Boone Park	Widen shoulders with bicycle lanes and signs
29	Bicycle	MacCorkle Avenue	Montrose Dr.	Patrick St.	Widen shoulders and signs
30	Bicycle	US-60	St. Albans	Culloden	Widen shoulders with bicycle lanes
31	Bicycle	Kanawha Trestle Trail	-	-	Bridge Upgrade
32	Bicycle	Washington Street; at Pennsylvania Ave.	-	-	Bicycle lane signs
33	Bicycle	Greenbrier Street; at I-64 Interchange	-	-	Bicycle lane signs
34	Bicycle	Washington Street; near CAMC	-	-	Bicycle lane signs
35	Bicycle	South Poplar Fark Road	Teays Valley Rd (CR 33) to CSX Railroad	CSX Railroad	Widen shoulders and bicycle lanes
36	Bicycle and Pedestrian	Great Teays Boulevard	WV 34	Teays Valley (CR 33)	Bicycle lanes, widen shoulders, and signs
38	Bicycle	Court Street	Kanawha Blvd	Piedmont Rd.	Bicycle lanes
39	Bicycle	7th Avenue	Virginia St West	Patrick St.	Bicycle lanes, signs and shared road markings
40	Bicycle	MacCorkle Avenue	Thayer St.	31st St.	Bicycle lanes
41	Bicycle and Pedestrian	Hurricane Creek Road (CR 19)	I-64	Walmart (Hurricane)	Sidewalk and signs
42	Bicycle	WV 34	Valley Park	Hurricane Creek Rd.	Pavement markings and signs

Table 5-5: Pedestrian Projects

ID	PROJECT TYPE	PROJECT ROAD	DESCRIPTION
1	Pedestrian	Kanawha Boulevard and Chesapeake Avenue	ADA compliant curb ramps
2	Pedestrian	Kanawha Boulevard and California Street	ADA compliant curb ramps
3	Pedestrian	Kanawha Boulevard and Greenbrier Street	ADA compliant curb ramps
4	Pedestrian	Kanawha Boulevard and Ruffner Avenue	Crosswalks
5	Pedestrian	Patrick St at 5th Street Intersection	Crosswalks and pedestrian signal
6	Pedestrian	WV 34 between Hurricane Creek Road and Hurricane Middle School	Sidewalk
7	Pedestrian	Penn Avenue to CAMC Women and Children's Hospital	Crosswalks
8	Pedestrian	MacCorkle Avenue (US 60); Gateway Shopping Center to Oliver Street	Crosswalks

The ID's listed in bold, italicized font represent projects that are located on non-State-owned roads or facilities.

Figure 5-1: Bicycle and Pedestrian Projects in Kanawha County

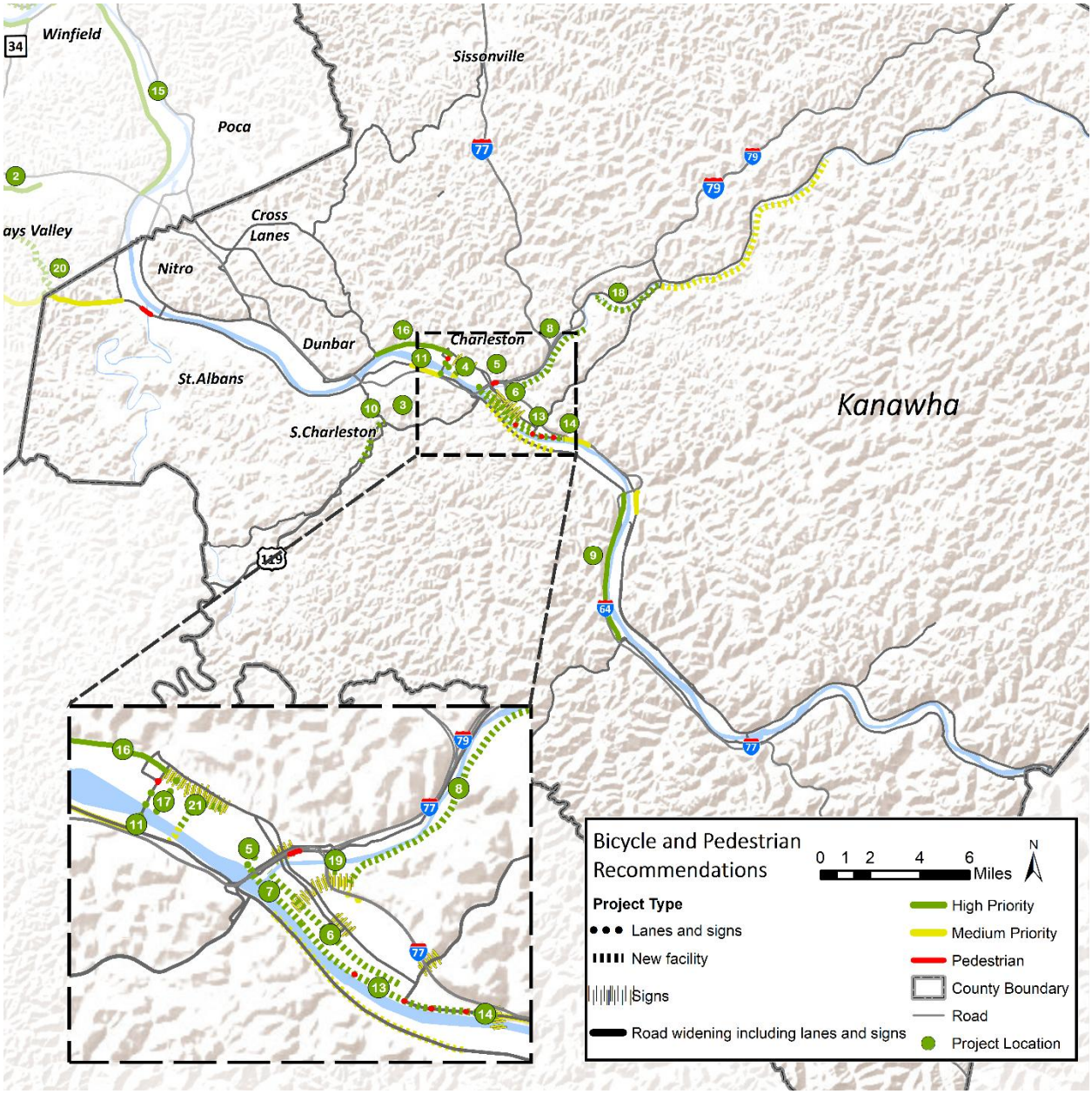
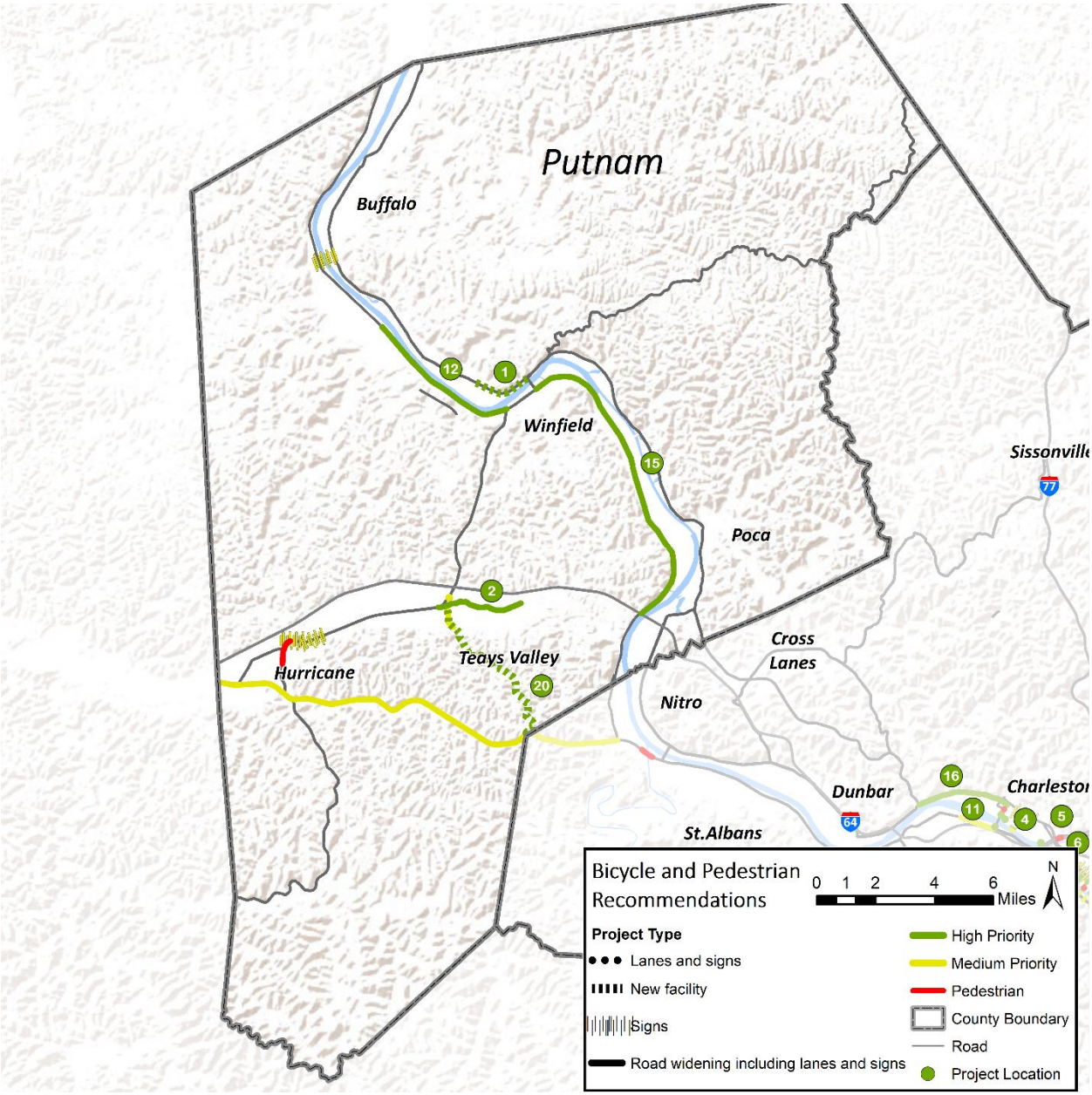
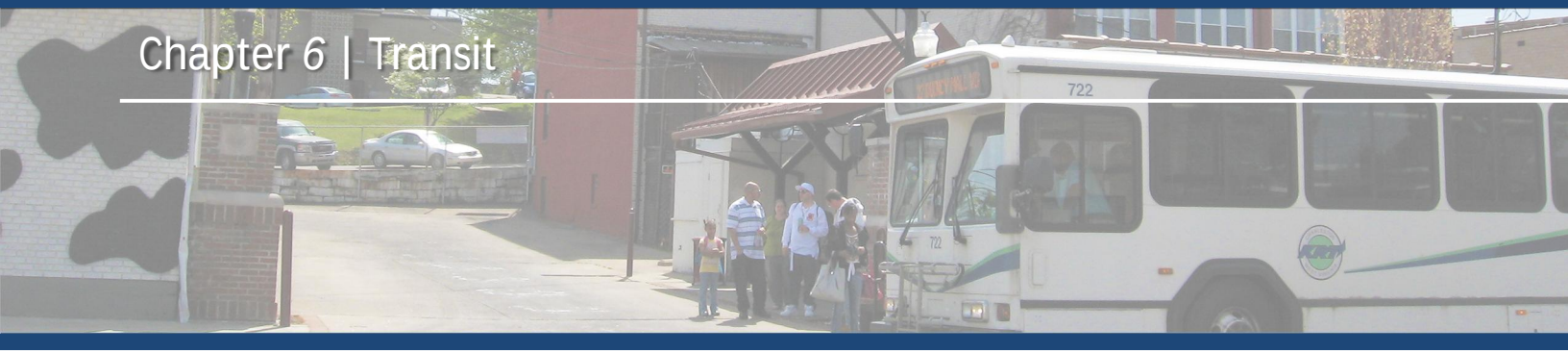


Figure 5-2: Bicycle and Pedestrian Projects in Putnam County





Chapter 6 | Transit

Introduction

Transit provides mobility to thousands of residents who cannot, or choose not to drive. In addition to enhanced mobility, bus and/or rail transit also provides a regional air quality benefit by reducing the number of cars on the road, particularly during congested travel periods and on hot summer days. The region's transit services provide access to major regional employers, shopping areas, health care services, social services, and universities. Chapter 6 examines existing transit, rail, and air services as well as future initiatives. This chapter also identifies several roadway recommendations that will likely benefit the transit system.

The Kanawha Valley Regional Transportation Authority boasts multiple hybrid buses

The Impact of COVID-19 and CARES Act on Transit

During the COVID-19 pandemic, transit ridership fell across the country. Fares and other ridership-related funds are some of the largest sources of revenue for transit agencies. Due to other underlying economic conditions, transit agencies like the Kanawha Valley Regional Transportation Authority (KVRTA) struggled to maintain service operations. With a shortage of vehicle operators, service could no longer operate at full capacity.

The Coronavirus Aid, Relief, and Economic Security (CARES) Act is a $2.2 trillion stimulus bill that was passed on March 27, 2020. The CARES Act is a relief bill aimed to support state and local economic recovery. The Federal Transit Administration is responsible for the allocation of $25 billion to urbanized and rural areas. The funding is provided at a 100-percent federal share with no local matches required. The funds can be used to support operating, capital, or other expenses to respond to lost revenue generation from COVID-19.

The Kanawha Valley Regional Transportation Authority System

The KVRTA system serves Kanawha County and portions of Fayette and Putnam counties. The service area is approximately 913 square miles, serving a population of approximately 188,332 people. An estimated 88% of Kanawha County's residents live within three-quarters of a mile from a KVRTA route.

KVRTA operates a network of 20 fixed-routes oriented around the commercial center of Charleston. With the exceptions of four holidays, KVRTA provides service seven days a week. The earliest routes begin at 4:25 a.m. with service continuing until 12:55 a.m. the next day. Complimentary paratransit service, known as Kanawha Alternative Transit—or KAT—operates during the same days and hours.

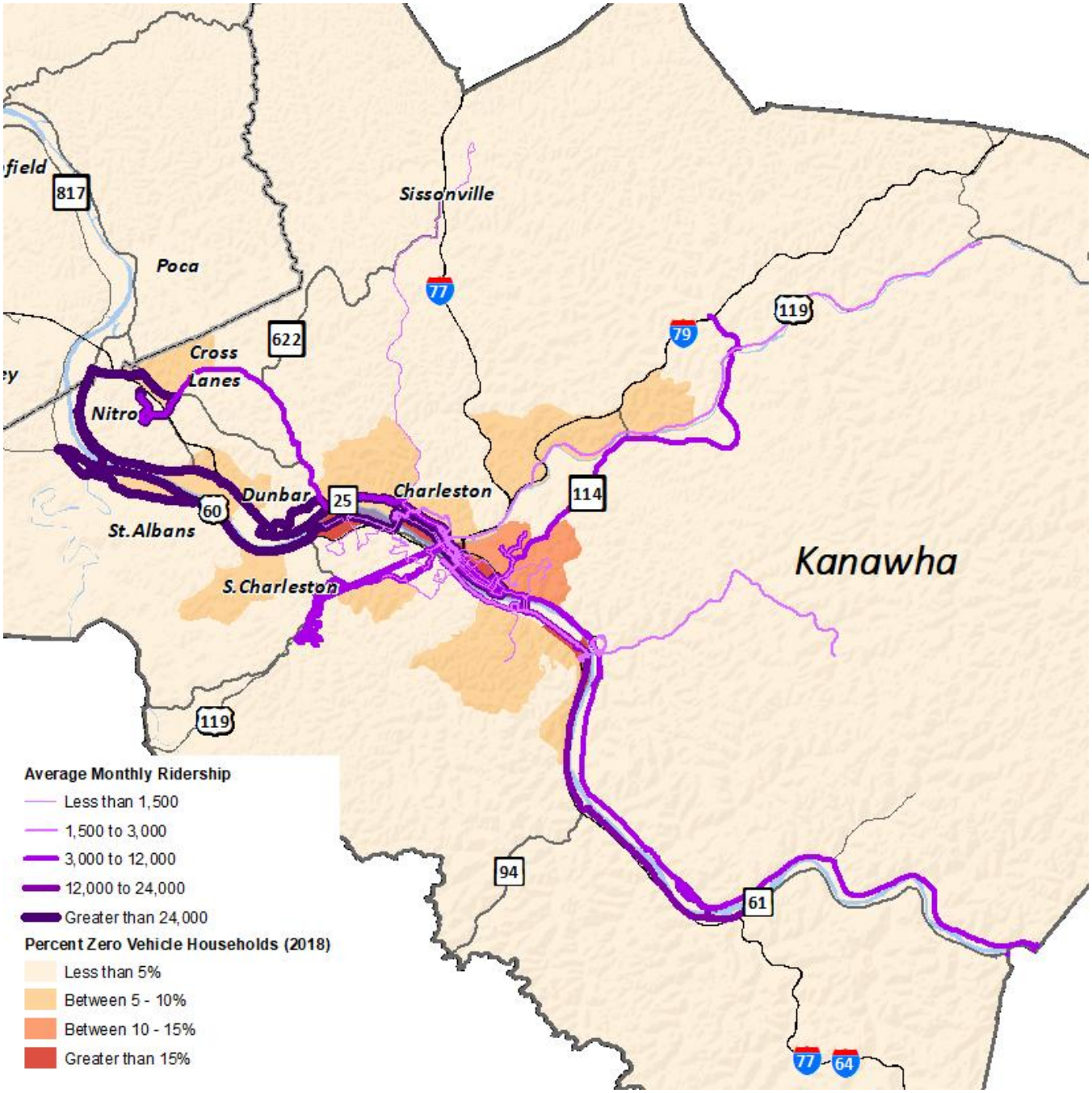
A single KVRTA rides costs a passenger $1.50, while daily passes are available for $2.50. The fares for the paratransit service are twice the rate of the fixed-route system. KVRTA offers discount passes and reduced senior fares for all routes. Tickets can be purchased at the KVRTA main office or the KRT Transit Mall Information Center.

The KVRTA operates a fleet of 49 vehicles for fixed-route service. The fleet consists of 30- and 35-foot-long transit coaches and minibuses. KVRTA also has 13 cutaway vans for the KAT complimentary paratransit service.

KVRTA's operations, maintenance, and administrative headquarters are located on 4th Avenue in Charleston. The downtown transfer center, KRT City Centre Station, is currently under rennovation. When complete the new transit centre will house a ticket office, conference room, and office space for dispatchers. Additional ticket vending machines will be installed in front of the new building and upgraded passenger shelters will be installed along Laidley Street. The bus travel lanes and sidewalks will also be widened during the remodel and digital passenger informational displays will be installed. The new KRT City Centre Station will be a component of the multiuse, multimodal space that includes commercial and entertainment venues, hotels, and government offices.

Rendering of KRT City Centre Station Renovation

Figure 6-1: Average Monthly Ridership



KVRTA System Analysis

To adapt to the challenging fiscal climate, KVRTA conducted a system analysis to evaluate potential service expansion and reduction. The study included an analysis of demographics and passenger surveys, evaluated the existing route structure, forecasted future service levels, and proposed future funding strategies. The goals of the study included modernizing the transit system to better connect the customers with their communities and develop opportunities for increased communication and partnership.

Service modifications included the removal of three routes: Woodward Drive, Montgomery/Eskdale, and Garrison Avenue/Hillsdale. Two new routes were added, South Side and the Charleston Loop, and an express route was also added to the Southridge route.

Another outcome of the system analysis was KRT Live. KRT Live is a mobile app developed for KVRTA passengers to view fare and schedule information and locate their bus in real time. The mobile app highlights a commitment to providing multimodal service throughout the Kanawha Valley.

Table 6-1: Average Monthly Ridership by Route 2019 & 2020

ROUTE NUMBER	ROUTE NAME	2019 AVERAGE MONTHLY RIDERSHIP	2020 AVERAGE MONTHLY RIDERSHIP
1	St. Albans/W. Charleston	38,655	26,481
2	Cabin Creek/Kanawha City	21,485	14,659
3	Nitro/Institute	25,820	16,749
5	Tyler Mtn./Cross lanes	7,031	4,113
6	Elkview	7,031	4,113
7	Campbells Creek	1,574	922
8	Sissonville	1,471	988
10	Northgate/Hillcrest	755	507
11	Wertz Avenue	588	474
13	Beech Avenue	1,861	1,222
14	City Park	1,300	593
15	South Hills	860	789
16	South Park	1,414	1,104
17	Southside	3,303	2,224
18	Fort Hill/Montrose	1,089	656
19	Trolley/Charleston Loop	1,190	941
20	Virginia Street	1,207	829
21	Southridge	5,743	4,313
22	Montgomery/Quincy	11,094	7,865
23	Clendenin	2,990	2,026

Transit Expenditures and Revenues

The two primary funding sources for KVRTA's gap between costs and farebox revenue are:

- Special levy money
- The Federal Transit Authority (FTA) Section 5307 Operating Assistance

The levy amount, determined by local property taxes, requires approval by Kanawha County voters every four years (60.0% approval is required). FTA apportions Section 5307 funds on a formula basis. KVRTA also uses a portion of its Section 5307 funds for capital expenses. Historically, KVRTA has also received capital assistance from the FTA Section 5339 (Bus Discretionary Fund). KVRTA does not directly receive operating assistance from the State.

Transit Throughout the Region

As previously mentioned, KVRTA routes extend into small portions of Putnam and Fayette counties. Transit throughout Putnam County has been studied in the past. The study revealed insufficient interest and funding. The IT Bus began January 5, 2009 and intended to improve commuter traffic between Charleston and Huntington, WV. Passengers could ride from Huntington to Charleston in the morning or evening for $3. The service was originally funded through federal and state grants; however, the funding was quickly exhausted in 2012. In order to generate revenue, the fare was increased by $1 and the operating costs were split between KVRTA, the State of WV, and TTA (Tri-State Transit Authority in Huntington). After the fare increase and a decline in gas prices, ridership dropped from 1,500 riders a month to 500 and the service ended on August 28, 2015.

In partnership with the WVDOT, Baron's Bus provides service between Charleston and Morgantown along Interstate 79. The service runs once daily seven days a week and twice daily on Sundays, Mondays, Thursdays, Fridays and Saturdays. The bus picks up and drops off at multiple locations in Charleston and Morgantown, and also stops in Clendenin, Flatwoods, Weston, Clarksburg and Fairmont. Cost is dependent on distance and ranges from $3 to $15. I ride 79 connects KVRTA, Greyhound Bus Service and Mountain Line Transit.

Recommendations

The potential transit benefits were considered when prioritizing highway improvement projects and developing recommendations. A detailed route analysis was completed recently and was not studied as part of this plan. The following projects listed in Table 6-2 provide roadway improvement recommendations along current KVRTA routes. The study team anticipates that these projects will improve transit operations on routes that use these roadways.

Table 6-2: Roadway Improvements Along KVRTA Routes

PROJECT ID	ROADWAY	DESCRIPTION
KC-1	3rd Street Underpass	Widen and upgrade the underpass
KC-4	US 119 (Corridor G)	Add a third lane to US 119 NB
KC-5	US 119 (Corridor G)	Add third lane in both directions (north and southbound); add Cantley Flyover to US 119 southbound
KC-6	US 119 (Corridor G)	Add third lane in both directions; upgrade frontage road between Emerald Road and Paula Road
KC-8A	US 60 (Dupont Avenue)	Widen to four-lanes divided (Section A of US 60 Upgrade Study)
KC-8C	US 60 (Dupont Avenue)	Add center turn lane from Sycamore Road to Britt Hollow (approximately 1.2 miles); add right turn lane at recycling center
KC-8D	US 60 (Dupont Avenue)	Add center turn lane west through London for approximately one mile in length
KC-9	WV 114 (Greenbrier Street)	Widen to three-lanes with a two-way left-turn lane
SH-1	MacCorkle Avenue	Restripe; provide multimodal accommodations; underground utilities; improve intersections
RSA-1	Patrick Street	Add turn lane at intersection of 4th Avenue and Patrick Street
RSA-3	US 60 (Dupont Avenue)	Add an eastbound right at William Street; add right-in-right-out (RIRO) at William Street; add turnaround lane for U-turns
RSA-4	I-64 Eastbound Off Ramp	Widen off-ramp to provide a drop decision lane

Planning Process

KVRTA faces the challenge of needing to do more with less. There is insufficient funding to cover KVRTA's capital and operational costs. Under MAP-21 legislation, Section 5339 (Bus and Bus Facilities Program) replaced Section 5309 (Bus Discretionary Fund). The WV Division of Public Transit will administer Section 5339 and distribute funding to all eight of the small-urban areas throughout the state.

Additionally, transit funding has changed due to shifting urbanized area boundaries. Specifically, Teays Valley is now part of the Huntington, WV urbanized area. Transit funding may shift again after the Census 2020 population numbers are released, as well as what may be available as a part of the Infrastructure Investment and Jobs Act.

The project team considered potential transit benefits when prioritizing highway improvement projects and developing recommendations. This prioritization occurred with the understanding that a detailed market study and system analysis was recently completed. There are several roadway projects that will impact transit routes; completion of these projects should improve the operation of KVRTA routes.

Transit Asset Management Planning

Transit Asset Management is a requirement for all transit providers receiving federal funds due to requirements from MAP-21 and the FAST Act. Transit Asset Management (TAM) is a business model that uses the condition of assets to guide the optimal prioritization of funding at transit properties to keep our transit networks in a State of Good Repair. The West Virginia Division of Public Transit is coordinating with the transit providers throughout West Virginia to develop a TAM Plan, asset management performance targets, and safety performance targets. KVRTA is coordinating with RIC to develop and annually report the following performance targets:

- Percentage of non-revenue service vehicles that have met or exceeded their Useful Life Benchmark (ULB)
- Percentage of revenue vehicles, within a particular asset class, that have met or exceeded their ULB
- Percentage of facilities with a condition rating below 3.0 on the FTA Transit Economic Requirements Model scale
- Fatalities per total vehicle revenue miles by bus and demand response service
- Injuries per total vehicle revenue miles by bus and demand response service
- Safety Events per total vehicle revenue miles by bus and demand response service
- System Reliability, measured as revenue miles operated divided by the number of major mechanical failures by bus and demand response service

Passenger Rail

Two long-distance Amtrak lines currently serve West Virginia. The *Capitol Limited*, operating between Washington, D.C. and Chicago, IL, stops in Harpers Ferry, WV and Martinsburg, WV. Meanwhile, the *Cardinal* route, providing service from Chicago, IL to New York, NY, stops in Charleston, Huntington, and other West Virginia communities. The Cardinal route offers three trips per week. Table 6-2 shows the passenger volumes on the Cardinal increased and decreased over the past three years. The ridership data is not yet available for 2020.

Charleston, WV Amtrak Station

Table 6-3: West Virginia Passenger Rail Ridership

YEAR	RIDERSHIP
FY 2017	50,596
FY 2018	54,493
FY 2019	51,568

Additionally, the West Virginia State Rail Plan outlines recommendations for intercity passenger rail service throughout the state, as outlined below.

Immediate Intercity Passenger Rail Recommendations

- Create regional routes and state partnerships with Virginia, Pennsylvania, and Ohio to support upgrading *Cardinal* passenger Rail service.
- Re-examine the Cardinal Passenger Train Enhancement Fund and consistently fund.
- Increase multimodal options and improve transportation accessibility and station access in Huntington, WV.
- Construct sidewalks and improve station accessibility and station access in Martinsburg, WV.
- Develop a more robust awareness campaign for passenger (commuter and intercity) rail service in the state, including availability of up-to-date timetables at stations and an online presence.
- Improve universal accessibility / ADA compliance at passenger, commuter, and tourist rail stations.
- Ensure bike racks are available on Amtrak intercity rail corridors and advertise this feature locally.

Near-Term Intercity Passenger Rail Recommendations

- Continue to collaborate with freight railroads and Amtrak to mitigate delays.
- Continue involvement in the Cardinal working group.
- Upgrading of *Cardinal* service- Establish funding and operational strategy; Establish state partnerships and collaboration for regional routes, i.e. WV/VA, WV/PA, WV/OH.
- Evaluate coordination of connecting bus and train schedules.
- Utilize the Amtrak Station Host Program to post volunteers at stations.
- Identify Charleston station needs including dedicated parking spaces and better connections to local transit, conduct needs assessment for multimodal terminal.
- Conduct assessment of potential Huntington Multimodal Terminal, to include transit and rail co-location.

Passenger Air

Yeager Airport in Kanawha County serves four commercial airlines (American Airlines, United, Delta, and Spirit) and provides direct flights to Charlotte, Chicago, Washington DC, Atlanta, Philadelphia, Fort Lauderdale, Myrtle Beach, and Orlando. In 2019, there were 223,000 passenger boardings (enplanements) at the airport which was a 4.2% increase from 2018. Unfortunately, during 2020 there was a 60% decrease in passenger arrivals and departures.

Yeager Airport in Charleston, WV

Currently, Yeager Airport is developing a master plan to expand the existing runway and plan for future travel demands. The number of annual passengers in 2017 was 425,000, this number is expected to grow to 575,000 and 626,000 over the next ten and twenty years, respectively. The public comment period is still underway; next steps include continued coordination with WVDOT-Aeronautics and an Environmental Assessment.

Chapter 7 | Freight

Introduction

Freight transportation is critical to the regional and national economy. Truck traffic is a significant component, and the highway element of the *RIC Metropolitan Transportation Plan* considers freight needs in the discussion and prioritization of highway recommendations. However, freight is a highly multi-modal sector, with longer and less time-sensitive freight trips made by rail and barge, while the most time-sensitive freight is shipped by air.

Chapter 7 examines the regional freight network in the context of truck, rail, water, and air freight movement. The chapter reviews the West Virginia State Freight Plan, highlights anticipated changes, and concludes with a series of recommendations. While most of the discussion focuses on goods movement – trends in recreation, as well as tourism can affect these transportation modes. As with goods movement, tourism trips are governed in many cases by trends originating outside the Kanawha-Putnam region, but affect transportation needs within the region.

Truck Freight

The Kanawha-Putnam region is located at a critical juncture of freight corridors in West Virginia. I-64 runs east-west through West Virginia and serves as a key corridor connecting markets in Virginia and Ohio. I-77 and I-79 are north-south corridors connecting markets in Ohio, Pennsylvania, Virginia, and North Carolina. As Interstate highways, I-64, I-77, and I-79 are by default included in West Virginia's highway freight network. US 35 and US 60 are two arterial routes identified in the *2018 West Virginia State Freight Plan* due to their high volume of trucks (at least 25% using passenger car equivalents), access to energy production or distribution networks, and connections to the national freight network.

The COVID-19 pandemic drastically impacted the trucking industry throughout 2020 and into 2021. Supply chains around the globe were increasingly strained as logistics and goods movement labor forces were hit hard by coronavirus infections, and the U.S. trucking industry was no exception. The bleak economic outlook and resulting economic downturn partially impacted imports and exports, but the increasing reliance on e-commerce and home delivery kept demand for trucking high as the pandemic progressed.

As commuters increasingly worked from home instead of driving to work, vehicle volumes on some of the most heavily used roadways in the Kanawha-Putnam region dropped during the early stages of the pandemic in the spring and summer of 2020. Figure 7-1, Figure 7-2, and Figure 7-3 show the Average Truck Travel Time Reliability for major U.S., state, and interstate highways in the Kanawha-Putnam region for the month of June in 2019, 2020, and 2021, respectively. Truck Travel Time Reliability is a performance measure used to assess freight

transportation conditions on freeways. The TTTR is defined as the 95th percentile truck travel time divided by the 50th percentile truck travel time using data from the FHWA's National Performance Management Research Data Set (NPMRDS). Figure 7-1Figure 7-1 represents pre-COVID travel conditions in June 2019. Figure 7-2 represents travel conditions in the early stages of the pandemic when stay-at-home orders were in place and travel restrictions were imposed. There is a noticeable increase in TTTR from 2019 to 2020 as overall vehicle volumes decreased, increasing travel speeds. Figure 7-3 shows travel conditions in June 2021 during the later stages of the pandemic when travel restrictions were eased in West Virginia and surrounding states. There are similarities in high TTTR values between 2019 and 2021, specifically on I-64, US Routes 60 and 119, and State Route 25.

Figure 7-1: Average Truck Travel Time Reliability – June 2019

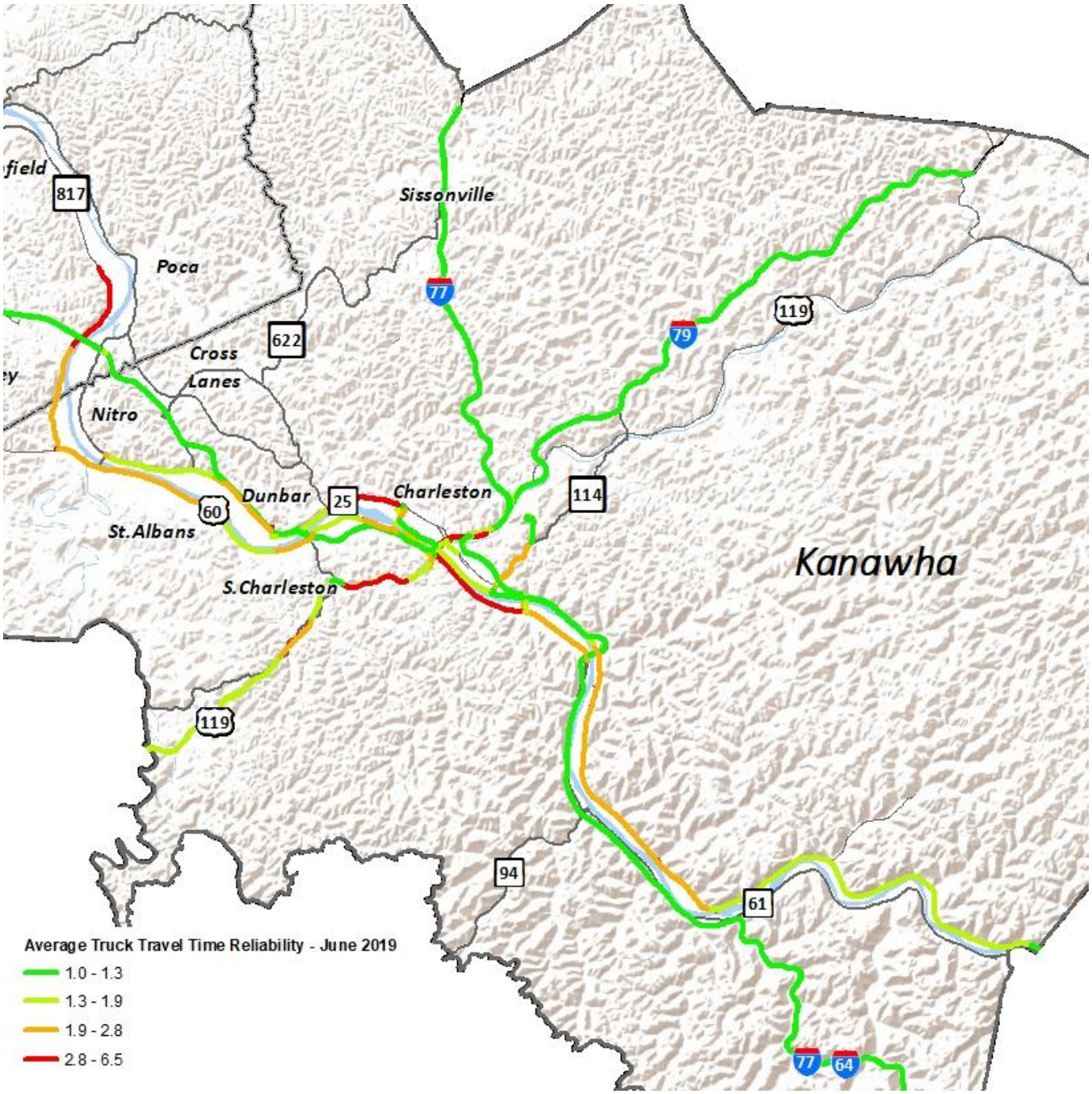


Figure7-2: Average Truck Travel Time Reliability – June 2020

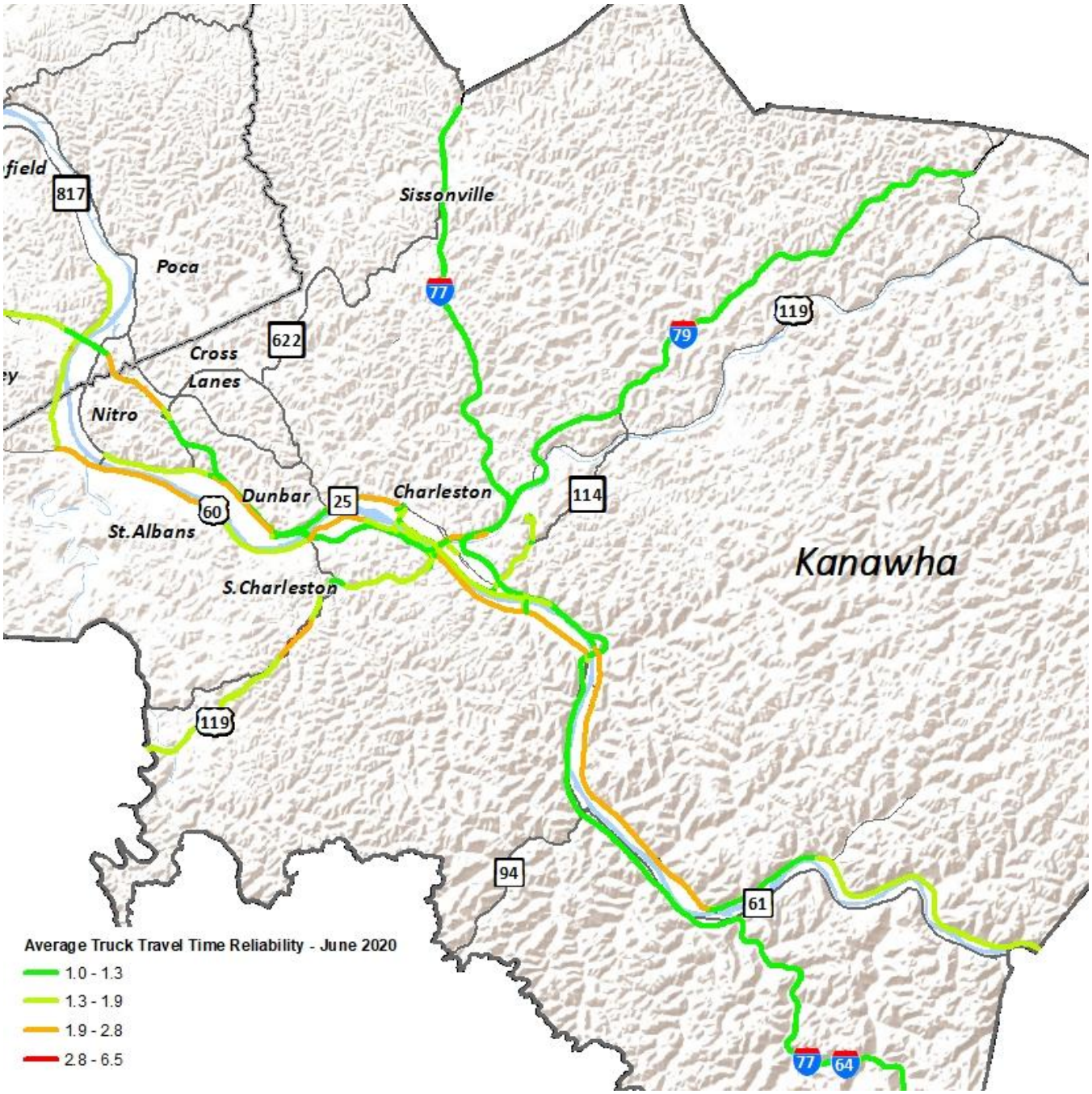
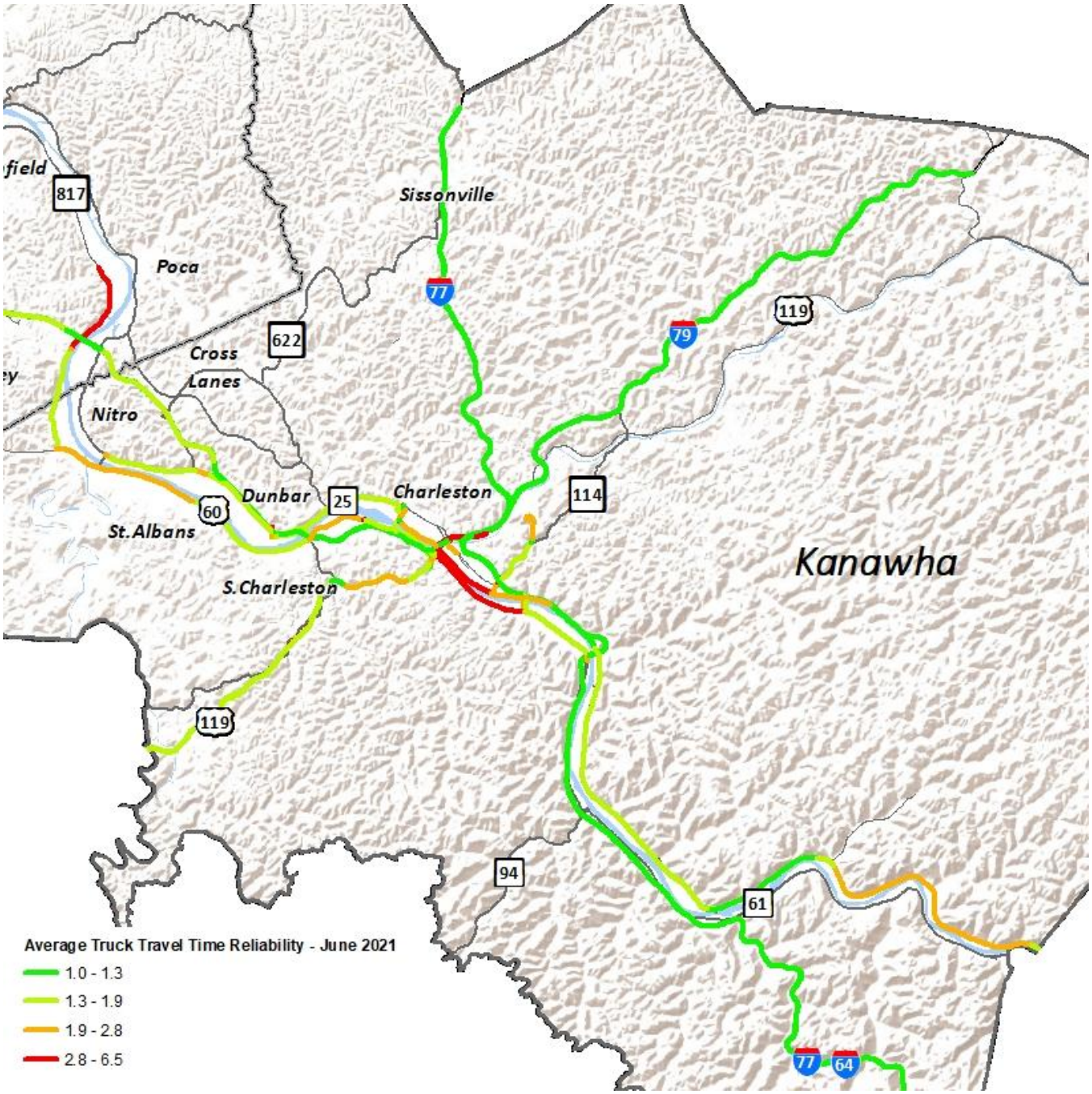


Figure 7-3: Average Truck Travel Time Reliability – June 2021



The FHWA's Freight Analysis Framework (FAF) data provides estimates for the tonnage and value of goods moved to, from, and within the state of West Virginia using 2017 data from the Commodity Flow Survey. These estimates are an indicator of the changing economic conditions in the state over time. Table 7-1Table 7-1 shows goods movements to, from, and within the state using FAF data, and Table 7-2 shows goods movement trends using FAF data. 30-year Commodity flow forecasts and estimates of highway network truck flows will be released later in 2021. According to the 2012 FAF data (the most recent survey year), the region's interstates (I-64, I-77, I-79) handled the bulk of truck traffic in Kanawha and Putnam counties. Sections of I-77 have AADT truck percentages that exceed 30%.

Table 7-1: 2012 West Virginia Commodity Flows

Top Commodities Shipped From West Virginia			
By value moved in billions of dollars ($2013)		*By weight moved in millions of tons (2013)*	
Coal-n.e.c.	$6.2	Coal	84.7
Base metals	$4.6	Coal-n.e.c.	9.8
Plastics/rubber	$4.4	Gravel	5.5
Coal	$3.9	Basic chemicals	4.0
Chemical prods.	$3.2	Base metals	3.4
Top Commodities Shipped To West Virginia			
By value moved in billions of dollars ($2013)		*By weight moved in millions of tons (2013)*	
Fuel oils	$8.7	Fuel oils	8.0
Mixed freight	$5.0	Coal	7.5
Plastics/rubber	$4.1	Gravel	3.8
Base metals	$3.6	Coal-n.e.c.	3.8
Basic chemicals	$3.6	Basic chemicals	3.4
Top Commodities Shipped Within West Virginia			
By value moved in billions of dollars ($2013)		*By weight moved in millions of tons (2013)*	
Machinery	$3.8	Coal	24.2
Pharmaceuticals	$1.3	Gravel	19.0
Coal	$1.3	Logs	11.2
Unknown	$1.2	Waste/scrap	4.5
Motorized vehicles	$1.1	Nonmetal min. prods.	3.8

Table7-2: 2017 West Virginia Commodity Flows

Top Commodities Shipped From West Virginia			
By value moved in billions of dollars ($2017)		*By weight moved in millions of tons (2017)*	
Coal-n.e.c.	$7.2	Coal	104.6
Coal	$6.9	Coal-n.e.c.	40.4
Pharmaceuticals	$6.5	Fuel oils	6.6
Plastics/rubber	$4.3	Wood prods.	4.0
Base metals	$3.3	Nonmetal min. prods.	2.7
Top Commodities Shipped To West Virginia			
By value moved in billions of dollars ($2017)		*By weight moved in millions of tons (2017)*	
Mixed freight	$6.2	Coal	10.0
Precision instruments	$5.0	Coal-n.e.c.	10.0
Machinery	$4.5	Gravel	8.6
Pharmaceuticals	$4.3	Gasoline	4.7
Plastics/rubber	$3.5	Fuel oils	2.4
Top Commodities Shipped Within West Virginia			
By value moved in billions of dollars ($2017)		*By weight moved in millions of tons (2017)*	
Gasoline	$4.4	Coal	40.8
Fuel oils	$3.6	Gravel	11.3
Coal	$2.1	Gasoline	8.5
Machinery	$1.6	Logs	7.9
Mixed freight	$1.2	Fuel oils	7.0

Table7-3: West Virginia Freight Mode Share

Freight Mode Share From West Virginia				
Mode	*By Value ($2017B)*	*Mode Value %*	*By Weight (2017 M of tons)*	*Weight Mode %*
Air (include truck-air)	$0.4	0.8%	0.0	0.0%
Multiple modes & mail	$2.6	5.5%	2.1	1.2%
Other and unknown	$0.1	0.1%	0.1	0.1%
Pipeline	$6.7	14.1%	39.4	23.0%
Rail	$3.2	6.8%	52.6	30.7%
Truck	$32.1	67.4%	30.6	17.8%
Water	$2.5	5.3%	46.7	27.2%
Freight Mode Share To West Virginia				
Mode	*By Value ($2017B)*	*Mode Value %*	*By Weight (2017 M of tons)*	*Weight Mode %*
Air (include truck-air)	$0.9	1.7%	0.0	0.1%
Multiple modes & mail	$15.9	29.2%	3.0	5.3%
Other and unknown	$0.0	0.0%	0.0	0.0%
Pipeline	$4.0	7.3%	12.8	22.8%
Rail	$1.8	3.3%	7.2	12.8%
Truck	$30.9	56.8%	20.1	35.8%
Water	$0.9	1.6%	13.1	23.3%
Freight Mode Share Within West Virginia				
Mode	*By Value ($2017B)*	*Mode Value %*	*By Weight (2017 M of tons)*	*Weight Mode %*
Air (include truck-air)	$0.0	0.0%	0.0	0.0%
Multiple modes & mail	$0.3	1.3%	0.2	0.2%
Other and unknown	$0.0	0.0%	0.0	0.0%
Pipeline	$0.3	1.3%	1.7	1.9%
Rail	$1.1	4.8%	12.4	13.5%
Truck	$20.2	89.4%	62.0	67.9%
Water	$0.7	3.2%	15.0	16.4%

Rail Freight

Rail also plays an important role in the movement of goods throughout the region and the state. Rail is typically used to transport heavy bulk commodities that do not have a time-sensitive schedule for delivery. Rail freight represents approximately 30% of goods and commodities moved from West Virginia, in large part due to the importance of coal to the state's economy. However, the Statewide Freight Plan indicates that rail freight has decreased in recent years due to the decreased market demand for coal. Other rail-dependent commodities with growth potential in the state, such as oil and gas products and container cars, can satisfy that demand.

CSX Transportation (CSXT) and Norfolk Southern Corporation (NS), the state's two Class I railroads, operate over 2,100 miles of West Virginia's rail infrastructure and two primary routes on the northern and southern banks of the Kanawha River. CSXT operates a primary route through the region, connecting Charleston to Cincinnati, OH and Richmond, VA. Meanwhile, NS operates a secondary route that connects Charleston, WV to Columbus, OH. These railroads also capitalize on the region's intermodal facilities. CSXT serves the TRANSFLO facility in South Charleston, while NS serves the Allied Warehousing facility in Nitro.

Water Freight

The Kanawha River is essential for the movement and exchange of commercial goods in the region. The Kanawha River is joined at Charleston by the Elk River, at St. Albans by the Coal River, and at Poca by the Pocatalico River.

The U.S. Army Corps of Engineers (USACE) estimates that there are 65 port facilities (docks) located throughout the two-county region, 16 of which connect to the region's rail infrastructure. These ports are primarily responsible for the shipment of bulk commodities such as limestone, sand, gravel, coal, petroleum products, and chemicals. Barge transportation accounts for 23% of all goods moved in tons to West Virginia and 27% of all goods moved in tons from West Virginia. As fuel prices rise, barge traffic could potentially become a more attractive shipping mode, particularly since barges are approximately 29% more fuel-efficient than rail and 31% more fuel-efficient than truck (National Waterways Foundation). Barge transit is best suited for commodities that do not have time-sensitive delivery schedules and has the potential to reduce landside freight movement congestion.

The M-70 Marine Highway Corridor (one of 24 national marine highway corridors) includes the Ohio, Mississippi, and Missouri Rivers—as well as connecting commercial navigation channels, ports, and harbors—from Pittsburgh to Kansas City. Additional investments along the Ohio River, located 20 miles from the Putnam County line, could also increase throughput tonnage along the Kanawha River.

Pipeline Transport

West Virginia has been at the center of recent growth in the domestic shale gas industry in the last few years. According to the FAF data, pipeline transportation represents 23% of all goods and commodities moved in tons and 14% by value from West Virginia, behind rail (30.7%) and water (27.2%) as the most used modes to ship goods outside the state. Growing demand for natural gas and petroleum products could offset the decreasing demand for coal. According to the United State Energy Information Administration, in 2016 West Virginia ranked third among U.S. states in natural gas production with over 2.36 billion cubic feet produced. In 2019, West Virginia ranked sixth with 1.97 billion cubic feet produced, representing a slight decline in production relative to other rapidly growing states.

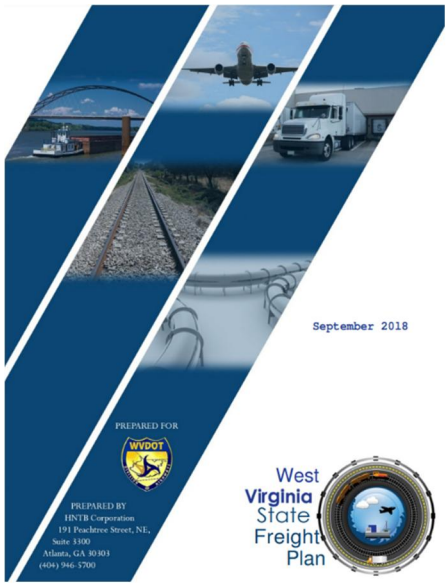
At the time of the development of the Statewide Freight Plan, there were nine pipeline projects at various stages of development underway in the state. Though oil and gas production is centered in the resource-rich northern part of the state, several pipelines carry commodities through the Kanawha-Putnam region, and given its central location in the state, the region could be an ideal site for resource processing plants in the future. For instance, the Appalachian Storage Hub is a proposed pipeline near Huntington, West Virginia that would run along the entire length of the West Virginia and Ohio border. This project would also require several plants in the Charleston area, bringing in-demand jobs and investment to the region.

Air Transport

Air freight is typically characterized by low-weight, small volume, high-value cargo shipments that need to be delivered on time-sensitive schedules. Air cargo operations are divided into air cargo freight forwarding companies, integrated carriers (FedEx, UPS), and cargo shipments stored in regularly scheduled commercial passenger flights. Air cargo is typically more prevalent at airports that have strong connectivity and short travel times to domestic and international destinations. Notable air cargo hubs around West Virginia include Memphis, TN, Louisville, KY, and Atlanta, GA.

Yeager Airport in Kanawha County serves five commercial airlines (American Airlines, Delta Air Lines, Delta Connection, Spirit Airlines, and United Express) and provides direct flights to Charlotte, Philadelphia, Washington, D.C., Atlanta, Orlando, Myrtle Beach, and Chicago. Yeager Airport has the largest number of passengers of any airport in West Virginia but has limited air cargo activity. The National Plan of Integrated Airport Systems (2021-2025) listed Yeager Airport as a nonhub commercial service airport, and no air cargo data was found, possibly due to limited activity.

West Virginia State Freight Plan



The West Virginia State Freight Plan was completed in September 2018. This plan provides an understanding of the existing and future freight network in West Virginia through 2040. The goals of the plan reflect the national freight planning goals in the National Freight Policy, which include the following elements: safety, economic competitiveness, maintenance, technology, economic, and environmental impacts. The specific goals of the plan are outlined below:

1. Evaluate existing transportation systems and how they are used by different industry sectors in and through West Virginia;
2. Identify a freight network based on federal guidelines;
3. Develop a freight planning framework that can be used for statewide and Metropolitan Planning Organizations (MPO) plans;
4. Better position West Virginia for federal funding, particularly regarding freight projects; and
5. Strengthens relationships with the freight industry through outreach activities.

Freight Related Improvements

Several of the *RIC Metropolitan Transportation Plan's* financially constrained project recommendations address current and anticipated freight needs. In determining objective scores for projects, proximity to industrial and manufacturing shipping centers was taken into consideration to identify improvements that would benefit freight mobility.

The existing conditions and current forecasts for rail, water, and air transportation modes do not call for additional or distinct transportation improvements. As noted in the discussions above, demand for these modes may be affected by economic trends in commodities (particularly the energy sector) or tourism. These trends should be monitored to determine if distinct future needs arise for rail, water, or air transportation improvements.

Table 7-4: Freight Related Improvements (including Vision projects)

PROJECT ID	ROADWAY NAME	PROJECT DESCRIPTION
RSA-1	Patrick Street	Enhances the 4th Avenue/ Patrick Street Intersection by adding turn lanes to both streets
PC-6A	Teays Valley Road (CR 33)	Widen to 3 lanes between WV 34 and US 35 in areas where two lanes currently exist
RSA-2	WV 34	Install roundabouts at I-64 ramp and Great Teays Blvd. Implement access management
KC-U2	Northern Connector, ALL PHASES	Northern Connector, Sections C, D, E - 4 lane facility from I-64 to I-77.
KC-7	WV 94 (Lens Creek Road)	From Six Mile Hollow Road to Interstate 64: Widen to 3-lanes on steep grades to provide truck passing lanes
RSA-4	I-64 EB Off Ramp	Widen off-ramp to Virginia Street W to provide a drop decision lane

Chapter 8 | Safety and Security

Introduction

Federal transportation planning regulations mandate that metropolitan transportation plans give specific consideration to the aspects of transportation involving safety and security. Transportation-related issues involving safety and security are costly to individuals, communities, and all levels of government when they are not properly addressed by planning efforts. The *Regional Intergovernmental Council Metropolitan Transportation Plan (RIC MTP)* addresses these requirements primarily by identifying existing safety issues and incorporating them into the transportation recommendations and prioritization process. The following chapter evaluates safety and security by analyzing vehicular, pedestrian, bicyclist, freight and rail transportation statistics and considerations. The analysis includes maps that provide a geographic overview of crashes throughout the region and identify high accident locations. The chapter concludes with recommended safety and security improvements for all modes of transportation.

Traffic Safety and Crash History

Traffic safety is a key component of any successful transportation plan and a critical consideration for community-wide mobility. Examining crash history and traffic patterns can aid in the identification of locations where improvements in traffic safety are most needed.

Figure 8-5 shows the relative density of crashes that occurred in the study area from 2013 to 2019. Many of the areas that show a higher density of crashes correspond to areas of high traffic volumes, interstate interchanges, and activity centers.

Table 8-1 provides greater detail about crash types for all fatal crashes in West Virginia from 2015 to 2019.

Safety concerns were expressed during public meetings for both motorized and non-motorized transportation.

Table 8-1: West Virginia Fatalities by Crash Type – All Crashes, 2015-2019

CRASH TYPE	FATALITIES (%)	FATALITIES (ACTUAL)*
Single Vehicle	59.8%	834
Involving a Large Truck	14.6%	203
Involving Speeding	27.5%	383
Involving a Rollover	28.4%	396
Involving a Roadway Departure	69.3%	967
Involving an Intersection (or Intersection Related)	12.3%	171

**A fatality can be in more than one category. The sum of the individual cells will not equal the total due to double counting.*

Crash Trends

According to the West Virginia FFY 2020 Highway Safety Plan, 1,233 traffic serious injuries were recorded in West Virginia for 2015. The rate of serious injuries continues to trend downward in West Virginia. Between 2008 and 2017, there was an overall decrease of 69% for serious injuries. A total of 717 crashes with serious injuries occurred within the Kanawha-Putnam area during safety performance target years 2015 through 2019. Table 8-2 summarizes serious injury crashes within the Kanawha-Putnam area during 2015 through 2019.

Table 8-2: Serious Injuries by Safety Performance Target Year, Kanawha-Putnam Area

SAFETY PERFORMANCE TARGET YEAR	NUMBER OF SERIOUS INJURIES
2015	169
2016	154
2017	142
2018	134
2019	116
Total	715

Crash Fatalities

From 2015 to 2019, 1,431 traffic fatalities occurred in West Virginia. Of these 1,431 fatalities, 131 took place in Kanawha County and 42 occurred in Putnam County. Single vehicle crashes accounted for the majority of the fatalities. Approximately 63% of single vehicle crashes occurred on rural roads. According to the West Virginia Highway Safety Plan, Kanawha County was ranked first out of ten counites where fatalities occurred in 2018, making up 14% of the total fatalities in West Virginia for that year.

Pedestrian fatalities and bicyclist fatalities accounted for 122 deaths during 2015 through 2019. Between 2015 and 2019 the total number of fatalities increased from 19 to 31 fatalities respectfully. Table 8-3 shows the total number of pedestrian and bicycle fatalities between 2015 and 2019.

Table 8-3: Pedestrian Fatalities and Bicyclist/Other Cyclist Fatalities in West Virginia, 2015-2019

YEAR	PEDESTRIAN FATALITIES	BICYCLIST	TOTAL FATALITIES
2015	19	1	20
2016	24	1	25
2017	26	3	29
2018	22	5	27
2019	31	3	34
Total	122	13	135

Table 8-4: Car Crash Fatalities, Kanawha and Putnam Counties, 2015-2019

YEAR	KANAWHA	PUTNAM	TOTAL FATALITIES
2015	23	4	27
2016	21	5	26
2017	31	10	41
2018	40	9	49
2019	16	14	30
Total	131	42	173

The highest concentration of crashes occurred at downtown intersections and along key commercial corridors, most often at the entrances to malls, restaurants, convenience stores, and gas stations. The following intersections represent examples of commercial locations with high crash frequencies.

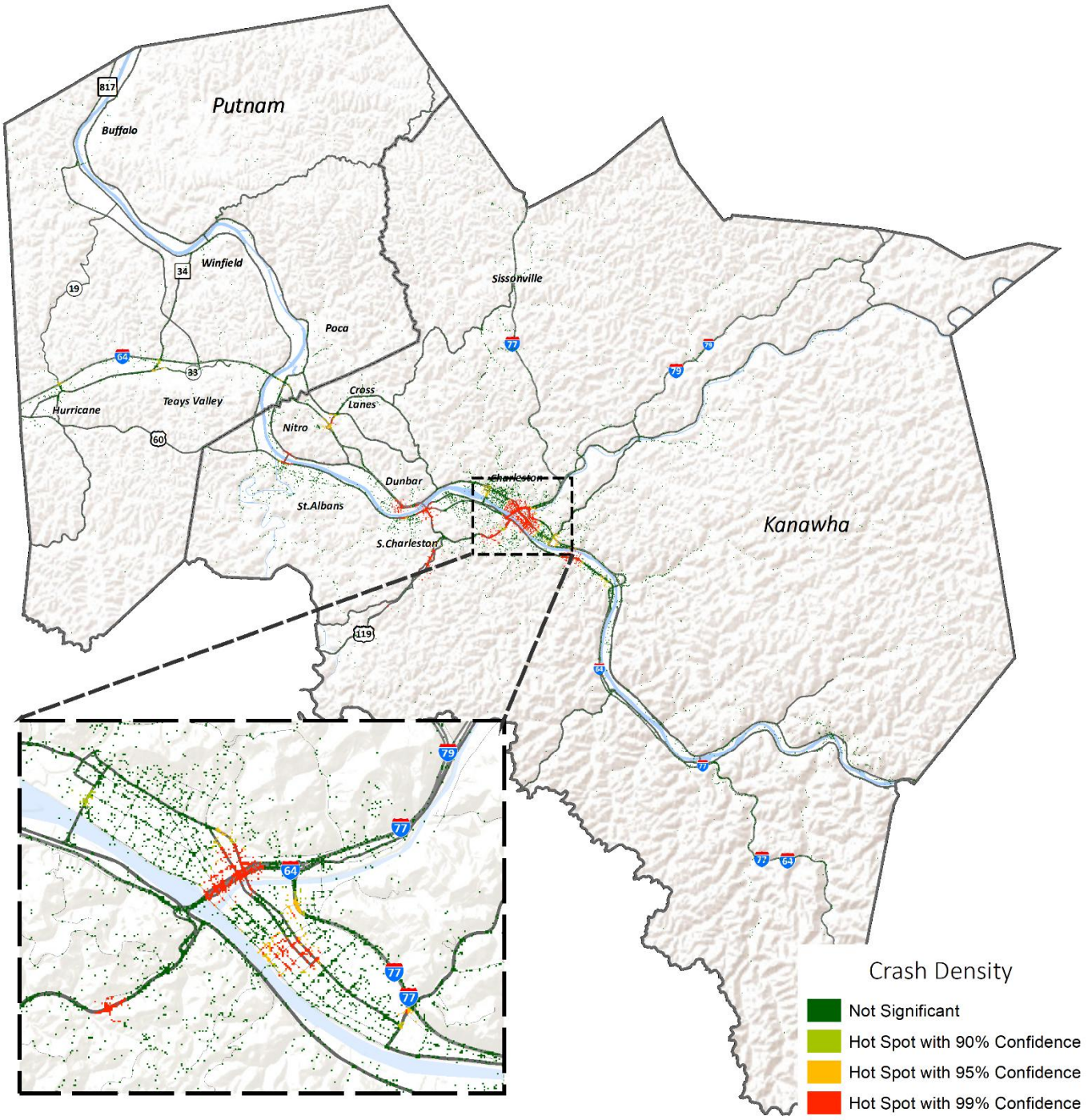
Stakeholders indicated that the I-64/I-77 interstate split (Charleston) is a high crash location. Source: Google Maps

- Teays Valley: A high frequency of crashes occurred on WV 34, south of the I-64 interchange (near McDonalds and the TA Travel Center). The disconnection of pedestrian facilities in this area is also a safety issue.
- I-64: Stakeholders indicated that the I-64/I-77 interstate split (in Charleston) is a high crash location. Safety issues are potentially compounded when drivers (often trucks) abruptly change lanes from the I-64/I-77 eastbound/southbound lanes (at the interstate split) to the I-77 northbound through lanes. Stakeholders also expressed major concern regarding I-64 between Institute and Cross Lanes. This section of interstate has a significant increase in grade and roadway geometry.
- Downtown Charleston: Crashes occurred throughout downtown, with high concentrations at the intersection of Pennsylvania Avenue and Lee Street, Washington Street East and Court Street, Washington Street East and Brooks Street, Washington Street East and Ruffner Street, and Washington Street East and Greenbrier Street.

Although the RIC MTP does not offer specific recommendations for each of these locations, the project team recommends that local governments consider signal improvements and access management strategies when evaluating these corridors and intersections. To further enhance safety for bicycle and pedestrians, other recommendations to be considered should include:

- Intersection treatments for bicycles:
  - Bicycle boxes
  - Stop bars
  - Lead signal indicators
- Facility treatments for bicycles:
  - Dedicated bicycle lanes
  - Curb extensions
  - High visibility signage
  - Separated trails or multi-use pathways
- Intersection treatments for pedestrians:
  - Signalized pedestrian crossings
  - Mid-block crossings
- Facility treatments for pedestrians:
  - Separated or buffered sidewalks
  - Lighting enhancements
  - Pedestrian overpasses or underpasses

Figure 8-1: Crash Density 2015-2019



Safety Performance for Transportation Planning

MAP-21 and the FAST Act place a strong emphasis on transportation performance management by utilizing system information to strategically decide on investments and policies to achieve national performance goals and to increase accountability and transparency of the federal highway and transit programs. This process ensures efficient and appropriate investments of federal transportation funds. National performance goals have been established for the following areas: Safety, Infrastructure Condition, Congestion Reduction, System Performance, Traffic Congestion, On-Road Mobile Source Emissions, Freight Movement and Transit Safety. Currently, the Safety Final Rule has established five performance measures:

- Number of Fatalities
- Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT)
- Number of Serious Injuries
- Rate of Serious Injuries per 100 million Vehicle Miles Traveled (VMT)
- Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries

The West Virginia Department of Transportation (WVDOT) established statewide targets for each performance measure that meet federal requirements and requirements designated by the FHWA Transportation Performance Management (TPM) Timeline. Once performance measures are established, initial targets are designated for the baseline performance period. The data used in each performance area have different criteria for performance measures along with varying reporting deadlines.

> *Example: For Performance Measure 1 (PM 1, Highway Safety Performance Measures), per federal requirements, WVDOT must set targets for each performance measure by August 31 of each year. Within 180 days from the date WVDOT establishes annual statewide safety targets, RIC must either elect to adopt the statewide targets, supporting WVDOTs efforts at achieving those targets, or establish quantifiable targets of their own.*

The RIC MPO has elected to adopt WVDOT statewide targets and support WVDOT efforts for each applicable performance area. The continual monitoring and reporting of targets for all performance measures are federally required of both State DOTs and MPOs to efficiently guide future decision-making for transportation investments.

Table 8-5: Safety Performance Targets for the RIC MPO Planning Area, 2018-2019

NUMBER OF FACILITIES	GOAL	2018 TARGET	2019 TARGET
Fatalities	50% Reduction by 2030 (from 2009)	281.8	274.2
NUMBER OF SERIOUS INJURIES	**GOAL**	**2018 TARGET**	**2019 TARGET**
Serious Injuries	66% Reduction by 2030 (from 2013)	1235.8	1188.3
FATALITY RATE PER HMVMT*	**GOAL**	**2018 TARGET**	**2019 TARGET**
Fatality Rate	50% Reduction by 2030 (from 2009)	1.437	1.45
INJURY RATE PER HMVMT*	**GOAL**	**2018 TARGET**	**2019 TARGET**
Serious Injury Rate	66% Reduction by 2030 (from 2013)	6.302	5.877
NUMBER OF NON-MOTORIZED FATALITIES AND SERIOUS INJURIES	**GOAL**	**2018 TARGET**	**2019 TARGET**
Bike & Ped Fatalities & Serious Injuries	66% Reduction by 2030 (from 2013)	89.4	84.5

**HMVMT – Hundred Million Vehicle Miles Traveled*

System Performance Report

The System Performance Report was created by RIC staff to help optimize transportation investments through system monitorization, data management, and implementation of the Transportation Performance Management (TPM) framework into transportation planning programs and processes. A report of this nature aids in assessing the efficiency of the existing transportation system, provides guidance to implement performance-based planning into current and future transportation investments, and supports FHWA's TPM and Performance-Based Planning and Programming (PBPP) framework to the maximum extent feasible.

The periodic updates to the System Performance Report will allow RIC to efficiently track and manage performance measures and targets. An additional benefit includes the ability to evaluate progress toward desired performance goals.

Hazardous Intersection Study

In 2019, RIC began work on the Hazardous Intersection Study. The main objective of the study was to reduce crashes throughout Kanawha and Putnam counties. RIC staff began the initial phase of the study by developing an extensive list of 50 intersections within the MPO area utilizing both crash data and public input. RIC staff, along with local stakeholders and the West Virginia Division of Highways (WVDOH) selected Burgess & Niple Inc. to complete the study.

Once the 50 prioritized intersections were identified, a total of five intersections were chosen for further study. The study locations are as follows:

- WV 34 between Great Teays Boulevard and I-64
- Pennsylvania Avenue (North and South) between Virginia Street to Washington Street
- Patrick Street and Kanawha Boulevard
- US 60 between Mile Branch Road and Hull Avenue
- MacCorkle Avenue and Montrose Road

Field reviews and traffic counts were conducted for all study locations. A total of four virtual stakeholder meetings were held throughout different stages of the study's planning process. Each study location has the following supplemental resources: crash trends analysis and collision diagram, field visit information, countermeasure identification, stakeholder meeting and final report.

Public Input

Key stakeholders and members of the public also voiced their concerns about safety and security in the region. Generally, the public emphasized the need for additional bicycle and pedestrian facilities, expressing that sidewalks and designated bicycle lanes would improve safety and enhance connectivity. The public specifically mentioned safety concerns about the following locations:

- US 35 at the Buffalo Bridge: Trucks frequently crash here.
- CR 33 along Teays Valley: Sight distance issues and many subdivision entrances.
- I-64 between Institute and Cross Lanes: Significant increase in curb grade and curves. This causes tractor trailer crashes during inclement weather.
- King Street, Institute Area: For several years, there have been concerns about pedestrian safety along King Street, which borders Shawnee Park.

There were several comments regarding safety in school zones; there is a need for speed reductions, but significant traffic congestion occurs.

Rail Safety

There are 3,651 total rail crossings in the state of West Virginia. Types of rail crossings include at-grade, over-road, and under-road crossings. Approximately 1,240 are public crossings and 1,761 are private. Of all at-grade crossings, 639 crossings utilize at least one active warning device such as flashing lights or bells, while 1,472 use passive warning devices such as stop signs or pavement markings.

Between 2011-2012, RIC conducted the St. Albans Railroad Crossing Study which evaluated existing deficiencies at thirty-nine (39) intersections, seven (7) at-grade rail crossings, and six (6) grade-separated rail crossings. Following a thorough analysis of existing conditions of highway traffic, train volumes, travel times, and crash data, the study team proposed three alternatives. The 3rd Street underpass (Alternative 2) proposed to eliminate horizontal and vertical clearance restrictions at the existing 3rd Street underpass was selected as the preferred choice for improvements. In 2015, the 3rd Street underpass was involved in an additional study called the St. Albans Third Street Corridor Study. The 3rd Street Study proposed a separate pedestrian facility under the existing railroad. The recommendation provided a safer, more attractive pedestrian facility to discourage illegal pedestrian crossings, which are common at this location. Removing the existing sidewalk from the roadway and replacing it with a separate pedestrian crossing facility will allow for wider travel lanes and a longer turn lane.

According to the West Virginia State Rail Plan, 115 highway-rail-at-grade crossing incidents have been reported since 2013. The incidents resulted in a total of three (3) fatalities and sixty (60) injuries, with more than 70% occurring on public-at-grade crossings. There were nine (9) injuries reported at the at-grade rail crossings of highways in the state of West Virginia, the second highest since 2013 which totaled 30. Overall, total rail accidents have decreased by 68% during the last decade from 60 events in 2010 to 19 in 2019. While the total amount of rail accidents has declined, total fatalities have increased from 2016 through 2019. Safety can be improved through the installation, use of active warning devices on more at-grade crossings, and educational outreach efforts.

Table 8-6 examines the last decade of highway-railroad crashes in Kanawha and Putnam counties. Kanawha County had the highest in total number of accidents (20) between 2010 and 2019 out of all counties in West Virginia. No accidents were reported between 2015 and 2016 in either county.

Table 8-6: Highway-Railroad Accidents by County, 2010-2019

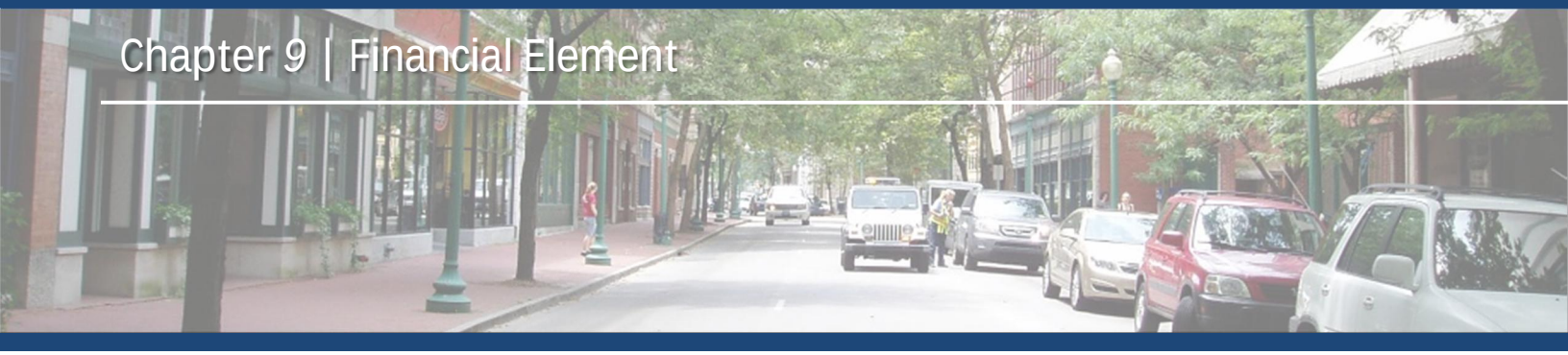
COUNTY	NUMBER OF ACCIDENTS	TOTAL INJURED	TOTAL FATALITIES
Kanawha	20	7	1
Putnam	6	1	1
Total	26	8	2

Recommendations

The majority of the fiscally constrained projects encourage improvements in vehicular and pedestrian safety. In prioritizing projects, the study team considered public and stakeholder comments as well as crash locations to determine the projects' impacts on safety. The project team awarded higher scores to those proposed projects that correspond to high accident locations. Ideally, the plan's proposed roadway improvements can help reduce the frequency and/or severity of crashes. The following recommended projects shown in Table 8-7 are located along corridors with a particularly high frequency of crashes.

Table 8-7: Areas with High Geographic Correlation of High Crash Locations

PROJECT ID	ROADWAY	DESCRIPTION
KC-4	US 119 (Corridor G)	Widen from MacCorkle Ave to Lucado Rd to improve operations
CL-8	Goff Mountain Rd/Big Tyler Rd (WV 622)	Widen from 3 to 5 lanes from Old Goff Mountain Rd to the traffic signal at Kroger
KC-6	US 119 (Corridor G)	Widen from Emerald Rd to Jefferson Rd to improve operations
KC-5	US 119 (Corridor G)	Widen from Lucado Rd to Emerald Rd to improve operations
KC-8D	Dupont Ave (US 60)	Add center turn lane west through London for approximately one mile, reducing risk of rear-end collisions and improving traffic flow



Chapter 9 | Financial Element

Introduction

The *Regional Intergovernmental Council Metropolitan Transportation Plan* (*RIC MTP*) outlines the region's long-range transportation strategies. In accordance with both state and federal requirements, the RIC MTP is required to be financially constrained. The intent of a long-range transportation plan is to demonstrate how projects that have been recommended and prioritized can realistically be funded by the plan's horizon year. It is essential to understand the expected levels of future funding, estimated planning-level project costs, and to have consistent assumptions that address all modes of transportation. A financially constrained plan allows RIC, member jurisdictions, and supporting agencies to focus on near-term opportunities and to identify strategies that support plan implementation.

The following chapter summarizes the financial constraint methodology and results. The recommendations and prioritization are consistent with Chapter 4.

Financially Constrained Plan Development

The financially constrained plan—which is required by the FAST Act and MAP-21 for long-range transportation plans—shows the proposed investments over the life of the plan that are reasonably anticipated based on future revenues during a series of funding periods. Achieving this balance is referred to as "financial constraint." The funding periods summarized for the RIC MTP are as follows:

- 2021-2025
- 2026-2030
- 2031-2040
- 2041-2050

The 2021-2025 funding period includes the committed projects and associated funding from the Dynamic State Transportation Improvement Program (DSTIP) or West Virginia STIP. The projects and funding levels identified during this time period have already been identified as priority projects through previous performance-based planning efforts. As such, these projects are not re-evaluated as part of this MTP update.

The 2025-2030, 2031-2040, and 2041-2050 funding periods help divide the remainder of the projects and project revenues into five- and ten-year time bands. The projects that cannot be funded within the 2050 fiscally constrained plan are considered to be a part of the vision plan.

The blend of transportation recommendations proposed to meet the needs of the region over the next twenty-five years is consistent with revenue forecasts. The proposed recommendations were developed in collaboration with the Regional Intergovernmental Council (RIC) MPO, the West Virginia Department of Transportation (WVDOT), the Federal Highway Administration (FHWA), member jurisdictions, and the public. The proposed projects include roadway, freight, bicycle, pedestrian, and transit improvements for the duration of this plan. Since transit costs and revenues are generated and maintained by the Kanawha Valley Regional Transportation Authority (KVRTA), transit was not considered as part of this financially constrained plan. The financial plan details both the proposed investment toward these recommendations and revenue forecasts over the life of the RIC MTP. The recommendations also reflect travel benefits and socioeconomic impacts identified in Chapter 4 and the Appendix.

These projects are the result of extensive public outreach. The participation process included two rounds of virtual community workshops, an interactive online survey, an interactive project website, stakeholder interviews, and the participation of the plan's Steering Committee. More information on the community outreach effort can be found in Chapter 1 and the Appendix.

Financially Constrained Plan Assumptions

The recommendations were derived from a variety of sources, including previous planning efforts, deficiencies analysis, and feedback from the public. Projects from previous planning efforts were more likely to have estimated project costs. Where possible, these estimated costs were brought forward into the current plan and inflated to current year dollars (i.e. 2021). The projects that did not have previously identified costs were independently estimated by considering the unit cost for recommended facility types, along with consideration for project elements including contingency, anticipated right-of-way, design, and environmental and/or utility costs.

All of the dollar figures discussed in this chapter were analyzed in current year dollars and then inflated to reflect the projected year of expenditure or implementation time band. The inflation rate used to determine the year of expenditure dollars was derived from WVDOT's Calendar Year *2017 Long Range Revenue Estimates for use in MPO Long Range Transportation Plans*. Since the last plan's update, detailed studies to determine more accurate project costs have been completed. These project costs have been updated to accurately reflect to the current year dollar amount.

Chapter 9 provides an overview of revenue assumptions, probable cost estimates, and financial strategies in addition to the assumptions used to determine these values. In subsequent plan updates, all funding programs, projects, and assumptions will be re-evaluated.

Roadway

Roadway Capital

The capital roadway projects that were identified during recommendation development were taken through a regional prioritization process. The outcome of that process is a list of prioritized projects that can be considered for incorporation into the financially constrained plan. To determine when projects should be implemented, the

priority project list is compared to the available revenues. In the Kanawha-Putnam region, funding for capital roadway projects is primarily obtained through federal and state sources as outlined by the DSTIP.

Currently, the funding received from WVDOT accounts for the majority of all capital highway funding available in the study area. There are several new widening projects or improvement projects that are under construction using money derived from the DSTIP:

- WV 622 Widening
- RHL Boulevard Construction
- US 119 Oakwood Area Improvements (RCUT)
- US 35/I-64 Widening

Additional information on these committed projects can be found in Chapter 4.

The federal revenue levels available for the RIC MPO have been projected by WVDOT in the document *Calendar Year 2017 Long Range Revenue Estimates for use in MPO Long Range Transportation Plans*. The revenues in the RIC area are projected from 2021-2050 in the document. To fully project the revenues for the life of the RIC MTP, the assumptions outlined by WVDOT were used to develop these revenue projections, along with a 1.5% annual inflation rate, were applied to forecast the years 2046-2050. The funding levels for committed projects in the STIP were combined with the projected revenues for the years 2026-2050 to determine that there will be a total of $863.3 million available for capacity highway projects of the life of this plan.

Table 9-1: Highway Capital Revenue Summary (year of expenditure dollars)

PERIOD	AMOUNT
2021-2025[1]	$100,800,000
2026-2030	$108,487,275
2031-2040	$299,165,483
2041-2050	$455,719,790
Total	$863,372,548

It is essential that the revenue estimates reflect a reasonable level of future funding dollars based on the current level of funding. As a result, this revenue estimate does not consider potential changes to the state funding structure.

When the funding levels have been established, the next step is to consider the needs that should be fulfilled within each funding period of the plan. To determine the priority order, the prioritization results documented in

[1] 2021-2025 is consistent with the WVDOT Dynamic State Transportation Improvement Program and was accessed on July 7, 2021.

Table 4-8 were considered. The capital roadway project prioritization evaluated recommendations based on a series of quantitative and qualitative metrics that addressed the plan's guiding principles. While it would be ideal to implement every project, realistically, only certain projects can be funded. As a result, higher ranked projects were considered first for funding.

During the financial constraint process, higher cost projects were also considered higher priority despite not having enough revenues available for a given funding period. In those instances, lower cost projects with the most favorable prioritization score would be advanced to make use of the available revenues in that funding period.

The following figures and tables divide the capital roadway projects into 2021-2025 (committed), 2026-2030, 2031-2040, 2041-2050, and unfunded vision categories. Figure 9-1 shows the capital roadway projects divided by these funding periods. Tables 9-2 through 9-6 break out the financially constrained projects during each of these funding periods.

Based on the financial analysis, twenty-one out of twenty-seven roadway capital projects for the RIC MTP can be funded within the 2050 horizon year. Each funding period's list of projects is financially constrained within that period with a small amount of revenue that is carried over to the next funding period. In accordance with federal guidance, the midpoint year for each funding period was used to determine the potential project year of expenditure (resulting in an inflated project cost). There are approximately $2.2 billion of unmet needs in the MPO planning area.

After determining the financial constraint, the projects that are anticipated to receive funding were tested within the travel demand model. Figure 9-2 shows the remaining 2050 network congestion following the implementation of these projects. Additional performance data for the financially constrained network can be found in the Appendix.

Figure 9-1: Financially Constrained Projects

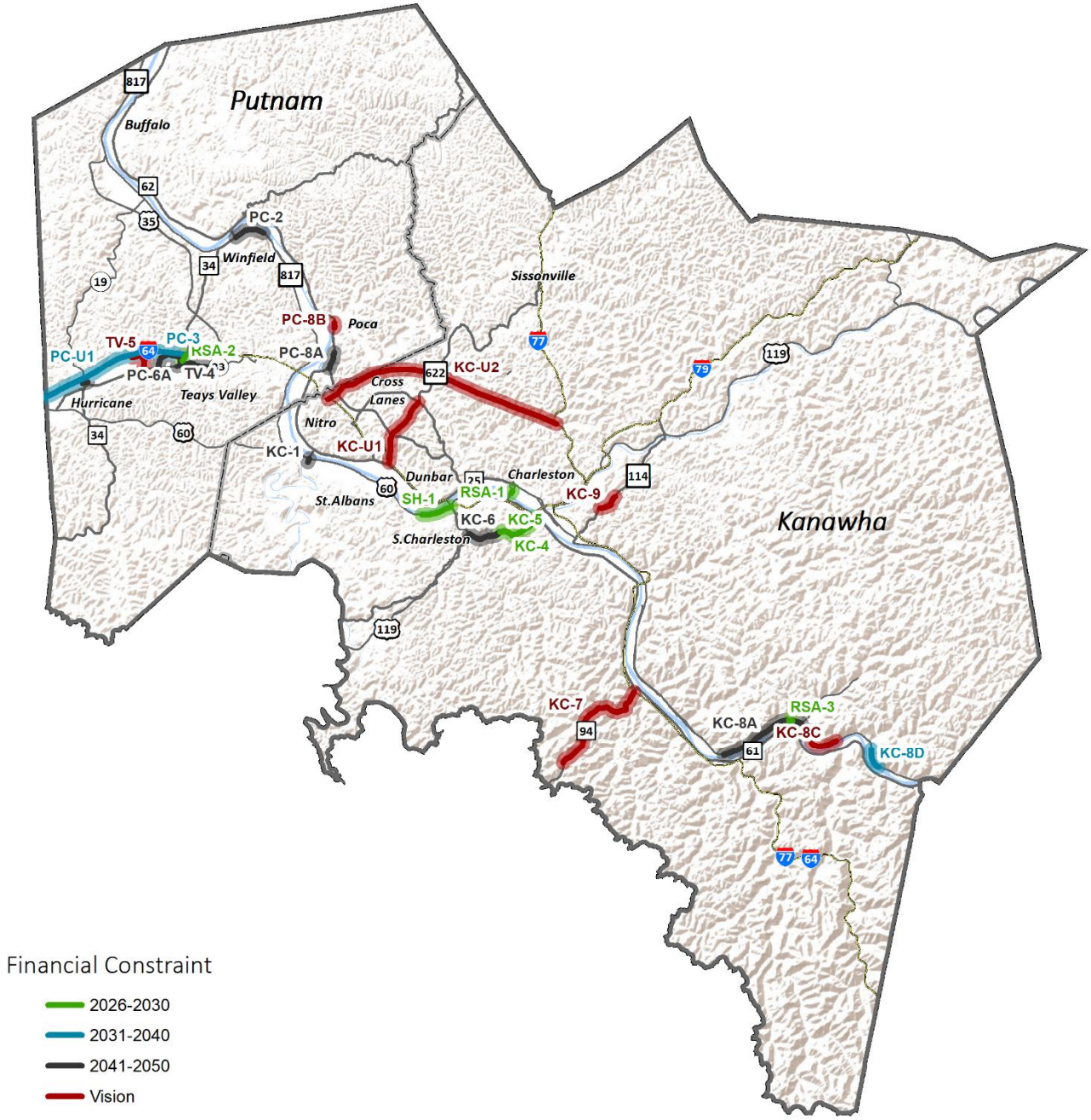


Figure 9-2: 2050 Volume-to-Capacity

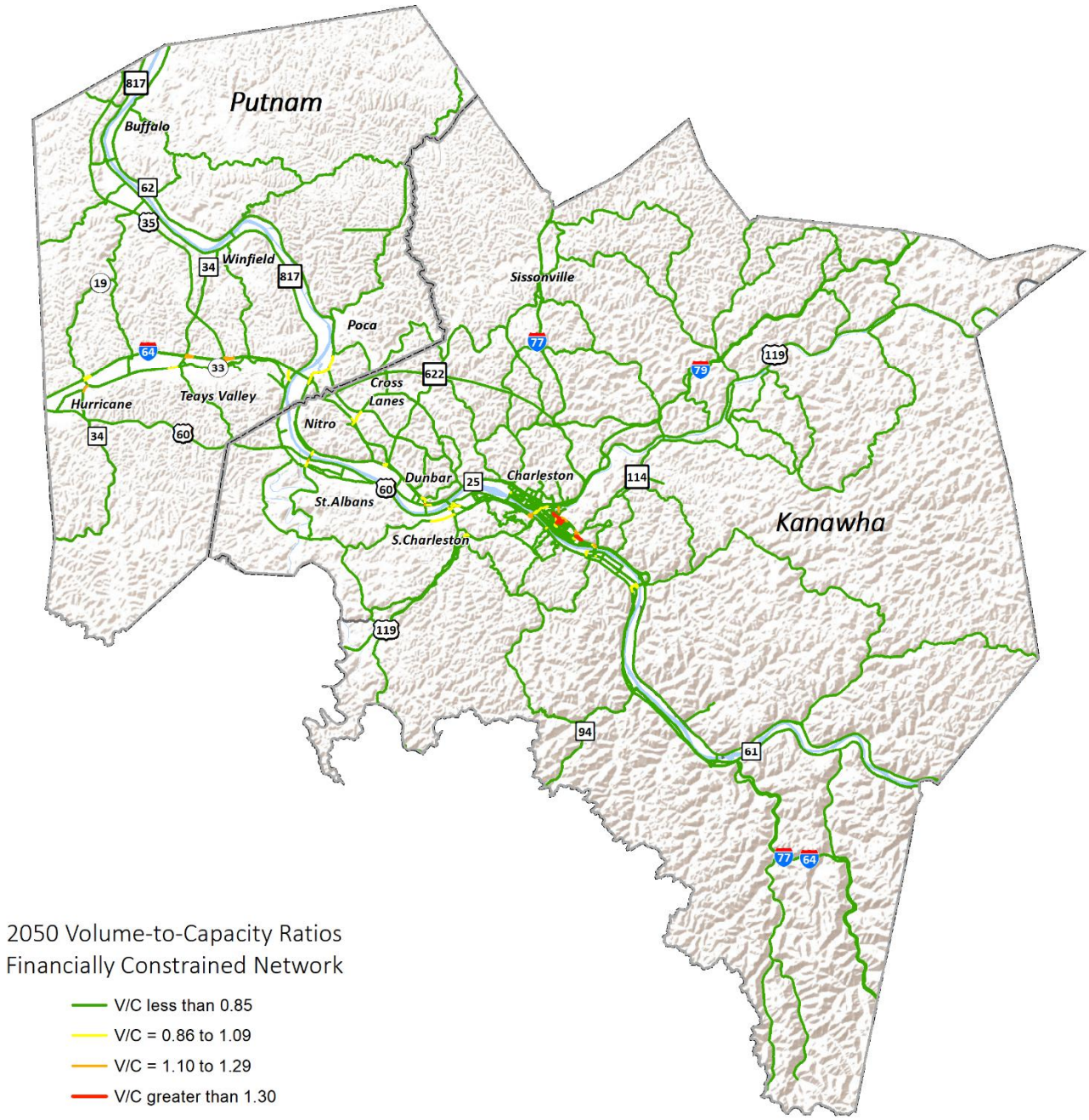


Table 9-2: Committed Roadway STIP Projects 2021-2025

FACILITY	PROJECT DESCRIPTION
Interstate 64 – Nitro to US 35	Upgrade to 6 lanes
WV 622 – Cross Lanes	Widen roadway
US 119 Oakwood Area Improvements	Construct RCUT
RHL Boulevard Connection	Construct new roadway

Table 9-3: 2026-2030 Financially Constrained Projects (year of expenditure dollars)

ID	FACILITY	FROM	TO	PROJECT DESCRIPTION	ANTICIPATED COSTS
RSA-1	Patrick Street	4th Ave	Patrick Street Plaza	Intersection modifications	$406,898
SH-1	MacCorkle Ave	Rock Lake Drive	Jefferson Road	Multiple (restripe, signal optimization, sidewalk enhancements, etc.)	$6,242,273
KC-5	US 119 (Corridor G)	I-64 Connector	Lucado Road (generally)	Widening, Cantley Flyover	$49,915,000
KC-4	US 119 (Corridor G)	MacCorkle Avenue	Lucado Road	Widening	$16,581,120
RSA-3	US 60 (Dupont Ave)	Hull Ave	William Street	Intersection improvements	$709,009
RSA-2	WV 34	I-64	Great Teays Blvd	Roundabout corridor	$4,926,320

Table 9-4: 2031-2040 Financially Constrained Projects (year of expenditure dollars)

ID	FACILITY	FROM	TO	PROJECT DESCRIPTION	ANTICIPATED COSTS
PC-U1	Interstate 64	Cow Creek Road	Cabell County Line	Upgrade to 6 lanes	$163,756,181
PC-3	Interstate 64	Cow Creek Road	WV 34	Upgrade to 6 lanes	$89,321,553
KC-8D	US 60	Old Town Road	Browns Mountain Road	Widening	$18,527,159

Table 9-5: 2041-2050 Financially Constrained Projects (year of expenditure dollars)

ID	FACILITY	FROM	TO	PROJECT DESCRIPTION	ANTICIPATED COSTS
PC-6A	Teays Valley Road (CR 33)	WV 34	Thomas Drive	Widening	$46,195,692
KC-8A	US 60 (Dupont Ave)	Kellys Creek Road (CR 81)	Chelyan Bridge	Access Management	$135,316,681
PC-2	WV 817	Winfield Bridge	Planters Road	Widening	$43,115,980
KC-6	US 119 (Corridor G)	Jefferson Road Interchange	Emerald Road	Widening	$107,648,651
PC-8A	WV 62	WV 25	Dairy Road	Widening	$5,459,522
KC-1	3rd Street Underpass	-	-	Widening	$36,825,588
TV-4	Mt. Vernon Road (CR 34)	WV 34	WV 34 (Teays Valley Road)	Modernization	$20,298,704
PC-4	Hurricane Improvements	-	-	Access Management	$4,442,032

Table 9-6: Unconstrained Vision Plan Projects (2051 dollars)

ID	FACILITY	FROM	TO	PROJECT DESCRIPTION	ANTICIPATED COSTS
KC-U1	Institute Connector	Institute Interchange	WV 622	New Alignment	$247,475,641
KC-9	WV 114 (Greenbrier Street)	Airport Road	Rutledge Road (CR 46)	Widening	$65,191,429
KC-8C	US 60	Sycamore Road	Britt Hollow	Widening	$78,229,715
KC-U2	Northern Connector	I-64	I-77	New Alignment	$1,564,548,508
KC-7	WV 94 (Lens Creek Road)	Six Mile Hollow Road	I-64	Widening	$184,165,786
PC-8B	WV 62	Heizer Creek Road	Poca City Limits (southside)	Widening	$55,412,714
TV-5	Sleepy Hollow Road	Teays Valley Road	Cow Creek Road	Widening	$62,457,595

Maintenance Funding

Maintenance funding in the Kanawha-Putnam region is primarily utilized for routine roadway maintenance in addition to paving dirt roadways, replacing traffic signals, adding pedestrian and bicycle facilities. Maintenance needs are primarily funded by the state, with some additional funding provided by municipalities. The City of Charleston has a user fee in place to help cover the cost of maintenance on city streets. For the purposes of this plan, maintenance funding levels were determined using the *WVDOT Calendar Year 2017 Long Range Revenue Estimates for use in the MPO Long Range Transportation Plans*. Statewide non-improvement expenditures including Set-Asides, Debt Service, Administration, and Routine Maintenance were pulled from this document. Per the guidance of this document, 14.3% of all available statewide funding is expected to be used for the RIC MPO area. These maintenance funds are only expected to increase with inflation. Therefore, additional maintenance funds are not being allocated for new or improved facilities, as it would result in a deficiency in maintenance funds in future years.

By projecting these funding sources through the 2050 horizon year of the RIC MTP, the total maintenance funding available for the region totals to approximately $3.7 billion. The maintenance costs generated annually are assumed to be equal to the revenue available.

Table 9-7: Highway Maintenance Revenue Summary (year of expenditure dollars)

PERIOD	AMOUNT
2021-2025	$475,116,642
2026-2030	$586,408,108
2031-2040	$1,617,07,887
2041-2050	$1,102,554,882
Total	$3,781,153,519

New Funding Set Asides

Recently, MPOs have been setting aside a certain amount of revenue to ensure all of the region's needs are being addressed. Similar to the maintenance funds described above, this financial plan considers two crucial categories shown in Table 9-8. These funding categories ensure that the RIC MPO has dedicated funds to use on safety and ADA compliant projects through the plan's 2050 horizon year as new needs arise. While the DSTIP currently allocates $9 million for ADA implementation throughout the state, this set aside money provides flexibility for the RIC MPO. These funds could be used by the RIC MPO to pursue projects that are high-impact and low-cost.

Table 9-8: New Funding Categories (per year)

NEW FUNDING CATEGORIES	AMOUNT PER YEAR
Safety and Intersections	$1,000,000
ADA Implementation	$500,000

Bicycle and Pedestrian

New bicycle and pedestrian facilities in the Kanawha-Putnam area are primarily funded utilizing state and federal funding. These funding sources have historically included the Transportation Alternatives Program (TAP), National Recreational Trails (NRT), Highway Safety Improvement Program (HSIP), and other state and federal funding sources. Since a portion of the RIC MPO includes Huntington—a part of the WV-KY-OH Transportation Management Area—a portion of TAP funds can be directly allocated inside the RIC MPO area. The local match is typically around 20% for TAP funding.

In order to forecast bicycle and pedestrian revenue projections, statewide TAP and NRT funding levels were obtained from the DSTIP. The committed projects that appear in the DSTIP are added into the 2021-2025 period. Using guidance from the WVDOT C*alendar Year 2017 Long Range Revenue Estimates for use in MPO Long Range Transportation Plans*, 14.3% of all available statewide funding is expected to be used in the RIC MPO. Table 9-9 projects the revenues for bicycle and pedestrian projects within the Kanawha-Putnam area using these assumptions.

Table 9-9: Bicycle and Pedestrian Revenue Summary (year of expenditure)

PERIOD	AMOUNT
2021-2025	$7,592,210
2026-2030	$9,461,275
2031-2040	$26,483,541
2041-2050	$41,128,130
Total	$84,665,156

There are numerous bicycle and pedestrian improvement projects that have funding already allocated within the DSTIP. These committed projects primarily include sidewalk construction and multi-use pathways. A list of committed projects is included in Table 9-10.

Chapter 5 includes a list of recommended bicycle and pedestrian facilities in priority order. The RIC MPO should continue to prioritize bicycle and pedestrian recommendations and carry forward these projects into implementation. When feasible, bicycle and pedestrian projects should be considered as part of recommended roadway improvements.

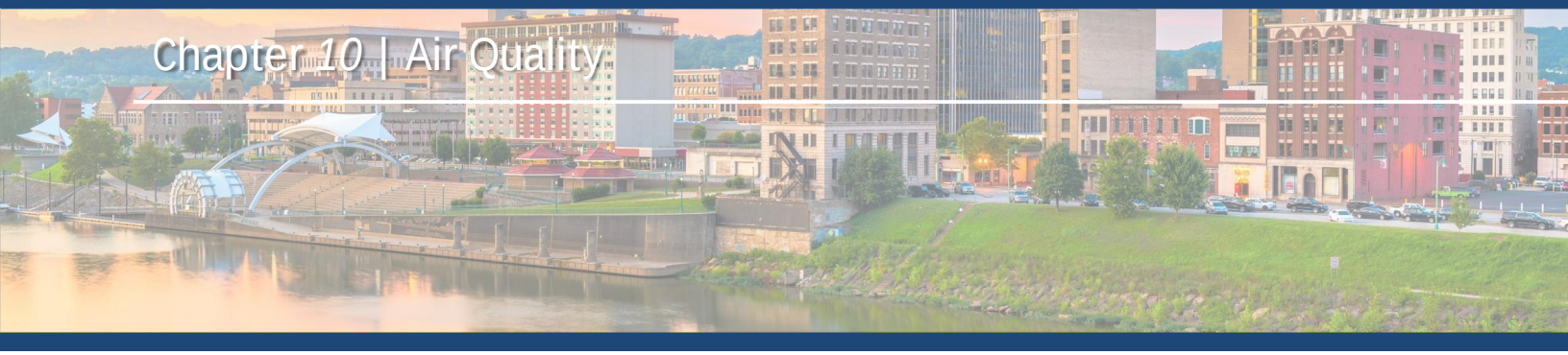
Table 9-10: Committed Bicycle and Pedestrian STIP Projects, 2021-2025

PROJECT DESCRIPTION	ANTICIPATED COSTS
Charleston Washington St Streetscape	$254,772
Grosscup Ave Sidewalk	$30,000
Charleston Sidewalks South	$156,000

PROJECT DESCRIPTION	ANTICIPATED COSTS
Dunbar 12th St Streetscape	$332,834
Dunbar 12th Streetscape 2014	$201,344
St Albans Streetscape 2014	$241,000
Grosscup Ave Sidewalk	$75,000
Hatfield McCoy Kanawha Construct Trail System	$100,000
Hurricane Sidewalks	$276,000
Great Teays Blvd Sidewalk	$340,000
Rhoda High School Ave 3rd	$88,800
Hurricane Main St Sidewalks	$116,000
Teays Valley Sidewalks 2015	$300,000
Winfield Downtown Streetscape	$294,650

Conclusion

The RIC MTP provides a vision for transportation that considers existing and future needs and priorities for all modes of travel. The creation of a financially constrained plan helps ensure that prioritized projects can be reasonably funded and implemented for the duration of the long range plan. The RIC MTP has identified numerous transportation needs throughout the region, not all of which can be funded using the currently projected revenue streams. As projects move into funding and implementation, the RIC MPO will collaborate with WVDOT and FHWA to determine how to best advance the recommended projects of this plan. The MPO will continue to opportunistically seek new funding sources. The project priorities should be reassessed through future planning cycles as new data becomes available. This dynamic process will provide guidance for the region to effectively address its transportation needs.



Chapter 10 | Air Quality

Introduction

Transportation air quality conformity is a way to ensure that federal funding and approval are awarded to those transportation activities that are consistent with air quality goals. Under the Clean Air Act (CAA), transportation and air quality modeling procedures must be coordinated to ensure that the TIP and MTP are consistent with the State Implementation Plan (SIP). The SIP is a federally required document that provides a comprehensive assessment of regional air quality conditions (motorized and non-motorized) and desired targets if applicable. The purpose of the SIP is to ensure that the State and its member jurisdictions will be able to attain or maintain the levels of the National Ambient Air Quality Standards (NAAQS).

In order to receive transportation funding from the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), state and local transportation agencies in nonattainment or maintenance areas must demonstrate that all transportation air quality conformity requirements of the CAA are being met as set forth in the transportation conformity rule. As such, transportation plans are expected to conform to the SIP.

The integration of transportation and air quality planning is intended to ensure that transportation plans, programs, and projects will not:

- Cause or contribute to any new violation of any standard in any area;
- Increase the frequency or severity of any existing violation of any standard in any area; or
- Delay timely attainment of any standard or any required interim emissions reductions or other milestones in any area.

National Ambient Air Quality Standard Designations

The CAA requires the EPA to set NAAQS for pollutants considered harmful to public health and the environment. A nonattainment area is any area that does not meet the national primary or secondary NAAQS. A maintenance area is any area that the EPA previously designated as a nonattainment area for one or more pollutants, and subsequently redesignated as an attainment area subject to the requirement to develop a maintenance plan under section 175A of the CAA. The Charleston area has previously been designated maintenance under the ozone and fine particulate matter ($PM_{2.5}$) NAAQS. Transportation conformity requires nonattainment and maintenance areas to demonstrate that all future transportation projects will not hinder the area from reaching its attainment goals. Currently, the Charleston area is in attainment for all criteria pollutants. Additional

information is provided about the background and history of the region's previous nonattainment and maintenance status.

Ozone

Ozone is formed by chemical reactions occurring under specific atmospheric conditions. Two of the important classes of compounds in these reactions are hydrocarbons (including VOC) and oxides of nitrogen (NOx). Both of these are components of vehicular exhaust. Additionally, the hydrocarbons may be produced by evaporation from vehicle fuel system components and by displacement of vapors in the gas tank during refueling. By controlling these emissions, ozone formation can be controlled.

Effective June 15, 2004, EPA finalized ground-level ozone designations under the 1997 8-hour ozone NAAQS. Under this standard, a region was designated as being in nonattainment of the 1997 8-hour ozone standard if the 3-year average of the individual fourth highest air quality monitor readings, averaged over 8 hours throughout the day, exceeded the NAAQS of 0.08 parts per million (ppm).

The Charleston area, comprising Kanawha and Putnam counties, was designated as nonattainment for the 8-hour ozone standard in the April 30, 2004 Federal Register (69FR23858). However, the area was reclassified to attainment on August 10, 2006. As a provision of this attainment designation, the area was required to adhere to a maintenance plan that establishes motor vehicle emission budgets (MVEBs) for NOx and VOCs. Estimates of vehicle emissions were compared against these budgets to determine regional conformity for the ozone precursors.

On March 12, 2008, EPA revised its NAAQS for ozone by strengthening the standard to 0.075 ppm. This revised 2008 8-hour ozone NAAQS is calculated in the same manner as the 1997 ozone NAAQS. Kanawha and Putnam counties were designated as attainment areas per the 2008 8-hour ozone standard. To accompany the 2008 standard, EPA established air quality designations (77 FR 30088). The rule provides for the revocation of the 1997 ozone NAAQS for transportation conformity purposes to occur 1 year after the effective date of the designations for the 2008 ozone NAAQS (July 20, 2012). Transportation conformity no longer applies to those areas that have been redesignated to attainment for the 1997 ozone NAAQS that are also classified as attainment for the 2008 ozone NAAQS. However, it was the finding of *South Coast Air Quality Management District v. EPA* in February of 2018 that the requirements for maintenance areas under the 1997 8-hour ozone standard should be retained.

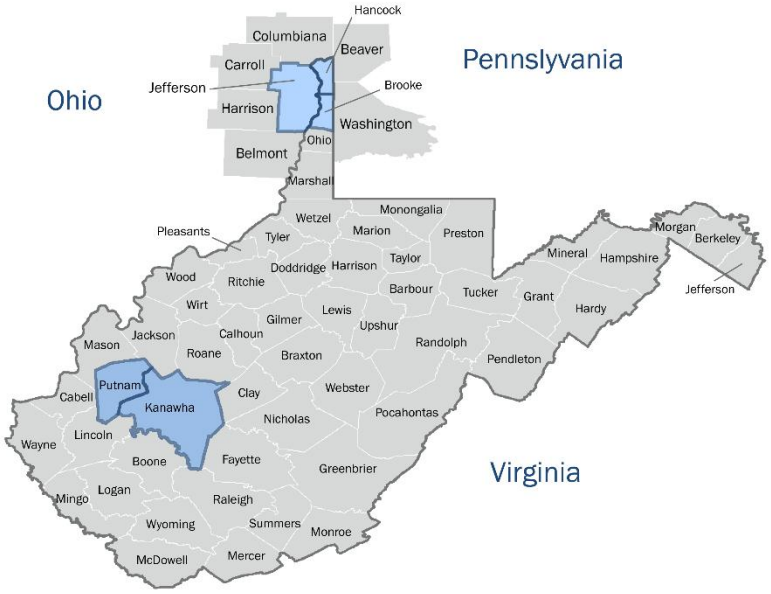
The 8-hour ozone standard was further strengthened to 0.070 ppm on December 28, 2015 (80 FR 65292). The previous 2008 standard was not revoked and remained in effect for designated areas. The Kanawha-Putnam region is in attainment for the 2015 8-hour ozone standard.

In summary, the Charleston region is currently in attainment for the currently applicable 8-hour ozone standards, but continues to be subject to the qualitative conformity reporting requirements from its previous maintenance designation under the 1997 standards as a result of the *South Coast v. EPA* finding. The most recent quantitative air quality conformity analysis for the Charleston region was prepared by RIC and the West Virginia Department of Transportation (WVDOT) and adopted on September 13, 2018.

$PM_{2.5}$

Fine particle pollution can be emitted directly into the atmosphere or formed in the atmosphere. For example, sulfates and nitrates are two types of secondary particles. The former is a result of power plant and industry emissions, while the latter results from automobiles, power plants, and other combustion emission sources. Scientific studies have found a significant association between the exposure to fine particulates and such severe health issues as heart disease, lung disease, and premature death.

PM2.5 24-Hour Standard:
Maintenance Areas with Insignificant Highway Source Emissions



$PM_{2.5}$ Annual Standard

In 1997, the EPA issued the PM2.5 fine particulate NAAQS in order to protect public health. The annual standard was set at 15 micrograms per cubic meter (µg/m3) and was based on a 3-year average of annual mean PM2.5 concentrations. The Charleston area, including Kanawha and Putnam counties, was designated as a nonattainment area under the 1997 annual PM2.5 NAAQS. However, the area was redesignated to an attainment area on April 30, 2014.

On January 15, 2013, the EPA issued updated annual and 24-hour PM2.5 standards. Known as the 2012 PM2.5 standard, the threshold for annual PM2.5 is set at 12 µg/m3 and is assessed in the same manner as the 1997 annual PM2.5 NAAQS. The Charleston area was designated as an attainment area for the 2012 annual PM2.5 standard. The rule provides for the revocation of the 1997 annual PM2.5. Transportation conformity no longer applies to those areas that have been redesignated to attainment for the 1997 annual PM2.5 NAAQS that are also classified as attainment for the 2012 annual PM2.5 NAAQS. As a result, no air quality analysis for the annual PM2.5 standard is required for the Kanawha-Putnam area.

$PM_{2.5}$ 24-Hour Standard

On December 18, 2006, the EPA issued the 2006 PM2.5 standard that tightened the 24-hour fine particle standard from 65 µg/m3 to 35 µg/m3. The Charleston area (Kanawha and Putnam counties) was designated as a nonattainment area under the 2006 24-hour PM2.5 standard. However, the area was redesignated to an attainment area on April 30, 2014. As part of the 2012 PM2.5 standard (issued January 15, 2013), the EPA affirmed the 24-hour PM2.5 threshold set in 2006, maintaining a value of 35 µg/m3.

In 2012, the West Virginia Department of Environmental Protection (WVDEP) initiated the process to redesignate the Kanawha- Putnam area to reflect a finding of insignificance for highway sources of the 2006 24-hour PM2.5 standard. The redesignation request for a finding of mobile source insignificance was approved.

The federal requirements—40 CFR 93.109(f)—stipulate that areas designated as attainment with SIP insignificant motor vehicle emissions findings are not required to satisfy a regional emissions analysis for §93.118 and/or §93.119 for a given pollutant/precursor and NAAQS. Instead, areas with SIP insignificance findings adopt qualitative conformity determination for regional transportation plans and TIPs.

Although the area is designated as attainment and there is a finding of insignificance, this does not preclude RIC from complying with the other still-effective requirements of the transportation conformity rule, such as interagency consultations, hot spot analyses as necessary, latest planning assumptions, public participation, etc.

Climate Change and Resiliency

The natural environment and transportation planning are undeniably intertwined. A variety of trends will influence the future of transportation planning including shifting environmental factors, advancing technologies, and changing society dynamics. West Virginia's economy is heavily dependent on the efficient movement of people and goods in and out of the state. It is imperative to understand the current climactic trends in the state and across the nation to determine long-term strategies for transportation.

What is Climate Change?

Climate change is defined as the long-term change in average weather patterns due—in large part—to human activities.[1] Climate change poses a threat to the capacity and reliability of transportation infrastructure. These naturally occurring events will take place more frequently and with more drastic consequences on existing systems. Several examples of these events could include extreme temperatures, severe storm events, and rising sea levels. An impact of climate change that is most pertinent to West Virginia is more frequent flash flooding during intense precipitation.[2] While this is one example, the impact of severe flooding on the durability and life cycle of transportation infrastructure like roads or bridges will be a challenge to overcome. Not only will climate change impact the life-cycle costs associated with existing transportation infrastructure, but it will also increase like likelihood of traffic delay, disruptions of peak-hour travel, and the failure of transportation systems. Table 11-1 shows the potential weather-related impacts to transportation infrastructure.[3]

[1] NASA, https://climate.nasa.gov/resources/global-warming-vs-climate-change/
[2] West Virginia Statewide Standard Hazard Mitigation Plan, https://emd.wv.gov/MitigationRecovery/Documents/2013%20WV%20Statewide%20Hazard%20Mitigation%20Plan%20Update.pdf
[3] Trends, Drivers, and Opportunities: https://transportation.wv.gov/highways/programplanning/LRTP/Documents/Environment_Research%20Paper.pdf

Table 11-1: Weather-Related Impacts on Transportation Infrastructure

WEATHER RELATED EVENT	TRANSPORTATION IMPACT
Increase in average temperature	• Expands and softens pavement causing potholes • Increases stress on bridge joints • Increase life-cycle costs of roads, highways, and bridges • Increases precipitation causing freezing in winter months • Expands rail tracks requiring track repairs
Increase in drought event	• Increases likelihood of wildfires • Reduces permeability of soil
Increase in severe storm event	• Disrupts traffic flow • Delays construction • Weakens soil that support bridges and roads

Addressing Climate Change

The development of a long-range plan should consider strategies to create resilient transportation infrastructure. As described in Chapter 1, the onset of the RIC MTP consisted of an alignment matrix comparing the plan's guiding statements with federal goals. Several of the FAST Act federal goals could be interpreted to address climate change. While the RIC MPO has addressed all of the federal goals through the creation of the plan's guiding statements, RIC should continue to find creative ways to incorporate resiliency into transportation planning to combat climate change proactively. There are several strategies or investments that the RIC MPO could make to better prepare for the impacts of climate change:

- Invest in Transit-Oriented Development
- Construct Sustainable Street Designs
- Prepare an Emergency Management Planning Strategy

Transit-Oriented Development

Transit-Oriented Development—or TOD—creates walkable and livable communities for people of all ages and abilities. Not only does TOD create walkable communities, but it also provides a wider variety of transportation choices like biking or taking transit. TOD can relieve the cost of transportation on lower income households, bolster public transportation ridership, and reduce emissions that are associated with driving a personal vehicle.

Sustainable Street Design

As outlined in Chapters 5 and 6, mode choice plays a crucial component to addressing air quality and, more generally, climate change. Street designs that focus on protected and dedicated alternative modes of transportation will not only enhance the community's quality of life, but it will also encourage biking, walking, or

taking transit as opposed to driving. The strategic planning of street design can also impact stormwater runoff, water quality, and mitigate the heat island effect. All of these benefits address some adverse effects of climate change. A sustainable street design is both a proactive and strategic investment into a variety of transportation infrastructure. By creating a diverse, resilient transportation system will only better position the RIC MPO in the long-term.

Emergency Management Planning

To effectively combat the adverse effects of climate change, creating a strategy to plan for hazardous weather conditions is essential. The West Virginia Statewide Hazard Mitigation Plan begins to consider what the impacts of climate change might or will be on the state as a whole. Despite the plan being updated in 2013, it sets the foundation for municipalities to start considering a strategy to assess and plan for new or potentially unseen impacts. Continual monitoring of natural hazards or aging infrastructure through a variety of existing data sources can help inform emergency planning efforts on an MPO scale.

Challenges

While there are several challenges associate with addressing climate change, the largest barrier is funding. As outlined in Chapter 9, there are already a limited number of financial resources available to RIC. By leveraging the prioritization process, the RIC MPO can demonstrate that projects not only fulfill capacity projects and performance-based needs, but also outline the benefits of a resilient transportation system.

Conclusion

As discussed in Chapter 2, resiliency and climate change should be considered during the decision-making process during transportation planning and construction. The RIC MPO should continue to consider the regional impacts of climate change on transportation systems. By continuing to understand the challenges of climate change and resiliency, the MPO will be better positioned to adapt to the dynamic, environmental landscape.

Conformity Determination

Financial Constraint

The planning regulations, Sections 450.322(b)(11) and 450.324(e), require the transportation plan to be financially constrained while the existing transportation system is being adequately operated and maintained. Only projects for which construction and operating funds are reasonably expected to be available are included. The RIC MPO, in conjunction with WVDOT, has developed an estimate of available funds for “capacity increasing” transportation projects within the region. A project selection process was used to identify the projects that improve regional traffic congestion and fall within the overall available funding estimates.

Public Participation

The *RIC Metropolitan Transportation Plan* (MTP) has undergone the public participation requirements set forth in the Final Conformity Rule and Final Statewide / Metropolitan Planning Rule. The draft document was made available for 30 days of public review and comment beginning on August 9, 2021. Any comments received on the RIC MTP and conformity determination will be considered for incorporation prior to a request for approval from the RIC Policy Board.

Interagency Consultation

Members of the region's interagency consultation group—consisting of FHWA, FTA, US EPA, WVDOT, and WV DEP-DAQ—were engaged in discussions about the status of the region's air quality and its relation to the MTP. Based on the current attainment status of the region, as well as the feedback of the interagency consultation group, it has been concluded that the RIC MTP conforms to federal and state air quality requirements. This chapter represents the qualitative air quality conformity process that is required for the preparation of this plan.