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.

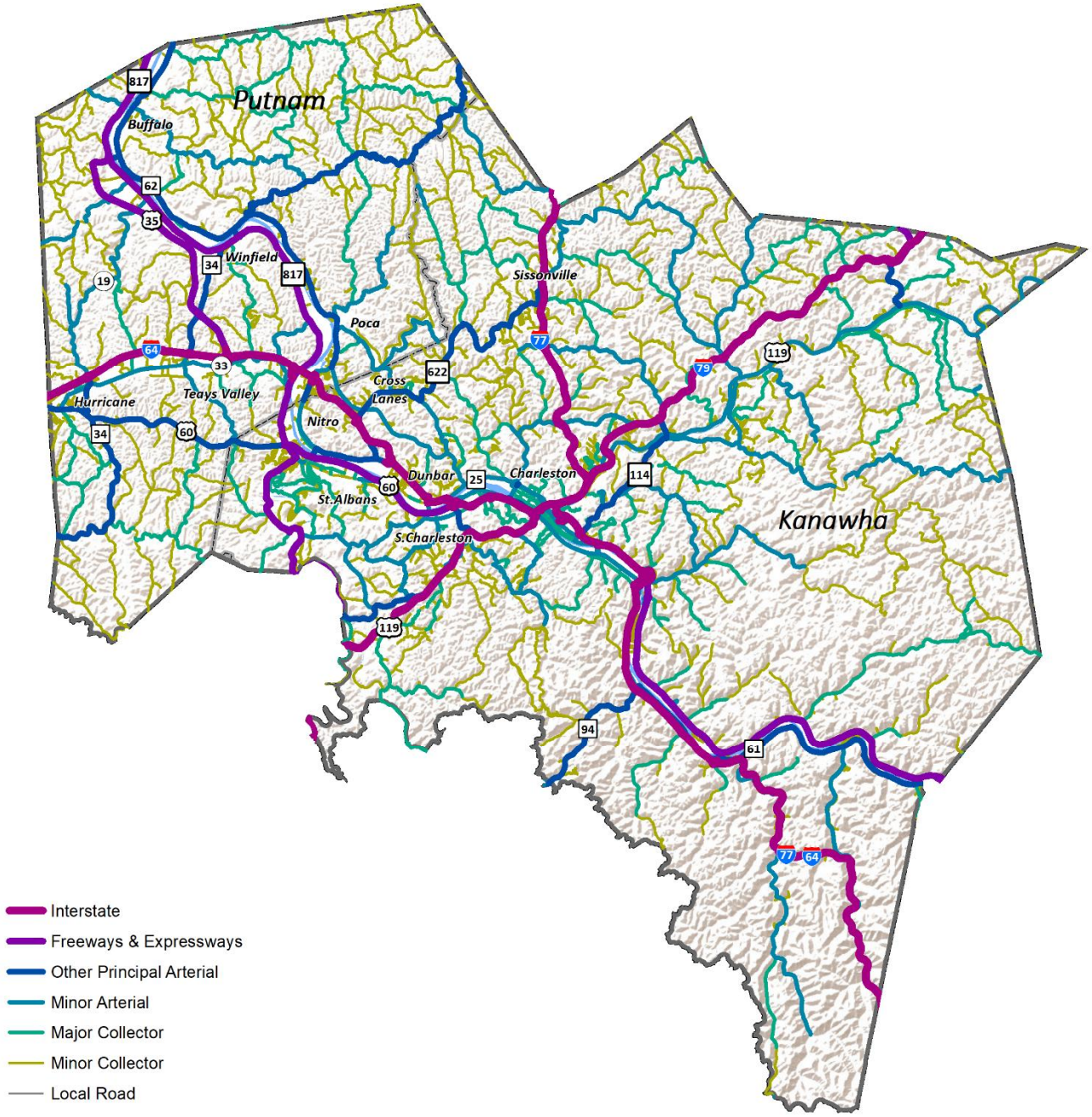
The two major considerations for classifying arterials for neighborhood streets are mobility and access. The primary function of local or neighborhood streets is to provide access; these streets are intended to serve neighborhoods or localized areas including mixed-use or commercial land uses with low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

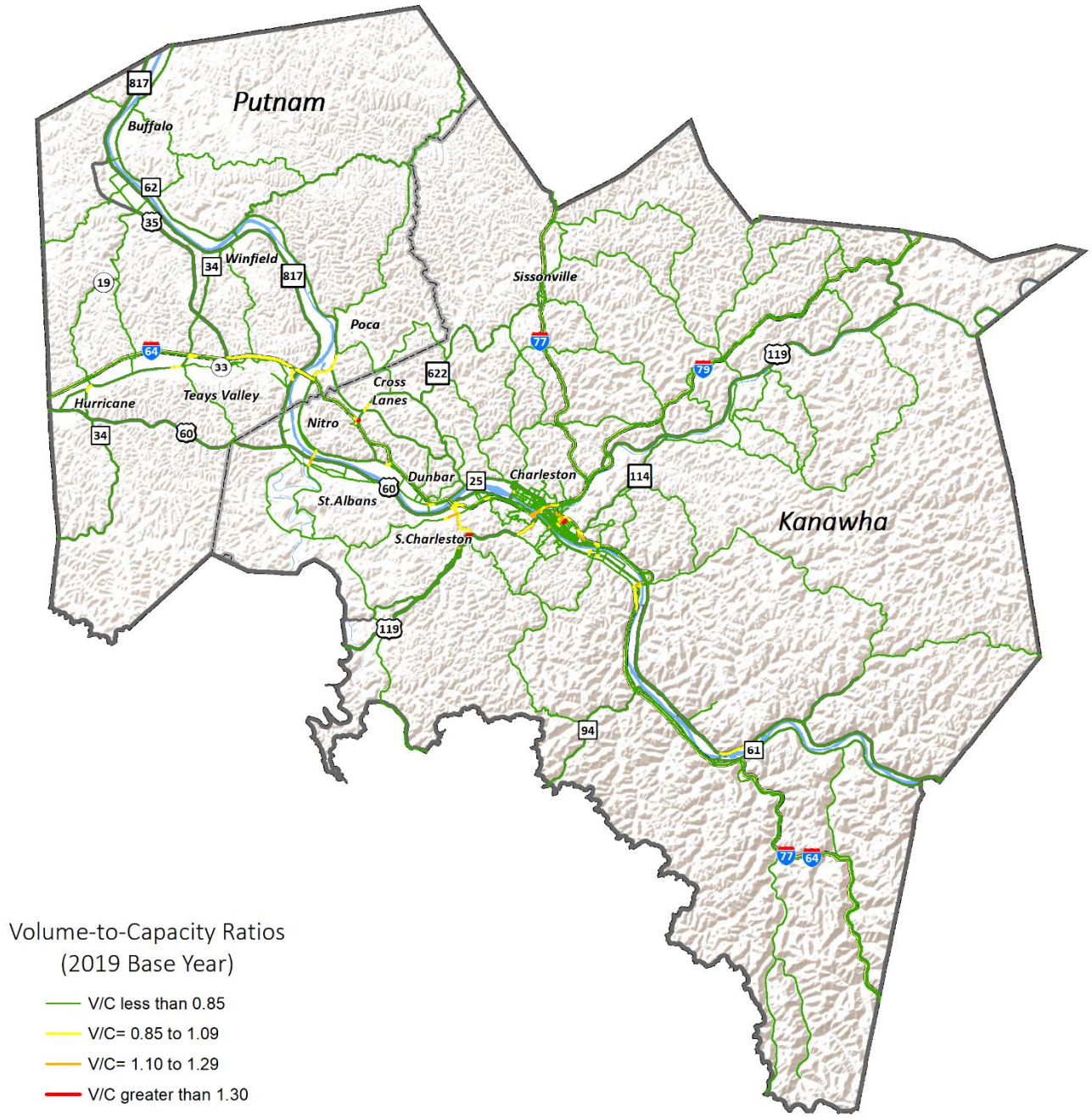
Corridor Operations and System Deficiencies

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

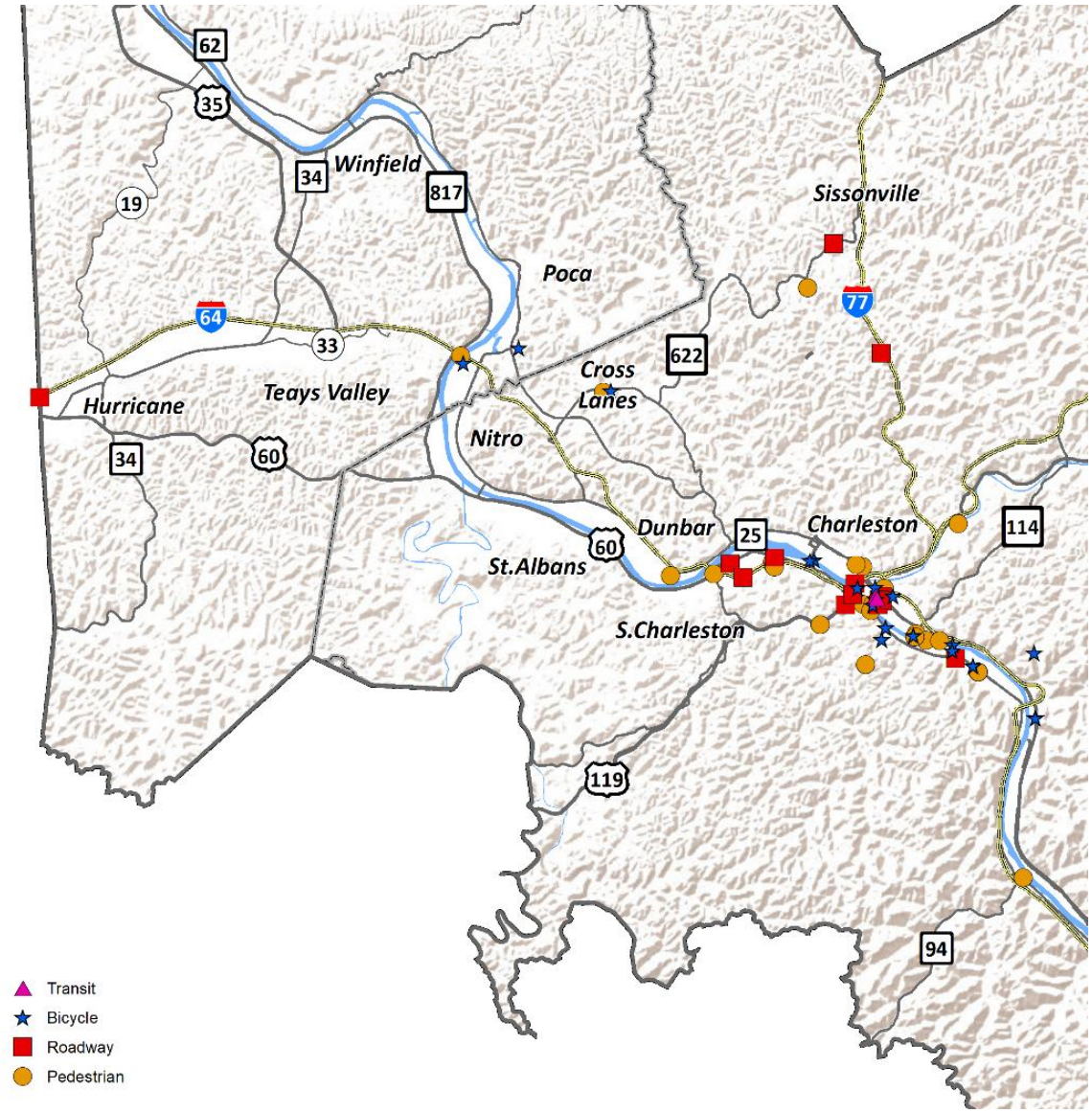


Public Perception and Insight

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.

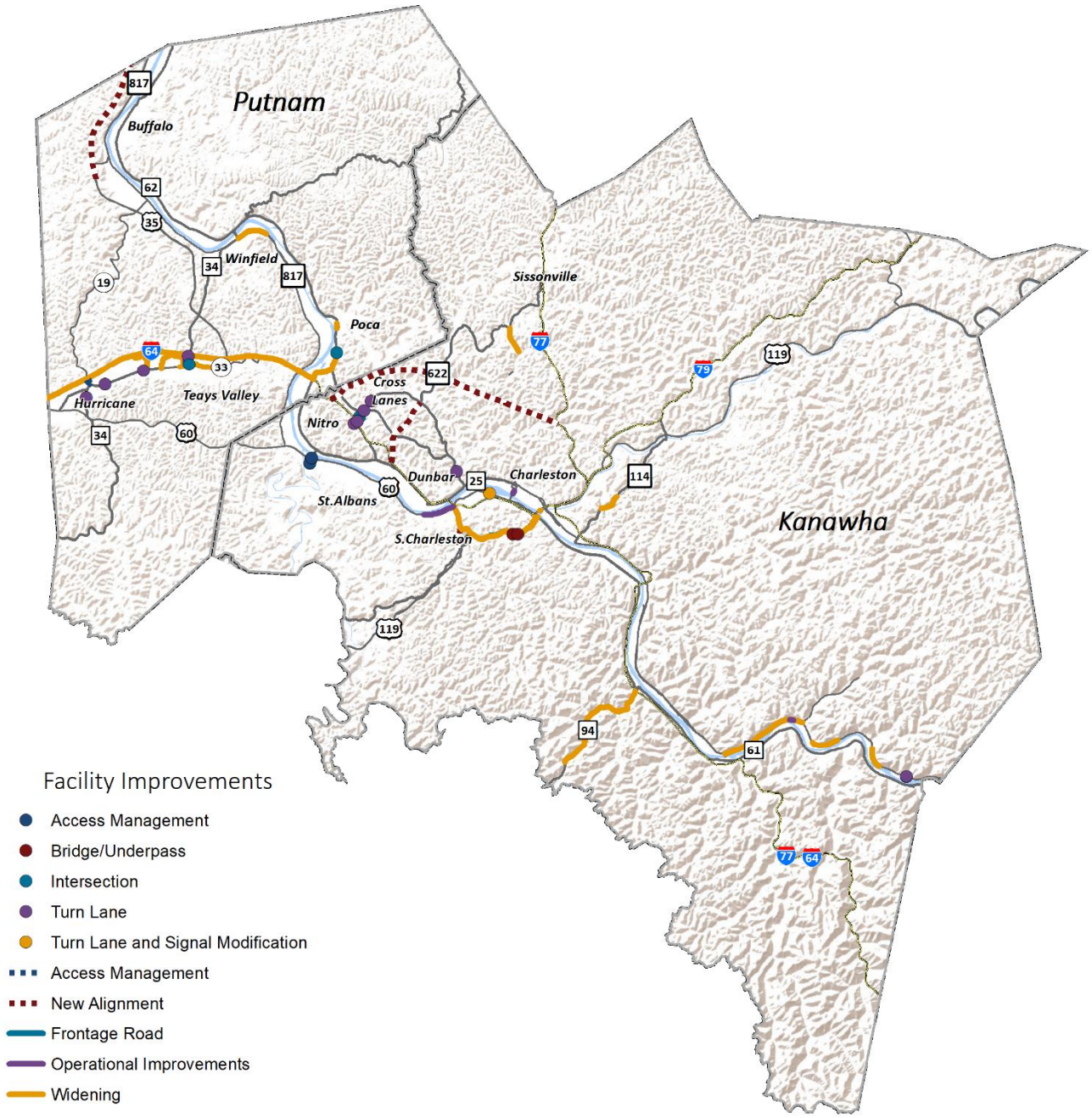
Recommendation Development

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