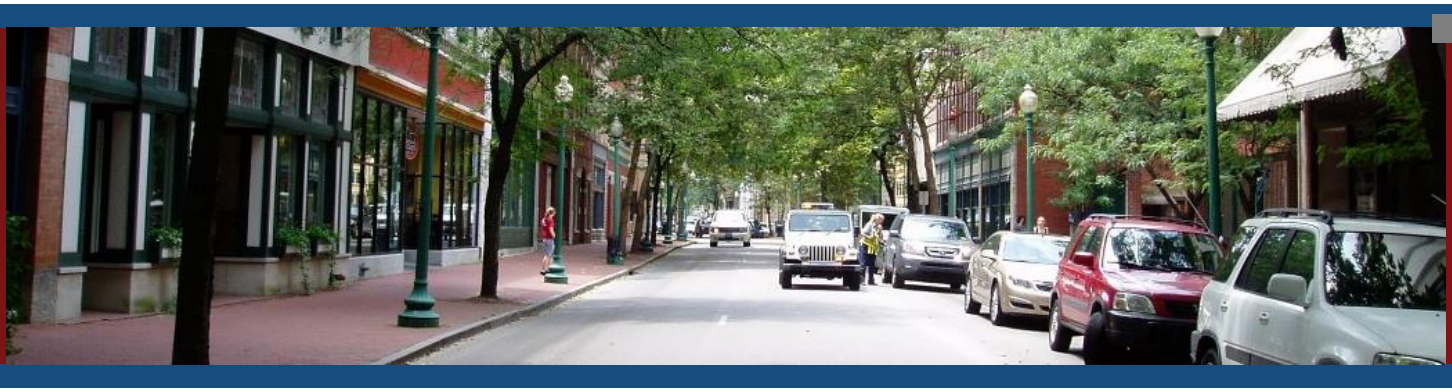
CHAPTER 1
Introduction



Introduction

Maintenance of a Congestion Management Process (CMP) is a requirement for all MPOs in Transportation Management Areas (TMAs) under federal law. Consistent with the guidance from the Final Rule on the CMP, the intent of the CMP is to "address congestion management through a process that provides for safe and effective integrated management and operation of the multimodal transportation system." A vibrant congestion management process can serve a valuable role in addressing the region's transportation needs in light of the following:

- Funding levels limit the number of new large scale projects which can be planned and constructed
- Transportation safety is becoming an increasingly important planning consideration

A portion of Putnam County falls within the Huntington, WV-KY-OH Transportation Management Area (TMA) thus requiring a CMP to be completed. The primary agency responsible for planning activities for the Huntington, WV-KY-OH TMA is KYOVA (Kentucky-Ohio-West Virginia Interstate Planning Commission). The Regional Intergovernmental Council (RIC) is responsible for transportation planning activities for the Putnam County, West Virginia area that falls within the TMA boundaries. It is the intent of this CMP to expand CMP activities to the entire RIC planning area in Putnam County and Kanawha County and to coordinate with KYOVA on the CMP recommedations in the Putnam County portion of the Huntington, WV-KY-OH TMA.

Typically, the Congestion Management Process Policy and Procedures Handbook needs to be updated every four years concurrent with or following the development of the Regional Intergovernmental Council's (RIC) Long Range Transportation Plan which is also updated on a four-year cycle. The current iteration of the CMP is being prepared in conjunction with the development of the Kanawha-Putnam 2045 Regional Transportation Plan. This RIC Congestion Management Process Policy and Procedures Handbook addresses the following requirements:

1. Establishes the initial Congestion Management Process for the Regional Intergovernmental Council Metropolitan Planning Area Boundary.

2. Addresses changes in Federal Transportation Legislation resulting from the passage of MAP-21 (June 2012) and the FAST Act (December 2015) and the subsequent rulemaking available at the time when this Policy and Procedures Handbook was developed in mid-2017. In some cases, anticipated rulemaking regarding transportation performance measures has been incorporated to potentially reduce the need for interim updates outside of the four-year cycle.

Congestion Management Process

The Congestion Management Process (CMP) is a management system and process conducted by metropolitan planning organizations (MPO), such as RIC, to improve traffic operations and safety through the use of either strategies that reduce travel demand or the make use of operational improvements. While RIC is not required by Federal law to prepare a CMP for its entire planning area, the MPO has chosen to incorporate a CMP into their planning efforts. The public will typically benefit from having a functional CMP in place because it can improve travel conditions through the use of low cost improvements or strategies. The improvements can be moved forward in a relatively short time frame (within 5-10 years) compared to more traditional capacity improvements, such as adding additional travel lanes, which can take more than 10 years to complete and cost significantly more. Projects identified through the CMP may also be added to future updates of the Regional Transportation Plan should they require additional funding or a longer time frame to complete.

The Federal Highway Administration (FHWA) defines a CMP as "a systematic approach collaboratively developed and implemented throughout a metropolitan region, that provides for the safe and effective management and operation of new and existing transportation facilities through the use of demand reduction and operational management strategies."

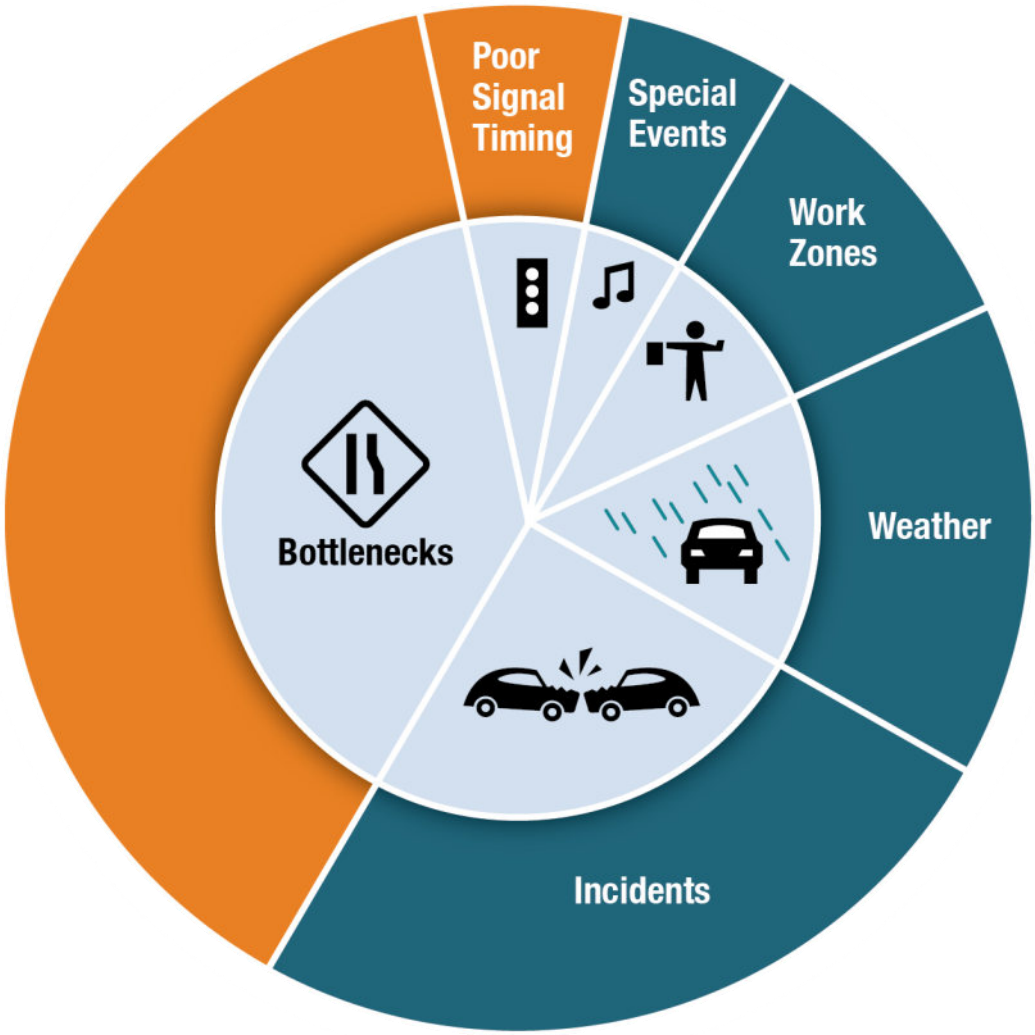
Causes of Congestion

The process of congestion management begins by understanding the cause of the problem. **Figure 1-1** illustrates the results of a national study presented by FHWA on the sources of congestion. Six major causes of congestion are identified:

- **Bottlenecks –** points where the roadway narrows or regular traffic demands (typically at traffic signals) cause traffic to back up; these are the largest source of congestion and typically cause a roadway to operate below its adopted level of service standards.
- **Traffic Incidents –** crashes, stalled vehicles, debris on the road; these incidents cause about one quarter of congestion problems.
- **Work Zones –** for new road building and maintenance activities, such as filling potholes; caused by necessary activities, but the amount of congestion caused by these actions can be reduced through a variety of strategies.
- **Bad Weather –** cannot be controlled, but travelers can be notified of the potential for increased congestion and signal systems can adapt to improve safety.
- **Poor Traffic Signal Timing –** the faulty operation of traffic signals or green/red lights where the time allocation for a road does not match the volume on that road; poor signal timings are a source of congestion on major and minor streets.
- **Special Events –** cause "spikes" in traffic volumes and changes in traffic patterns; these irregularities either cause or increase delay on days, times, or locations where there usually is none.

As shown in **Figure 1-1**, bottlenecks are the largest cause of congestion nationally, followed by traffic incidents and bad weather. Adverse weather cannot be controlled, but policies and improvements can be put in place to control traffic incidents and bottlenecks. Due to the lack of comprehensive local studies on the causes of congestion, these national data are widely used in CMP updates. The data suggest that local causes are likely to be similar, with bottlenecks and traffic incidents typically being the top two causes of congestion.

Figure 1-1: Causes of Congestion



Federal Requirements

Public Law 112-141, the Moving Ahead for Progress in the 21st Century Act (MAP-21), was signed into law on July 6, 2012 and provided federal transportation funding for fiscal years 2013 and 2014. MAP-21 was the first transportation legislation enacted since 2005 and provides updated policy and programmatic framework for investments to guide the growth and development of the country's vital transportation infrastructure. It was the intent of MAP-21 to create a streamlined, performance-based, multi-modal program to address the needs of the national transportation system as outlined in the National Goals listed below. Fundamental aspects of this legislation extend to future fiscal years through continuing legislation and a new transportation bill. On December 4, 2015, Public Law 114-94, the Fixing America's Surface Transportation Act (FAST Act) was signed into law. The FAST Act will likely fund transportation programs for fiscal years 2016 through 2020 and is the first long-term surface transportation authorization enacted in a decade that provides funding certainty for surface transportation. The FAST Act will support critical transportation projects to ease congestion and facilitate freight movement on major roads by establishing and funding new policies and programs.

National Goals

- **Safety –** to achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
- **Infrastructure condition –** to maintain the highway infrastructure asset system in a state of good repair.
- **Congestion reduction –** to achieve a significant reduction in congestion on the National Highway System.
- **System reliability –** to improve the efficiency of the surface transportation system.
- **Freight movement and economic vitality –** to improve the National Highway Freight Network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- **Environmental sustainability –** to enhance the performance of the transportation system while protecting and enhancing the natural environment.
- **Reduced project delivery delays –** to reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

RIC's CMP Goals

Introduction

A series of CMP goals were developed to guide the process of monitoring congestion and improving the mobility of persons and goods for the area served by RIC. These were compiled by referencing the guiding statements developed as part of the Kanawha-Putnam 2045 Regional Transportation Plan.

The goals are presented below. They will be used as a tool for selecting strategies and performance measures for strategy monitoring and evaluation. Elements in italics are provided for reference only and are not part of the CMP.

Goal 1: Preserve and sustain the natural and built environments

- Encourage use of alternative transportation modes and/or energy sources that reduce air pollution, fuel consumption, and other environmental impacts.
- *Minimize development impacts in areas of cultural and historical significance.*
- *Reduce development impacts on environmentally sensitive areas.*
- Develop strategies to decrease single occupancy vehicle (SOV) trips and vehicle miles traveled (VMT).
- Improve access to areas of historical, cultural, and recreational significance.

Goal 2: Promote economic development through targeted transportation investments

- Improve access to key economic nodes and areas of planned development.
- Support transportation investments and policies that work to create jobs and improve access to people, places, and goods.
- 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.
- Promote multimodal access to encourage economic growth in distressed areas.

Goal 3: Improve the integration of land use and transportation

- 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.
- Encourage efficient infill and redevelopment to maximize use of the existing transportation system.
- Maximize effectiveness of parking infrastructure and regulations.

Goal 4: Promote an efficient, interconnected, and accessible transportation network

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

Goal 5: Improve travel safety and security in the Greater Kanawha Valley

- Reduce the number of injuries, fatalities, and hazardous spills.
- Mitigate potential conflicts and delays at rail crossing sites.
- Reduce the number of high incident-accident locations.
- Facilitate coordination for emergency preparedness.
- Promote long-term resiliency of the transportation network to prevent interruptions, endure damages, and quickly recover from disturbances.
- 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.

Goal 6: Support and strengthen the current transportation network

- Reduce the number of operational conflicts between various transportation modes.
- 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.

Federal Regulations

The Appendix A summarizes the Federal requirements for a Congestion Management Process in Transportation Management Areas. This guidance is codified in the Code of Federal Regulations (CFR (Section 450.322) — Statewide Transportation Planning; Metropolitan Transportation Planning; Final Rule). While the entire RIC MPO area is not required to prepare a CMP, the federal regulations provide useful guidance as to the types of information that are most helpful for this process.

Congestion Management Process: A Guidebook

Federal Eight-Step Congestion Management Process

In April 2011, the FHWA released the Congestion Management Process: A Guidebook document which provides additional detail and guidance to MPOs in the development and application of a congestion management process. This guidebook includes an eight-step process that summarizes the key parts of an ongoing congestion management process. These steps are summarized in **Figure 1-2.**

Figure 1-2: Federal Eight-Step Congestion Management Process

Incorporating Travel-Time Reliability in the CMP: A Primer

Travel-time reliability is defined as the consistency and dependability in travel times that are measured from day-to- day and/or across different times of the day. Travel-time reliability is significant to the CMP because it incorporates a systematic method to address the issue of traffic congestion caused by non-recurring events. Non-recurring events include:

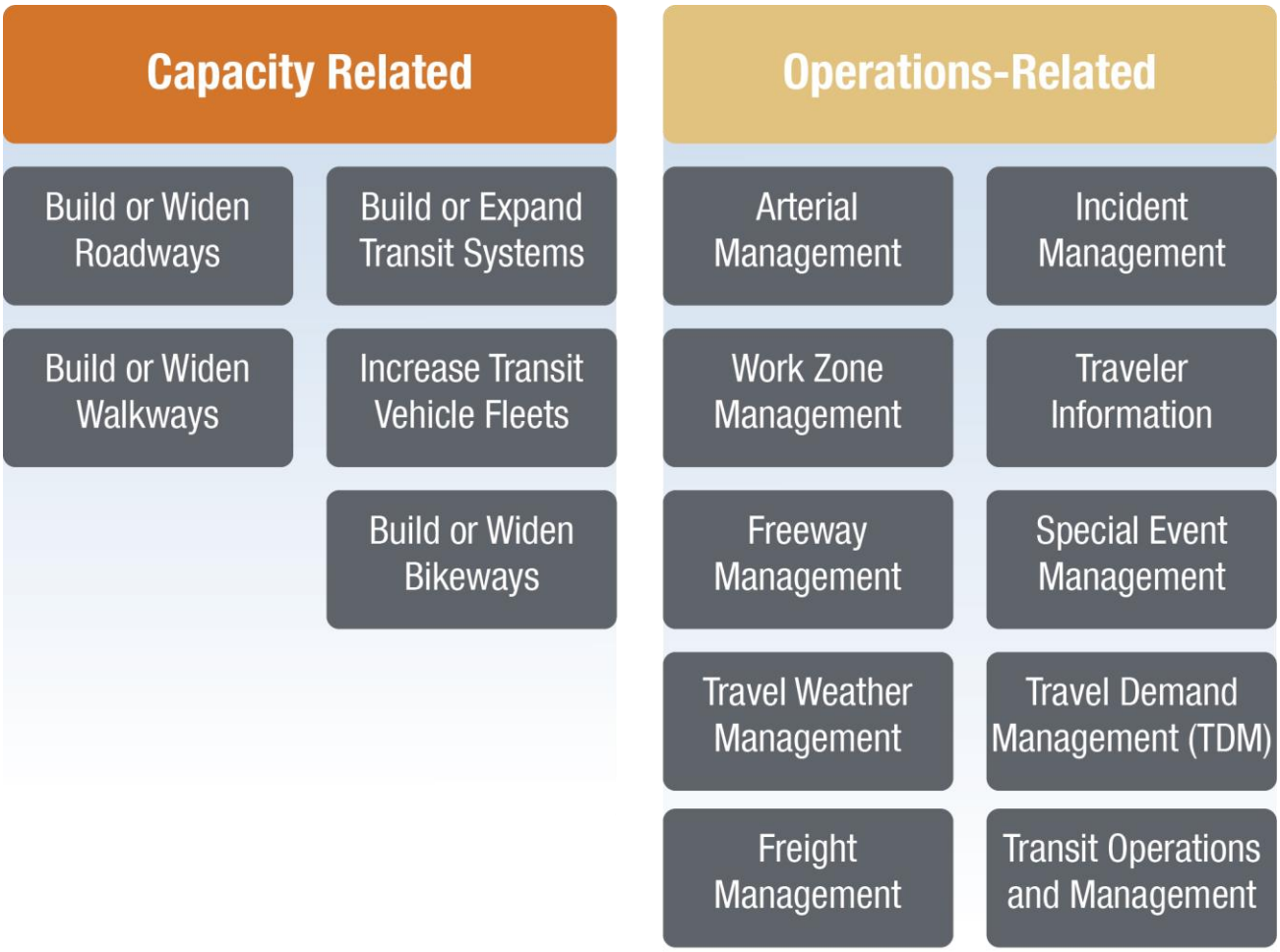
Traffic Incidents *Road Work Zones* *Weather* *Special Events*

Non-recurring events account for a majority of total traffic congestion-related delay in the United States and not until recently were there cost-effective data collection opportunities. In addition to more inexpensive travel-time monitoring technologies, there are three factors that have contributed to a greater focus on travel-time reliability in MPOs. These factors include:

- **Constraints on Expansion of the Transportation System –** New roadway construction and roadway expansion has largely ended in the United States due to high costs, the built-out nature of urbanized areas, and the community desire for multimodal streets.
- **Expectations of the Traveling Public –** Surveys have shown that the traveling public often values travel-time reliability more than speed.
- **Federal Surface Transportation Reauthorization Law –** When MAP-21 was signed into law, a process that involved performance measurement, target setting, and transportation investment reporting was established and seven national goals were set. Three years later, the FAST Act was signed into law and included the same national goals. One of the seven goals is: System reliability – to improve the efficiency of the surface transportation system.

The benefits of incorporating travel-time reliability into the CMP include a superior understanding of the regional transportation system that contains capacity expansion strategies. The inclusion of travel-time reliability will take the CMP a step further by also featuring a heavier concentration of operation strategies, such as signal retiming or traveler information as appropriate by the area and type of transportation corridor.

Figure 1-3: Typical Capacity and Operations Related Strategies



CMP Policy and Procedures Handbook Overview

As mentioned previously, RIC is choosing to incorporate a CMP into its routine planning efforts. This handbook outlines the policies and procedures that will ensure that the federal and state requirements are addressed. Specific performance evaluation information on the two county CMP roadway network will be included in future State-of-the System/Transportation Trends Reports.

This handbook is outlined to follow the eight-step CMP, based on federal guidelines. The main purpose of this handbook is to (1) Develop CMP Goals and Objectives; (2) Define the Regional CMP Network; (3) Develop Multimodal Performance Measures; (4) Identify the potential sources of data to monitor system performance; (5) identify policies and procedures for the update of the CMP. The report chapters found in this handbook are described in more detail below.

Chapter 1- Introduction – The purpose of the CMP (based on federal requirements), an introduction to the causes of congestion, and an overview of the handbook are provided.

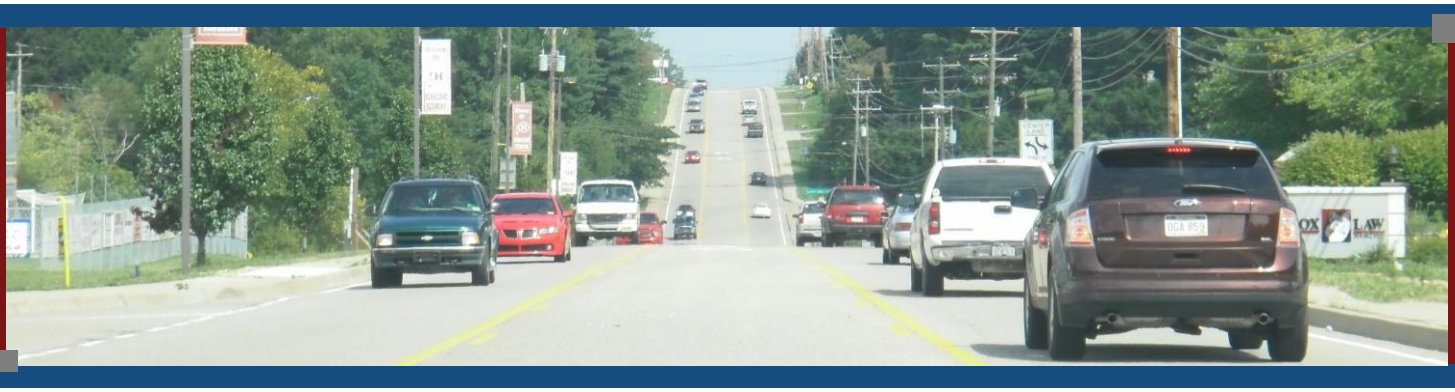
Chapter 2 - CMP Overview – The eight-step CMP is described and a general overview of the process is provided as well as the update schedule for the RIC Transportation Trends Report.

Chapter 3 - Network Identification – A description of the area of application and transportation network used for the CMP process is provided.

Chapter 4 - Development of CMP Performance Measures – A brief summary is provided of congestion related measures that can be used to monitor the effectiveness of the CMP.

Chapter 5 - Congested Corridor Selection and CMP Strategies – This chapter describes how congested corridors are typically identified and strategies that can be used to reduce congestion and different strategies that can be used to improve identified congested corridors.

Chapter 6 - Monitoring and Strategy Effectiveness – This chapter describes monitoring of identified strategies as well as information that can be found in the RIC Transportation Trends Report. This chapter also describes how to evaluate and monitor the system, identify congested corridors and select corridors for evaluation, evaluate corridors and potential strategies (described in Chapter 5), and prioritize and program improvements.



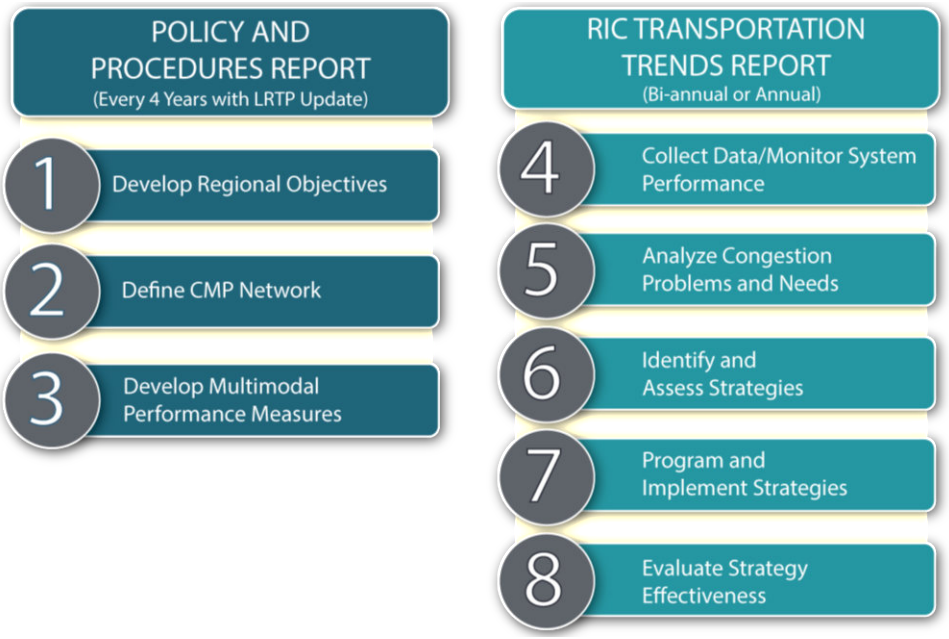
CMP Overview

RIC Eight-Step Congestion Management Process

This section documents the revised Congestion Management Process for RIC that will be used to address the Federal requirements and unique local needs and opportunities of the communities in the region. This process closely matches the Federal Eight-Step Process and includes additional detail in specific sections where appropriate.

Figure 2-1 demonstrates the Eight-Step process that will be used by RIC. As noted, the first three steps will typically be updated concurrent with each update of the Regional Transportation Plan which takes place every four years. Steps 4 to 8 will potentially be updated on a more frequent basis. The remainder of this section details the eight steps and their utility in the Congestion Management Process.

Figure 2-1: RIC's Approach to the Federal Eight Step Process



CMP in the Metropolitan Planning Process

The CMP is a working tool that needs to be effectively integrated into the MPO's project prioritization process, Transportation Improvement Plan (TIP), and Regional Transportation Plan (RTP). The objectives- driven, performance-based CMP starts with the monitoring and evaluation of current conditions to identify where congestion exists. Based on the identified goals and objectives and the established performance measures of the CMP, this evaluation leads to the identification of potential mitigation strategies, selection of appropriate strategies, and the development of a monitoring plan.

The outputs of the CMP, such as identified congested corridors/locations and their recommended mitigation measures, then proceed through the CMP process where they are evaluated and projects or programs are selected for application. The projects or programs that are identified through the CMP are then moved into project development and programmed into the TIP for funding and implementation. The completed projects are then monitored to evaluate the strategy effectiveness on a system-wide basis. For RIC, CMP projects are primarily funded using federal and state funds with local matching revenues. RIC can periodically update their most important strategies and associated funding considerations through the TIP and RTP update process.

Public Involvement Process

The purpose of CMP public involvement activities is to provide the public with information on congestion monitoring activities that are in place in the region as well as planned improvements to mitigate congestion.

As recent federal regulations warrant involvement of the public during all key stages of transportation projects, it is important to involve the public in all key stages of transportation improvement projects within and beyond the CMP. Otherwise, lack of public support and awareness may adversely impact the success of any potential transportation project. Therefore, the proposed CMP improvement projects/strategies will be presented to the citizens of the RIC region at various public involvement activities.

During the development of the Kanawha-Putnam 2045 Regional Transportation Plan, a Steering Committee was formed to help guide the planning process. This Steering Committee participated in key milestones of the development of the RTP and the CMP. The Steering Committee included representation from a cross-section of agencies, jurisdictions, and interest groups, such as:

- West Virginia Department of Transportation (WVDOT)
- Federal Highway Administration (FHWA)
- City of Hurricane
- City of Dunbar
- City of Charleston
- Kanawha Valley Regional Transportation Authority (KVRTA)
- Kanawha County
- Putnam County
- Charleston Area Alliance
- Upper Kanawha Valley Economic Development Authority

Additional stakeholders were also engaged through this process representing schools, emergency services, utilities, freight providers, and jurisdictions.

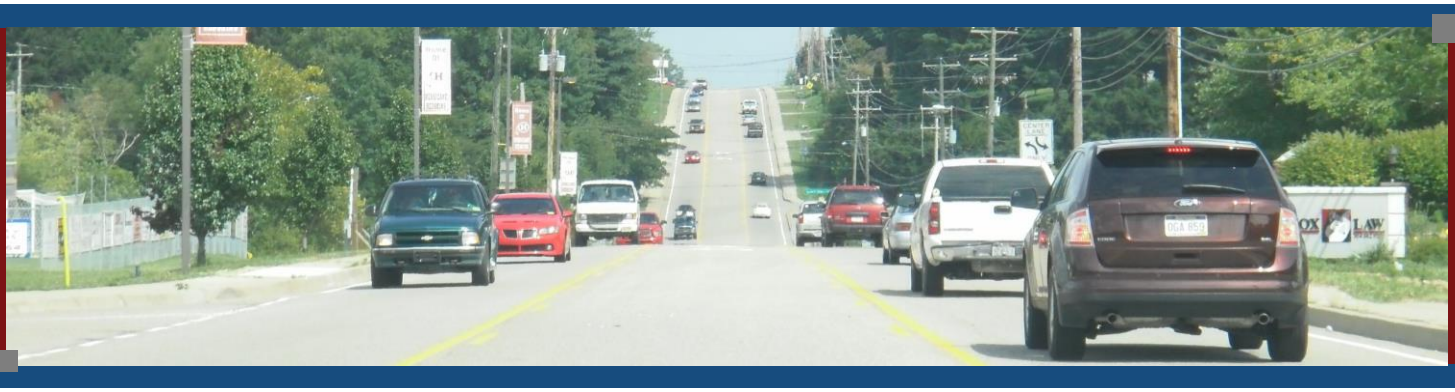
As the CMP is updated in the future, it is recommended that the RIC Transportation Technical Advisory Committee (TTAC) be included in CMP related matters. This ensures that CMP issues are addressed routinely as an ongoing activity of RIC. A key contribution of the RIC TTAC will be to identify, track, and evaluate potential congestion- or safety-related issues on the CMP roadway network.

CMP Actions/Recommendations

A list of recommendations and actions is presented to enhance the CMP and become more efficient in the overall MPO planning process. The actions/recommendations presented below will be reviewed and considered by RIC staff and the RIC TTAC for incorporation into the regional plannig process as necessary.

- Update the CMP Policy and Procedures Handbook (CMP Steps 1-3) on a four-year cycle consistent with the update cycle of the RTP. Timing of the completion of CMP updates in advance of finalizing RTP updates would benefit integration of CMP strategies into the RTP.
- Develop a routine RIC State-of-the-System/Transportation Trends Report to track effectiveness of the selected strategies, to the extent possible and to evaluate trends and conditions for the multi-modal transportation system in the CMP study area. The RIC State-of-the-System/Transportation Trends Report will include steps 4 through 8 of the CMP process:
    - Step 4: Collect Data/Monitor System Performance
    - Step 5: Analyze Congestion Problems & Needs
    - Step 6: Identify and Assess Strategies
    - Step 7: Congested Corridor Selection and CMP Strategies
    - Step 8: Monitoring and Strategy Effectiveness (combined with Step 4)
- Enhance coordination with agencies participating in the CMP by framing desirable strategy types and defining roles for partnering agencies. This is essential, as most congestion and mobility strategies will ultimately be funded and managed at the state level.
- Projects from the CMP process may identify projects for inclusion in the RTP either through the four-year update cycle or through plan amendments.
- Identify data collection recommendations on collecting key congestion data, as well as working with agency partners to close data gaps identified in this CMP.
- Perform outreach and education efforts to inform interested parties and stakeholders. These may include:
    - Maintain a CMP page on the RIC website.
    - Develop a brochure and/or newsletter on the CMP and its benefits.

Continue monitoring changes to federal CMP regulations and modify/update CMP to reflect new requirements



Network Identification

Introduction

This chapter of the CMP component presents an overview of the geographic area of application and the transportation network for the RIC CMP.

Area of Application and Transportation Network

The CMP area of application includes the transportation system that needs to be evaluated and monitored and where congestion management policies and procedures need to be applied. The geographic area of application for this CMP Update consists of the major regional roadways in the two-county RIC region. Consistent with federal guidelines, the RIC CMP covers a multimodal transportation network. In addition to evaluating congestion on the roadway network, the RIC CMP evaluates transit, bicycle/pedestrian/trail, and freight movement networks within its designated area of application. The CMP roadway network is described below.

Roadway Network

The RIC CMP roadway network includes two groups of roadways:

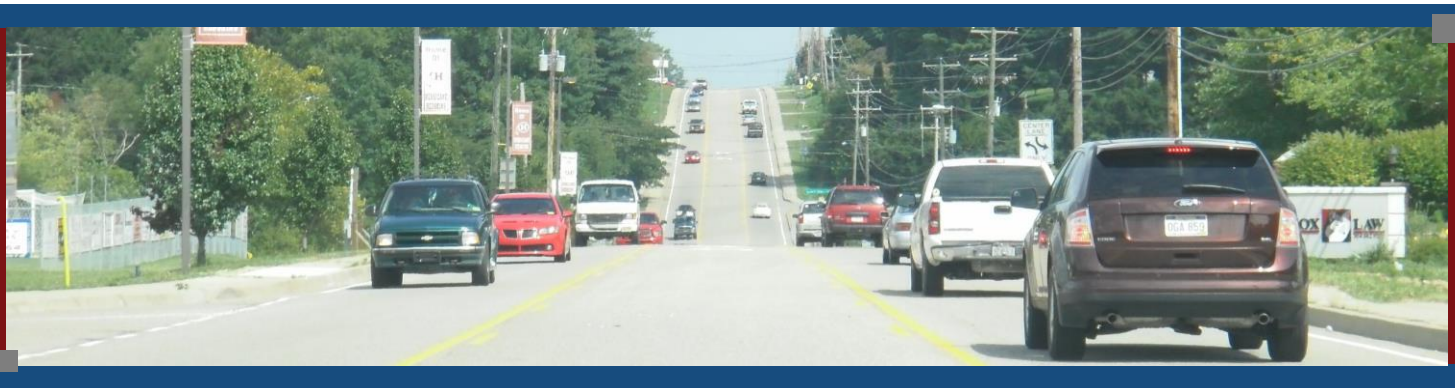
CMP Network - Key Regional Roadways (National Highway System (NHS) Routes): RIC will be required to frequently report performance statistics on the NHS routes and were separated into the first tier of CMP network roadways to facilitate the update of these statistics.

Non-CMP Network - Other Regional/Major Roadways: This represent other major regional roadways, including regional roadways forecasted to be potentially congested in the currently adopted 2040 Long Range Transportation Plan.

The map in **Figure 2-1** illustrates the RIC CMP Network. This represents the study area and network for the RIC CMP. Chapter 5 provides further information on congested corridors and strategies.

RIC CMP Network

Figure 4-1



Development of CMP Performance Measures

Introduction

MAP-21 and the FAST Act place an emphasis on performance-based planning. In order to carry forward the guidance of these pieces of legislation, FHWA is in the process of developing a series of performance measures which will be implemented at the state and metropolitan levels. As these performance measures are identified, they will be incorporated into the RTP and TIP development process.

The RIC CMP has attempted to identify a series of potential performance measures that can help serve as a guide until formal performance measures are introduced. These performance measures are used as tools to measure and monitor the effectiveness of the transportation system in the CMP. They assist in identifying and tracking as areas progress in monitoring congestion. However, these measures are dependent upon the transportation network and the availability of data. They typically are used to measure the extent and severity of congestion and for the evaluation of the effectiveness of the selected strategies.

As identified by FHWA, a set of good performance measures:

- Includes quantifiable data that are simple to present and interpret and have professional credibility,
- Describes existing conditions and can be used to identify problems and to predict changes,
- Can be calculated easily and with existing field data, uses techniques available for estimating the measure, and achieves consistent results, and
- Applies to multiple modes and is meaningful at varying scales and settings.

CMP Performance Measures

The CMP performance measures were selected to address the existing conditions for the multimodal network in the region. The measures are organized into the following major categories:

- Safety Performance Measures
- Roadway Capacity Performance Measures
- Reliable Travel Time Performance Measures
- Goods Movement Performance Measures
- Public Transit Performance Measures
- TDM Performance Measures

Some of these CMP performance measures were identified based on numerous monitoring activities currently conducted and/ or planned by various local and state agencies responsible for providing or supporting transportation facilities and services in the region. Detailed descriptions of each of these measures, together with an explanation of how the required data are or will be collected, are presented in the remainder of this chapter.

This section explains each of the CMP performance measures listed above in more detail. A section at the end of each category of performance measures discusses sources of and identifies those suggested performance measures where data is not currently available.

Safety Performance Measures (5-Year Rolling Average)

Crashes at intersections and roadway segments are used as an indicator of congestion. Considered a measure of nonrecurring congestion, this measure uses data that are widely available through the many local and state agencies that track them on an ongoing basis throughout the CMP application area. All data is collected and summarized in the form of a 5-year rolling average.

Number of Fatalities

Summary of the number of fatalities from motor vehicle crashes. This is measured by the number of fatalities and not the number of fatality crashes.

Fatality Rate

Summary of the number of fatalities from motor vehicle crashes normalized by exposure in the form of vehicle miles of travel (100,000). This is measured by the number of fatalities and not the number of fatality crashes.

Serious Injuries

Summary of the number of incapacitating injuries from motor vehicle crashes. This is measured by the number of persons receiving incapacitating injuries and not the number of incapacitating injury crashes.

Serious Injury Rate

Summary of the number of incapacitating injuries from motor vehicle crashes normalized by exposure in the form of vehicle miles of travel (100,000). This is measured by the number of persons receiving incapacitating injuries and not the number of incapacitating injury crashes.

Non-Motorized Safety (Fatalities + Serious Injuries)

Summary of the number of fatalities and incapacitating injuries from motor vehicle crashes that involve pedestrians or bicyclists. This is measured by the sum of the number of fatalities and incapacitating injuries and not the number of fatality or incapacitating injury crashes.

Number of School Hot Spot Locations Unprogrammed

List of school locations with identified safety concerns and proposed safety enhancement facility recommendations.

Data Collection/Availability

Crash data is collected through various law enforcement agencies. The data for fatality crashes are provided by WVDOH. Data is not currently available for serious injury crashes. As a result, all performance measurement currently involves fatality crashes only.

Roadway Capacity Performance Measures

Over Capacity Centerline Roadway Miles on CMP Network

Summarizes the centerline roadway miles operating with a volume to capacity ratio greater than 1.0 to help quantify the level of congestion within the region. This measure can be broken down to reflect interstates and other routes.

Volume/Capacity Ratio

The volume-to-capacity (V/C) ratio is used as the major tool in measuring roadway conditions and is a measure of the amount of traffic on a given roadway in relation to the amount of traffic the roadway was designed to handle. For this measure the different parts of the transportation system are grouped (National Highway System (NHS) – Interstate, National Highway System – Non-Interstate, Non-NHS CMP Network) and the sum of volumes is compared to the sum of capacities.

Data Collection/Availability

Evaluation of roadway capacity and travel volumes from the base year of the regional travel demand model.

Reliable Travel Time Performance Measures

Percent of the Interstate System Providing for Reliable Travel Times

Percent of the Interstate System providing reliable travel times as reported in Person-Miles.

Percent of the Non-Interstate NHS Providing for Reliable Travel Times

Percent of the Non-Interstate National Highway System providing reliable travel times as reported in Person-Miles. This will typically only be measured on principal arterial roadways due to the availability of data and a limited number of minor arterial facilities.

Data Collection/Availability

Travel time data would come from the National Performance Management Research Data Set (NPMRDS) or an FHWA approved equivalent data set. State DOTs, in agreement with MPOs, are required to define reporting segments consistently for all measures and submit them to FHWA. In general, reporting segments in urbanized areas would have a maximum length of ½ mile, while the maximum length in non-urbanized areas would be 10 miles, unless an individual travel time segment is longer. These data are not being gathered and reported as a part of the current CMP. This measure will be required to be reported by June 15, 2018.

Additional guidance can be found in the following FHWA resource document:

https://www.fhwa.dot.gov/tpm/rule/systemperf20042016.pdf

Goods Movement Performance Measures

Truck Travel Time Reliability (TTTR) Index

Percent of the NHS providing reliable truck travel times. The Travel Time Index is the ratio of the peak-period travel time to the free-flow travel time. This measure is computed for the AM peak period (6 am to 9 am) and PM peak period (4 pm to 7 pm) on weekdays. Averages across urban areas, road sections, and time periods are weighted by VMT using volume estimates derived from FHWA's HPMS.

Data Collection/Availability

Truck Travel Time Reliability Data will be reported as data becomes available, using the FHWA Highway Performance Monitoring System (HPMS) database.

Vehicle Miles Traveled (VMT) Exceeding Capacity on Designated Truck Routes

Measures the total vehicle miles of travel exceeding capacity on designated truck routes. The VMT for a roadway segment is calculated by multiplying the AADT of all vehicles on that segment by the length of the segment in miles.

Data Collection/Availability

Evaluation of roadway capacity and travel volumes from the base year of the regional travel demand model.

Number of Freight Hotspot Locations Unprogrammed

The number of freight hotspot locations which do not have a plan for funding and constructing improvements.

Data Collection/Availability

RIC staff may choose to identify a freight hotspot list using input from the TTAC and other stakeholders. When this occurs, these locations will be compared to proposed project recommendations in the TIP and RTP.

Public Transit Performance Measures

Percent of Congested Roadway Centerline Miles with Transit Service

Summarizes the proportion of congested roadway centerline miles with regularly scheduled transit service (fixed-route local bus service).

Data Collection/Availability

Transit providers' annual report – National Transit Database (NTD).

Passenger Trips per Revenue Hour

Summarizes the system wide number of passengers boarding a transit vehicle during one revenue service hour.

Data Collection/Availability

Transit providers' annual report – National Transit Database (NTD).

Average Service Frequency

The average service frequency for all fixed-route transit services bus routes operated on the CMP roadway network is measured. This measure identifies average frequencies by transit system, along with the region-wide average.

Data Collection/Availability

Data for this performance measure is not currently available from the transit provider.

Annual Ridership

Annual ridership summarizes the total number of unlinked passenger trips from all transit routes that operate in the CMP application area. Passengers are counted each time they board vehicles, no matter how many vehicles they use to travel from their origin to their destination.

Data Collection/Availability

Transit providers' annual report – National Transit Database (NTD).

TDM Performance Measures

Percent of Commuters Using Carpools or Vanpools

Summarizes the percent of persons reporting using carpools and vanpools in Kanawha and Putnam Counties. A carpool is defined as a group of two or more people who commute to work or other destinations together in a private vehicle, while a vanpool is typically a prearranged group of 5 to 15 people who share their commute to work.

Data Collection/Availability

American Community Survey (ACS) – US Census Bureau

CMAQ Rule

Total Emission Reductions

Summarized for all projects financed with funds from the 23 U.S.C. 149 CMAQ program apportioned to State DOTs in areas designated as nonattainment or maintenance for ozone (O_3), carbon monoxide (CO), or particulate matter (PM_{10} and $PM_{2.5}$). This is a project specific measure and is not calculated on a systemwide basis.

Data Collection/Availability

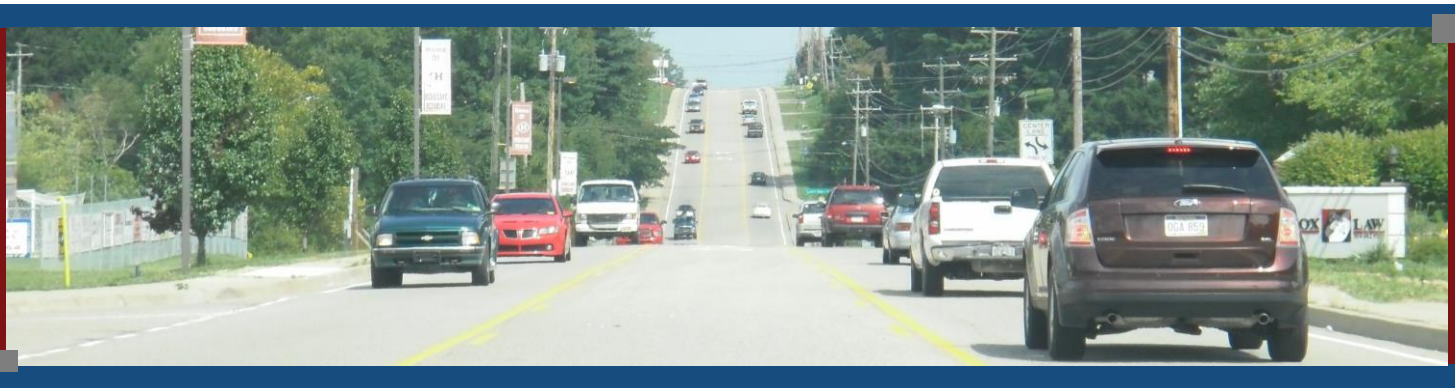
This measure will require a technical evaluation for each CMAQ funded project.

Relationship of CMP Performance Measures to Guiding Statements

Each performance measure identified in the previous section is linked directly back to the guiding statements that aided in the development of the *Kanawha-Putnam 2045 RTP.*

	Goal 1: Preserve and sustain the natural and built environments	**Goal 2:** Promote economic development through targeted transportation investments	**Goal 3:** Improve the integration of land use and transportation	**Goal 4:** Promote an efficient, interconnected, and accessible transportation network	**Goal 5:** Improve travel safety and security in the Greater Kanawha Valley	**Goal 6:** Support and strengthen the current transportation network
Safety Performance Measures						
Number of Fatalities					✚	✚
Fatality Rate					✚	✚
Serious Injuries					✚	✚
Serious Injury Rate					✚	✚
Non-Motorized Safety (Fatalities + Serious Injuries)	✚	✚			✚	✚
Number of School Hotspot Locations Unprogrammed	✚			✚	✚	✚
Roadway Capacity Performance Measures						
Over capacity roadway miles on CMP Network	🚗	🚗		🚗	🚗	🚗
Volume /Capacity Ratio	🚗	🚗		🚗	🚗	🚗
Reliable Travel Time Performance Measures						
Percent of Person-Miles Traveled on the Interstate That Are Reliable		🚗		🚗	🚗	🚗
Percent of Person-Miles Traveled on the Non- Interstate NHS That Are Reliable		🚗		🚗	🚗	🚗
Goods Movement Performance Measures						
Truck Travel Time Reliability (TTTR) Index		🚚		🚚	🚚	🚚
Vehicle Miles Traveled at or Over Capacity on Designated Truck Routes		🚚		🚚		🚚
Number of Unprogrammed Freight Hotspot Locations Unprogrammed		🚚	🚚	🚚		🚚
Public Transit Performance Measures						
Percent of Congested Roadway Centerline Miles with Transit Service	🚌	🚌		🚌		
Transit Passenger Trips per Revenue Hour	🚌	🚌		🚌		
Transit Average Peak Service Frequency (National Transit Database)	🚌	🚌		🚌		
Transit Annual Ridership	🚌	🚌		🚌		
TDM Performance Measures						
Percent of Commuters Using Carpools or Vanpools	🚐			🚐		
CMAQ Rule						
Total Emission Reductions (Specific to CMAQ Funded Projects)	⛽					

Figure 4-1: Summary of Goals and CMP Performance Measures Relationship



Congested Corridor Selection and CMP Strategies

This section summarizes the advancement and management of the CMP strategies. This includes the process for selecting corridors and projects for implementation in the future as well as an identifying schedules, responsibilities, costs, and possible funding sources for each strategy.

Congested Corridor Selection and Project Selection Process

The purpose of the CMP is to identify actual projects. The CMP process involves selecting congested corridors that will undergo detailed evaluation for identifying potential projects/programs that can be potentially completed on the corridors. The process follows three phases (an overview illustration is provided in Figure 7-1):

Congested Corridor Network Identification (Phase 1)

Routine monitoring efforts are used to review the level of service on the roadway network to identify recurring congestion. Roadways that are congested today are considered for review through the CMP screening process. Corridors are identified as being "not congested," "approaching congestion or minimally congested," or "extremely congested," as summarized below).

- **Not Congested:** Corridors that are not anticipated to operate below their adopted level of service standards in either the existing conditions or after committed improvements in the STIP are completed.
- **Approaching Congestion or Minimally Congested:** Corridors that are approaching congestion or are minimally congested based on one of the following three criteria (projects on these corridors may have the greatest impact):
    - ***Approaching Congestion* –** Corridors that are not congested but have segments that have traffic volumes that consume more than 80% of the roadway's capacity but do not exceed the physical capacity of the roadway with either the existing conditions or following the completion of committed STIP projects.
    - ***Congested Today* –** Existing corridors with traffic volumes that exceed the physical capacity of the roadway.

- **Extremely Congested:** Roadways in the Existing + Committed (E+C) network that have forecast volumes that are greater than the physical capacity (typically occurs when using detailed analysis and the volume-to-capacity ratio is 1.08 or greater) of the roadway and are considered severely congested.

Crash data management systems also are used to identify corridors or intersections with a high frequency of crashes that result in non-recurring congestion. Safety improvements not only reduce the potential harm to persons in our communities but also can reduce congestion. Generally, non-congested corridors do not need to be addressed by the CMP; however, the other two categories typically will require one or more congestion-relieving strategies (project, mobility improving program, etc.).

Extremely congested corridors typically will require either capacity improvements or a shift to other mobility strategies that rely significantly on public transportation or reductions in travel demand. In some cases, extremely congested corridors may respond favorably to the installation of operational improvements; these would be considered on a case-by-case basis where appropriate. The corridors approaching congested or minimally congested typically represent the corridors that will be most responsive to CMP improvement strategies.

After the congested network and corridors have been identified, a specific corridor can be selected for detailed analysis and project identification and construction. The TTAC reviews the selection of corridors. Once corridors are selected and evaluated, they will not need to be reevaluated until the next RTP update cycle. Corridors typically are selected based on the following:

1. Corridors without committed projects in the STIP that are forecasted to be approaching congestion, minimally congested, or extremely congested by the horizon year of the RTP.
2. The corridor(s) that would receive the greatest mobility or operational benefit from the CMP process.

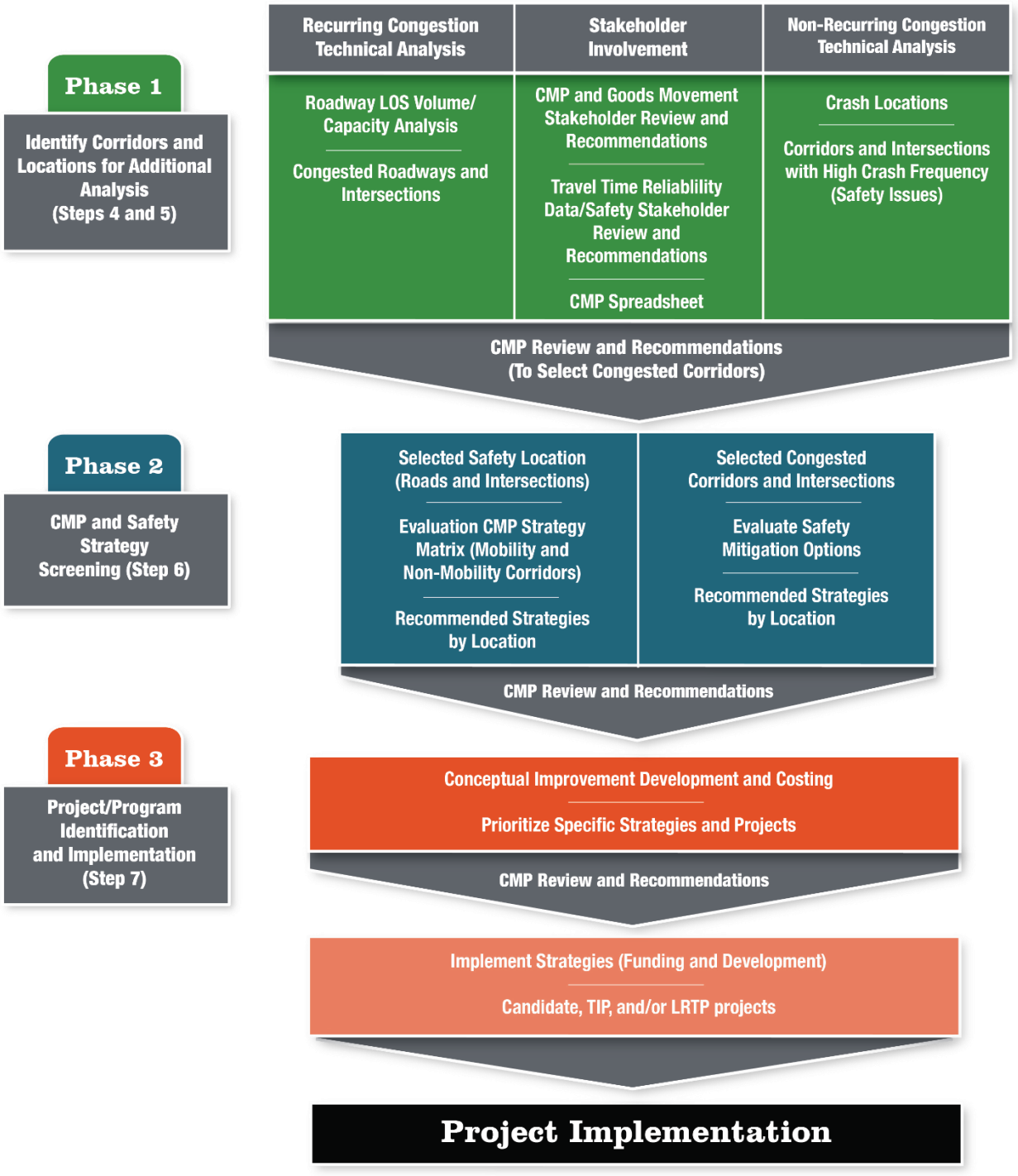
CMP and Safety Strategy Screening (Phase 2)

Once congested corridors are selected for review, they are selectively screened to identify mitigation strategies appropriate to reduce congestion or improve safety to reduce crashes. The CMP Strategy Matrix (found in Appendix B is used to address recurring congestion, and the Safety Mitigation Strategy Matrix (found in Appendix C) is used to address nonrecurring congestion. The matrix includes strategies in five tiers as identified in the CMP Strategy Toolbox. The CMP Strategy Matrix typically is used in a workshop setting to quickly review a corridor, and the Safety Mitigation is applied based on a review of crash data.

Project and Identification and Advancement (Phase 3)

The congestion or safety mitigation strategies that are identified as having the greatest potential benefit are then evaluated in greater detail based on committee or technical recommendations. During this phase, additional analysis of potential projects is undertaken to identify the specific improvement, barriers to implementation, and costs. “Programs” such as demand-reducing programs or policy changes are evaluated to identify recommended action items. This may result in a refocusing of existing resources, such as existing rideshare programs or local maintenance crews where possible, programming improvements in the local agency capital improvement programs, or working with WVDOT to identify candidate projects for advancement in future RTPs.

Figure 5-1: Corridor/Strategy Selection Process

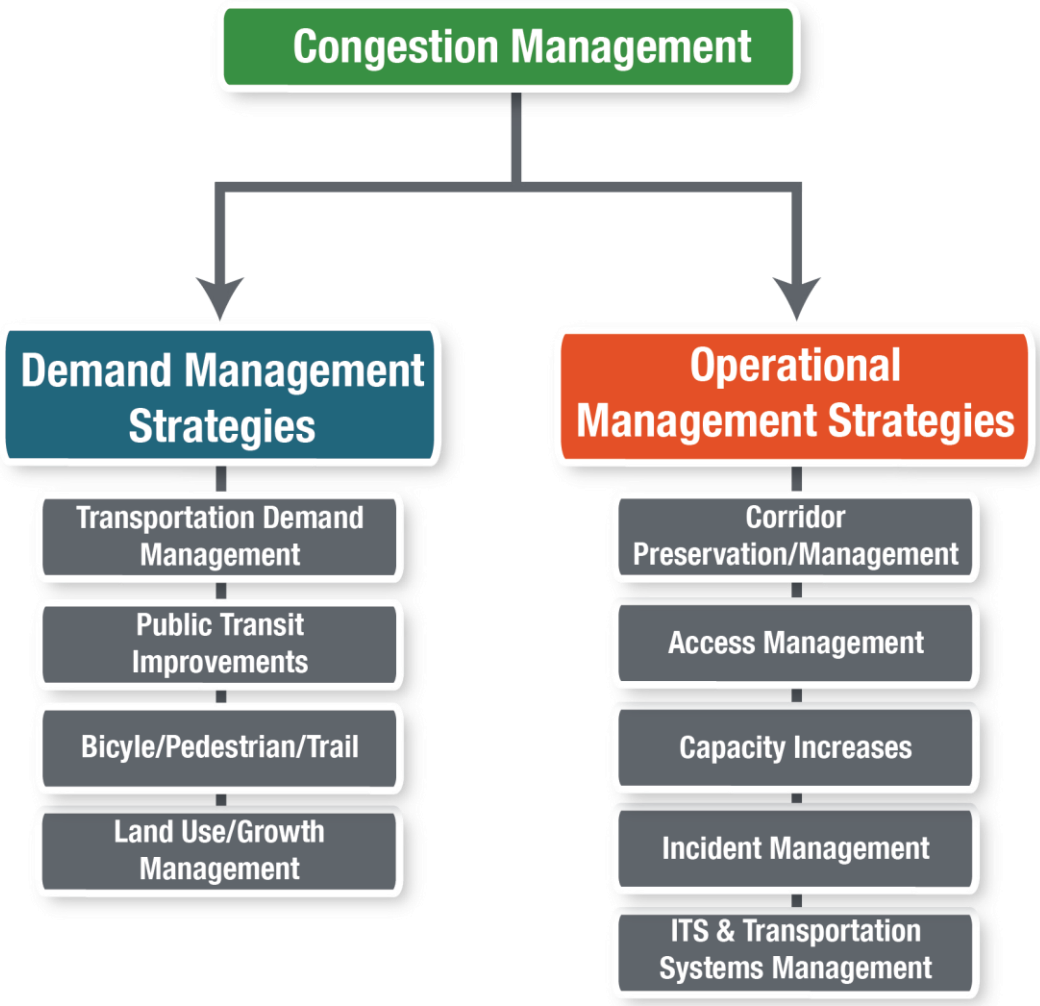


Congestion Management Strategies

This section of the CMP identifies and evaluates the strategies intended for mitigating existing and future congestion in the regional CMP roadway network. A Toolbox of Strategies is presented to help policy makers and planners effectively use these congestion reduction strategies.

A full range of potential strategies has been identified for RIC in its multimodal CMP network. These strategies can be grouped into the following broad categories as presented in Figure 5-2.

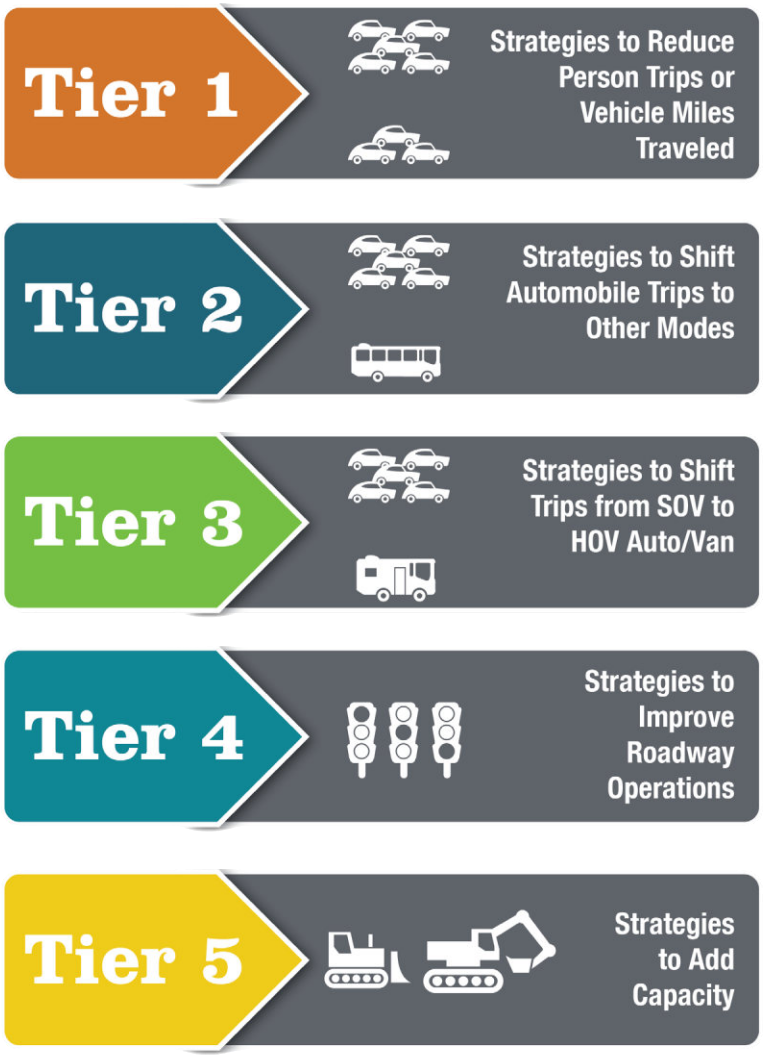
Figure 5-2: Congestion Management Strategies



Toolbox of Strategies

The CMP uses a strategy toolbox with multiple tiers of strategies to support the congestion strategy or strategies for congested corridors. Following an approach used by other MPOs and promoted by FHWA, the toolbox of congestion mitigation strategies is arranged so that the measures at the top take precedence over those at the bottom. The toolbox is presented below.

Figure 5-3: Congestion Management Toolbox



The "top-down" approach promotes the growing sentiment in today's transportation planning arena and follows FHWA's clear direction to consider all available solutions before recommending additional roadway capacity. The RIC CMP toolbox of strategies is presented in detail in the remainder of this section.

Transportation Demand Management Strategies

These strategies are used to reduce the use of single occupant motor vehicles, as the overall objective of TDM is to reduce the miles traveled by automobile. The following TDM strategies, not in any particular order, are available for consideration in the toolbox to potentially reduce travel in the peak hours. Strategies include:

- **Alternative Work Hours:** There are three main variations: staggered hours, flex-time, and compressed work weeks. Staggered hours require employees in different work groups to start at different times to spread out their arrival/departure times. Flex-time allows employees to arrive and leave outside of the traditional commute period. Compressed work weeks involve reducing the number of days per week worked while increasing the number of hours worked per day.
- **Telecommuting:** Telecommuting policies allow employees to work at home or a regional telecommute center instead of going into the office, all the time or only one or more days per week.
- **Guaranteed Ride Home Programs:** These programs provide a safety net to those people who carpool or use transit to work so that they can get to their destination if unexpected work demands or an emergency arises.
- **Alternative Mode Marketing and Education:** Providing education on alternative modes of transportation can be an effective way of increasing demand for alternative modes. This strategy can include mapping Websites that compute directions and travel times for multiple modes of travel.
- **Safe Routes to Schools Program:** This federally-funded program provides 100 percent funding to communities to invest in pedestrian and bicycle infrastructure surrounding schools.
- **Preferential or Free Parking for HOVs:** This program provides an incentive for employees to carpool with preferred of free-of-charge parking for HOVs.

Land Use/Growth Management Strategies

The strategies in this category include policies and regulations that would decrease the total number of auto trips and trip lengths while promoting transit and non-motorized transportation options. These strategies include the following:

- **Negotiated Demand Management Agreements:** As a condition of development approval, local governments require the private sector to contribute to traffic mitigation agreements. The agreements typically set a traffic reduction goal (often expressed as a minimum level of ridesharing participation or a stipulated reduction in the number of automobile trips).
- **Trip Reduction Ordinance:** These ordinances use a locality's regulatory authority to limit trip generation from a development. They spread the burden of reducing trip generation among existing and future developments better than Negotiated Demand Management Agreements.
- **Infill Developments:** This strategy takes advantage of infrastructure that already exists, rather than building new infrastructure on the fringes of the urban area.

- **Transit Oriented Developments:** This strategy clusters housing units and/or businesses near transit stations in walkable communities. By providing convenient access to alternative modes, auto dependence can be reduced.
- **Design Guidelines for Pedestrian-Oriented Development:** Maximum block lengths, building setback restrictions, and streetscape enhancements are examples of design guidelines that can be codified in zoning ordinances to encourage pedestrian activity.
- **Mixed-Use Development:** This strategy allows many trips to be made without automobiles. People can walk to restaurants and services rather than use their vehicles.

Public Transit Strategies

Two types of strategies, capital improvements and operating improvements, are used to enhance the attractiveness of public transit services to shift auto trips to transit. Transit capital improvements generally modernize the transit systems and improve their efficiency; operating improvements make transit more accessible and attractive. The following strategies are included in the toolbox for consideration:

- **Transit Capacity Expansion:** This strategy adds new vehicles to expand transit services.
- **Increasing Bus Route Coverage or Frequencies:** This strategy provides better accessibility to transit to a greater share of the population. Increasing frequency makes transit more attractive to use.
- **Implementing Regional Express Transit:** Multi-agency transit programs such as the pilot express bus service between Huntington and Charleston that was tested in recent years can take transit connectivity to a higher level. This type of service works best when paired with easy connections to the fixed-route transit service providers on either end, as well as with park-and-ride lots and other high quality stop and station locations.
- **Providing Real-Time Information on Transit Routes:** Providing real-time information on bus progress either at bus stops, terminals, and/or personal wireless devices makes bus travel more attractive.
- **Reducing Transit Fares:** This relatively easy-to-enact strategy encourages additional transit use, to the extent that high fares are a real barrier to transit. However, due to the direct financial impact on the transit system operating budgets, reductions in selected fare categories may be a more feasible strategy.
- **Provide Exclusive Bus Right-Of-Way:** Exclusive right-of-way includes bus ways, bus-only lanes, and bus bypass ramps. This strategy is applied to freeways and major highways that have routes with high ridership.

Non-Motorized Transportation Strategies

Non-motorized strategies include bicycle, pedestrian, and trail facility improvements that encourage non-motorized modes of transportation instead of single-occupant vehicle trips. The following strategies are included:

- **New Sidewalk Connections:** Increasing sidewalk connectivity encourages pedestrian traffic for short trips.
- **Designated Bicycle Facilities on Local Streets:** Enhancing the visibility of bicycle facilities increases the perception of safety. In many cases, bicycle lanes can be added to existing roadways through restriping.
- **Improved Bicycle Facilities at Transit Stations and Other Trip Destinations:** Bicycle racks and bicycle lockers at transit stations and other trip destinations increase security. Additional amenities such as locker rooms with showers at workplaces provide further incentives for using bicycles.
- **Improved Safety of Existing Bicycle and Pedestrian Facilities:** Maintaining lighting, signage, striping, traffic control devices, and pavement quality and installing curb cuts, curb extensions, median refuges, and raised crosswalks can increase bicycle and pedestrian safety.
- **Exclusive Non-Motorized ROW:** Abandoned rail rights-of-way and existing parkland can be used for medium- to long-distance bicycle trails, improving safety and reducing travel times.
- **Complete Streets:** Routinely designing and operating the entire right-of-way can enable safe access for all users including pedestrians, bicyclists, motorists, and transit. Elements that may be found on a complete street include sidewalks, bike facilities, special bus lanes, comfortable and accessible transit stops, frequent crossing opportunities, median islands, accessible pedestrian signals, curb extensions, support for changing mobility technologies, and more.

Transportation Demand Management Strategies

The following TDM strategies are recommended to encourage HOV use:

- **Ridesharing (Carpools & Vanpools):** In ridesharing programs, participants are matched with potential candidates for sharing rides. This typically is arranged/encouraged through employers or transportation management agencies that provide ride-matching services. These programs are more effective if combined with HOV lanes, parking management, guaranteed ride home policies, and employer-based incentive programs.
- **High Occupancy Vehicle Lanes:** This increases corridor capacity while, at the same time, providing an incentive for single-occupant drivers to shift to ridesharing. These lanes are most effective as part of a comprehensive effort to encourage HOVs, including publicity, outreach, park-and-ride lots, rideshare matching services, and employer incentives.
- **Park-and-Ride Lots:** These lots can be used in conjunction with HOV lanes and/or express bus services. They are particularly helpful when coupled with other commute alternatives such as carpool/vanpool programs, transit, and/or HOV lanes.
- **Employer-Landlord Parking Agreements:** Employers can negotiate leases so that they pay for parking spaces used only by employees. In turn, employers can pass along parking savings by purchasing transit passes or reimbursing non-driving employees with the cash equivalent of a parking space.
- **Parking Management:** This strategy reduces the instance of free parking to encourage other modes of transportation. Options include reducing the minimum number of parking spaces required per

development, increasing the share of parking spaces for HOVs, introducing or raising parking fees, providing cash-out options for employees not using subsidized parking spaces, and expanding parking at transit stations or park- and-ride lots.

- **Managed Lanes:** FHWA defines managed lanes as highway facilities or a set of lanes in which operational strategies are implemented and managed (in real time) in response to changing conditions. Examples of managed lanes may include high-occupancy toll (HOT) lanes with tolls that vary based on demand, exclusive bus-only lanes, HOV and clean air and/or energy-efficient vehicle lanes, and HOV lanes that could be changed into HOT lanes in response to changing levels of traffic and roadway conditions.

Intelligent Transportation Systems (ITS) Strategies

The strategies in ITS use new and emerging technologies to mitigate congestion while improving safety and environmental impacts. Typically, these systems are made up of many components, including sensors, electronic signs, cameras, controls, and communication technologies. ITS strategies are sets of components working together to provide information and allow greater control of the operation of the transportation system. The following strategies are included in the toolbox.

- **Dynamic Messaging:** Dynamic messaging uses changeable message signs to warn motorists of downstream queues; it provides travel time estimates, alternate route information, and information on special events, weather, or accidents.
- **Advanced Traveler Information Systems (ATIS):** ATIS provide an extensive amount of data to travelers, such as real-time speed estimates on the Web or over wireless devices and transit vehicle schedule progress. It also provides information on alternative route options.
- **Integrated Corridor Management (ICM):** This strategy, built on an ITS platform, provides for the coordination of the individual network operations between parallel facilities creating an interconnected system. A coordinated effort between networks along a corridor can effectively manage the total capacity in a way that will result in reduced congestion.
- **Transit Signal Priority (TSP):** This strategy uses technology located onboard transit vehicles or at signalized intersections to temporarily extend green time, allowing the transit vehicle to proceed without stopping at a red light.

Transportation Systems Management Strategies

Transportation Systems Management (TSM) strategies identify operational improvements to enhance the capacity of the existing system. These strategies typically are used together with ITS technologies to better manage and operate existing transportation facilities. The following strategies are included in the toolbox.

- **Traffic Signal Coordination:** Signals can be pre-timed and isolated, pre-timed and synchronized, actuated by events (such as the arrival of a vehicle, pedestrian, bus, or emergency vehicle), set to adopt

one of several pre- defined phasing plans based on current traffic conditions, or set to calculate an optimal phasing plan based on current conditions.

- **Channelization:** This strategy is used to optimize the flow of traffic for making left or right turns usually using concrete islands or pavement markings.
- **Intersection Improvements:** Intersections can be widened and lanes restriped to increase intersection capacity and safety. This may include auxiliary turn lanes (right or left) and widened shoulders.
- **Bottleneck Removal:** This strategy removes or corrects short, isolated, and temporary lane reductions, substandard design elements, and other physical limitations that form a capacity constraint that results in a traffic bottleneck.
- **Vehicle Use Limitations and Restrictions:** This strategy includes all-day or selected time-of-day restrictions of vehicles, typically trucks, to increase roadway capacity.
- **Improved Signage:** Improving or removing signage to clearly communicate location and direction information can improve traffic flow.
- **Geometric Improvements for Transit:** This strategy includes providing for transit stop locations that do not affect the flow of traffic, improve sight lines, and improve merging and diverging of buses and cars.
- **Intermodal Enhancements:** Coordinating modes makes movement from one mode to the other easier. These enhancements typically include schedule modification to reduce layover time or increase the opportunity for transfers, creation of multimodal facilities, informational kiosks, and improved amenities at transfer locations.
- **Goods Movement Management:** This strategy restricts delivery or pickup of goods in certain areas to reduce congestion.

Incident Management Strategies

- **Freeway Incident Detection and Management Systems:** This strategy addresses primarily non-recurring congestion, typically includes video monitoring and dispatch systems, and may also include roving service patrol vehicles.

Access Management Strategies

- **Access Management Policies:** This strategy includes adoption of policies to regulate driveways and limit curb cuts and/or policies that require continuity of pedestrian, bicycle, and trail facilities.

Corridor Preservation/Management Strategies

- **Corridor Preservation:** This strategy includes, where applicable, land acquisition techniques such as full title purchases of future rights-of-way and purchase of easements to plan proactively in anticipation of future roadway capacity demands.
- **Corridor Management:** This strategy is applicable primarily in moderate- to high-density areas and includes strategies to manage corridor rights-of-way. The strategies range from land-use regulations to landowner agreements such as subdivision reservations, which are mandatory dedications of portions of subdivided lots that lie in the future right-of-way.

Strategies to add capacity are the costliest and least desirable strategies and should be considered last resort methods for reducing congestion. As the strategy of cities trying to "build" themselves out of congestion has not provided the intended results, capacity-adding strategies should be applied after determining the demand and operational management strategies identified earlier are not feasible solutions. The key strategy is to increase the capacity of congested roadways through additional general purpose travel lanes.

- Increase the capacity of congested roadways through additional general purpose travel lanes.
- Increase the capacity of the system through new roadway facilities.

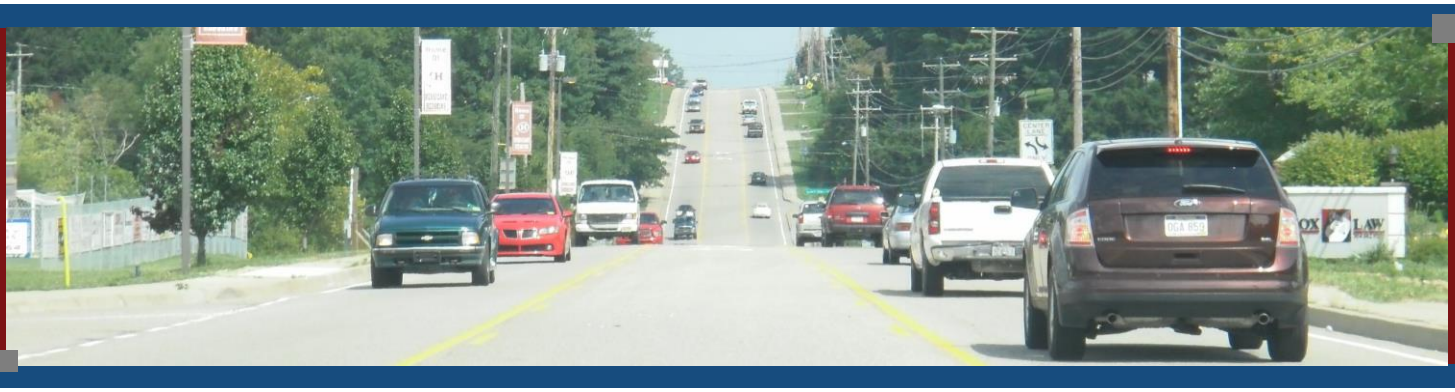
CMP Safety Mitigation

The RIC CMP process includes safety issues in the identification of congested corridors by making use of crash data produced by the West Virginia Department of Highways. This system produces reports by crash type or cause which can be used to identify safety issues on the major roadway network for both congested and non-congested roadways. Reducing the number of crashes that occur on major roadways can reduce nonrecurring congestion. While the delay incurred resulting from crashes cannot be determined easily, it is a significant contribution of delay on major roadways.

Congestion Mitigation Matrix

The CMP Strategy Matrix is used to address recurring congestion. The matrix, included as Appendix B, shows strategies in five tiers as identified in the CMP Strategy Toolbox. The CMP Strategy Matrix typically is used in a workshop setting with agency stakeholders to quickly screen through the strategies in order to identify appropriate strategies that may provide a benefit within the corridor. Following the screening of a corridor using the matrix, strategies which were identified as having a high level of potential benefit or medium level of potential benefit are considered for additional analysis where appropriate. The CMP Strategy Matrix identifies the general level of applicability by mode given the different trip types as follows:

- **Regional Trips:** Long distance trips and/or pass-through trips through the county. Typically, these trips are auto dependent unless served by premium transit modes.
- **Regional Access Trips:** Moderate distance trips that have at least one trip end (origin or destination) within the corridor. Typically, these trips are auto dependent.
- **Local Access Trips:** These are shorter trips with at least one trip end within the corridor. Typically, the bicycle mode can compete favorably with the auto modes of travel relative to travel time.
- **Local Circulation Trips:** These are very short trips where both trip ends likely occur within proximity to the corridor. Typically, walking and bicycling have travel times comparable to auto usage. Public transportation is typically not viable in the absence of frequent local circulator transit service since walking times are of relatively short duration.



Monitoring and Strategy Effectiveness

Introduction

The FHWA guidelines call for CMPs to include provisions to monitor the performance of strategies selected to address congestion. Regulations require "a process for periodic assessment of the efficiency and effectiveness of implemented strategies, in terms of the area's established performance measures." This step of the process helps determine whether operational or policy adjustments are needed to make the current strategies work better and provides information about how various strategies work in order to identify future approaches within the CMP study area.

Data collection and performance monitoring are ongoing with the various periodic assessments of roadway, transit, bicycle/pedestrian/trail, freight network performance in the region. However, this CMP also identifies the need for a process that supports the routine tracking of the effectiveness of the applied congestion mitigation strategies and the multimodal transportation system as a whole. This evaluation process is described in detail below.

Overview of Monitoring Plan

FHWA identifies congestion monitoring as just one of the several aspects of transportation system performance that leads to more effective investment decisions for transportation improvements. Safety, physical condition, environmental quality, economic development, quality of life, and customer satisfaction are among the aspects of performance that also require monitoring.

The Final Rule on Metropolitan Transportation Planning identifies the requirement for "a coordinated program for data collection and system performance monitoring to assess the extent of congestion, to contribute in determining the causes of congestion, and evaluate the efficiency and effectiveness of implemented actions." In addition, it also indicates that "to the extent possible, this data collection program should be coordinated with existing data sources and coordinated with operations managers in the metropolitan area."

As a result, the goal of the RIC CMP system monitoring plan is to develop an ongoing system of monitoring and reporting that relies primarily on data already collected or planned to be collected in the region. The components of the monitoring plan include roadways, public transit, bicycle/pedestrian/trail, TDM, and goods movement where:

- Roadways are monitored through annual LOS analysis using traffic counts and other related data constantly collected throughout the region.
- Crashes are monitored to identify potential non-recurring congestion.
- Transit performance is monitored continuously through various operating and capital plans (as available).
- Bicycle/pedestrian/trail facility data are monitored and updated in various databases.
- Significant goods movement corridors are evaluated to address mobility needs of the goods movement providers.

The RIC CMP will make use of a routine RIC State-of-the-System/Transportation Trends Report to document the performance of the transportation system as in the next section.

RIC Transportation Trends Report

As a key tool in the RIC CMP Transportation Trends Report will be developed in the interim years until the next CMP update. This report will track the effectiveness of the strategies, to the extent possible with the available project level data, and conditions of the multimodal transportation system as a whole. The same set of quantifiable performance measures established for the CMP as described in Chapter 4 of this report will be used to measure system performance at corridor and system levels. The measures that will be used in the RIC Transportation Trends Report for the RIC CMP include:

- Safety Performance Measures
- Roadway Capacity Performance Measures
- Reliable Travel Time Performance Measures[1]
- Goods Movement Performance Measures[1]
- Public Transit Performance Measures
- TDM Performance Measures

The commitment and schedule for preparing a routine RIC Transportation Trends Report will be determined by the RIC's TTAC and Policy Board.

Typically, the RIC Transportation Trends Report will be completed by RIC during the years between RTP updates and the report is contingent on available funding. In the future, the RIC Transportation Trends Report is anticipated to support the requirement of the Transportation Improvement Program (TIP) to the maximum extent practicable, provide a description of the anticipated effect of the TIP toward achieving the performance targets established in the Plan, and how the TIP links investment priorities to those performance targets.

Using available data, the project team in coordination with RIC staff created the first RIC Transportation Trends Report. The table on the following page provides further insight to the performance measures identified in the CMP.

[1] These performance measure do not yet have data available from the WVDOH.

CMP PERFORMANCE MEASURES		
Safety Performance Measures		
Number of fatalities (3-years)	35 total fatalities	
Fatality Rate (3-years)	0.1 per 100,000 VMT	
Non-Motorized Safety (Pedestrian Fatalities, 3-years)	7 total fatalities	
Number of School Hot Spot Locations	• Winfield High School • Hurricane Middle School • Hurricane High School • West Teays Elementary School • Poca Middle School	When discussing the CMP process with stakeholders, their primary concern was congestion occurring around schools. This list of hot spots includes the schools within the study area in which the RTP recommends transportation improvements to alleviate congestion.
Roadway Capacity Performance Measures		
Over Capacity Centerline Miles on CMP Network	31.9 miles	This number is out of 1,024 total centerline miles included in the CMP network, meaning only 3% of the entire network is operating over the design capacity.
Over Capacity Centerline Miles on Interstates	18.2 miles	
Over Capacity Centerline Miles on Other Routes	13.7 miles	
Average Interstate Volume-to-Capacity Ratio	0.57	
Average NHS Routes Volume-to-Capacity Ratio	0.20	
Average Other Routes Volume-to-Capacity Ratio	0.49	
Public Transit Performance Measures		
Percent of Congested Roadway Centerline Miles with Transit Service	6.5	Kanawha Valley Regional Transit Authority covers 913 square miles in Kanawha County and provides approximately 200 centerline miles of fixed route service. While annual ridership and passenger trips per revenue hour have slightly decreased since the end of the recession, KVRTA is still functioning as the highest used transit authority in the state. The Tri-State Transit Authority garnered an annual ridership below 1 million and West Virginia University's PRT serves slightly less passengers per year (2,349,023).
Transit Passenger Trips per Revenue Hour (2015 National Transit Profiles)	16.2	
Transit Annual Ridership (2015 National Transit Profiles)	2,705,123	
TDM Performance Measures		
Percent of Population Carpooling – Kanawha	12%	In the State of West Virginia approximately 10.1% of workers over 16 years of age commute to work in a carpool. Nationwide, 9.5% of the working population over 16 commute to work in a carpool.
Percent of Population Carpooling – Putnam	9%	

Appendices

Federal CMP Regulations

The following section summarizes the Federal requirements for a Congestion Management Process in Transportation Management Areas. This guidance is codified in the Code of Federal Regulations (CFR (Section 450.322) — Statewide Transportation Planning; Metropolitan Transportation Planning; Final Rule). While the entire RIC MPO area is not required to prepare a CMP, the federal regulations provide useful guidance as to the types of information that are most helpful for this process.

The transportation planning process in a TMA shall address congestion management through a process that provides for safe and effective integrated management and operation of the multimodal transportation system.

- Cooperatively developed and implemented
- Travel reduction strategies
- Operational management strategies

a) The CMP should result in multimodal system performance measures and strategies that can be reflected in the metropolitan transportation plan and the TIP.

b) Acceptable levels of service may vary from area to area. In addition, consideration should be given to the following strategies:
   - Manage demand
   - Reduce single occupant vehicle travel
   - Improve transportation system management and operations
   - Improve efficient service integration within and across the following modes:
     i. Highway
     ii. Transit
     iii. Passenger and freight rail operations
     iv. Non-motorized transport
   - Where general purpose lanes are determined to be appropriate, must give explicit consideration to features that facilitate future demand management strategies.

c) The CMP shall be developed, established, and implemented in coordination with Transportation Systems Management (TSM) and operations activities. The CMP shall include:
   - Methods to monitor and evaluate the performance of the multimodal transportation system
     i. Identify the underlying causes of congestion
     ii. Identify and evaluate alternative strategies
     iii. Provide information supporting the implementation of actions
     iv. Evaluate the effectiveness of implemented actions
   - Definitions of congestion management objectives and appropriate performance measures to assess the extent of congestion and support the evaluation of the effectiveness of strategies. Performance measures should be tailored to the specific needs of an area and established cooperatively by the State, MPOs, and operators of major modes of transportation, including providers of public transportation.

- Establishment of a coordinated program for data collection and system performance monitoring to define the extent and duration of congestion. To the extent possible, this program should be coordinated with existing sources, including providers of public transportation.
- Identification and evaluation of the anticipated performance and expected benefits of congestion management strategies that will contribute to the more effective use and improved safety of the existing and future transportation system. Examples of strategies to consider include:
    i. Demand management measures, including growth management and congestion pricing
    ii. Traffic operational improvements
    iii. Public Transit improvements
    iv. Information Technology Services (ITS) technologies
    v. Where necessary, additional system capacity
- Identification of an implementation schedule, implementation responsibilities, and possible funding sources for each strategy.
- Implementation of process for periodic assessment of the effectiveness of implemented strategies. Results of this assessment shall be provided to decision makers and the public to provide guidance on the selection of effective strategies for future implementation.

d) TMA-designated nonattainment for ozone or carbon monoxide may not program Federal funds for any project that will result in a significant increase in the carrying capacity of Single Occupant Vehicles (SOVs), with the exception of safety improvements or the elimination of bottlenecks (within the limits of the appropriate projects that can be implemented).

e) In TMAs designated nonattainment for ozone or carbon monoxide, the CMP shall provide an appropriate analysis of reasonable (including multimodal) travel demand reduction and operational management strategies for a corridor in which a project with a significant increase in SOV capacity is proposed to move forward with Federal funds.

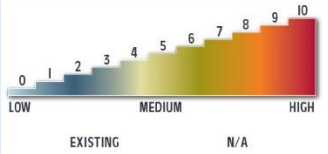
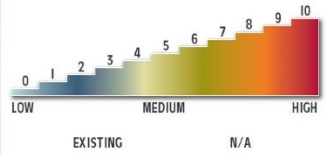
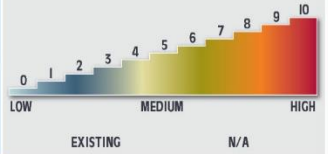
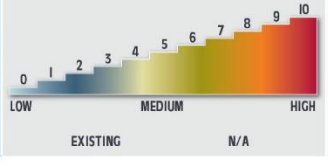
f) State laws, rules, and regulations pertaining to congestion management systems or programs may constitute the congestion management process, if FHWA and FTA find that these are consistent with the intent of this process.

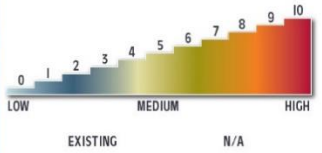
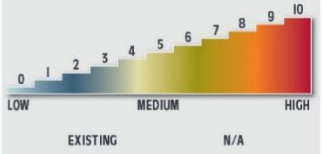
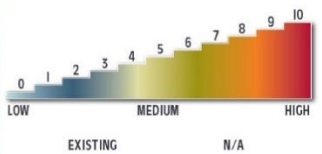
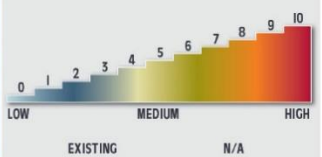
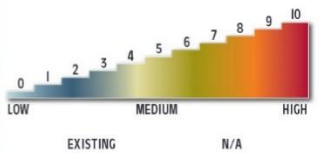
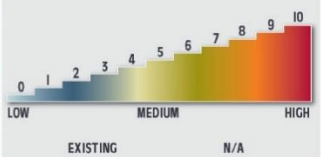
g) Congestion management plan. An MPO serving a TMA may develop a plan that includes projects and strategies that will be considered in the TIP of such MPO. Such plan shall:

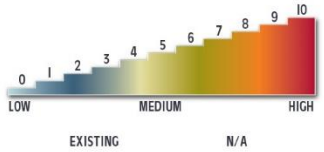
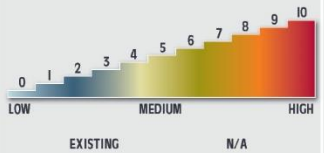
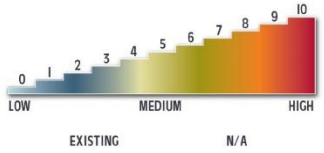
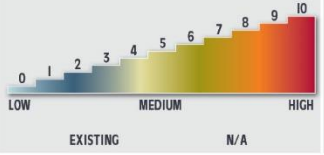
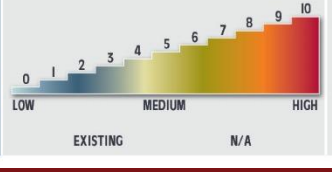
- Develop regional goals to reduce miles traveled during peak commuting hours and improve transportation connections between areas with high job concentration and areas with high concentrations of low-income households;
- Identify existing public transportation services, employer based commuter programs, and other existing transportation services that support access to jobs in the region; and
- Identify proposed projects and programs to reduce congestion and increase job access opportunities.

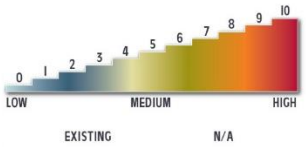
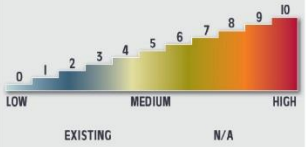
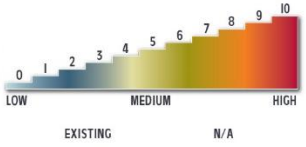
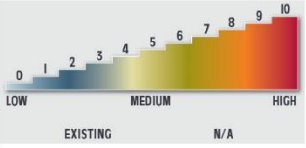
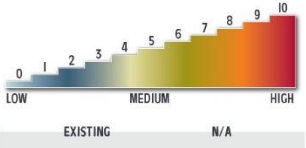
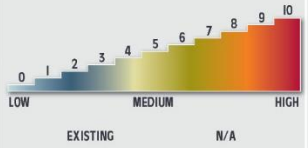
In developing the CMP, an MPO shall consult with employers, private and nonprofit providers of public transportation, transportation management organizations, and organizations that provide job access reverse commute projects or job-related services to low-income individuals.

Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Applicability to Kanawha and Putnam Counties	Distribution of Trip Types: Regional Traffic	Distribution of Trip Types: Regional Access	Distribution of Trip Types: Local Access	Distribution of Trip Types: Local Circulation	Potential Effectiveness	Recommendations/ Comments
Tier 1: Strategies to Reduce Person Trips or Vehicle Miles Traveled	LT	**1.01 Congestion Pricing:** Congestion pricing can be implemented statically or dynamically. Static congestion pricing requires that tolls are higher during traditional peak periods. Dynamic congestion pricing allows toll rates to vary depending upon actual traffic conditions. The more congested the road, the higher the cost to travel on the road. Dynamic congestion pricing works best when coupled with real-time information on the availability of other routes.	Low					0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	
	ST/LT	**1.02 Alternative Work Hours:** There are three main variations: staggered hours, flex-time, and compressed work weeks. Staggered hours require employees in different work groups to start at different times to spread out their arrival/ departure times. Flex-time allows employees to arrive and leave outside of the traditional commute period. Compressed work weeks involve reducing the number of days per week worked while increasing the number of hours worked per day.	Med					0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	
	ST/LT	**1.03 Telecommuting:** Telecommuting policies allow employees to work at home or a regional telecommute center instead of going into the office, all the time or only one or more days per week.	Med					0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	
	ST/LT	**1.04 Emergency Ride Home Programs:** These programs provide a safety net to those people who carpool or use transit to work so that they can get to their destination if unexpected work demands or an emergency arises.	Med					0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	
	ST/LT	**1.05 Alternative Mode Marketing and Education:** Providing education on alternative modes of transportation can be an effective way of increasing demand for alternative modes. This strategy can include mapping websites that compute directions and travel times for multiple modes of travel.	Low					0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	

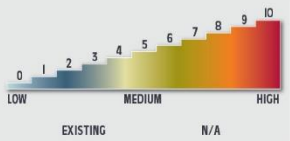
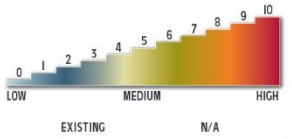
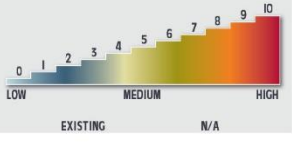
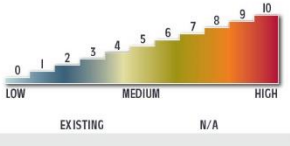
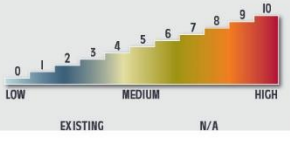
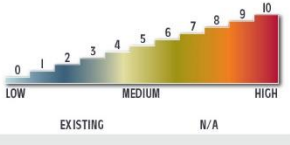
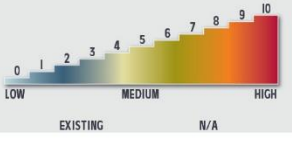
Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Applicability to Kanawha and Putnam Counties	Distribution of Trip Types: Regional Traffic	Regional Access	Local Access	Local Circulation	Potential Effectiveness	Recommendations/ Comments
Tier 1: Strategies to Reduce Person Trips or Vehicle Miles Traveled	**ST/LT**	**1.06 Safe Routes to Schools Program:** This program provides funding to communities to invest in pedestrian and bicycle infrastructure surrounding schools.	**High**						
	ST/LT	**1.07 Preferential for Free Parking for HOVs:** This program provides an incentive for employees to carpool with preferred of free-of-charge parking for HOVs.	**Med**						
	ST/LT	**1.08 Negotiated Demand Management Agreements:** As a condition of development approval, local governments require the private sector to contribute to traffic mitigation agreements. The agreements typically set a traffic reduction goal (often expressed as a minimum level of ridesharing participation or a stipulated reduction in the number of automobile trips).	**Low**						
	ST/LT	**1.09 Trip Reduction Ordinance:** These ordinances use a locality's regulatory authority to limit trip generation from a development. They spread the burden of reducing trip generation among existing and future developments better than Negotiated Demand Management Agreements.	**Low**						
	ST	**1.10 Infill developments:** This strategy takes advantage of infrastructure that already exists, rather than building new infrastructure on the fringes of the urban area.	**Med**						
	ST/LT	**1.11 Design Guidelines for Pedestrian-Oriented Development:** Maximum block lengths, building setback restrictions, and streetscape enhancements are examples of design guidelines that can be codified in zoning ordinances to encourage pedestrian activity.	**Med**						

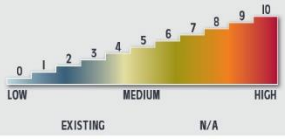
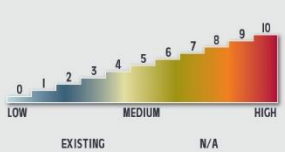
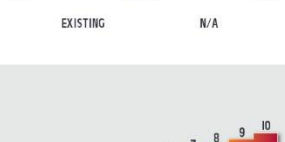
Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Applicability to Kanawha and Putnam Counties	Distribution of Trip Types: Regional Traffic	Regional Access	Local Access	Local Circulation	Potential Effectiveness	Recommendations/ Comments
Tier 1	**ST/LT**	**1.12 Mixed-Use Development:** This strategy allows many trips to be made without automobiles. People can walk to restaurants and services rather than use their vehicles.	**Med**						
Tier 2: Strategies to Shift Automobile Trips to Other Modes	**ST/LT**	**2.01 Transit Capacity Expansion:** This strategy adds new vehicles to expand transit services.	**Med**						
	ST/LT	**2.02 Increasing Bus Route Coverage or Frequencies:** This strategy provides better accessibility to transit to a greater share of the population. Increasing frequency makes transit more attractive to use.	**Med**						
	LT	**2.03 Implementing Regional Premium Transit:** Premium transit such as Bus Rapid Transit (BRT) best serves dense urban centers where travelers can walk to their destinations. Premium transit from suburban areas can sometimes be enhanced by providing park-and-ride lots.	**Low**						
	ST/LT	**2.04 Providing Real-Time Information on Transit Routes:** Providing real-time information on bus progress either at bus stops, terminals, and/or personal wireless devices makes bus travel more attractive.	**Low**						
	ST	**2.05 Reducing Transit Fares:** This relatively easy-to-implement strategy encourages additional transit use, to the extent that high fares are a real barrier to transit. However, due to the direct financial impact on the transit system operating budgets, reductions in selected fare categories may be a more feasible strategy to implement.	**Low**						

Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Applicability to Kanawha and Putnam Counties	Distribution of Trip Types								Potential Effectiveness	Recommendations/ Comments
				Regional Traffic		Regional Access		Local Access		Local Circulation			
Tier 2: Strategies to Shift Automobile Trips to Other Modes	**LT**	**2.06 Provide Exclusive Bus Right-Of-Way:** Exclusive right-of-way includes bus ways, bus-only lanes, and bus bypass ramps. This strategy is applied to freeways and major highways that have routes with high ridership.	**Low**										
	ST/LT	**2.07 New Sidewalk Connections:** Increasing sidewalk connectivity encourages pedestrian traffic for short trips.	**Med**										
	ST/LT	**2.08 Designated Bicycle Lanes on Facilities or Routes:** Enhancing the visibility of bicycle facilities increases the perception of safety. In many cases, bicycle lanes can be added to existing roadways through restriping.	**Med**										
	ST	**2.09 Improved Bicycle Facilities at Transit Stations and Other Trip Destinations:** Bicycle racks and bicycle lockers at transit stations and other trip destinations increase security. Additional amenities such as locker rooms with showers at workplaces provide further incentives for using bicycles.	**Low**										
	ST	**2.10 Improved Safety of Existing Bicycle and Pedestrian Facilities:** Maintaining lighting, signage, striping, traffic control devices, and pavement quality and installing curb cuts, curb extensions, median refuges, and raised crosswalks can increase bicycle and pedestrian safety.	**Med**										
	LT	**2.11 Exclusive Non-Motorized ROW:** Abandoned rail rights-of-way and existing parkland can be used for medium- to long-distance bicycle trails, improving safety and reducing travel times.	**Low**										

Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Applicability to Kanawha and Putnam Counties	Distribution of Trip Types: Regional Traffic	Regional Access	Local Access	Local Circulation	Potential Effectiveness	Recommendations/ Comments
Tier 2	**ST/LT**	**2.12 Intermodal Enhancements:** Coordinating modes makes movement from one mode to the other easier. These enhancements typically includes schedule modification to reduce layover time or increase the opportunity for transfers, creation of multi-modal facilities, informational kiosks, and improved amenities at transfer locations.	**Med**						
Tier 3: Strategies to Increase Vehicle Occupancy	**LT**	**3.01 Ridesharing (Carpools, Vanpools, Lyft, Uber):** In ridesharing programs, participants are matched with potential candidates for sharing rides. This is typically arranged/ encouraged through employers or transportation management agencies, which provide ride-matching services. These programs are more effective if combined with HOV lanes, parking management, guaranteed ride home policies, and employer-based incentive programs.	**High**						
	ST/LT	**3.02 High Occupancy Vehicle Lanes:** This increases corridor capacity while at the same time providing an incentive for single-occupant drivers to shift to ridesharing. These lanes are most effective as part of a comprehensive effort to encourage HOVs, including publicity, outreach, park-and-ride lots, rideshare matching services, and employer incentives.	**Low**						
	ST/LT	**3.03 Park-and-Ride Lots:** These lots can be used in conjunction with HOV lanes and/or express bus services. They are particularly helpful when coupled with other commute alternatives such as carpool/vanpool programs, transit, and/or HOV lanes.	**Med**						
	ST/LT	**3.04 Employer-Landlord Parking Agreements:** Employers can negotiate leases so that they pay only for parking spaces used by employees. In turn, employers can pass along parking savings by purchasing transit passes or reimbursing non-driving employees with the cash equivalent of a parking space.	**Low**						
	ST/LT	**3.05 Parking Management:** This strategy reduces the instance of free parking to encourage other modes of transportation. Options include reducing the minimum number of parking spaces required per development, increasing the share of parking spaces for HOVs, introducing or raising parking fees, providing cash-out options for employees not using subsidized parking spaces, and expanding parking at transit stations or park-and-ride lots.	**Low**						

Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Applicability to Kanawha and Putnam Counties	Distribution of Trip Types: Regional Traffic	Regional Access	Local Access	Local Circulation	Potential Effectiveness	Recommendations/ Comments
Tier 3	**LT**	**3.06 Managed Lanes:** The Federal Highway Administration (FHWA) defines managed lanes as highway facilities or a set of lanes in which operational strategies are implemented and managed (in real time) in response to changing conditions. Examples of managed lanes may include the following: high-occupancy toll (HOT) lanes with tolls that vary based on demand; exclusive bus-only lanes; HOV and clean air and/or energy-efficient vehicle lanes; and HOV lanes that could be changed into HOT lanes in response to changing levels of traffic and roadway conditions.	**Low**					0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	
Tier 4: Strategies to Improve Roadway Operations	**ST/LT**	**4.01 Dynamic Messaging:** Dynamic messaging uses changeable message signs to warn motorists of downstream queues; it provides travel time estimates, alternate route information, and information on special events, weather, or accidents.	**High**					0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	
	ST/LT	**4.02 Advanced Traveler Information Systems (ATIS):** ATIS provide an extensive amount of data to travelers, such as real-time speed estimates on the web or over wireless devices and transit vehicle schedule progress. It also provides information on alternative route options.	**High**					0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	
	ST/LT	**4.03 Integrated Corridor Management (ICM):** This strategy, built on an ITS platform, provides for the coordination of the individual network operations between parallel facilities creating an interconnected system. A coordinated effort between networks along a corridor can effectively manage the total capacity in a way that will result in reduced congestion.	**High**					0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	
	ST	**4.04 Transit Signal Priority (TSP):** This strategy uses technology located onboard transit vehicles or at signalized intersections to temporarily extend green time, allowing the transit vehicle to proceed without stopping at a red light.	**Low**					0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	
	ST	**4.05 Truck Signal Priority:** This strategy gives priority to a traffic signal approach when trucks are detected. This can reduce truck travel times and potentially increases safety by reducing the number of trucks arriving at the end of the green phase, which may reduce red light running.	**Med**					0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	
	ST	**4.06 Traffic Signal Coordination:** Signals can be pre-timed and isolated, pre-timed and synchronized, actuated by events (such as the arrival of a vehicle, pedestrian, bus or emergency vehicle), set to adopt one of several pre-defined phasing plans based on current traffic conditions, or set to calculate an optimal phasing plan based on current conditions.	**High**					0 1 2 3 4 5 6 7 8 9 10 LOW MEDIUM HIGH EXISTING N/A	

Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Applicability to Kanawha and Putnam Counties	Distribution of Trip Types: Regional Traffic	Regional Access	Local Access	Local Circulation	Potential Effectiveness	Recommendations/ Comments
Tier 4: Strategies to Improve Roadway Operations	**ST/LT**	**4.07 Channelization:** This strategy is used to optimize the flow of traffic for making left or right turns usually using concrete islands or pavement markings.	**High**						
	ST/LT	**4.08 Intersection Improvements:** Intersections can be widened and lanes restriped to increase intersection capacity and safety. This may include auxiliary turn lanes (right or left) and widened shoulders.	**High**						
	ST/LT	**4.09 Bottleneck Removal:** This strategy removes or corrects short, isolated, and temporary lane reductions, substandard design elements, and other physical limitations that form a capacity constraint that results in a traffic bottleneck.	**High**						
	LT	**4.10 Vehicle Use Limitations and Restrictions:** This strategy includes all-day or selected time-of-day restrictions of vehicles, typically trucks, to increase roadway capacity.	**Low**						
	ST	**4.11 Improved Signage:** Improving or removing signage to clearly communicate location and direction information can improve traffic flow.	**Med**						
	ST/LT	**4.12 Geometric Improvements for Transit:** This strategy includes providing for transit stop locations that do not affect the flow of traffic, improve sight lines, and improve merging and diverging of buses and cars.	**Low**						
	ST/LT	**4.13 Goods Movement Management:** This strategy restricts delivery or pickup of goods in certain areas to reduce congestion.	**Low**						

Tier	Short-Term/ Long-Term	Congestion Mitigation Strategy	Applicability to Kanawha and Putnam Counties	Distribution of Trip Types: Regional Traffic	Regional Access	Local Access	Local Circulation	Potential Effectiveness	Recommendations/ Comments
Tier 4: Strategies to Improve Roadway Operations	**ST/LT**	**4.14 Freeway Incident Detection and Management Systems:** This strategy addresses primarily non-recurring congestion, typically includes video monitoring and dispatch systems, and may also include roving service patrol vehicles.	**High**						
	ST/LT	**4.15 Access Management Policies:** This strategy includes adoption of policies to regulate driveways and limit curb cuts and/or policies that require continuity of sidewalk, bicycle, and trail networks.	**High**						
	ST/LT	**4.16 Corporate Preservation:** This strategy includes implementing, where applicable, land acquisition techniques such as full title purchases of future rights-of-way and purchase of easements to plan proactively in anticipation of future roadway capacity demands.	**Low**						
	ST/LT	**4.17 Corporate Management:** This strategy is applicable primarily in moderate- to high-density areas and includes strategies to manage corridor rights-of-way. The strategies range from land-use regulations to landowner agreements such as subdivision reservations, which are mandatory dedications of portions of subdivided lots that lie in the future right-of-way.	**Low**						-
	ST/LT	**4.18 Complete Streets:** Routinely design and operate the entire right of way to enable safe access for all users including pedestrians, bicyclists, motorists, and transit Element that may be found on a complete street include sidewalks, bike lanes (or wide paved shoulders), special bus lanes, comfortable and accessible transit stops, frequent crossing opportunities, median islands, accessible pedestrian signals, curb extensions, and more.	**High**						
Tier 5: Strategies to Add Capacity	**LT**	**5.01 Add General Purpose Travel Lanes:** Increase the capacity of congested roadways through additional general purpose travel lanes (or passing lanes on rural two-lane facilities).	**High**						

Impaired Driving	Speeding/Agressive Driving	Occupant Protection
This typically is focused on alcohol impaired driving only, however consideration may also be given to expanded the focus to include drug impaired driving due to its prevalence and close association to alcohol impairment.	Aggressive driving often manifests itself as a combination of speeding and recklessness, particularly dangerous highway behavior. Speeding (well above the speed limit), changing lanes frequently without signaling, following too closely, flashing headlights, driving on shoulders to pass, driving across marked barriers, shouting or gesturing at other drivers, uncontrolled anger, and stress created by traffic congestion are among the causes and manifestations of aggressive driving. Aggressive drivers also tend to be high-risk drivers who are more likely to ride unrestrained and also to drink and drive. For the purposes of quantifying the impact of aggressive driving on crashes, a definition was proposed for "suspected aggressive driving crashes". These crashes were identified as those with the contributing circumstances of Exceeding Speed Limit, Exceeding Safe Speed, Changing Lanes Improperly, Following Too Closely, Disregarded Traffic Control, and Passing Improperly.	The combination of lap and shoulder belts, child passenger safety devices and airbags offer the most effective injury prevention intervention available for passenger vehicle occupants.
Other Strategies	**CMP Related Strategies**	**Other Strategies**
• Increase and improve DUI enforcement • Improve prosecution and adjudication of impaired driving cases • •Improve related legislation (open container, high blood alcohol penalties, etc.) • Improve prevention, public education, and training • Improve the treatment system (i.e., DUI programs, treatment providers, and health care providers) • Improve data collection and analysis	• Expand the appropriate use of speed monitoring trailers • Initiate changeable message signs in key locations to convey information to motorists regarding significant events which affect their trave **Other Strategies** • Identify aggressive driving through driver/crash/citation/adjudication databases for drivers meeting certain criteria • Add aggressive driving as a causative crash factor on the UTCR • Minimize work zone and other traffic delays which can lead to aggressive driving • Create or expand Targeted Enforcement Programs • Utilize aggressive driver hot sheets which identify drivers involved in multiple aggressive driving crashes. • Develop public information/tolerance campaigns for the dangers of aggressive driving • Conduct training for all law enforcement in West Virginia on how to detect aggressive drivers. • Promote use of advanced technologies for data collection and ultimately for automated enforcement and consistent adjudication.	• Evaluate the feasibility of a "ride the school bus program" for students who now use personal vehicles • Develop public and private (corporate) partnerships to increase seatbelt usage both on and off the job • Continue Click It or Ticket Statewide Mobilization • Conduct Incentive Programs such as the LifeSavers Project for rewarding officers who aggressively enforce occupant protection laws • Utilize enforcement to increase seatbelt usage through: ▪ Occupant Protection Information Checkpoints ▪ Directed Patrols ▪ Overtime Patrols ▪ Selective enforcement in areas with low usage rates ▪ Sustained enforcement of seatbelt law • Continue using the Click it or Ticket branding/model of high visibility and paid media messaging • Inform decision makers to gain support for enhanced seatbelt legislation and policies • Educate public on child safety restraint systems and occupant protection through Safe Communities Coordinators • Increase occupant protection programs geared toward teenagers

Lane Departure Crashes	Highway Safety Data Improvements	
Lane departure crashes, in which a vehicle unintentionally departs from its lane and crashes with another vehicle, rolls over, or hits a fixed object. Historically lane departure crashes represent a substantial portion of the statewide crash problem.	Good information, properly used, is the cornerstone of sound highway safety decisions. Knowing the "how, who, when, where, and why" of crashes is the foundation of a comprehensive traffic safety analysis system. While crash data may be the most utilized element of this system, traffic, roadway environment, citation, emergency medical services and injury surveillance, courts, and driver records are also key elements needed to determine where limited funding, staffing and other resources should be dedicated. Traffic safety data should be made readily available for analysis and use in the formation of safety policy as well as the evaluation of safety decision and programs. The technology exists to gather, integrate, and utilize information on a wide variety of important traffic safety issues. Understanding and using information technology to the greatest advantage is a critical challenge in this state and nationally. • The State of West Virginia is currently updating its traffic crash records capability to provide required data to address the FAST Act safety performance measures.	
CMP Related Strategies		
• Identify corridors with disproportionate numbers and high rates of lane departure crashes and conduct road safety assessments • Develop projects for installation of centerline rumble strip(e)s and cable barrier • Develop projects for installation of edgeline rumble stripes • Include the review and installation of signing, guardrail, and other safety features on resurfacing projects • Identify locations for removal, relocation or delineation of troublesome fixed objects • Incorporate proven strategies into policies, directives, standards and procedures • Develop projects for enhanced curve treatments and/or geometry improvements where cost effective • Increase paved shoulder widths and improve stone shoulder travers ability • Consider center-left-turn-lane section on high volume, high turning movement routes with high lane departure rates • Utilize wider (6" or 8") markings where appropriate • Explore use of innovative friction treatments and increased skid testing		
Other Strategies		
• Develop high run-off rate route list for enforcement agencies to use in developing patrol routes • Correlate high impaired driving and high lane departure routes for even more effective enforcement • Develop a multifaceted, targeted media campaign which combines impaired driving, seatbelts and lane departure (all rural road issues) • Develop maintenance safety training		