Congestion Management Process

Updating the 2010 document and methodology

Photo: Seacoastonline.com

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What is a Congestion Management Process (CMP)?

- A regional approach for managing congestion

- Provides a set of actions that for effective management and operation of the transportation system

- Linked to the planning and environmental review processes

- Based on agreed to travel demand reduction and operational management strategies, as well as increases in capacity.

- Can be integrated into Long Range Plan or a developed as a separate document

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What Is the CMP Used For?

- ✓ Identify congested locations

- ✓ Determine the causes of congestion

- ✓ Develop alternative strategies to mitigate congestion

- ✓ Track and evaluate the impact of previously implemented congestion management strategies

- ✓ Prioritize projects for the TIP and Ten Year Plan

- ✓ Provide information for environmental analyses

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CMP Document Organization

- Framework, Goals & Objectives
- Geographic Area & Defined Network
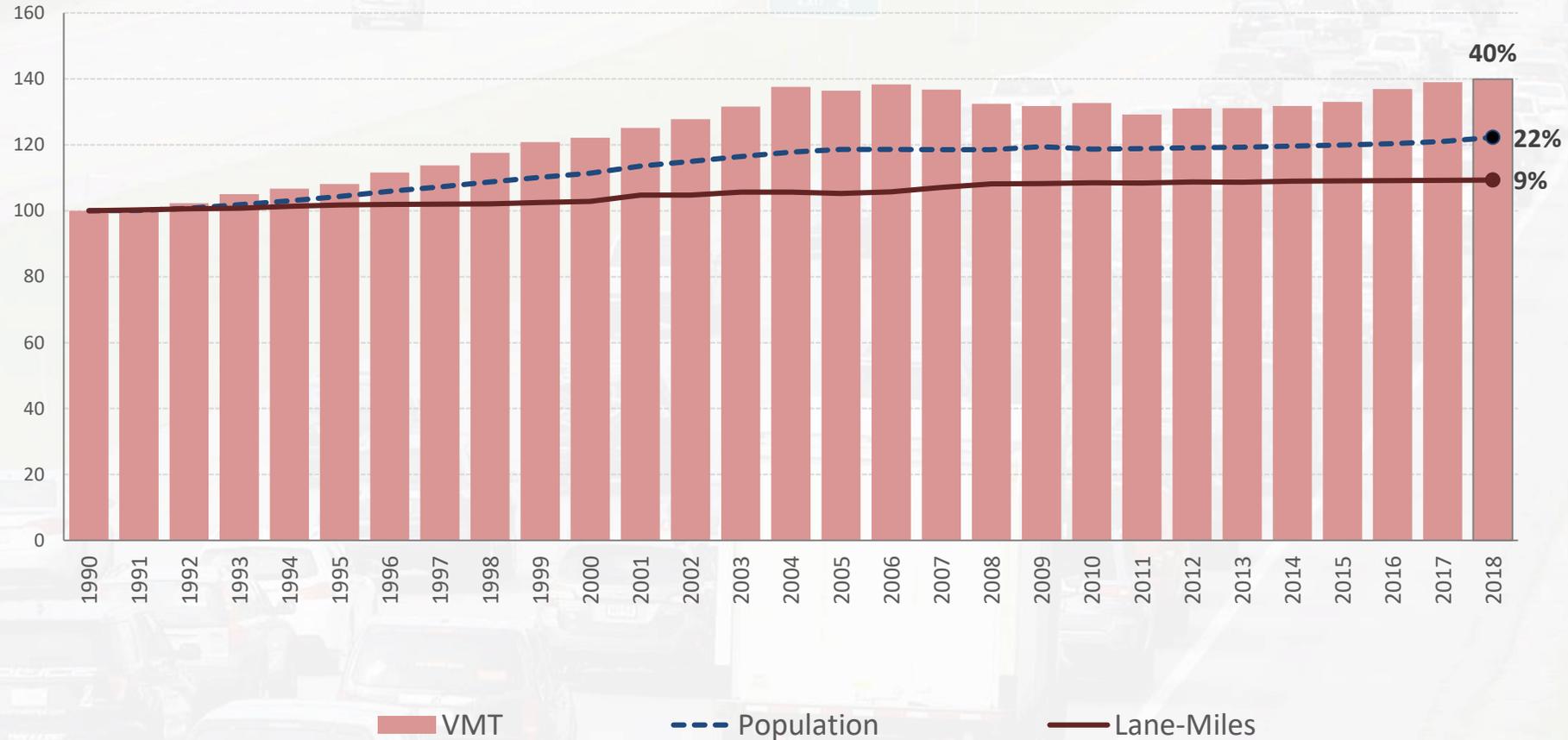- Defining & Identifying Congestion
- Performance Measures & Targets
- Performance Monitoring Plan
- Congestion Management Strategies
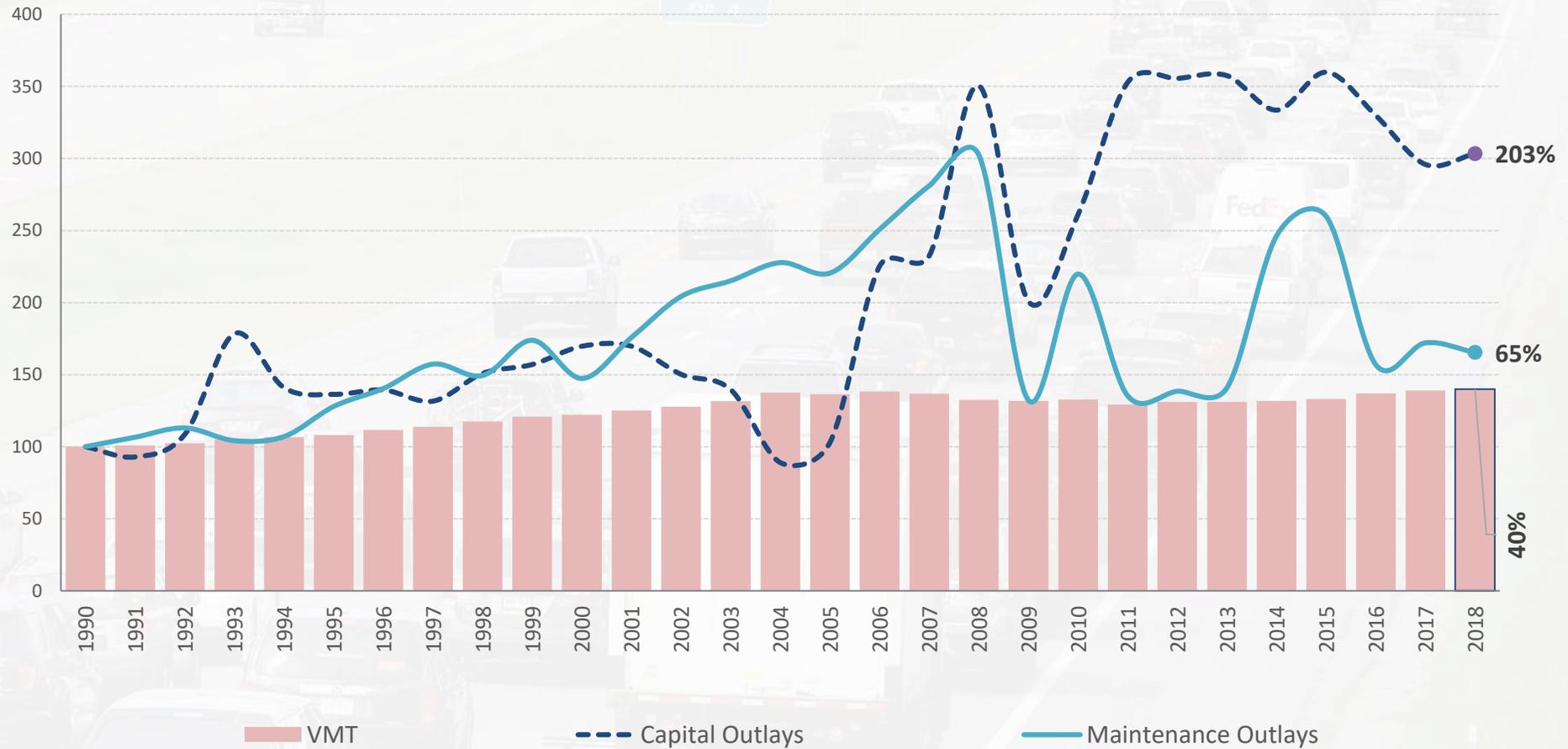
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Framework, Goals & Objectives

Figure 1: Change in VMT, Population, and Roadway Lane-Miles (indexed) 1990-2018

Framework, Goals & Objectives

Figure 2: Change in Expenditures Compared to VMT 1990-2018 (Indexed)

Legend: VMT, Capital Outlays, Maintenance Outlays

203%
65%
40%

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Framework, Goals & Objectives

Figure 3: RPC Region Total Annual Delay (Hours)
from Congestion

	Est. Population	Est. Total Delay	Per Capita Delay
2016	*192,479*	*2,225,063*	*11.56*
2017	*194,043*	*2,335,637*	*12.04*
2018	*196,509*	*2,133,393*	*10.86*
2019	*196,748*	*2,769,691*	*14.08*
Total % Change	**2.2%**	**24.5%**	**21.8%**
Ave. Annual Growth Rate	**0.7%**	**7.6%**	**6.8%**

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Framework, Goals & Objectives

- **Avoid – Reduce or avoid the need for travel**
  - Support dense, mixed-use development
  - Transit, Pedestrian, and bike friendly design
  - Broadband internet infrastructure

- **Shift – Move to more environmentally friendly modes of travel**
  - Provide options for how & when people travel
  - Invest in infrastructure: Transit routes & stops, bike lanes/paths, sidewalks & paths
  - Traveler information & incentives to utilize more efficient modes, routing, and timing decisions

- **Improve – Optimize existing infrastructure and energy efficiency of system**
  - Address bottlenecks
  - Optimize signal systems and controls
 - Support more environmentally friendly vehicles

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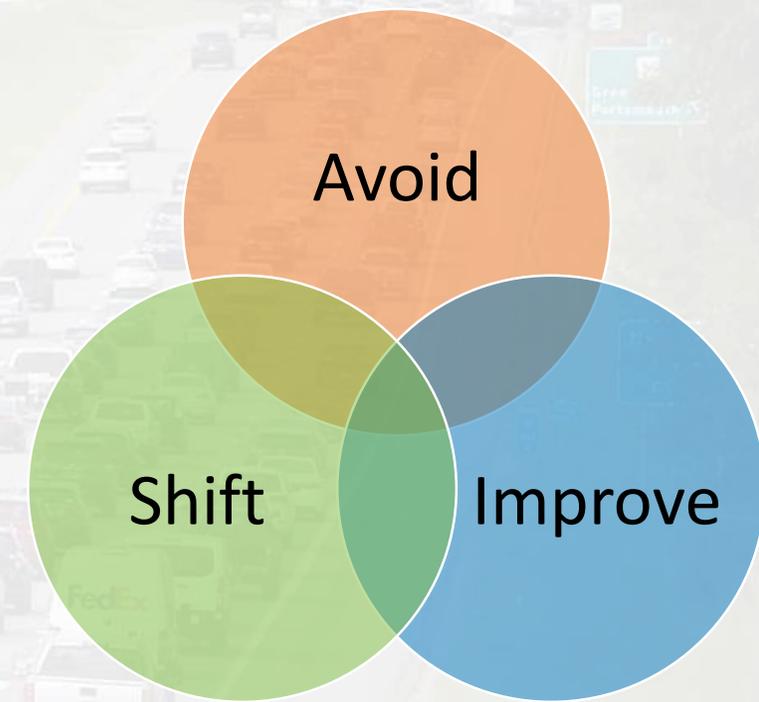
Framework, Goals & Objectives

Figure 4: Congestion Management Objectives

Objective	Timeframe
Conduct travel time reliability analysis on state highways in the MPO Region utilizing data from the National Performance Management Research Data Set (NPMRDS).	Annually, beginning January 2020
Compile CMP data and analysis in an ESRI Story Map or similar format for distribution.	Annually, beginning June 2020
Coordinate with Boston Urbanized Area and other MPOs to ensure consistency across regional boundaries.	Annually
Use the performance metrics to evaluate corridors and sites in the region and recommend strategies and projects to be incorporated into the MPO LRTP and prioritized for the State Ten Year Plan.	Even years beginning Summer 2020
Integrate the outputs of the CMP into the project development and prioritization process for the LRTP, Ten Year Plan, and TIP.	Even years, beginning fall 2020
Establish permanent automatic traffic monitoring stations along all high-priority inter-regional (NHDOT Tier 1) corridors by 2025.	2025
Periodically review the contents of the CMP and update components to reflect changes in goals, data, methods, and strategies.	Every 4 years beginning in 2023
Evaluate and advocate for the use of appropriate strategies for addressing congestion to be implemented as part of project proposals currently in the LRTP and the State Ten Year Plan.	Ongoing as part of project development

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Geographic Area & Defined Network
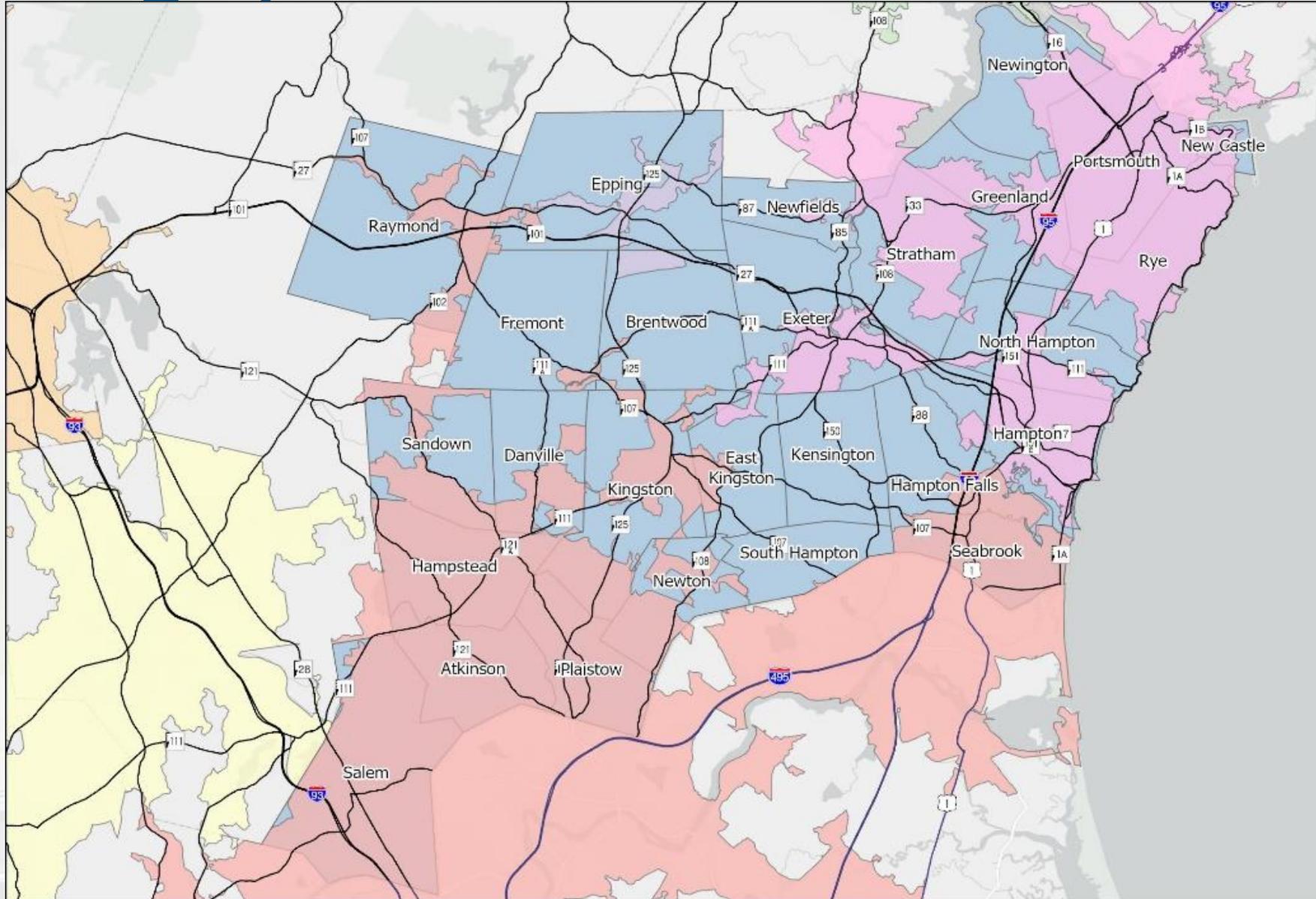
2 Urbanized Areas
- Portsmouth
- Boston

All 27 Communities

Extend into Maine & Mass

Geographic Area & Defined Network
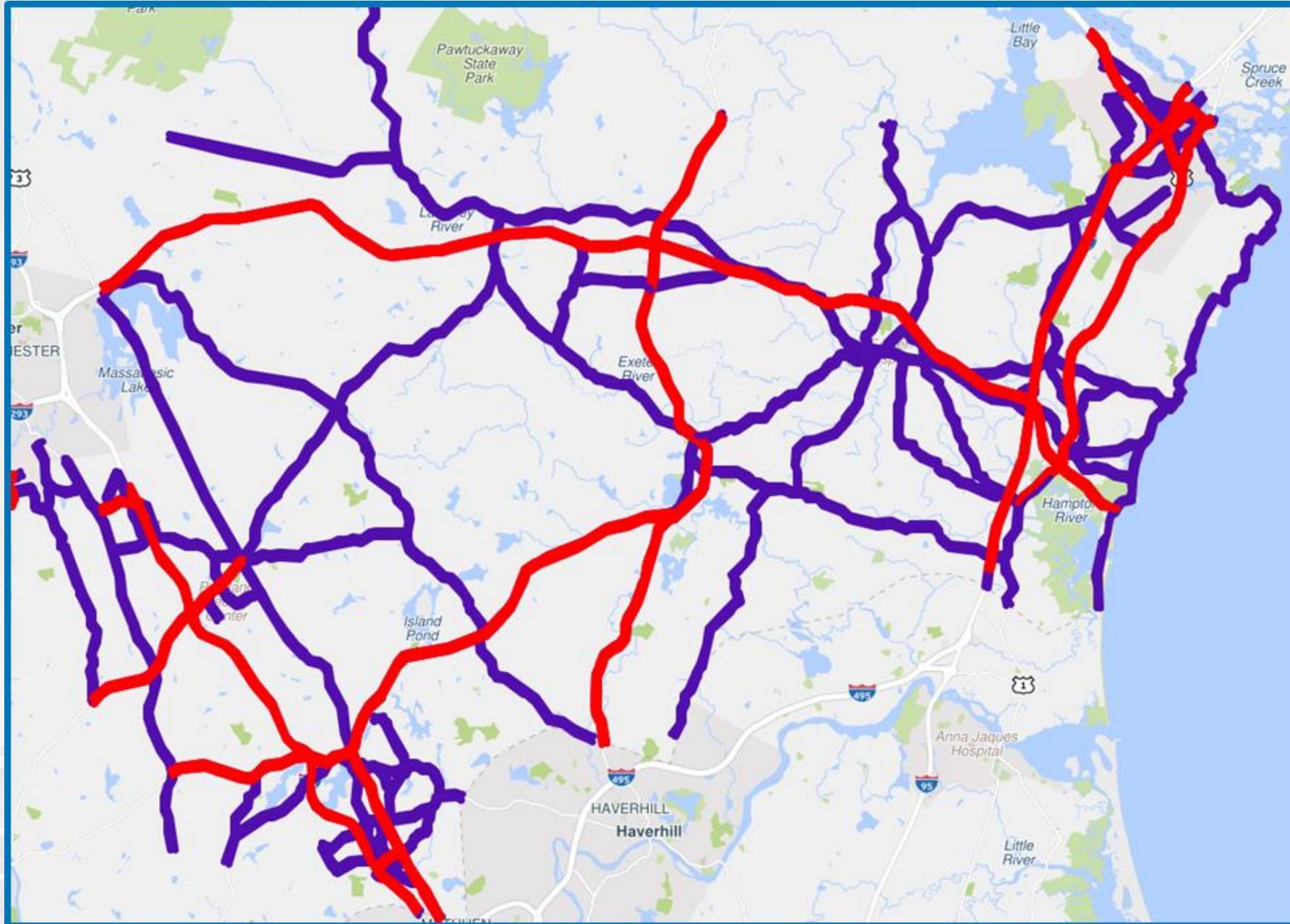
- Interstates 93 & 95
- NH 101
- NH 16
- NH 125
- US 1
- NH 28
- All other numbered State Highways
- COAST Transit System
- MTA/CART Transit System
- WildCat Transit System
- Port of New Hampshire
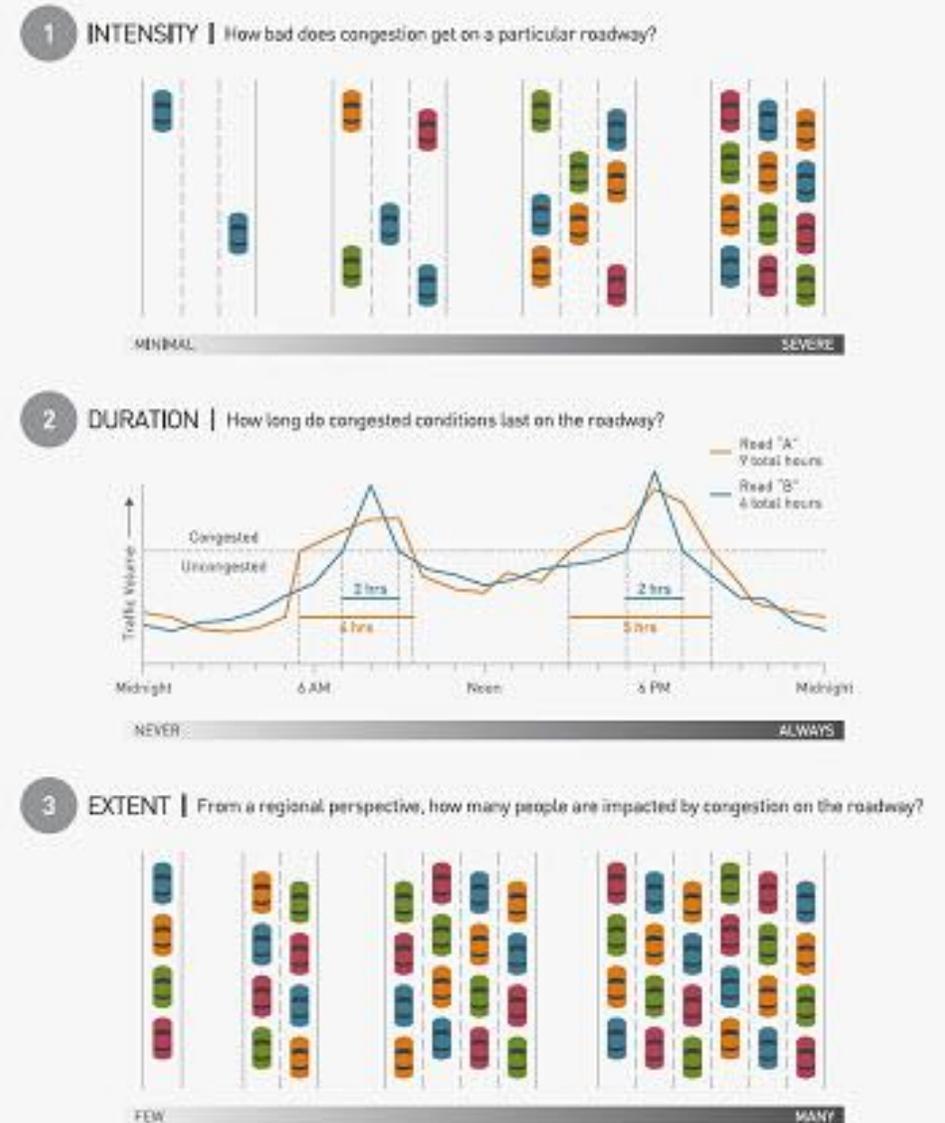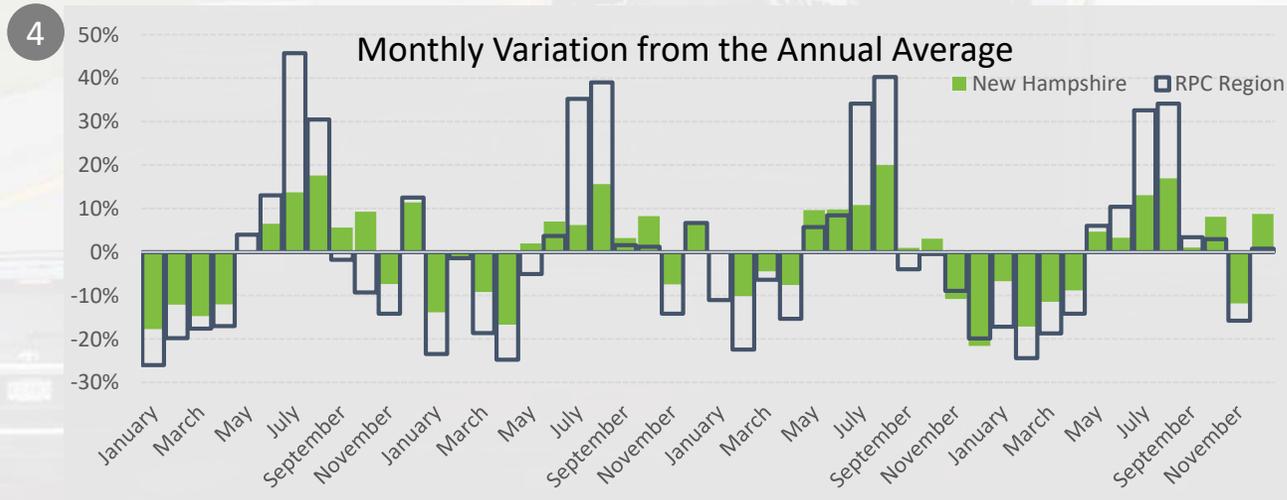- PanAM Railroad

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Defining & Identifying Congestion

- ## Recurring Congestion
  - **Physical Bottlenecks**
  - **Traffic Control Devices**

- ## Non-Recurring Congestion
  - **Crashes and other incidents**
  - **Work zones**
  - **Weather**
  - **Special Events**
  - **Fluctuations in Normal Traffic**

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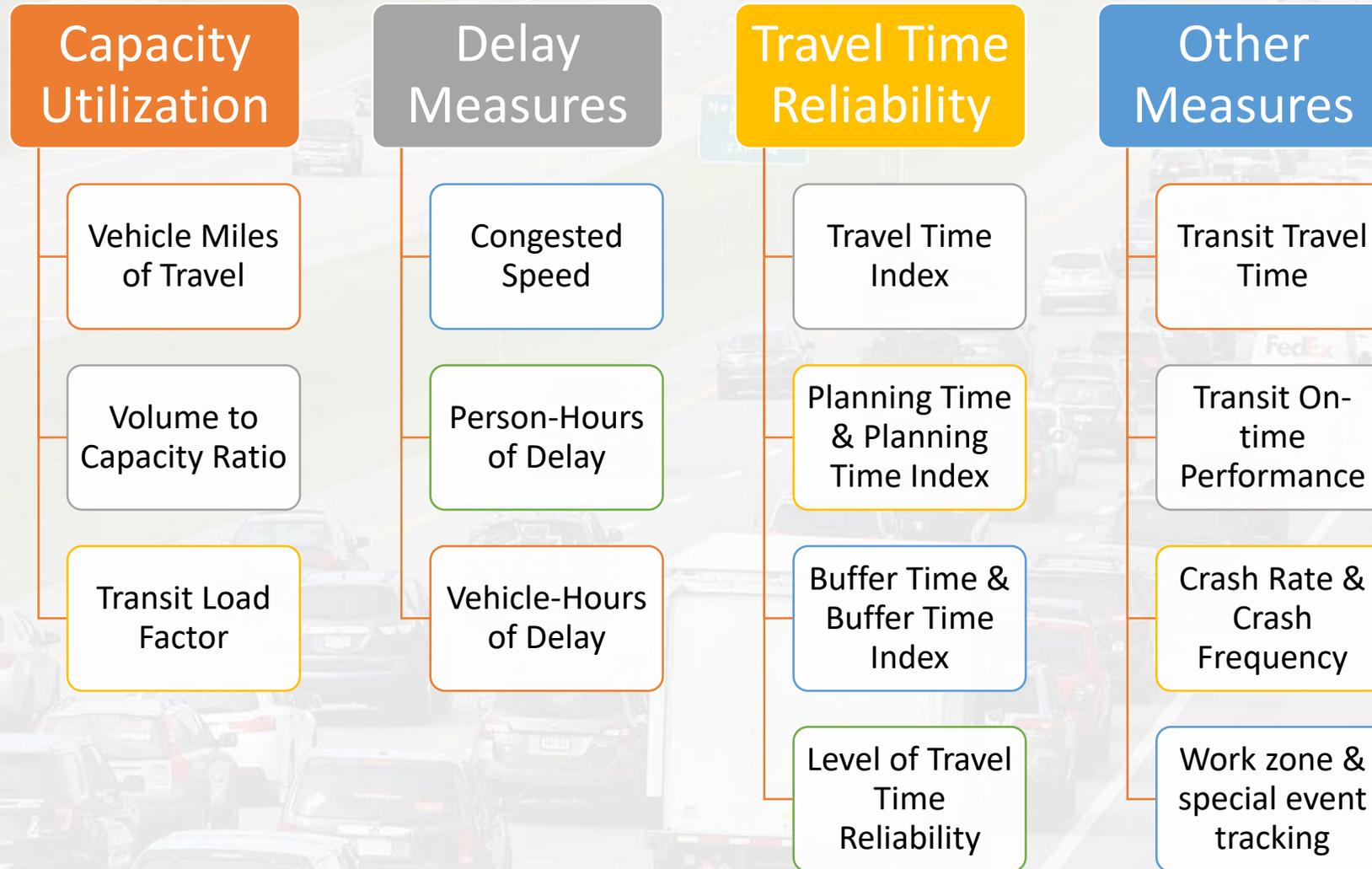PLANNING
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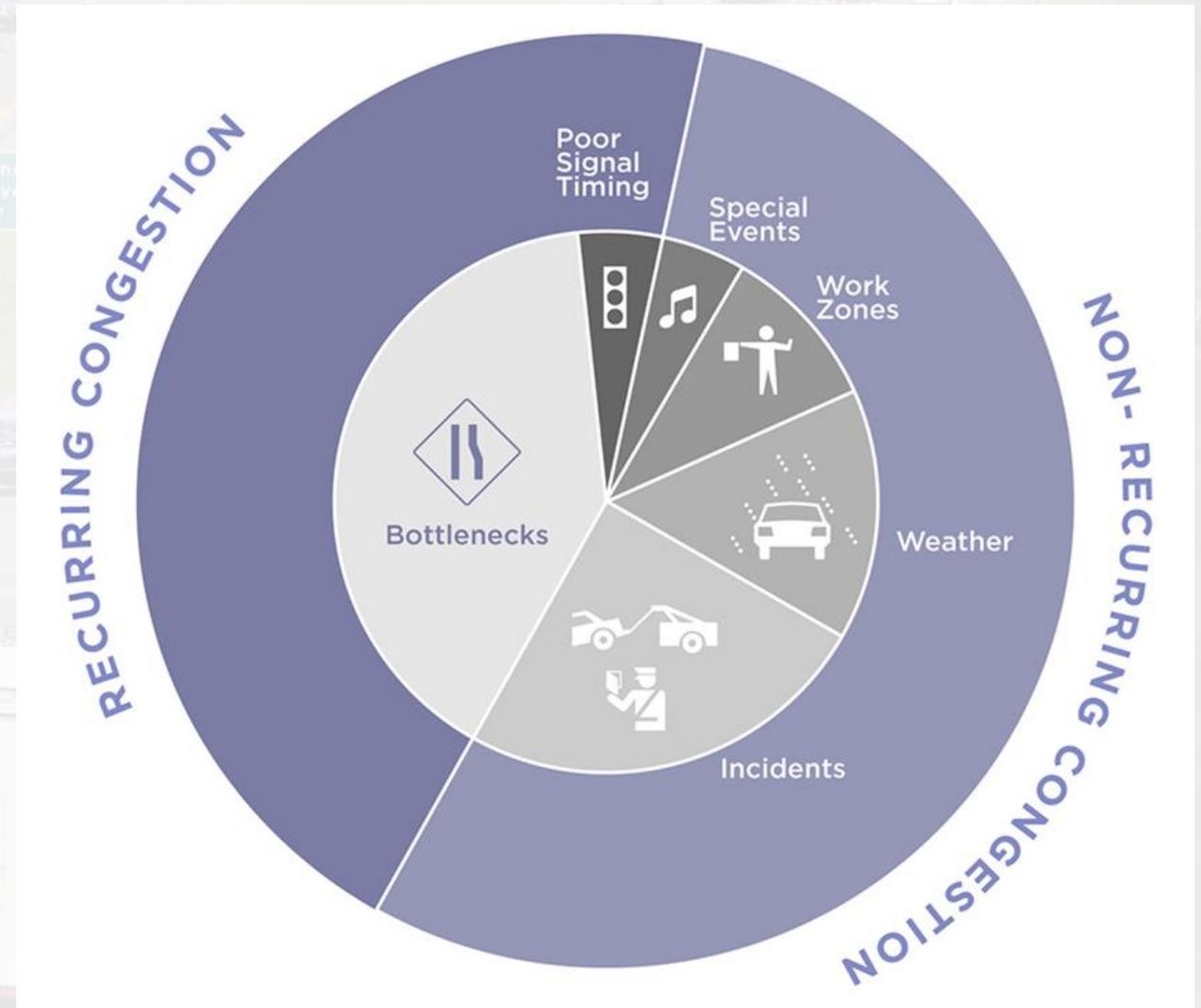
Four Dimensions of Congestion

1. **Intensity** – The Relative severity of congestion at a particular location

2. **Duration** – The amount of time that congested conditions persist

3. **Extent** – The number of system components or users affected

4. **Variability** – The changes in congestion that occur on different days or at different times.

1 INTENSITY | How bad does congestion get on a particular roadway?

MINIMAL — SEVERE

2 DURATION | How long do congested conditions last on the roadway?

NEVER — ALWAYS

3 EXTENT | From a regional perspective, how many people are impacted by congestion on the roadway?

FEW — MANY

Source: Atlanta Regional Commission, CMP, 2006

4 Monthly Variation from the Annual Average

■ New Hampshire □ RPC Region

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Performance Measures & Targets

Capacity Utilization
- Vehicle Miles of Travel
- Volume to Capacity Ratio
- Transit Load Factor

Delay Measures
- Congested Speed
- Person-Hours of Delay
- Vehicle-Hours of Delay

Travel Time Reliability
- Travel Time Index
- Planning Time & Planning Time Index
- Buffer Time & Buffer Time Index
- Level of Travel Time Reliability

Other Measures
- Transit Travel Time
- Transit On-time Performance
- Crash Rate & Crash Frequency
- Work zone & special event tracking

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Integrate Performance Based Planning Metrics

Goal Area	Performance Measures
Road Safety	• *Number of Fatalities* • *Rate of Fatalities per 100 million vehicle miles traveled (VMT)* • *Number of serious injuries* • *Rate of serious injuries per 100 million VMT* • *Number of non-motorized fatalities and non-motorized serious injuries* • *Motorcycle Fatalities (MPO Only – Not required by FHWA)*
Pavement Condition	• *Percent of Interstate Miles in Good Condition* • *Percent of Interstate Miles in Poor Condition* • *Percent of Non-Interstate National Highway System Miles in Good Condition* • *Percent of Non-Interstate National Highway System Miles in Poor Condition*
Bridge Condition	• *Percent of Bridges by deck area on the National Highway System in Good Condition* • *Percent of Bridges by deck area on the National Highway System in Poor Condition*
Transit Asset Condition (State of Good Repair)	• *Rolling Stock: The percentage of revenue vehicles that exceed the useful life benchmark (ULB)* • *Equipment: The percentage of non-revenue service vehicles that exceed the ULB* • *Facilities: The percentage of facilities that are rated less than 3.0 on the Transit Economic Requirements Model (TERM) Scale.* • *Infrastructure: The percentage of track segments that have performance restrictions.*
Reliability of the National Highway System	• *Percent of reliable person-miles traveled on the Interstate* • *Percent of reliable person-miles traveled on the non-Interstate National Highway System (NHS)*
Freight Movement and Economic Vitality	• *Percentage of Interstate system mileage providing for reliable truck travel time (Truck Travel Time Reliability Index)*

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Performance Monitoring

- Annual Traffic Count Program

- Analysis of travel time data

- Analysis of crash data

- Transit use and other metrics

- Park and Ride utilization

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Outputs

- ## ArcGIS StoryMap – Updated Annually (at least)

  - ### Regional picture of congestion data and trends

  - ### Up-to-date Status on performance metrics

  - ### Data used in project development and selection process

- ## System Performance Report – Updated every two years

  - ### Part of the Transportation Improvement Program (TIP) and Long Range Transportation Plan (LRTP).

  - ### Demonstrates how projects are helping to meet goals

- ## Congestion Management Process Document

  - ### Goals and Objectives – tied to larger planning process

  - ### How we measure and track congestion

  - ### List of available strategies to address congestion

DRAFT FY21 Congestion Management Process Story Map

Rockingham Planning Commission | therpc.org

Last Updated June 18, 2020

RPC Federal Performance Report

System Reliability

The System Performance Final Rule, effective, May 20, 2017, establishes six measures in three performance areas to carry out the National Highway Performance Program (NHPP), the National Highway Freight Program (NHFP) and Congestion Mitigation and Air Quality Program (CMAQ). The overall goal of these performance areas is to promote effective use of Federal transportation funds in addressing congestion and highway capacity needs, as well as reducing emissions from the transportation system. The CMAQ emissions reduction measure is applicable only to those areas designated as nonattainment or maintenance for ozone, carbon monoxide or particulate matter. The CMAQ traffic congestion measures are applicable only to those nonattainment areas that are also in urbanized areas of over 1 million people. As the RPC region is in attainment, those three measures do not apply and are not discussed in this system report.
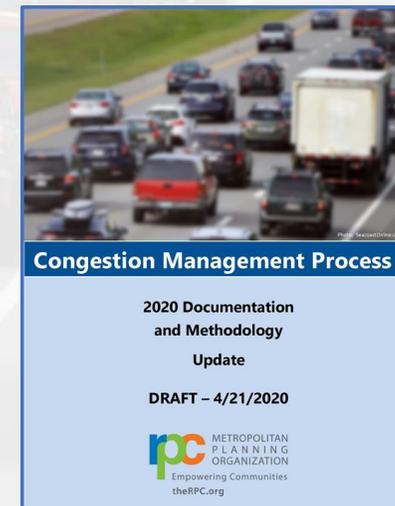
Goal
The overall goal of these performance areas is to improve the efficiency and reliability of the transportation system for both passenger travel and goods movement.

Performance Measures and Targets
Six measures in three performance areas were established in the System Performance rule and three of them (in two areas) are applicable to the RPC MPO region. These metrics are intended to identify trends and assess progress towards improving the overall function of the highway system.

Goal Area	Reliability of the National Highway System
Performance Measures	• *Percent of reliable person-miles traveled on the Interstate* • *Percent of reliable person-miles traveled on the non-Interstate National Highway System (NHS)*
Goal Area	Freight Movement and Economic Vitality
Performance Measures	• *Percentage of Interstate system mileage providing for reliable truck travel time (Truck Travel Time Reliability Index)*

Congestion Management Process

2020 Documentation and Methodology

Update

DRAFT – 4/21/2020

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Congestion Management Strategies

- Active Transportation: Strategies that promote cycling and walking as alternatives to driving.

- Goods Movement: Strategies that address deficiencies in the freight transportation network.

- Traveler Information & Incentives: Strategies that look to better inform travelers and provide motivations to modify the method and timing of travel to reduce congestion.

- Transit: Strategies that promote the use of transit as an alternative to driving.

- Community Development & Design: Strategies that reduce the need for motor vehicle travel through development patterns and design decisions.

- Roadway Capacity Expansion: Strategies that increase the capacity of roadways to manage additional demand for travel.

- Systems Management & Operations: Strategies that look to efficiently and effectively manage the transportation network to reduce congestion.

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Congestion Management Strategies

Active Transportation

Goods Movement

Traveler Information & Incentives

Transit

Community Development and Design

Roadway Capacity Expansion

Systems Management & Operations

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Congestion Management Strategies

Area	Strategy	Approach	Short (1-5 Years)	Medium (5-10 Years)	Long (> 10 Years)	Construction	Operations & Maintenance	Facilities & Equipment	Enforcement	Public Policy Changes	Economic Incentives	Private Sector	Efficiency	Capacity	Safety	Accessibility	Reliability	Trip Reduction	Mode Shift	Resiliency & Sustainability	Fuel/Emissions Reduction
Active Transportation	New Sidewalks and Designated Bicycle Lanes on Local Streets	Shift	●	●		●	●	●	●	●			●		●	●		●	●	●	●
	Improved Bicycle Facilities at Transit Stations and Other Trip Destinations	Shift	●			●	●	●					●		●	●		●	●	●	●
	Improved Safety of Existing Bicycle and Pedestrian Facilities	Shift	●				●	●					●		●	●		●	●	●	●
	Exclusive Non-Motorized Rights-of-Way	Shift		●		●	●	●					●	●	●	●		●	●	●	●
Goods Movement	Railroad Infrastructure Expansion and Bottleneck Removal	Shift		●		●							●		●			●	●	●	●
	Short Sea Shipping	Shift		●									●		●			●	●	●	●
	Intermodal Freight Facilities	Shift			●	●						●	●		●			●	●	●	●
	Port Facility Expansion	Shift		●		●	●	●					●		●			●	●	●	●
	Truck Parking	Improve	●			●	●	●		●		●	●		●			●			●
	Grade Crossing Separations	Improve			●	●	●	●					●	●	●		●				●

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Plan for Adoption

Task	2020 & even years going forward							2021 & odd years			
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Draft CMP and Story Map Published	■										
Public Comment	■	■									
Planning Partner Comment	■	■									
TAC Review and Recommendation		■									
Policy Committee Adoption			■								
Integrating CMP into Project Solicitation		■	■	■	■	■	■	■	■	■	■
Monitor Congestion	■	■	■	■	■	■	■	■	■	■	■

- Public engagement portal via publicinput.com to collect comments and suggestions

- Send draft document to Federal, State, and regional planning partners

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