AUGUST 2020

RHODE ISLAND CONGESTION MANAGEMENT PROCESS

EXECUTIVE SUMMARY

STATE OF RHODE ISLAND
DEPARTMENT OF ADMINISTRATION

RHODE ISLAND STATEWIDE PLANNING PROGRAM

CONGESTION MANAGEMENT AND COVID-19

The State of Rhode Island faced unprecedented challenges with COVID-19 in 2020 which has had significant impacts to overall economic activity and to the levels of congestion on the transportation system. This report reflects the levels of congestion and transportation system conditions that existed prior to the onset of COVID-19. The report recommends performance measures to help track congestion levels on an on-going basis and strategies to address congestion impacts as the level of economic activity increases. While the baselines observed for the year 2018 will be drastically different than those in 2020, the methodology remains sound and will be vital for the tracking of congestion in the upcoming years. The lessons learned during the COVID-19 pandemic also suggest that strategies such as working from home and otherwise substituting travel with electronically mediated activity could play an important role in helping to manage congestion in the future.

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WHAT IS THE CONGESTION MANAGEMENT PROCESS?

A congestion management process (CMP) is a systematic process for identifying congestion and its causes, developing processes to monitor transportation system performance and reliability, and developing congestion management strategies and moving them into the funding and implementation stages. Federal law requires all metropolitan areas with populations greater than 200,000 residents to develop a Congestion Management Process. In Rhode Island the Division of Statewide Planning is responsible for metropolitan planning, and this CMP document serves as the required CMP for the Providence metropolitan area.

WHY DEVELOP THE CMP?

The Congestion Management Process helps alleviate the negative effects of traffic congestion in Rhode Island.

Negative Effects of Traffic Congestion

Time
Loss of Time and Productivity

Health
Long Commutes= Increased Weights, Lower Fitness Levels
Higher Chronic Stress, High Blood Pressure, Increased Fatigue

Environment
71 % of Air Pollution in the U.S. Comes from Vehicles on the Road

Economy
Goods Movement - Negatively Effects Supply Chains → Increased Transportation Time = Increased Costs of Goods for Consumers

WHO DEVELOPED THE CMP?

The Congestion Management Task Force is responsible for developing and implementing Rhode Island's Congestion Management Process. The Task Force includes State and Federal agency staff charged with monitoring and addressing recurring and non-recurring congestion. The Task Force identifies Rhode Island's congested roadways and recommends detailed corridor planning studies to address congestion causes and prioritize solutions within those corridors. This group also makes recommendations to be implemented immediately through Rhode Island's Transportation Management Center, short term through Rhode Island Public Transit Authority (RIPTA) services or active design of projects, or long term through projects funded in the Statewide Transportation Improvement Program (STIP) and through land use regulations.

RIPTA

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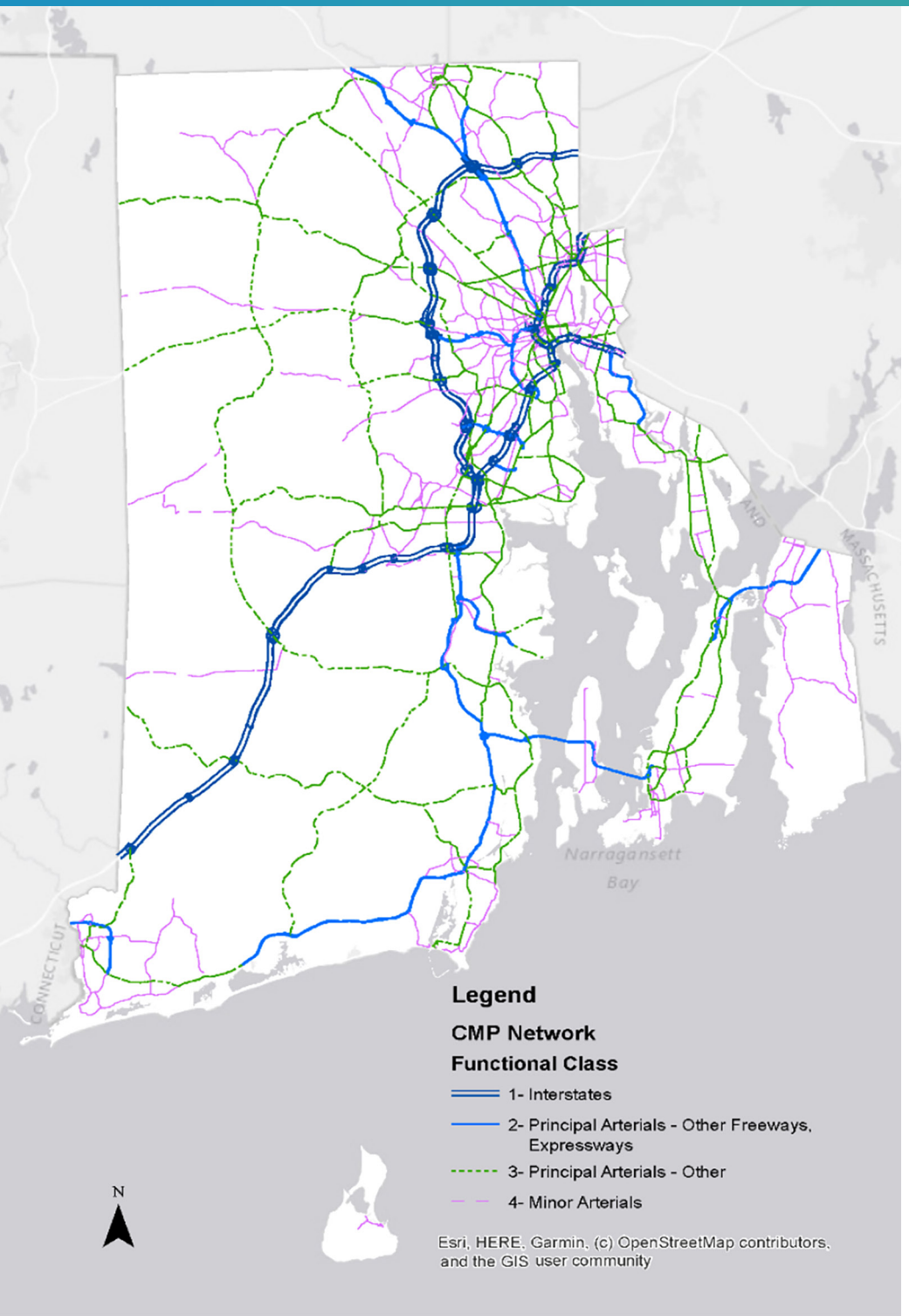
LOCAL

WHAT ARE THE OBJECTIVES OF THE CMP?

This CMP defines eight congestion management objectives that support the goal areas identified in the RI Moving Forward 2040 Plan (the state's Long-Range Transportation Plan):

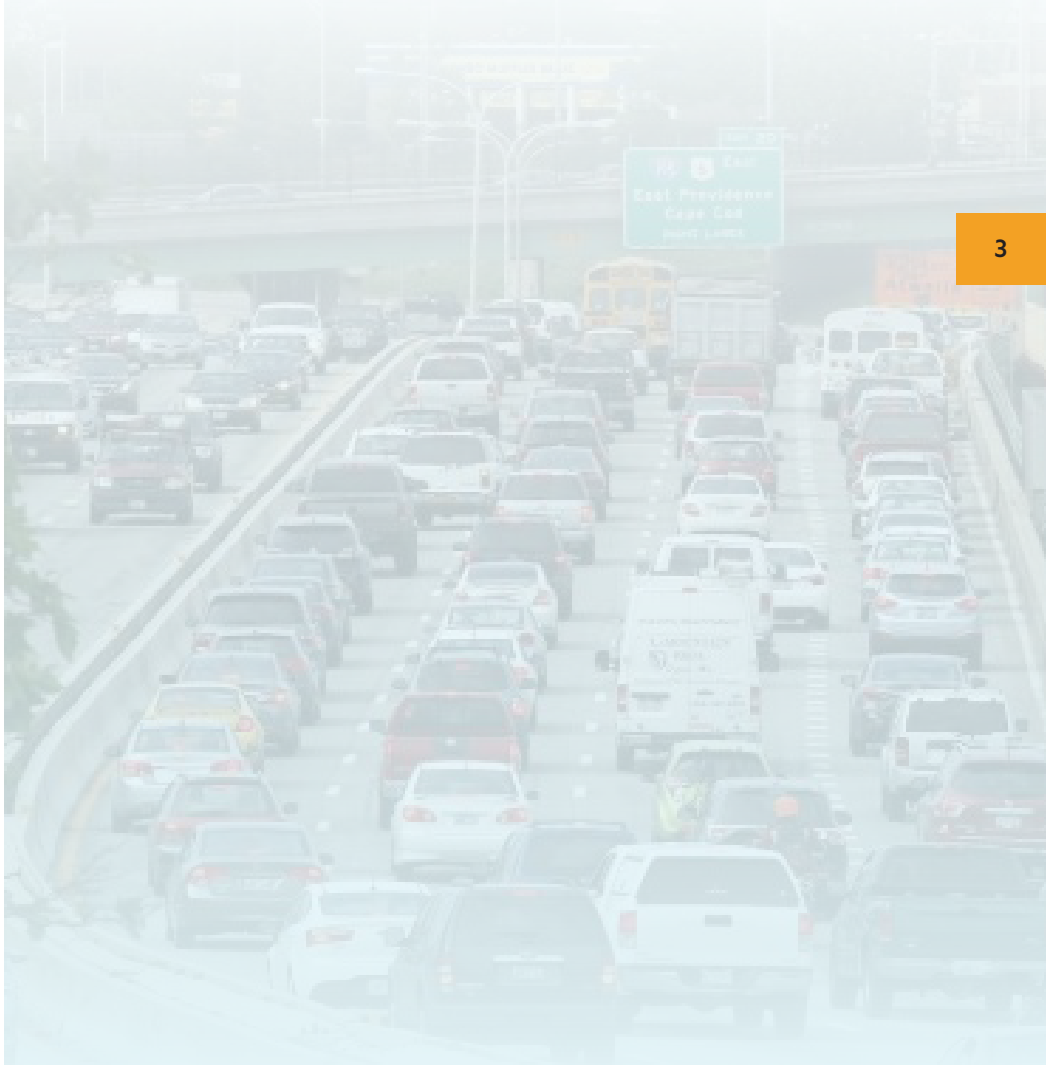
RI CMP Objectives	Moving RI Forward Goal Areas				
	Connect People and Places	Reinvent the Transportation Network	Strengthen Communities	Promote Environmental Sustainability	Support Economic Growth
Improve Reliability of the Transportation System	●	■			■
Reduce Recurring Congestion	●	■			■
Improve Freight and Goods Movement					●
Increase Modal Choice and Competitiveness	●	●	■		
Improve Intermodal Connectivity	●	●	■	■	●
Promote and Invest in Innovative Congestion Management Technologies	■	■			
Promote Land Development and Infill Development/ Redevelopment in Transportation-Efficient Locations		■	■	■	
Reduce Emissions and Improve Air Quality		■		●	

● Direct Link/Impact on Goal Area ■ Indirect Link/Impact on Goal Area



THE CMP NETWORK?

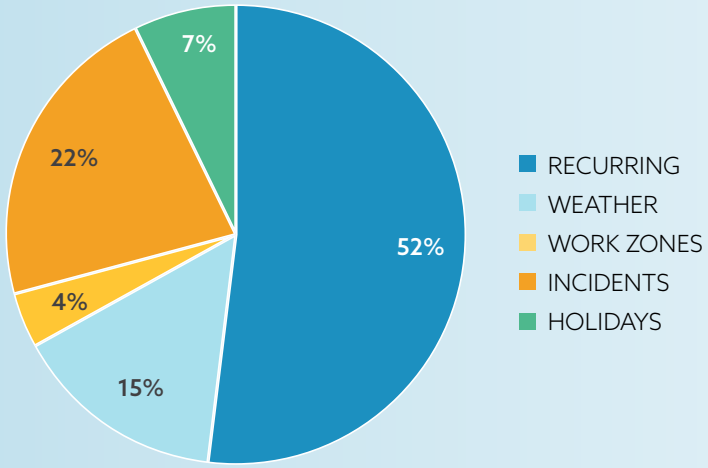
The CMP network defines the transportation system on which the state will monitor congestion and identify solutions. A total of 1,073 road-miles are included in the network. In addition to Rhode Island's major roadways, the network includes all RIPTA bus routes, the Providence/Newport Ferry shuttle service, the Massachusetts Bay Transportation Authority (MBTA) Providence commuter rail line, and bicycle infrastructure (shared use paths).



SOURCES OF CONGESTION IN RHODE ISLAND TODAY

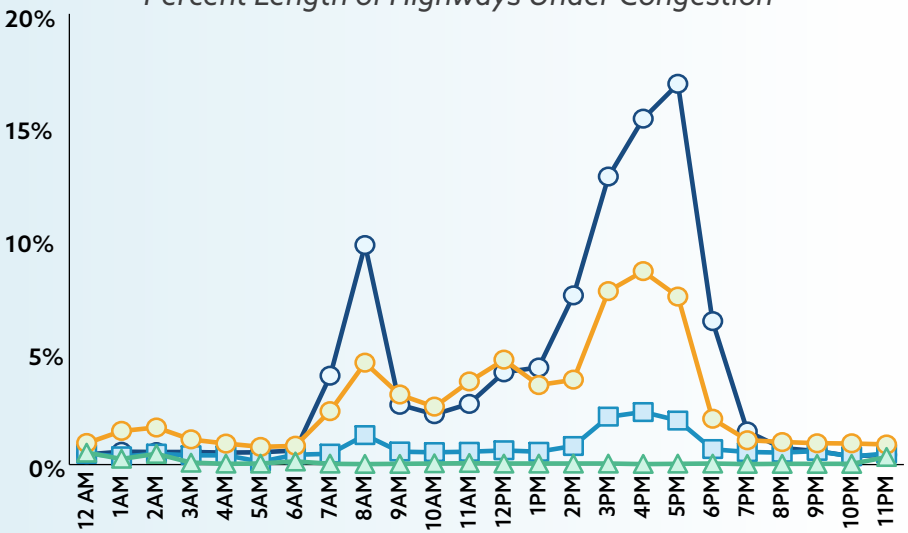
About half of all congestion is "recurring" and related to traffic demand that exceeds the capacity of the roadway. Nearly one-quarter is due to incidents, 15 percent is related to weather, and the remainder is related mainly to holiday traffic or work zones. It is notable that the State has managed to contain the delays from work zones through time restriction and nighttime work.

Sources of Congestion in Rhode Island
January to December 2018



Most of the congestion in the state is centered around the metropolitan Providence region, with the greatest congestion on the highways within the City of Providence. In fact, 50 percent of all highways within the City are considered congested during weekday evening peak commute periods. After the metropolitan Providence region, the next most congested region in the State is the East Bay and Aquidneck Island. The South County and rural areas are relatively uncongested, with less than 3 percent of highway miles congested during an average evening peak period.

Percent Length of Highways Under Congestion

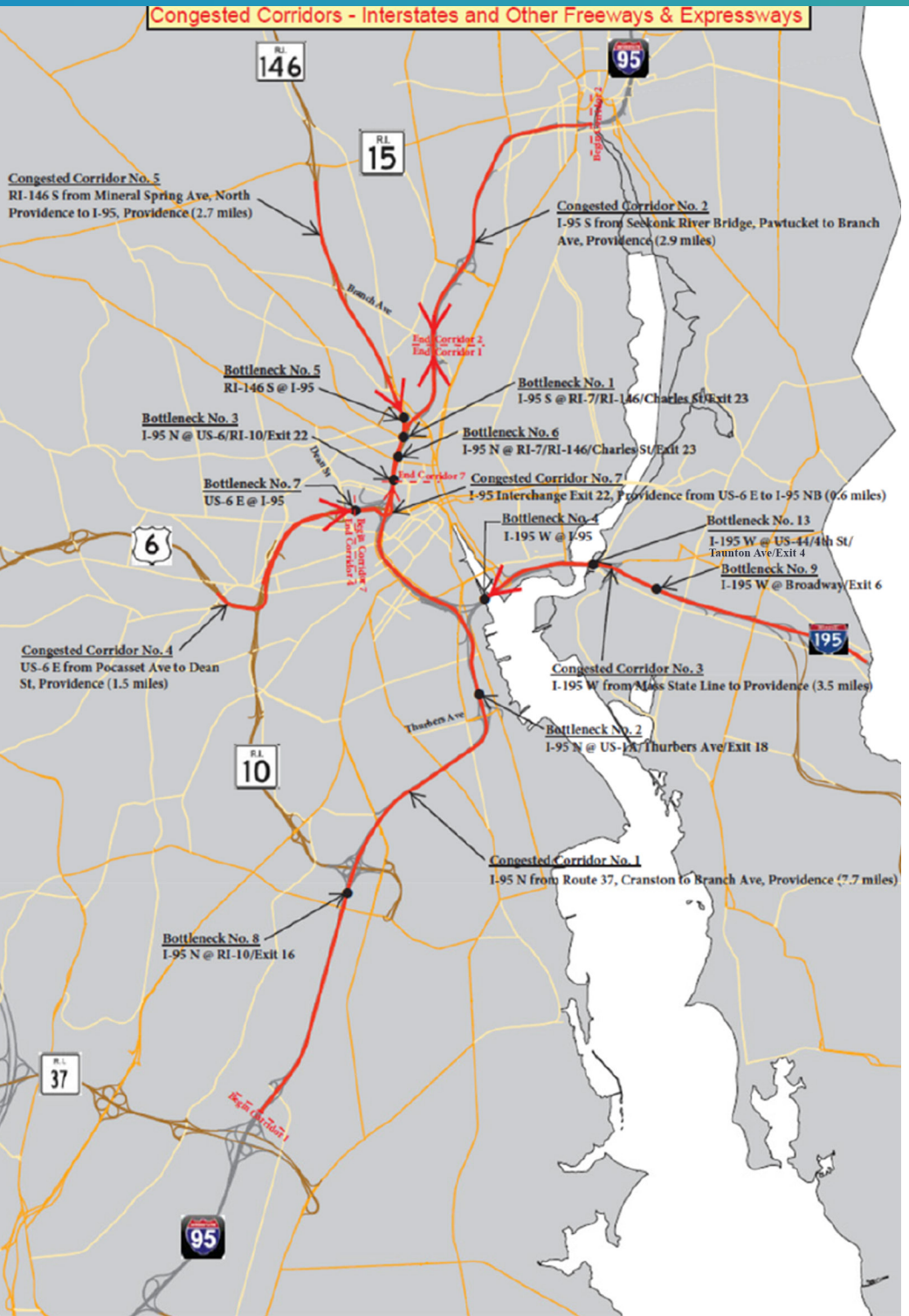


DEFINITION OF "UNACCEPTABLE" CONGESTION

The Congestion Management Task Force and project team developed the following definition for "unacceptable" congestion based on national standards for travel time reliability and delay, shown below:

Travel Time Reliability is a measure of consistency or dependability of travel time. It is considered unacceptable when: $\frac{80th\ percentile\ travel\ time}{50th\ percentile\ travel\ time} > 1.5$

Delay is a measure of speed reduction below posted speed limit. It is considered unacceptable when speed < 60% of posted speed limit.



TOP CONGESTED CORRIDORS AND BOTTLENECKS – INTERSTATES AND OTHER FREEWAYS AND EXPRESSWAYS

An analysis was conducted to identify the top 30 bottleneck locations and top 20 congested corridors in Rhode Island on the CMP network, based on measures of total traffic delay. The following image shows bottlenecks and congested corridors around the Providence Metro region.

TOP 30 BOTTLENECKS

Rank	Bottleneck Location[1]	Average Max Length[2]	Average Daily Duration[3]	Peak Hour Travel Speed Through Bottleneck (mph)		Peak Hour Travel Times Through Bottleneck (min)	
				AM	PM	AM	PM
1	I-95 S @ RI-7/RI-146/Charles St/Exit 23	2.29	3 h 43 m	24.3	20.4	5.7	6.7
2	I-95 N @ U.S. 1 ALT/Thurbers Ave/Exit 18	2.24	2 h 4 m	31	26.4	4.3	5.1
3	I-95 N @ U.S. 6/RI-10/Exit 22	1.69	2 h 20 m	44.8	22.9	2.3	4.4
4	I-195 W @ I-95	2.52	46 m	23.2	20.3	6.5	7.4
5	RI-146 S @ I-95	1.02	3 h 37 m	20.2	19.2	3	3.2
6	I-95 N @ RI-7/RI-146/Charles St/Exit 23	1.89	1 h 5 m	44.6	23.7	2.5	4.8
7	U.S. 6 E @ I-95	0.67	4 h 41 m	21.5	14.7	1.9	2.7
8	I-95 N @ RI-10/Exit 16	2.34	1 h 1 m	28.3	31.1	5	4.5
9	I-195 W @ Broadway/Exit 6	1.24	1 h 5 m	13.2	15.4	5.6	4.8
10	U.S. 1 S @ Airport Rd	0.64	5 h 55 m	22.2	20.7	1.7	1.9
11	RT-103/RI-103 E @ RI-103/Main St	1.12	3 h	16.6	12.3	4	5.5
12	RI-146 N @ Sayles Hill Rd	0.38	6 h	30.4	15.4	0.8	1.5
13	I-195 W @ U.S. 44/4th St/Taunton Ave/Exit 4	0.92	1 h 22 m	23.6	19.1	2.3	2.9
14	RI-114 N @ RI-103/Baker St/Child St	0.63	5 h 13 m	15.4	10.7	2.5	3.5
15	RI-4 S @ W Allenton Rd	1.7	1 h 14 m	36.5	40.9	2.8	2.5
16	RI-2 S @ RI-117/Centerville Rd	0.92	2 h 43 m	NA	19.7	NA	2.8
17	U.S. 1 N @ RI-117/Greenwich Ave/Centerville Rd	1.09	1 h 35 m	26.1	14.6	2.5	4.5
18	RI-15 W @ RI-7/Douglas Ave	1.42	2 h 2 m	21.7	14.3	3.9	6
19	RI-4 N @ I-95	0.58	48 m	43.6	38.4	0.8	0.9
20	RI-15 E @ RI-126/Smithfield Ave	1.53	1 h 8 m	17.1	13.2	5.4	7
21	U.S. 6 W @ Hartford Pike	0.79	4 h 28 m	39.6	39.4	1.2	1.2
22	RI-15 E @ RI-7/Douglas Ave	0.6	3 h 17 m	14.8	11.8	2.4	3.1
23	U.S. 1 S @ RI-4	0.27	5 h 21 m	14	11.9	1.2	1.4
24	Eddy St S @ I-95/Thurbers Ave	1.01	1 h 49 m	14	10.6	4.3	5.7
25	RI-15 E @ RI-146/Louisquisset Pike	0.63	2 h 35 m	19	13.9	2	2.7
26	Ri-2 N @ Ri-115/Toll Gate Rd	0.41	3 h 30 m	NA	18.1	NA	1.4
27	U.S. 44 W @ RI-5/Sanderson Rd/Cedar Swamp Rd	0.71	2 h 18 m	18.7	17.1	2.3	2.5
28	U.S. 44 W @ I-195	0.76	1 h 27 m	11.6	13.8	3.9	3.3
29	RI-146 S @ Sayles Hill Rd	0.98	1 h 4 m	28.1	34	2.1	1.7
30	I-295 N @ RI-37/EXIT 3	1.18	48 m	49.1	37.8	1.4	1.9

[1] Approximate location of the origin of the bottleneck (when observed speed goes below 60 percent of a reference or free flow speed).
[2] Average of the maximum queues formed during each occurrence of the bottleneck.
[3] Average of the duration of each occurrence of the bottleneck.

TOP 20 CONGESTED CORRIDORS

Rank	Corridor *From—To*	Functional Classification	Len (mi)	ADT	AM Peak Hour Travel Time (min)		PM Peak Hour Travel Time (min)	
					EB/NB	WB/SB	EB/NB	WB/SB
1	Interstate 95 Northbound Route 37, Cranston – Branch Ave, Providence	Interstate	7.7	166,800	15.7	NA	18.4	NA
2	Interstate 95 Southbound Seekonk Bridge, Pawtucket – Branch Ave, Providence	Interstate	2.9	95,400	NA	7.3	NA	7.6
3	Interstate 195 Westbound Mass State Line – I-95 Interchange, Providence	Interstate	3.5	81,500	NA	11.1	NA	10.9
4	U.S. Route 6 Eastbound Pocasset Ave, Providence – Dean St, Providence	Other Freeway & Expressway	1.5	84,200	4.4	NA	4.3	NA
5	State Route 146 Southbound Mineral Spring Ave, N Providence – I-95, Providence	Other Freeway & Expressway	2.7	64,800	NA	7.5	NA	6.3
6	U.S. Route 44 Route 116, Smithfield – Canal St, Providence	Principal Arterial	8.3	23,500	24.4	20.4	26.5	24.9
7	I-95/U.S. Route 6 Exit 22 Ramp, Providence U.S. Route 6 Eastbound to I-95 Northbound	Interstate	0.6	50,000	2	NA	4.2	NA
8	Route 15/Mineral Spring Ave U.S. Route 44, N Providence – Main St, Pawtucket	Principal Arterial	5.1	19,900	16.9	17.1	20.4	21.6
9	Branch Ave, Providence Douglas Ave (RI-7) – North Main St	Minor Arterial	2	20,000	8.9	6.8	9.4	9.5
10	Dean St, Providence Westminster St – Kinsley Ave	Minor Arterial	0.8	40,000	3.7	4	5.6	4.7
11	Route 146 Northbound I-295 Lincoln – Sayles Hill Rd, North Smithfield	Other Freeway & Expressway	1.2	30,000	2.2	NA	4.3	NA
12	Cranston St, Providence Huntington Ave – Westminster St	Minor Arterial	1.3	22,000	8.6	2.4	9.7	3.6
13	U.S. Route 1/Dave Gavitt Way Frontage Rd NB Broad St – I-95 Interchange Exit 22	Principal Arterial	0.7	35,200	2.1	NA	4.3	NA
14	Route 113/East St Providence St, West Warwick – Post Rd Extn, Warwick	Principal Arterial	2.2	25,100	5.7	6.7	6.8	7.8
15	Hartford Ave, Providence Killingley St – Olneyville Square	Minor Arterial	1.7	53,000	5.1	5.5	5.4	6
16	North Main St, Providence Randall St – Branch Ave	Principal Arterial	0.3	20,100	1.2	1.4	1.2	1.5
17	Westminster St, Providence Olneyville Square – Franklin St	Minor Arterial	1.4	10,600	6.9	7	7.2	9.2
18	Eddy St, Providence Broad St – Dyer St	Principal Arterial	2	17,100	9.3	8.4	10.1	10.1
19	Warwick Ave, Cranston/Broad St, Providence Park Ave, Cranston – Elmwood Ave, Providence	Principal Arterial	4	18,500	11.4	10.7	13.5	13.5
20	Route 114 (Pawtucket Ave/Prospect St/Broad St) I-195 Exit 7, East Providence – Hunt St, Central Falls	Principal Arterial	7.1	16,000	21.7	20.7	25	23.6

CONGESTION MANAGEMENT STRATEGIES

Congestion management strategies available to Rhode Island include:

Travel demand management strategies that eliminate or reduce the need to make trips by motor vehicle.

Land use strategies that promote mixed-use and transit-oriented development and allow for reduced use of motor vehicles for some discretionary trips.

Strategies that expand public transportation and promote the use of higher occupancy modes.

Bicycle and pedestrian strategies that shift trips to bicycling and walking modes.

Operational improvements and intelligent transportation systems (ITS) that make the best use of existing capacity.

Pricing strategies that reduce vehicle demand.

Roadway/mobility (non-ITS) strategies that are designed to help improve operations and relieve bottlenecks on existing facilities through improvements that do not add capacity.

Roadway capacity expansion strategies such as adding additional capacity to existing roadway facilities or constructing new roadway facilities that serve newer developed or rapidly developing areas, or where gaps exist in the existing freeway or arterial network.

Many of these strategies already have been implemented in Rhode Island or studied through statewide plans, modal plans, and other State and local studies. The State's preference is to first implement lower-cost demand management strategies that reduce travel and operational strategies that make more efficient use of roadway capacity. Consistent with Federal guidance, high-cost capacity increases that primarily serve single occupant vehicle are left as a last resort.

It should also be noted that Rhode Island currently has several specific projects and programs that directly address the identified bottlenecks and congested corridors. These projects and programs are detailed in the Plan.

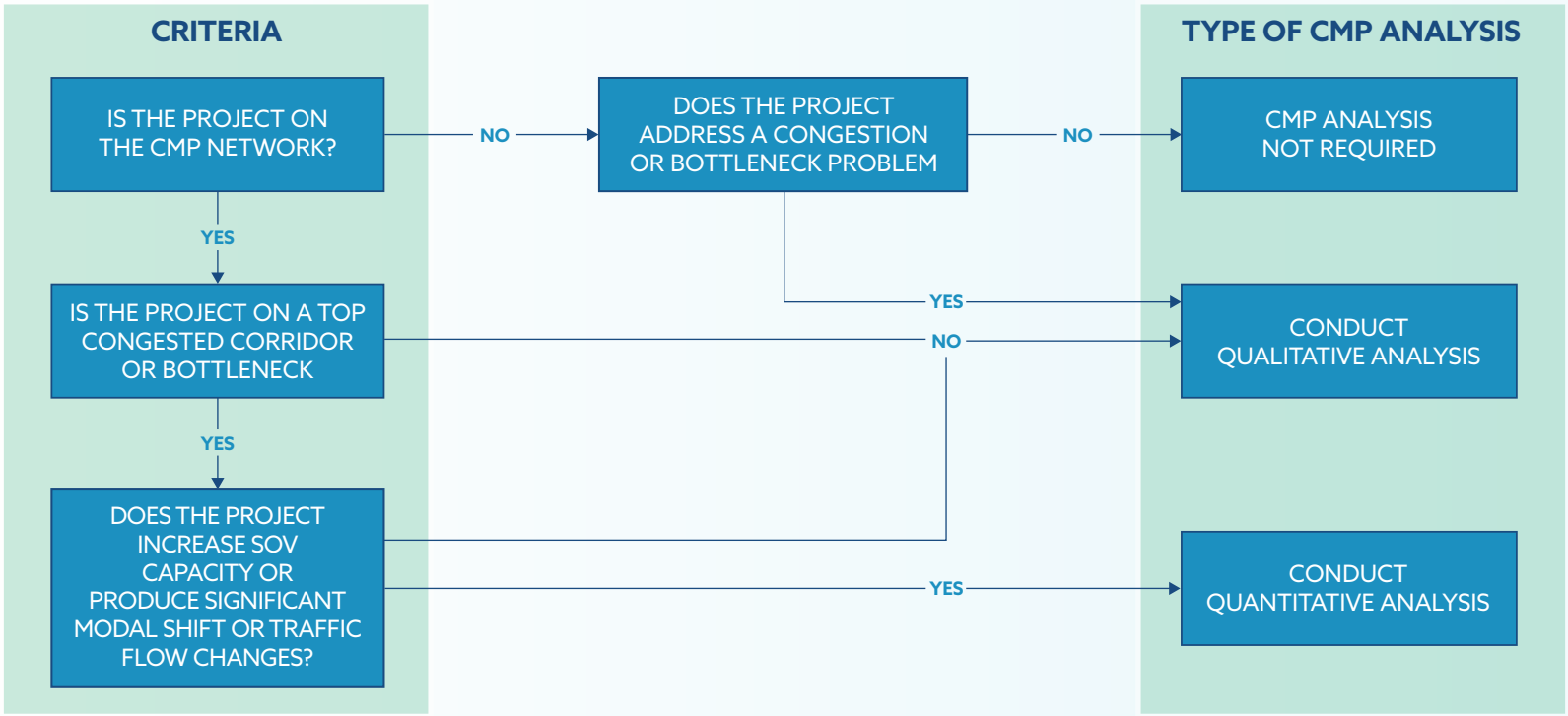
CMP PERFORMANCE MEASURES

The CMP defines 40 performance measures that relate to the CMP objectives and presents baseline (2018) data on nearly all of these measures. These measures describe highway travel delay and reliability, freight movement, travel by public transportation, bike path connectivity, land use, congestion reducing technology, and emissions from transportation.

CMP ANALYSIS PROCESS

The congestion management process is designed to interface with existing long-range planning and programming processes, as well as other modal plans and major corridor plans. Information from the CMP performance monitoring should be used to consider priorities in long-range planning and programming and to monitor performance over time. Congestion management strategies from the CMP should be considered in the long-range plan and modal and corridor studies, particularly those on identified bottlenecks and congested corridors. A series of questions is provided that should be documented for all STIP projects, to ensure that congestion management is adequately considered for each funded project and to help prioritize projects.

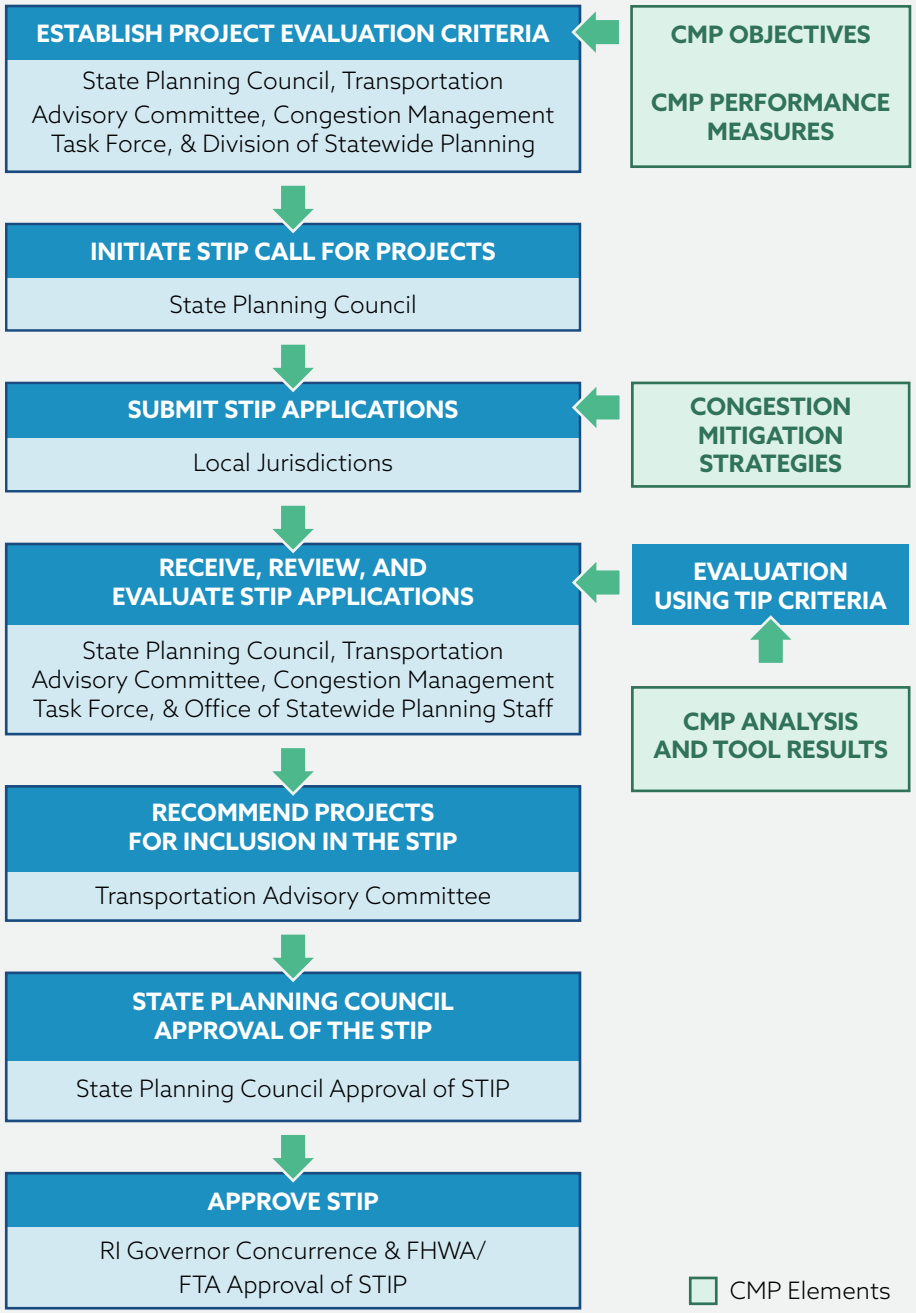
The CMP specifies that proposed transportation projects may require either a quantitative or qualitative analysis of congestion related effects, depending the type and scale of the project. The below flowchart shows the criteria for determining the type of analysis required.



CONGESTION MANAGEMENT STRATEGIES

The final section of the CMP is an action plan that details activities that Rhode Island agencies should undertake collaboratively over the next five or more years to implement the Congestion Management Process. Actions are divided into the following groups:

Data Collection, Evaluation, and Monitoring— Developing better information and data to track the success of efforts to mitigate congestion	• Preparing an annual congestion performance monitoring report. • Conducting pre and post evaluation of implemented projects. • Expanding specific data sources needed to monitor congestion and management strategies.
Planning Activities— Actions to more fully develop congestion management strategies in specific focus areas	• Developing STIP project selection criteria that incorporate factors related to each of the CMP objectives. • Conduct congestion mitigation studies on bottlenecks priority corridors listed in the CMP. • Develop more detailed plans on specific strategies, including a transportation demand management strategic plan, a shared mobility and curb management strategic plan, a statewide pedestrian plan, access management guidelines, and pricing options.
Implementation Activities— Actions to implement projects to directly reduce congestion	• Expanding the Rhode Island Strategically Targeted Affordable Roadway Solutions (RI*STARS) program to work with municipalities to retime traffic signals on arterial streets at least every five years. • Implementing remote monitoring and advanced signal control systems on top congested corridors. • Developing a service patrols program to rapidly respond to and help clear incidents and reduce secondary incidents. • Create a funding/incentive program to assist municipalities in implementing Complete Streets concepts.
Coordination Activities— Ongoing intra and interagency coordination to implement the CMP	• Congestion Management Task Force meetings • Coordination with other task forces and planning studies



INTEGRATION OF THE CMP WITH THE STATE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)

The STIP lists transportation projects that the State of Rhode Island intends to implement using Federal funds in conjunction with State funds. The STIP is the primary means of implementing most of the congestion management strategies and projects identified through the CMP. The chart identifies how the CMP can be integrated into existing STIP processes.

Relating to the CMP, the STIP invests funding in transportation alternatives statewide and encompasses the RI*STARS Bottleneck Reduction Program. Many of the Federal funding sources cited, including the Surface Transportation Block Grant Program, the National Highway Freight Program, and the CMAQ, are directed at projects that reduce congestion, along with accomplishing other objectives.

This diagram is based on discussions with the Rhode Island Division of Statewide Planning and the State Planning Council/MPO Overview and Handbook.

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