CDTC
Capital District Transportation Committee

Regional Operations and Travel Reliability: CDTC's Congestion Management Process

NYSAMPO-FHWA Reliability Planning Workshop

July 27th, 2021

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About CDTC

- Federally-designated Metropolitan Planning Organization (MPO)
- Albany, Rensselaer, Saratoga, and Schenectady counties
- Regional transportation planning via *New Visions* plan
- ~$100 million in federal transportation funding through Transportation Improvement Program

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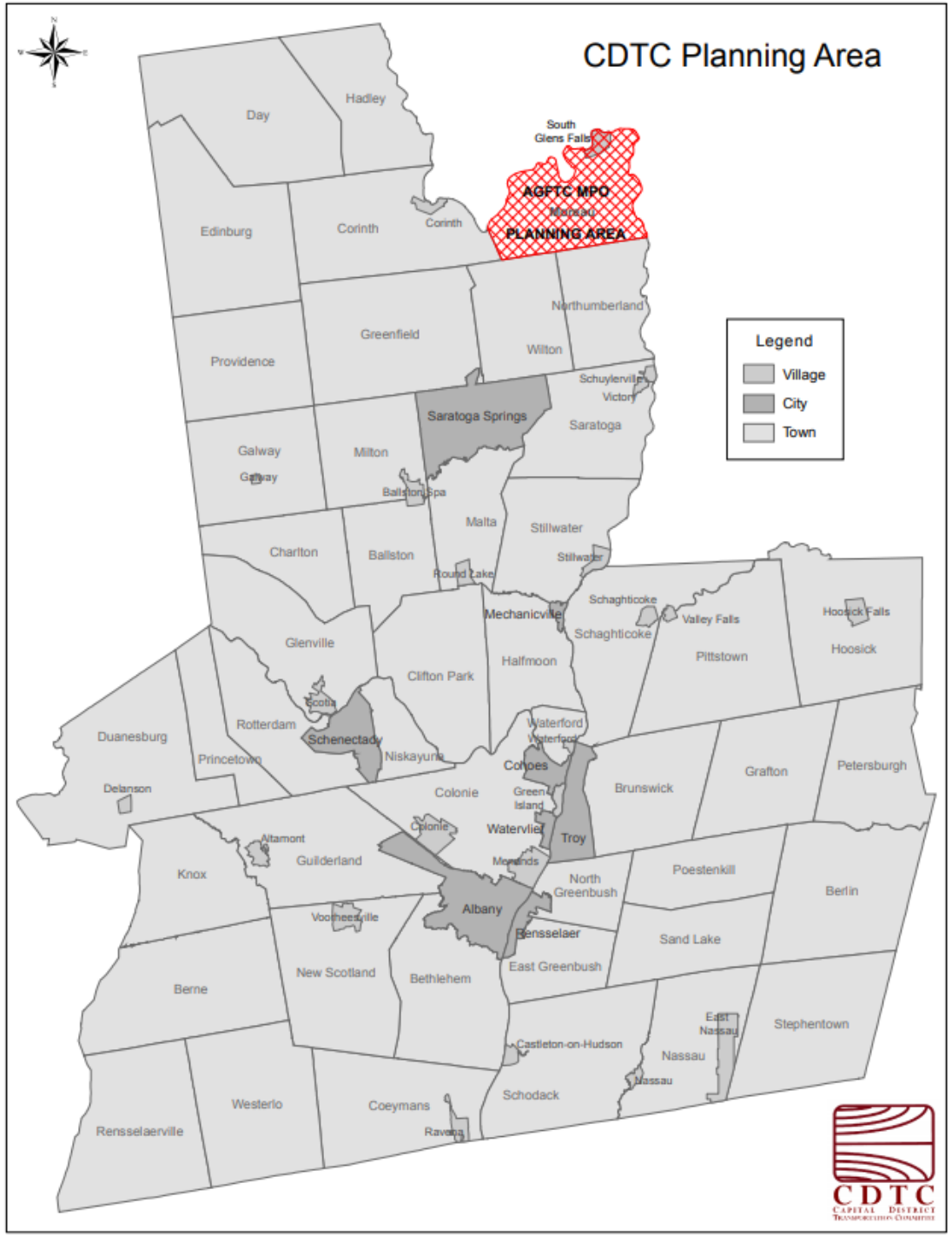


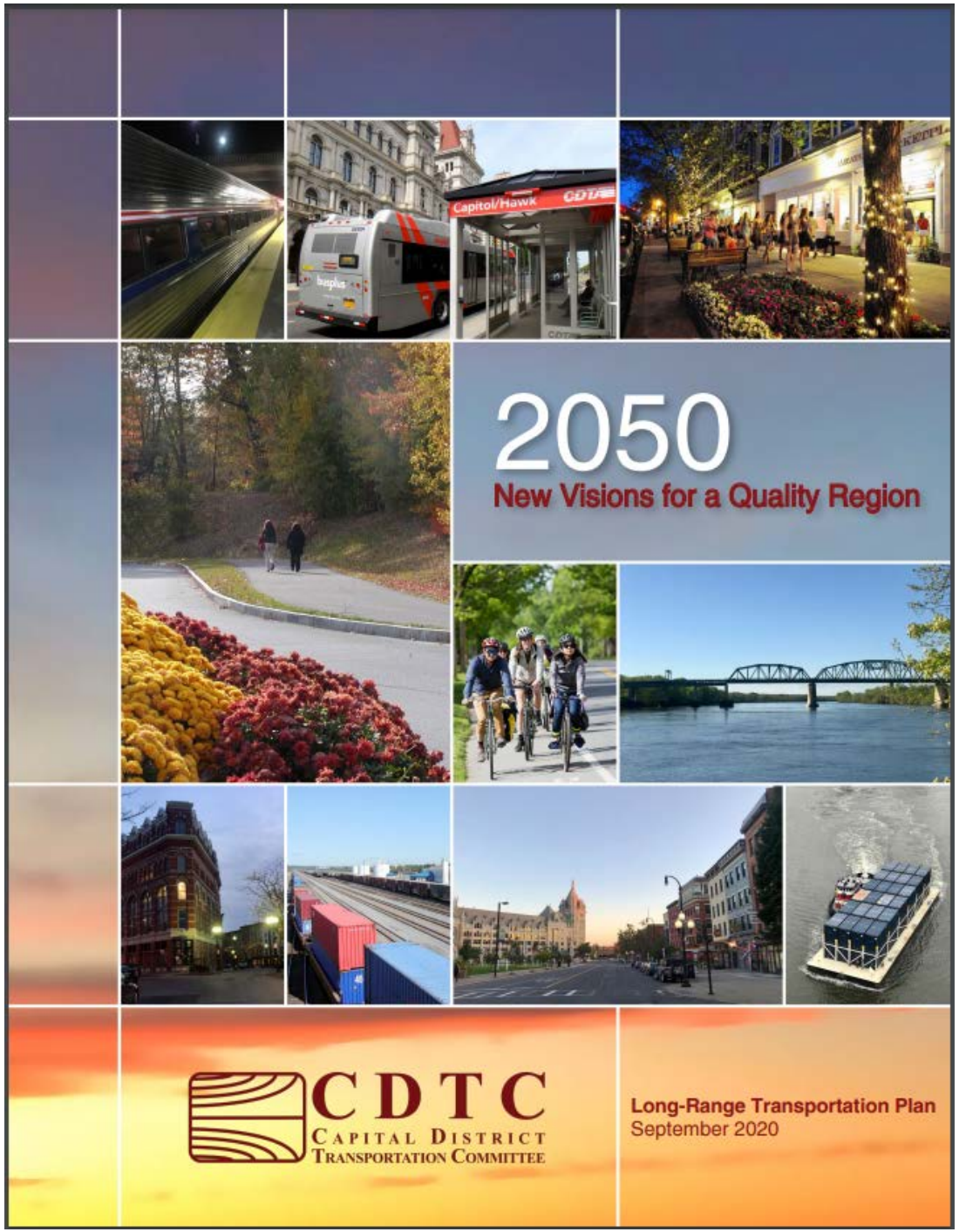
About *New Visions 2050*

- Adopted September 3rd, 2020
- Guided by ten Federal Planning Factors, including:

7	Promote efficient *system management and operation.*

- Further guided by CDTC's Planning & Investment Principles, including:

5	Maintain travel reliability

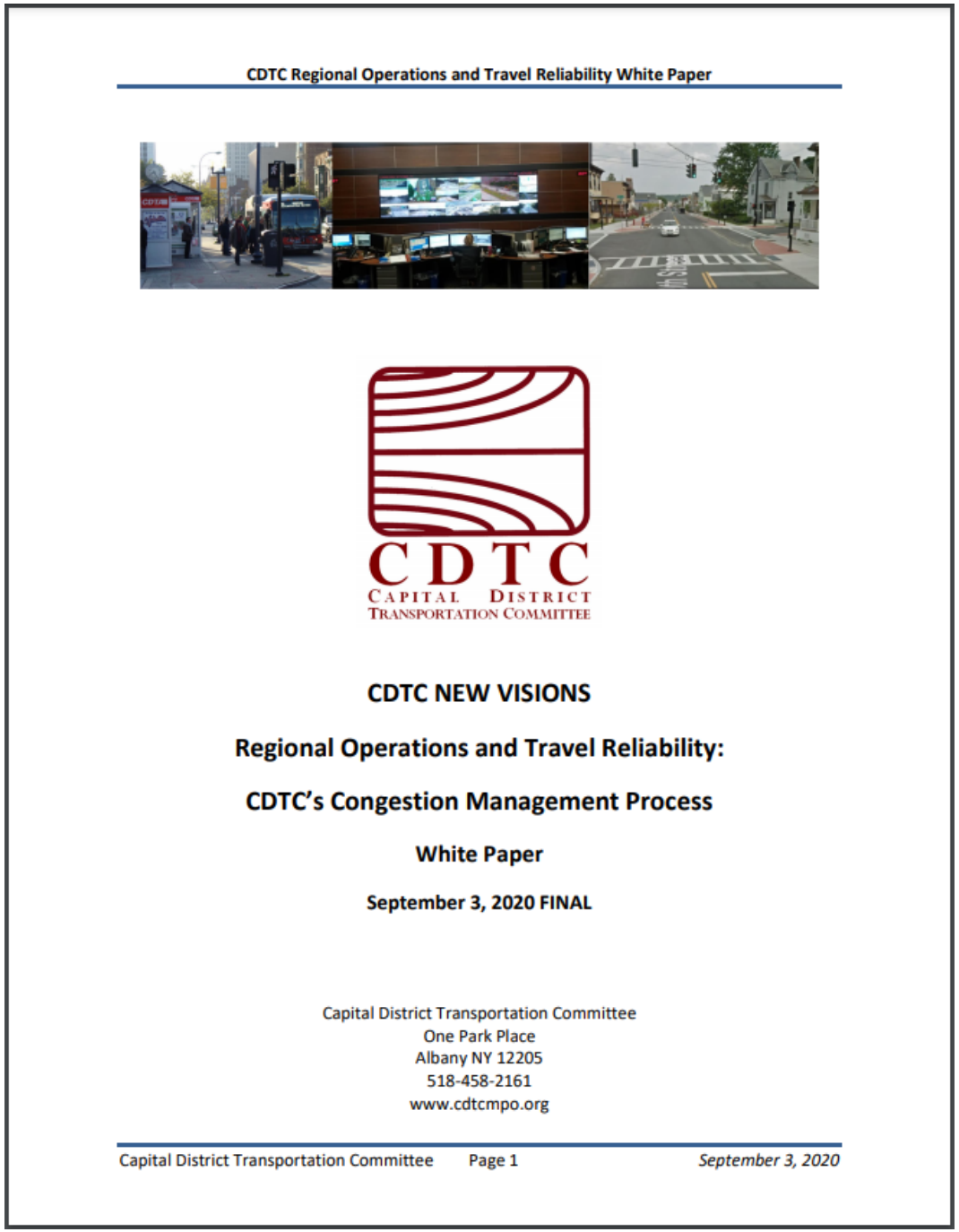


About *New Visions 2050*

- Regional Operations & Travel Reliability
- Congestion Management Process (CMP)
  - Federally required for all MPOs with population greater than 200,000

- **Travel Reliability** – An important performance measure for CDTC and required by the FAST Act

  - *"We can't eliminate all congestion, but we can manage congestion."*



CDTC Regional Operations and Travel Reliability White Paper

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CDTC NEW VISIONS

Regional Operations and Travel Reliability:

CDTC's Congestion Management Process

White Paper

September 3, 2020 FINAL

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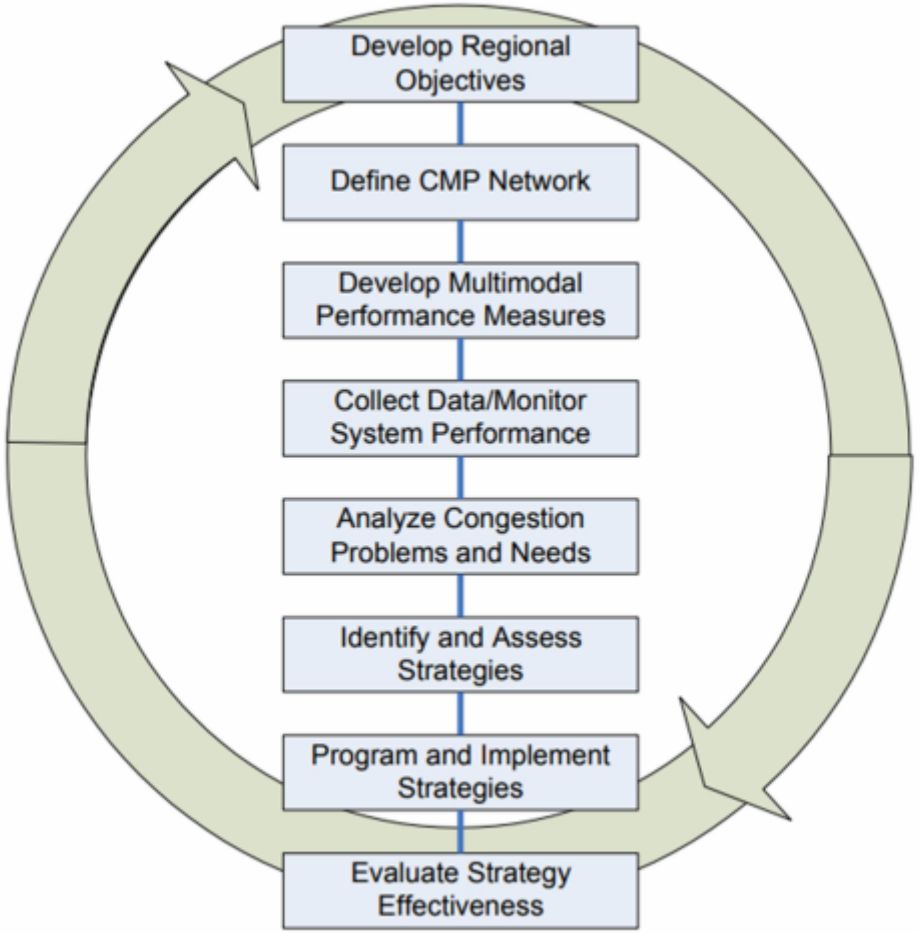
Capital District Transportation Committee Page 1 *September 3, 2020*

About *New Visions 2050*

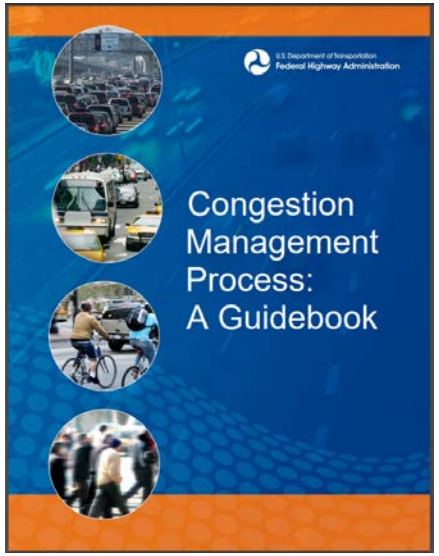
- Travel Reliability as a New Visions Planning & Investment Principle:
  - “The focus of the CDTC Congestion Management Process is on reliability. Reliable traffic flow is more important than reducing congestion. Because it is not possible to eliminate all congestion, drivers must accept some levels of congestion during the peak hours; but focusing on reliability can significantly improve traffic flow. Most of the congestion in the Capital District is caused by “non-recurring delay” such as delay caused by a vehicle crash, a snowstorm or major weather event, or construction. TSMO strategies such as special event management, road weather management, and traffic incident management may be used to mitigate sources of non-recurring congestion. “

Congestion Management Process: Eight Steps

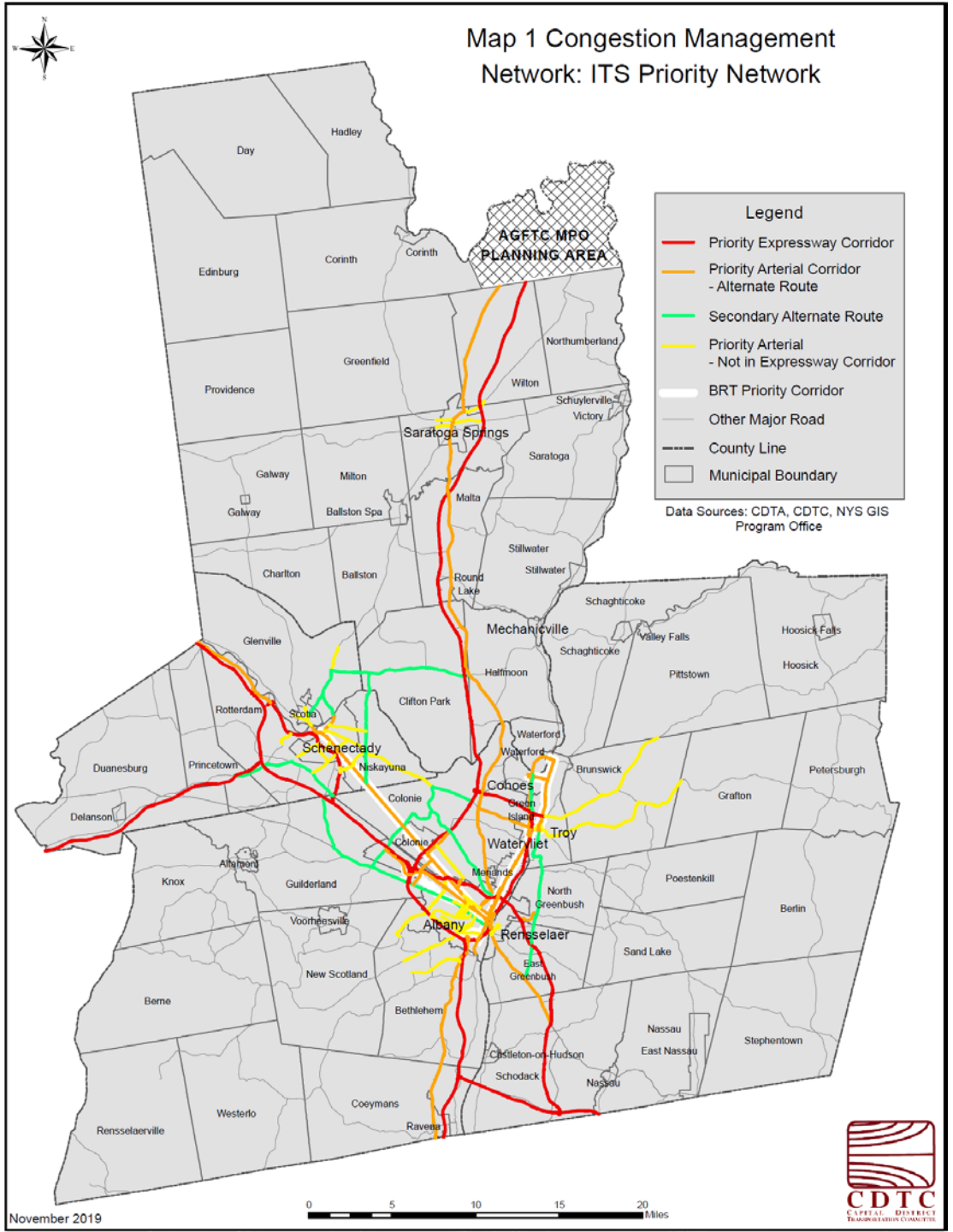


Elements of the Congestion Management Process

From:



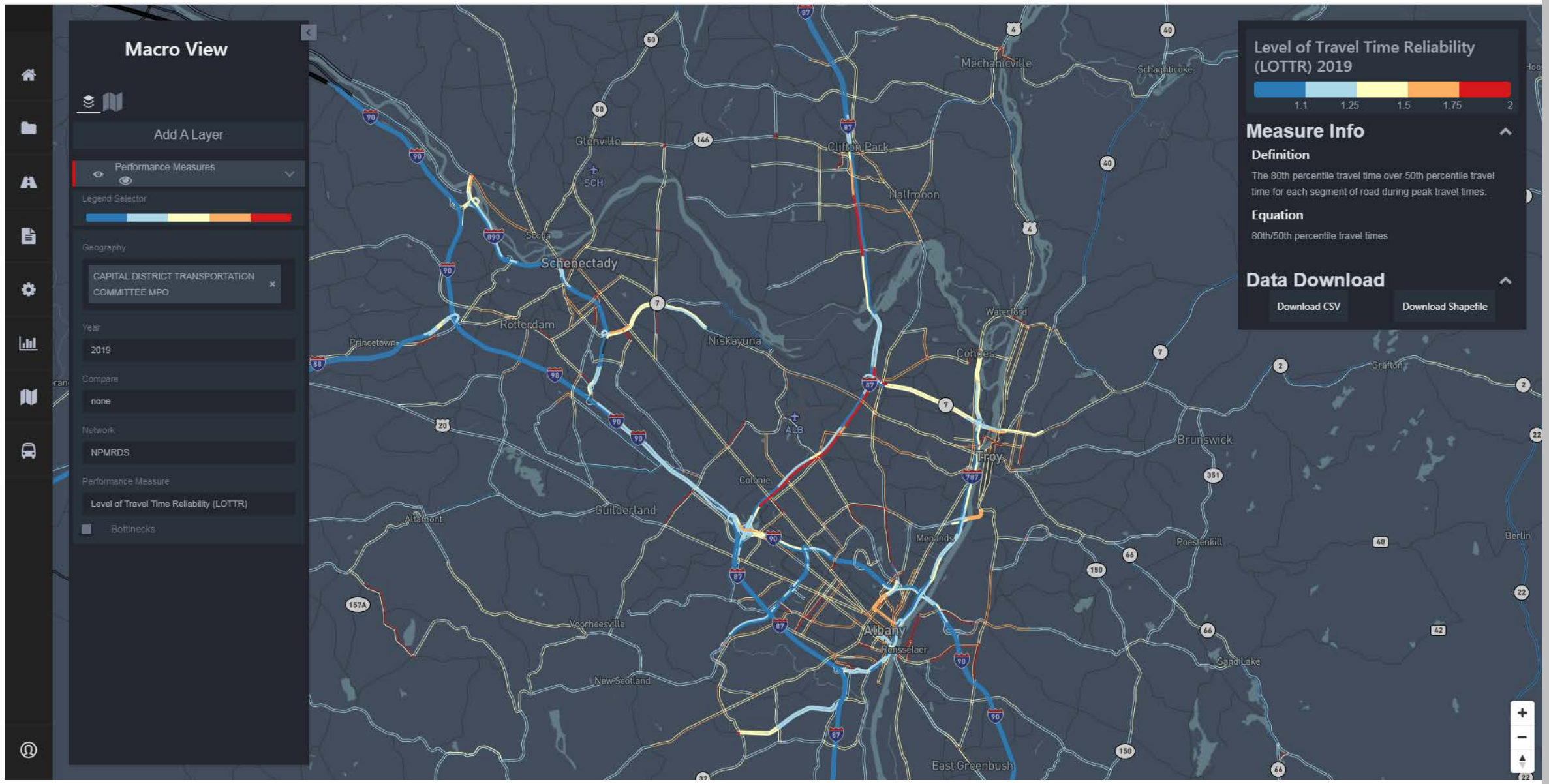
Congestion Management Network: the Intelligent Transportation System Priority Network



New Data Source

- National Performance Management Research Data Set (**NPMRDS**)
- Anonymized travel time data from probe vehicles
- Collected under contract with FHWA
- UAlbany Visualization and Informatics Lab (AVAIL), under contract with NYSDOT, has developed a powerful tool to summarize and analyze the NPMRDS data:

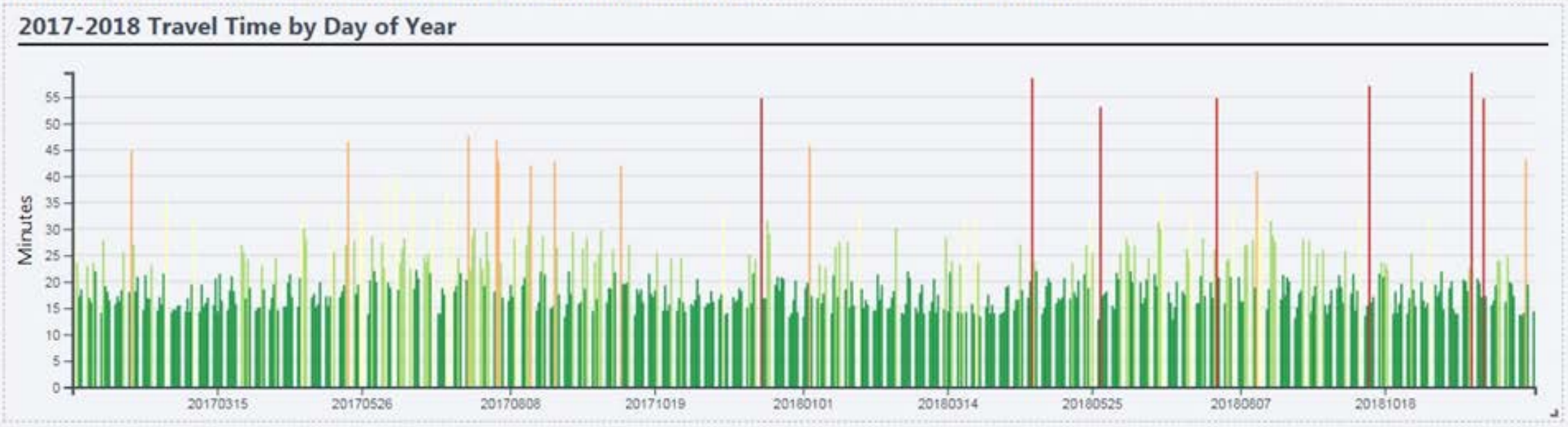
AVAIL NPMRDS Tool



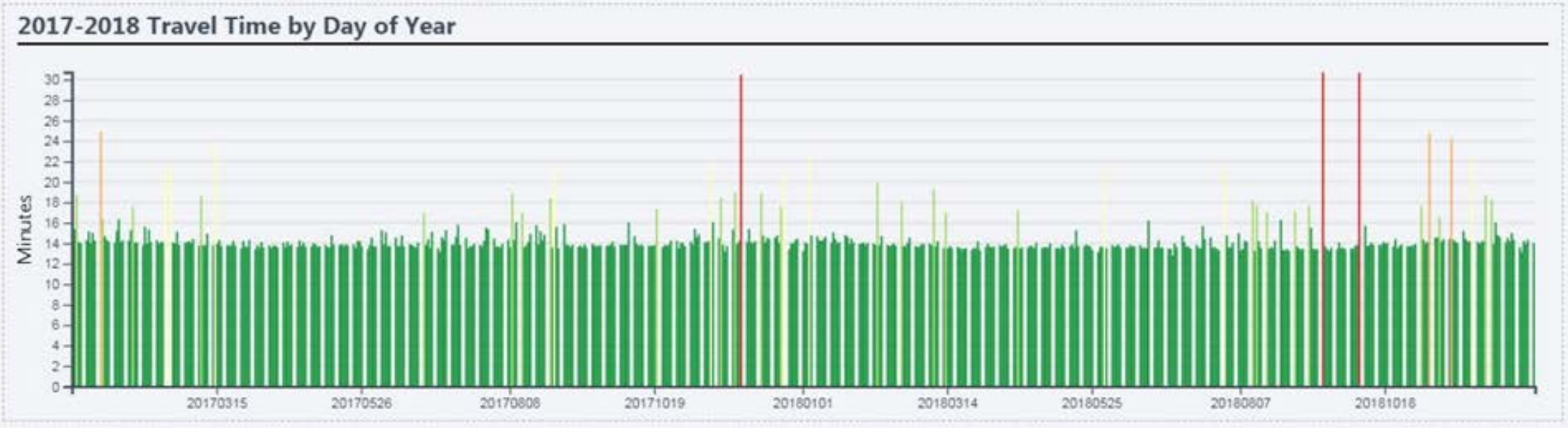
Performance Measures: Measures of Reliability

- LOTTR (Level of Travel Time Reliability) and TTTR (Truck Travel Time Reliability)
- For corridor level analysis CDTC has used the Planning Time Index (PTI) measure of reliability:
  - For the PM Peak, PTI is defined as: PM Peak 95% travel time / freeflow travel time
- Reliability is a difficult concept to explain to the average person, so NPMRDS graphs really make it clear.

Northway, Exit 1-9, Weekday PM Peak Period, Northbound PTI= 3.24



Northway, Exit 9-1, Weekday PM Peak Period, Southbound PTI= 1.35



2018 Weekday Average Speed, 95th Percentile Speed, and Planning Time Index

	PM Peak Hour			AM Peak Hour		
Corridor	Average Speed (mph)	95th Percentile Speed (mph)	Planning Time Index	Average Speed (mph)	95th Percentile Speed (mph)	Planning Time Index
Northway, Exits 1-9, Northbound	39.7	20.1	3.24	60.4	54.8	1.20
Northway, Exits 9-1, Southbound	58.1	48.6	1.35	48.1	30.1	2.23
Northway, Exit 9 to Hudson River, Northbound	65.7	58.3	1.21	65.7	59.8	1.18
Northway, Hudson River to Exit 9, Southbound	65.9	60.9	1.15	63.9	59.3	1.34
I-90, I-787 to Northway, Westbound	44.4	22.3	2.80	56.2	48.3	1.30
I-90, Northway to I-787, Eastbound	51.1	31.4	2.03	54.7	45.1	1.41
I-90, Patroon Island Bridge to Exit 12, Eastbound	60.5	51.4	1.29	60.9	53.9	1.23
I-90, Exit 12 to Patroon Island Bridge, Westbound	61.3	52.6	1.28	58.1	44.7	1.50
I-787, Route 7 to Exit 23, Southbound	54.4	42.0	1.51	49.3	32.8	1.94
I-787, Exit 23 to Route 7, Northbound	45.6	26.0	2.43	55.9	49.2	1.27
Route 7, I-787 to Northway, Westbound	26.8	12.8	4.83	54.8	45.9	1.37
Route 7, Northway to I-787, Eastbound	55.3	44.4	1.45	44.6	23.9	2.70
I-890, Thruway Exit 25 to Exit 4, Westbound	53.5	39.8	1.55	52.9	41.7	1.48
I-890, Exit 4 to Thruway Exit 25, Eastbound	52.2	39.3	1.57	53.4	42.6	1.45
I-890, Exit 4 to Thruway Exit 26, Westbound	53.6	41.0	1.49	53.3	42.8	1.43
I-890, Thruway Exit 26 to Exit 4, Eastbound	53.9	41.0	1.49	53.6	43.4	1.41
Thruway, Exit 21A to Exit 23	64.5	61.4	1.11	63.3	60.6	1.12
Thruway, Exit 23 to Exit 21A	63.6	58.7	1.14	64.5	60.6	1.11
Thruway, Exit 23 to Exit 24	62.7	59.0	1.15	65.1	62.0	1.10
Thruway, Exit 24 to Exit 23	64.2	61.1	1.10	63.9	60.0	1.12
Thruway, Exit 24 to Exit 25	48.6	29.7	2.18	61.7	56.5	1.15
Thruway, Exit 25 to Exit 24	62.5	57.7	1.15	50.4	32.1	2.06
Thruway, Exit 25 to Exit 26	62.2	53.9	1.25	62.9	55.2	1.22
Thruway, Exit 26 to Exit 25	63.9	58.2	1.16	62.5	58.4	1.16
Thruway, Exit 21A to Massachusetts State Line	60.4	54.7	1.17	59.9	53.9	1.19
Thruway, Massachusetts State Line Exit 21A	60.5	55.2	1.19	61.7	55.2	1.19
I-88, Thruway to Route 20	55.6	43.6	1.41	55.6	44.2	1.41
I-88, Route 20 to Thruway	58.1	47.6	1.35	59.0	48.7	1.32

Performance Measures: Peak Hour Excessive Delay

- Calculated using the NPMRDS data.
- **Excessive delay:** extra amount of time spent in congested conditions defined by speed thresholds that are lower than a normal delay threshold. The speed threshold used by CDTC is 20 miles per hour or 60 percent of the posted speed limit, whichever is greater.
- *Consistent* delay is more tolerable than *unpredictable* delay

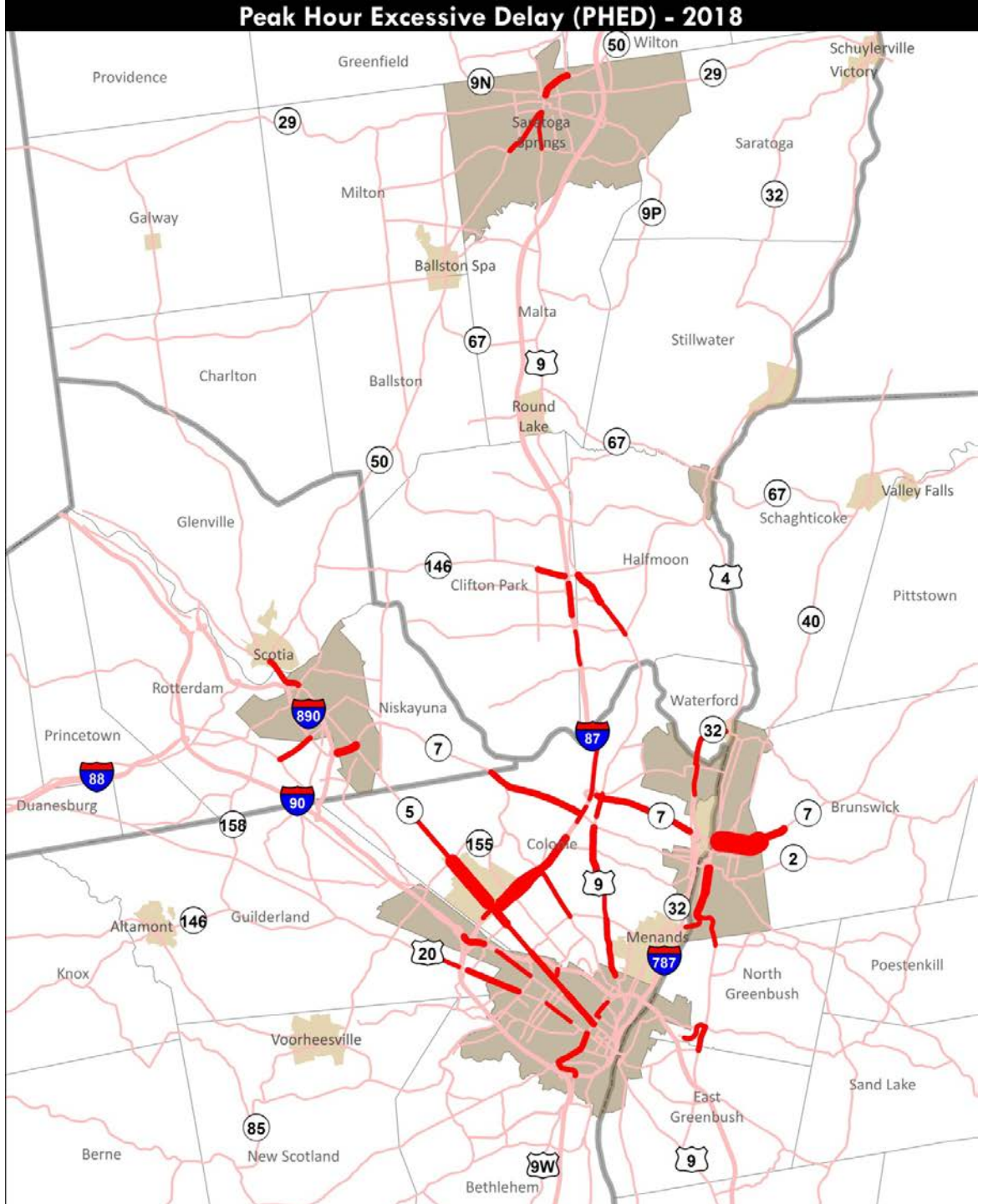
Peak Hour Excessive Delay (PHED) - 2018

PHED ≤ 30,000

PHED = 30,001 - 127,000

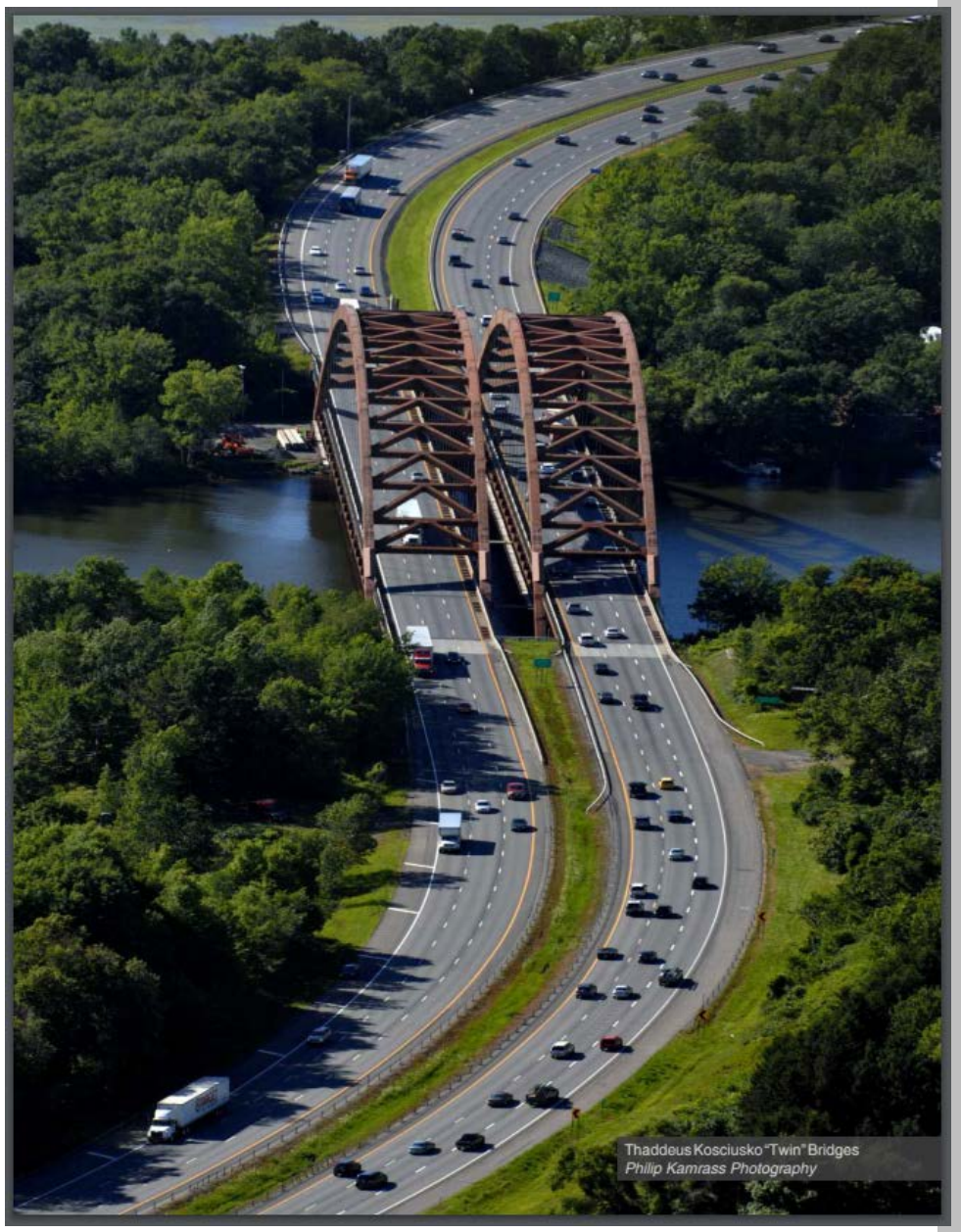
Source: NPMRDS accessed via npmrds.availabs.org on 10/30/19

Peak Hour Excessive Delay (PHED):
The extra amount of time spent in congested conditions defined by speed thresholds that are lower than a normal delay threshold. The speed threshold is 20 MPH or 60 % of the posted speed limit, whichever is greater. PHED is calculated in person hours.



Identify and Assess CMP Strategies

- Travel Demand Management
- Traffic Signal Technology and Intersection Improvements
- ITS technologies for transportation operations
- Arterial Management and Land Use Planning
- Funding for Operations



Pictured: I-87/US 9 Integrated Corridor Management Plan

Program and Implement CMP Strategies

- General recommendations:
  - **Funding for operations** (TMC, traffic signals, ITS, bus rapid transit, and more).
  - **Major highway expansion should not be considered**: widening projects are less cost-effective and do little to address non-recurring congestion. Strategic removal of bottlenecks, however, can be considered.
  - **Right-size our existing roadways**: certain facilities may have unused capacity, and are costly to maintain. Bike, ped, or transit right-of-way may fit on these roadways.

Program and Implement CMP Strategies

- Capital Region Transportation Management Center

The HELP program provides roadside assistance

Variable message signs help motorists avoid incidents and delays

The TMC operates 75 Digital CCTV cameras

Pictured: Region 1 TMC in Latham, NY

Program and Implement CMP Strategies (cont.)

- Strategy recommendations:
  - **Community Traffic Engineering Services Program**
  - **Regional Traffic Signal Timing Program**: on hold due to COVID's impacts on traffic
  - **Active Traffic Management Strategies:** evaluate if dynamic lane assignment, ramp metering, speed harmonization, etc., would work on the region's interstates

Program and Implement CMP Strategies (cont.)

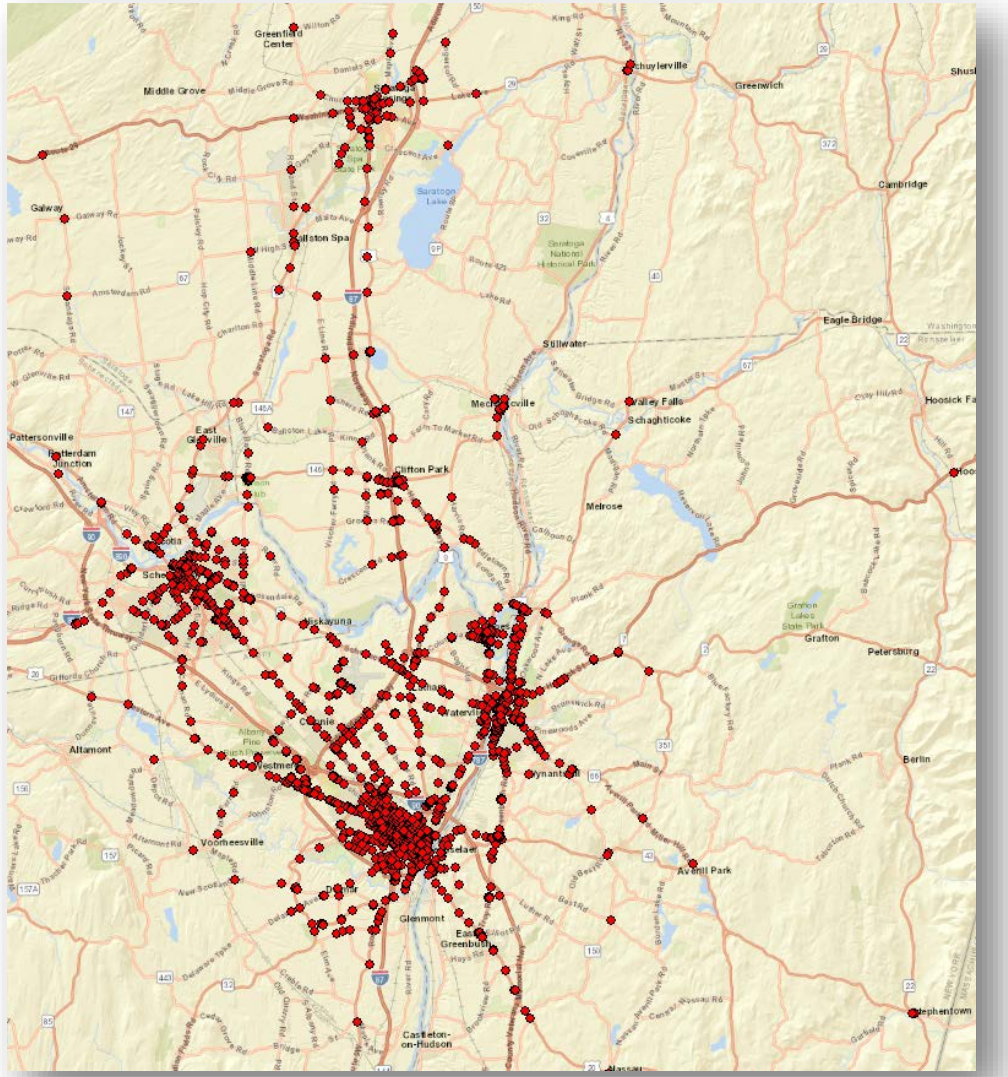
- Strategy recommendations:
  - **Classification of Signalized Arterials:** data-driven approach to prioritizing corridors for traffic signal upgrades and transit ITS deployment. Signalized arterials classified based on traffic volumes, transit use, access management, signal delay, travel time reliability, safety, and other factors.
  - **Automated Traffic Signal Performance Measures Pilot**
  - **Regional Transportation Systems Management Operations (TSMO) Plan**

Ongoing task: Region 1 Traffic Incident Management Committee

- Recommendation of CDTC CMP
- Region 1 was largest region in NY without a TMC
- Extensive coordination with Region 1 and Main Office staff
- Kickoff held February 25th
- Future agenda item: use of CDTC's travel demand model for incident modeling

Completed task: Signalized intersection inventory

- 1148 signalized intersections
- City of Albany: 313 signals
- Locals operate 58% of the signals; Region 1 operates 42%.
- Route 5 corridor has 92 signals; US-9 has 84.
- Slightly more than half of all signals (51%) are on one of just 11 corridors.



Above: Signalized intersections in the CDTC region

Upcoming task: Data Collection Services

- Proposals due July 9th, 2021
- Traffic counts on roadways where we expect our current data is out-of-date:
  - COVID traffic recovery; shifts in travel behavior due to work-from-home, school-from home
  - Recent housing/employment developments
  - Shifting demographics
- *Has the 'peak hour' shifted from PM to mid-day?*
- Counts will help determine post-COVID "new normal" traffic equilibrium
- Fall 2021

Upcoming task: Regional Signal Timing Program

- CMP recommendation; on hold due to COVID
- Will follow the Data Collection Services project
- Scope of work:
  - Turning movement counts on signalized corridors and isolated signals
  - Traffic modeling
  - Signal timing optimization; signal coordination on corridors
  - Field timing and observation
- Expected 2022

Upcoming task: Complete data refresh

- Post-COVID update to all data, maps, lists of congested places
  - Using AVAIL NPMRDS tool
  - Remake PHED maps
  - Remake PTI corridor rankings
- How has congestion shifted since 2018 update?
- What old planning assumptions no longer hold?
- What new congestion patterns do we see?
  - Shift in locations, time of day

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Thank you!

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