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

cdtcmpo.org
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.”
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
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.
<table>
<thead>
<tr>
<th>Corridor</th>
<th>PM Peak Hour</th>
<th>AM Peak Hour</th>
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<tbody>
<tr>
<td></td>
<td>Average Speed (mph)</td>
<td>95th Percentile Speed (mph)</td>
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<tr>
<td>Northway, Exits 1-9, Northbound</td>
<td>39.7</td>
<td>20.1</td>
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<td>Northway, Exits 9-1, Southbound</td>
<td>58.1</td>
<td>48.6</td>
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<tr>
<td>Northway, Exit 9 to Hudson River, Northbound</td>
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<td>58.3</td>
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<td>I-90, I-787 to Northway, Westbound</td>
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<td>22.3</td>
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<tr>
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<td>51.4</td>
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<td>I-88, Route 20 to Thruway</td>
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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.availlabs.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

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 9\textsuperscript{th}, 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
- \textit{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
Thank you!

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