

# National Rural ITS Conference

## Update on Performance Management Guidance: PM3 Measures

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Rich Taylor

FHWA Office of Operations



# Agenda

- National Performance Management Research Data Set (NPMRDS) and PM3
  - Intro to NPMRDS and NPMRDS Resources
  - PM3 Measures and Metrics\*
- PM3 Analysis Tools and Processes
  - PM3 Analysis Tools\*
  - PM3 Implementation
- Transportation Performance Management (TPM) Resources

*\*Highlight rural-specific elements*



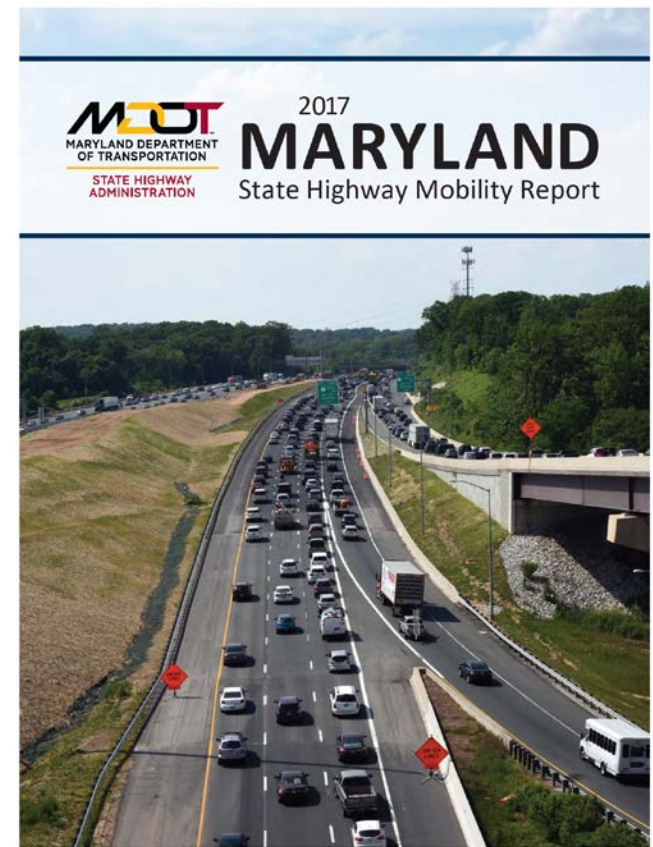
# Using NPMRDS for PM3 Metric and Measure Calculation

- The NPMRDS is the source of the required travel time data for PM3 measures
  - The NPMRDS includes average travel time data every 5 minutes on the National Highway System (NHS)
- Free to use for State DOTs, MPOs and their contractors for performance management activities



# About NPMRDS

- How is the NPMRDS used?
  - State DOT Reports/Studies
  - MPO Reports/Studies
  - FHWA and USDOT Research
    - Freight
    - Safety
    - Operations
    - Other



# NPMRDS Resources

- NPMRDS Quarterly Webinars
  - Link to recordings:
    - [https://ops.fhwa.dot.gov/perf\\_measurement/index.htm](https://ops.fhwa.dot.gov/perf_measurement/index.htm)
  - Next webinar:
    - Thursday, November 8, 2018, 1-3 p.m. Eastern
    - Register now:
      - <https://collaboration.fhwa.dot.gov/dot/fhwa/WC/Lists/Seminars/DispForm1.aspx?ID=1799>
- NPMRDS Technical Assistance
  - E-mail: [NPMRDS@ritis.org](mailto:NPMRDS@ritis.org)



# PM3 Measures

Measure Area	Performance Measures
Performance of the National Highway System (Subpart E)	<ul style="list-style-type: none"><li>• <b>Interstate Travel Time Reliability Measure:</b> Percent of person-miles traveled on the Interstate that are reliable</li><li>• <b>Non-Interstate Travel Time Reliability Measure:</b> Percent of person-miles traveled on the non-Interstate NHS that are reliable</li></ul>
Freight Movement on the Interstate System (Subpart F)	<ul style="list-style-type: none"><li>• <b>Freight Reliability Measure:</b> Truck Travel Time Reliability (TTTR) Index</li></ul>

*Note: These measures contribute to the National Highway Performance Program (NHPP) and National Highway Freight Program (NHFP)*



# PM3 Measures (continued)

Measure Area	Performance Measures
Measures for Assessing the CMAQ Program – Traffic Congestion (Subpart G)	<ul style="list-style-type: none"><li>• <b>PHED Measure:</b> Annual Hours of Peak Hour Excessive Delay (PHED) Per Capita</li><li>• <b>Non-SOV Travel Measure:</b> Percent of Non-Single Occupancy Vehicle (SOV) Travel</li></ul>
Measures for Assessing the CMAQ Program – On-Road Mobile Source Emissions (Subpart H)	<ul style="list-style-type: none"><li>• <b>Emissions Measure:</b> Total Emission Reductions</li></ul>



# Reliability Metric: LOTTR Example

$$\frac{\text{Longer Travel Time (80th)}}{\text{Normal Travel Time (50th)}} = \frac{\# \text{ seconds}}{\# \text{ seconds}} = \text{Level of Travel Time Reliability Ratio}$$

## Level of Travel Time Reliability (LOTTR)

*(Single Segment, Interstate Highway System)*

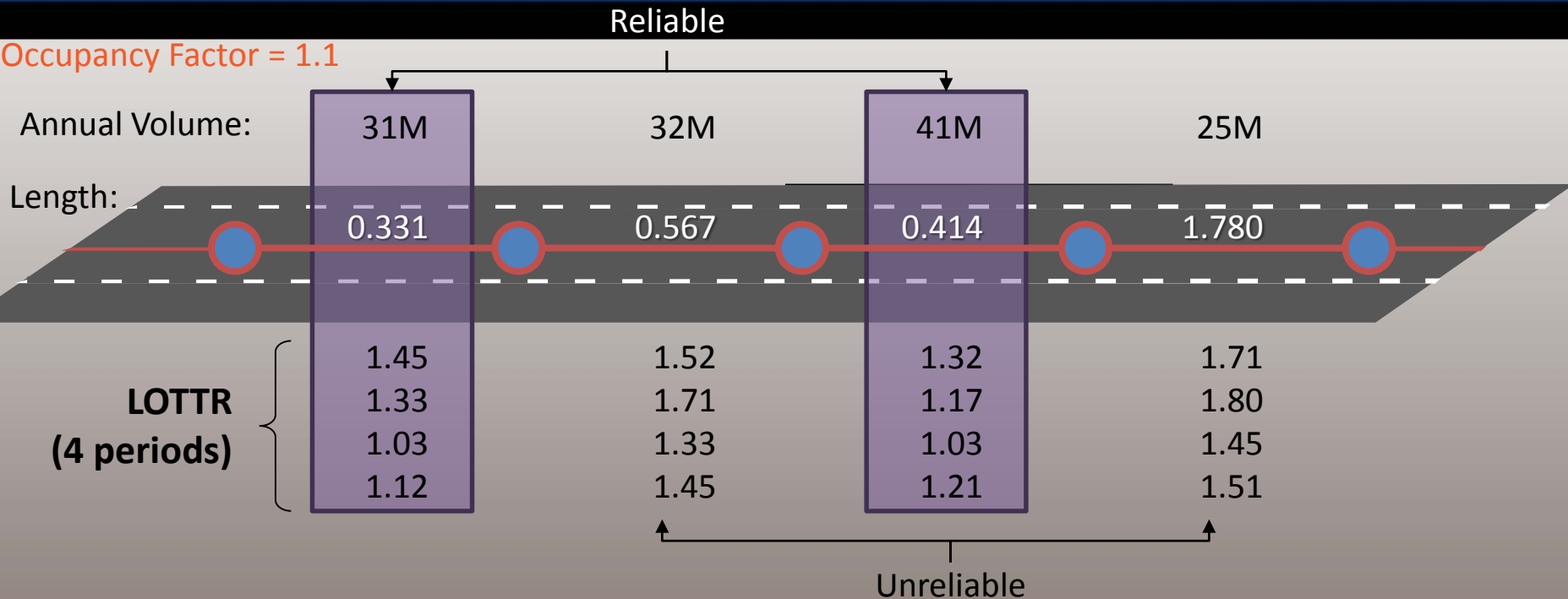
Monday – Friday	6am – 10am	LOTTR = $\frac{44 \text{ sec}}{35 \text{ sec}} = 1.26$
	10am – 4pm	LOTTR = 1.39
	4pm – 8pm	LOTTR = <b>1.54</b>
Weekends	6am – 8pm	LOTTR = 1.31
Must exhibit LOTTR below 1.50 during <b>all</b> of the time periods		<b>Segment IS NOT reliable</b>





# Reliability Measure: Complete Example

Occupancy Factor = 1.1



$$\begin{aligned}
 \text{Travel Time Reliability Measure} &= \frac{(0.331 \times 31 \times 1.1) + (0.414 \times 41 \times 1.1)}{(0.331 \times 31 \times 1.1) + (0.567 \times 32 \times 1.1) + (0.414 \times 41 \times 1.1) + (1.780 \times 25 \times 1.1)} \\
 &= \frac{11.287 + 18.671}{11.287 + 19,958 + 18.671 + 48.950} \\
 &= \frac{29.958}{98.866} \\
 &= 30.3\%
 \end{aligned}$$



# PM3 Analysis Tools (1)

- The TPM Capacity Building Pooled Fund PM3 Analysis Tools (University of Maryland CATT Lab)
  - Metric and Measure calculation modules
  - Limited visualization tools
  - Metric Reporting Tool (to FHWA via HPMS)
  - Technical assistance
- Cost is \$23k-36k per year per state based on size (includes MPO usage)
  - 35 states have signed up via Pooled Fund or UMD
- Administered by the American Association of State Highway and Transportation Officials (AASHTO)
  - Contact Matt Hardy ([mhardy@aaashto.org](mailto:mhardy@aaashto.org))



# PM3 Tool (Pooled Fund)









NPMRDS Analytics




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What's New  
03/29/18

 <b>DASHBOARD</b> Create your own personal dashboards to monitor corridor performance in regions of interest. <a href="#">Tutorial</a> <a href="#">Help</a>	 <b>MASSIVE DATA DOWNLOADER</b> Download raw probe data from our archive for offline analysis. <a href="#">Tutorial</a> <a href="#">Help</a> <a href="#">History</a>
 <b>CONGESTION SCAN</b> Analyze the rise and fall of congested conditions on a stretch of road. <a href="#">Tutorial</a> <a href="#">Help</a> <a href="#">History</a>	 <b>TREND MAP</b> Create animated maps of roadway conditions. <a href="#">Tutorial</a> <a href="#">Help</a> <a href="#">History</a>
 <b>PERFORMANCE CHARTS</b> Chart performance metrics over time. <a href="#">Tutorial</a> <a href="#">Help</a> <a href="#">History</a>	 <b>PERFORMANCE SUMMARIES</b> Report on Buffer Time Index, Planning Time Index, and other performance metrics. <a href="#">Tutorial</a> <a href="#">Help</a> <a href="#">History</a>
 <b>NPMRDS COVERAGE MAP</b> Explore the coverage completeness of the NPMRDS on a month-by-month basis. <a href="#">Tutorial</a> <a href="#">Help</a>	 <b>TUTORIALS</b> Learn how to use each of the tools in the suite.

**MAP-21**  
Create a dashboard widget to monitor states', MPOs', and Urbanized Areas' performances against the new MAP-21 ruling.  
[Help](#)

# PM3 Tool (Pooled Fund) (continued)

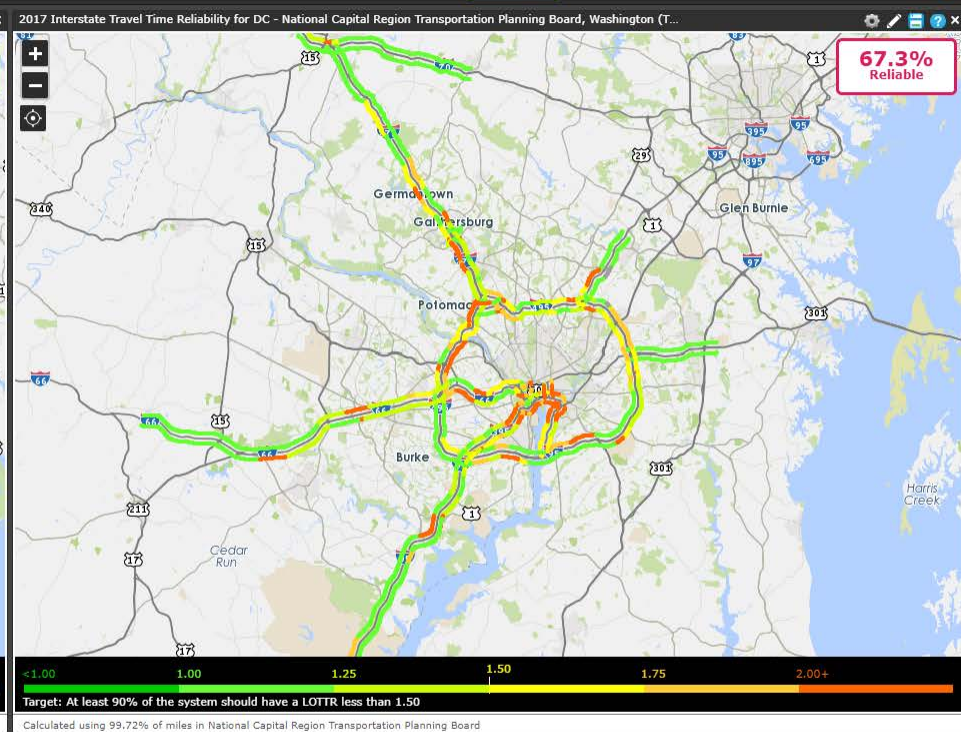
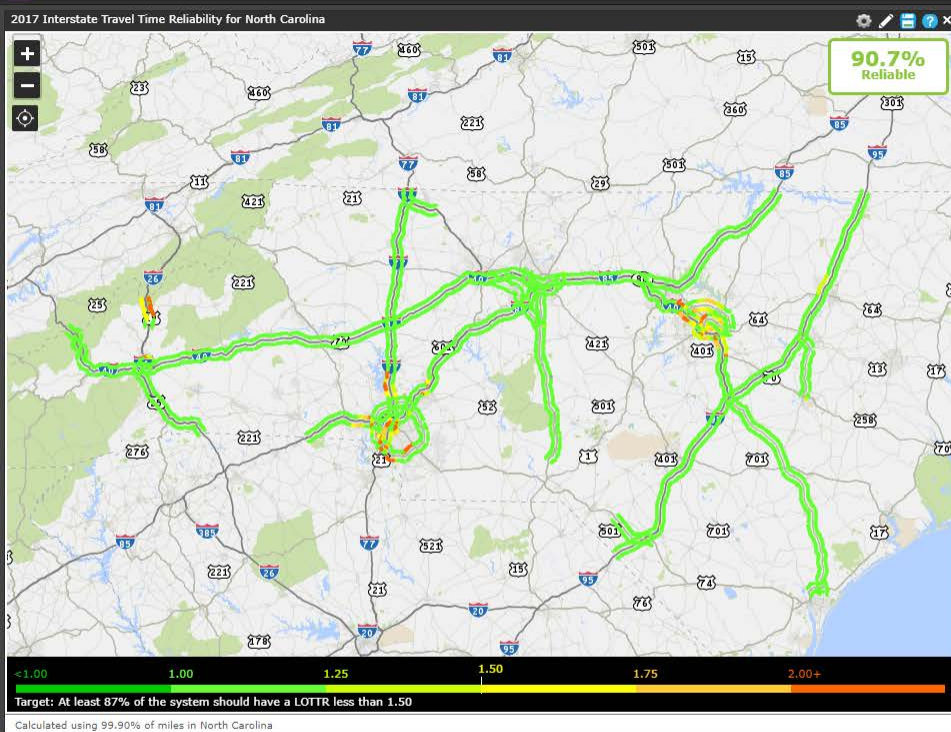
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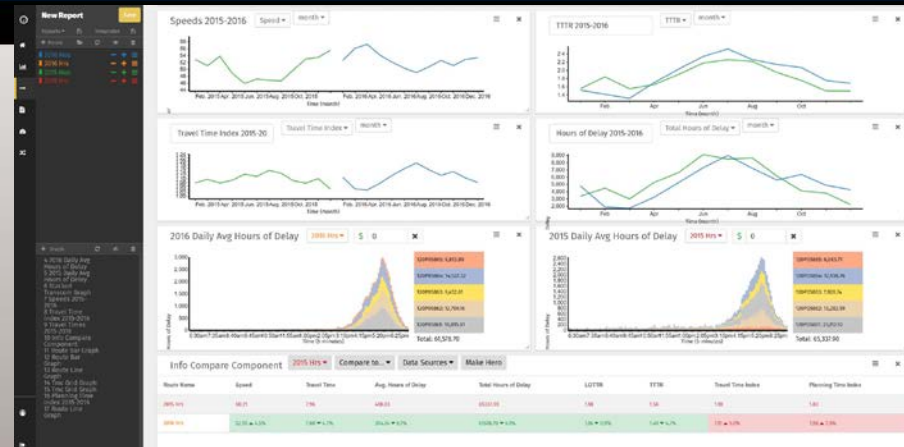
RTDash

+ Add widget Select a dashboard...



# PM3 Analysis Tools (2)

- AVAIL PM3 Tool (Albany Visualization and Informatics Lab)
- iPeMS (Iteris) Tool
- DIY – Do It Yourself
  - In-House, Contractors and/or Universities calculating the metrics/measure and assisting with target setting



# PM3 Analysis Tools (3)

- Related Tool
  - Tool for Operations Benefit Cost Analysis (TOPS-BC)
    - Companion to FHWA's Operations Benefit/Cost Desk Reference
      - <http://www.ops.fhwa.dot.gov/publications/fhwahop12028/index.htm>
    - TOPS-BC is a sketch-planning level decision support tool developed by the FHWA Office of Operations that can be used for a wide range of Transportation System Management and Operations (TSMO) strategies.





# PM3 Implementation

## • Important Dates in 2018\*:

- 5/20 - State DOTs establish 1st Performance Period targets
- 6/15 - State DOTs submit baseline metric data (2017) to FHWA via HPMS
- 8/2 - State DOTs submit hourly traffic volume estimate and percent share of traffic volume methodologies for CMAQ PHED measure
- 10/1 - State DOT Baseline Performance Report and MPO CMAQ Performance Plans (as applicable)
- 10/1 – State DOT/MPO requests for NPMRDS-equivalent data sets for 2019 due
- 11/16 - MPOs establish 1st Performance Period targets and report to respective state DOTs



# PM3 Implementation (continued)

- Important Dates in 2019\*:
  - 6/15 - State DOTs submit annual (2018) metric data to FHWA via HPMS
  - 10/1 – State DOT/MPO requests for NPMRDS-equivalent data sets for 2020 due
- Important Dates in 2020\* (same as 2019 plus the following):
  - 10/1 - CMAQ measure applicability re-assessment
  - 10/1 - State DOTs report their 2-year (midpoint performance period) progress and adjusted 4-year targets to FHWA in their Mid-Performance Period Progress Report





# TPM Resource Links

- TPM Website
  - <https://www.fhwa.dot.gov/tpm>
- TPM Guidance
  - Metric and measure calculation guides
  - HPMS metric submittal guidance
- TPM Frequently Asked Questions (FAQs)
- TPM Implementation Plan
  - <https://www.fhwa.dot.gov/tpm/plan.pdf>



# More TPM Resources

- Training
  - Many TPM courses available now through the National Highway Institute (NHI)
    - <https://www.fhwa.dot.gov/tpm/resources/training.cfm>
  - Congestion Including Freight course coming Winter 2019 (web-based with “office hours”)
- Peer Exchanges in the near future(?)



# Discussion/Questions

- Rich Taylor, FHWA Office of Operations
  - Operations Performance Measures and Management Program Manager
  - E-mail: [rich.taylor@dot.gov](mailto:rich.taylor@dot.gov)
  - Websites:
    - [https://ops.fhwa.dot.gov/perf\\_measurement/index.htm](https://ops.fhwa.dot.gov/perf_measurement/index.htm)
    - TPM: <https://www.fhwa.dot.gov/tpm>

