Transportation Performance Management Webinar Series

Target Setting for System Performance Measures

Sponsored by the TPM Pooled Fund
with Support from AASHTO CPBM Leadership and FHWA

August 12, 2020
TPM Target Setting Miniseries Webinar 4

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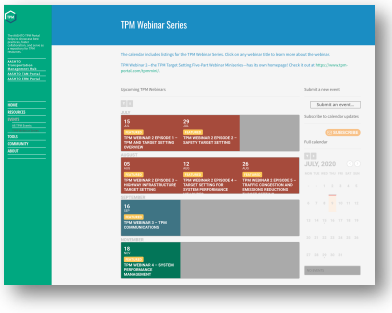
Transportation Performance Management Webinar Series

- Our regular webinar series is held every two months, on topics such as communications, system performance management, data sources, and many more to come!
- Today is Episode 4 of a special, five-part Target Setting Webinar Miniseries that will run through August
- We welcome ideas for future webinar topics and presentations
- Use the webinar Q&A panel during the webinar
  - Submit questions for today's presenters
  - Submit ideas for future webinar topics



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Welcome

The TPM Pooled Fund, the AASHTO Committee on Performance Based Management, and FHWA are pleased to sponsor this webinar series!

- Sharing knowledge is a critical component of advancing performance management practice

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Webinar Agenda

2:30	**Welcome and Introduction and TPM Pooled Fund Overview** Christos Xenophontos (Rhode Island DOT), Matt Hardy (AASHTO) and Hyun-A Park (Spy Pond Partners, LLC)
2:40	**FHWA Perspective on Target Setting for System Performance** Nelson Hoffman (FHWA)
2:50	**System Reliability Performance Targets Under Extreme Uncertainty** **Subrat Mahapatra** (Maryland DOT SHA)
3:05	**New Jersey DOT: Target Setting for System Performance** Sudhir Joshi (New Jersey DOT)
3:20	**TPM Coordination and Collaboration on System Performance: The WILMAPCO Perspective** Dan Blevins (WILMAPCO)
3:35	**Target Setting for MAP-21 System Performance Measures: Some Challenges and MnDOT's Approach** Michael Iacono (Minnesota DOT)
3:50	**Q&A and Wrap Up**

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Nelson Hoffman, FHWA

U.S. Department of Transportation
Federal Highway Administration

TPM
HOW WE GET THERE

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August 12, 2020

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

SYSTEM RELIABILITY PERFORMANCE

UNDER EXTREME UNCERTAINTY

Subrat Mahapatra
DEPUTY DIRECTOR
TSMO & CATS
MDOT SHA

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Presentation Outline

- ***2018 Target Establishment***
- ***2020 Mid-period Performance - COVID Impacts***
- ***Next Steps***

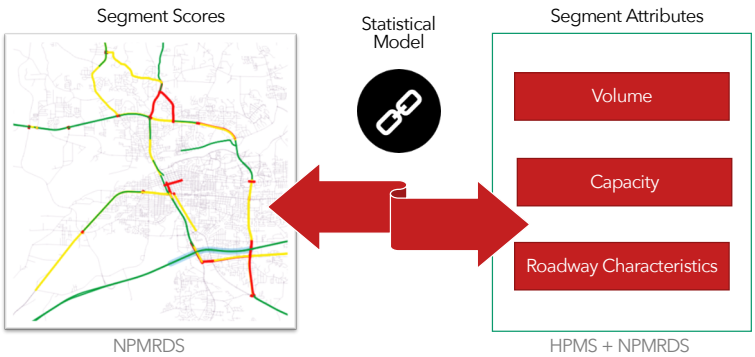
Acknowledgment

Mark Egge
Data Scientist
High Street Consulting

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

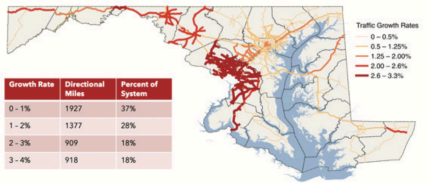
Image Source: Craig Fildes, Flikr

2018: TARGET ESTABLISHMENT



Developed a novel approach to predicting changes in travel time reliability based on a roadway's travel volume, capacity, and location.

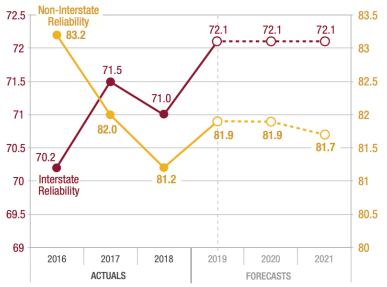
MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

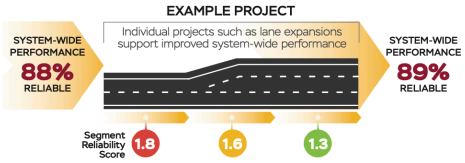


Growing traffic volumes negatively affect roadway reliability.

MDOT SHA's planned capacity expansion and ITS improvements to improve system reliability are shown on the map above.

Forecasted Future Performance





Based on growing traffic volumes and MDOT's investments in improving roadway reliability, reliability on the Interstate is forecasted to slightly improve between now and 2021, and reliability on the Non-Interstate Highways is forecasted to slightly worsen.

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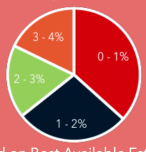
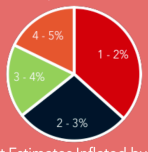
2018 FORECAST SCENARIOS

		Expected Growth	High Growth
	Forecasting Model Run Under Multiple Sets of Assumptions	Growth Rates, as % of Road Network  Based on Best Available Estimates	Growth Rates, as % of Road Network  Best Estimates Inflated by 1%
No Build	Current Capacity	**"No Build"** • 1% Average Growth • No Additional Capacity	**"No Build, High Growth"** • 2% Average Growth • No Additional Capacity
Build	Programmed STIP Capacity & ITS Projects Completed On Time	**"Build"** • 1% Average Growth • Project-Based Capacity Expansion & Reliability Improvement	**"Build, High Growth"** • 2% Average Growth • Project-Based Capacity Expansion & Reliability Improvement

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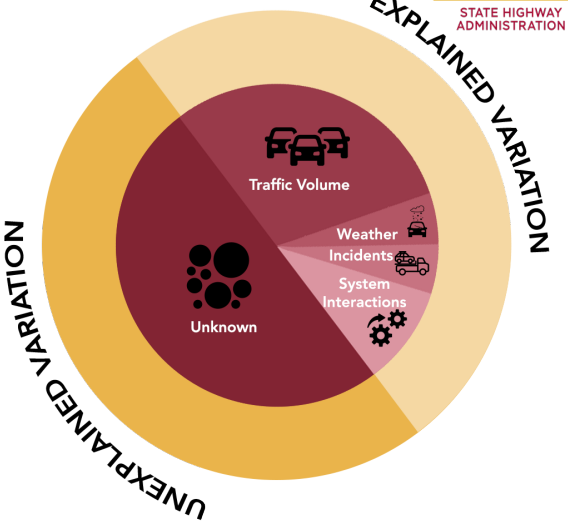
MODEL PERFORMANCE

Models explained 20 – 30% of variation in travel time reliability (or up to 50% with weather and traffic incidents).

Limited explanatory power, but provided a principled expectation about the future at a time when no trend or benchmarking data existed.



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2018 TARGET SETTING CONSIDERATIONS

- Margin for Error
  - Road Network Changes
  - PM3 Score Calculation Evolution
  - NPMRDS TMC Network Changes
  - Economics Factors
  - Project Uncertainty
- Targets can be revised in 2020

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2020 MID-PERIOD PERFORMANCE

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

2018 2019 2020 ...

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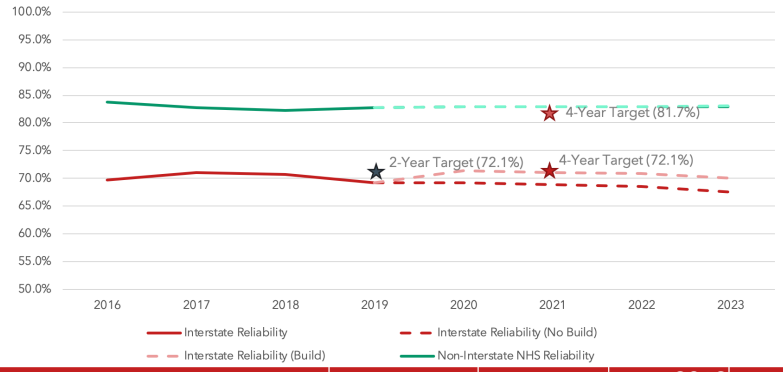
INTERSTATE & NON-INTERSTATE NHS RELIABILITY



Measure	2017 Baseline	2019 Target	2019 Actual	2021 Target
Interstate Reliable Person-Miles Traveled	71.4%	72.1%	**69.4%**	72.1%
Non-Interstate NHS Reliable Person-Miles Traveled	82.7%	N/A	82.7%	81.7%
Truck Travel Time Reliability (TTTR) Index	1.88	1.87	**1.86**	1.88

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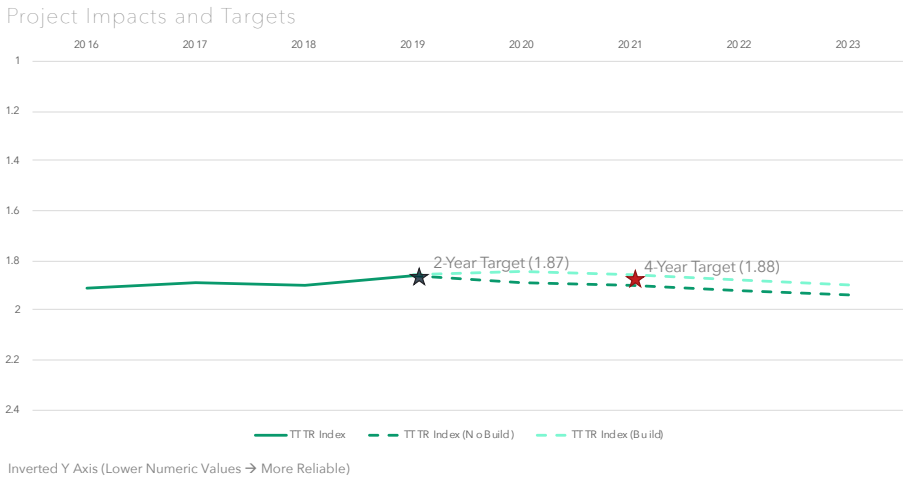
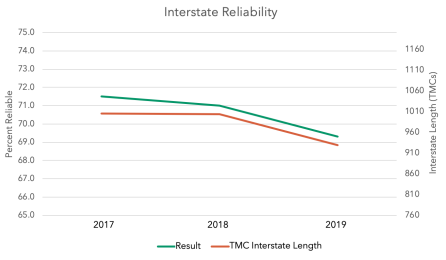
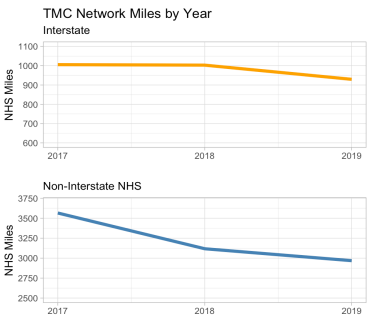
TRUCK TRAVEL TIME RELIABILITY INDEX



2020 TARGET RESET CONSIDERATIONS

- Margin for Error
  - Road Network Changes
  - PM3 Score Calculation Evolution
  - **NPMRDS TMC Network Changes**
  - Economics Factors
  - Project Uncertainty





Reliable Interstate TMCs disproportionately removed

2020 TARGET RESET CONSIDERATIONS

- Margin for Error
  - Road Network Changes
  - PM3 Score Calculation Evolution
  - NPMRDS TMC Network Changes
  - Economics Factors
  - **Project Uncertainty**

Example: I-270 Corridor Scope and Delivery Changes

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2020 TARGET RESET CONSIDERATIONS

- Margin for Error
  - Road Network Changes
  - PM3 Score Calculation Evolution
  - NPMRDS TMC Network Changes
  - **Economics Factors**
  - Project Uncertainty

In 2018, considered two economic scenarios: growth, and high growth.

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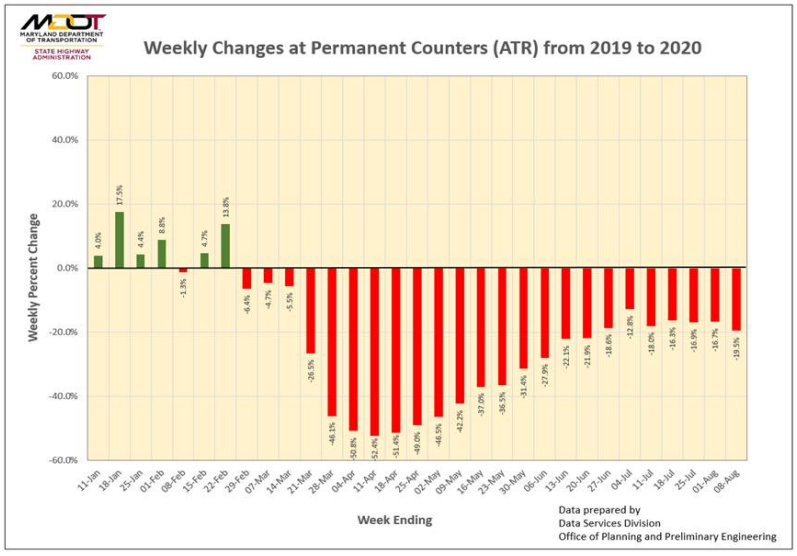
TARGET-SETTING CIRCUMSTANCES HIGHLY UNCERTAIN IN COVID PANDEMIC ERA…

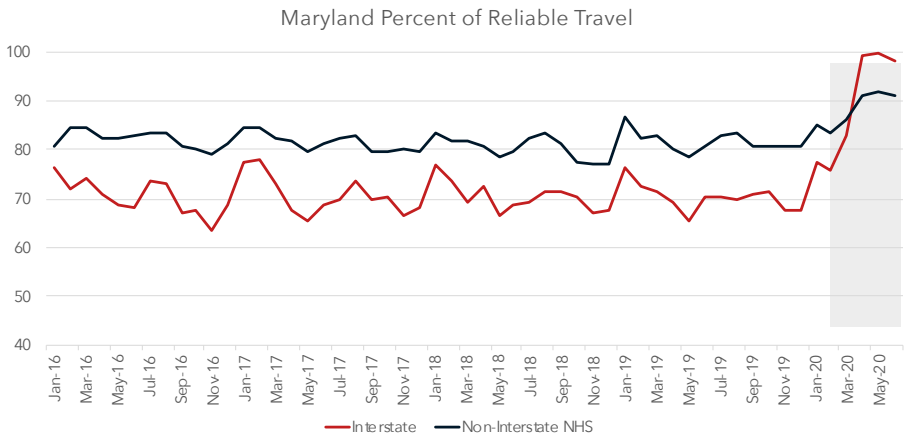
- Demand Uncertainty
- Supply Uncertainty
- Policy & Recovery Time Uncertainty

2020 COVID-19 TRAFFIC IMPACTS



TRAVEL TIME RELIABILITY

In the Age of COVID-19



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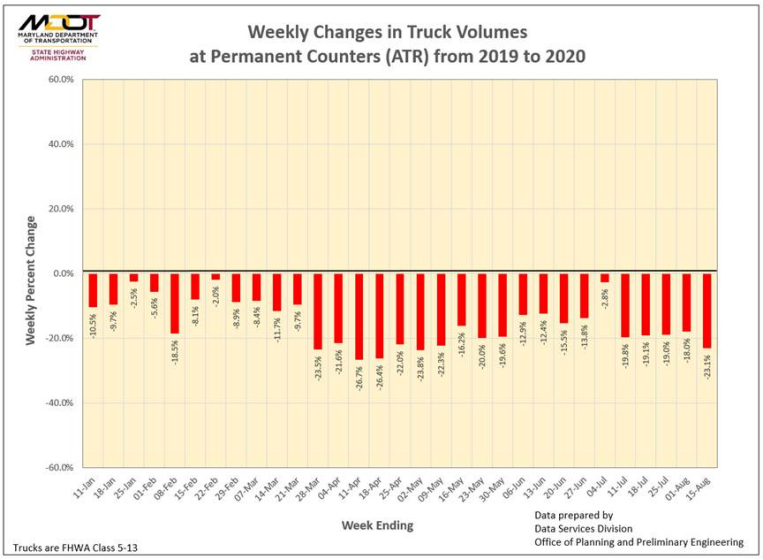
2020 COVID-19 FREIGHT IMPACTS



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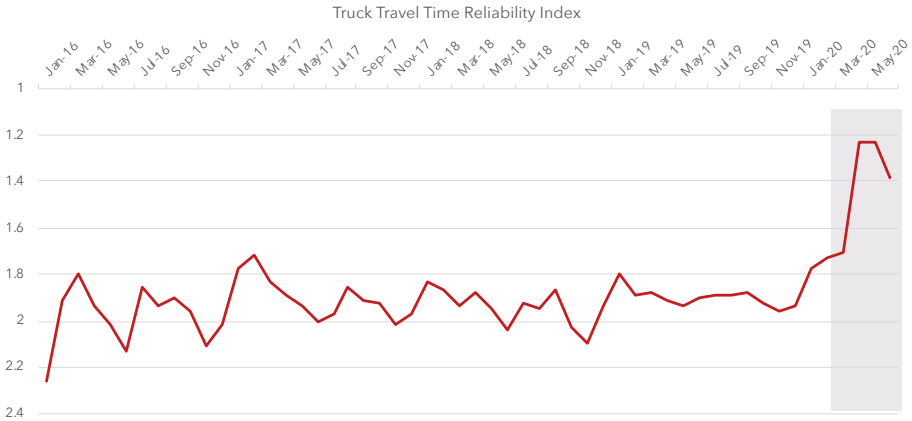
TTTR (FREIGHT) INDEX

In the Age of COVID-19



Lower Numerical Scores are Better (Inverted Y Axis)

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SUPPLY UNCERTAINTY

- Travel was down by 50% at the peak of COVID. Travel is still down by 15-20%. Fewer VMT translates into lesser transportation funding.
- Transit ridership and airport travel down, activities at MVA down means lesser $$ coming to transportation trust fund.
- Six year CTP has seen significant decreases in state budget which impacts SOGR activities, new facilities and TSMO investments – ALL THESE IMPACT THE SUPPLY SIDE

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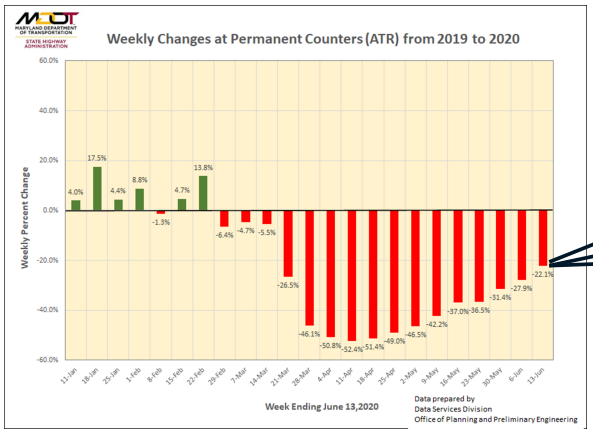
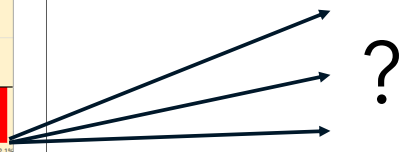
POLICY, FUNDING & RECOVERY TIME UNCERTAINTY





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NEXT STEPS

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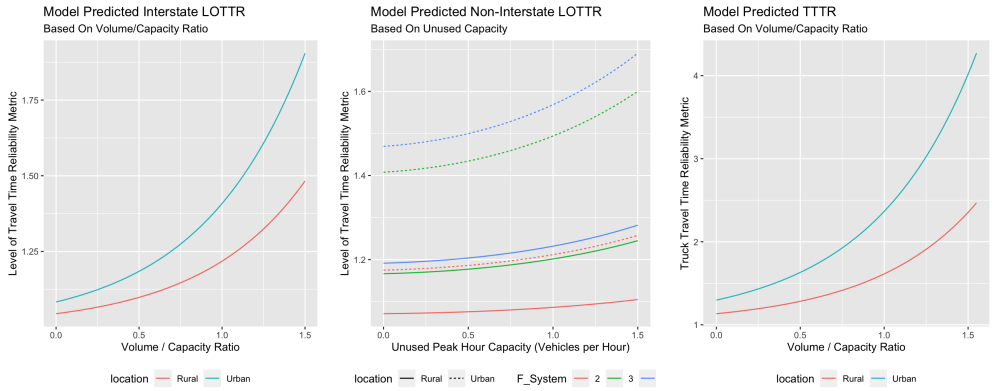
STATISTICAL MODELS

Model Response Curves



Models have small R^2 values (~0.3), keeping with the idea that bottlenecks explain about 20% of travel time variation, but all coefficient estimates are highly statistically significant ($p < 0.001$).

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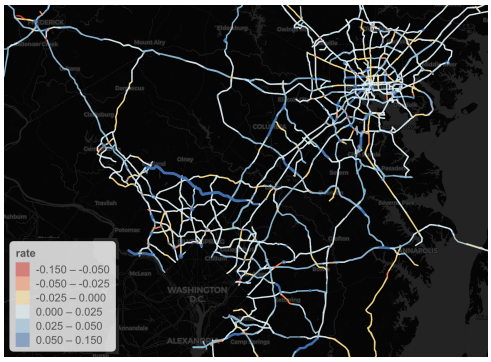
UPDATE FUTURE VOLUMES

Grow Traffic Volumes by Based on 2015 – 2019 Trends

Factor 2020 drops in traffic volumes



Growth rates damped for high V/C segments

Baseline Rates

Growth Rate	Directional Miles (Statewide)	Percent of System (Statewide)
< 0%	587	15%
0 - 1%	525	13%
1 - 2%	866	22%
2 - 3%	1321	33%
3 - 5%	380	12%
> 5%	187	5%

Low Growth Scenario: -1% to All

High Growth Scenario: +1% to All

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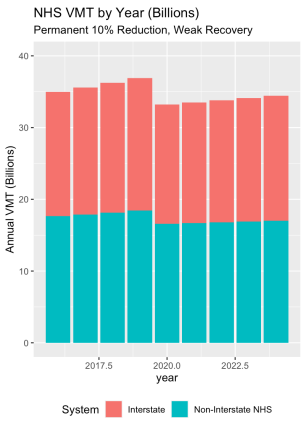
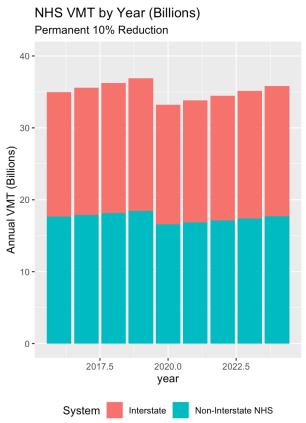
VMT GROWTH SCENARIOS

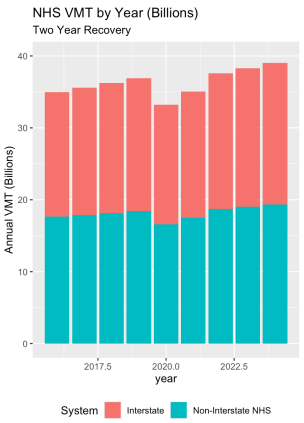
MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION



10% Volume Reduction in 2020
0.6% Weighted Avg Growth



10% Volume Reduction in 2020
1.6% Weighted Avg Growth



10% Volume Reduction in 2020
Full Recovery by 2022
1.6% Weighted Avg Growth

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NEXT STEPS

MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION

- Evaluate the impacts of TMC network changes on baselines, adjust/ update *if necessary*
- Account for COVID-19 related traffic drops and reliability improvements to adjust 4-year targets
- Adopt a scenario-based approach with negative, slow and fast economic recovery to develop targets
- Present findings and recommendations to MDOT Leadership, FHWA, MPOs and other partners

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QUESTIONS?
THANK YOU!

CONTACT INFORMATION

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TPM Webinar - Target Setting Miniseries 4

Target Setting for System Performance Measures
8/12/2020

complete team
Planning • Operations Collaboration

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Background

NJDOT

3,200 Employees

2,755 miles of State, Interstate, Toll & Authority Roadways, and Palisades Interstate Parkway

11th In population (9 Million)

1st In population density

Most in urban areas, but large sections of rural areas

3 MPOs

that completely cover the entire state

Highway Authorities
Major Toll Roads
Palisades Interstate Parkway

Public Transit Operators

and many private bus carriers throughout the State

Millennials and empty nesters driving the demand for mixed-use, walkable downtowns

Underserved, disabled residents need reliable transportation options, effects of COVID-19 Pandemic on future of Transportation

Strategically located in the Northeast corridor, NJ's geographic diversity - shore, mountains, cities, towns and rural environments - along with significant retail, office, warehousing, ports and pharmaceutical corridors create many transportation opportunities and challenges.

Complete Team is a collaborative construct between NJ's planners and operators whose mission is to facilitate better linkages between Regional Transportation Planning & Investment Decision-making, and Transportation Systems Management and Operations (TSMO)

About Us

What is complete team?

Complete Team Members

Our members represent many organizations in planning, operations & big data

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An Approach NJDOT took in Setting Initial Targets

We started early on in 2016 with Complete Team when NPRM was issued

During the 2016 Complete Team Meetings, the following topics were discussed:

- System Performance Notice to Proposed Rulemaking – In collaboration with MPOs (Complete Team) provided comments to AASHTO and in the Docket - August 2016
- Initiated discussion on TMC conflation with University of Maryland's CATT Laboratory - June 2016
- Discussion on the anticipated Final rule at the Complete Team meeting - December 2016
- Discussion on NJ Transit data.

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An Approach NJDOT took in Setting Initial Targets and Coordination with Planning Partners

FHWA Workshop on System Performance Rule No. 3 (August 2017 - Cambridge, MA)

We continued discussion with Complete Team in 2017:

- TPM Pool Fund Initiatives
- Coordination Requirements and Agreements
- Data Requirements and Analyses, Challenges – Initiated NPMRDS TMC Corrections
- Tools
- Targets Setting - Schedule
- NHS Travel Time Reliability & Annual Hours of Peak-Hour Excessive Delay (PHED) per Capita Measures
- Truck Travel Time Reliability (TTTR) Index Measure
- CMAQ On-Road Mobile Source Emissions & Percent Non-SOV Travel Measures

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An Approach NJDOT took in Setting Initial Targets and Coordination with Planning Partners on Target Setting and challenges

Six Complete Team meetings and a Data-Agreement Subcommittee meeting in 2018 prior to Targets Due date on 10/1/2018

- TPM Pooled Fund Initiatives & Tools – Purchased Additional NPMRDS v2 Data
- NJTPA/DVRPC Urbanized Area - Consensus from Complete Team
- Annual Hours of Peak-Hour Excessive Delay (PHED) per Capita and Non-SOV Measures (UZA Coordination meetings by NJTPA and DVRPC with neighboring States)
- Posted Speed Limit Data required by UMD-CATT Lab for PHED
- Data Requirements and Analyses, Challenges for Each PM 3 Measures
- Submitted verification of TMC links with HPMS to UMD-CATT Lab
- Updates on Freight Reliability: FHWA Performance Measures Reporting Mechanism, Updates on TTTR for Interstate System , Actual Targets
- MPOs CMAQ Performance Plan

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Challenges and Barriers and How We Have Overcome

Data Issues:

- The NPMRDS data contained incorrect routes in Interstate and Non-Interstate NHS categories: Initiated Verification of TMC links with 2017 HPMS and Collaborated with MPOs, and submitted a combined report to CATT Lab and Texas A&M Institute
- Posted Speed Limits (PSL)Missing from NPMRDS – Collaborated with TRANSCOM for PSL conflated with TMCs to provide to CATT Lab

Forecasting for Reliability and Aligning Projections/Targets:

- No Historical data available for comparison as NPMRDS dataset is different from INRIX/HERE data sets
- Purchased Additional 2016 NPMRDS dataset for comparison purpose, but was not much helpful as results were very different compared to 2017
- We finalized Targets based on 2017 values in collaboration with Complete Team
- Considered a Holistic Approach in Setting Targets for New Jersey

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Developing Written Provisions

Benefits / Challenges

Benefits

- **No conflicts** between agencies as Complete Team provided a well-established platform for collaboration and coordination among partner agencies, which ensured consistency and accountability
- **Well documented** development of the Written Procedures was in full coordination with partner agencies, helping us achieve our planning goals
- **Relieved burden on a single agency** to becoming an expert in developing Written Procedures

Challenges

- The Planning Rule 23 CFR 450.314(h) was **interpreted differently** by different agencies
- **Conflict** between the date of May 20, 2019 for Written Procedures and the date for the phase-in of the Planning Rule relating to the System Performance measures, stipulated in 23 CFR 450.340(e) and (f)
- **Needed to determine** if the Performance Based Planning and Programming (PBPP) requirements of the planning rule shall apply to all STIP/TIP amendments, but not to administrative modifications of the STIP/TIP
- The **level of details needed** and determining which agencies need to get involved
- Two MPOs involving multiple states needed to coordinate with state's respective FHWA Division for **guidance**

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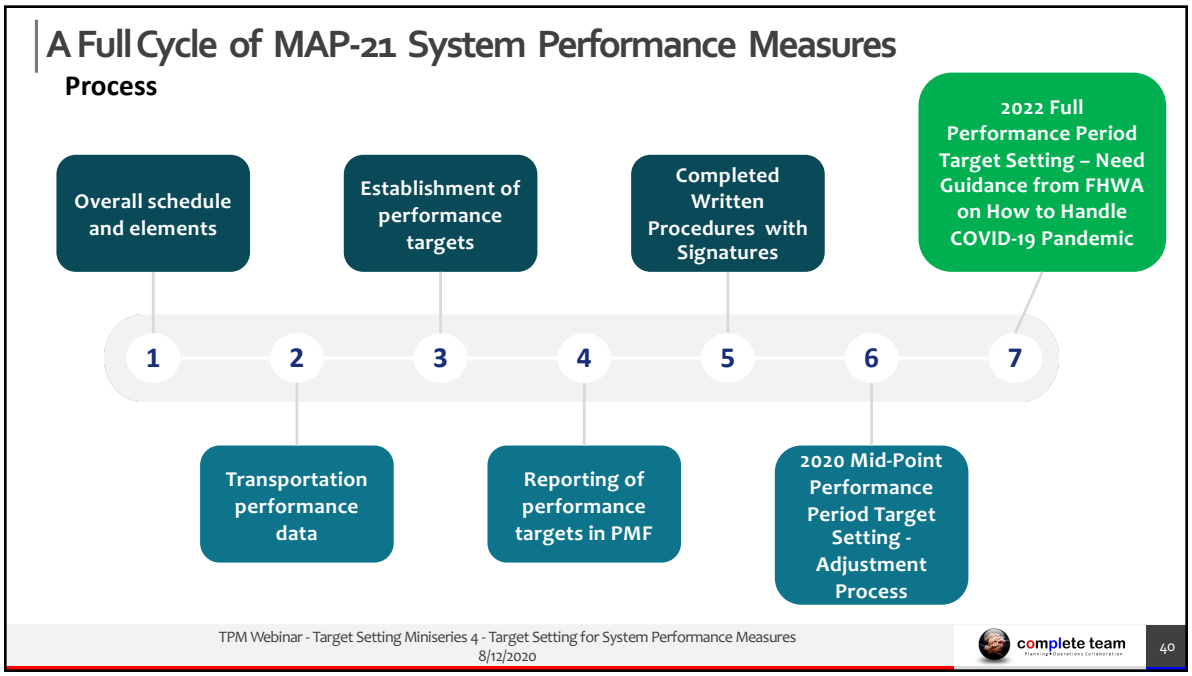
A Full Cycle of MAP-21 System Performance Measures
Process
Overall schedule and elements
Establishment of performance targets
Completed Written Procedures with Signatures
2022 Full Performance Period Target Setting – Need Guidance from FHWA on How to Handle COVID-19 Pandemic
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Transportation performance data
Reporting of performance targets in PMF
2020 Mid-Point Performance Period Target Setting - Adjustment Process
TPM Webinar - Target Setting Miniseries 4 - Target Setting for System Performance Measures
8/12/2020
complete team
40

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Thank You
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complete team
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TPM Coordination & Collaboration The WILMAPCO Perspective

www.wilmapco.org

WILMAPCO

Wilmington Area Planning Council

Prepared for:
TPM Webinar
August 2020

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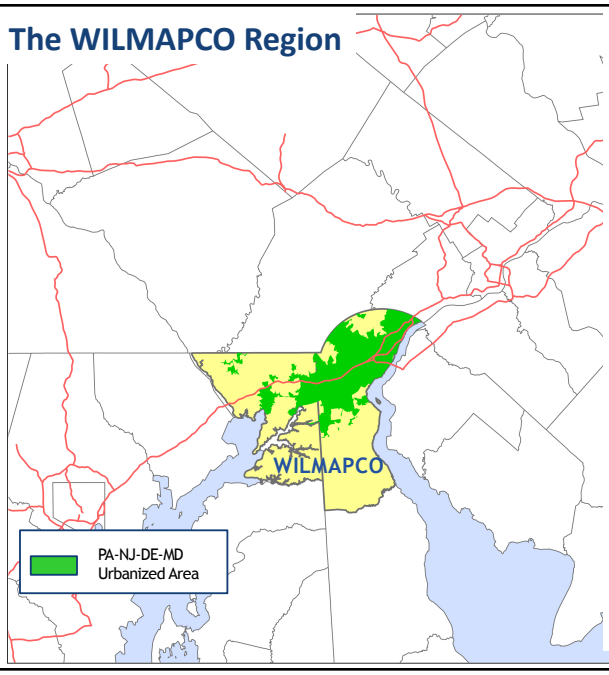
The WILMAPCO Region



- 2018 ACS Population: 664,000
- Part of the Philly PA-MD-NJ-DE Urban Area. 2018 pop: 5,538,000
- Approx. 10% of UA population
- 2050 Population: 748,000
- 2-County, 2-State MPO
  9 Council members
- Recently Updated RTP (Mar. 2019)
- Certification Review (Nov. 2018)

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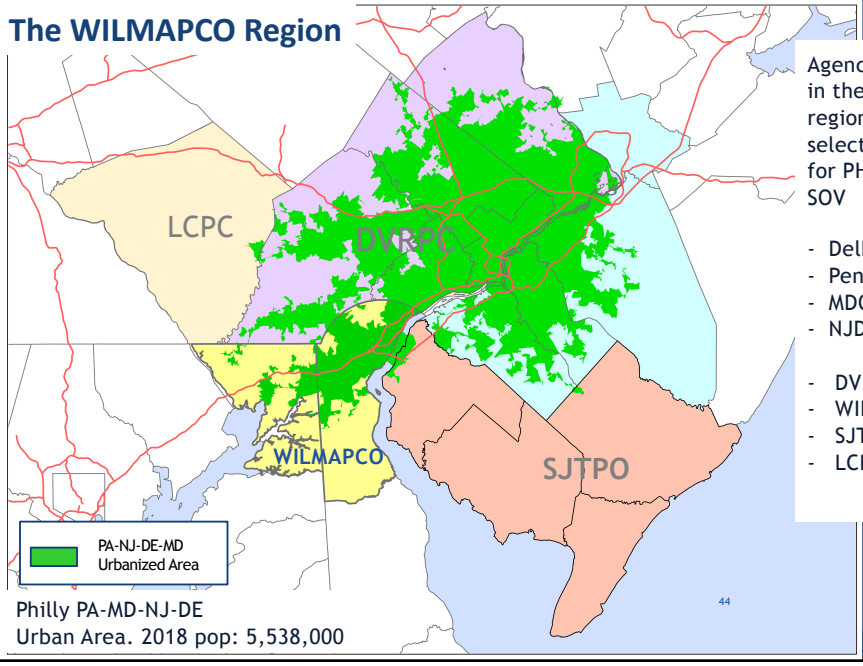
The WILMAPCO Region



Philly PA-MD-NJ-DE
Urban Area. 2018 pop: 5,538,000

Agencies involved in the single, regional target for selected measures for PHED & Non-SOV

- DelDOT
- PennDOT
- MDOT
- NJDOT

- DVRPC
- WILMAPCO
- SJTPO
- LCPC

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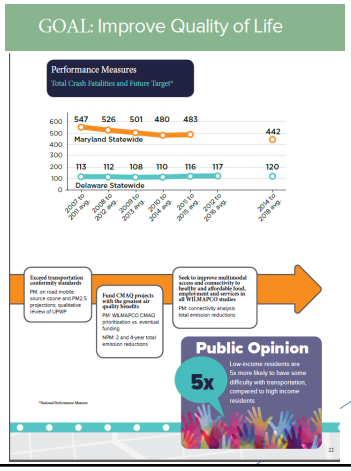
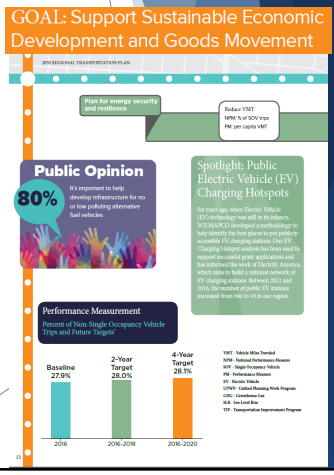
Where TPMs are Found

TPM in the RTP

- Adopted in March 2019
- Embedded measures within appropriate goals





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Where TPMs are Found

TPM in the TIP

- Created "Appendix H" in the TIP
- Provides quick summary and details of ALL measures
- Provides a home for the material where any updates will be included in annual approvals/amendments of the TIP

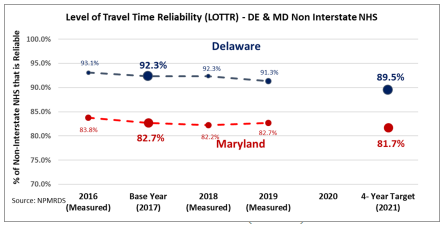
Transportation Performance Measure 4: Travel Time Reliability Measures - Level of Travel Time Reliability

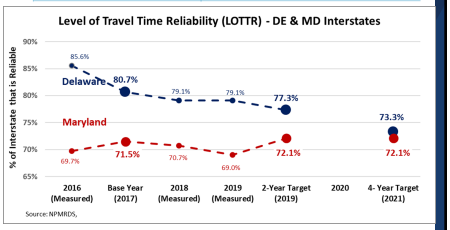
Level of Travel Time Reliability (LOTTR) is defined as the ratio of the longer travel times (80th percentile) to a "normal" travel time (50th percentile), using data from FHWA's National Performance Management Research Data Set (NPMRDS). Reliability is measured during the full calendar year broken down into 4 time periods: AM Peak, Midday, PM Peak and Weekends. If any of these segments have a LOTTR above 1.50, the segment is determined not reliable. All non-reliable segments are then calculated in combination with daily traffic volumes and average vehicle occupancy to produce the total number of person-miles impacted by each unreliable segment.

Travel time reliability performance measures
Interstate Travel Time Reliability Measure: % of person-miles traveled on the Interstate that are reliable
Non-Interstate Travel Time Reliability Measure: % of person -miles traveled on the non-Interstate NHS that are reliable

Illustration of Reliability Determination

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





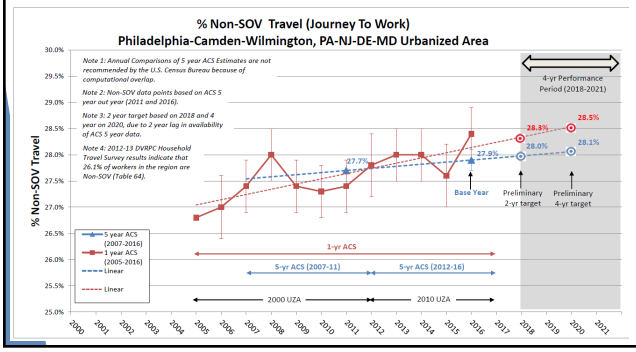
Data Sources:
Travel times - Travel Time Data Set (NPMRDS)
Travel volumes - Annual volume calculated as: AADT x 365 days.
Average vehicle occupancies (AVO) data tables published by FHWA.

46

Experiences - Pro:

Regional Coordination

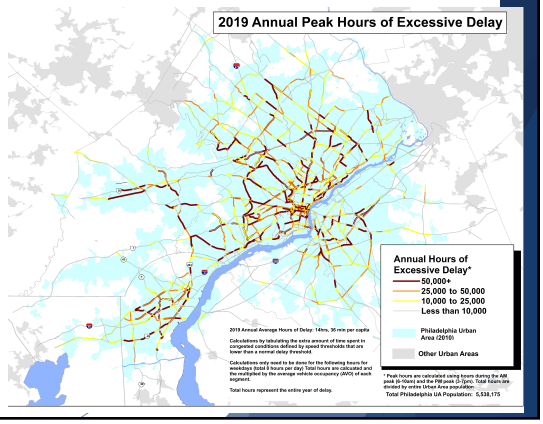
- Additional Agreement for PM 3 efforts with MD/DE/PA/NJ Urban Area
- Documented meetings of all agencies on the development and methodology used to create targets
- Led by DVPRC



CMAQ Traffic Congestion System Performance Management Addendum for the Philadelphia, PA-NJ-DE-MD Urbanized Area

to be addended to the System Performance Management Written Procedures/Agreements of

The Delaware Valley Regional Planning Commission (DVRPC), the Lancaster County Transportation Coordinating Committee (LCTCC), the North Jersey Transportation Planning Authority (NJTPA), the South Jersey Transportation Planning Organization (SJTPO), and the Wilmington Area Planning Council (WILMAPCO)

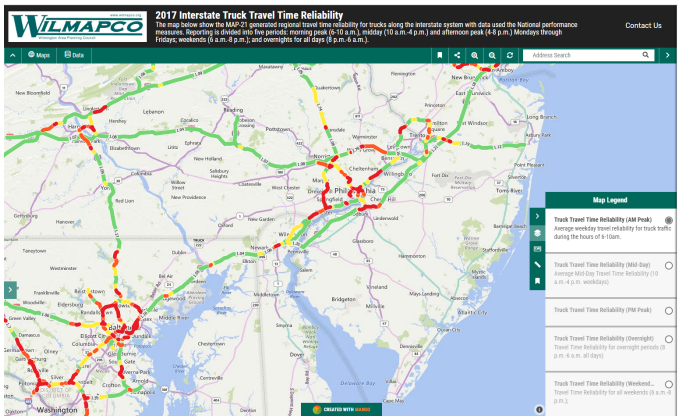


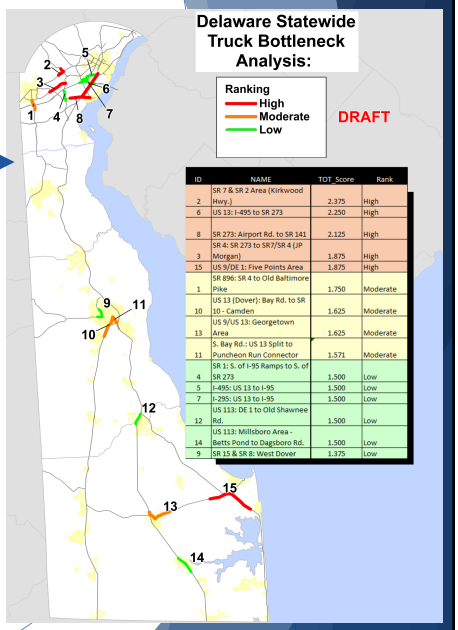
47

Experiences - Pro:

Big Help for Freight

- Made for easier coordination/discussion
- Easy travel time data access for surrounding States
- Big help for Truck Bottlenecks





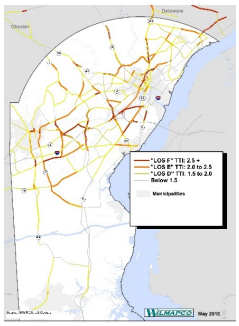
48

Experiences - Pro:

Helped enhance Reliability data to make better planning decisions

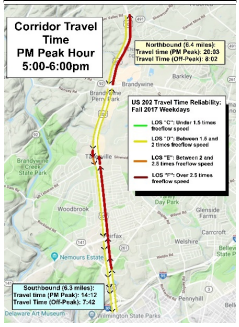
Three main reliability assessment areas:

Regional



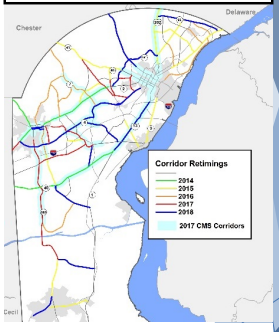
- RTP
- TIP Prioritization
- CMP Corridor Selection
- Multi-State Plans

Corridor/Subarea



- CMP Corridor Profiles
- Time of day analysis (15 min.) intervals
- Sub-area Studies
- Use in PMs for TIDs?

Operational



- Segment by segment
- Signal retiming
- Intersection LOS
- Quickly perform Before/after analysis for project effectiveness & AQ benefits

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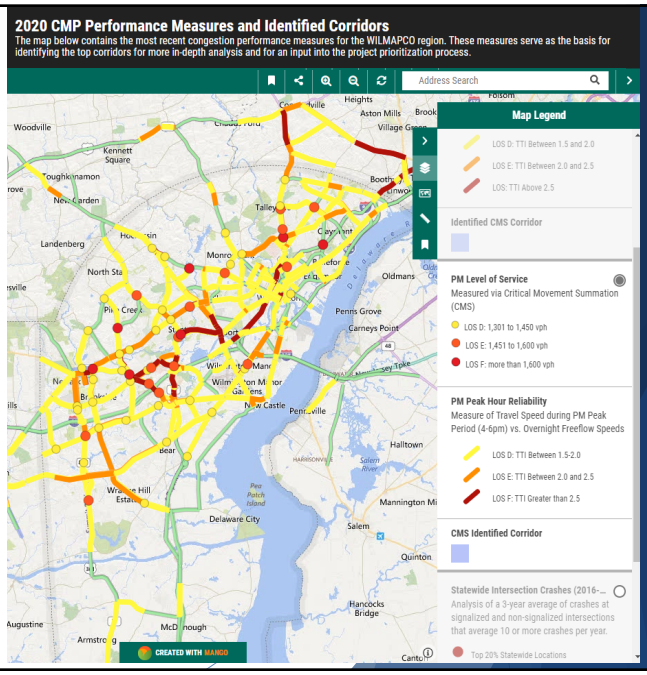
Experiences - Pro:

Pros:

- Helped to brings data-driven analysis to the forefront
- Ease of GIS-based material allows for better visuals for sharing with public



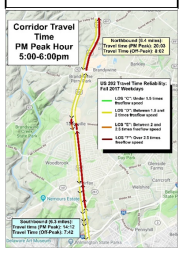
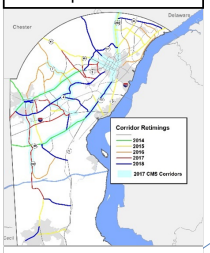
50

Experiences - Con:

- Not enough time to "move the needle"
- Changing inputs can make for odd outputs
- Relaying index material to public/decision makers can be challenging
- Local perception of congestion vs. National standards

Capital projects too long to program/construct for any real feedback

Use of data for "small" improvements
Has been successful

Corridor/Subarea	Operational
	
- CMP Corridor Profiles - Time of day analysis (15 min.) intervals - Sub-area Studies - Use in PMs for TIDs?	- Segment by segment - Signal retiming - Intersection LOS - Quickly perform Before/after analysis for project effectiveness & AQ benefits

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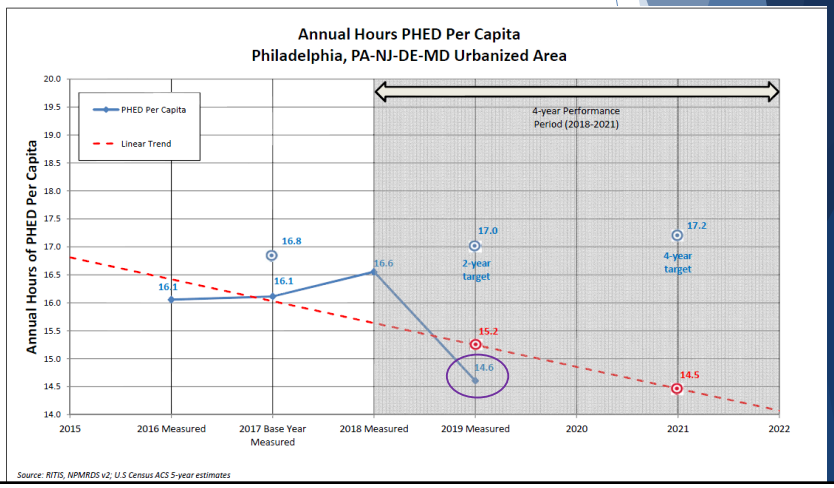
Experiences - Con:

- Not enough time to "move the needle"
- Changing inputs can make for odd outputs
- Relaying index material to public/decision makers can be challenging
- Local perception of congestion vs. National standards

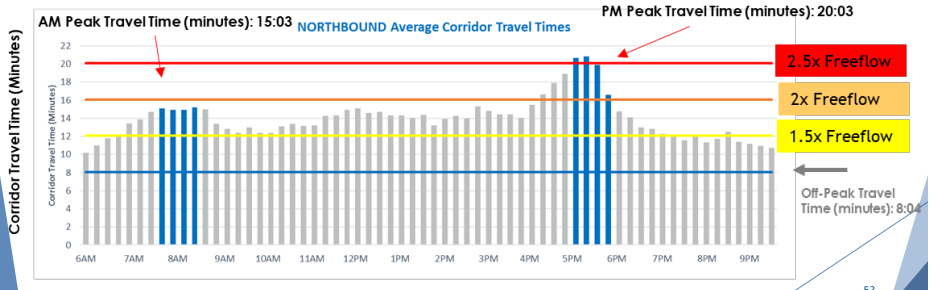
Changes to AADT, truck volumes and road segments have given some confusing results

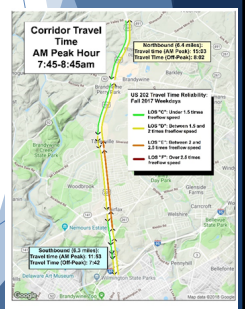


Experiences - Con:

- Not enough time to "move the needle"
- Changing inputs can make for odd outputs
- Relaying index material to public/decision makers can be challenging
- Local perception of congestion vs. National standards

- Large scale county/regionwide values unimportant to locals
- "What does it mean for my street"
- "just tell me how long it takes!"





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- Not enough time to "move the needle"
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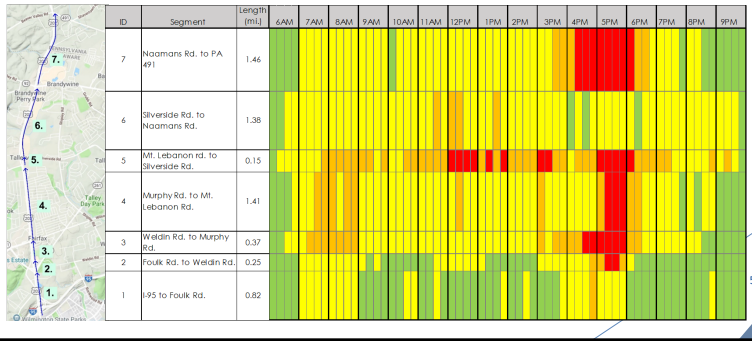
- Relaying index material to public/decision makers can be challenging
- Local perception of congestion vs. National standards

  - Large scale county/regionwide values unimportant to locals
  - "What does it mean for my street"

Congestion Duration—Travel Time Reliability NORTHBOUND

Travel Time Reliability Index US 202—Northbound; I-95 to PA 491



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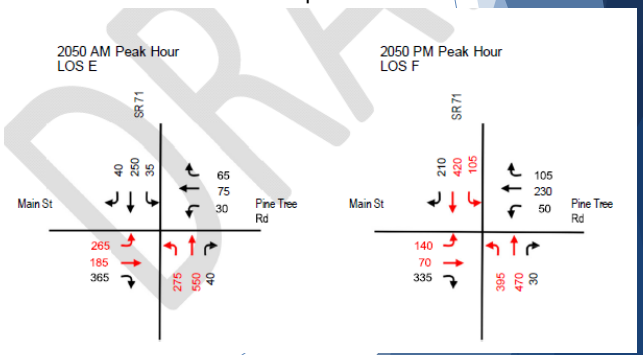
Experiences - Con:

- Not enough time to "move the needle"
- Changing inputs can make for odd outputs
- Relaying index material to public/decision makers can be challenging
- Local perception of congestion vs. National standards

4 hour "peak"

Monday – Friday	6am – 10am
	10am – 4pm
	4pm – 8pm
Weekends	6am – 8pm
Must exhibit LOTTR below 1.50 during all of the time periods	

1 hour "peak"



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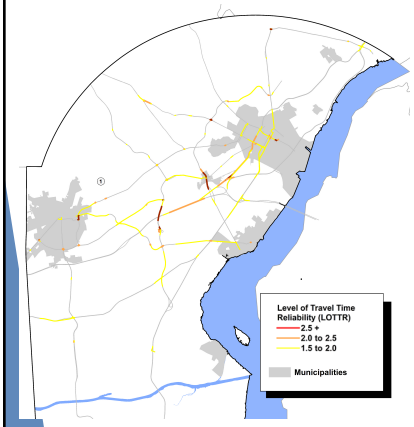
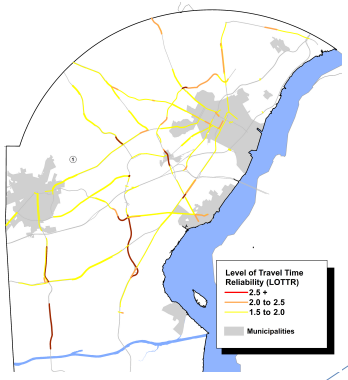
Experiences - Con:

- Not enough time to "move the needle"
- Changing inputs can make for odd outputs
- Relaying index material to public/decision makers can be challenging
- Local perception of congestion vs. National standards

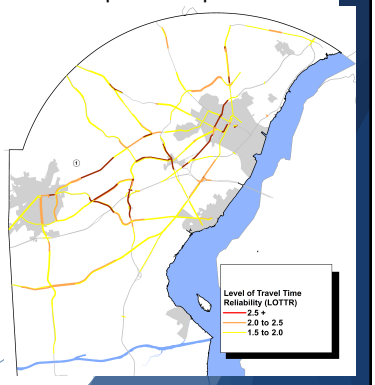
National Measures



AM "peak" 7-9am



PM "peak" 4-6pm



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Thank You!

Dan Blevins
dblevins@wilmapco.org
www.wilmapco.org

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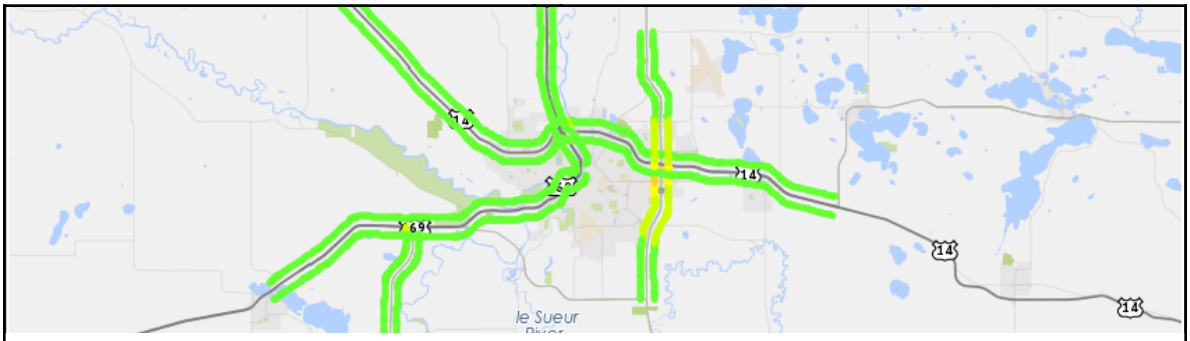

Target Setting for MAP-21 System Performance Measures: Some Challenges and MnDOT's Approach

TPM Target Setting for System Performance Measures Webinar
8/12/2020

Michael Iacono

DEPARTMENT OF TRANSPORTATION
MnDOT Office of Transportation System Management

mndot.gov

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PM3: Reliability Measures

NHS travel time reliability

- Percent of person-miles traveled on the Interstate that are reliable (Interstate Travel Time Reliability Measure)
- Percent of person-miles traveled on the non-Interstate NHS that are reliable (Non-Interstate Travel Time Reliability Measure)

Interstate freight reliability

- Truck travel time reliability on the Interstate System (Average Truck Reliability Index)

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The LOTTR Metric: Segment Level

Level of Travel Time Reliability (LOTTR) Metrics

- Computed for each of 4 time periods for the entire year (nearest hundredth)

$$LOTTR_i = \frac{80th\ Percentile\ Travel\ Time_i}{50th\ Percentile\ Travel\ Time_i}$$

Where *i* is the time period:

1. 6 a.m. – 10 a.m., weekdays
2. 10 a.m. – 4 p.m., weekdays
3. 4 p.m. – 8 p.m., weekdays
4. 6 am. – 8 p.m., weekends

- Computed for every reporting segment

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DEPARTMENT OF TRANSPORTATION

Technical Issues

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Uncertainty

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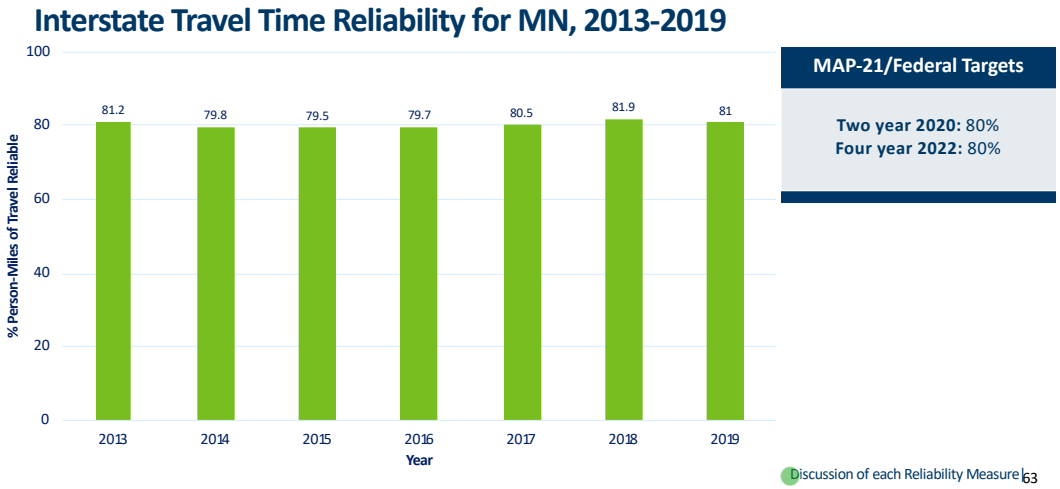
PM3: Interstate Travel Time Reliability



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PM3: Truck Travel Time Reliability Index

Truck Travel Time Reliability Index for MN, 2013-2019

MAP-21/Federal Targets

Two year 2020: 1.5
Four year 2022: 1.5

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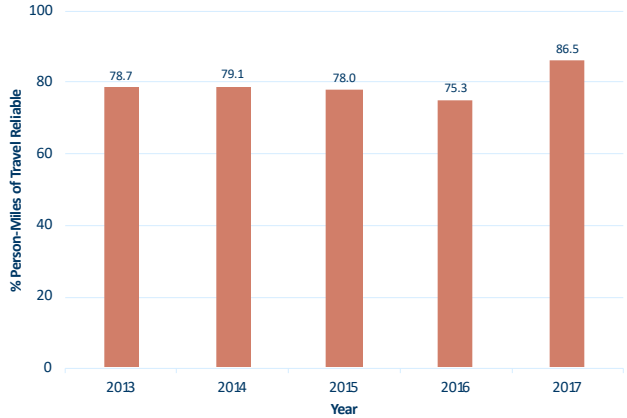
PM3: Non-Interstate NHS Travel Time Reliability Data used for 2018 target setting

Non-Interstate NHS Travel Time Reliability for MN, 2013-2017



MAP-21/Federal Targets

Two year 2020: -*
Four year 2022: 75%

* Not required by CFR

NPMRDS data used in initial target setting in 2018

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PM3: Reliability Targets

PM3 Reliability Statewide Targets as set in 2018

	Two Year 2020	Four Year 2022
Interstate Reliability	80%	80%
Non-Interstate NHS Reliability	N/A	75%
Freight Reliability	1.5	1.5

Target Setting Considerations in 2018

Poor data reliability prior to 2017	MPO feedback on 2 and 4 year Interstate targets

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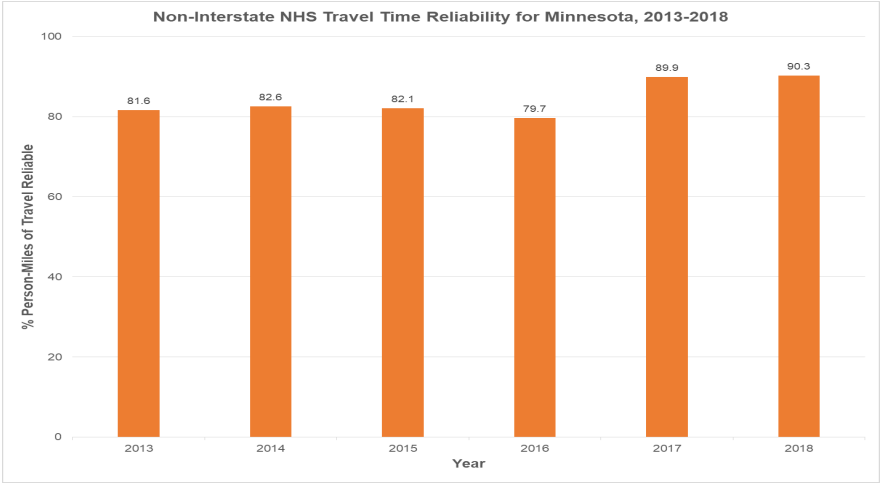
Non-Interstate NHS Travel Time Reliability (Statewide)



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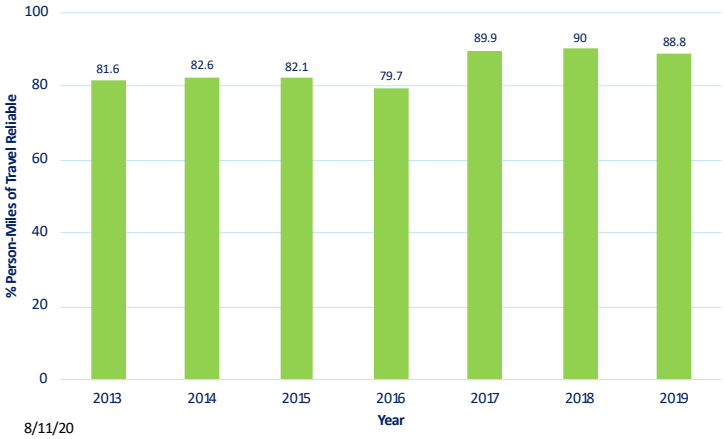
PM3: Non-Interstate NHS Travel Time Reliability

Non-Interstate NHS Travel Time Reliability for MN, 2013-2019



MAP-21/Federal Targets

Two year 2020: -*
Four year 2022: 75%

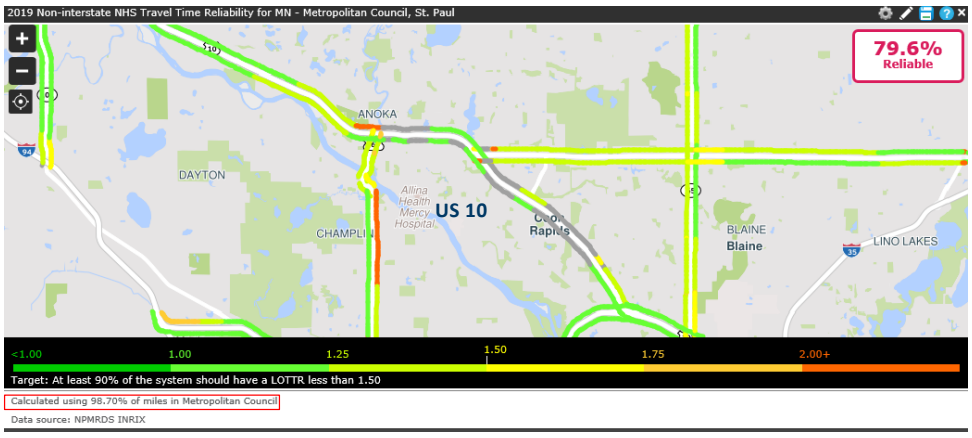
* Not required by CFR

Recommend adjusting 2022 target to 90%

Note: data source change in 2017

Discussion of each Reliability Measure

Data Accuracy and Quality



Data Accuracy and Quality

- Do you own quality control
- Check network for completeness, missing links
  - Report NHS network updates that may be missing
- Look for missing data, errors and possible outliers
- Issues affect our ability to understand the present and predict the (near) future

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DEPARTMENT OF TRANSPORTATION

Process Issues

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Understanding and Communicating About Measures

	Interstate Reliability Measure	Non-Interstate NHS Reliability Measure	Truck Travel Time Reliability Measure
Area of Applicability	Statewide and MPO level	Statewide and MPO level	Statewide and MPO level
Numerator in Metric Calculation	80th Percentile	80th Percentile	95th Percentile
Weighting Criterion for Segments	Person-Miles of Travel	Person-Miles of Travel	Segment Length
Threshold Level for Segment Reliability	Yes (1.50)	Yes (1.50)	No
Travel Time Data Used in Calculation	Passenger Vehicles and Trucks	Passenger Vehicles and Trucks	Trucks only

Other Planning/Process Issues

- Importance to other groups
  - MPOs
  - District staff
  - Senior leadership
- Nature of targets
  - Expected outcome vs. active goal
    - Does this affect resource allocation?

Competition With Other Policy Objectives

Minnesota State Highway Investment Plan (MnSHIP)

System Stewardship	Transportation Safety	Critical Connections	Healthy Communities	Other
• Pavement Condition • Bridge Condition • Roadside Infrastructure Condition • Facilities • Jurisdictional Transfer	• Traveler Safety	• Twin Cities Mobility • Greater MN Mobility • Freight • Bicycle Infrastructure • Accessible Pedestrian Infrastructure	• Regional + Community Improvement Priorities	• Project Delivery • Small Programs

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Lessons About Target Setting

- Many possible approaches
- Take advantage of flexibility
  - Revisit every 2 years (or sooner)
  - Get more and better information (reduces uncertainty)
- Make use of existing and archived data
  - NPMRDS Analytics
  - Benchmarking and Peer Comparisons
- Communication about PM3 Measures
  - What do they mean?
  - How can they potentially be used?
- Other uses for reliability metric data

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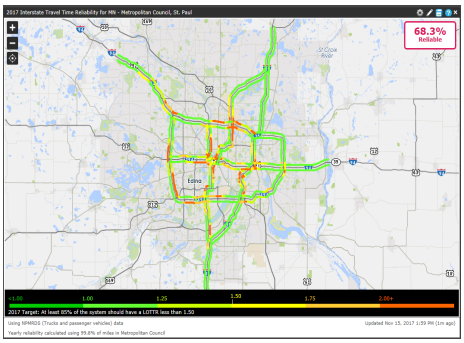
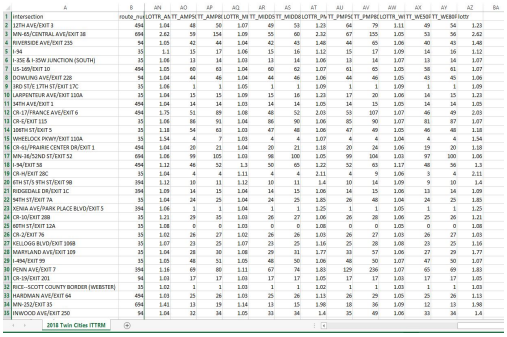
Other Potential Applications

Project-level evaluation, ranking

Corridor analysis

Bottleneck Identification

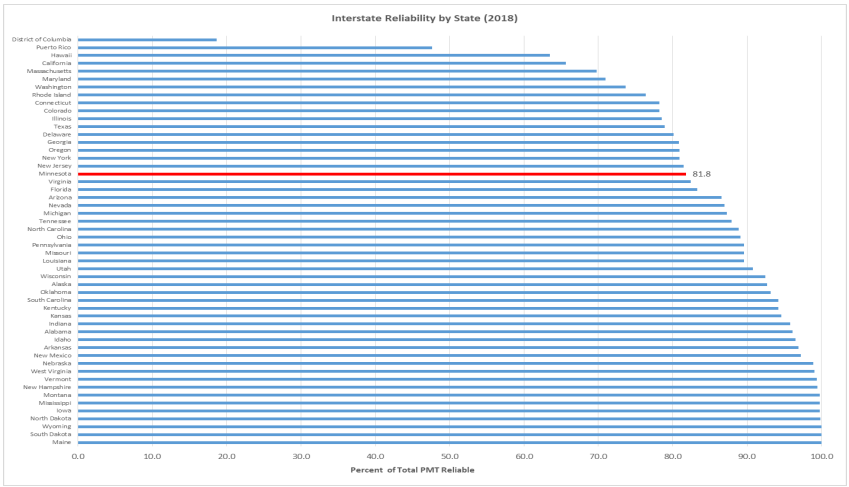




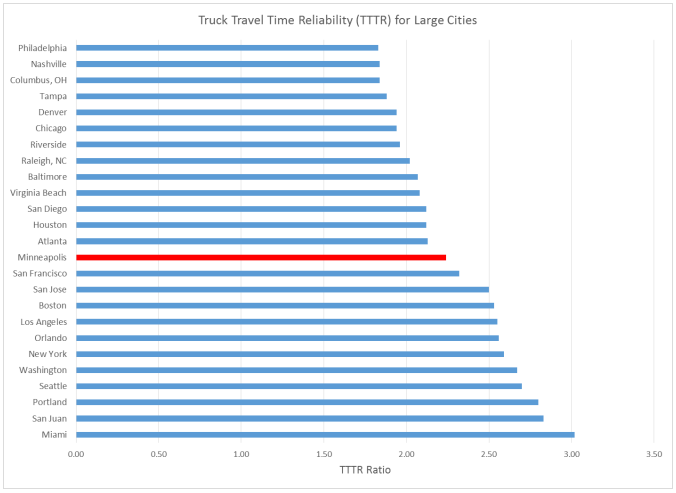
Intersection	route_nun	LOTTR_AN	TT_AMPS	TT_AMPR	LOTTR_MI	TT_MIDDS	TT_MIDDB	LOTTR_PN	TT_PMPS	TT_PMPB	LOTTR_WI	TT_WESB	TT_WEBB	lottr
12TH AVE/EXIT 3	494	1.04	48	50	1.07	49	53	1.23	64	79	1.11	49	54	1.23
MN-65/CENTRAL AVE/EXIT 38	694	2.62	59	154	1.09	55	60	2.32	67	155	1.05	53	56	2.62
RIVERSIDE AVE/EXIT 235	94	1.65	42	44	1.04	42	43	1.48	44	65	1.06	40	43	1.48
I-94	35	1.1	15	17	1.06	15	16	1.12	15	17	1.09	14	16	1.12
I-35E & I-35W JUNCTION (SOUTH)	35	1.06	13	14	1.03	13	14	1.06	13	14	1.07	13	14	1.07
US-169/EXIT 10	494	1.65	60	63	1.04	60	62	1.07	61	65	1.05	58	61	1.07
DOWLING AVE/EXIT 228	94	1.04	44	46	1.04	44	46	1.06	44	46	1.05	43	45	1.06
3RD ST/E 17TH ST/EXIT 17C	35	1.06	1	1	1.05	1	1	1.09	1	1	1.09	1	1	1.09
LARPENTEUR AVE/EXIT 110A	35	1.04	15	15	1.09	15	16	1.23	17	20	1.06	14	15	1.23
54TH AVE/EXIT 1	494	1.04	14	14	1.03	14	14	1.05	14	15	1.05	14	14	1.05
CR-17/FRANCE AVE/EXIT 6	494	1.75	51	89	1.08	48	52	2.03	53	107	1.07	46	49	2.03
CR-C/EXIT 115	35	1.06	86	91	1.06	86	90	1.06	85	90	1.07	81	87	1.07
108TH ST/EXIT 5	35	1.18	54	63	1.03	47	48	1.06	47	49	1.05	46	48	1.18
WHEELOCK PKWY/EXIT 110A	35	1.54	4	7	1.03	4	4	1.07	4	4	1.04	4	4	1.54
CR-61/PRAIRIE CENTER DR/EXIT 1	494	1.04	20	21	1.04	20	21	1.18	20	24	1.06	19	20	1.18
MN-36/52ND ST/EXIT 52	694	1.06	99	105	1.03	98	100	1.05	99	104	1.03	97	100	1.06
I-94/EXIT 38	494	1.12	48	52	1.3	50	65	1.22	52	63	1.17	48	56	1.3
CR-H/EXIT 28C	35	1.04	4	4	1.11	4	4	2.11	4	9	1.06	3	4	2.11
6TH ST/3 9TH ST/EXIT 9B	394	1.12	10	11	1.12	10	11	1.4	10	14	1.09	9	10	1.4
RIDGEDALE DR/EXIT 1C	394	1.09	14	15	1.06	14	15	1.06	14	15	1.06	13	14	1.09
94TH ST/EXIT 7A	35	1.04	24	25	1.04	24	25	1.85	26	48	1.04	24	25	1.85
XENIA AVE/PARK PLACE BLVD/EXIT 5	394	1.06	1	1	1.04	1	1	1.25	1	1	1.05	1	1	1.25
CR-10/EXIT 20B	35	1.21	25	35	1.03	26	27	1.06	26	28	1.06	25	26	1.21
60TH ST/EXIT 12A	35	1.08	0	0	1.03	0	0	1.08	0	0	1.05	0	0	1.08
CR-J/EXIT 76	35	1.02	26	27	1.02	26	26	1.03	26	27	1.03	26	27	1.03
KELLOGG BLVD/EXIT 106B	35	1.07	23	25	1.07	23	25	1.16	25	28	1.08	23	25	1.16
MARYLAND AVE/EXIT 109	35	1.04	28	30	1.08	29	31	1.77	33	57	1.06	27	29	1.77
I-494/EXIT 99	35	1.05	48	51	1.05	48	50	1.06	48	50	1.07	47	50	1.07
PENN AVE/EXIT 7	394	1.16	69	80	1.11	67	74	1.83	129	236	1.07	65	69	1.83
CR-19/EXIT 201	94	1.03	17	17	1.03	17	17	1.05	17	17	1.03	17	17	1.05
RICE--SCOTT COUNTY BORDER (WEBSTER)	35	1.02	1	1	1.03	1	1	1.02	1	1	1.03	1	1	1.03
HARDMAN AVE/EXIT 64	494	1.03	25	26	1.03	25	26	1.13	26	29	1.05	25	29	1.13
MN-252/EXIT 35	694	1.41	13	19	1.14	13	15	1.96	18	36	1.09	12	13	1.98
INWOOD AVE/EXIT 250	94	1.04	32	34	1.05	33	34	1.4	35	49	1.05	33	34	1.4

2018 Twin Cities ITTRM

Benchmarking State-Level Reliability



Truck Travel Time Reliability Measure (Large Cities)



DEPARTMENT OF TRANSPORTATION

Thank you!

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- This webinar covers transportation agency target setting for federal PM3 CMAQ measures, including policy, planning and performance considerations related to target setting.
- Topics will include decision analysis methods for setting targets, making CMAQ targets meaningful to the public, and target setting and related planning and programming challenges.
- When: August 26, 2020 2:00 EDT

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