Transportation Performance Management (TPM) Webinar Series

TPM Future Needs

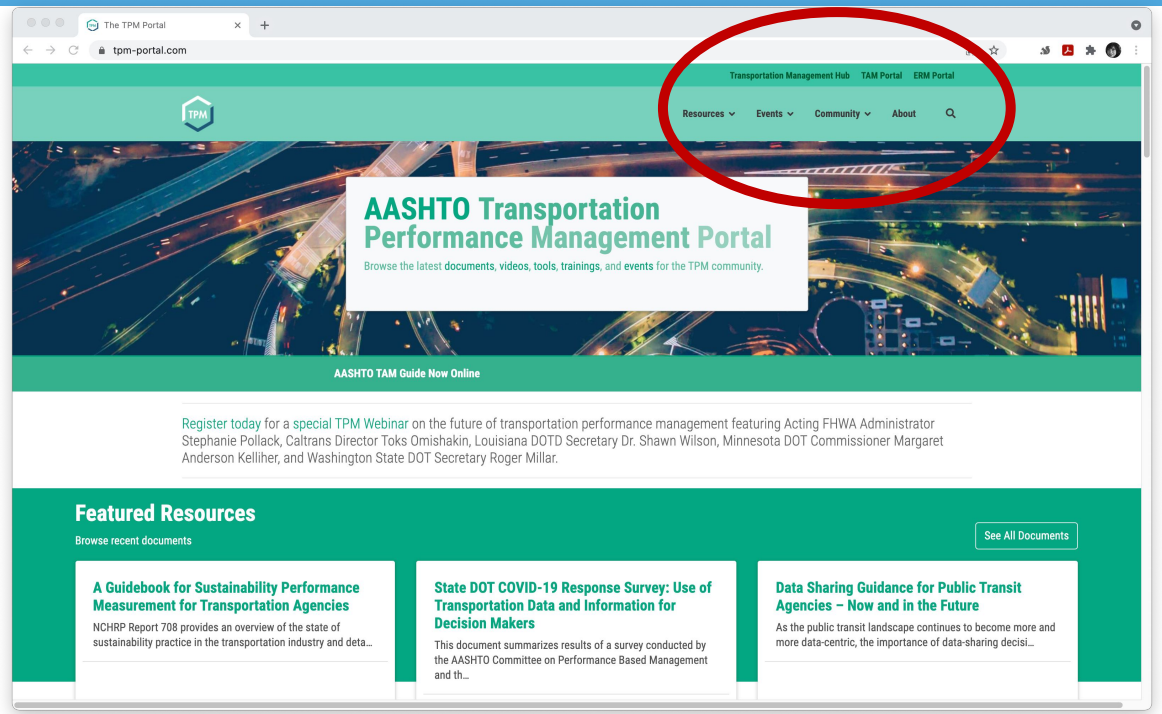
Sponsored by the TPM Pooled Fund
with support from AASHTO CPBM Leadership and FHWA

July 21, 2021

TPM Webinar 7

Transportation Performance Management Webinar Series

- Our TPM webinar series is held every two months, on topics such as communications, system performance management, data sources, and many more to come!
- Today is the 7th webinar in our bi-monthly series
- 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



Find us on the NEW AASHTO TPM Portal
https://www.tpm-portal.com

FHWA Welcome

Steve Gaj

Asset and Performance Management Team Lead, FHWA

Steven.Gaj@dot.gov

Webinar Agenda

2:00 **Webinar Welcome and Introduction**
Christos Xenophontos, Rhode Island DOT, Steve Gaj, FHWA
and Matt Hardy, AASHTO

2:05 **NCHRP 20-24(127) Performance Management Implementation Concerns, Issues and Challenges – Project Findings**
Hyun-A Park and Lori Richter, Spy Pond Partners

2:15 **FHWA – TPM Lessons Learned**
Pete Stephanos, FHWA

2:25 **Current Performance Measures: A Discussion**
Scott Zainhofsky, North Dakota DOT and Andrew Ludasi, New Jersey DOT

2:50 **Telling a Better Story**
Deanna Belden, Minnesota DOT and Karen Miller, Missouri DOT

3:15 **Q&A**
Hyun-A Park

3:25 **Closing Remarks and Charge**
Tim Henkel, Minnesota DOT

NCHRP 20-24(127) TPM Implementation Concerns, Issues and Challenges

Project Findings

Hyun-A Park & Lori Richter
Spy Pond Partners, LLC
hpark@spypondpartners.com
lrichter@spypondpartners.com

TPM

U.S. Department of Transportation Federal Highway Administration

AASHTO The Voice of Transportation

Research Objectives

Document TPM implementation concerns, issues and challenges

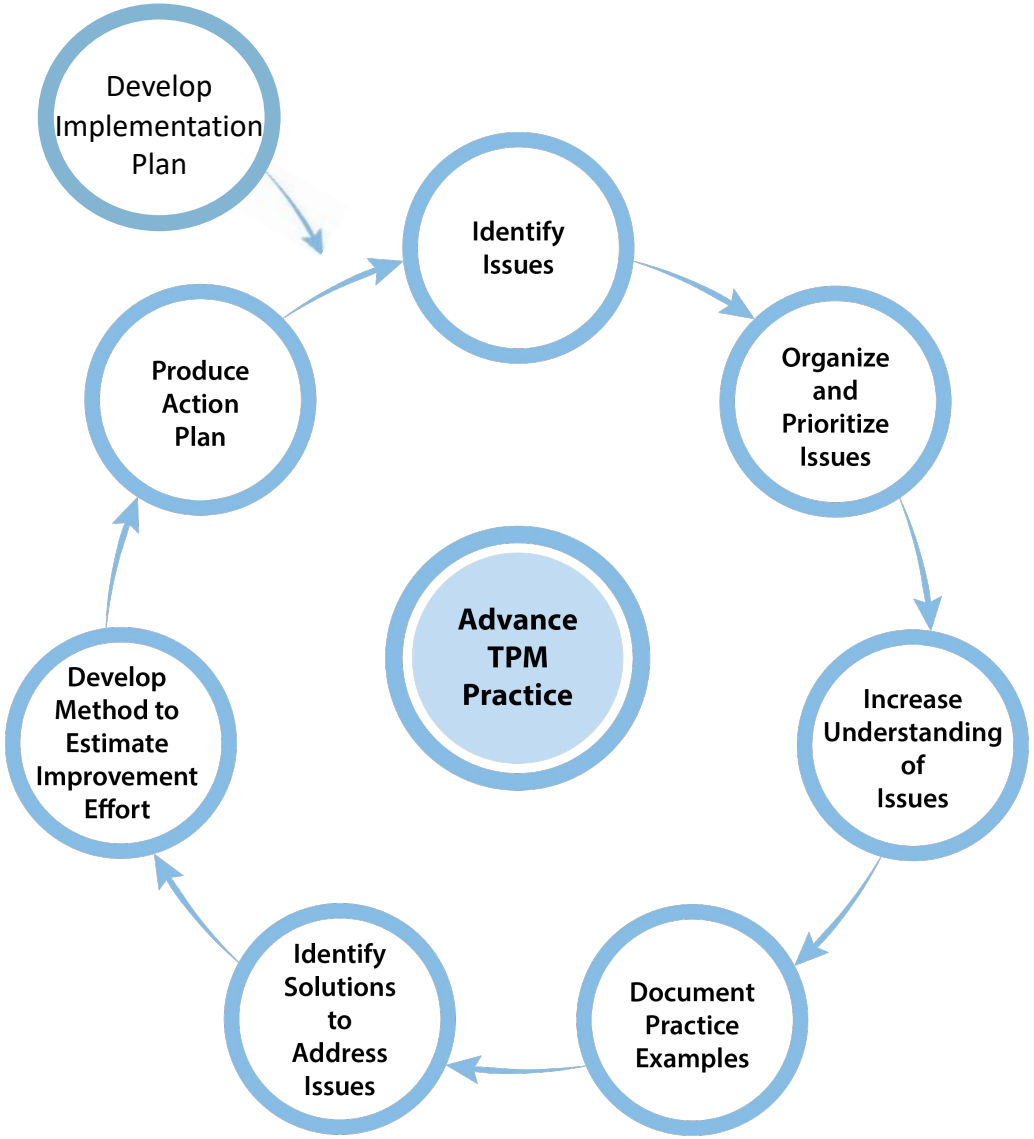
- Prioritized list of concerns, issues and challenges
- Linked to specific examples

Provide a framework for more systematic assessment of implementation cost

- Realistic proposals to address, mitigate, or eliminate
- Framework agencies may use to develop estimates of their implementation levels of effort
- Possible next steps and action items

Develop an implementation plan

- Updates based on COVID (if needed)
- Transition to CPBM
- Review process



Information Gathering and Synthesis

- Literature Review
- FHWA Survey Data
- Federal Reporting Comments
- Interviews
- Review Sessions

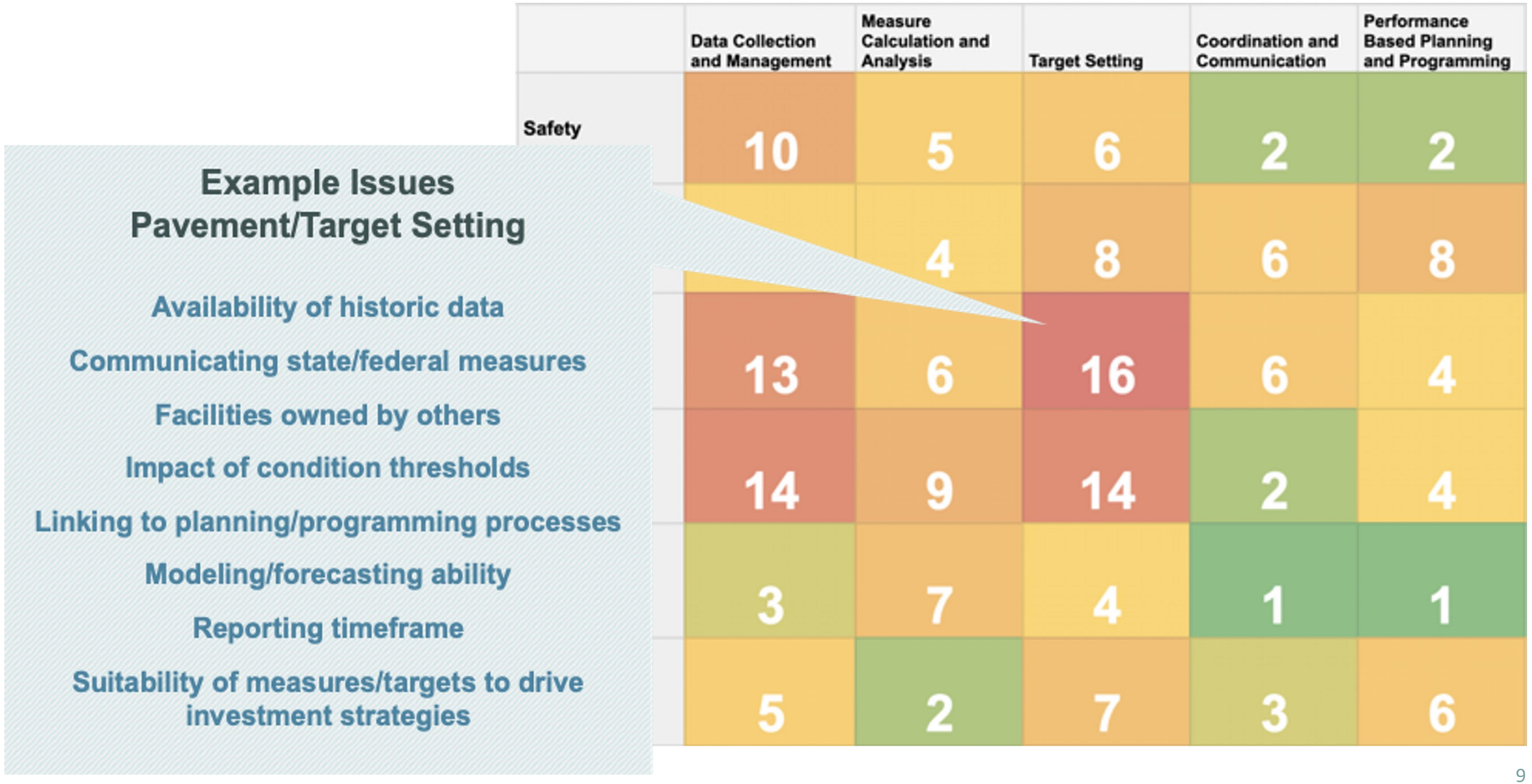
1. **Capture Themes and Context**
   - Clarify Scope and Focus
   - Outline Key Findings
2. **Identify Issues and Challenges**
   - Document TPM Issues and Challenges
   - Track Index of Issues
3. **Organize and Integrate**
   - Group and Sort Issues
   - Synthesize Issues

Information Gathering and Review Findings

TPM Implementation Challenges
by TPM process
and TPM area
Count of Issues and Challenges in PM1, PM2, PM3 submittals
(basis for target commentary)

	Data Collection and Management	Measure Calculation and Analysis	Target Setting	Coordination and Communication	Performance Based Planning and Programming
Safety	10	5	6	2	2
Bridge	4	4	8	6	8
Pavement	13	6	16	6	4
System Performance	14	9	14	2	4
Freight	3	7	4	1	1
Emissions	5	2	7	3	6

Information Gathering and Review Findings



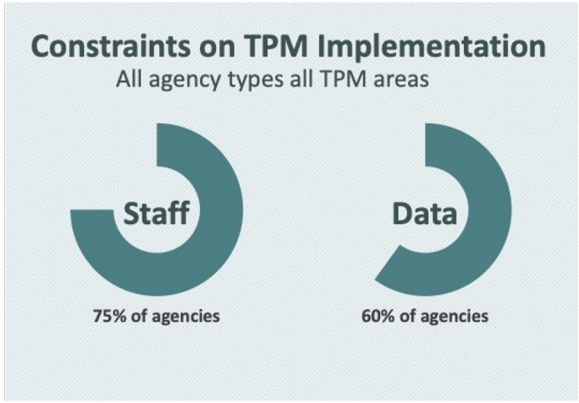
	Data Collection and Management	Measure Calculation and Analysis	Target Setting	Coordination and Communication	Performance Based Planning and Programming
Safety	10	5	6	2	2
	4	8	6	8	
	13	6	16	6	4
	14	9	14	2	4
	3	7	4	1	1
	5	2	7	3	6

Information Gathering and Review Findings

TPM Implementation Challenges
by Agency Type and TPM area

Survey data – National TPM Implementation Review

TPM Area	State DOTs	Large MPOs	Med. MPOs	Small MPOs
Highway Safety		Least challenging	Least challenging	Least challenging
Bridge	Least challenging			
Pavement				
System Performance	Most challenging			
Freight			Most challenging	Most challenging
Emissions				
Transit SOGR		Most challenging		



Lack of Availability and Quality of Data Sets for National Performance Measures

- New collection requirements
- Gaps in baseline and historical data
- Issues with the timeliness, consistency and coordination of data
- Reliance on partner agencies for provision of data and analytics

"Having inconsistent data (e.g. NPRMDS changing with a new contract) makes it challenging to set meaningful targets with little history to review."

"Lack of national data for some measures is a challenge for transportation agencies who do not own the assets, as well as for MPOs who have to rely on State DOTs to provide data."

– Agency Interviews

Challenges with Using National Measures to Support Agency Decision-Making

- Communicating how state-based and national performance measures relate to each other
- Difference between state-based measures used for meeting agency and regional goals and those used for national goals.
- Complex, abstract and broad measures are confusing to technical and non-technical audiences.
- Lack of experience and limited capability with forecasting and modeling.

"Peak hour delay (10-hr delay per capita) is meaningless, complicated to explain, not how users experience it."

– Agency Interviews

Not Able to Integrate with Agency Business Processes and Practices

- TPM must be resourced in addition to other activities.
- Timing of project/program development timeframes does not support efficient and effective performance-based planning practices.
- Calendars are not aligned or practical for target-setting.
- External communication and coordination is inconsistent.

"Safety set over a year in August; PM2 over every 2 years; PM3 over every 2 years; Transit asset management every year in October; Many different TPM requirements that are not associated with each other."

— Agency Interviews

Need Alignment of Reporting and Management Responsibilities

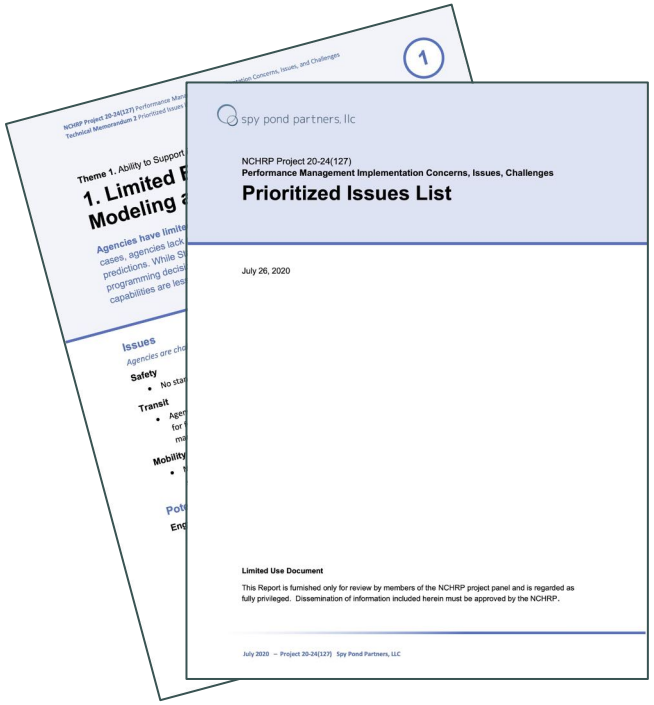
- Challenges coordinating with owners.
- Control of investment decisions.

"Huge challenge being a bi-state MPO as not each state shares data, has similar information available, similar tools, same level of analysis or the SMEs (subject matter experts) to help us understand their data."

– Agency Interviews

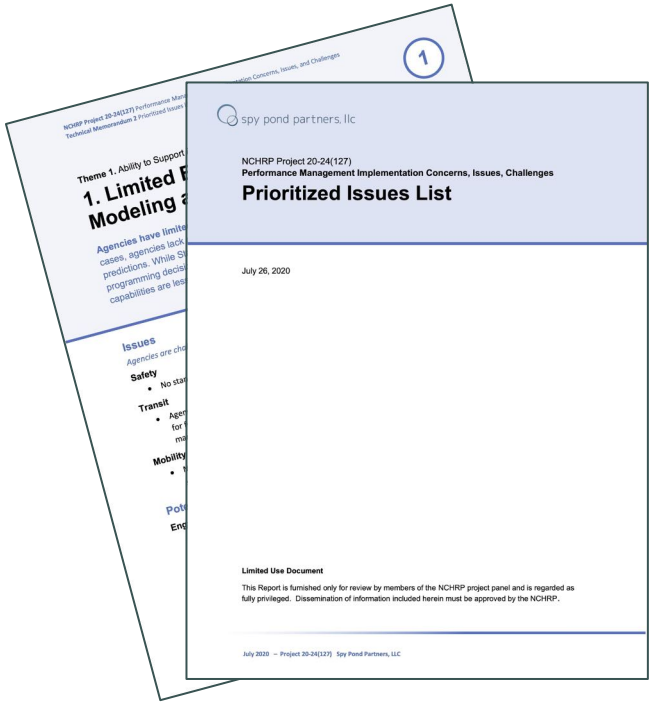
Summary of Tier 1 Issues – Most Critical

- Resourcing TPM
- Communicating National vs. State Measures
- Control of Investment Decisions
- Coordination with Other Owners
- Limited Experience Modeling and Forecasting
- Timing of Project/Program Development Timeframe
- External Communication and Coordination



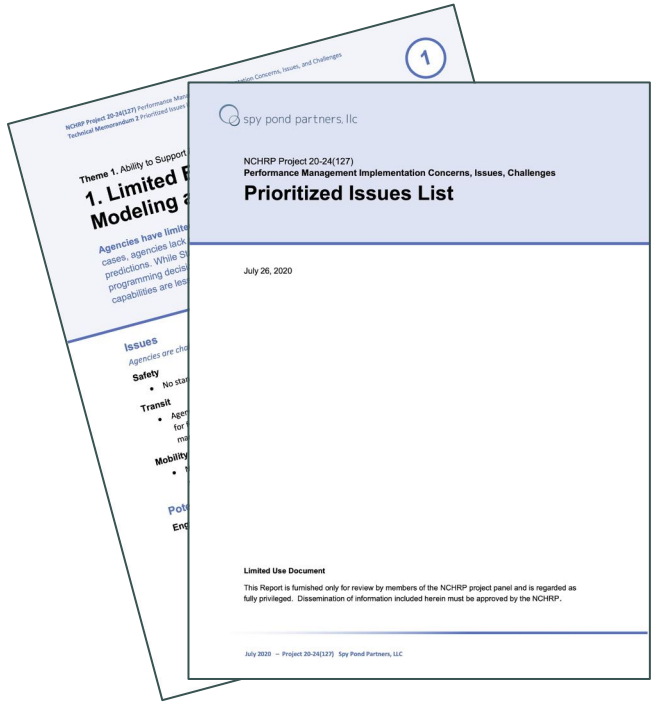
Summary of Tier 2 Issues – Critical

- New Collection Requirement
- Ability to Quantify Impacts and Outcomes
- Suitability to Drive Investments
- Internal Communication and Coordination
- Alignment of State and Federal Calendars



Summary of Tier 3 Issues – Lower Criticality

- Accommodating Incomplete Baseline and Historic Data
- Differences from Established Datasets
- Pressure to Set Extremely Pessimistic Targets
- Reliance on Partners' Resources, Tools, and Knowledge
- Reliance on Thresholds
- Availability of Standard Datasets
- Impact of Data Quality Issues



Action Planning and Implementation

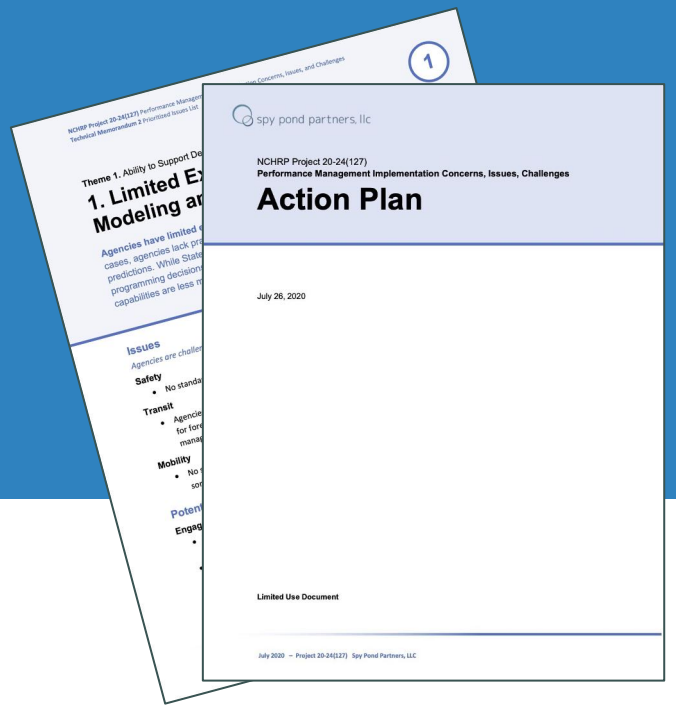
Potential Mitigation Actions

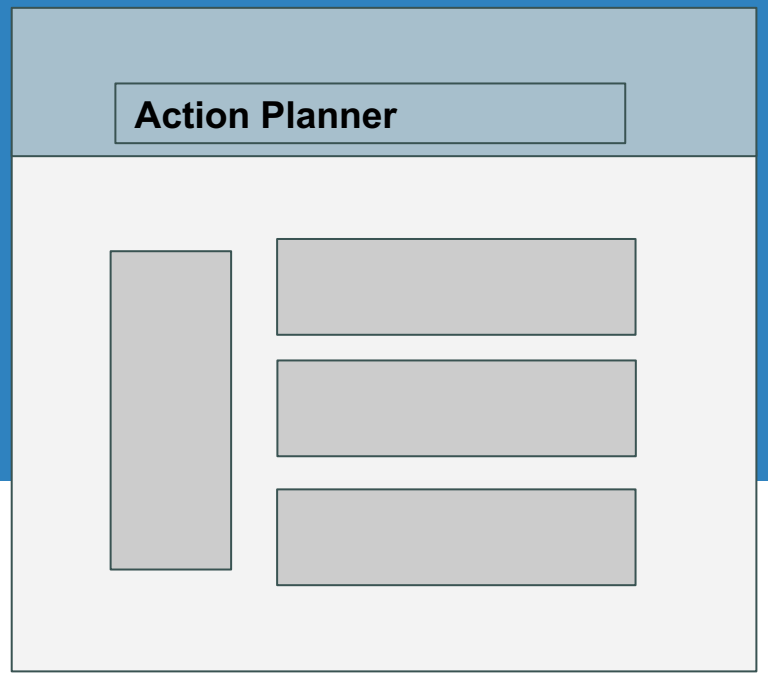
- Engagement
- Guidance
- Research
- Training
- Policy
- Data

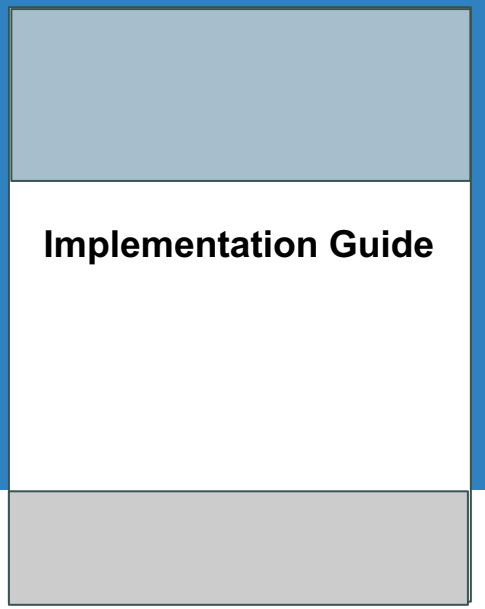
Example – Resourcing TPM

Mitigation Approach	Responsible	Key Stakeholders	Additional Data or Information Needed	Analytical Complexity	Barriers	Potential for Improving TPM Results
Engagement						
1. Develop a peer exchange or similar forum for sharing information on the efficient and effective resourcing of TPM.	AASHTO, FHWA, TPM Pooled Fund	state DOTs MPOs	Stakeholder input on topics	Low	a. Participation b. Funding c. Sponsorship	Medium
2. Continue promoting to the TPM community the existing tools to streamline TPM implementation, including the *TPM Benchmarking Tool* , *TPM Toolbox* and *Communicating Performance Website* .	TPM Pooled Fund	state DOTs MPOs	None	Low	None	High
Guidance						
1. Develop templates and job aids to facilitate carrying out TPM activities, including practitioner examples that agencies have found useful.	AASHTO, FHWA	state DOTs MPOs	Good State Examples	Medium	a. Availability of examples	High
2. Provide guidance on developing data business plans to streamline processes and optimize resourcing for TPM.	AASHTO, FHWA, TPM Pooled Fund	state DOTs MPOs	Data Business Plan Research inputs	Low	a. Availability of existing guidance b. Mechanism to put into action	Medium
Training						
1. Develop technical training and webinars specific to TPM					a. Availability of	

Key Products







Action Plan – Print

- Prioritized issues
- Defined mitigation actions
- Defined LoE framework

Action Plan – Web

- Prioritized issues
- Linked mitigation actions
- Applied estimation tool

Implementation Guide

- Action Plan User Guide
- CPBM Implementation Plan
- Maintenance Plan

FHWA TPM Lessons Learned

Pete Stephanos
Director, Office of Stewardship, Oversight, and Management
Acting Chief Strategy Officer, FHWA
peter.stephanos@dot.gov

Current Performance Measures: A Discussion

Scott Zainhofsky

Planning/Asset Management Division Engineer, North Dakota DOT

szainhofsky@nd.gov

Andrew Ludasi

Principal Engineer, Office of Freight Planning, New Jersey DOT

Andrew.Ludasi@dot.nj.gov

TPM

U.S. Department of Transportation Federal Highway Administration

AASHTO The Voice of Transportation

❖Keys to Success, today

- ❑ This is NOT a lecture – Please participate
- ❑ Let's be productive
  - ➢ We need all our partners working together
- ❑ Acknowledge there is a need to tell a national story
  - ➢ Deanna and Karen will cover, later
- ❑ Let's discuss:
  - ➢ How do we use the current federal measures?

WHAT STATES DO:

- All develop long-range & modal plans
  - Including substantial stakeholder input
  - ID strategic goals, important to local customers

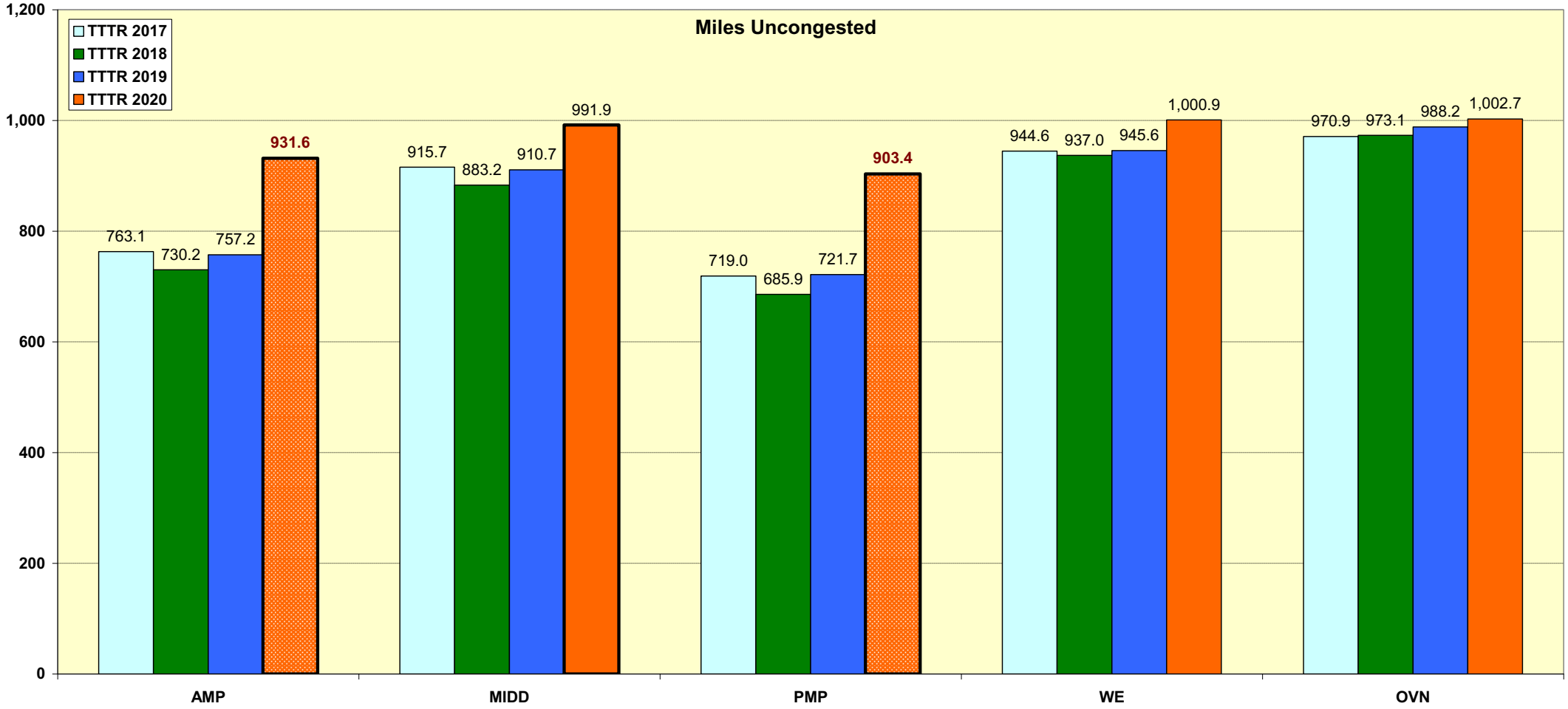
- All manage an integrated system that is much larger than the NHS
  - PM2 & PM3 measures only cover the NHS
  - In rural states like ND, NPMRDS dataset doesn't even cover most of the NHS.

VISION ZERO
Zero fatalities. Zero excuses.

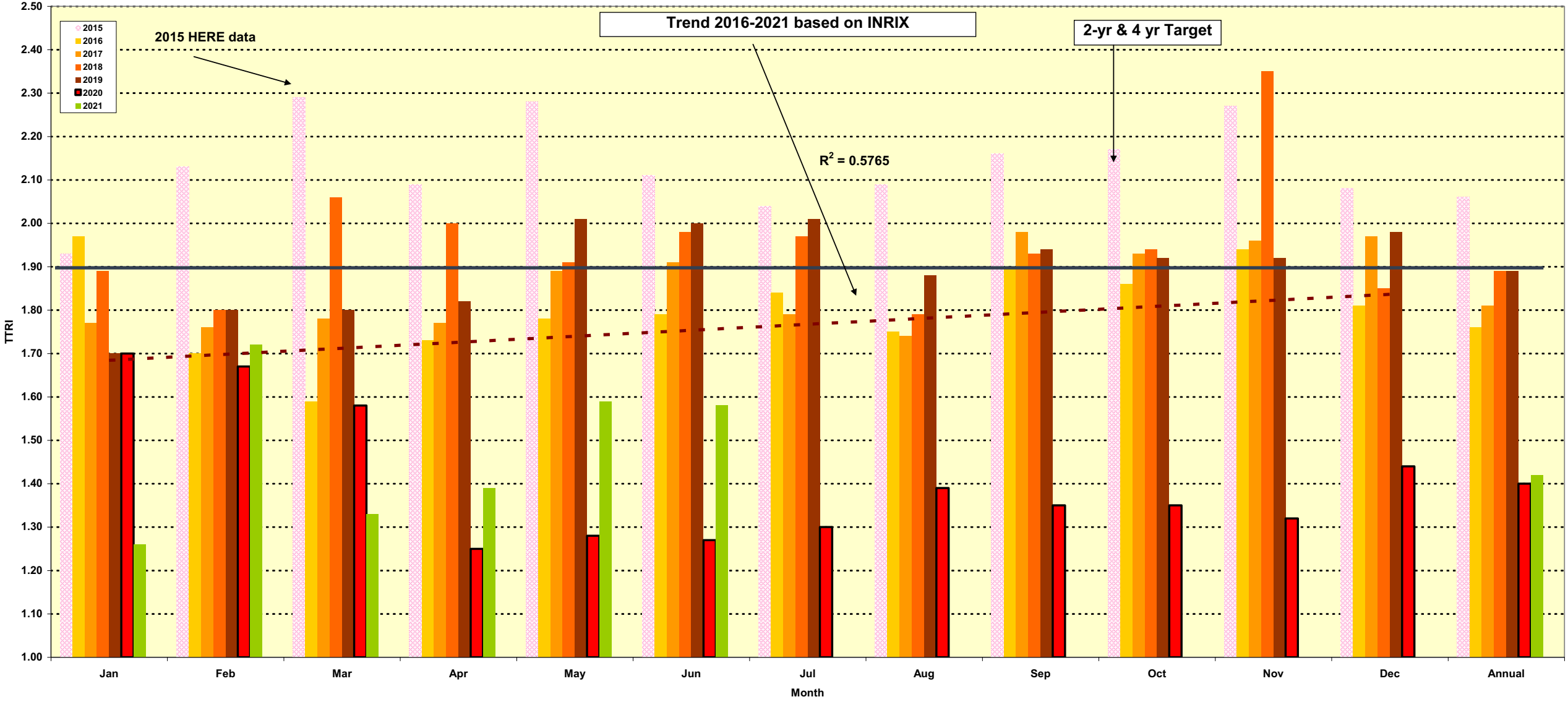
NORTH Dakota | Transportation
Be Legendary.

NPMRDS

- **Source of data changed from HERE to Inrix in 2016; *initial* target setting based on 2017 & 2018**
  - ❑ **TMC count (number of road segments) changes year-on-year, while road network has very few or no changes**
  - ❑ **Takes no account of construction or non-recurring congestion when Performance Measure emphasis is on regular congestion**
  - ❑ **Truck traffic peaks mid day between the rush hours even if some trucks are in rush hour congestion**
  - ❑ **Therefore the time of day in which the worst congestion occurs skews the overall result and is not normalized for volume**



Month on Month TTTRI as used for targets



TTTRI 2015-2020

- **Changes in number of segments and total miles year on year.**
- **The %age of of congested segments varies year on year.**
- **Segments showing congestion overnight increased as part of the whole, while all congestion was down significantly in 2020, along with overall volume; truck volume was down only April-June and to a much lesser degree.**

			TTTR 2017					
			AMP	MIDD	PMP	WE	OVN	TTTRI
Segments	1,166	Segments Uncongested	797	1015	717	1060	1105	514
		Segments Congested	369	151	449	106	61	652
Total Miles	998.5	Miles Uncongested	763.1	915.7	719.0	944.6	970.9	563.9
		% Uncongested	76.4%	91.7%	72.0%	94.6%	97.2%	56.5%
		TTRI from time period	373	56	494	151	92	
		% of TTRI from TOD	32.0%	4.8%	42.4%	13.0%	7.9%	**1.81**

			TTTR 2018					
			AMP	MIDD	PMP	WE	OVN	TTTRI
Segments	1,213	Segments Uncongested	777	993	716	1,091	1,153	504
		Segments Congested	436	220	497	122	60	709
Total Miles	994.8	Miles Uncongested	730.2	883.2	685.9	937.0	973.1	529.5
		% Uncongested	73.4%	88.8%	68.9%	94.2%	97.8%	53.2%
		TTRI from time period	345	83	649	77	59	
		% of TTRI from TOD	28.4%	6.8%	53.5%	6.3%	4.9%	**1.89**

			TTTR 2019					
			AMP	MIDD	PMP	WE	OVN	TTTRI
Segments	1,433	Segments Uncongested	913	1,138	838	1,224	1,295	619
		Segments Congested	520	295	595	209	138	814
Total Miles	1,019.7	Miles Uncongested	757.2	910.7	721.7	945.6	988.2	570.8
		% Uncongested	74.3%	89.3%	70.8%	92.7%	96.9%	56.0%
		TTRI from time period	388	84	685	107	151	
		% of TTRI from TOD	27.1%	5.9%	47.8%	7.5%	10.5%	**1.89**

			TTTR 2020					
			AMP	MIDD	PMP	WE	OVN	TTTRI
Segments	1,390	Segments Uncongested	1,198	1,297	1,132	1,306	1,327	1,024
		Segments Congested	192	93	258	84	63	366
Total Miles	1,020.8	Miles Uncongested	931.6	991.9	903.4	1,000.9	1,002.7	838.6
		% Uncongested	91.3%	97.2%	88.5%	98.1%	98.2%	82.2%
		TTRI from time period	331	38	619	109	288	
		% of TTRI from TOD	23.8%	2.7%	44.5%	7.8%	20.7%	**1.40**

	Here	Inrix							
Month	***2015***	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**Avg**	**Avg ~ COVID**
Jan	*1.93*	1.97	1.77	1.89	1.70	1.70	1.26	1.72	1.72
Feb	*2.13*	1.70	1.76	1.80	1.80	1.67	1.72	1.74	1.74
Mar	*2.29*	1.59	1.78	2.06	1.80	1.58	1.33	1.69	1.71
Apr	*2.09*	1.73	1.77	2.00	1.82	1.25	1.39	1.66	1.74
May	*2.28*	1.78	1.89	1.91	2.01	1.28	1.59	1.74	1.84
Jun	*2.11*	1.79	1.91	1.98	2.00	1.27	1.58	1.76	1.85
Jul	*2.04*	1.84	1.79	1.97	2.01	1.30		1.78	1.90
Aug	*2.09*	1.75	1.74	1.79	1.88	1.39		1.71	1.79
Sep	*2.16*	1.90	1.98	1.93	1.94	1.35		1.82	1.82
Oct	*2.17*	1.86	1.93	1.94	1.92	1.35		1.80	1.80
Nov	*2.27*	1.94	1.96	2.35	1.92	1.32		1.90	1.90
Dec	*2.08*	1.81	1.97	1.85	1.98	1.44		1.81	1.81
Annual	***2.06***	**1.76**	**1.81**	**1.89**	**1.89**	**1.40**	**1.42**		

TTTRI 2021 Jan-June

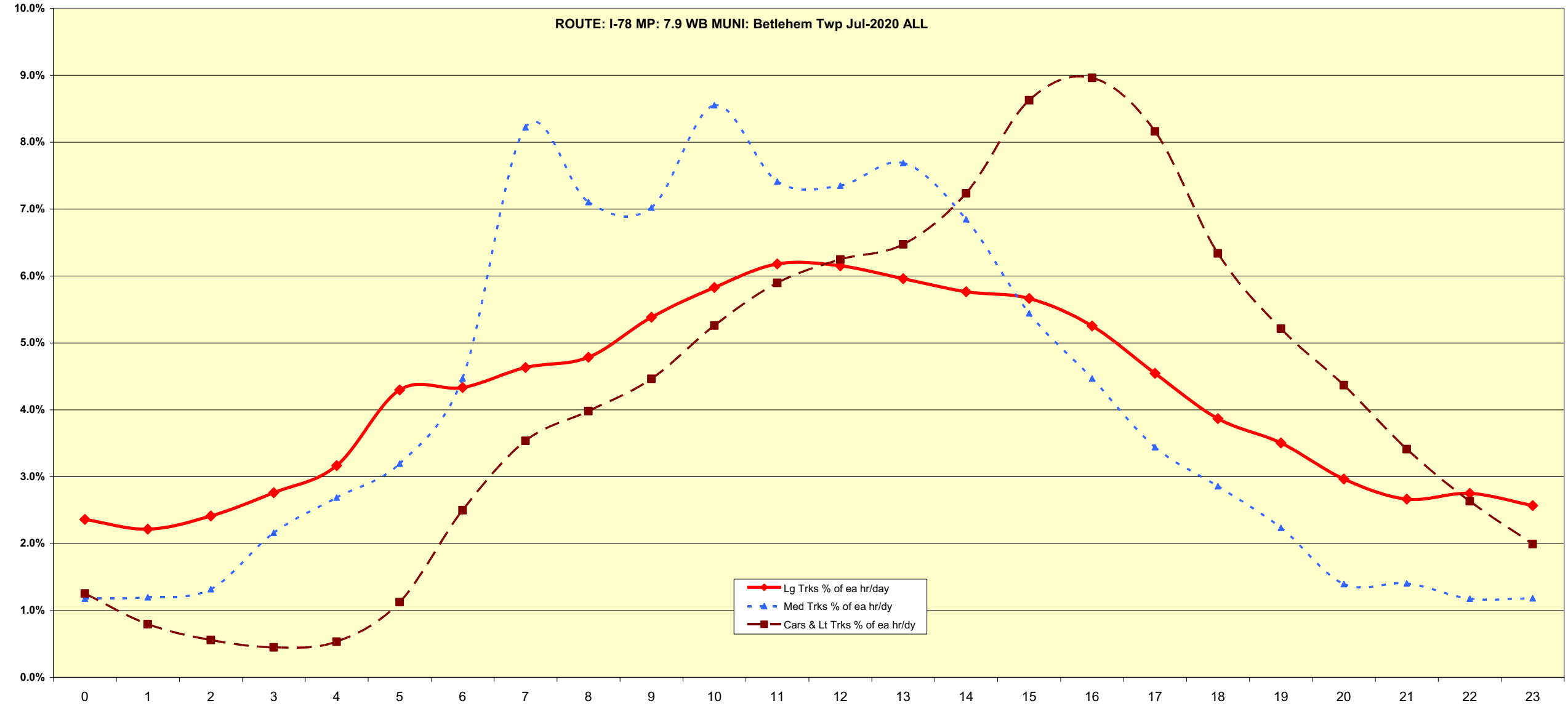
Recall: **FHWA definition of congested is TTTRI > 1.5**

Most segments are uncongested midday and overnight, BUT overnight also accounts for disproportionate number of segments as having the worst TTTRI, most of which are *un*congested

			TTTR 2021					
			AMP	MIDD	PMP	WE	OVN	TTTRI
Segments	1,390	Segments Uncongested	1,281	1,216	1,129	1,265	1,328	1,069
		Segments Congested	109	174	261	125	62	321
Total Miles	1,020.8	Miles Uncongested	983.2	953.4	902.2	979.1	1,004.3	872.8
		% Uncongested	96.3%	93.4%	88.4%	95.9%	98.4%	85.5%
		TTTRI from time period	104	74	539	237	430	
		% of TTRI from TOD	7.5%	5.3%	38.8%	17.1%	30.9%	**1.42**
		Period TTTRI	1.19	1.23	1.32	1.25	1.19	
		Max TTTRI	11.17	7.65	9.75	12.22	6.86	
		Median TTTRI	1.13	1.15	1.19	1.17	1.17	
		Min TTTRI	1.04	1.04	1.05	1.06	1.06	
		Median TTTRI congested	1.98	2.06	2.23	2.13	1.99	
		Median TTTRI uncongested	1.13	1.14	1.16	1.16	1.17	
		How many worst TTTRI uncongested	82	42	357	183	405	
			7.7%	3.9%	33.4%	17.1%	37.9%	

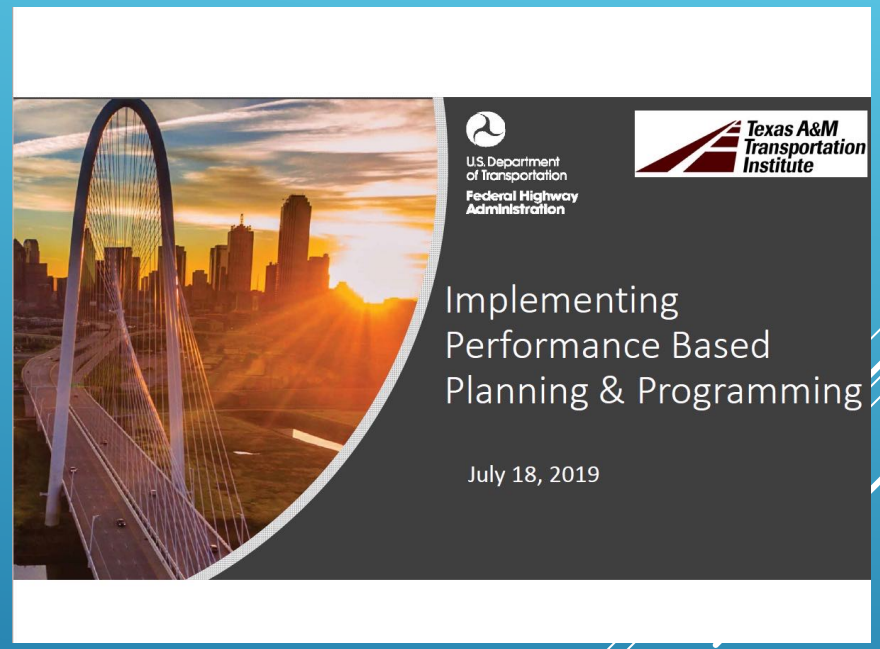
Example of truck volume by time of day

shows need to normalize TTTRI to reflect volume



IT'S ABOUT INTEGRATED PBPP

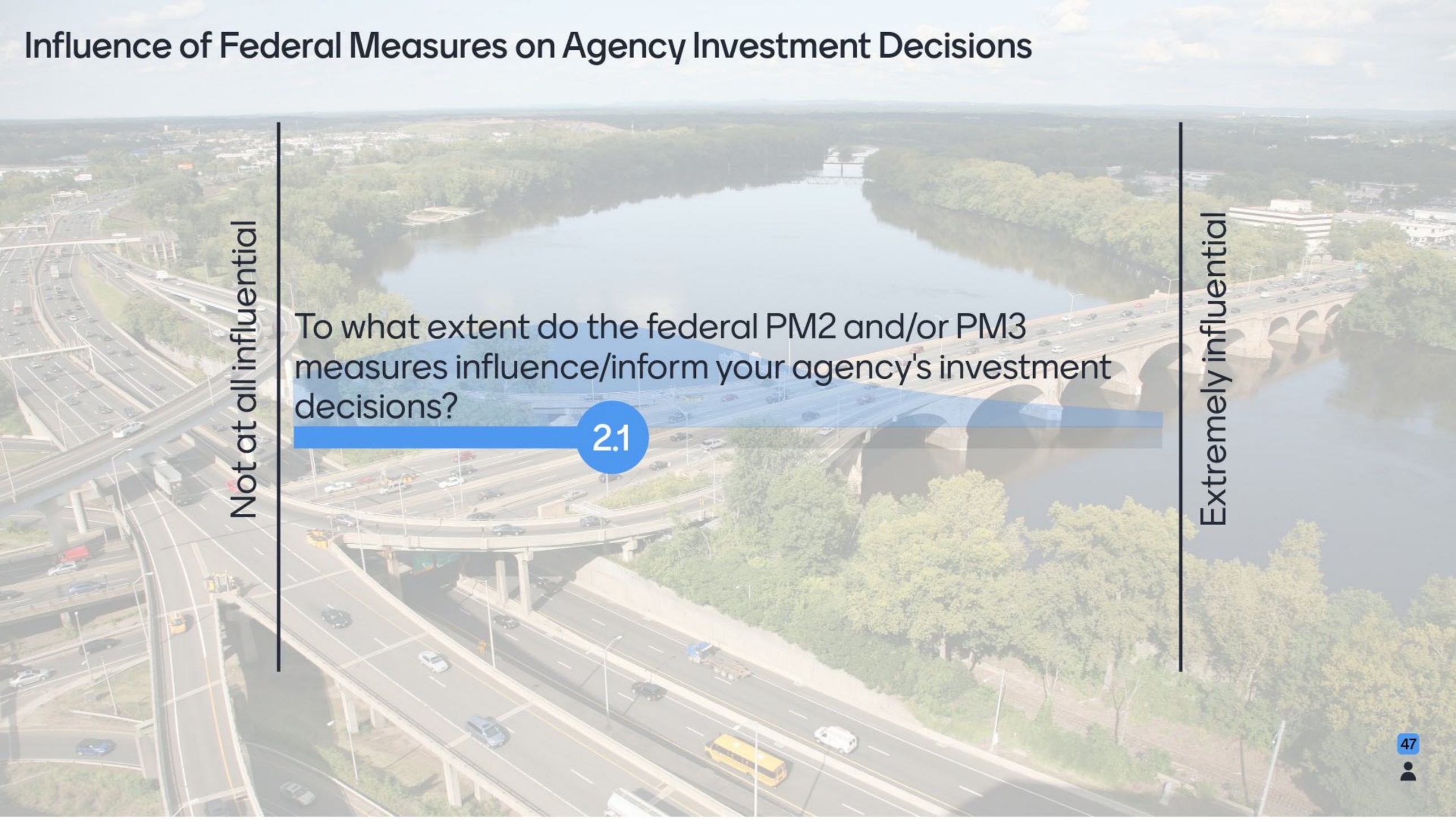
- Federally-required LRTP ID's goals
- States should & do use those goals to guide investments on their WHOLE system
  - States must have an integrated process for that whole system.
  - That process doesn't need to be dictated but must be acknowledged as needed.



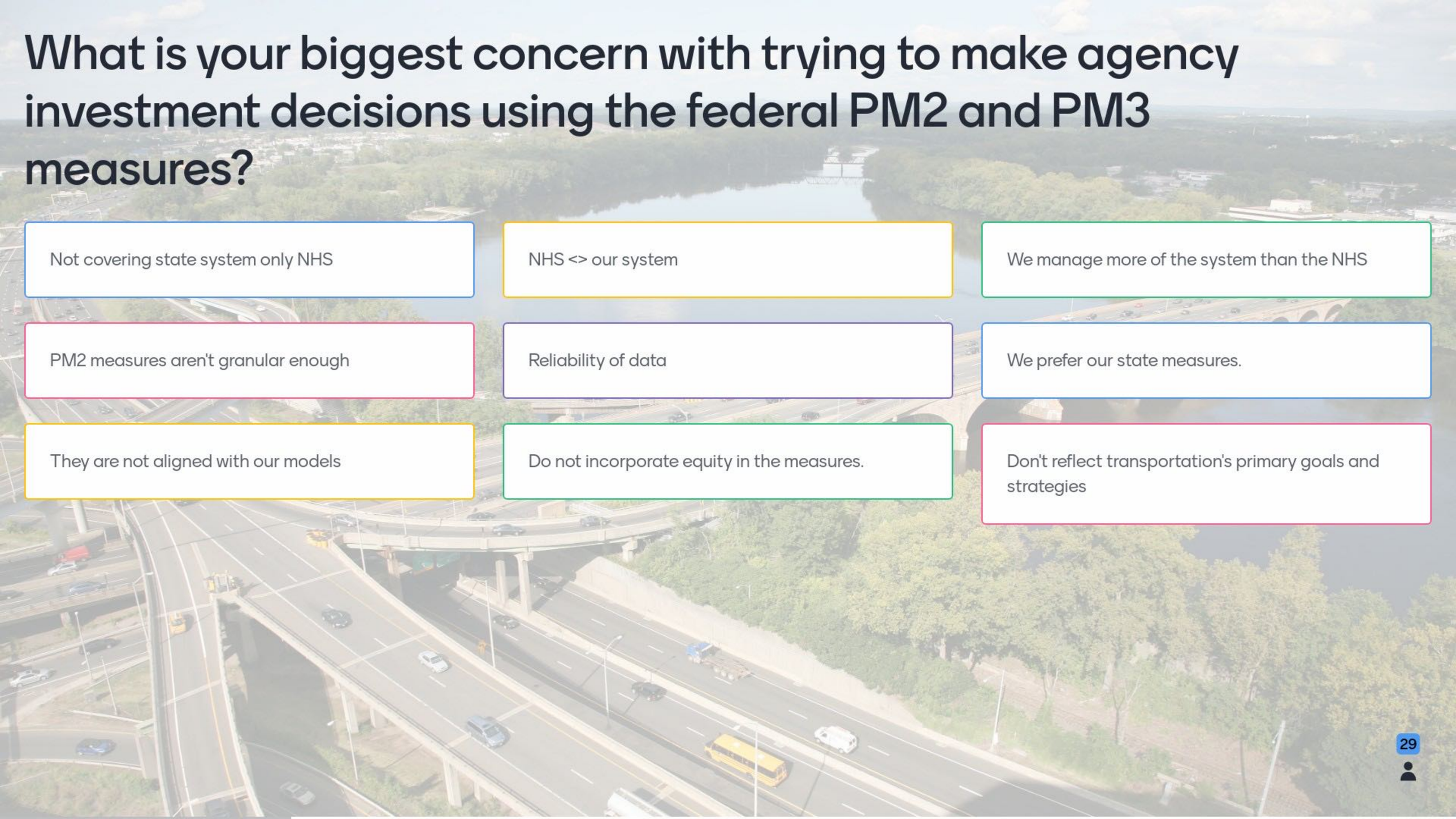
BOTTOM LINE:

As long as states are using PBPP processes,
federal performance measures
can just tell the
national story

Influence of Federal Measures on Agency Investment Decisions



What is your biggest concern with trying to make agency investment decisions using the federal PM2 and PM3 measures?



Not covering state system only NHS

NHS <> our system

We manage more of the system than the NHS

PM2 measures aren't granular enough

Reliability of data

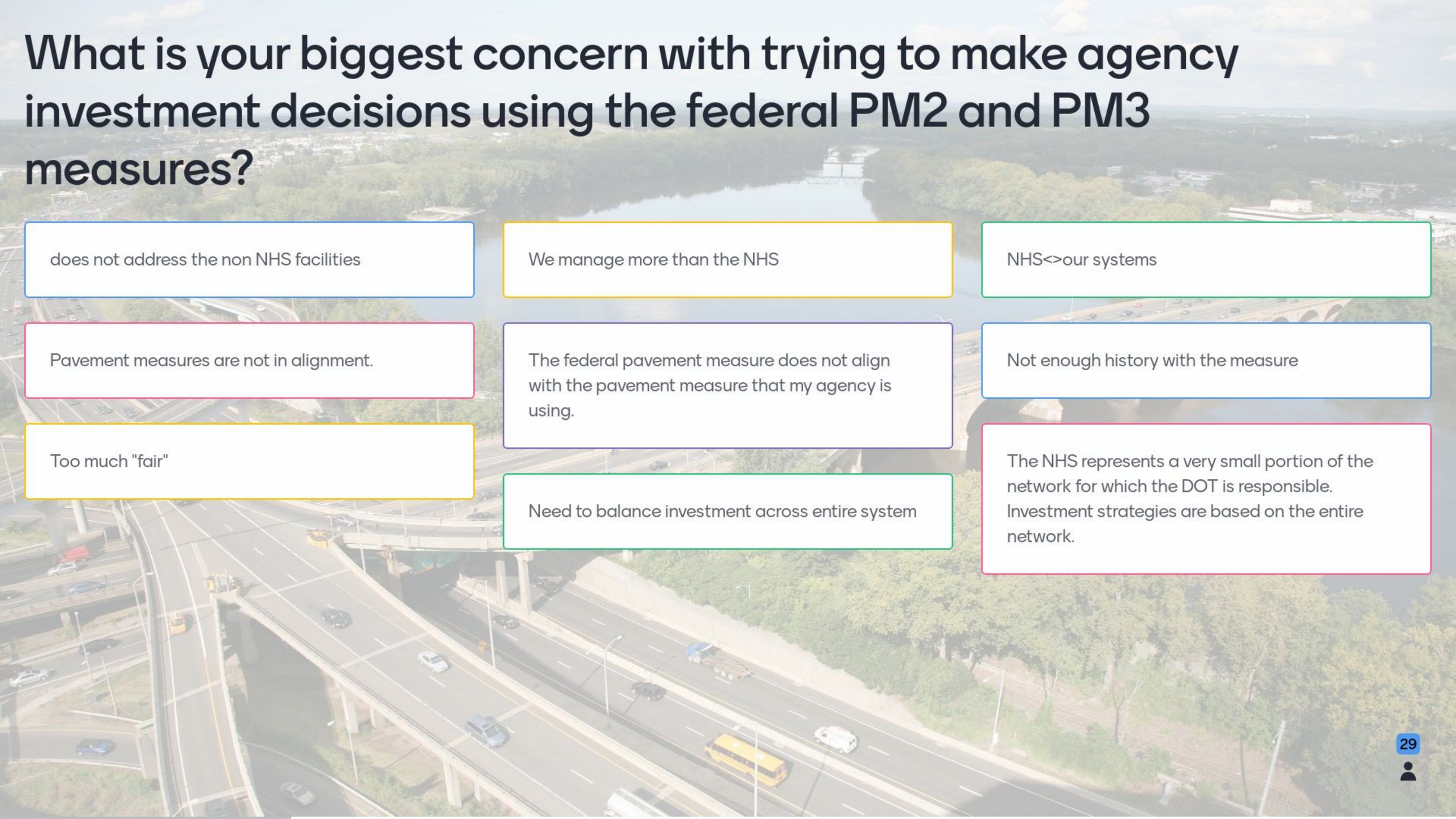
We prefer our state measures.

They are not aligned with our models

Do not incorporate equity in the measures.

Don't reflect transportation's primary goals and strategies

What is your biggest concern with trying to make agency investment decisions using the federal PM2 and PM3 measures?



does not address the non NHS facilities

We manage more than the NHS

NHS<>our systems

Pavement measures are not in alignment.

The federal pavement measure does not align with the pavement measure that my agency is using.

Not enough history with the measure

Too much "fair"

Need to balance investment across entire system

The NHS represents a very small portion of the network for which the DOT is responsible. Investment strategies are based on the entire network.

What is your biggest concern with trying to make agency investment decisions using the federal PM2 and PM3 measures?

PM3: Not clear that these measures correlate to congestion or are important

Larger system than NHS

The pavement condition collected by the state DOT using IRI + metrics don't align with PCI from local agencies on locally owned NHS

reliability of the analysisreliability of the data visualization

Federal good/fair/poor measures are only concerned with failing pavements.

not entirely reliable data

Responsible for assets outside our control that are on the NHS

Pavement measure does not always adequately represent distress - issue for managing pavement condition and messaging

Communicating with other owners to get PM2 info

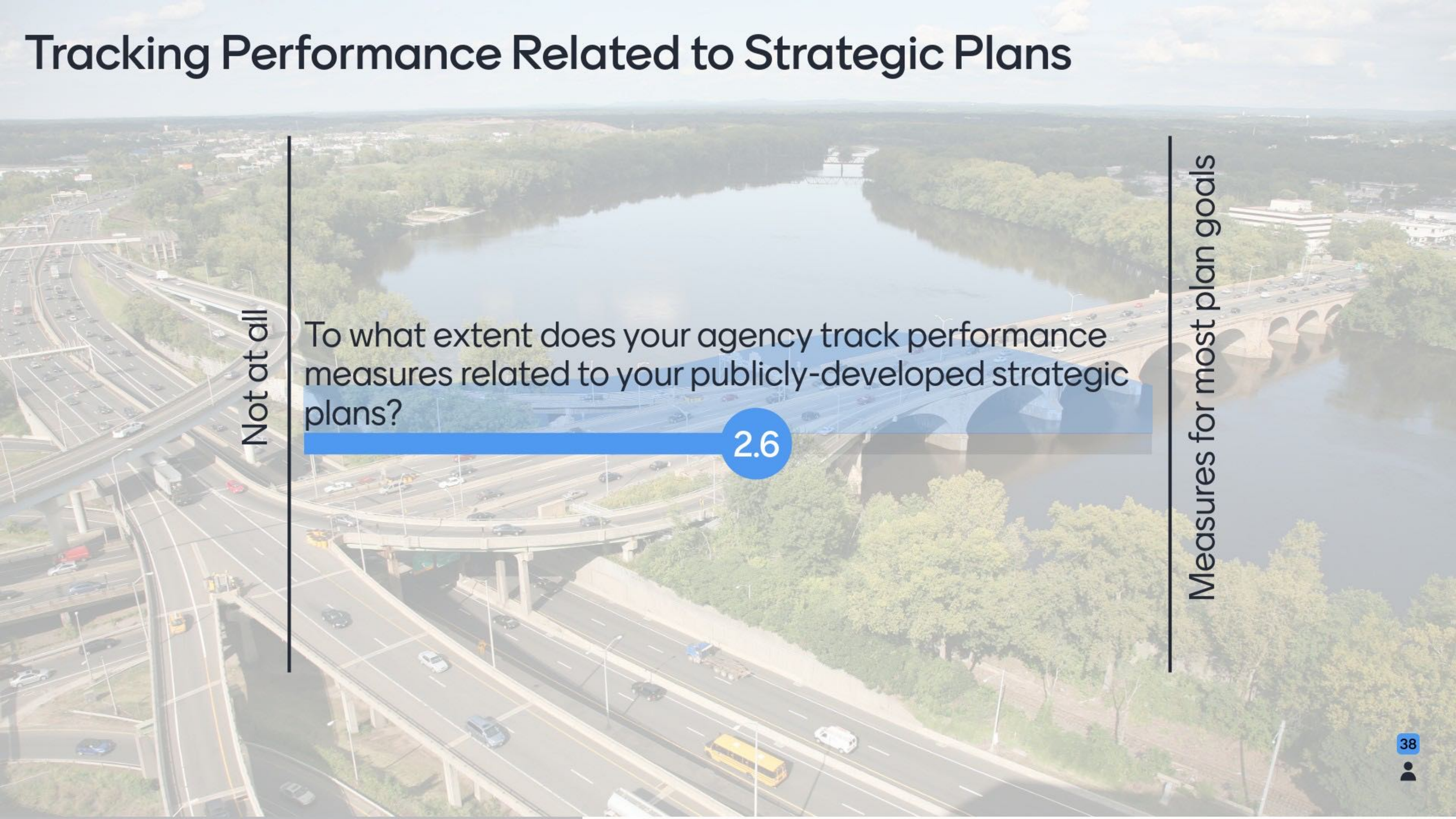
What is your biggest concern with trying to make agency investment decisions using the federal PM2 and PM3 measures?

Bridges, a small number of large bridges by sq ft have outweighed influence

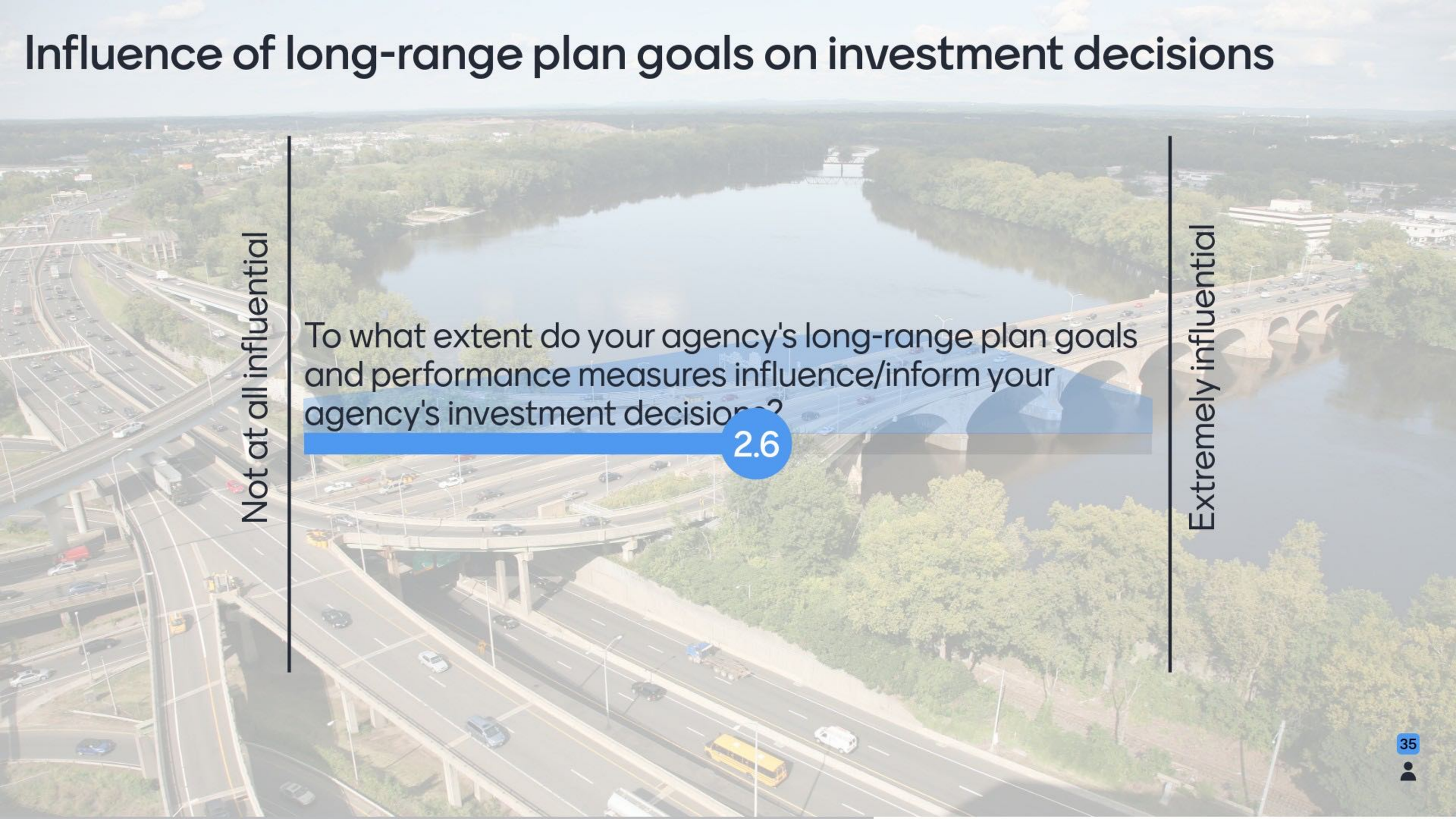
Too confined to NHS, manage entire state systemToo short term to influence longer term investment decisions

29

Tracking Performance Related to Strategic Plans



Influence of long-range plan goals on investment decisions



Telling a Better Story

Deanna Belden

Director of Performance, Risk & Investment Analysis, Minnesota DOT

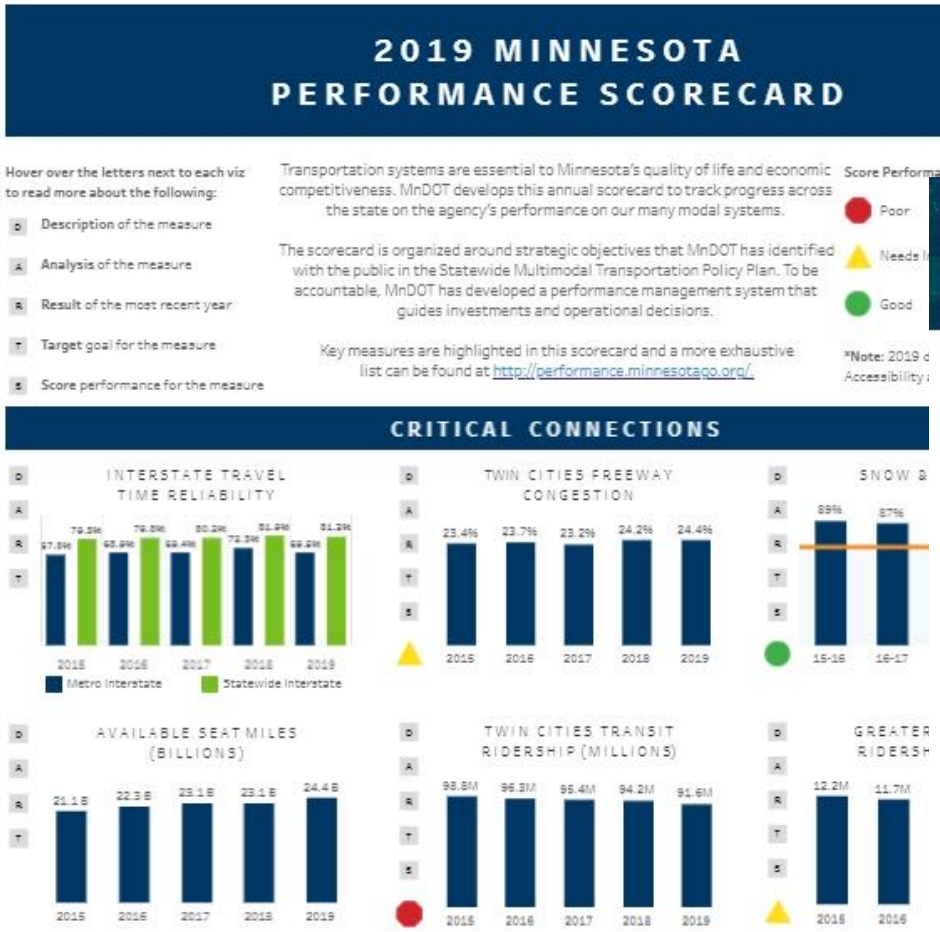
deanna.belden@state.mn.us

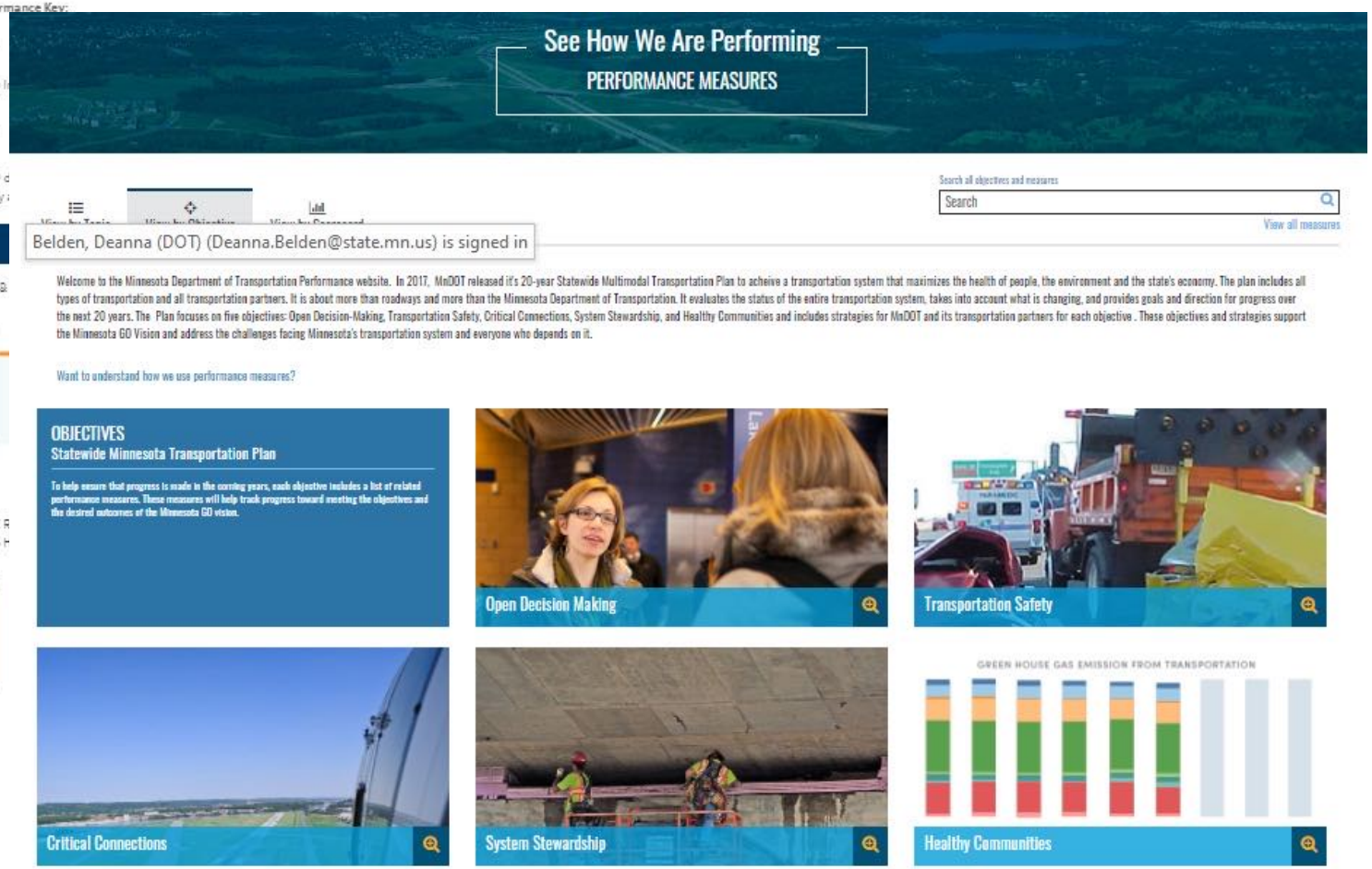
Karen Miller

Transportation Planning, Missouri DOT

Karen.Miller@modot.mo.gov

Telling a Better Story

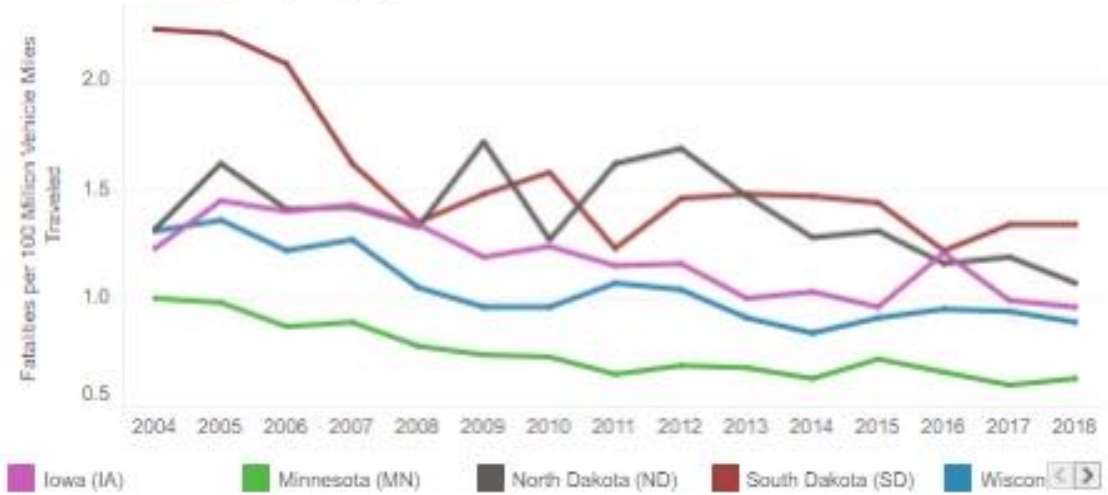




Transportation safety is a top priority for Minnesota. It includes the safety of individual users and the safety of the communities connected by the system. Understanding the number, causes, type, and locations of fatal crashes vital in MnDOT's efforts to develop effective countermeasures.

Fatal Accident Rates of Nearby States

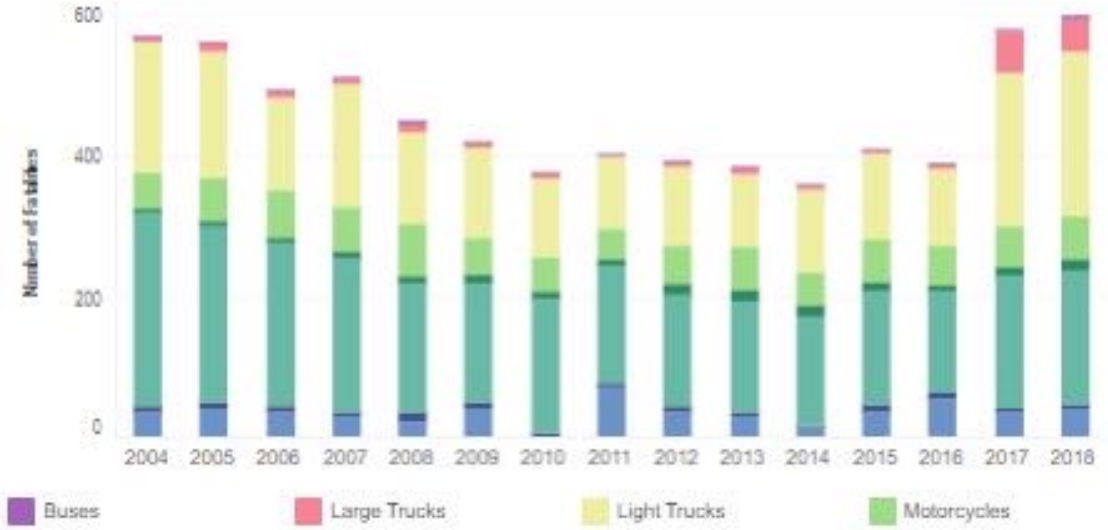
Source: Federal Analysis Reporting System



MINNESOTA HAS THE LOWEST FATALITY RATES COMPARED TO NEARBY STATES

Type of Vehicle in Highway Fatalities, MN

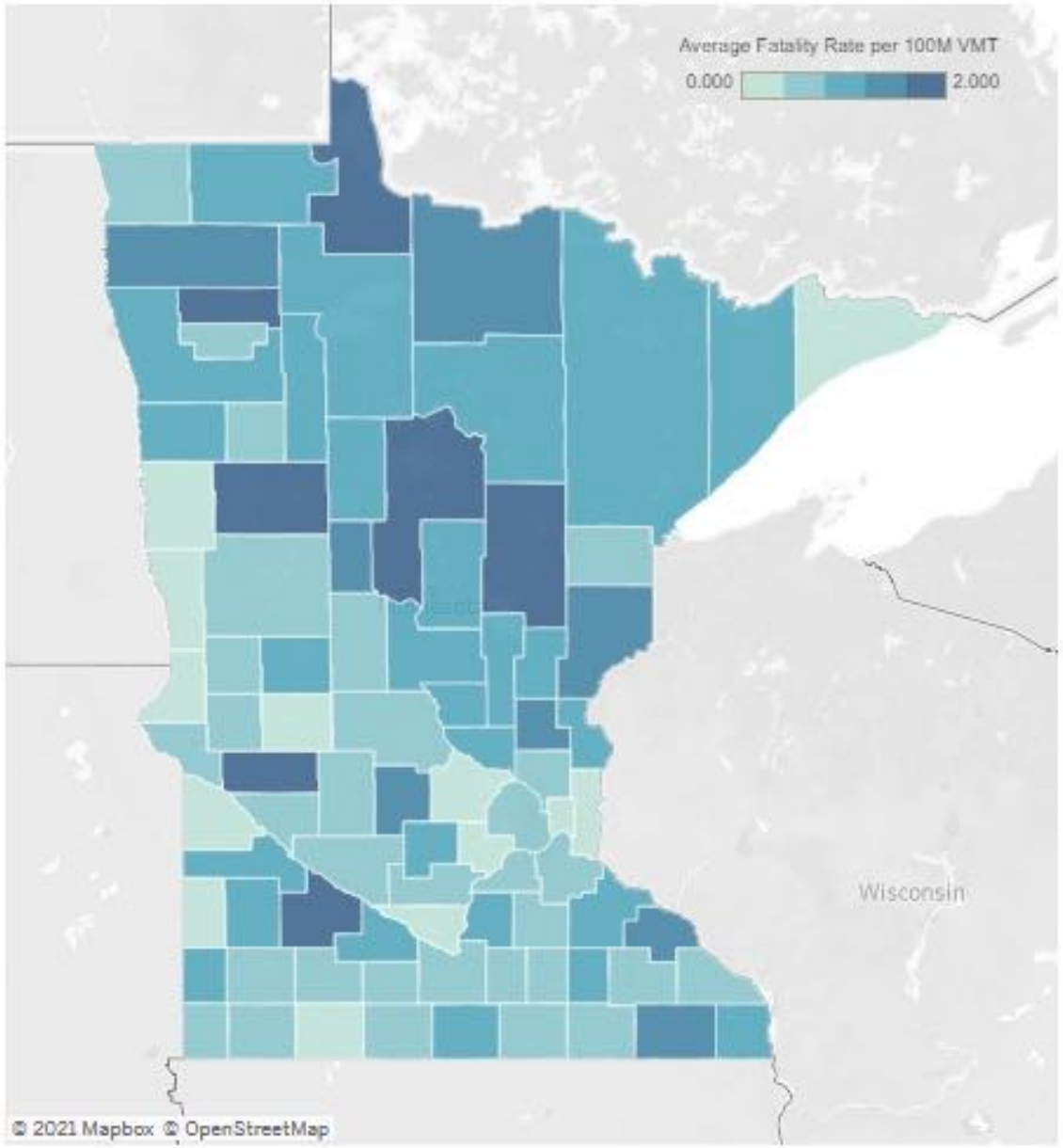
Source: Federal Highway Data



RURAL COUNTIES EXPERIENCED HIGHER FATALITY RATES THAN THE METRO AREA

MOST FATAL CRASHES ON HIGHWAYS ARE PASSENGER VEHICLES

Average Fatality Rate per 100 Million Vehicle Miles Traveled (VMT), 2016-2018



While biking to work commuters come across streets with different levels of traffic stress. More experienced bikers may feel confident on LTS 3 or 4 while others may feel more comfortable sticking to LTS 1 or 2. The maps below show job accessibility using LTS 1 and 2 within 30 minutes and 60 minutes.

What impacts job accessibility?

Job Location

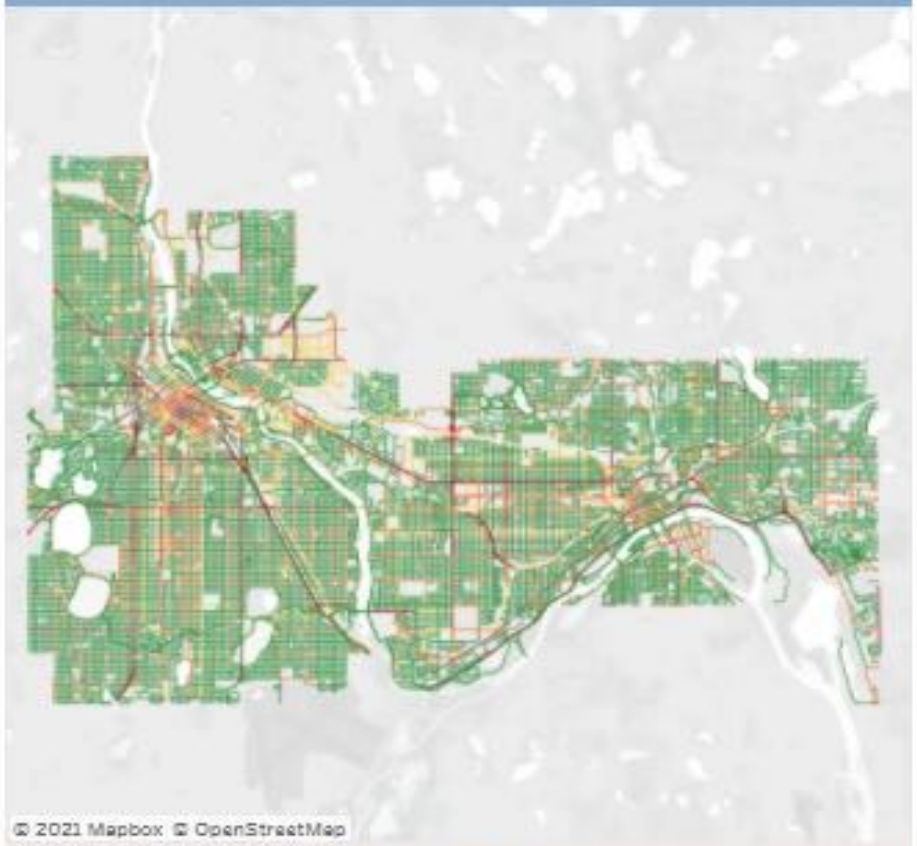
+

Road Network

+

Commuter Comfort

Twin Cities Road Network by Level of Traffic Stress



Level of Traffic Stress

- 1 - Suitable for all ages, usually seperated path
- 2 - Suitable for adults
- 3 - Buffered bike lane on high speed roads
- 4 - No bike lane on high speed roads

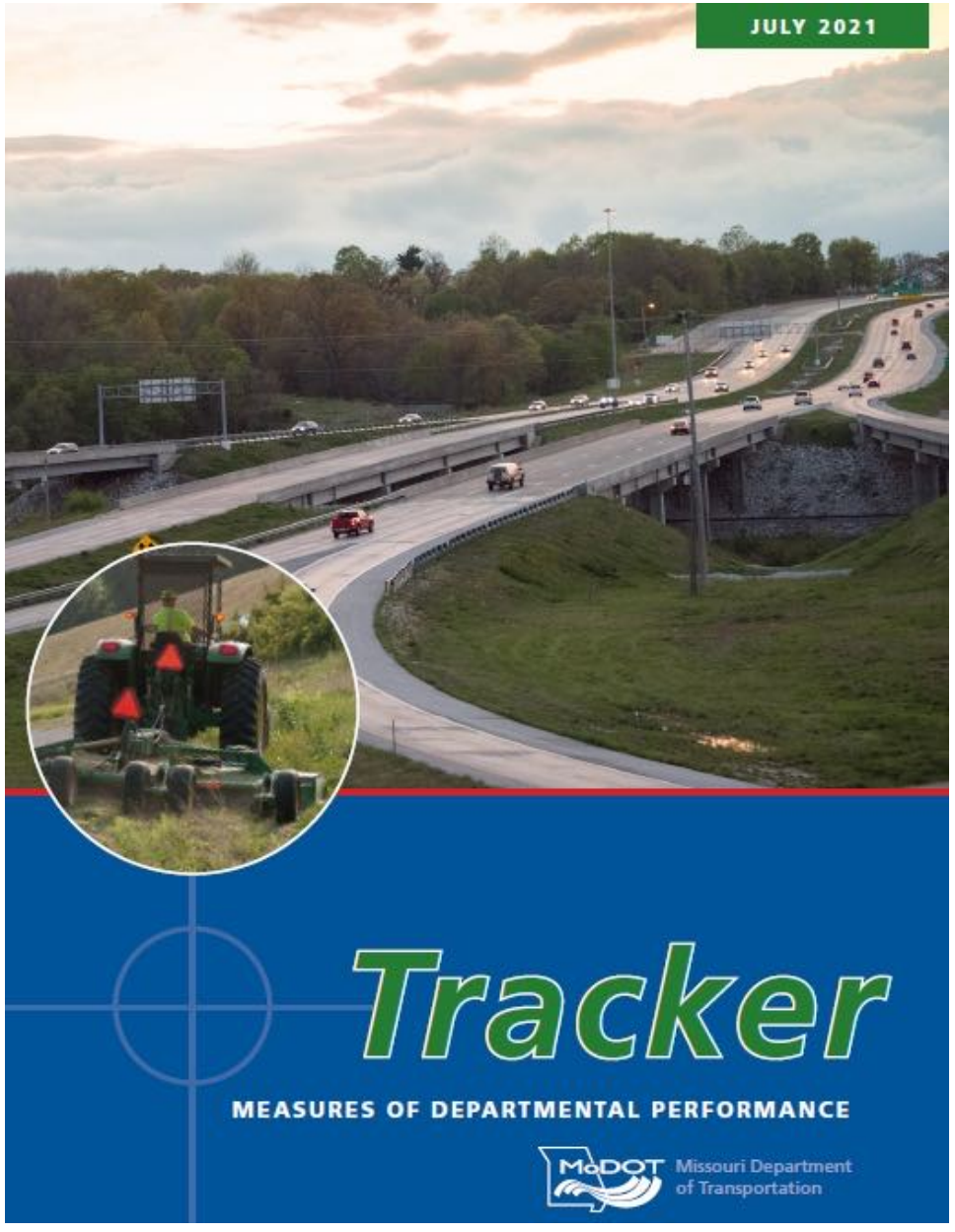
30 minute commute

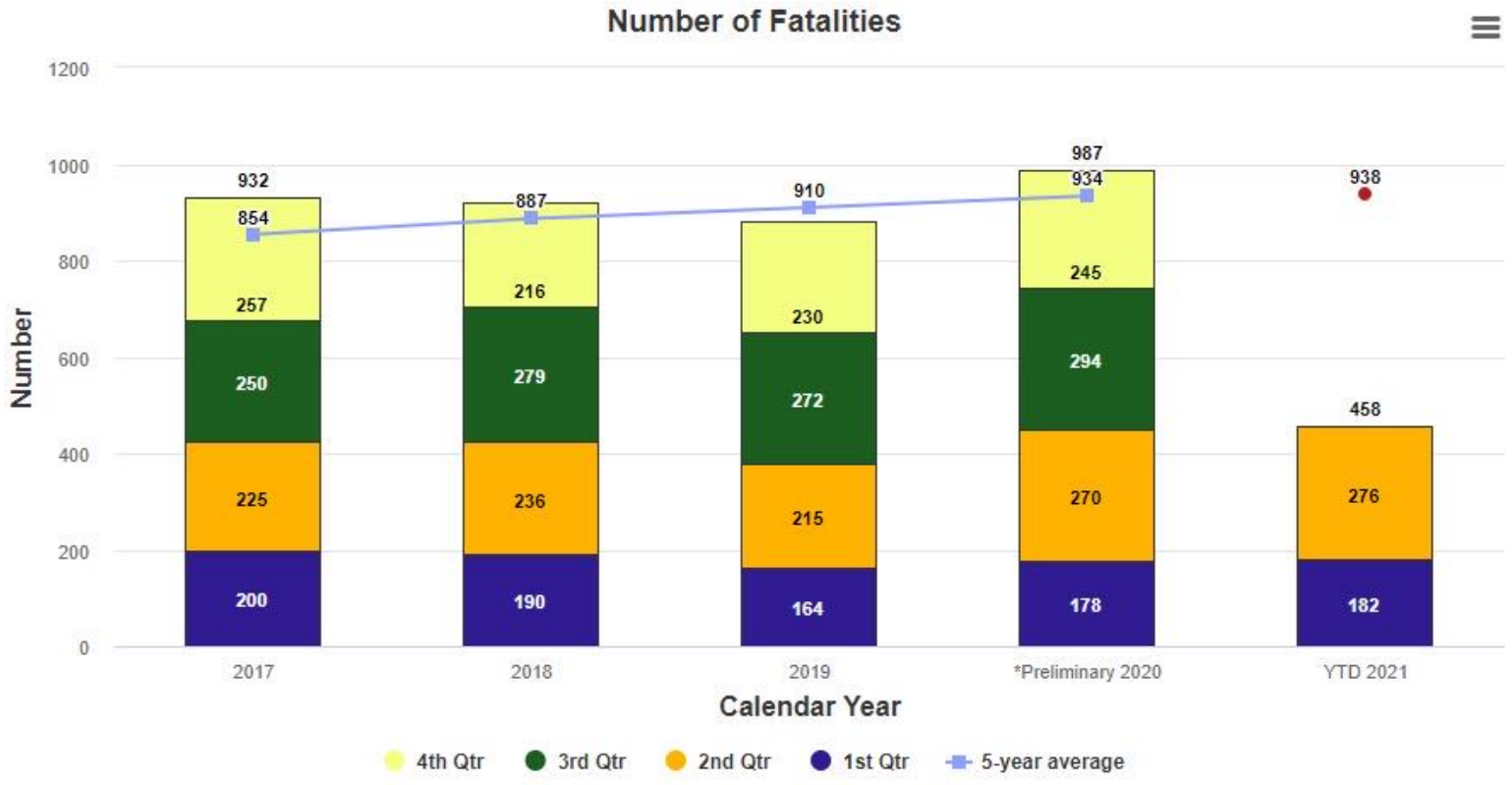
60 minute commute

Total Accessible Jobs

0 — 381797

State Performance





Target: 938

FHWA National Goals

(1) **Safety** -To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

(2) **Infrastructure condition** -To maintain the highway infrastructure asset system in a state of good repair.

(3) **Congestion reduction** -To achieve a significant reduction in congestion on the National Highway System.

(4) **System reliability** -To improve the efficiency of the surface transportation system.

(5) **Freight movement and economic vitality** -To improve the National Highway Freight Network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.

(6) **Environmental sustainability** -To enhance the performance of the transportation system while protecting and enhancing the natural environment.

(7) **Reduced project delivery delays**-To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

Source: 23 U.S.C. 150(b) National Goals

What national goal areas are missing that would help tell your agency's story?

Resilience, equity, ghg

GHG

Off NHS

tourism

Customer satisfaction

Quality of work

Freight weight, width, and height capacity.

GHG reduction

Bike/pedestrian service levels

30

What national goal areas are missing that would help tell your agency's story?

Off NHS

public health

equityresilienceghg

GHG, environmental mitigation(wetland restoration, accessibility

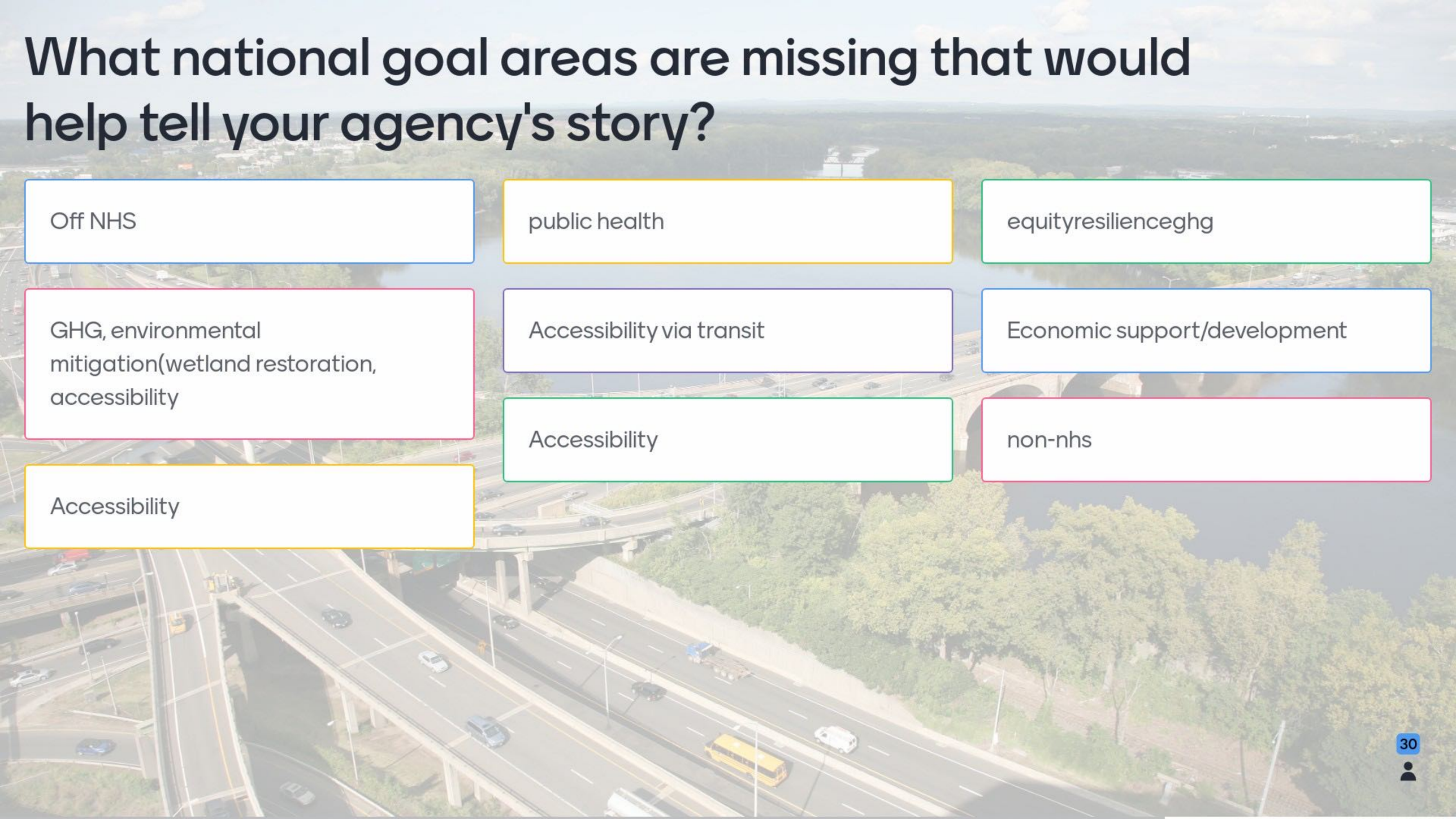
Accessibility via transit

Economic support/development

Accessibility

non-nhs

Accessibility



30

What national goal areas are missing that would help tell your agency's story?

Freight / EJ

On budget/On schedule

Rural connectivity

Technology obsolescence

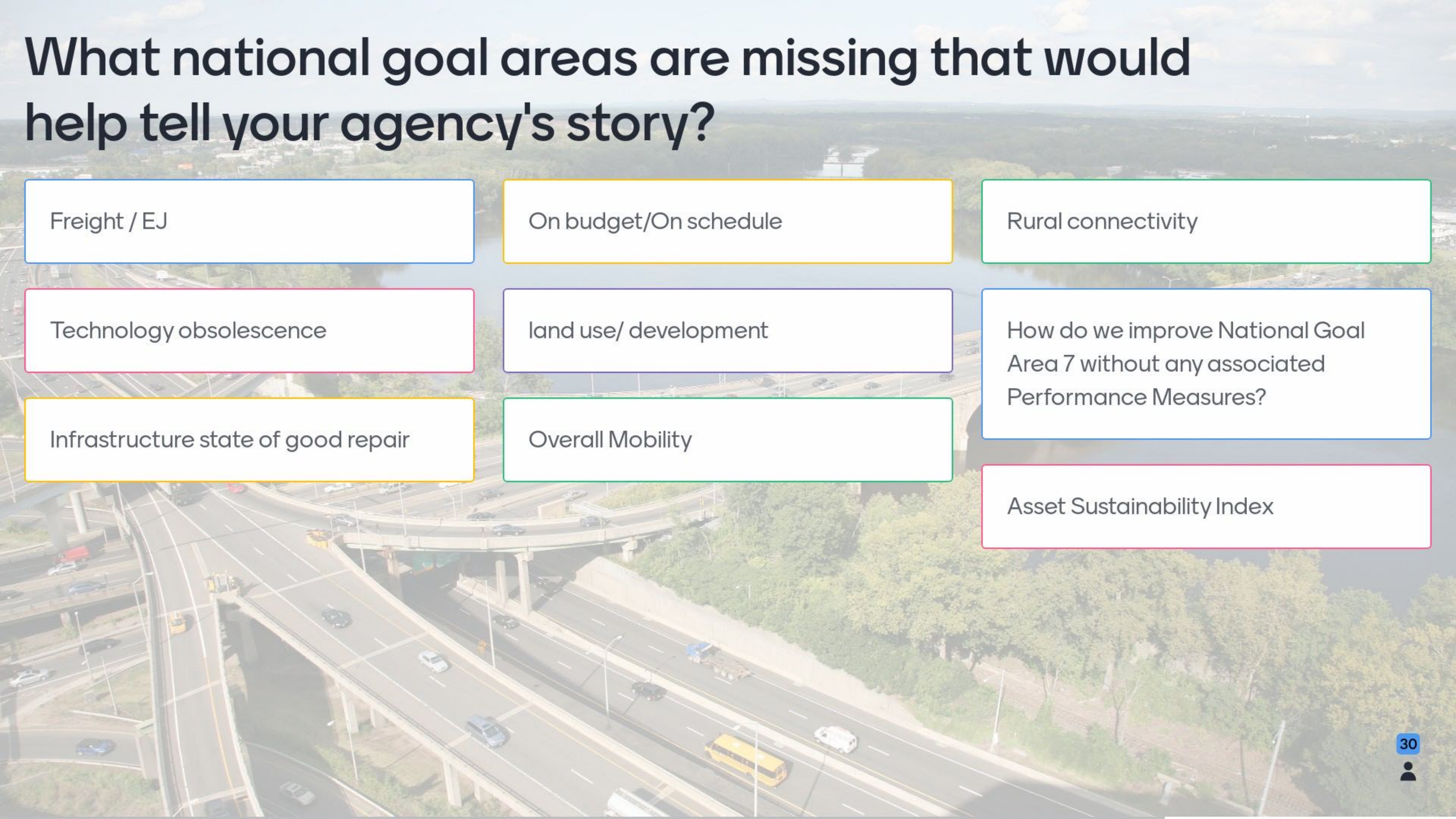
land use/ development

How do we improve National Goal Area 7 without any associated Performance Measures?

Infrastructure state of good repair

Overall Mobility

Asset Sustainability Index

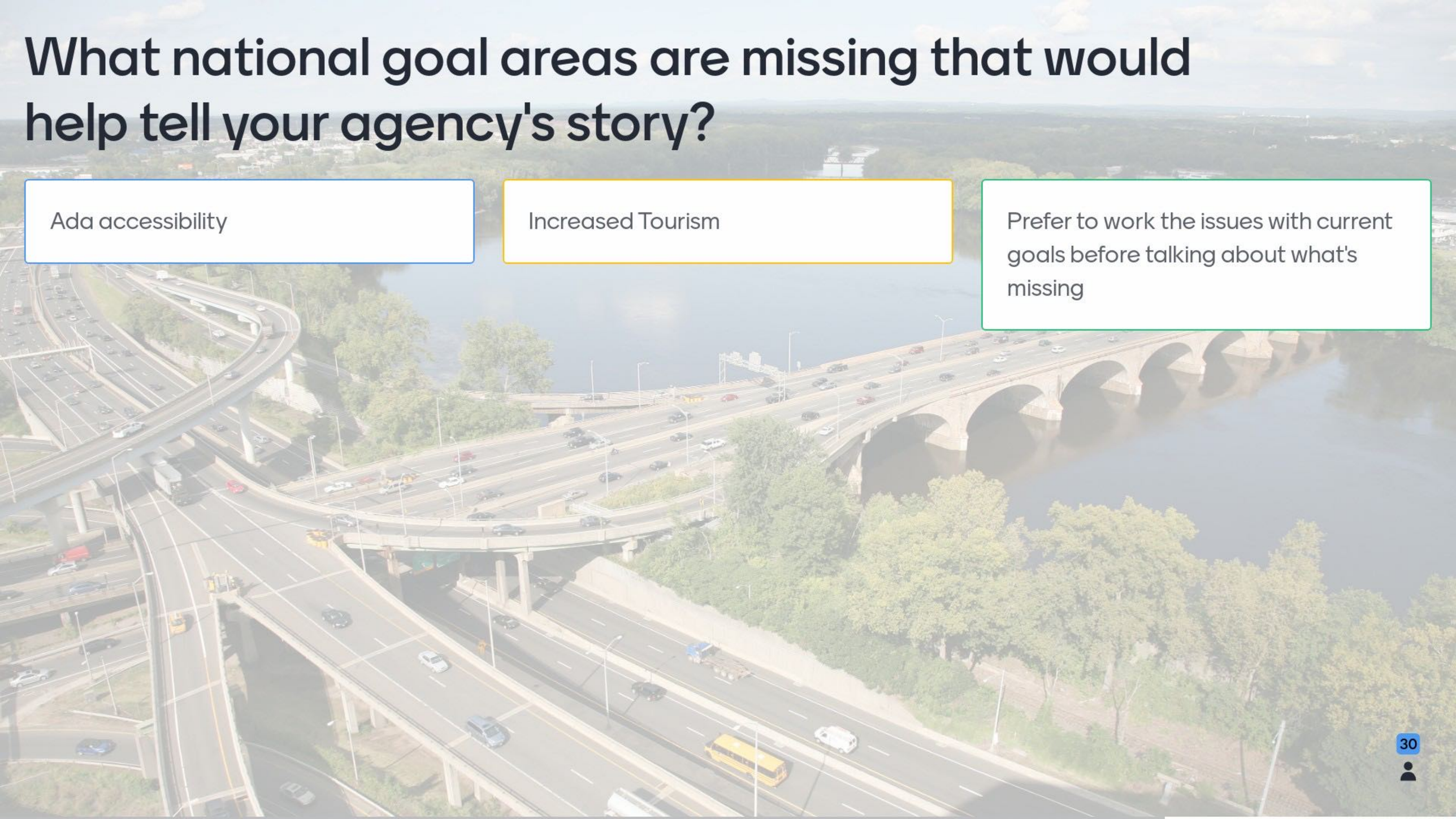


What national goal areas are missing that would help tell your agency's story?

Ada accessibility

Increased Tourism

Prefer to work the issues with current goals before talking about what's missing



30

How would you prioritize these missing goal areas?

Questions?

Submit your questions using the webinar's Q&A feature

Closing Remarks and Charge

Tim Henkel

Assistant Commissioner, Modal Planning and Program Management Division, MnDOT

tim.henkel@state.mn.us

All TPM Webinars: https://www.tpm-portal.com/event-directory/tpm-webinars/

Save the Dates!

A bimonthly webinar series, Wednesdays at 2:00 PM EST

Visit TPM-Portal.com to register

- **September 15, 2021 2:00 PM Eastern Time**
- **November 17, 2021 2:00 PM Eastern Time**

Please let us know about topics of interest for future webinars!

Federal Highway Administration

AASHTO THE VOICE OF TRANSPORTATION

TPM

For more information or to register:

TPM–Portal.com