Transportation Asset Management Webinar Series



Webinar 51 October 20, 2021 Sponsored by FHWA and AASHTO

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Webinar 51 TAM & TSMO

Sponsored by FHWA and AASHTO

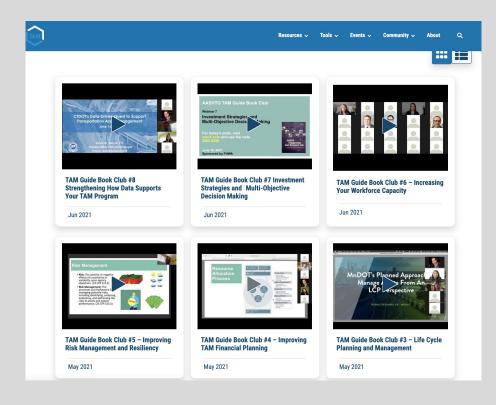




Webinar 51 – October 20, 2021

FHWA/AASHTO Asset Management Webinar Series

- This is the 51nd in a webinar series that has been running since 2012
- Webinars are held every two months, on topics such as off-system assets, asset management plans, asset management and risk management, and more
 - 3rd Wednesdays, 2PM Eastern
- We welcome ideas for future webinar topics and presentations
- Submit your questions using the webinar's Q&A feature



Welcome

FHWA and the AASHTO Sub-Committee on Asset Management are pleased to sponsor this webinar series

Sharing knowledge is a critical component of advancing asset management practice

Learning Objectives

- Building working knowledge of key concepts and definitions relevant to TAM and TSMO
- Beginning to apply this knowledge in order to answer the following questions:
 - What approaches are agencies taking to leverage TSMO in their TAM processes?
 - What benefits can my agency expect by applying a TAM approach to managing our ITS and other TSMO assets?
 - What are key lessons-learned for agencies as looking to better integrate TAM and TSMO?
- SHARE LESSONS-LEARNED, IDEAS, and KNOWLEDGE

Webinar Agenda

2:00 Welcome and Introduction

Matt Hardy, AASHTO, Steve Gaj, FHWA, Will Duke, Spy Pond Partners

2:10 FHWA Topic Introduction and Overview Steve Gaj and Joe Gregory, FHWA

- 2:25 TAM and TSMO at Iowa DOT Scott Marler, Iowa DOT
- 2:40 Utah DOT Presentation Tyler Laing and Jamie Mackey, Utah DOT
- 2:55 DFW Region Operational Asset Inventory Natalie Bettger, NCTCOG
- 3:15 Q&A Matt Hardy
- **3:30** Wrap-Up Matt Hardy and Will Duke



Transportation Systems Management and Operations and Asset Management

Joe Gregory, P.E. FHWA Office of Operations FHWA/AASHTO Asset Management and TSMO Webinar October 20, 2021

Defining TSMO (1/4)

U.S. Department of Transportation Federal Highway Administration

Transportation Systems Management and Operations (TSMO):

An integrated set of strategies to optimize the performance of existing infrastructure through the implementation of multimodal and intermodal, cross-jurisdictional systems, services, and projects designed to preserve capacity and improve security, safety, and reliability of the transportation system.

23 USC 101 (a) (30)



U.S. Department of Transportation Federal Highway Administration

Defining TSMO (2/4)

Provides an approach that applies operational improvements to maximize system performance

Is an integrated set of strategies and programs that improve transportation mobility, safety, and reliability

Enables transportation agencies to implement low-cost and cost-effective solutions, balance supply and demand, provide flexible solutions to meet changing conditions, and stretch limited funding to benefit more areas and customers



Defining TSMO (3/4)



Can be applied on existing transportation facilities, in the design of new facilities, and systemwide

Complements traditional infrastructure investment

FHWA "What is TSMO?" website <u>https://ops.fhwa.dot.gov/tsmo/</u>



Defining TSMO (4/4)

- Work Zone Management
- Traffic Incident Management
- Special Event Management
- Road Weather Management
- Traffic Signal Coordination
- Traveler Information
- Ramp Management
- Access Management

- U.S. Department of Transportation Federal Highway Administration
- Congestion Pricing
- Active Transportation and Demand Management
- Integrated Corridor Management
- Transit Management
- Freight Management
- Improved Bicycle and Pedestrian Crossings
- Connected and Automated Vehicle Deployment
- Mobility on Demand

Asset Management Infrastructure Condition

Goal: Maintain the highway infrastructure asset system in a state of good repair.

Manage the network for the long term at the minimum practicable cost to:

Improve or preserve asset condition and system performance. Manage risk.

Short-term performance measures are key indicators.





Why do we do Asset Management?

U.S. Department of Transportation Federal Highway Administration

Preserve our assets and minimize their whole-life costs.

Operate in a financially sustainable manner.

Provide a framework to improve performance on a long-term basis.



TSMO and Asset Management (1/2)



TSMO and asset management work toward enhancing system performance with similar processes, but they have different focuses.

Asset management focuses on the condition of assets.

TSMO focuses on safety, mobility, and reliability.

Both share a strategic, performance-based approach to monitoring performance and applying actions to reach targets.

Applying Asset Management to TSMO

Historically, agencies have prioritized technology deployment in support of TSMO. Maintenance has been an afterthought.

Significant investment in technology.



TSMO and Asset Management (2/2)

U.S. Department of Transportation Federal Highway Administration

Applying TSMO to Asset Management

Move beyond pavement and bridges.

Transportation Asset Management Plans (TAMPs).

States are encouraged to add assets beyond pavement and bridges, such as Intelligent Transportation Systems (ITS), traffic signals, and other infrastructure that support TSMO.

Connecting TAMPs and TSMO Plans



Resources (1/2)

U.S. Department of Transportation Federal Highway Administration

FHWA Office of Asset Management Website http://www.fhwa.dot.gov/asset/index.cfm

National Highway Institute (NHI) Transportation Asset Management Training Courses

FHWA TAMP Implementation Workshop – Life-Cycle Planning, Risk, and Financial Planning Analysis

Technical Assistance

Peer Exchanges



Resources (2/2)

U.S. Department of Transportation Federal Highway Administration

FHWA Asset Management for Operations Website https://ops.fhwa.dot.gov/program_areas/ops-asset-mgmt.htm

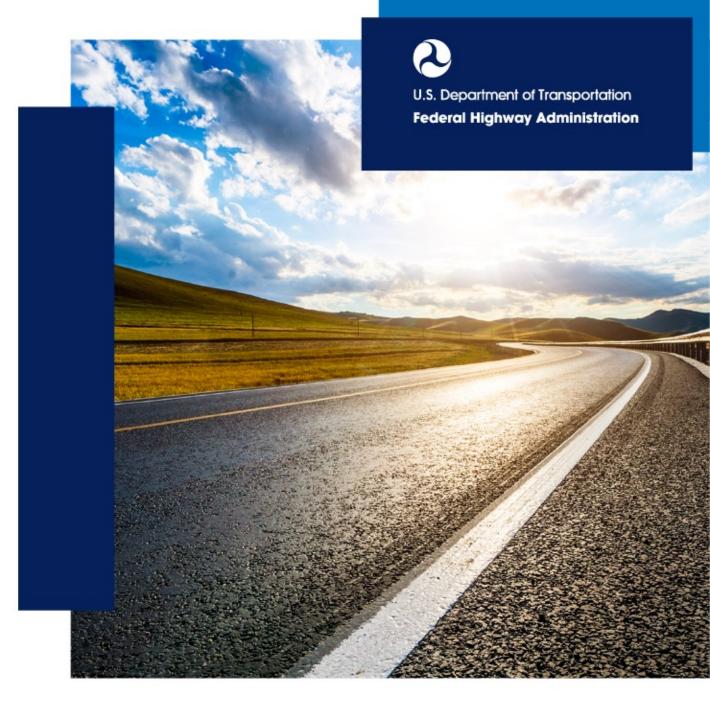
TSMO and Asset Management Fact Sheet https://ops.fhwa.dot.gov/publications/fhwahop18094/index.htm



Questions?

Stephen Gaj, stephen.gaj@dot.gov or (202) 366-1336

Joe Gregory, joseph.gregory@dot.gov or (202) 366-0610







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TAM and TSMO at **lowa DOT**

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Photo Credit: Dan Garneau





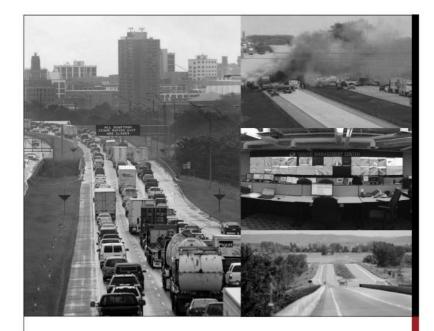


Our Vision

We envision the safest, smartest transportation system in the nation, one that's made to last.



TAM and TSMO at Iowa DOT



TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS (TSMO) STRATEGIC PLAN

A coordinated approach to managing and operating our roadways as safely and efficiently as possible, focused on maximizing existing infrastructure, addressing the causes of breakdowns in flow, and overall performance of the transportation system.

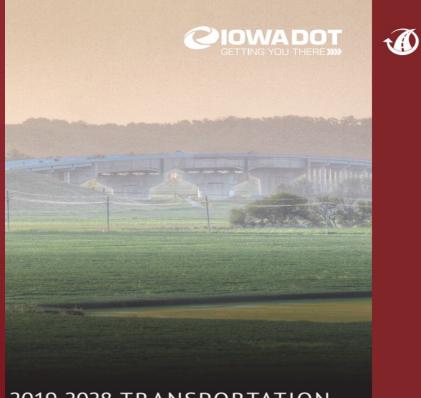
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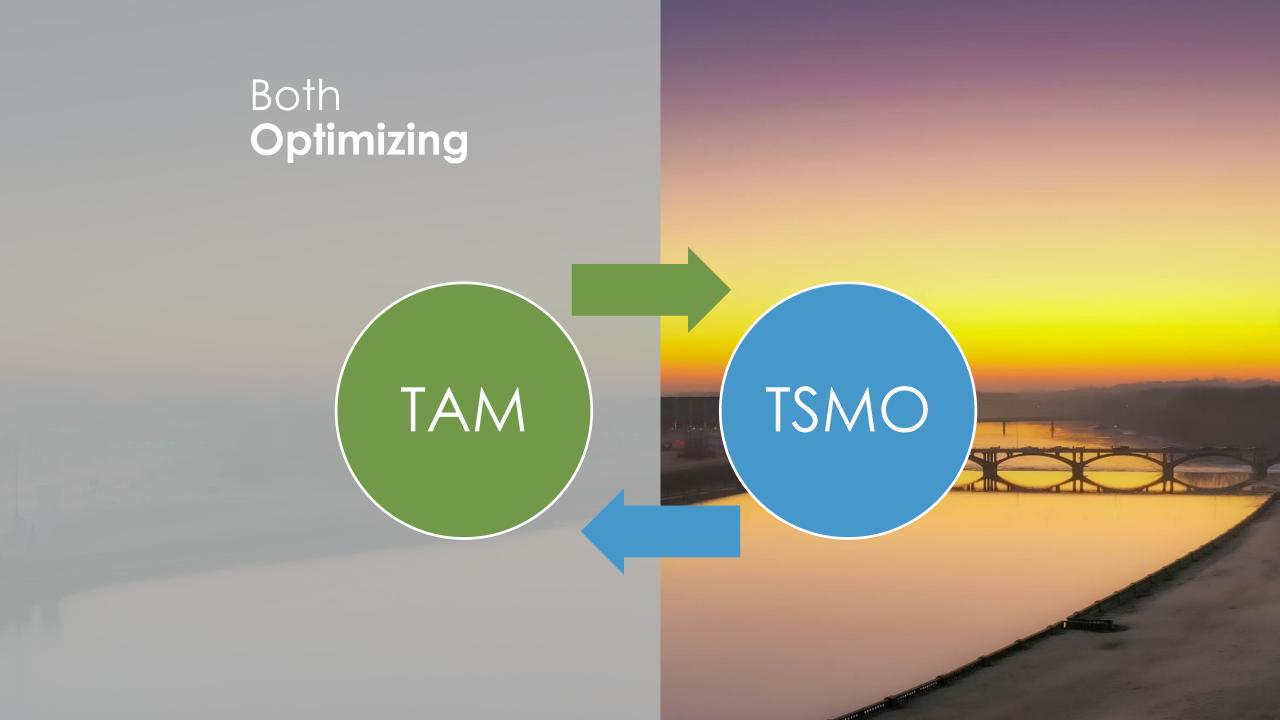


TAM and TSMO at Iowa DOT

Transportation asset management is a strategic approach to managing transportation infrastructure. It embodies a philosophy that is comprehensive, proactive, and long term. The overall goals of asset management are to minimize long-term costs, extend the life of the transportation system, and improve the transportation system's performance.



2019-2028 TRANSPORTATION ASSET MANAGEMENT PLAN







What is TSMO?



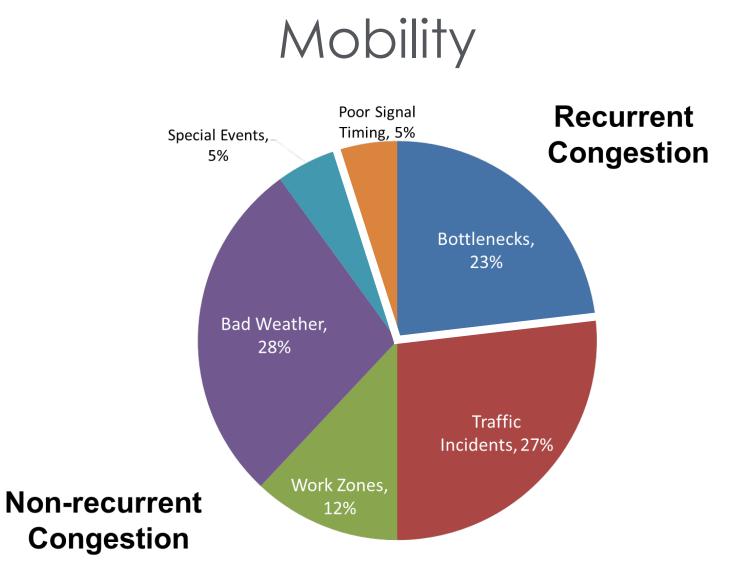






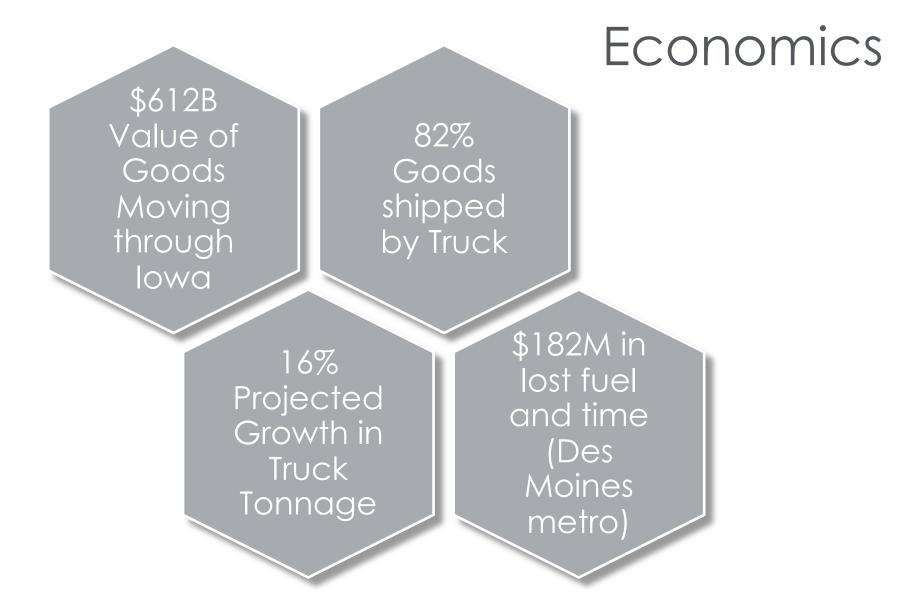
















The Iowa Model







Service Layer Plans

Traffic Management Center	Intelligent Transportation Systems (ITS) & Communications	Traveler Information	Traffic Incident Management
Emergency Management	Work Zone Management	Active Transportation and Demand Management	Cooperative Automated Transportation





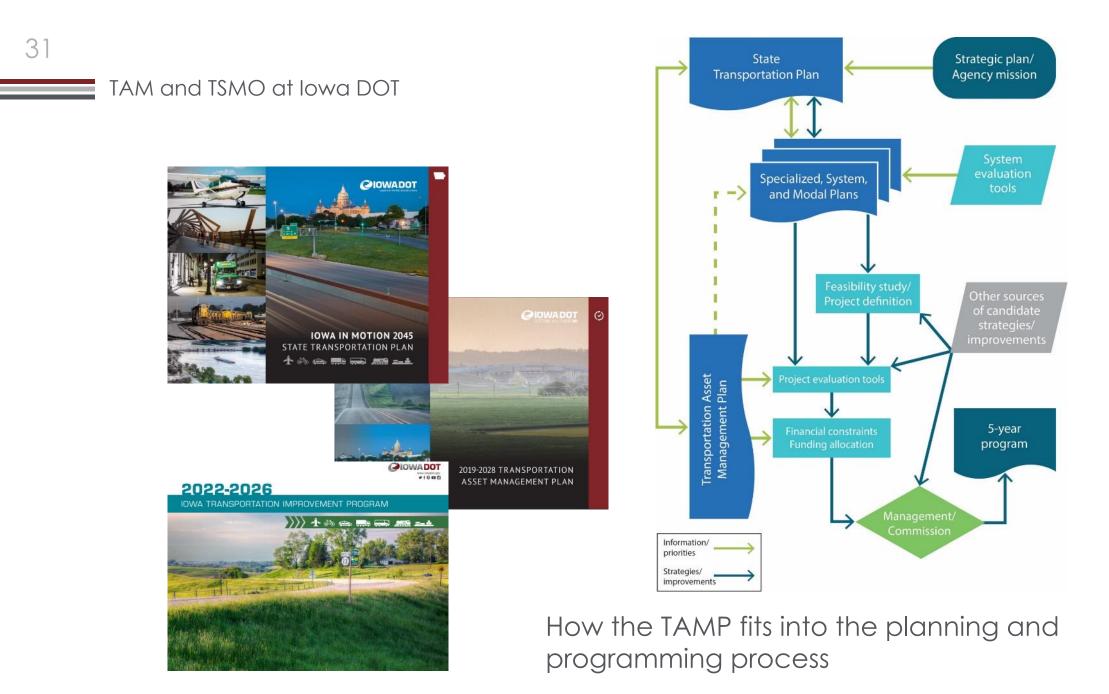




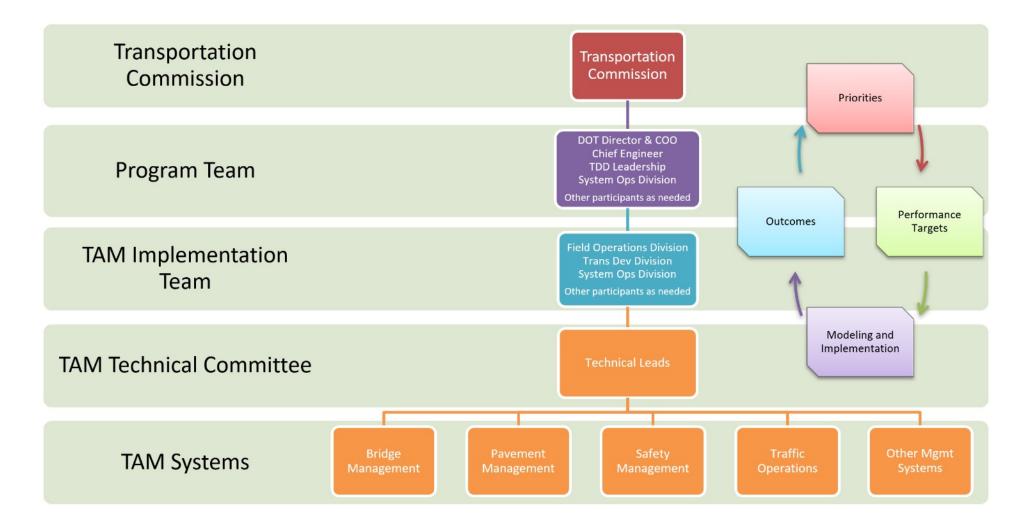
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TAM Helps US

- 1. Build, preserve, operate, maintain, upgrade, and expand the transportation system more costeffectively throughout its whole life
- 2. Improve performance of the transportation system
- 3. Deliver to Iowa DOT's customers the best value for every dollar spent
- 4. Enhance Iowa DOT's credibility and accountability in its stewardship of transportation assets



TAM Governance Structure





TAM and TSMO provide Perspectives on the System



Informing Investment Decisions

- Screening
 - ICE and ICE-OPS
- Planning
 - Interstate Investment Plan
 - Integrated Corridor Management
- Project initiation
 - Project Scoping & Prioritization
 - Rightsizing

ICE		ICE-OPS			
Infrastructure Condition	Index	Infrastructure Condition Index - Operations			
Rating based on infrastruct condition and performance		Quantifies the relative risk to safe and reliable operation			
Pavement Condition Index	25%	AADT	20%		
Bridge Condition Index	25%	Annual Bottleneck Duration	15%		
International Roughness Index	15%	Incident Density	15%		
Combination Truck AADT	15%	Crash Rate	15%		
Single-Unit Truck AADT	5%	Buffer Time Index	10%		
Passenger AADT	5%	Event Center Proximity	5%		
Congestion Index (V/C)	10%	Flood Event Density	5%		
		Winter Weather Sensitive Mileage	5%		
		Freight Network Mileage	5%		
		ICE Infrastructure Score	5%		
Both are used to help screen corridors for potential needs in long-range planning and project scoping.					



INTERSTATE INVESTMENT PLAN

- Fiscally-constrained plan for all of lowa's Interstate routes through 2040
- Developed a "plan for every segment" to address the timing and scope of critical needs
- Stewardship is the priority, and alternatives to capacity expansion encouraged



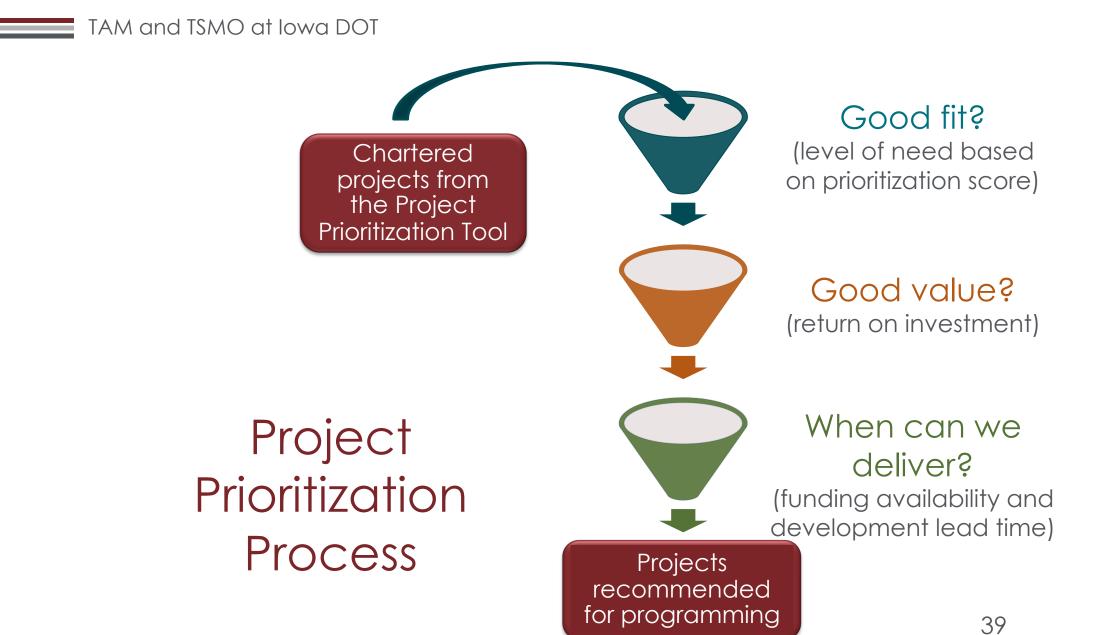
Integrated Corridor Management

- An Integrated Corridor Management (ICM) approach means to proactively manage and operate transportation systems in a region.
- Roadways and other transportation options (such as transit) are operated, controlled, and treated as an integrated system, rather than as individual components.

In other words, ICM helps us:

use our EXISTING INFRASTRUCTURE to provide the MOST SERVICE out of what we ALREADY HAVE.







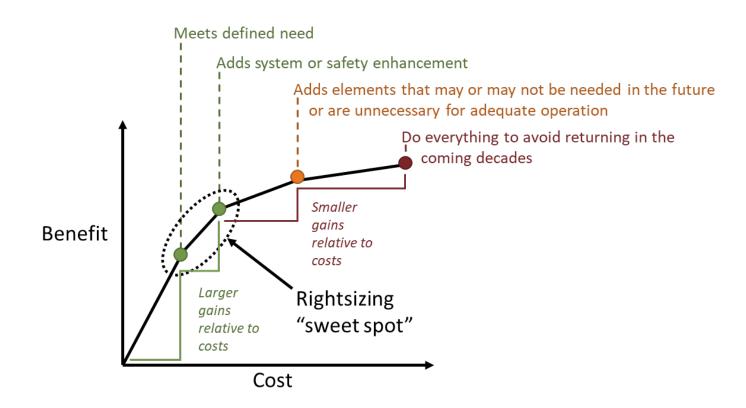
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criticality.



Rightsizing Policy

• Seeking the "sweet spot"

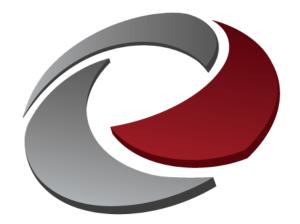




Summary

- TAM and TSMO are both critical functions for DOTs
- When combined, they provide powerful insights and strategies to help us serve our users and be good stewards of the system
- Iowa DOT has been actively working on using TAM and TSMO together to help bring forward costeffective solutions

Utah Presentation (placeholder)



THANK YOU FOR YOUR TIME AND ATTENTION



DFW Region Operational Asset Inventory

Natalie Bettger, NCTCOG

TAM and Transportation System Management Webinar Wednesday, October 20, 2021

Presentation Overview

- Asset Inventory
 - Traffic Signals
 - ITS
 - Managed Lanes
 - Auto Occupancy Detection
 - Demand Reduction
- Asset Performance

Survey/Inventory Objectives

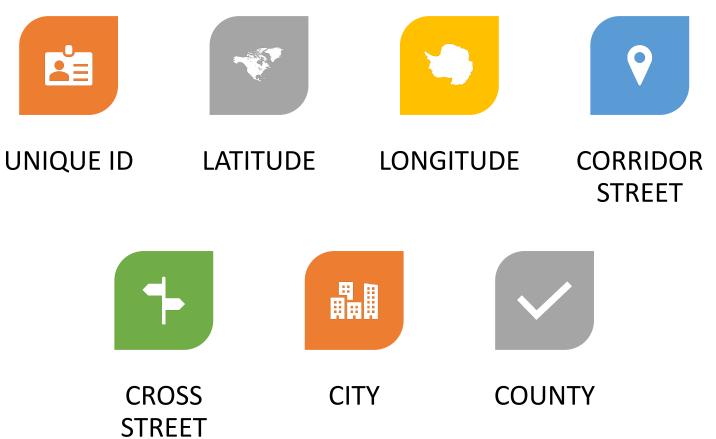
- Define and refine initial minimum standards to achieve stated RTSRP/RTSP goals
- Identify potential improvements to elevate signals that do not meet the minimum standards to a level capable of efficient and reliable traffic signal operations.

Current Traffic Signal Layer

GIS Layer with ~ 6,400 traffic signals

Manual Entry

Fields Include



Traffic Signal Asset Inventory

- 1. Assets at Each Signal Intersection
- 2. Based on Minimum Equipment Standards
- 3. Develop Survey
- 4. Develop Live Web Interface with Log-In
- 5. City or Consultant Assistance
- 6. Allows for Continuous Online Updates

Traffic Signal Asset Survey

- 1. City Signal ID
- 2. On-System or Off-System
- 3. Age of Controller / Cabinet
- 4. Controller Manufacturer
- 5. Cabinet Type
- 6. Connected to Central Traffic Signal Operating System; Central Operating System (name)
- 7. Advanced detection; Detection operational
- 8. Flashing Yellow Arrows
- 9. LED Signal Heads
- 10. Uninterruptible Power Supply/Battery Back-up System
- 11. Global Positioning System Clocks
- 12. Remote Communication; Communication Type (fiber/radio/other?)
- 13. Pedestrian Detection; Pedestrian Detection Type
- 14. Bicycle Detection; Bicycle Detection Type
- 15. Using Emergency Vehicle Preemption / Priority (e.g. Opticom); System name and type (centralized or local)?
- 16. Using Transit Priority? System name and type (centralized or local)?
- 17. Rail Preemption or Other Preemption
- 18. Cameras for Remote Monitoring; Camera Type
- 19. Other Sensors, Connected Vehicle Devices (e.g. Cellular-V2X or Dedicated Short Range Com.)
- 20. Provide Signal Data to Third Parties (e.g. TTS or Connected Signals); Shared Signal Data Accessible via Cloud, API, or other method?

Signal Located Near (to be performed by NCTCOG):

RR Tracks Bike Trails or On-Street Bike Paths Transit Stations

Schools

Universities

Hospitals

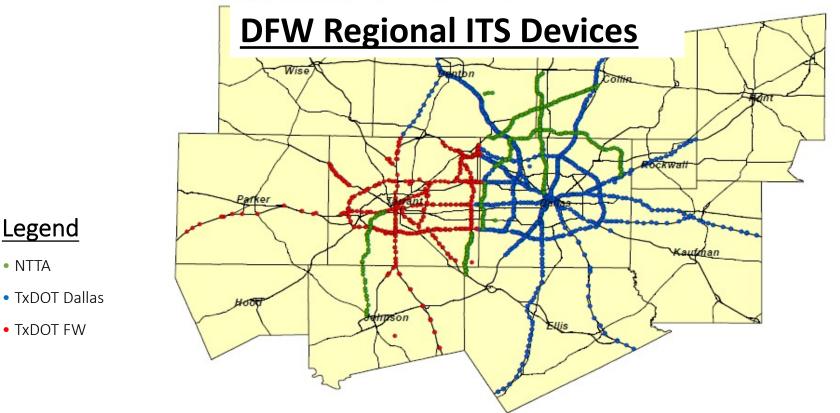
Others

Legend

TxDOT FW

• NTTA

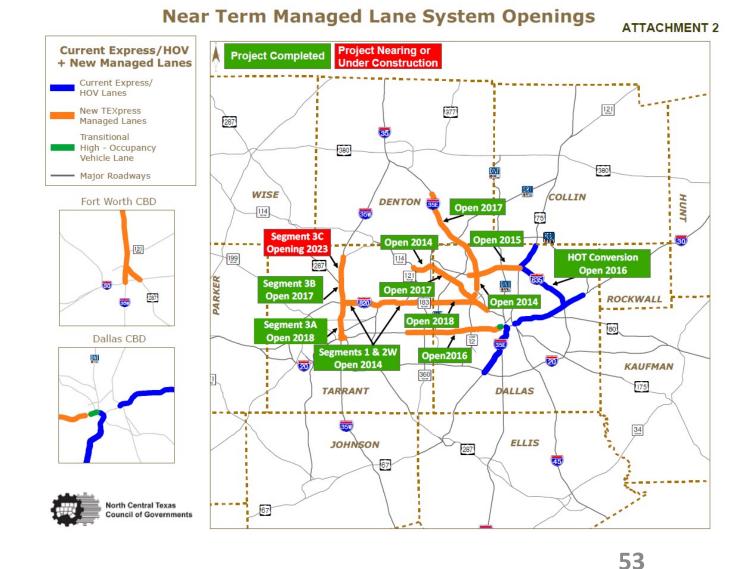
Collect from TxDOT and Tollway Authority and Private Operators Includes: CCTV, DMS, Sensor Location, Satellite Buildings, Fiber and Wireless Coverage



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Managed Lanes Assets

- Limits
- Number of Lanes
- Operator
- Dynamically Priced
- Occupancy Rules
- Vehicle Size Rules
- Prohibited Vehicles
- Speed
- Hours of Operation (reversible)
- Separation Treatment



NCTCOG TDM Goal: Implementation of strategies that reduce the demand for drive-alone travel on roadways by offering alternatives to driving alone. **Regional TDM-Related Programs and Initiatives:**

- Regional Employer Trip Reduction (ETR) Program
- Regional Vanpool Program
- <u>TryParkinglt.com</u>, Ride-match and Commuter Tracking System
- Park-and-Ride Facilities
- Bicycle / Pedestrian Initiatives

Travel Demand Management/ Demand Reductions

Carpool Vanpool Transit (Bus/Rail) Bicycle Scooter Walk Telework **Drive Alone Trips** Brown Bag Lunch

Mode: (С		Carpool or vanpool
(С		Drive alone
(С		Transit
(С	×	Walk
(С	óò	Bike
(С	2	Scooter
(С	11	Multi (e.g., walk + transit)
(С	1	Telecommute
(С		Brown bag lunch
(С	<u>*</u>	Compressed week

Asset Performance

Asset Performance – Traffic Signals / ITS

Device Uptime

Validation Checks

System Performance/Region-Wide Data

- Intersection Delay
- Red/Green Ratio
- Travel Times/Speed
- Crashes
- Trips/VMT Reduced
- Other

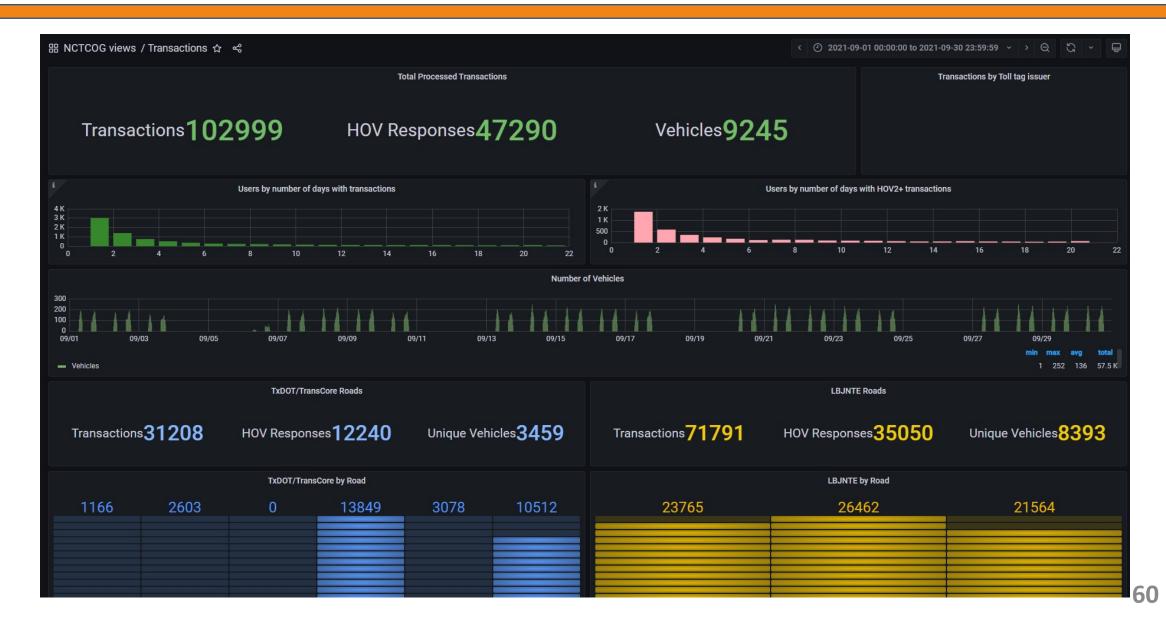
Asset Performance – Managed Lanes

- Total Transactions
- Total HOV Transactions
- Total Truck Transactions
- Average Tolls Paid by HOV Registered Users
- Average Tolls Paid by Managed Lane
- Number Events over Toll Cap
- Number Events < 35 mph
- Average Speed on Managed Lane
- Average Speed on General Purpose Lanes

Asset Performance – Auto Occupancy

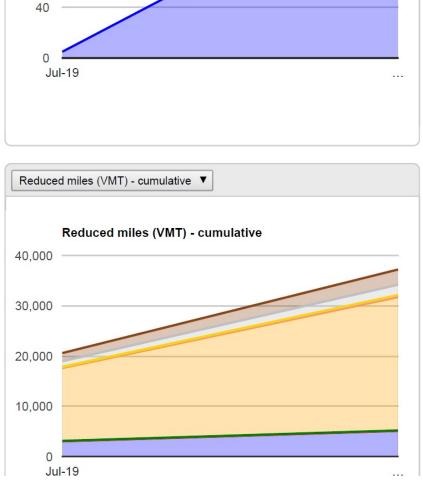


Asset Performance – Auto Occupancy (cont.)



Asset Performance – Demand Reduction

DURING THE PERIOD			
New members	173	(88% prev. dr. alone)	
Active members	86	(75% prev. dr. alone)	
Deleted accounts	28		
All trips	All modes V	Carpool 🔻	
Recorded trips	1,822	565	
Participants	75	18	
Avg trip distance (mi)	16.5	22	
Avg vehicle occupancy	-	2.1	
Reduced trips	2,591	211	
Reduced miles (VMT)	36,788	5,162	
Gallons of gas saved	1,671	221	
Reduced NOx (lbs)	9.08	1.27	
Reduced VOC (lbs)	2.03	0.28	
Reduced PM 2.5 (lbs)	0.32	0.05	
Reduced CO (tons)	0.13	0.02	
Reduced CO2 (tons)	16.4	2.17	
Money saved	\$21,337	\$2,9 94	



ADMINISTRATIVE DASHBOARD CUSTOMIZABLE REPORTS

Questions, Feedback, Other Ideas

Natalie Bettger Senior Program Manager nbettger@nctcog.org 817-695-9280

Questions?

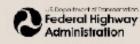
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Save the Dates! A bimonthly webinar series, Wednesdays at 2:00 PM EST Next Webinar Wednesday, December 15, 2021– 2:00 PM EST







For more information or to register: https://www.tam-portal.com