



Transportation Systems Management and Operations (TSMO)

TxDOT DFW TSMO Program Plan Review

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U.S. Department
of Transportation
**Federal Highway
Administration**

FHWA's TSMO Definition: **Integrated 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.**



TxDOT Goals and Objectives:

Optimize System Performance – Develop and operate an **integrated** transportation system that provides **reliable** and accessible mobility, and enables economic growth.

Promote Safety – Champion a culture of **safety.**



- **Executive Summary**

Outlines the purpose of TSMO and key action items categorized as:

- Early Wins
- Low-Cost/High Impact
- High-Cost/High Impact
- High Impact Led by District Partners

- **Capability Maturity Model Dimensions and Process**

Identifies “Where We Are” versus “Where We Want to Be”

- **Project and Program Recommendations**

48 action items identified to address District priorities

- **List of Potential Tactical Plans**

Tactical plan provide greater detail in how to act upon high priority recommended action items



STAKEHOLDER INVOLVEMENT TIMELINE





Internal TxDOT District Stakeholders

- District Engineer
- Area Engineers
- District Core Functional Groups (Planning, Design, Operations, Maintenance)

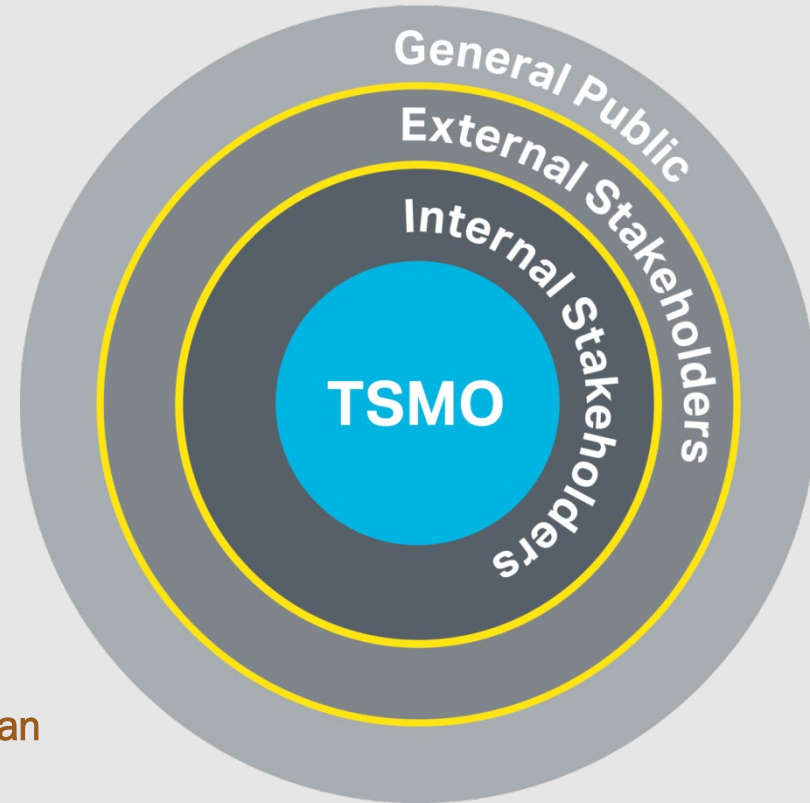
Internal TxDOT Other Stakeholders

- Traffic Safety Division
- Other Divisions

External Partners

- Cities and Counties (Transportation)
- Cities and Counties (First Responders)
- Transit Agencies
- NCTCOG
- NTTA

General Public – Not Included in the TSMO Program Plan



Stakeholder Engagement

Internal TxDOT Stakeholders

- District Engineers and Senior Staff
- Traffic Safety Division

Partner Agency Leadership Meetings

- Cities and Counties
- NCTCOG, DART, NTTA

TSMO Outreach Workshops

- TxDOT Dallas District
- TxDOT Fort Worth District
- Regional Partner Agencies

Individual Stakeholder Outreach Meetings

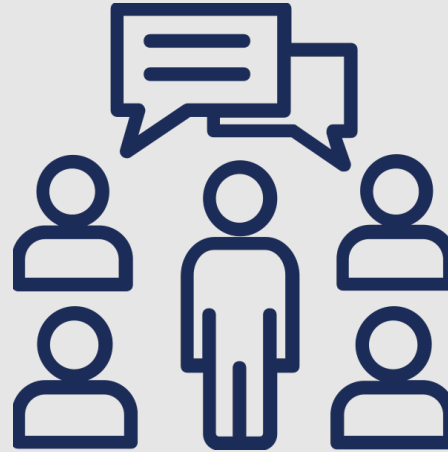
- TxDOT and Cities

Capability Maturity Model and Framework Workshops

- TxDOT and Regional Partner Agencies

NCTCOG ITS Stakeholders Meeting

- TxDOT and Regional Partner Agencies



**TxDOT
Internal Outreach**
Late 2019

**Partner Agency
Leadership Meetings**
March 2020

**TSMO Outreach
Workshops**
May 2020

**Capability Maturity Model
(CMM) Workshops**
August 2020

**Capability Maturity
Framework (CMF) Workshops**
October 2020

**TSMO Mission, Vision,
and Goals Work Session**
December 2020

**State of the
Practice Report**
February 2021

**Draft TSMO
Program Plan**
March 2021

**Final TSMO Program Plan
and Roll Out Events**
April-May 2021



Focus Areas



Traffic Incident
Management



Work Zone
Management



Road Weather
Management



Planned Special
Events



Traffic Signal
Management



General
Traffic
Management

Capability Maturity Model Dimensions



Business
Processes



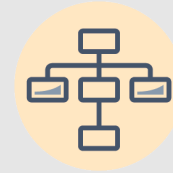
Systems &
Technology



Performance
Measurement



Culture



Organization &
Workforce

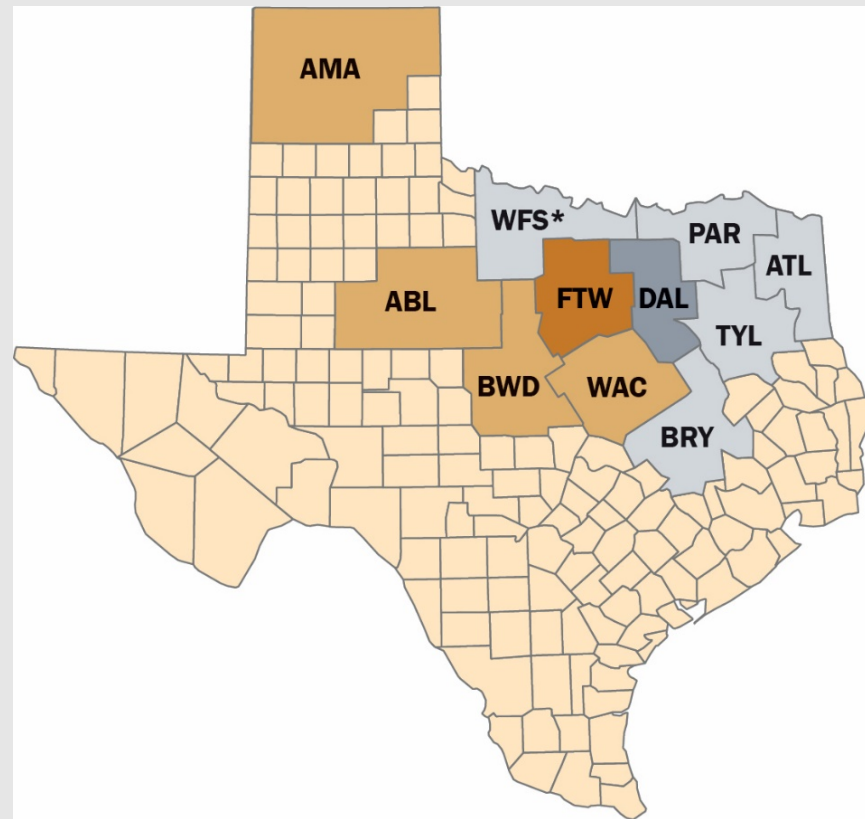
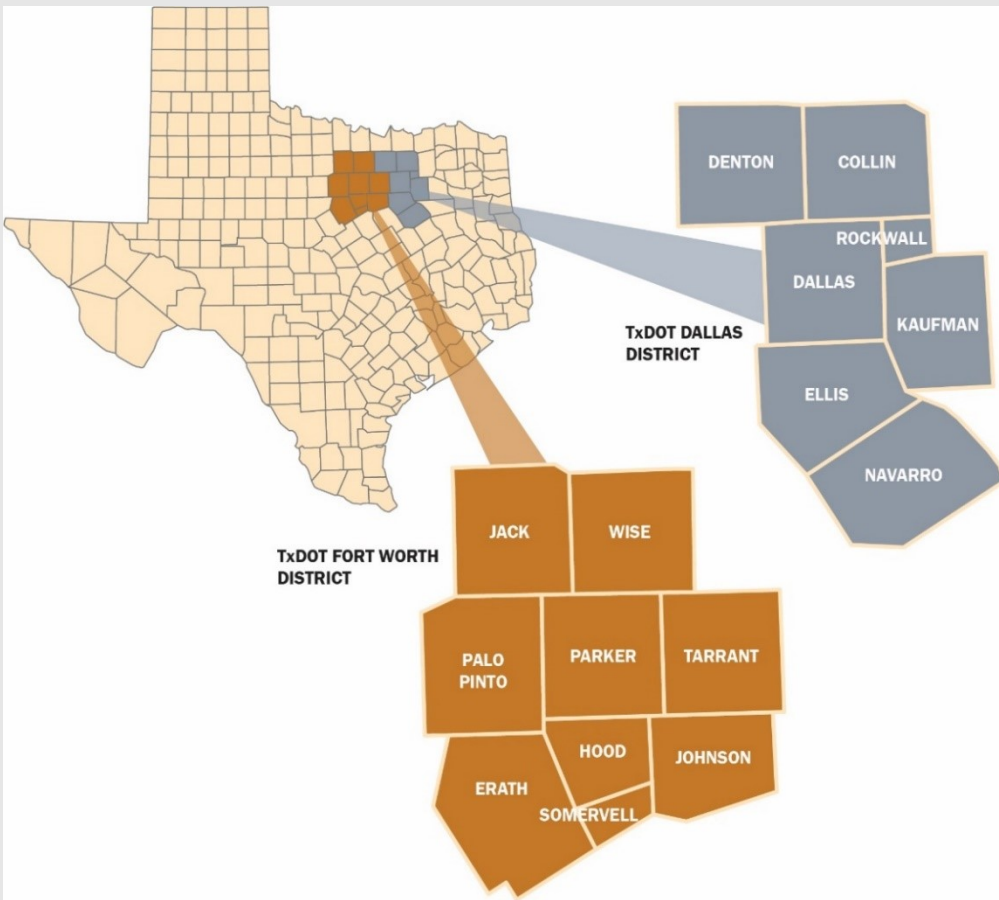


Collaboration



TxDOT DFW TSMO Program Plan

Highlights



*Districts that Receive ITS Support from Dallas and Fort Worth. (*Prior to 2021 Wichita Falls was supported by Fort Worth.)*



OVERVIEW OF THE DALLAS AND FORT WORTH DISTRICTS



Serving a population of

7,300,000 TEXANS



Over
110 MILLION
miles driven
each day

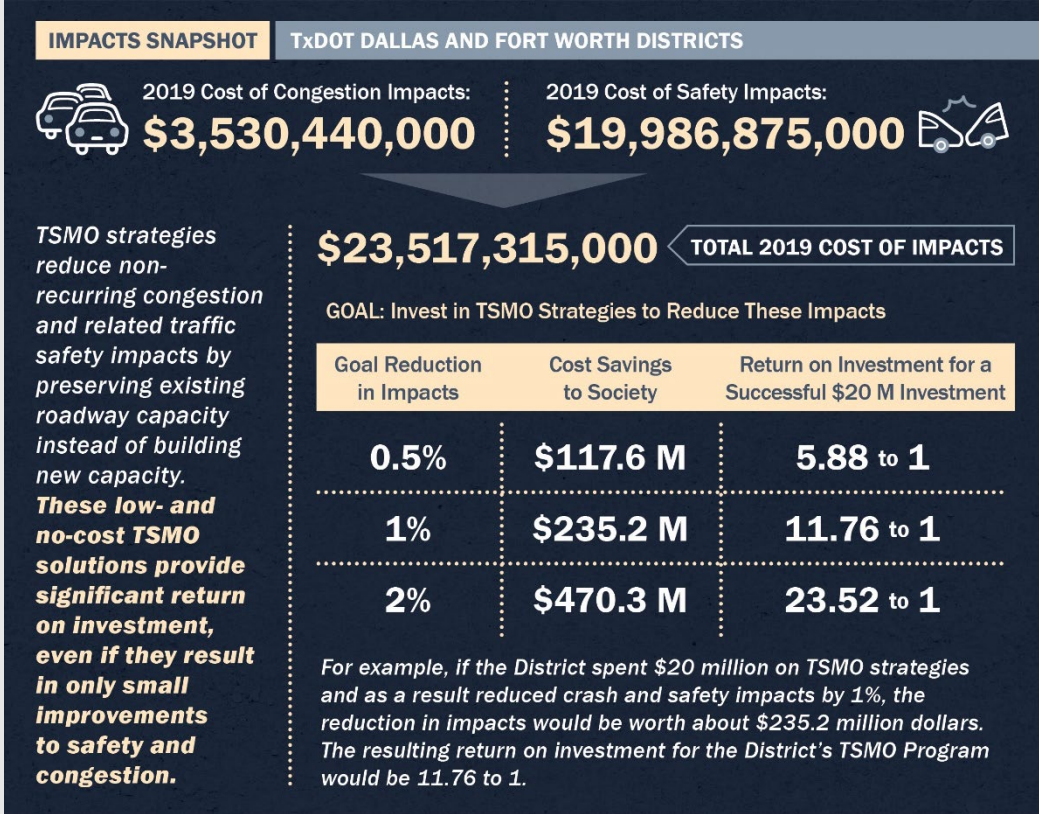


Congestion caused
28,177,000
hours of delay
in 2019

739 PEOPLE
died in traffic
crashes in 2019



19,000
LANE-
MILES
of roadway





Dallas and Fort Worth Districts TSMO Goals and Objectives

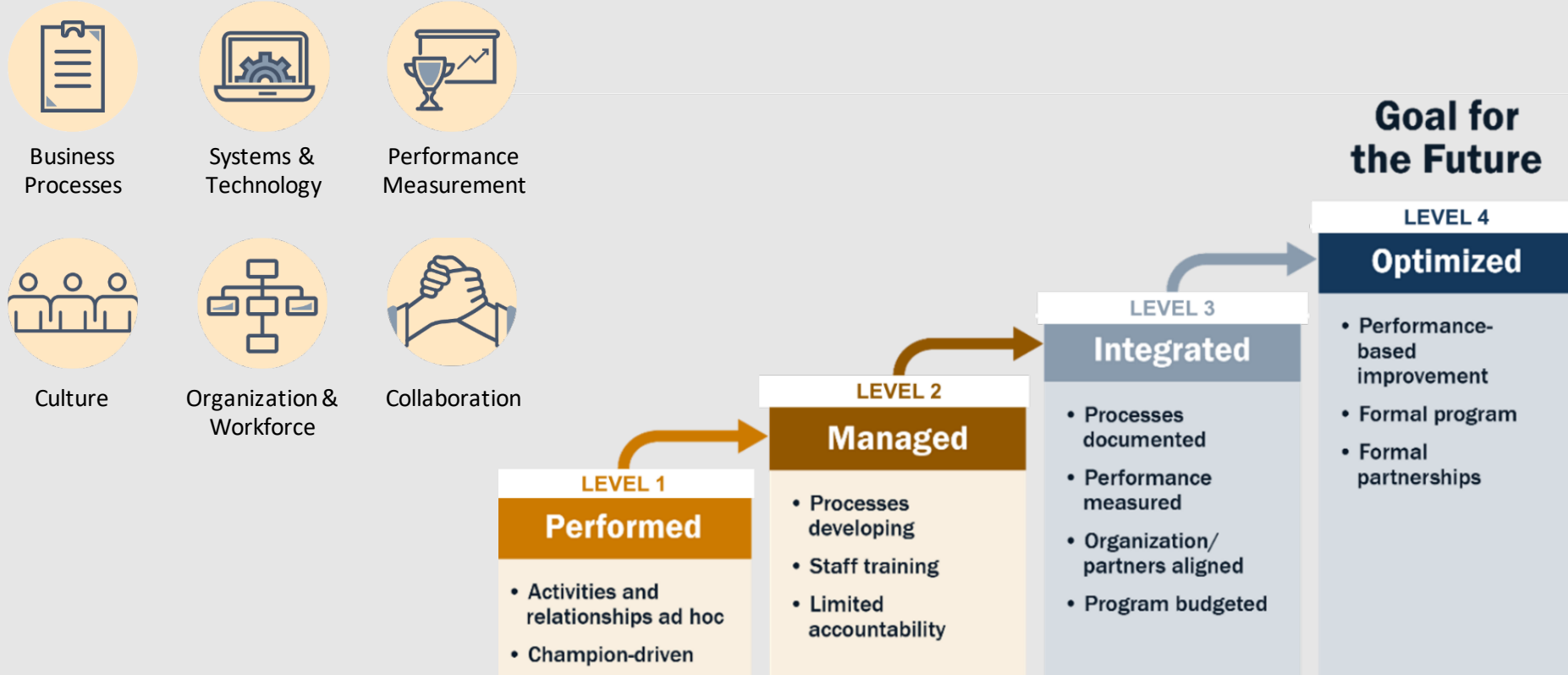
TxDOT Statewide TSMO Goals	TxDOT Statewide TSMO Strategic Objectives	TxDOT Dallas and Fort Worth Districts TSMO Program Objectives
Safety	Reduce crashes and fatalities through continuous improvement of traffic management systems and procedures.	<ul style="list-style-type: none">• Reduce crash fatalities by half by 2035 and achieve zero fatalities by 2050.• Reduce work zone and secondary crashes over the next five years.• Include safety in the project prioritization and development process.
Reliability	Optimize travel times on transportation systems in critical corridors to ensure travelers are reaching their destinations in the amount of time they expected for the journey.	<ul style="list-style-type: none">• Increase percent of person-miles traveled on the Interstate system that are reliable over the next five years.• Increase percent of person-miles traveled on the non-Interstate national highway system (NHS) that are reliable over the next five years.
Efficiency	Implement projects that optimize existing transportation system capacity and throughput.	<ul style="list-style-type: none">• Maintain a Regionwide TxDOT Transportation Management System (TMS) asset operational uptime of 90% or greater.• Use safety and traffic operations performance data to identify where additional investment is needed.• Implement performance measures to monitor traffic signal timing efficiency.• Consider all modes of transportation in the project development process.



Dallas and Fort Worth Districts TSMO Goals and Objectives













TxDOT Statewide TSMO Goals	TxDOT Statewide TSMO Strategic Objectives	TxDOT Dallas and Fort Worth Districts TSMO Program Objectives
Customer Service	Provide timely and accurate travel information to customers so they can make informed mobility decisions.	<ul style="list-style-type: none">• Expand the availability of real-time traveler information to the public and third-party consumers.• Increase the timeliness and accuracy of traveler information systems maintained by the Districts' TMCs.
Collaboration	Proactively manage and operate an integrated transportation system through multi-jurisdictional coordination, internal collaboration, and cooperation between various transportation disciplines and partner agencies.	<ul style="list-style-type: none">• Conduct multiagency training in TIM and TSM.• Continue District leadership and participation in the Area TIM meetings.• Coordinate with impacted agency stakeholders throughout all phases of project delivery.• Promote data sharing across transportation and public safety agencies.
Integration	Prioritize TSMO as a core objective in the agency's planning, design, construction, operations, and maintenance activities.	<ul style="list-style-type: none">• Institutionalize TSMO activities into the Districts' day-to-day operations.• Implement roadway enhancements, such as lane markings, that benefit the public and technologically advanced vehicles.• Explore design options to incorporate connected and automated vehicle operations.

Capability Maturity Model and Framework Workshops



Capability Maturity Model and Framework Workshops



Overall Capabilities					
TSMO Capability Dimensions	Level 1 Performed	Level 2 Managed	Level 3 Integrated	Level 4 Optimized	Region Score
Business Processes		 			2.6
Systems & Technology		 			2.6
Performance Measurement		 			2.2
Culture		 			2.5
Organization & Workforce		 			2.5
Collaboration		 			2.6



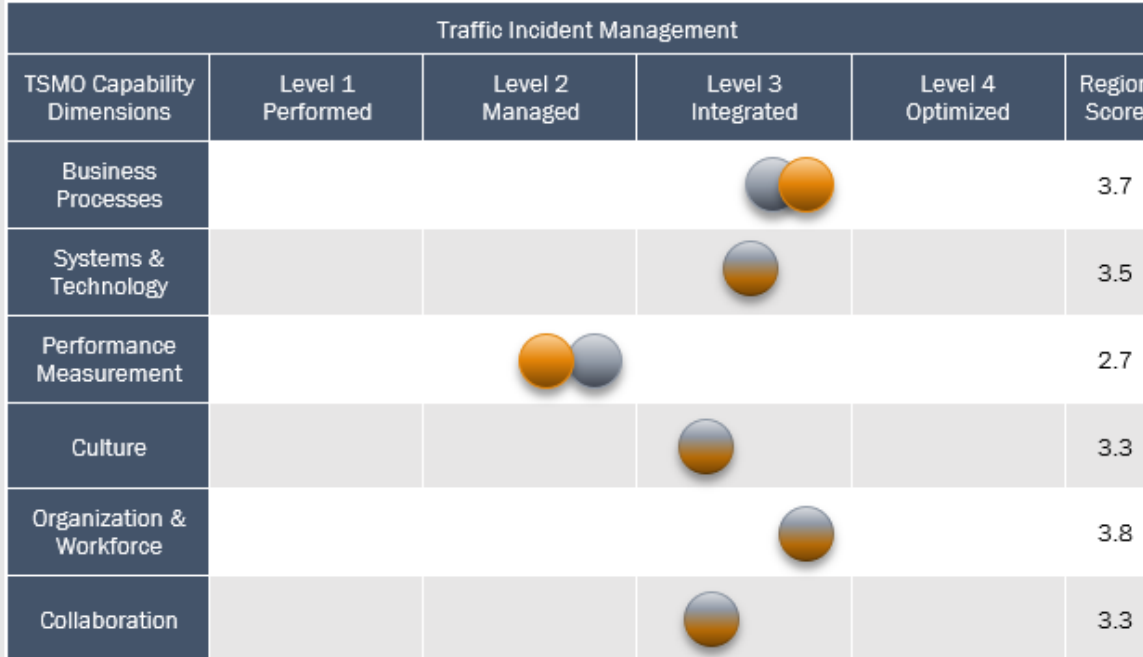
Dallas District



Fort Worth District

Goal is to Move Each Dimension Towards the Next Level

CMM Assessment: Traffic Incident Management



Dallas District



Fort Worth District



Both Districts

Goal is to Move Each Dimension Towards the Next Level

CMM Assessment: Work Zone Management



Work Zone Management					
TSMO Capability Dimensions	Level 1 Performed	Level 2 Managed	Level 3 Integrated	Level 4 Optimized	Region Score
Business Processes					3.1
Systems & Technology					2.5
Performance Measurement					2.6
Culture					2.5
Organization & Workforce					2.6
Collaboration					2.5



Dallas District















Fort Worth District

Goal is to Move Each Dimension Towards the Next Level

CMM Assessment: Road Weather Management



Road Weather Management					
TSMO Capability Dimensions	Level 1 Performed	Level 2 Managed	Level 3 Integrated	Level 4 Optimized	Region Score
Business Processes	 				1.8
Systems & Technology		 			2.5
Performance Measurement	 				1.5
Culture		 			2.6
Organization & Workforce		 			2.3
Collaboration		 			2.5



Dallas District



Fort Worth District

Goal is to Move Each Dimension Towards the Next Level

CMM Assessment: Planned Special Events



Planned Special Events					
TSMO Capability Dimensions	Level 1 Performed	Level 2 Managed	Level 3 Integrated	Level 4 Optimized	Region Score
Business Processes		 			2.3
Systems & Technology	 				2.1
Performance Measurement					2.3
Culture		 			2.8
Organization & Workforce					2.0
Collaboration		 			2.8



Dallas District



Fort Worth District













Both Districts

Goal is to Move Each Dimension Towards the Next Level

CMM Assessment: Traffic Signal Management



Traffic Signal Management					
TSMO Capability Dimensions	Level 1 Performed	Level 2 Managed	Level 3 Integrated	Level 4 Optimized	Region Score
Business Processes		 			2.4
Systems & Technology		 			2.5
Performance Measurement					1.5
Culture					2.0
Organization & Workforce		 			2.4
Collaboration		 			2.3



Dallas District



Fort Worth District














Both Districts

Goal is to Move Each Dimension Towards the Next Level

CMM Assessment: General Traffic Management



Traffic Management					
TSMO Capability Dimensions	Level 1 Performed	Level 2 Managed	Level 3 Integrated	Level 4 Optimized	Region Score
Business Processes		 			2.3
Systems & Technology					2.2
Performance Measurement		 			2.5
Culture					2.0
Organization & Workforce					1.8
Collaboration		 			2.1



Dallas District



Fort Worth District



Both Districts

Goal is to Move Each Dimension Towards the Next Level



Recommended Action Items (48 Total)



Traffic Incident Management (10)



Work Zone Management (10)



Road Weather Management (5)



Planned Special Events (4)



Traffic Signal Management (8)



General Traffic Management (11)











DFW TSMO Implementation Roadmaps



● TxDOT Dallas District ● TxDOT Fort Worth District ● TxDOT Traffic Safety Division										
Action Item Name and Number	2021	2022		2023		2024		2025		2026
	H2	H1	H2	H1	H2	H1	H2	H1	H2	H1
BUSINESS PROCESSES										
●● BP-01: Implement TIM Response Measures for Major Construction										
●● BP-02: Conduct Post-Construction Event Reviews										Ongoing
●● BP-03: Establish Procedures for Collecting and Analyzing Work Zone Road User Cost Data										
●● BP-04: Conduct After Action Reviews for Weather Events										Ongoing
●● BP-05: Conduct Post-Planned Special Event Reviews										Ongoing
● BP-06: Improve Local Partner Knowledge of Existing Agreements										Ongoing
●● BP-07: Establish Regional Resource Sharing Agreements										
● BP-08: Revise TxDOT Design Summary Report to Increase Emphasis on Operations										
●● BP-09: Support Regional Traffic Data Sharing Agreements										Ongoing
●● BP-10: Develop a Multi-Year TMS Maintenance Plan										
● BP-11: Develop TxDOT Dallas ITS Master Plan										
● BP-12: Establish Notification Process to Cities for Over Height/Oversize Vehicles Permits										
SYSTEMS & TECHNOLOGY										
●● ST-01: Establish Standardized Radio Communications for TIM Response Dispatch Information										
●● ST-02: Develop and Implement Plan for Regional Courtesy/Service Patrol Program Expansion										
●● ST-03: Utilize Decision Tool to Expand Work Zone Technology Deployments										
●● ST-04: Develop Automated Construction Notification Application										
●● ST-05: Provide Work Zone Closure Information through Third-Party Apps										Ongoing
● ST-06: Deploy Flood Warning and Closure Devices										

Key Recommended Action Items: Early Wins



Action No.	District or Division	Action Description	TSMO Focus Area	TSMO Capability Dimension
Early Win Recommended Action Items				
BP-11	DAL	Develop TxDOT Dallas ITS Master Plan: Develop an ITS Master Plan for the TxDOT Dallas District to identify and prioritize ITS and communication infrastructure deployments throughout the District.		
CO-01	DAL & FTW	Conduct Quarterly TxDOT District TIM Meetings: Conduct quarterly meeting between TxDOT Dallas and TxDOT Fort Worth Districts.		
CO-03	DAL & FTW	Conduct After-Action Reviews for Major Incidents: Establish criteria for determining which incidents require after-action reviews and conduct reviews as needed.		
CO-04	DAL & FTW	Include Planned Special Events in Traffic Management Team Meetings: Add discussion on planned special events and invite planned special event managers to the regional Traffic Management Team (TMT) meetings.		
CO-07	DAL & FTW	Create Contact List for Special Signal Timing Notifications: Create a service/email exchange contact list for notification of implementation of incident-based traffic signal timing plans.		

Regional Partner Involvement?



Local Public Safety and Traffic











Local Traffic and Event Organizers



Local Traffic

Key Recommended Action Items: Low Cost, High Impact



Action No.	District or Division	Action Description	TSMO Focus Area	TSMO Capability Dimension
Low Cost, High Impact Recommended Action Items				
PM-01	DAL, FTW, & TRF	Improve TIM Performance Collection and Reporting: Improve TIM related data collection and reporting, with a focus on recording incident response time, roadway clearance time, incident clearance time, secondary crash data and time to return to normal flow on all incidents tracked in Lonestar.		
OW-06	DAL, FTW, & TRF	Develop a Traffic Signal Training and Staff Development Program: Develop and implement a formal training program to improve capability and staff development of TxDOT traffic signal staff and local partners.		
CO-02	DAL & NCTCOG	Expand the Regional TIM Team in the Dallas District: Partner with NCTCOG to expand the attendance and participation in the Regional TIM Team in the Dallas District and formalize after-action reviews.		
CO-05	DAL, FTW, & TRF	Conduct Quarterly Signal Technician Forums: Conduct quarterly signal technician forums for TxDOT and partner agencies to improve collaboration, share best practices, and establish a regional competency regarding signal maintenance and operations.		

Regional Partner Involvement?

☒ **Local Law Enforcement and DPS**

☒ **Local Traffic**

☒ **Local Public Safety and Traffic**

☒ **Local Traffic**

Key Recommended Action Items: High Cost, High Impact



Action No.	District or Division	Action Description	TSMO Focus Area	TSMO Capability Dimension
High Cost, High Impact Recommended Action Items				
ST-02	DAL & FTW	Develop and Implement Plan for Regional Courtesy/Service Patrol Program Expansion: Develop regional courtesy/service patrol plan for expansion; considering network coverage, hours of operation, and baseline of services provided.		
PM-07	DAL & FTW	Develop and Implement Automated Traffic Signal Performance Measures: Develop a formal program and implement necessary technology and software to support Automated Traffic Signal Performance Measures operations on key District corridors.		
OW-02	DAL	Establish Dedicated TIM Coordinator Position: Establish a dedicated TIM coordinator position in the Dallas District to support TIM activities throughout this District.		
OW-03	DAL & FTW	Establish Dedicated Work Zone Coordinator Position: Establish regional-level work zone coordinator position for coordination of construction closures to avoid conflicts and ensure communication to impacted stakeholders.		









Regional Partner Involvement?



Dallas County Sheriff

Key Recommended Action Items: Partner Led, High Impact



Action No.	District or Division	Action Description	TSMO Focus Area	TSMO Capability Dimension
High Impact Recommended TSMO Actions Items Led by District Partners				
BP-08	TRF	Revise TxDOT Design Summary Report to Increase Emphasis on Operations: Revise the TxDOT Design Summary Report form to increase focus on TSMO related strategies including Smart Work Zones during construction, and traffic signals and ITS post-construction.		
PM-09	TRF	Develop Implementation Plan for Regional Data Usage: Develop implementation plan to maximize the region's utility of available probe-based INRIX and Streetlight data.		
PM-02	NCTCOG (Partner Agency)	Develop Regional TIM Database: Develop regional TIM database in partnership with NCTCOG and local agencies to track TIM quick clearance performance on routes throughout the DFW Region.		
OW-01	NCTCOG, TRF, DAL & FTW	Provide Recurring Regional TIM Training: Continue partnering with NCTCOG and other agencies to identify agencies that have not been involved with training and provide recurring regional TIM training in a multidisciplinary setting.		

Regional Partner Involvement?

- ☑ Local Traffic and NCTCOG
- ☑ Local Traffic
- ☑ Local Traffic and Law Enforcement
- ☑ Local Public Safety and Traffic

Key Recommended Action Items: Tactical Plans



Potential Tactical Plan	Supports District TSMO Goals						Key Internal and External Partners	Expected Long-Term Program Costs	Expected Ongoing Program Level of Effort	Expected Return on Investment for District	TSMO Action Items Addressed
	Safety	Reliability	Efficiency	Customer Service	Collaboration	Integration					
Safety Service Patrol Expansion Plan	✓	✓	✓			✓	DAL & FTW Operations Departments, DAL & FTW Area Engineers, DAL & FTW TMC Staff, Dallas County Sheriff	\$\$\$	<div><div></div><div></div><div></div><div></div><div></div></div>	Highest	ST-02
Dallas District ITS Master Plan	✓	✓	✓	✓	✓	✓	DAL Operations Department, DAL Area Engineers	\$\$\$	<div><div></div><div></div><div></div><div></div><div></div></div>	Highest	BP-11
Traffic Management System Device Maintenance Plan		✓	✓			✓	DAL & FTW Operations Departments, DAL & FTW Maintenance Sections	\$\$	<div><div></div><div></div><div></div><div></div><div></div></div>	High	BP-10
Work Zone Technology Deployment Expansion Plan		✓		✓		✓	DAL & FTW Operations Departments, DAL & FTW Area Engineers, DAL & FTW Construction Departments	\$	<div><div></div><div></div><div></div><div></div><div></div></div>	High	BP-03, ST-03
Regional Probe-Based Data Integration Plan		✓	✓	✓	✓	✓	TxDOT Traffic Safety Division, DAL & FTW Operations Departments, DAL & FTW Area Engineers, Local Transportation Agencies	\$	<div><div></div><div></div><div></div><div></div><div></div></div>	High	PM-08, PM-09
Traffic Management and Signal Staff Development Plan						✓	TxDOT Traffic Safety Division, DAL & FTW Area Engineers, DAL & FTW Operations Departments, DAL & FTW Signal Shops, Local Transportation Agencies	\$	<div><div></div><div></div><div></div><div></div><div></div></div>	High	OW-06, OW-07
Planned Traffic Event Notification System Concept of Operations			✓			✓	TxDOT Traffic Safety Division, DAL & FTW Construction Departments, DAL & FTW Operations Departments, DAL & FTW Area Engineers, Local Transportation Agencies, Event Organizers	\$\$	<div><div></div><div></div><div></div><div></div><div></div></div>	Medium	ST-04
ATSPM Regional Expansion and Deployment Plan	✓	✓	✓			✓	TxDOT Traffic Safety Division, DAL & FTW Operations Departments, DAL & FTW Area Engineers, Local Transportation Agencies, NCTCOG	\$\$	<div><div></div><div></div><div></div><div></div><div></div></div>	Medium	PM-07, CO-06
Regional TIM Database Concept and Architecture	✓	✓	✓			✓	TxDOT Traffic Safety Division, DPS and Local Law Enforcement, DAL & FTW Operations Departments, Local Transportation Agencies, NCTCOG	\$	<div><div></div><div></div><div></div><div></div><div></div></div>	Medium	PM-01, PM-02

Overview

- TSMO Definition
- Benefits of TSMO

Meetings

- Upcoming Meetings
- Past Meeting Presentation Slides

TSMO Resources

- TxDOT Developed TSMO Video
- Links to FHWA and TxDOT TSMO Resources
- TxDOT DFW TSMO Program Plan and Other Reports

Transportation Systems Management and Operations (TSMO)

Dallas - Fort Worth TSMO Program Plan Overview



Overview

Meetings

TSMO Resources

Contacts



TxDOT TSMO Program Plan Review

- TxDOT District Review for Revised and Final Draft
- TxDOT Traffic Safety Division and Communications Division Review

Roll-Out

- NCTCOG ITS Stakeholders Meeting – April 7, 2021
- Meetings with TxDOT Dallas and Fort Worth District Engineer and Senior Staff – April through May 2021
- General Stakeholder Presentation – July 15, 2021

Project Website (TSMODFW.org)

- Update Project Website with Reports and Other Resources
- Notify All Stakeholders

Questions?



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Project Webpage

www.tsmodfw.org

TxDOT TSMO Webpage

www.txdot.gov/inside-txdot/division/traffic/tsmo.html