TxDOT DFW TSMO Capability Maturity Model Virtual Work Sessions July-August 2020

Summary Report

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Acronyms

CMM	Capability Maturity Model
DFW	Dallas-Fort Worth
DPS	Department of Public Safety
EMS	Emergency Medical Services
ITS	Intelligent Transportation Systems
MPO	Metropolitan Planning Organization
NCTCOG	North Central Texas Council of Governments
PD	Police Department
PSE	Planned Special Event
RWM	Road Weather Management
TIM	Traffic Incident Management
TMC	Transportation Management Center
TSM	Traffic Signal Management
TSMO	Transportation Systems Management and Operations
TTI	Texas A&M Transportation Institute
TxDOT	Texas Department of Transportation
WZM	Work Zone Management

Executive Summary

Texas Department of Transportation's (TxDOT) Dallas and Fort Worth Districts hosted an interactive webinar series to provide a self-assessment of the region's transportation systems management and operations (TSMO) capabilities to support their TSMO Program Plan. The self-assessment will help determine a set of actions that will support effective TSMO solutions and strategies—based on the Capability Maturity Model (CMM) framework. The process engaged both TxDOT staff and decision makers at stakeholder and partner agencies that regularly collaborate to manage and operate the roadway network. The work session series provided a structured focus on six dimensions of capability: culture, organization and staffing, business processes, performance measurement, systems and technology, and collaboration. Participants evaluated their current activities and arrangements by assessing the strengths, weaknesses, and potential actions to advance operations.

This self-assessment event was originally planned to occur as a day-long, in-person workshop. Due to meeting restrictions related to the Coronavirus pandemic, the workshop was split into four virtual sessions, which were held over a period of about one month. The first session introduced participants to the CMM self-assessment process used by all stakeholders. The hour-long session stepped through foundational CMM materials and left time for questions and answers. An important step for this first webinar was recruiting stakeholders to engage in meaningful discussion in one or all of the three remaining work sessions, each focused on various "TSMO Strategic Areas of Management." Each focused session was scheduled for 90 minutes and allotted a smaller set of participants to assess current strategies and identify actions to improve upon operational strategies. The TSMO Strategic Areas of Management focus sessions included:

- Traffic Incident Management (TIM),
- Traffic Signal Management (TSM)/Traffic Management, and
- Road Weather Management (RWM)/Planned Special Events (PSE)/Work Zone Management (WZM).

Additionally, the Dallas and Fort Worth Districts each completed CMM surveys to rate specific abilities within the above Strategic Areas of Management. This document provides an overview of the three work sessions, observations from the survey, and a summary of key takeaways for the TxDOT Dallas and Fort Worth Districts' TSMO Program Plan. An executive summary of these key takeaways is provided below.

Key Takeaways

- In total, the workshops engaged 28 staff from TxDOT and other partner agencies in the Dallas/Fort Worth (DFW) region. Some attendees participated in multiple sessions. The number of participants in each work session was:
  - TIM: 12 participants, 4 from TxDOT and 8 from other agencies.
  - TSM/Traffic Management: 20 participants, 10 from TxDOT and 10 from other agencies.
  - RWM/PSE/WZM: 11 participants, 4 from TxDOT and 7 from other agencies.
- Performance measurement was identified as a weakness during all three work sessions.

- TIM training is a strength in DFW with many multi-disciplinary opportunities available. However, collaboration could be further strengthened by after-action reviews to continuously improve.
- TSM collaboration between TxDOT and cities varies by individual relationship, and processes could be formalized and documented to ensure effective collaboration across the region.
- Planning and deployment strategies for road weather events are generally positive and collaborative.
- PSE planning is also strong, and considerations of PSEs are built into project designs. Communication between organizations is healthy.
- WZM was considered to be strong, particularly on major projects that have dedicated coordination meetings and staff resources. However, these practices are not applied to everyday activities.
- Surveys revealed areas for improvement, even in areas where participants reported relative strength during work sessions.

Chapter 1: Introduction

TxDOT Dallas and Fort Worth Districts conducted joint virtual work sessions in support of the TxDOT Dallas-Fort Worth (DFW) TSMO Program Plan in July and August 2020. The plan seeks to increase safety, reduce congestion, and improve transportation reliability in the DFW region by identifying cost-effective potential improvements in how the region operates and maintains the transportation system.

District Survey Overview

Separately from the CMM work sessions, Dallas and Fort Worth District staff completed a survey of their capabilities outside of the work session asking them to answer more detailed questions about specific facets of TSMO operations in their districts. The full results are available in a separate file, with the following table summarizing the number of questions and average scores presented by topic.

Table 1: District Survey Overview

Survey Topic	Number of Questions	Average Score
Traffic Incident Management	56	3.4
Traffic Signal Management	17	2.3
Work Zone Management	18	2.7
Road Weather Management	19	2.1
Planned Special Events	16	2.4
Traffic Management	21	2.2
Total	147	

Virtual Work Session Overview

The series of work sessions provide self-assessments of TSMO capabilities for the TxDOT Districts to improve the effectiveness of TSMO solutions and strategies. The first webinar, held on July 16th, 2020, provided an overview of the framework used to assess the key strategic areas and work completed to date. This session also gauged interest for the follow-up webinars where specific inputs related to advancing TSMO in various key strategic areas would be discussed.

During the July 16th introductory webinar, the team stepped through the concept of the CMM self-assessment for TSMO. A “capability maturity” approach focuses on the key dimensions that impact how transportation operations can advance in the region for business processes, systems and technology, performance measurement, agency culture, organization and staffing, and collaboration. Improving these capabilities are essential to continuous improvement of TSMO and its performance impacts.

The three follow-on work sessions included a self-assessment exercise of current conditions related to transportation operations by TxDOT and partner agency staff that reviewed the strengths and weaknesses of current

TSMO capabilities. One work session was held on August 6th, and two were held on August 18th. The participants discussed current capabilities, including strengths and weaknesses, and suggested actions that could improve operations. The identified actions were logical (and doable) "next steps" to improve the region's TSMO capability. These actions will be used to inform the development of the DFW TSMO Plan.

Introductory CMM Webinar Overview

On July 16th, the project team conducted an introductory webinar to raise awareness of both TSMO in general and of TxDOT's Dallas and Fort Worth District TSMO efforts specifically. The team conducted a one-hour webinar that introduced the CMM framework and described how they revised the planned day-long workshop to be four virtual sessions. Participants were asked to express interest in each of three work sessions on specific TSMO strategies.

The webinar outlined the CMM framework detailing the six CMM dimensions:

- Business Processes,
- Systems and Technology,
- Performance Measures,
- Culture,
- Organization and Staffing, and
- Collaboration.

The team introduced participants to defining actions that advance the dimensions of the CMM. Finally, the team outlined the three topic areas of the work sessions and prompted participants to participate in the CMM self-assessment for:

- Traffic Incident Management,
- Road Weather/Planned Special Events/Work Zone Management, and
- Traffic Signal Management/Traffic Management.

Chapter 2: Individual Work Session Summaries

The following sections contain summaries of the three individual virtual work sessions. Note that the key takeaways shown in the Executive Summary are takeaways that also apply across the three individual work sessions.

Work Session 1: Traffic Incident Management

Overview

The first work session addressed traffic incident management. The work session was held on August 6, 2020, via Microsoft Teams. There were 12 participants, including:

- Four TxDOT staff, and
- Eight attendees from other agencies:
  - North Central Texas Council of Governments (NCTCOG),
  - City of Allen,
  - City of Arlington,
  - City of Irving,
  - City of Mesquite,
  - City of Plano, and
  - City of Richardson.

Attendees were reintroduced to the six CMM dimensions as well as a series of considerations for TIM, shown in Table 2. Participants were then asked to respond to two prompts:

- Which dimension seems to be most "in order" for TIM strategies in the DFW area?
- Which dimension seems to have the most room for improvement for TIM strategies in the DFW area?

The responses to these prompts are summarized in the key takeaways section that follows and listed in Appendix A.

Table 2: Work Session 1 Capability Maturity Framework

TIM Capability Maturity Framework
Is there a formal TIM program that is supported by a multidisciplinary, multiagency team or task force, which meets regularly to discuss and plan for TIM activities?
Is agency leadership actively involved in program-level TIM decisions (i.e., policy establishment, training, funding, legislation, etc.)?
Is an Authority Removal Law in place and understood by TIM stakeholders?
What outreach activities are in place to educate the public and elected officials about TIM?
Is Roadway Clearance Time being measured? Other data collected and measured?
Is there a formal TIM program that is supported by a multidisciplinary, multiagency team or task force, which meets regularly to discuss and plan for TIM activities?

Key Takeaways

Participants identified support from TxDOT and partner organization leadership as an important strength for the DFW region. Under this leadership, TSMO activities and on-going collaboration have increased from informal or ad-hoc activities to more formal relationships with dedicated roles and budgets. Participants noted that the region has strong awareness of collaboration opportunities: identifying key partners and utilizing their abilities was specifically identified as a strength in this area.

Multi-disciplinary or cross-disciplinary training was frequently cited as a strength in the DFW region. Standardized TIM meetings and training are currently occurring within the Fort Worth District through four existing TIM teams (another two are planned). NCTCOG, the DFW area's metropolitan planning organization (MPO), offers first responder training that is open for all to attend. This program has trained more than 3,200 staff in the region. However, communication about training availability was identified as a weakness. Local agencies stated that they were not aware of scheduled training opportunities available to their staff.

Safety patrol programs are implemented in the region as Mobility Assistance Patrol, Courtesy Patrol, or Roadside Assistance Patrol. The names for this type of program vary by implementing agency, but the missions are similar.

Participants commented that performance measures need to be tracked and reported across agencies, and this point was echoed by many participants. Suggested measures included time to respond, time to clear, number of secondary crashes, and traveler delay. Participants further felt that performance should be measured both on and off the TxDOT highway system.

During- and after-action collaboration and business processes were identified as a weakness. Communication at the incident command level is an ongoing challenge in the region; participants commented on disagreement on roles during events. Without a strong after-action review process, there is not currently an opportunity to collaboratively improve processes before the next event.

Actions to Advance

The following table displays the actions identified by participants to advance TSMO.

Table 3: Work Session 1 Actions to Advance

Action	Owners	Dimension
Use performance metrics to support budget request for TIM programs.	TxDOT, MPO, localities	Performance Measures
Conduct after-action reviews.	TxDOT and all partners	Business Processes, Collaboration
Improve performance measures reporting and develop notification protocols with agencies.	TxDOT	Performance Measures
Hire dedicated personnel to oversee the City's Traffic Management Center.	Localities	Organization
Invest in technology such as drone scene documentation that would reduce incident duration.	TxDOT	Systems and Technology
Establish quarterly meeting of TxDOT Districts to get everyone thinking in the same terms, possibly starting two districts at a time.	TxDOT	Culture

Work Session 2: Traffic Signal Management/Traffic Management

Overview

The second work session addressed Traffic Signal Management and Traffic Management strategies. The work session was held on August 18, 2020, via Microsoft Teams. There were 20 participants, including:

- Ten TxDOT staff.
- Ten attendees from other agencies:
  - North Central Texas Council of Governments (NCTCOG),
  - City of Allen,
  - City of Arlington,
  - City of Irving,
  - City of Mesquite,
  - City of Plano, and
  - City of Richardson.

Attendees were reintroduced to the six CMM dimensions and a series of considerations for TSM, shown in Table 4. Participants were then asked to respond to two prompts:

- Which dimension seems to be most "in order" for Traffic Signal and Traffic Management strategies in the Dallas and Fort Worth Districts?
- Which dimension seems to have the most room for improvement for Traffic Signal and Traffic Management strategies in the Dallas and Fort Worth Districts?

The responses to these prompts are summarized in the key takeaways section that follows and listed in Appendix B.

Table 4: Work Session 2 Capability Maturity Framework

TSM Capability Maturity Framework
How does TxDOT involve or support local agencies in signal planning and maintenance processes?
How does TxDOT respond or support response when there is an issue with a traffic signal?
How does TxDOT respond to public input or agency stakeholder input regarding traffic signals?
How can performance of traffic operations and signalized intersections be improved locally or throughout the District?
What data or information on local traffic signals would partners find useful for TxDOT to share?

Key Takeaways

Collaboration between regional partners on signal timing and traffic management was considered a strength by the participants. A signal retiming program exists to coordinate signal operations. Participants agreed that there is a

general willingness to collaborate with regards to traffic management. Other participants commented that they did not share this experience. Collaboration and knowledge of existing capabilities or support is currently based on relationships (at times with former colleagues), while localities without an existing relationship have not experienced the same willingness to coordinate. This communication challenge exists between TxDOT and cities as well as between adjacent cities.

Business processes related to planning and procurement were seen as a strength in the DFW area. Local leadership and NCTCOG's data-driven signal project prioritization process lead to short timeframes to implementation. These processes were predominantly seen as a strength; however, participants noted that longer-term planning for signal projects could be helpful too. For example, signal considerations should be incorporated from the earliest possible project planning phase. Participants noted that adding technology or infrastructure after a project is constructed is more costly than doing so during construction. Additionally, the availability of cooperative buying contracts facilitates procurement.

Coordination on technology infrastructure and integration of local and state systems were identified as weaknesses. While some localities reported accessing TxDOT infrastructure such as fiber and cameras, others found tying into TxDOT systems to be difficult. This difference is caused in part by the relationship-driven successes as well as long times to establish new, formal agreements. Standard procedures could help. A central cloud base platform for the region could be an option for information sharing. Direct C2C communication requirements could be avoided with technology like cloud-based platforms to overcome individual agency differences for sharing data such as video feeds and traffic signal metrics. The video sharing pilot has been successful using this method.

Finally, participants commented on the need for standardized performance measures to be tracked and reported throughout the region.

Actions to Advance

The following table displays the actions identified by participants to advance TSMO.

Table 5: Work Session 2 Actions to Advance

Action	Owners	Dimension
Develop documented procedures for cities and other stakeholders to request access to TxDOT CCTV, conduit, and fiber.	TxDOT	Business Processes, Collaboration
Establish monthly coordination calls between cities and the Dallas District, similar to Fort Worth District meetings.	TxDOT	Collaboration
Encourage increased use of 511DFW to track and coordinate planned construction by all agencies.	TxDOT, localities	Business Processes, Collaboration
Revise TxDOT's Design Summary Report (a planning/design document filled out prior to PS&E) to include more checklist items and questions regarding traffic operations/signal issues.	TxDOT (may apply to local documents as well)	Business Processes
Take advantage of cloud-based technology platforms to overcome individual agency differences for data sharing such as video feeds and, traffic signal data metrics.	TxDOT	Systems and Technology
Utilize a formal process that includes external coordination to improve incident notifications.	TxDOT	Collaboration
Systematically fund operations and maintenance of TSMO systems.	TxDOT, MPO, localities	Organization

Work Session 3: Road Weather/Planned Special Events/Work Zone Management

Overview

The third work session addressed road weather, planned special events, and work zone management. The work session was held on August 18, 2020, via Microsoft Teams. There were 11 participants, including:

- Four TxDOT staff.
- Seven attendees from other agencies:
  - North Central Texas Council of Governments (NCTCOG),
  - City of Arlington,
  - City of Grand Prairie,
  - City of Plano, and
  - City of Richardson.

Attendees were reintroduced to the six CMM dimensions and a series of considerations for road weather, planned special events, and work zone management, shown in Table 5. Participants were then asked to respond to two prompts:

- For Work Zone Management/Planned Special Events/Road Management During Inclement Weather programs, what is working well in the region?
- For Work Zone Management/Planned Special Events/Road Management During Inclement Weather programs, what are challenges or areas of improvement for the region?

The responses to these prompts are summarized in the key takeaways section that follows and listed in Appendix C.

Table 6: Work Session 3 Capability Maturity Framework by Topic

Road Weather Management (RWM) Capability Maturity Framework
How are TxDOT's RWM activities funded and used?
How integrated are RWM activities?
What is the level of availability of road weather information through existing systems and technologies?
How does TxDOT report road weather performance to the public?
How willing is TxDOT and its partner agencies to make decisions based on proactive RWM measures?
How do Maintenance, Transportation Management Center (TMC) operations, and other TSMO teams coordinate to support RWM?
PSE Management Capability Maturity Framework
Are mechanisms in place to assess and address needs, and proactively plan for events?
Does budgeting for PSEs occur to ensure operations are sufficiently resourced?
Is PSE transportation and related event data captured (via TMCs, transit systems, venues, etc.), and are the data shared with other entities for real-time operational purposes? (i.e., Baylor Football Games)
Are transportation operations for PSEs understood as important and integrated into the culture of all regional operating entities?
Are mechanisms in place to assess and address needs, and proactively plan for events?
Does budgeting for PSEs occur to ensure operations are sufficiently resourced?
WZM Capability Maturity Framework
How does TxDOT plan for and involve its partners when developing work zone plans?
How does TxDOT coordinate and partner with local agencies when there are simultaneous ongoing projects along a corridor or within a region?
How is institutional WZM knowledge in various parts of TxDOT captured and shared?
How do TxDOT and partner agencies alert one another to planned and upcoming closures?
How does law enforcement collaborate or assist with WZM activities?
How does TxDOT incorporate other stakeholders (general public, schools, businesses, emergency medical services (EMS), etc.) into WZM processes?

Key Takeaways

The DFW districts and their partners identified many strengths in the road weather, planned special events, and work zone category and generally agreed that capabilities are strong in this area. In general, collaboration,

communication, and business processes were seen as strengths, and performance measurement was a weakness. When asked about performance measurement, participants did not identify any examples of current practices.

Inclement weather planning and response were generally considered to be in good order. During winter weather events, District staff pre-stages equipment and supplies to respond quickly, and Districts share equipment when needed. Participants noted that TxDOT could improve preparedness by ensuring that equipment is ready to use in advance; equipment is not used on a day-to-day basis and may not be prioritized for maintenance and repair.

Participants also considered special event planning and implementation as a strength. The DFW area has frequent special events, especially at professional sports facilities in Arlington. Participants commented that coordination with ITS staff is good, and preparedness for special events is built into roadway project design. Traffic control plans incorporate special events and local traffic patterns and vary by day of week. Participants commented that TxDOT does a good job communicating with the public through the media and Waze. City staff commented that they can communicate with TxDOT and their contractors when an issue arises. Communication with transit agencies was identified as an area for improvement, however.

A disparity between large-scale projects and on-going practices was observed by participants. Major projects have monthly traffic management meetings and designated mobility coordinators that have resulted in better coordination and outcomes. However, these practices and roles do not exist on a continuous basis for ongoing activity in the DFW area. Participants observed that for project-specific concerns, engaging relevant partners before or during project kick-off would improve coordination.

Actions to Advance

The following table displays the actions identified by participants to advance TSMO.

Table 7: Work Session 3 Actions to Advance

Action	Owners	Dimension
Post construction and special events closures on 511DFW and Waze. Ideally, this process would be automated.	TxDOT; cities	Collaboration and Technology & Systems
Include traffic and event management topics in recurring meetings (e.g., traffic signal data sharing meeting at NCTCOG).	TxDOT; MPO	Collaboration
Continue or establish traffic management and coordination meetings as a part of ongoing major construction. These currently happen on a project-basis, but could be broadened to the region or continued after project completion.	TxDOT	Collaboration
Coordinate construction on parallel arterials to ensure there are alternate routes.	TxDOT; cities	Business Processes

Use signal performance measurements to prioritize modernization projects.	TxDOT; MPO	Performance Measurement
Establish mobility coordinator roles on a wider range of construction projects or as a standing role.	TxDOT	Organization

Chapter 3: District Survey Summary

The Dallas and Fort Worth Districts answered separate, identical surveys rating their maturity for nearly 150 questions within six topic areas. Ratings ranged from 1 to 4, where 4 indicates mature, sustainable processes and 1 indicates an activity not currently happening or is happening only on an ad hoc basis. The following sections summarize the questions rated by the Districts as the greatest strengths and weaknesses in the DFW area and identify where the Districts' responses differed by more than one point. The consistent nature of the scoring across districts in all but one category shows that the districts have very similar maturity in most categories. The average rating for each of the six topic areas is shown in the following table.

Table 8: Average Survey Ratings by Topic Area

Topic Area	Dallas	Fort Worth	Combined
Traffic Incident Management	3.3	3.4	3.4
Traffic Signal Management	2.3	2.2	2.3
Work Zone Management	3.1	2.3	2.7
Road Weather Management	2.3	2.0	2.1
Planned Special Events	2.4	2.3	2.4
Traffic Management	2.1	2.2	2.2

Traffic Incident Management

TIM was rated as the strongest area by both Districts, and both Districts responded with a score of level 3-4 on most capability questions. The lowest rated capabilities related to the tracking of secondary crashes. Neither District is using secondary crash metrics to influence its TIM operations, and neither has established a performance target to reduce crashes. The Dallas District responded that it collects secondary crash data, while the Fort Worth District did not. Additionally, neither District is currently using computer-aided dispatch in their traffic management center/traffic operations center systems as they do not oversee that function.

Respondents identified several areas where TSMO strategies are applied inconsistently. For example, end-of-queue warnings are not evenly applied within or across Districts, but they are used in some situations or depending upon responding agency. Similarly, signal timing changes during incident response are not uniformly applied. While there are pre-planned detour routes identified in some contexts, these are not uniformly distributed or implemented across agencies.

Traffic Signal Management

TSM ratings provided by the Dallas and Fort Worth Districts ranged between level 2-3 in most areas. These ratings indicate that for most traffic signal concerns, Districts have processes that are not uniformly available or applied. Flexibility to adjust funding, use of design standards, and maintaining a state of good repair were all identified as

strengths. The Districts responded that performance measures are not used to identify the need for operational improvements (the only response receiving a score of 1 in this topic area). Responses were similar between the Dallas and Fort Worth Districts throughout this topic area.

Work Zone Management

WZM was the second-highest b as fully mature: both Districts agreed that project significance considerations were evaluated and refined regularly. The Districts rated themselves slightly differently on use of WZM performance measures. The Dallas District reported that it uses WZM performance measures collected from multiple projects and incorporates those into strategic planning decisions. The Fort Worth District reported only using WZM measures collected from some projects. Similarly, the Dallas District reported incorporating private-sector input, while the Fort Worth District did not. Both Districts identified WZM outreach and reporting as an area for improvement.

Road Weather Management

While road weather management was generally considered to be in good order during the work sessions, this topic area was the lowest rated in the survey. The highest rated capability within road weather management was the presence and ability of knowledgeable subject matter experts to influence procurement of technology. Both Districts indicated communication with the media about weather events as a strength. Additionally, seasonal allocation of TxDOT staff with specific roles related to road weather management was a strength.

The Dallas and Fort Worth Districts reported capacity building as a weakness, with the Dallas District reporting informal training, and the Fort Worth District indicating a lack of familiarity with capacity building. Performance measures were also identified as a weakness; Districts rated this capability level as 1. Consequently, Districts also reported an inability to communicate road weather performance to the public.

The Dallas District rated itself two levels higher than the Fort Worth District on two subjects. First, the Dallas District has staff availability to support maintenance, operations, and decision making, while the Fort Worth District reported utilizing an ad hoc approach with staff from various roles as availability allows. The Dallas District also reported routine coordination with the National Weather Service or private weather providers. The Fort Worth District commented that while it has access to data, there is little or no person-to-person coordination.

Planned Special Events

Almost all of the PSE capability questions were rated either level 2 or 3 by both Districts. This topic area has some features of maturity, but shortcomings to a fully mature operation were present in every question. As in other topic areas, the greatest weakness identified related to performance measurement. While the Dallas District indicated that it collects PSE data and shares it with some entities, the Fort Worth District indicated that PSE data are not collected and shared.

Traffic Management

Survey responses from both Districts indicated that traffic management was the second least mature topic area. Most responses rated current capabilities at level 2 or 3. However, strong topics were identified along with several weak points. The Dallas and Fort Worth Districts agreed that traffic management planning occurs at the metropolitan level based on agreed-upon objectives. Additionally, traffic management projects are at times incorporated into construction or maintenance efforts.

Both Districts reported that multimodal considerations are only included on an ad hoc basis for specific projects. Staff retention and preservation of institutional knowledge were identified as weaknesses. For traffic management, in general, both Districts reported only ad hoc activities. Communication of project benefits to the public was also rated as an immature capability by both Districts. Project-level information may be shared internally, but performance measures are not reported externally.

Appendix A: Strengths and Weaknesses Identified in Work Session 1 (Traffic Incident Management)

Strengths	Weaknesses
▪ **Standardized and regular TIM meetings**/training are happening. (Business Processes) — There are currently 4 TIM teams and will expand to 6. ▪ Identifying **key partners** and utilizing their strengths/collaboration. (Collaboration) ▪ **Multi-disciplinary training** opportunities are available. (Organization) ▪ **Continued training** available through NCTCOG. (Organization) ▪ District, county, law enforcement **leadership support** efforts. (Culture) — Working on a formalizing roles and relationships. Fort Worth District is working on a budget plan currently after working with partners over multiple phases of maturity. ▪ **First Responder training** is available through NCTCOG. More than 3,200 have been trained so far. (Organization) ▪ There is a regional **Safety Patrol Program**. In the region it is called Mobility Assistance Patrol, Courtesy Patrol, or Roadside Assistance Patrol depending on implementing agency.	▪ Traffic operations and city staff need to be **better integrated** into the training availability. NCTCOG notes that city staff are also welcome to attend training for First Responders. (Organization & Coordination) ▪ **Standardized performance measures** tracked and reported across agencies. Several respondents echoed this sentiment. (PM) — Suggested improvements: Time to respond, time to clear, secondary crashes, and traveler delay. Needed both on and off TxDOT System. ▪ **Communication at the incident command level** is an ongoing challenge. There can be disagreement on roles, such as who is calling the tow company. (Collaboration) ▪ **After-action reviews** need to be stronger. There needs to be a formalized meeting to resolve issues and standardize for next time. (Business Processes) ▪ Public safety and mobility can at times seem at odds with one another, and **performance measures** need to be agreed upon. (PM)

Appendix B: Strengths and Weaknesses Identified in Work Session 2 (Traffic Signal Management/Traffic Management)

Strengths	Weaknesses
▪ Collaboration between NCTCOG and regional partners on the **signal retiming program** works well though it does take a considerable amount of time to complete. (Collaboration) ▪ Overall willingness to **connect/coordinate** the region with regards to traffic management (Collaboration) ▪ Procurement - availability of **co-op contracts** (Business Processes) ▪ MPO's initiative to use **data-backed analysis** to determine projects (Performance Measures) ▪ Some jurisdictions have been able to tie into TxDOT **fiber** which has been helpful (Technology / Collaboration) ▪ **Planning and programming** for traffic signals/ITS/TSMO elements are more focused on shorter time-frame than other major infrastructure projects. The benefit is local leadership and short implementation, but results in weaknesses too. (Business Processes) ▪ **Quarterly coordination meetings** occur at the (Fort Worth) District level, and they try to bring in cities that border each other a couple at a time. (Collaboration)	▪ Collaboration: **City access to TxDOT infrastructure** such as CCTV camera, conduit system, and fiber system. — Note, some jurisdictions are having success, but that may be due to individual relationships ▪ **Plans to coordinate** on fiber or technology do not always happen upfront, increasing cost and time to implementation (Business Processes) ▪ Signal timing and managed signals collaboration and **ongoing communication** are breaking down between cities & TxDOT, or between cities & adjacent cities (Collaboration) — Currently informal when this is happening well — Mentioned in some form by several participants ▪ Need **more standardization**, such as formal standards or knowledge of existing standards (Business Processes) ▪ **Systems integration** between agencies (Systems and Technology) ▪ Standardized **Performance Measures** are needed (Performance Measures) ▪ The process it takes to implement **sharing agreements** between TxDOT and agencies takes too long to execute (Business Processes) ▪ **Planning and programming** for traffic signals/ITS/TSMO elements are more focused on shorter time-frame than other major infrastructure projects. As a weakness, these projects are not getting the same ongoing attention, coordination, and maintenance as big infrastructure projects (Business Processes) ▪ NCTCOG ITS Stakeholder Meeting occurs twice a year, but could be **more frequent** and provide more opportunities for input. (Collaboration)

Appendix C: Strengths and Weaknesses Identified in Work Session 3 (Road Weather/Planned Special Events/Work Zone Management)

Strengths	Weaknesses
▪ Having **pre-determined fixed implementations**. Then being able to make adjustments on the fly. (Culture/Business Processes) ▪ **Work zone training** and implementation is well done, especially on larger projects as well as coordination with ITS. (Organization) ▪ Planned event **coordination with ITS** is typically good, and planning of work around large events is built into projects now. (Collaboration/Business Processes) ▪ Inclement **weather coordination** works well as it pertains to planning and coordinating staff. (Collaboration) ▪ For winter weather events and planning, the Dallas District spends considerable effort to **pre-stage equipment** and supplies to respond to adverse weather conditions. Tends to work well and allow for a quick response by our maintenance sections. (Business Processes) ▪ I think we do a pretty good job getting **notification out to the media** concerning major road closures. (Collaboration) — Additionally, getting information to Waze is helpful for getting word to public. ▪ **Traffic control plans** include consideration of what days special events are happening (particularly in Arlington with many special events). (Business Processes) ▪ Cities can communicate with TxDOT (and contractors by extension) when work zone issues arise, and cities are able to fill gaps to keep projects moving. (Culture)	▪ **Initial kickoff meetings** coordinating cities and TxDOT are not strong. Currently, those introductions happen in meetings for later phases (Collaboration/Processes) ▪ **Parallel facilities** under construction at the same time (Business Processes) ▪ Inclement weather planning does not always include keeping equipment ready to use before it is needed. Since some equipment is not used in day-to-day operations, **repair/maintenance** needs may get passed over. (Processes, Systems) ▪ There have been **mobility coordinators** for major projects/corridors, and those have been very successful. However this is not standard or continuous roles outside of specific projects (Organization) ▪ Participants were asked about **performance measures,** and did not respond with any available examples/practices (PMs) ▪ Construction on arterials and alternate routes are not always **communicated to transit agencies** (Collaboration)

- Districts are good at **sharing equipment and staff** to respond to weather events. This is also done in advance when possible. (Culture, Collaboration)
- There is a **monthly traffic management** meeting that includes contractors, venues, cities for specific projects (Collaboration)