

Organizing for TSMO

Case Study 6: Collaboration – Partnering for Traffic Incident Management

July 2019



U.S. Department
of Transportation

**Federal Highway
Administration**

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Organizing for TSMO – Case Study 6: Collaboration

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. FHWA-HOP-19-068	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Organizing for TSMO – Case Study 6: Collaboration – Partnering for Traffic Incident Management		5. Report Date July 19, 2019	
		6. Performing Organization Code:	
7. Author(s) Lacey Atkins, Olivia R. Brey, Austin Hoekstra, Charles R. Lattimer		8. Performing Organization Report No.	
9. Performing Organization Name and Address Atkins North America, Inc. 482 South Keller Rd. Orlando, FL 32810		10. Work Unit No.	
		11. Contract or Grant No. DTFH6116D00048/0001	
12. Sponsoring Agency Name and Address United States Department of Transportation Federal Highway Administration 1200 New Jersey Ave. SE Washington, DC 20590		13. Type of Report and Period	
		14. Sponsoring Agency Code HOP	
15. Supplementary Notes Joseph Gregory (FHWA – HOTM)			
16. Abstract Given the varying stages of TSMO adoption and advancement, the Federal Highway Administration identified the need for case studies to provide examples of common challenges and best practices for transportation agencies to learn from each other. This is one of 12 case studies developed to support organizing for TSMO. This case study focuses on the collaboration dimension of the capability maturity model assessment when collaborating with first responders for traffic incident management (TIM) programs. Five agencies that frequently collaborate with first responders to improve safety and mobility were interviewed: the AZTech partnership, the Georgia Department of Transportation (GDOT), the Transportation Operations Coordinating Committee (TRANSCOM), the Tennessee Department of Transportation (TDOT), and the Maryland Department of Transportation State Highway Administration (MDOT SHA). Each agency provided information on how they collaborated with first responders, their lessons learned, and the next steps to continually improve these efforts.			
17. Key Words Capability Maturity Model, Transportation Systems Management and Operations, reliability		18. Distribution Statement No restrictions. This document is available to the public through the National Technical Information Service, Springfield, VA 22161. http://www.ntis.gov	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 30	22. Price

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List of Abbreviations and Acronyms

AASHTO	American Association of State Highway and Transportation Officials
ARIS	AZTech Regional Information System
CHART	Coordinated Highways Action Response Team
CMM.....	Capability Maturity Model
DPS	Department of Public Safety
FHWA.....	Federal Highway Administration
GDOT	Georgia Department of Transportation
MDOT SHA.....	Maryland Department of Transportation State Highway Administration
MDTA.....	Maryland Transportation Authority
MOU	Memoranda of Understanding
MPO.....	Metropolitan Planning Organization
MSP.....	Maryland State Police
RADS.....	Regional Archive Data System
SHRP2.....	Strategic Highway Research Program 2
TDOT	Tennessee Department of Transportation
TIM	Traffic Incident Management
TIME.....	Traffic Incident Management Enhancement
TMC.....	Traffic Management Center
TRANSCOM	Transportation Operations Coordinating Committee
TRB.....	Transportation Research Board
TSMO	Transportation Systems Management and Operations

EXECUTIVE SUMMARY

Transportation systems management and operations (TSMO) provides tools for transportation managers to address safety, system performance, and reliability. TSMO is “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.”¹ Through participation in the second Strategic Highway Research Program workshops, transportation agencies are working to support TSMO programs. Deploying intelligent transportation systems (ITS), hiring internal information technology staff, and using performance measures for data-driven decisions are just a few examples of the many activities a TSMO program can support.

Given the varying stages of TSMO adoption and advancement, the Federal Highway Administration identified the need for case studies to provide examples of common challenges and best practices for transportation agencies to learn from each other. This is one of 12 case studies developed to support organizing for TSMO. This case study focuses on the collaboration dimension of the capability maturity model assessment when collaborating with first responders for traffic incident management (TIM) programs.

Five agencies that frequently collaborate with first responders to improve safety and mobility were interviewed: the AZTech partnership, the Georgia Department of Transportation (GDOT), the Transportation Operations Coordinating Committee (TRANSCOM), the Tennessee Department of Transportation (TDOT), and the Maryland Department of Transportation State Highway Administration (MDOT SHA). Each agency provided information on how they collaborated with first responders, their lessons learned, and the next steps to continually improve these efforts. Some of the best practices identified include:

- AZTech’s established TIM Coalition, which meets to discuss regional challenges and celebrate success.
- GDOT’s Traffic Incident Management Enhancement task force connects with first responders. Monthly and annual meetings are held to refine and improve incident management protocols and procedures.
- TRANSCOM’s approach to multi-state incident management collaboration improves safety and mobility on interstate corridors and provides consistency to end users.
- TDOT’s TIM training facility provides a space for first responders and traffic operators to prepare and train for incident response.
- MDOT SHA’s Coordinated Highways Action Response Team provides multi-agency coordination with first responder partner agencies to identify staffing, training, and dedicated funding for incident management efforts.

¹ Source: <https://ops.fhwa.dot.gov/tsmo/index.htm>

CHAPTER 1 – INTRODUCTION

Historically, transportation agencies have managed congestion primarily by funding major capital projects that focused on adding capacity to address physical constraints such as bottlenecks. Operational improvements were typically an afterthought and considered after the new infrastructure was already added to the system. Given the changing transportation landscape that includes increased customer expectations, a better understanding of the sources of congestion, and constraints in resources, alternative approaches were needed. Transportation systems management and operations (TSMO) provides such an approach to overcome these challenges and address a broader range of congestion issues to improve overall system performance. With agencies needing to stretch transportation funding further and demand for reliable travel increasing, TSMO activities can help agencies maximize the use of available capacity and implement solutions with a high benefit-cost ratio. This approach supports agencies' abilities to address changing system demands and be flexible for a wide range of conditions.

Effective TSMO efforts require full integration within a transportation agency and should be supported by partner agencies. This can be achieved by identifying opportunities for improving processes, instituting data-driven decision-making, establishing proactive collaboration, and developing actionable activities to implement processes that optimize performance.

Through the second Strategic Highway Research Program (SHRP2), a national partnership between the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), and the Transportation Research Board, (TRB), a self-assessment framework was developed based on a model from the software industry. SHRP2 developed a framework for agencies to assess their critical processes and institutional arrangements through a capability maturity model (CMM). The CMM uses six dimensions of capability to allow agencies to self-assess their implementation of TSMO principles¹:

1. Business processes – planning, programming, and budgeting.
2. Systems and technology – systems engineering, systems architecture standards, interoperability, and standardization.
3. Performance measurement – measures definition, data acquisition, and utilization.
4. Culture – technical understanding, leadership, outreach, and program authority.
5. Organization and workforce – programmatic status, organizational structure, staff development, recruitment, and retention.
6. Collaboration – relationships with public safety agencies, local governments, metropolitan planning organizations (MPO), and the private sector.

Within each capability dimension, there are four levels of maturity (performed, managed, integrated, and optimized), as shown in Figure 1. An agency uses the CMM self-assessment to

¹ FHWA, Office of Operations, "Organizing for Reliability – Capability Maturity Model Assessment and Implementation Plans Executive Summary," May 2015. <https://ops.fhwa.dot.gov/docs/cmmexesum/sec1.htm>

identify their level of maturity in each dimension as well as their strengths and weaknesses and to determine actions they can take to improve their capabilities.

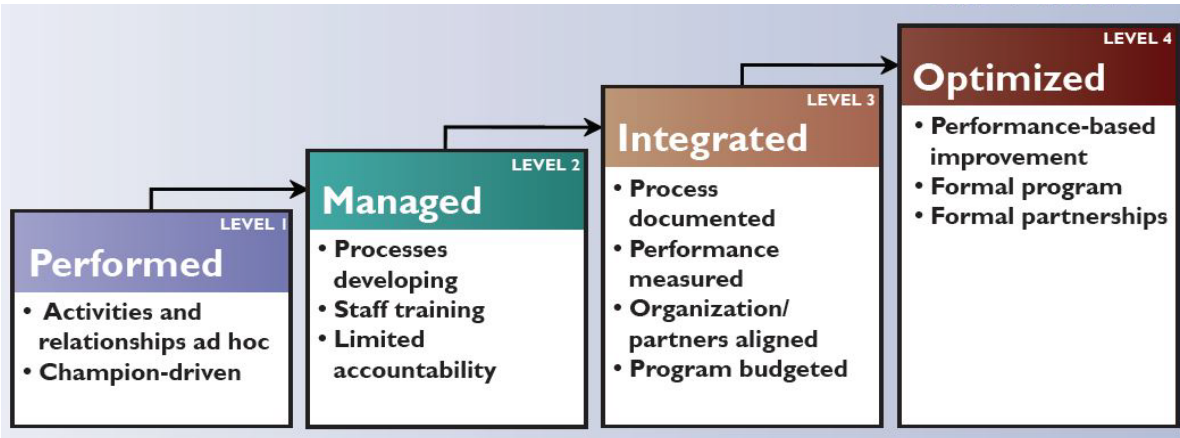


Figure 1. Chart. Four Levels of Maturity

Source: Creating an Effective Program to Advance Transportation System Management and Operations, FHWA Jan 2012

Purpose of Case Studies

In the first 10 years of implementation of the TSMO CMM, more than 50 States and regions used the tool to assess and improve their TSMO capabilities. With the many benefits experienced by these agencies, FHWA identified the need to develop case studies through previous efforts in SHRP2 to showcase leading practices to assist other transportation professionals in mainstreaming TSMO into their agencies. The purposes of the case studies are to:

- Communicate the value of changing the culture and standard practices towards TSMO to stakeholders and decision-makers.
- Provide examples of best-practices and lessons learned by other State and local agencies during their adoption, implementation, and mainstreaming of TSMO.

These case studies support transportation agencies by showing a wide range of challenges, opportunities, and results to provide proof for the potential benefits of implementing TSMO. Each case study was identified to address challenges faced by TSMO professionals when implementing new or expanding existing practices in the agency and to provide lessons learned.

Identified Topics of Importance

The TSMO collaboration component is important because the ability for organizations, partner agencies, and other local stakeholders to work together directly affects their ability to meet regional transportation goals. The agencies highlighted for this case study addressed those challenges through consistent collaboration with first responders.

Interviews

Agencies were selected for each case study based on prior research indicating that the agency was excelling in particular TSMO capabilities. Care was taken to include a diversity of

geographical locations and agency types (departments of transportation, cities, and MPOs) to develop case studies that other agencies could easily relate to and learn from. Interviews were conducted with selected agencies to collect information on the topic for each case study.

Description of Collaboration

Collaboration takes place in every aspect of TSMO programming. Early in program development, internal and external stakeholders work together to develop TSMO strategic elements such as vision, mission, goals, and objectives. Collaboration continues throughout development all the way to implementation of projects, programs, and services. The collaboration dimension of TSMO includes:

- Partnerships among levels of government.
- Stakeholder collaboration.
- Partnerships with public safety agencies.
- Internal agency collaboration.
- Partnerships with private sector.

Traffic incident management and safety patrol programs are critical to the success of TSMO and are most effective with collaboration. These programs include multi-discipline collaboration and execution from:

- Hazardous materials experts.
- Emergency medical services.
- Public information media.
- Emergency management.
- Towing and recovery.
- Law enforcement.
- Fire services.
- Transportation.
- Public and safety.²

Any of the listed service participants can be a first responder on the scene of an accident. For example, a traffic management center operator is alerted to a queue forming, caused by an incident on a major corridor. The operator can send information to the proper emergency services resulting in faster incident response and clearance and improved safety. The relationship between transportation professionals and emergency services can be an organized and documented process through TSMO programming. This promotes a shared understanding of the purpose and goals of an incident management program and defines the necessary roles and responsibilities for success. It increases incident response efficiency both in the field and at the operations center. The collaboration component of TSMO enables multi-discipline solutions to common transportation challenges.

² https://ops.fhwa.dot.gov/eto_tim_pse/about/tim.htm#ti

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Data shared between agencies can be used to make more informed decisions on project prioritization and design. It can also be shared with the public for success or safety purposes. Most importantly, agency collaboration and shared data can help save lives.

CHAPTER 2 – BEST PRACTICE EXAMPLES

AZTech, the Georgia Department of Transportation (GDOT), the Maryland Department of Transportation State Highway Administration (MDOT SHA), and the Tennessee Department of Transportation (TDOT) participated in previous second Strategic Highway Research Program (SHRP2) efforts. The capability maturity model (CMM) workshops with SHRP2 helped inform them about transportation systems management and operations (TSMO) and how it can apply to their agencies. The Transportation Operations Coordinating Committee (TRANSCOM) did not participate in the CMM workshops; however, they have excelled in TSMO activities and completed a modified CMM process with the Federal Highway Administration (FHWA). The following subsections highlight several successful initiatives that each agency accomplished, specifically regarding collaboration with first responders for TSMO.

AZTech

AZTech is a regional traffic management partnership in the Phoenix metropolitan area that guides application of intelligent transportation systems technologies for managing regional traffic. Six groups make up the partnership, including the executive committee, strategic steering committee, operations committee, traffic incident management (TIM) coalition, traffic management center (TMC) operators working group, and the media communications task force.

Co-location of Law Enforcement

The Arizona Department of Public Safety (DPS), the Arizona Department of Transportation (ADOT), and the Maricopa County Department of Transportation (MCDOT) collaborate to provide incident management strategies for the Phoenix metropolitan region. Previously, the Regional Emergency Action Coordination Team (REACT) focused primarily on responding to incidents on the region’s arterial network. A culture shift towards regional collaboration was facilitated by employing a former police chief who began communicating the role that law enforcement can play in an incident management program. Through a Maricopa Association of Governments-funded project in 2015, ADOT Traffic Operations Center (TOC) became home to ADOT and DPS staff and improved coordination with MCDOT REACT. DPS has been a huge champion for TIM through this multi-agency collaborative TOC. Since merging each agency’s incident response programs into a single collaborative effort, improved event response and clearance times have enabled the region to leverage the full capacity of their arterial network and highway system.

TIM Coalition

The AZTech TIM Coalition includes a range of incident management disciplines and the opportunity to discuss best practices, share ideas, and provide training. When the TIM Coalition was initiated, only transportation agencies were involved. To gain buy-in from other stakeholders, AZTech hired a retired police chief to lead field operations and provide a unique perspective to transportation agencies and first responders by experiencing all aspects first hand. AZTech also made a concerted effort to provide training on TIM strategies and express the value

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of TIM collaboration. Over time, the TIM Coalition has grown to include law enforcement, TMC operators, public information staff, and towing agencies.

During the meetings, tabletop exercises are performed to provide hands-on training and review best practices. This has been an effective way to encourage communication and discussion between first responder partners. When incidents occur, there is smooth collaboration between agencies to retime signals, deploy messages to dynamic message signs, and disseminate traveler information. The TIM Coalition is developing TIM Coins that will be awarded to first responders for completing training activities. These rewards will encourage continuous involvement in TIM activities and act as a physical reminder of best practices.

Data and Archiving

The Regional Archive Data System (RADS) is a regional repository for transportation data including signal timing data, 911 data, freeway management sensor data, construction and maintenance data, and additional third-party system data. RADS is valuable in providing analytics of incidents for traveler information and data to support TMC operator's decision-making.

AZTech developed the AZTech Regional Information System (ARIS) to provide geographically specific data, as shown in Figure 2. The system will send alerts to TMC staff when events occur within their geographic area and includes a tactical dashboard for TMC staff to act to dispatch staff or change signal timing. ARIS is most beneficial for areas outside the major metropolitan areas that do not have the need or resources for fully equipped TMCs.

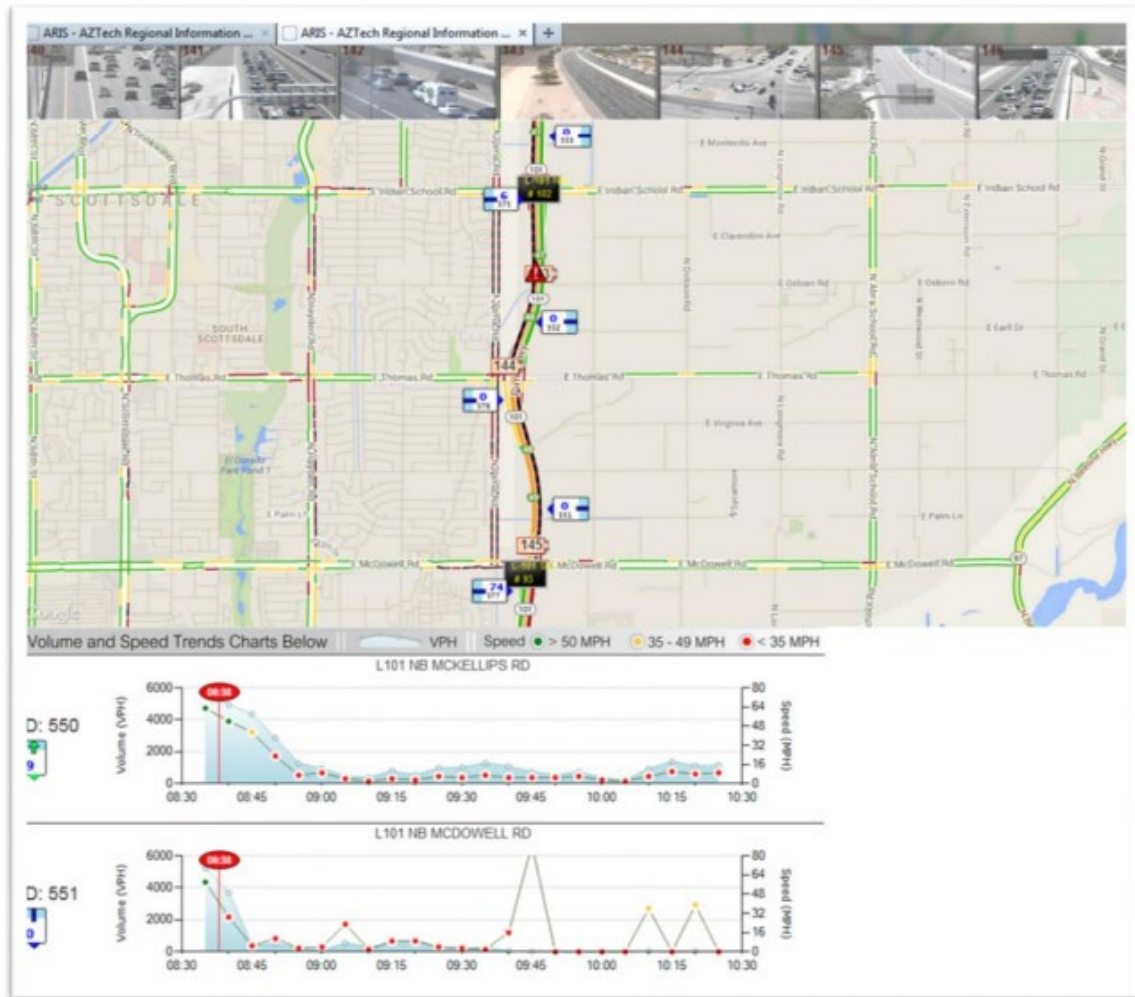


Figure 2. Photo. ARIS Tactical Dashboard

Source: <http://www.aztech.org/projects/aris.htm>

Georgia Department of Transportation (GDOT)

GDOT supports the transportation needs of the State of Georgia through seven districts. GDOT manages over 18,000 miles of interstates and highways, 5,000 miles of railroad track, 454 airports and heliports, and two marine ports.

Collaboration Task Force

Since 2002, GDOT has had the Traffic Incident Management Enhancement (TIME) Task Force in place to connect with first responders in the metro Atlanta region. The TIME Task Force meets monthly as well as annually to refine and improve incident management protocols and procedures. The TIME Task Force has been expanding statewide through TIM teams so other regions benefit from collaboration activities with first responders. TIM teams have been beneficial in engaging not only leadership in first responder organizations but also the “on the ground” staff such as the Highway Emergency Response Operators (HERO) within the Atlanta region and the Coordinated Highway Assistance and Maintenance Program (CHAMP)

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responders for rural areas. GDOT attributes their success with TIM to frequent engagement with first responders through the TIME Task Force that helps maintain open relationships, communicate training, and gain acceptance of new strategies.

One of the TIME Task Force’s major initiatives is encouragement of quick clearance through the Open Road Policy, which states “whenever a roadway or travel lane is closed or partially blocked by a traffic incident, the Georgia State Patrol, Department of Transportation, local law enforcement and other public safety agencies and responders will re-open the roadway as soon as possible.¹” The policy has been beneficial to collaborating with local agencies regarding TIM best practices to reduce non-recurring congestion. To encourage agencies to agree to the Open Road Policy, the TIME Task Force has allocated funding for first responder materials and equipment for agencies that have signed the policy.

The TIME Task Force also has an informative website that holds the TIM Guidelines for Georgia, a calendar of upcoming training opportunities, online training resources, and information regarding regional TIM teams and champions. This is a valuable resource for statewide stakeholders to learn more and get engaged. Figure 3 shows a typical regional TIM team meeting.



Figure 3. Photo. Regional TIM Team Meeting

Source: <http://timtaskforce.com/time-initiatives/tim-teams/>

First Responder Project Input

The TIME Task Force has been the primary opportunity for GDOT to discuss new operations strategies (including variable speed limits, ramp meters, and lane control) with first responders to gather feedback, train participants, and present on upcoming initiatives. GDOT has been designing and constructing a new partially elevated and tolled express lane facility that is approximately 30 miles long. This express lane facility includes reversible lanes to address peak travel time flows. Prior to opening the facility, GDOT collaborated with first responders to prepare for how incidents will be addressed on the new facility. Due to the close relationships

¹ Source: <http://timtaskforce.com/time-initiatives/open-roads-policy/>

GDOT has developed through the TIME Task Force, first responders were comfortable voicing their concerns and were open to learning more about technologies and operational strategies on the new express lane facility. GDOT has been meeting with first responders frequently to review and provide training for new infrastructure solutions included in the project, such as emergency access gates.

Transportation Operations Coordinating Committee (TRANSCOM)

The Transportation Operations Coordinating Committee (TRANSCOM) consists of representatives from 16 New York, New Jersey, and Connecticut transportation and public safety agencies. TRANSCOM is also supported by FHWA and the Federal Transit Administration. TRANSCOM's goal is to improve communication and the value of existing transportation management systems through collaboration and sharing data. Local law enforcement agencies are part of this 16-member agency and are integrally involved. Other first responders, such as tow operators, safety service patrols, and fire departments, receive communication from transportation agencies.

Member agencies meet regularly through committees including a board of trustees, technology and operations committee, and the finance and policy committee. Additional meetings are held to discuss specific technology developments and upcoming operational needs.

Regional Incident Management

Because the three States involved in TRANSCOM are geographically close, a trip may include travel on all three agencies' facilities. Real-time Regional Conditions Maps, shown in Figure 4, display travel conditions during major incidents and events, such as adverse weather events. During incidents or events, TRANSCOM acts as a regional clearinghouse by sharing messages or data to the member agencies and the agencies' TMCs. This helps TMC staff dispatch first responders and provide traveler information to the public. To do this, TRANSCOM uses technologies including traffic and incident management data, analytics for incident mobility impacts, and a unified closed-circuit television camera system. After an incident, a regional condition report is created that documents the impact and delay of trips caused by a specific incident. The data and analytics from TRANSCOM support continuous improvement of first responder and transportation agency response plans and actions.

TRANSCOM's approach is beneficial because it provides multi-state incident response using a unified approach. Data collected from condition reports informs future planning initiatives for the entire region.

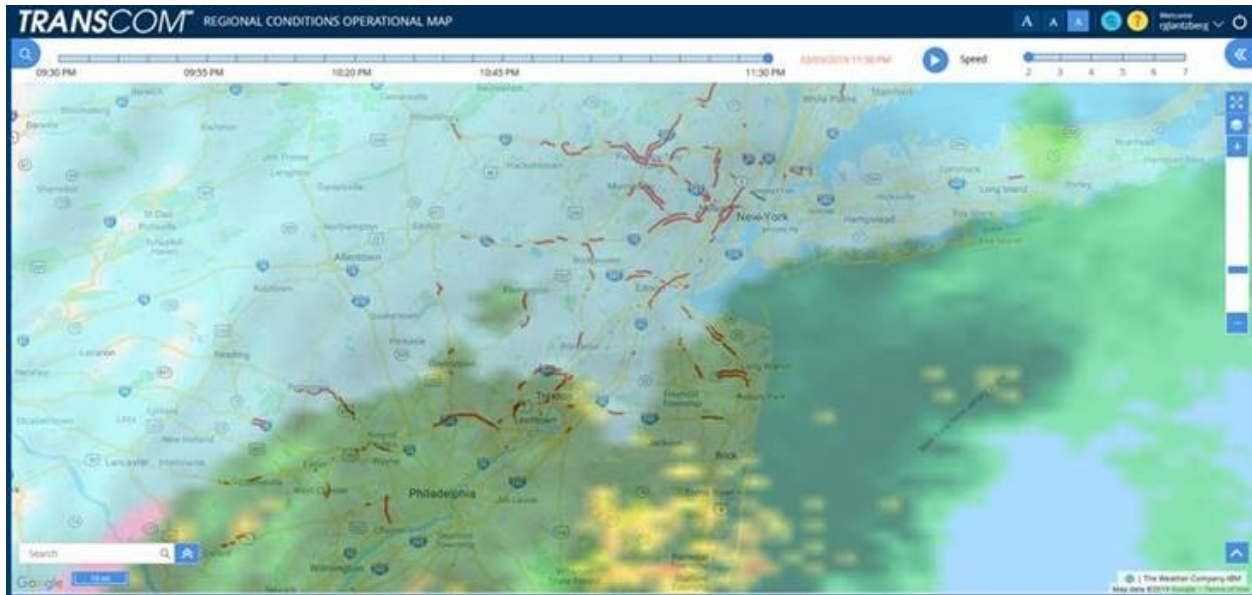


Figure 4. Photo. Regional Conditions Map

Source: TRANSCOM

Maryland Department of Transportation State Highway Administration (MDOT SHA)

The MDOT SHA is composed of seven districts that focus on policies, programs, and projects across the State. Non-tolled facilities including highways, freeways, and major arterials are managed and operated by MDOT SHA and all toll roads are owned and operated by Maryland Transportation Authority (MDTA).

Coordinated Highways Action Response Team Strategic Planning

Maryland's operations element, the Coordinated Highways Action Response Team (CHART), was formed through the collaboration of federal, local, and State agencies. CHART was established as a separate office with dedicated funding in 1998. The State agencies that are part of the joint program include MDOT SHA, MDTA, and Maryland State Police (MSP). CHART was initiated as a corridor-specific initiative, but it has since expanded to a statewide program.²

Through CHART, MDOT SHA has agreements and memoranda of understanding (MOU) with emergency service agencies to solidify partnerships. Collaboration activities are identified in the CHART Long Range Strategic Deployment Plan, such as identification of staffing, training, and dedicated funding. These activities are coordinated with local agencies, public safety agencies, and MSP as joint activities with CHART. The plan also includes regional communication networks, sharing data between agencies, traveler information, statewide service provider partnerships, and other strategies to improve maintenance and operations while working across jurisdictions.

² [http://www.chart.state.md.us/downloads/readingroom/StrategicPlanning/CHART%202013%20Long%20Range%20Strategic%20Deployment%20Plan%20\(LRSDP\).pdf](http://www.chart.state.md.us/downloads/readingroom/StrategicPlanning/CHART%202013%20Long%20Range%20Strategic%20Deployment%20Plan%20(LRSDP).pdf)

Partnership Opportunities

The CHART Board leads the program, sets strategic objectives, and establishes working groups to accomplish specific safety and mobility goals. The Board includes leadership representatives from technical and operational disciplines of MDOT SHA, MDTA, law enforcement, FHWA, and the University of Maryland and includes managers from many divisions and toll facilities. The group meets four times per year and offers the opportunity for leaders to develop multi-jurisdictional partnerships, protocols, and responsibilities.

MDOT SHA is also engaged in TIM for the Baltimore Region subcommittee, which includes representatives from local and State first responders. The subcommittee was formed to improve communication and coordination between agencies during incidents. MDOT SHA is a member of facility-specific organizations, such as the I-95 Corridor Coalition and the I-81 Corridor Coalition. These coalitions improve incident management data sharing, communications, and cooperation in corridor projects. Coalitions include law enforcement, State and local transportation agencies, and other public safety agencies.

Tennessee Department of Transportation (TDOT)

TDOT manages and maintains interstate and highway facilities statewide as well as rail, transit, waterways, and trail systems. TDOT is composed of four regions as well as a Traffic Operations Division that report to the Assistant Chief Engineer of Operations.

TIM Committees

TDOT implemented a regional TIM Coordinator stationed at the four regional TMCs. The regional TIM Coordinator is responsible for bringing together first responder partners and also holds the title of TMC Assistant Manager. This role provides continuity for TIM activities since the champions from partner agencies change often.

The regional TIM Coordinator also leads regional TIM committees, one per region for a total of four committees. Regional TIM committees meet quarterly with first responder partners. At the committee meetings, the group discusses annual self-assessments, MOUs for quick clearance, incident management strategies, and training needs. The regional TIM committee is the lead organization for hosting the SHRP2 TIM training, which helps connect first responders and encourages engagement.

TIM regional committees interface with a parent Statewide TIM Steering Committee that meets each quarter with statewide first responders, statewide agencies (including agencies relating to freight, agriculture, etc.), and local agencies.

Because of close collaboration with local agencies in TIM committees, over 300 agencies have signed quick clearance MOUs. This was achieved through goal setting on individual performance plans. It was also a requirement for grant funding from the Governor's Highway Safety Office, which encouraged significant participation from local agencies.

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With TIM strategies in place, TDOT was able to achieve the goal of clearing over 98 percent of incidents within 90 minutes or less. They have also started tracking secondary incident reduction and other performance metrics that are regularly shared with leadership and first responder partners.

TIM Training Facility

TDOT's TIM training facility was first considered at the Statewide TIM Steering Committee after the deployment of FHWA's SHRP2 National TIM Responder Training. The TDOT TIM training facility is the first in the country and was a collaborative effort between Tennessee Highway Patrol, Tennessee Department of Safety and Homeland Security, and TDOT. The State's enthusiasm for the TIM training facility was best highlighted when the Commissioner included the project in his individual performance plan with the Governor. With support from leadership and federal funding from the Highway Safety Improvement Project, TDOT completed the design and construction of the facility in October 2014.



Figure 5. Photo. TIM Training Facility

Source: <https://www.tn.gov/tdot/traffic-operations-division/transportation-management-office/training.html>

The TIM training facility includes infrastructure for multiple scenarios including two to six travel lanes with guardrail, an interchange, cable and steel barrier rail, and a four-way intersection. These infrastructure alternatives allow first responders to prepare for a wide range of conditions and provide the opportunity to learn best practices for responding to incidents. The TIM training facility is used for live exercises during the four-hour SHRP2 TIM Training as well as other training opportunities. TDOT has developed and advanced a TIM training course that includes integration with other operations and maintenance programs. The advanced, hands-on training at the TIM training facility has led to better understanding and comprehension of TIM techniques.

CHAPTER 3 – SUMMARY

Multi-discipline and multi-agency collaboration are key components for a successful traffic incident management (TIM) program. Traffic incidents greatly impact the reliability and safety of the transportation network. Frequent and formal collaboration between first responders, emergency services, traffic operators, law enforcement, and others can mitigate common challenges that arise from unplanned events on transportation facilities. The best practices identified to support collaborative incident management activities include:

- Establishing a multi-agency or multi-state TIM working group, coalition, or task force to discuss regional challenges and objectives related to incident management promotes collaboration. These groups can share best practices and ideas to improve incident response in their region.
- Training for incidents is beneficial to ensure multiple agencies can work together efficiently to improve incident clearance time and safety. Development of training facilities and response procedures promotes multi-agency collaboration by providing consistency and order to incident preparation, response, and clearance.
- Technology can be utilized to support incident management initiatives. Identifying software for multi-agency use enables incident alerts and commands to be clearly communicated to all TIM participants and to the public.

TIM programs are generally outward-facing programs through which successes and failures are easily seen by the traveling public. Providing improved reliability, safety, and consistency to the end users of transportation networks is a key objective in any TIM program. The best practices for collaborating within a TIM program highlighted in this case study can be adapted into other agencies' processes to mature their own incident management programs.

REFERENCES

Information for use in this case study was gathered from sources noted throughout the report together with the following web sites:

- FHWA’s What is Transportation Systems Management and Operations (TSMO)?
 - <https://ops.fhwa.dot.gov/tsmo>
- AASHTO’s TSMO Guidance
 - <http://www.aashtotsmoguidance.org/>
- FHWA’s Organizing and Planning for Operations
 - <https://ops.fhwa.dot.gov/plan4ops/>
- FHWA’s Organizing for Operations Resources
 - https://ops.fhwa.dot.gov/plan4ops/focus_areas/organizing_for_op.htm
- FHWA’s Organizing for Reliability – Capability Maturity Model Assessment and Implementation Plans
 - <https://ops.fhwa.dot.gov/docs/cmmexesum/sec1.htm>
- FHWA’s Creating an Effective Program to Advance Transportation Systems Management and Operations, Primer
 - <https://ops.fhwa.dot.gov/publications/fhwahop12003/index.htm>
- FHWA’s Improving Transportation Systems Management and Operations – Capability Maturity Model Workshop White Paper – Collaboration
 - <https://ops.fhwa.dot.gov/docs/cmmwhitepapers/collaboration/index.htm>
- MDOT SHACHART Long Range Strategic Deployment Plan
 - [http://www.chart.state.md.us/downloads/readingroom/StrategicPlanning/CHART%202013%20Long%20Range%20Strategic%20Deployment%20Plan%20\(LRSDP\).pdf](http://www.chart.state.md.us/downloads/readingroom/StrategicPlanning/CHART%202013%20Long%20Range%20Strategic%20Deployment%20Plan%20(LRSDP).pdf)
- Georgia Department of Transportation
 - <https://www.dot.ga.gov>
- AZTech
 - <http://www.aztech.org/>
- Tennessee Department of Transportation
 - <https://www.tn.gov/tdot.html>
- Transportation Operations Coordinating Committee
 - <https://xcm.org/XCMWebSite/Index.aspx>
- Maryland State Highway Administration
 - <https://www.roads.maryland.gov/Home.aspx>

Table 1. Interview Participants and Agencies

Agency	AZTech	Georgia Department of Transportation (GDOT)	Transportation Operations Coordinating Committee (TRANSCOM)	Tennessee Department of Transportation (TDOT)	Maryland Department of Transportation State Highway Administration (MDOT SHA)
Agency Representative Name:	Faisal Saleem	Mark Demidovich	Steve Levine	Brad Freeze	Subrat Mahapatra
Agency Representative Title:	Intelligent Transportation Systems Branch Manager	Assistant State Traffic Engineer	Executive Director	Director	Deputy Director, TSMO & CAV
Agency Representative Email:	faisalsaleem@mail.maricopa.gov	mdemidovich@dot.ga.gov	levine@xcm.org	Philip.b.freeze@tn.gov	smahapatra@mdot.maryland.gov
Interview Date:	June 19, 2018	July 19, 2018	July 25, 2018	August 13, 2018	August 14, 2018

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<https://ops.fhwa.dot.gov>

July 2019
FHWA-HOP-19-068