
CENTRAL FLORIDA TSM&O CONSORTIUM MEETING SUMMARY

Meeting Date: August 5, 2021 (Thursday) **Time:** 10:00 AM – 12:00 PM

Subject: TSM&O Consortium Meeting

Meeting Location: Hybrid – Teleconference and FDOT RTMC (4975 Wilson Rd. Sanford, FL 32771)

I. OVERVIEW

The purpose of this recurring meeting is to provide an opportunity for District Five FDOT staff and local/regional agency partners to collaborate on the state of the TSM&O Program and ongoing efforts in Central Florida. Jeremy Dilmore gave a short introduction and outlined the meeting agenda.

II. LOCAL AGENCY UPDATES – BREVARD COUNTY

Rich Ataman provided a brief presentation and demonstration of Brevard County's maintenance management platform via iWorQ. While the platform was still in development, Rich was able to demonstrate the benefits and functionality of the system.

- iWorQ tracks where maintenance personnel are performing maintenance updates
- several defined searches to organize work efforts
- provides management and staff with greater awareness of workloads, real-time progress, etc.
- Brevard County is currently moving the assets into a map-based work order system
 - this will be an additional module of iWorQ
 - started developing the map module in June/July; hoping to finish by September/October
- Brevard County is 72 miles long from the southernmost to the northernmost points with assets spread out across the County
- mapped all streetlights maintained by the County
- still identifying certain criteria so not all features have been implemented yet
- asset database includes a repository of all maintenance efforts, reports, and documentation associated with a specific asset
- asset database includes extensive notes section for technicians to fill out information
 - testing info and results
 - photos
 - cabinet schematics
- when signal technician arrives on-site, they'll be able to consult the asset database to determine any current or previous issues at that location

Discussion:

- **Q:** Cade Braud – did you evaluate multiple products in the selection process?

- **A:** Yes, this system was launched for the entire program in 2013. it expanded over time. Traffic Operations started using the system in 2015.
 - The Signs group has their entire sign asset inventory in the map component
- Cade – Brevard County is further ahead than Orlando; the City is currently using the Epic asset management
- Other counties/cities are using Epic
- **Q:** How difficult would it be to transfer data between iWorQ & Epic?
 - **A:** iWorQ is a SQL-based system with an open API, so theoretically it would be possible
- **Q:** Jeremy Dilmore – we were looking to connect the iWorQ data to ITSFM and MIMS so that it could get connected to other systems such as SIIA
 - when looking at systems, identifying common fields would help with connectivity/transferability between the application and FDOT apps like MIMS or SIIA
 - Common field – “Type 5”, “5”, “cabinet”, are different and would make transferring harder
- setup MIMS to crosswalk nicely
- Rich – all fields in iWorQ were created by County

III. GIS INITIATIVES

Anne Allan (InNovo Partners) provided an update on the NOEMI system on CFLSmartRoads.com. Anne also demonstrated work efforts to spatially illustrate how individual motorists interact with the transportation network when trying to detour around a major I-4 incident.

- NOEMI Update
 - Smart Signal View – standard view
 - Data Integration View – tracks data collection, QC, internal tracking
 - Timing Corridor View – live tracker of timing corridors
 - users are permitted to update data as necessary
 - can also attach files such as Synchro files
 - symbology is randomized each time user accesses map
 - viewing things doesn’t require login; editing requires a login
- Signal Intersection Inventory Application (SIIA)
 - tracks everything related to signals
 - comment system allows field users to edit information
 - living environment that changes rapidly
 - **Q:** Hazem El Assar – new signal design; is the Smart Signal design FDOT’s preference?
 - **A:** Yes. If it’s a larger RRR project or a widening project, we try to have the lane detection and other Smart Signal treatments implemented in design
 - Scopes for RRR/widening were updated 2.5 years ago to incorporate Smart Signal deployment
 - **Q:** How does County get access to NOEMI?
 - staff member must complete SAR and submit to FDOT staff or Anne Allan
 - <https://cflsmartroads.com/security.html>
- HERE Data Investigation

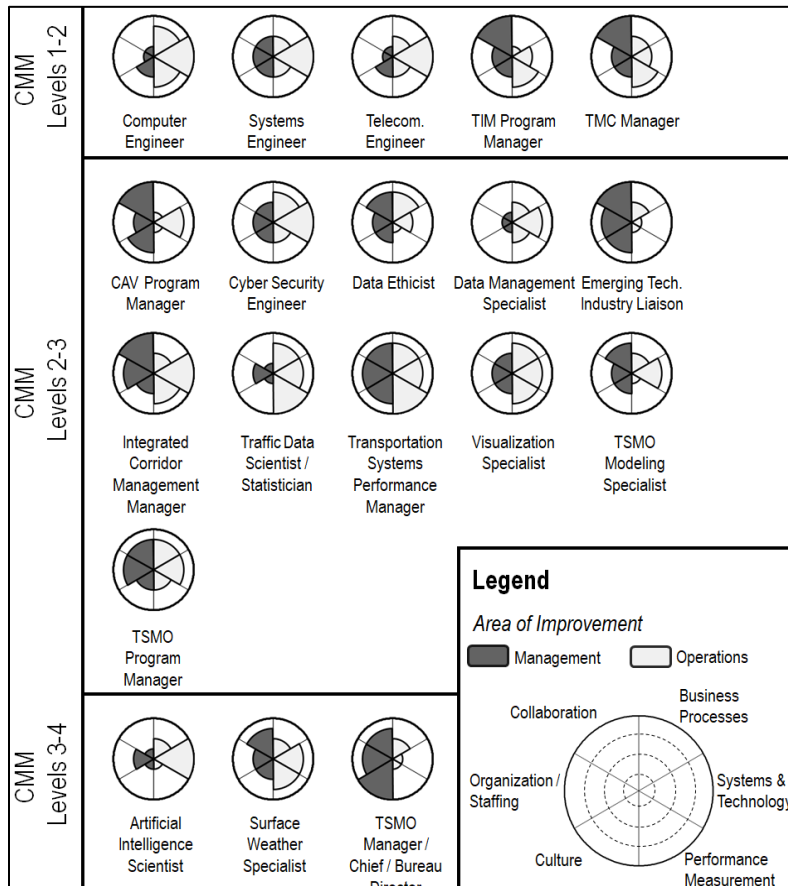
- Case Study #1 – demonstrated how HERE data illustrates a traffic incident on I-4 in Downtown
 - detour directions were not followed
 - travelers diverted onto residential roads
- Case Study #2 – Express Lanes in Miami
 - able to detect the vehicle involved in the incident
 - MOT deployed to keep people out of express lanes
 - Data
 - aggregated by hour, pretty confident in data
 - as you get more granular, the data shows more noise
 - one limitation – where no data is provided, we cannot be confident if the data is missing or if no one is traveling in that area
 - this is more of a problem in low-traffic time persists or locations
- Q: Steven Bostel – How big was the sample data?
 - A: 24-hour period.
 - Steven – It would be interesting to see the traffic for a launch event
- Lag for receiving data is approximately 30 minutes (data is accurate to the second, though).
- Jeremy – if anyone has other use cases/examples, please let us know
- Q: Bryan Homayouni – Could you explain the probe data/saturation rates?
 - A: HERE won't tell us the source of the data, though it's typically vehicle/cell phone
- Q: Is there any filter?
 - almost certainly they filter using a confidence level
 - Anne will ask for more information on confidence level and filtering
- Currently receiving data as lump CSVs; hoping to get streamed data eventually
- Would data be available for 2019?

IV. EMERGING TSM&O POSITIONS

David Williams provided a summary of the *TSM&O Workforce Guidebook*, published by NCHRP (Project 20-07) Transportation Research Board. The report provides a detailed analysis of anticipated TSM&O positions to come into wider use over the next few years.

- Purpose of Guidebook – “to provide practitioners with a tool to understand what is needed and how to develop a strong TSM&O workforce”
- Developed based on literature review and stakeholder interviews to identify issues, needs, and best practices for a TSM&O workforce
- Defines Knowledge, Skills, and Abilities
- Provides recommendations tailored to hiring these positions
- Provides info on training/professional development, including training sessions and courses
- Provides recommendations for maximizing workforce retention
- Guidebook Contents
 - Introduction

- Recruiting a TSM&O Workforce
- Model TSM&O Position Descriptions
- Developing a TSM&O Workforce
- Workforce Retention
- Appendices, including undergrad/grad courses, professional development courses, and sample TSM&O position job descriptions
- Provides situation for hiring each of the 19 emerging positions (below)



- Guidebook findings
 - limited TSM&O coursework or training for Legal, Procurement, or System Security categories
 - Introductory and Advanced trainings are sparse (Beginner trainings are widely available)
 - Graduate courses are more focused on Ops, Safety, Technology, and Network/Systems analysis
- Sample Job Descriptions provide content for potentially advertising positions (next page)
- City of Gainesville used the Guidebook to develop 2 positions:
 - ITS and CV/AV Technician Lead
 - ITS and CV/AV Program Manager
- For more information, <https://transportationops.org/tools/tsmo-workforce-guidebook>

Sample TSMO Job Description – Computer Engineer

Computer Engineer	
Job Title:	Computer Engineer
Minimum Years of Experience/Position Level:	5-10 Years/Mid-Level
Applicable to:	<input type="checkbox"/> DOT <input type="checkbox"/> County <input type="checkbox"/> City <input type="checkbox"/> MPO <input type="checkbox"/> Private <input type="checkbox"/> Toll Agency
General Summary of Position / Purpose of Position	
This position is a professional, licensed engineering specialist that provides advanced engineering and technical guidance for computer systems used in Transportation System Management and Operations (TSMO).	
Roles and Responsibilities	
1.0 Managerial	% of Time
1.1 Direct and supervise staff. 1.2 Meet regularly with employees to assign work, establish work objective and timelines to ensure working objectives are met. 1.3 Evaluate employees' performance, during established time frames, throughout the year and at formal review periods. 1.4 Motivate and train and/or ensure required training is available for staff. 1.5 Communicate regularly with direct reports, both individually and in staff meetings.	10%
2.0 Strategic Planning	% of Time
2.1 Develop and maintain plans for the organization's TSMO computer systems including inventories, architectures, technical information, application documentation, proposed projects, funding and timelines. 2.2 Collaborate with others related to overall TSMO planning. 2.3 Ensure computer system funding and resources are utilized in the most cost effective and beneficial manner. 2.4 Ensure the most current program elements, performance measures and functions are being implemented for computer systems.	15%
3.0 Customer Service	% of Time
3.1 Participate in meetings, on committees, task teams and other groups with internal and external customers to represent TSMO interests related to computer systems. 3.2 Maintain professional contact with elected officials, private companies, public, government agencies, and officials doing business with the State related to computer systems. 3.3 Promote good public relations with the persons contacted while adhering internal policies. 3.4 Provide accurate and timely responses to the public, contractors, and other department personnel. 3.5 Promote the resolution of outstanding technical and contractual issues. 3.6 Communicate effectively (strong written and verbal communication skills) and work well with team members from diverse technical backgrounds. 3.7 Coordinate with agency information technology (IT) staff whether within agency or separate state agency.	10%
4.0 Project Management	% of Time
4.1 Develop and manage internal work orders for system improvements performed by internal staff.	20%

4.2 Develop and manage consultant contracts and other types of agreements that support TSMO functions and/or relate to performance targets.	
4.3 Develop documentation for contract funding, request for proposal (RFP) and related documents, participation on technical review committees (TRC), evaluation of contract work products, consultant evaluation and invoice processing approval.	
5.0 Technical	% of Time
5.1 Act as a technical advisor on computer systems that support the TSMO program. These include user workstations, servers, data networks, TSMO applications, support applications, operating systems, device firmware, various data network technologies and topographies, may include knowledge of legacy systems and others. Supports the operations and maintenance of these systems. 5.2 Design computer systems and related software applications that support TSMO systems such as closed-circuit television, count and speed detection stations, dynamic message signs, weather stations, traffic signal systems, tolling, connected and automated vehicles, and others. 5.3 Collaborate with other technical staff such as Information Technology to assure system compatibility, operability, interoperability, and synchronization with other computer related planning and improvement efforts. 5.4 Participate on committees, task teams and in other groups as needed. 5.5 Oversee lead team / group activity, documenting results and related presentations as necessary. 5.6 Sign and Seal technical reports, plans, specifications, documents, etc. as required.	40%
6.0 Other	% of Time
6.1 Perform other duties as required.	5%
Education	
<input type="checkbox"/> High School Degree <input type="checkbox"/> Technical Degree/Associate Degree <input type="checkbox"/> Bachelor's Degree in Related Field <input checked="" type="checkbox"/> Bachelor's Degree in Engineering; or <input checked="" type="checkbox"/> Bachelor's Degree in Computer Science <input type="checkbox"/> Bachelor's Degree in Business <input type="checkbox"/> Bachelor's Degree in Environmental Science <input type="checkbox"/> Bachelor's Degree in Science, Economics, Statistics, or another Quantitative Field <input type="checkbox"/> Master's Degree in Engineering <input type="checkbox"/> Master's Degree in Engineering (preferred but not required) <input type="checkbox"/> Master's Degree in Quantitative Field (preferred but not required) <input type="checkbox"/> PhD in Civil Engineering, Transportation Engineering, Electrical or Computer Engineering, Computer Science, or related field (preferred but not required)	
Certificates, Licenses, Registrations	
<input type="checkbox"/> Registered Engineer in Training <input checked="" type="checkbox"/> Registered Professional Engineer <input type="checkbox"/> Professional Traffic Operations Engineer <input type="checkbox"/> Certified Information Systems Security Professional	

V. TSMCA UPDATES

Jeremy Dilmore discussed the District's recent coordination efforts with maintaining agencies to update/amend the Traffic Signal Maintenance and Compensation Agreement (TSMCA) for each agency.

- "Traffic Signals and Devices is defined as follows..."
 - large paragraph describing what devices maintaining agencies are required to maintain
 - no discussion of how the devices should be maintained or specific requirements
- Our industry is changing
 - Signal performance measures
 - ICMS
 - SunStore/Data Picker
 - Computer Vision
 - RSU / EVP
 - Planning and operations are driven by data
 - Increased need for uptime/availability
 - Higher standard for accuracy
- Response
 - No one-size-fits-all solution
 - Need to maintain high level of performance for assets
 - Need to know where agencies feel comfortable
 - Clarify the expectation of the TSMCA to be fair, but reflect unique conditions to every area
 - Developed spreadsheet of anticipated maintenance efforts for existing and upcoming devices
 - Asked Maintaining Agencies to identify preferred responsibilities
 - Holding ongoing one-on-one discussions with each maintaining agency to discuss roles and responsibilities
 - Most common responses across maintaining agencies
 - Maintaining Agency Responsibility
 - Cabinet, Detection, Preemption, Pedestrian, Signal Infrastructure, Signing
 - FDOT Responsibility
 - CV RSU, DMS, Metadata, Midblock Detection (MVDS)
- Next Steps
 - Follow-up one-on-one discussions
 - Additional conversations, as needed, to coordinate with IT and/or finetune TSMCA clarification
 - Finalize language with staff
 - Council/Board approvals
 - TSMCA update executed and "complete"
- TSMCA to be a living document

VI. CURRENT INITIATIVES

Jeremy Dilmore provided a brief update on current TSM&O- and ITS-related initiatives around the District.

- CV – working with manufacturers
 - there has been some firmware issues with connection to Security Credential Management System (SCMS)
 - will start deploying units once firmware is updated
 - PedSafe, SR 434 Pilot, signal near you
- RICMS – beta version has been started; test only
 - receiving bad suggestions, likely related to detection issues
 - recommendations are NOT being push through
 - expect reasonable recommendations in September/October timeframe
 - target for express lanes going live – Q1 CY2022
- Released RFP for Automated Channel Assignment
 - would identify items assigned with the wrong channel
- OBU – acquired contractor to install in vehicles in several counties and City of Ocala
 - contract was for DSRC; negotiated effort to switch to CV2X, but couldn't procure it
 - readvertised to be CV2X specifically
- AV Shuttle
 - CAV operations work well in testing
 - AC and Door has not been functioning well enough to pass the test
 - likely opening around September 2021
- V2X Data Platform (statewide initiative)
 - SwRI won
 - SunStore effect?
 - SunStore will still be around
 - focused on TSMO data
 - V2X is CAV data only
- Security Survey (statewide initiative)
 - will include traffic signals
 - not looking for super-specific information
 - required by Florida statute
 - trying to determine how exposed our system is
 - do not provide granular data
 - District by District

VII. NEXT MEETING

- October 7, 2021

VIII. ATTACHMENTS

- A – Presentation Slides
- B – Meeting agenda

END OF SUMMARY

This summary was prepared by David Williams and is provided as a summary (not verbatim) for use by the Consortium Members. The comments do not reflect FDOT's concurrence. Please review and send comments via e-mail to dwilliams@vhb.com so the meeting summary can be finalized.

Welcome to the TSM&O Consortium Meeting August 5, 2021



Meeting Agenda

1. Welcome
2. Local Agency Updates
 - Brevard County
3. GIS Initiatives
4. TSM&O Workforce Guidebook (NCHRP 20-07)
5. TSMCA Updates
6. Current Initiatives

Brevard County Update

Richard Ataman, Brevard County Traffic Operations

GIS Initiatives

Anne Allan, InNovo Partners



Transportation Systems Management & Operations



Emerging TSM&O Positions

TSM&O Workforce Guidebook
NCHRP Project 20-07

David Williams, VHB

TSM&O Workforce Guidebook

- **Purpose:** “to provide practitioners with a tool to understand what is needed and how to develop a strong TSM&O workforce.”
- “The guidebook goes into detail on the hiring and workforce development practices recommended through literature and currently in place within existing and successful TSMO programs.”
- Based on **literature review and stakeholder interviews** to identify issues, needs, and best practices for a TSMO workforce
- Defines **Knowledge, Skills, and Abilities (KSAs)**
- Provides recommendations **tailored to hiring** these positions
- Provides information on **training/professional development**, including training providers and courses
- Provides recommendations for maximizing **workforce retention**

TSM&O Workforce Guidebook

- Guidebook Contents (351 pages)
 - Chapter 1 – Introduction
 - Chapter 2 – Recruiting a TSMO Workforce
 - Chapter 3 – Model TSMO Position Descriptions
 - Chapter 4 – Developing a TSMO Workforce
 - Chapter 5 – Workforce Retention
- Appendices (274 pages)
 - Appendix A – Undergraduate Courses
 - Appendix B – Graduate Courses
 - Appendix C – Professional Development Courses and Training
 - Appendix D – TSMO Position Descriptions

Chapter 2 – Recruiting a TSMO Workforce

- Traffic Data Scientist/Statistician
- TSMO Manager/Chief/Bureau Director
- TSMO Program Manager
- Computer Engineer
- AI Scientist
- Telecommunications Engineer
- Data Management Specialist
- Visualization Specialist
- CAV Program Manager
- TIM Program Manager
- Cyber Security Engineer
- Transportation Data Ethicist
- Surface Weather Specialist
- Systems Engineer
- TSMO Modeling Specialist
- Emerging Technologies Industry Liaison
- Transportation Systems Performance Manager
- Integrated Corridor Management Manager
- TMC Manager

Table 3. Relationships between TSMO Job Positions and Typical DOT Business Areas

Job Position	Admin.	Planning	Design	Construction	Maint.	Asset & Perf. Management	Permitting & Enforcement	Traffic & Safety	Operations	Research
Traffic Data Scientist/Statistician	○	●	●	●	●	●	○	●	●	●
TSMO Manager/Chief/Bureau Director	●	●	●	●	●	●	●	●	●	●
TSMO Program Manager	●	●	●	●	●	●	●	●	●	●
Computer Engineer	○	○	○	○	○	●	○	●	●	●
Artificial Intelligence Scientist	○	○	○	○	○	●	○	●	●	●
Telecommunications Engineer	○	○	○	○	○	●	○	●	●	●
Data Management Specialist	○	○	○	○	○	●	●	●	●	●
Visualization Specialist	○	●	●	●	●	●	○	●	●	●
CAV Program Manager	●	●	●	●	●	●	○	●	●	●
TIM Program Manager	○	○	○	○	●	●	●	●	●	○
Cyber Security Engineer	○	○	○	○	○	●	○	●	●	●
Transportation Data Ethicist	●	○	○	○	○	●	○	○	●	●
Surface Weather Specialist	○	○	○	○	●	○	○	●	●	○
Systems Engineer	○	●	●	●	●	●	○	●	●	●
TSMO Modeling Specialist	○	●	●	●	●	●	○	●	●	●
Emerging Technologies Industry Liaison	●	○	○	○	○	●	○	○	●	●
Transportation Systems Performance Manager	●	●	●	●	●	●	●	●	●	●
Integrated Corridor Management Manager	●	●	●	●	●	●	●	●	●	●
Transportation Management Center Manager	●	○	○	○	●	●	●	●	●	●

Legend

- represents not typically involved
- represents some involvement
- represents frequent involvement

Abbreviations:

Admin: Administration
Maint: Maintenance

Perf: Performance

Chapter 2 – Recruiting a TSMO Workforce

- Future incremental evolution of traditional positions

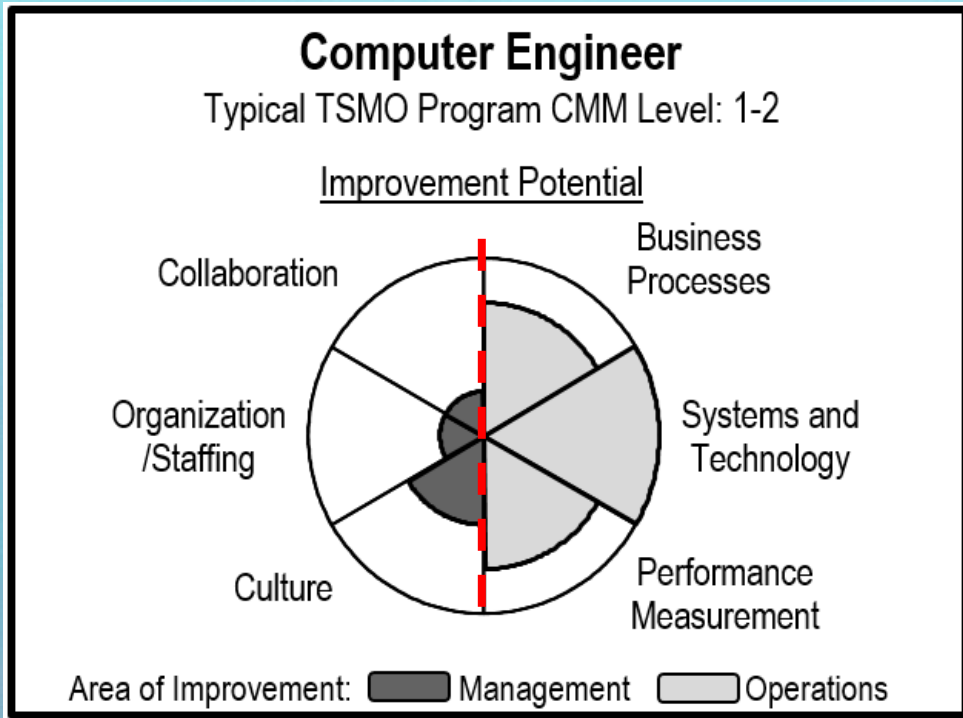
Job Title	General Summary of Position	Future Roles and Responsibilities
Traffic Engineer	Position is primarily responsible for applying principles and practices from civil engineering for the traffic operations of roads, streets, highways, and their networks to achieve a safe, efficient, and convenient movement of people and goods. This position is also responsible for traffic operations studies, such as safety studies, intersection operations studies, traffic impact studies, interstate operation studies, interchange modification report, traffic signal timing studies, and signal warrant studies.	<ul style="list-style-type: none"> • Use spatial data, such as geographic information system and relevant spatial analyses and statistics, for data-driven decision making. • Advocate for the appropriate TSMO countermeasures during the planning, design, and construction of highway projects as appropriate. • Consider connected and automated vehicles impacts on traffic operations.

Transportation Planner	Position is responsible for long-range transportation planning and considering safety, environmental, and efficiency issues in areas such as land use, infrastructure analysis, environmental compliance, and corridor planning. This position allocates resources to initiate and develop projects, and is responsible for the identification of needs, the preparation of plans and estimates, and adherence to regulations.	<ul style="list-style-type: none"> • Mainstream TSMO into the project planning process. • Integrate management and operations strategies into the metropolitan transportation planning process to maximize the performance of the existing and planned transportation system. • Implement modeling for analysis, visualization, planning, and training related to TSMO programs. • Take a multimodal approach to transportation planning. • Use scenario planning to understand range of potential TSMO impacts
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- Traffic Engineer
- Traffic Signal Engineer
- Freeway Ops Engineer
- Arterial Ops Engineer
- ITS Design Engineer
- ITS Planner
- Transportation Planner

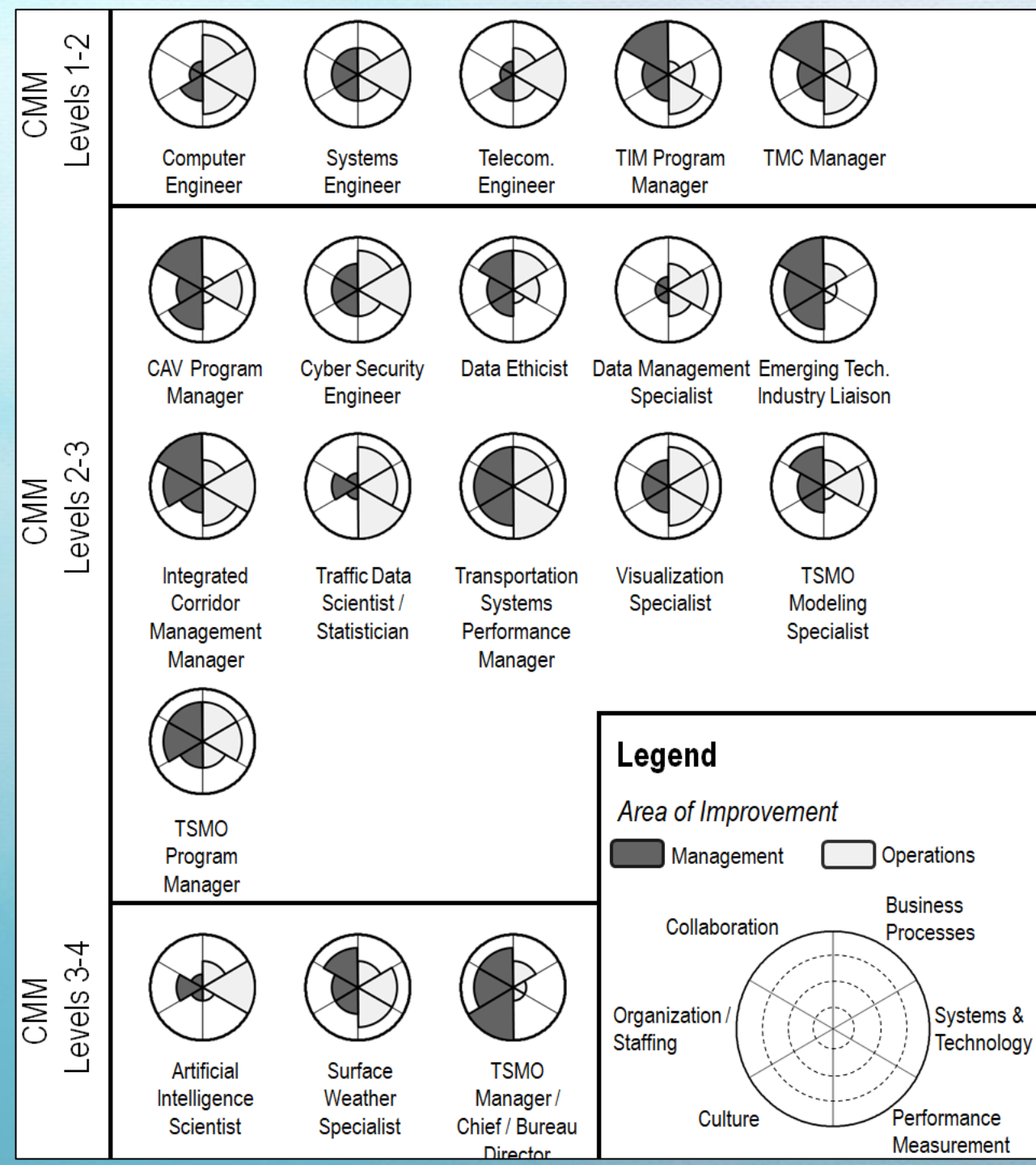
When to Recruit

- Using TSMO CMM grades
- Charts represent potential improvement due to new position



Sample of one position's chart.

All 19 position charts



Chapter 3 – Model TSMO Position

Computer Engineer

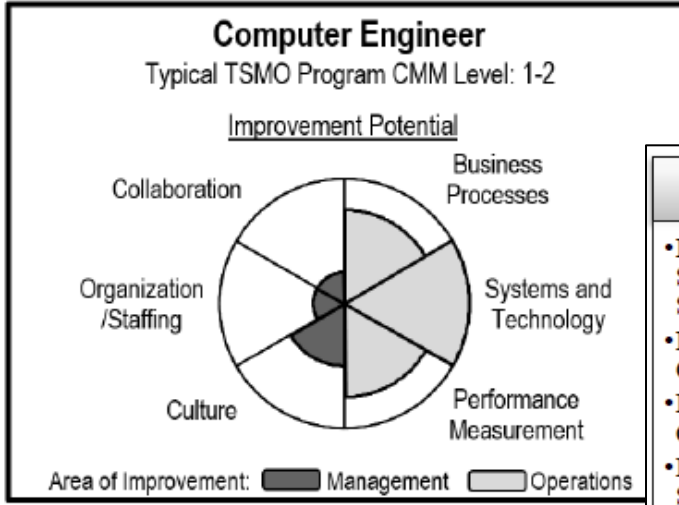
When is a Computer Engineer Needed?

A Computer Engineer leads computer support and serves as a specialist that gets the everyday work done. Hiring a Computer Engineer has the most significant impact on the system and technology dimension, especially as the rate of technology advancement increases. Whether it is improved decision support systems, big data, or virtual and augmented reality, the role of a computer engineer within a TSMO organization is only going to increase. The potential to improve business processes and performance measurement is relatively high because IT systems need to be developed and supported to enable improvement. Typically, this position is required for those TSMO programs with a CMM level of 1-2. Specific motivation for hiring a Computer Engineer include:

- The need for in-house IT expertise required specific to emerging technologies and hardware; traditional or external IT support becomes insufficient.
- Multiple systems/applications require continual integration and change management.
- The program is responsible for staying abreast of mobile, cloud, or edge computing.

What Knowledge, Skills, and Abilities are Required?

The Computer Engineer is a specialist who provides advanced engineering and technical guidance for computer systems used in TSMO. As such, core knowledge requirements include competency in computer science/engineering and coding languages. Skillsets necessary for this position include general computer, analytical, and communication skills (written and verbal). Required abilities for this position are data analysis, professional judgment, and teamwork. It is expected that knowledge of TSMO systems (hardware and architecture), local agency procedures, technical communication and report skills, interpersonal skills, and teamwork should also be included. TSMO challenges are complex and require much collaboration.



Knowledge	Skills	Abilities
<ul style="list-style-type: none"> • Knowledge of Computer Science, Engineering, Software Engineering • Knowledge of Relevant Coding Languages • Knowledge of Microsoft Office Programs • Knowledge of TSMO Systems (hardware and architecture) • Knowledge of Local Agency Procedures 	<ul style="list-style-type: none"> • General Computer Skills • Communication Skills, Written/Verbal • Analytical, Mathematical, or Problem-Solving Skills • Interpersonal Skills • Technical Communication, Report Development Skills • Time and Task Management Skills 	<ul style="list-style-type: none"> • Ability to Collect, Enter, or Analyze Data • Possess Professional Judgment • Ability to Work Well on a Team

Where and How Should Agencies Recruit for this Position?

When recruiting potential hires, agencies should look to other transportation agencies, consulting firms, the software industry, and academic or research institutions for potential hires with experience in developing and coding computer programs, in system engineering, and in TSMO and ITS applications.

A recruiter will be somewhat helpful to find the most qualified individuals to fill this position. Agencies could consider offering incentives in the form of a flexible work schedule, remote work options, and professional organization involvement.

Table 7. Sample Workforce Development Plan

Basic Training	Advanced Training
<p>New DOT Employee Orientation <i>Duration:</i> 1.5 hours <i>Format:</i> Webinar logged in DOT Knowledge Management System (KMS) <i>Description:</i> Provide a brief overview of TSMO at a very high level</p>	<p>New TSMO Employee Orientation <i>Duration:</i> 24 hours <i>Format:</i> ½ Immersion and ½ self-guided tutorial <i>Description:</i> Immersion training including visits to TMC, Statewide Emergency Operations Center (EOC), Maintenance Garage, Safety Service Patrol ride along, Snow Removal ride along (as weather permits) and university partner.</p>
<p>Co-Op/Intern Experience <i>Duration:</i> 8 hours <i>Format:</i> Lecture and site visits <i>Description:</i> ½ day lecture on TSMO and ½ visiting TMC and Safety Service Patrol</p>	
<p>TSMO 101 On-Line Training <i>Duration:</i> A series of about 6-30-minute modules that cover the basis of TSMO <i>Format:</i> Webinar with scored quizzes <i>Description:</i> Preliminary list of modules include: Introduction to TSMO, the role of the TMC, how TSMO impacts how we plan projects, how TSMO impact how we design projects, how TSMO impacts how we manage the transportation network</p>	<p>TSMO 201 Advanced On-Line Training <i>Duration:</i> A series of about 12-30-minute modules on advanced TSMO topics <i>Format:</i> Webinar with scored quizzes <i>Description:</i> Example topics include: Work Zone Management, Traveler Information, ITS Field Device Design, ITS Maintenance, Planning for TSMO, ITS Data Management</p>

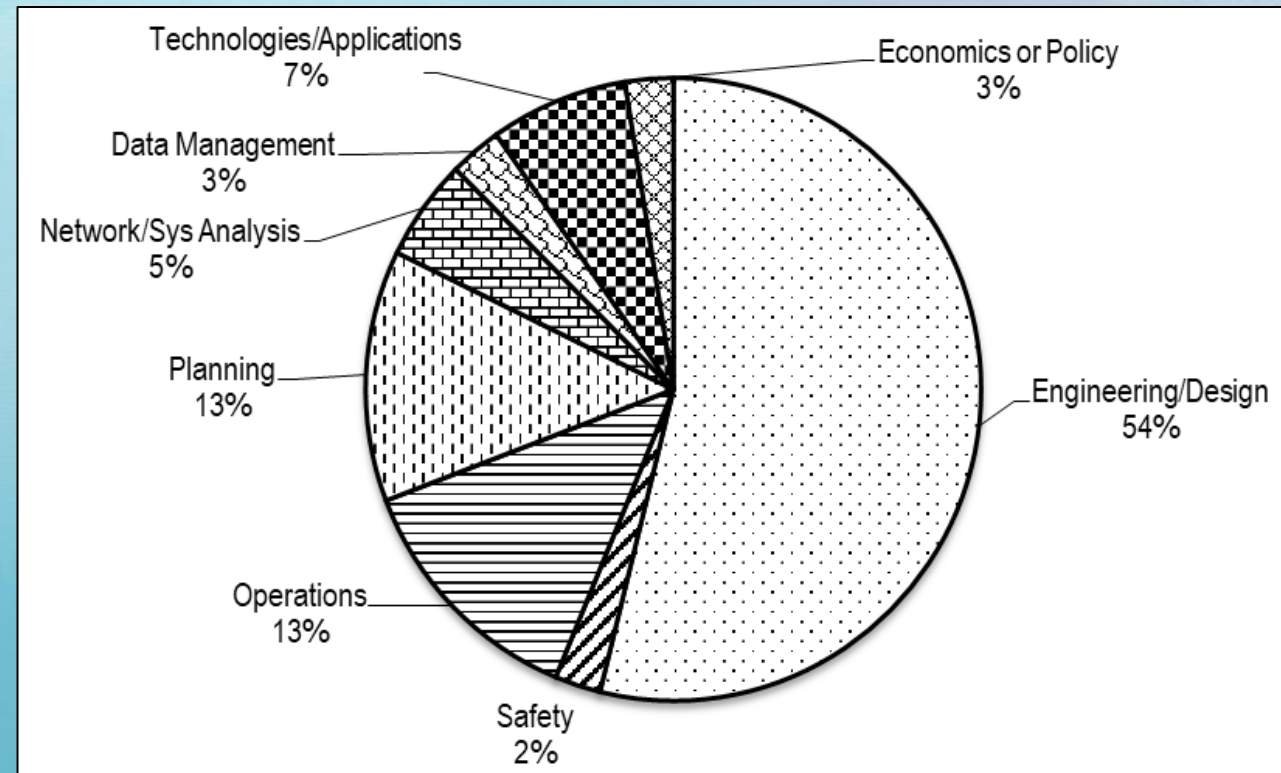
Chapter 4 – Developing a TSMO Workforce

Sample Workforce Development Plan

Basic Training	Advanced Training
<p>District Awareness Training <i>Duration:</i> 3.5 hours <i>Format:</i> Lecture <i>Description:</i> A series of 20-minute modules that provide an overview of DOT's TSMO Program</p>	<p>District TSMO Practitioner Training <i>Duration:</i> 8 hours <i>Format:</i> Lecture <i>Description:</i> Provide an overview of how District TSMO staff are expected to coordinate activities with Central Office including: budgeting, planning for operations, TSMO project Design, Traffic Incident Management, and Emergency Management</p>
<p>Basic State DOT Operations Academy <i>Duration:</i> 2 days <i>Format:</i> Combination of lectures, group exercises, and at least one field visit <i>Description:</i> A series of one-hour lectures by different regional subject matter experts Modeled after National Operations Academy</p>	<p>Advanced State DOT Operations Academy <i>Duration:</i> 4 days <i>Format:</i> Combination of lectures, group exercises, and at least one field visit <i>Description:</i> In-depth training on all aspects of TSMO including a presentation by national subject matter experts Modeled after National Operations Academy</p>

Chapter 4 – Developing a TSMO Workforce

- Sample Workforce Development Plan
- Review of existing training opportunities
 - 774 undergraduate courses were identified/reviewed in ABET accredited colleges (see Appendices)
 - 300 post-secondary education programs available for TSMO-related PD
 - Advanced training on all TSMO topic areas is sparse



Breakdown of Undergraduate Course Topics

Chapter 4 – Developing a TSMO Workforce

- Findings

- Limited TSMO coursework or PD training for Legal, Procurement, or System Security
- Introductory and Advanced trainings are sparse
- Graduate courses focused more on ops, safety, technologies/apps, network/systems analysis

Topic Area	Training Level			Total
	<i>Advanced</i>	<i>Basic</i>	<i>Introductory</i>	
System Architecture	1	4	6	11
Connected Vehicles	-	22	1	23
Data Management	2	8	-	10
Decision Support	-	12	-	12
Engineering/Design	1	32	2	35
Leadership	4	9	-	13
Legal	-	3	-	3
Traffic Operations	6	22	2	30
Performance Management	2	15	3	20
Planning	3	25	3	31
Procurement	-	4	-	4
Safety	1	27	1	29
Standards	-	13	4	17
Strategy/Challenges	-	12	-	12
System Security	-	5	-	5
Systems Engineering	1	9	2	12
Technologies/ Applications	-	25	5	30
Traffic Maintenance	9	28	2	39
Grand Total	30	275	31	336

Undergraduate Courses

<i>College/University</i>	<i>State</i>	<i>Course Name</i>	<i>Description</i>	<i>Credits Earned</i>
University of California, Irvine	California	Travel Demand Analysis II	Methods of discrete choice analysis and their applications in the modeling of transportation systems. Emphasis on the development of a sound understanding of theoretical aspects of discrete choice modeling that are useful in many applications in travel demand analysis. Prerequisite: CEE220A. Graduate students only. (Design units: 0)	4
University of California, Irvine	California	Travel Demand Analysis III: Activity-based Approaches	The methodological underpinnings of activity-based travel demand modeling. Presents methodologies within the context of a generalization of discrete choice modeling approaches, emphasizing the distinctions that separate these two approaches and presenting appropriate mathematical and statistical tools to address these distinctions. Prerequisite: ENGRCEE 220A. Graduate students only. (Design units: 0)	4
University of California, Irvine	California	Travel Demand Analysis I	Fundamentals of transportation systems analysis. Theoretical aspects of travel demand. Travel behavior. Modeling of performance characteristics and costs of transportation modes. In-depth presentation of travel demand modeling techniques. Development of travel choice models including mode, route, and destination choice. Equilibration. Graduate students only. (Design units: 0)	4
University of California, Irvine	California	Urban Transportation Networks II	Analytical approaches and algorithms to the formulation and solution of the equilibrium assignment problem for transportation networks. Emphasis on user equilibrium (UE) comparison with system optimal, mathematical programming formulation, supply functions, estimation. Estimating origin-destination matrices, network design problems. Prerequisite: ENGRCEE 221A and ENGRCEE 228A. Graduate students only. (Design units: 0)	4
University of California, Irvine	California	Urban Transportation Networks I	Analytical approaches and algorithms to the formulation and solution of the equilibrium assignment problem for transportation networks. Emphasis on user equilibrium (UE) comparison with system optimal, mathematical programming formulation, supply functions, estimation. Estimating origin-destination matrices, network design problems. Prerequisite: CEE220A. Graduate students only. (Design units: 0)	4
University of California, Los Angeles	California	Introduction to Transportation Engineering	Lecture, four hours; discussion, two hours; outside study, six hours. Designed for juniors/senior Civil Engineering students and Public Affairs graduate students. General characteristics of transportation systems, including streets and highways, rail, transit, air, and water. Capacity considerations, including planning, design, and operations. Components of roadway design, including horizontal and vertical alignment, cross sections, and pavements. Letter grading.	4
University of California, Los Angeles	California	Traffic Engineering Systems: Operations and Control	Lecture, four hours; fieldwork/laboratory, two hours; outside study, six hours. Designed for juniors/seniors and public affairs graduate students. Applications of traffic safety improvements, highway capacity analyses, signal design and timing, Intelligent Transportation Systems concepts, and traffic interface with railroads, urban transit, bicyclists, and pedestrians. Students analyze local roadway and present recommended improvements to public agency officials. Letter grading.	4
University of Central Florida	Florida	Highway Engineering	Three functional classifications are covered: planning, design and operation of transportation facilities. Emphasis is on the highway transportation mode. Fall, Spring	3
University of Central Florida	Florida	Transportation Analytics	Qualitative and quantitative approaches to contemporary transportation challenges, including economic theory, optimization algorithms, statistical methods, and sustainable transportation alternatives. Spring	3
University of Central Florida	Florida	Transportation Engineering Systems	Topics such as safety, Intelligent Transportation Systems, and airport transportation will be covered. Fall, Spring	3

Graduate Courses

<i>College/University</i>	<i>State</i>	<i>Course Name</i>	<i>Description</i>	<i>Credits Earned</i>
University of California - Irvine	California	Travel Demand Analysis II	Methods of discrete choice analysis and their applications in the modeling of transportation systems. Emphasis on the development of a sound understanding of theoretical aspects of discrete choice modeling that are useful in many applications in travel demand analysis	4
University of California - Irvine	California	Travel Demand Analysis III: Activity-based Approaches	The methodological underpinnings of activity-based travel demand modeling. Presents methodologies within the context of a generalization of discrete choice modeling approaches, emphasizing the distinctions that separate these two approaches and presenting appropriate mathematical and statistical tools to address these distinctions.	4
University of California - Irvine	California	Urban Transportation Networks I	Analytical approaches and algorithms to the formulation and solution of the equilibrium assignment problem for transportation networks. Emphasis on user equilibrium (UE) comparison with system optimal, mathematical programming formulation, supply functions, estimation. Estimating origin-destination matrices, network design problems.	4
University of California - Irvine	California	Urban Transportation Networks II	Advanced analysis, optimization, and modeling of transportation networks. Topics include advanced static and dynamic traffic assignment algorithms, linear and nonlinear multi-commodity network flow optimization, network simplex, and network control problems.	4
University of Central Florida	Florida	Geometric Design of Transportation Systems	Study of highway geometric design in the engineering of transportation systems.	3
University of Central Florida	Florida	Highway Capacity	Highway capacity for all functional classes of highway. Traffic signalization including traffic studies, warrants, cycle length, timing, phasing and coordination.	3
University of Central Florida	Florida	Traffic Engineering	Study of operator and vehicle characteristics, and design for street capacity, signals, signs, and markings.	3
University of Central Florida	Florida	Traffic Operations	Fundamentals of traffic flow theory and applications to traffic operations on highways and streets. Work on real life traffic operations project and report results.	3
University of Central Florida	Florida	Traffic Safety Analysis	Understanding crash research concepts, and identifying factors contributing to traffic crash occurrence.	3

Profession Development Courses

Organization	Program/Course Name	Level	Time Period	Description	Credentials Earned	Website	Target Audience	Fees	Delivery Method
A & SW Consultants Inc.	Advanced Maintenance of Traffic	Advanced	20 hours	Advanced course is required for personnel with responsibility or authority to decide on the specific Maintenance of Traffic requirements to be implemented.	Certificate of Completion	http://www.floridamot.com/mot-course-descriptions-1.html	Florida-area; particularly FDOT	\$ 450.00	Classroom
A & SW Consultants Inc.	Advanced Refresher Maintenance of Traffic	Advanced	8 hours	This Refresher class will review changes to Index 600 and MUTCD, which affect traffic control operations, as well as reiterate work zone practices.	Certificate of Completion	http://www.floridamot.com/mot-course-descriptions-1.html	Florida-area; particularly FDOT	\$ 250.00	Classroom
AASHTO - American Association of State Highway and Transportation Officials	TSMO Guidance: Business Processes - Level 3 to Level 4	Advanced		A complete range of guidance for Transportation Systems Management and Operations from which user-specific selections are made via the One-Minute Guidance Evaluation or the Customized Guidance Evaluation. The guidance is divided into six dimensions that represent features of transportation agencies and their activities critical to effective TSM&O. Each dimension is further divided into three or four sub-dimensions and through the evaluation processes, can be specified to the user agency's current level of maturity—organized to provide only that guidance appropriate to reaching the next level.		www.aashtotsmoguidance.org/browse/	State DOT/TSMO professionals	No Cost	Web Based
AASHTO - American Association of State Highway and Transportation Officials	TSMO Guidance: Collaboration - Level 3 to Level 4	Advanced		A complete range of guidance for Transportation Systems Management and Operations from which user-specific selections are made via the One-Minute Guidance Evaluation or the Customized Guidance Evaluation. The guidance is divided into six dimensions that represent features of transportation agencies and their activities critical to effective TSM&O. Each dimension is further divided into three or four sub-dimensions and through the evaluation processes, can be specified to the user agency's current level of maturity—organized to provide only that guidance appropriate to reaching the next level.		www.aashtotsmoguidance.org/browse/	State DOT/TSMO professionals	No Cost	Web Based
AASHTO - American Association of State Highway and Transportation Officials	TSMO Guidance: Culture - Level 3 to Level 4	Advanced		A complete range of guidance for Transportation Systems Management and Operations from which user-specific selections are made via the One-Minute Guidance Evaluation or the Customized Guidance Evaluation. The guidance is divided into six dimensions that represent features of transportation agencies and their activities critical to effective TSM&O. Each dimension is further divided into three or four sub-dimensions and through the evaluation processes, can be specified to the user agency's current level of maturity—organized to provide only that guidance appropriate to reaching the next level.		www.aashtotsmoguidance.org/browse/	State DOT/TSMO professionals	No Cost	Web Based
AASHTO - American Association of State Highway and Transportation Officials	TSMO Guidance: Organization/Workforce - Level 3 to Level 4	Advanced		A complete range of guidance for Transportation Systems Management and Operations from which user-specific selections are made via the One-Minute Guidance Evaluation or the Customized Guidance Evaluation. The guidance is divided into six dimensions that represent features of transportation agencies and their activities critical to effective TSM&O. Each dimension is further divided into three or four sub-dimensions and through the evaluation processes, can be specified to the user agency's current level of maturity—organized to provide only that guidance appropriate to reaching the next level.		www.aashtotsmoguidance.org/browse/	State DOT/TSMO professionals	No Cost	Web Based
AASHTO - American Association of State Highway and Transportation Officials	TSMO Guidance: Performance Measurement - Level 3 to Level 4	Advanced		A complete range of guidance for Transportation Systems Management and Operations from which user-specific selections are made via the One-Minute Guidance Evaluation or the Customized Guidance Evaluation. The guidance is divided into six dimensions that represent features of transportation agencies and their activities critical to effective TSM&O. Each dimension is further divided into three or four sub-dimensions and through the evaluation processes, can be specified to the user agency's current level of maturity—organized to provide only that guidance appropriate to reaching the next level.		www.aashtotsmoguidance.org/browse/	State DOT/TSMO professionals	No Cost	Web Based
AASHTO - American Association of State Highway and Transportation Officials	TSMO Guidance: Systems and Technology - Level 3 to Level 4	Advanced		A complete range of guidance for Transportation Systems Management and Operations from which user-specific selections are made via the One-Minute Guidance Evaluation or the Customized Guidance Evaluation. The guidance is divided into six dimensions that represent features of transportation agencies and their activities critical to effective TSM&O. Each dimension is further divided into three or four sub-dimensions and through the evaluation processes, can be specified to the user agency's current level of maturity—organized to provide only that guidance appropriate to reaching the next level.		www.aashtotsmoguidance.org/browse/	State DOT/TSMO professionals	No Cost	Web Based

Computer Engineer

Job Title:	Computer Engineer	Job Category:	<input type="checkbox"/> Management <input checked="" type="checkbox"/> Engineering <input type="checkbox"/> Specialist <input type="checkbox"/> Systems and Data Management
Minimum Years of Experience/Position Level:	5-10 Years/Mid-Level		
Applicable to:	<input checked="" type="checkbox"/> DOT <input checked="" type="checkbox"/> County <input checked="" type="checkbox"/> City	<input checked="" type="checkbox"/> MPO <input checked="" type="checkbox"/> Private <input checked="" type="checkbox"/> Toll Agency	
General Summary of Position / Purpose of Position			
This position is a professional, licensed engineering specialist that provides advanced engineering and technical guidance for computer systems used in Transportation System Management and Operations (TSMO).			
Roles and Responsibilities			
1.0 Managerial		% of Time	
1.1 Direct and supervise staff. 1.2 Meet regularly with employees to assign work, establish work objective and timelines to ensure working objectives are met. 1.3 Evaluate employees' performance, during established time frames, throughout the year and at formal review periods. 1.4 Motivate and train and/or ensure required training is available for staff. 1.5 Communicate regularly with direct reports, both individually and in staff meetings.		10%	
2.0 Strategic Planning		% of Time	
2.1 Develop and maintain plans for the organization's TSMO computer systems including inventories, architectures, technical information, application documentation, proposed projects, funding and timelines. 2.2 Collaborate with others related to overall TSMO planning. 2.3 Ensure computer system funding and resources are utilized in the most cost effective and beneficial manner. 2.4 Ensure the most current program elements, performance measures and functions are being implemented for computer systems.		15%	
3.0 Customer Service		% of Time	
3.1 Participate in meetings, on committees, task teams and other groups with internal and external customers to represent TSMO interests related to computer systems. 3.2 Maintain professional contact with elected officials, private companies, public, government agencies, and officials doing business with the State related to computer systems. 3.3 Promote good public relations with the persons contacted while adhering internal policies. 3.4 Provide accurate and timely responses to the public, contractors, and other department personnel. 3.5 Promote the resolution of outstanding technical and contractual issues. 3.6 Communicate effectively (strong written and verbal communication skills) and work well with team members from diverse technical backgrounds. 3.7 Coordinate with agency information technology (IT) staff whether within agency or separate state agency.		10%	
4.0 Project Management		% of Time	
4.1 Develop and manage internal work orders for system improvements performed by internal staff.		20%	

- 4.2 Develop and manage consultant contracts and other types of agreements that support TSMO functions and/or relate to performance targets.
- 4.3 Develop documentation for contract funding, request for proposal (RFP) and related documents, participation on technical review committees (TRC), evaluation of contract work products, consultant evaluation and invoice processing approval.

5.0 Technical

- 5.1 Act as a technical advisor on computer systems that support the TSMO program. These include user workstations, servers, data networks, TSMO applications, support applications, operating systems, device firmware, various data network technologies and topographies, may include knowledge of legacy systems and others. Supports the operations and maintenance of these systems.
- 5.2 Design computer systems and related software applications that support TSMO systems such as closed-circuit television, count and speed detection stations, dynamic message signs, weather stations, traffic signal systems, tolling, connected and automated vehicles, and others.
- 5.3 Collaborate with other technical staff such as Information Technology to assure system compatibility, operability, interoperability, and synchronization with other computer related planning and improvement efforts.
- 5.4 Participate on committees, task teams and in other groups as needed.
- 5.5 Oversee lead team / group activity, documenting results and related presentations as necessary.
- 5.6 Sign and Seal technical reports, plans, specifications, documents, etc. as required.

% of Time

40%

6.0 Other

- 6.1 Perform other duties as required.

% of Time

5%

Education

- High School Degree
 Technical Degree/Associate Degree
 Bachelor's Degree in Related Field
 Bachelor's Degree in Engineering; or
 Bachelor's Degree in Computer Science
 Bachelor's Degree in Business
 Bachelor's Degree in Environmental Science
 Bachelor's Degree in Science, Economics, Statistics, or another Quantitative Field
 Master's Degree in Engineering
 Master's Degree in Engineering (preferred but not required)
 Master's Degree in Quantitative Field (preferred but not required)
 PhD in Civil Engineering, Transportation Engineering, Electrical or Computer Engineering, Computer Science, or related field (preferred but not required)

Certificates, Licenses, Registrations

- Registered Engineer in Training
 Registered Professional Engineer
 Professional Traffic Operations Engineer
 Certified Information Systems Security Professional

Chapter 5 – Retaining a TSMO Workforce

Table 11. Best Practices for Retaining a TSMO Workforce

Best Practice	Category	Literature	Interviews
Enhance on-boarding processes	Trainings and Professional Development	✓	
Offer ongoing professional development	Trainings and Professional Development	✓	✓
Offer mentorship programs and opportunities	Trainings and Professional Development		✓
Provide training, including cross-functional training	Trainings and Professional Development	✓	✓
Offer performance-based compensation	Human Resource Benefits	✓	
Provide flexible work arrangements	Human Resource Benefits	✓	✓
Ensure employee recognition	Human Resource Benefits	✓	
Provide regular and effective feedback	Human Resource Benefits		✓
Clearly articulate mission and vision	Workplace Culture	✓	
Clearly define expectations and policies	Workplace Culture	✓	✓
Provide clear internal organization communication	Workplace Culture		✓
Ensure organizational integrity	Workplace Culture		✓
Host team celebration and events	Workplace Culture	✓	
Increase diversity	Workplace Culture		✓
Provide leadership opportunities	Workplace Culture		✓
Promote and ensure workplace safety	Workplace Culture	✓	
Support professional organization involvement	Workplace Culture		✓
Allow appropriate and creative office space	Workplace Culture	✓	
Offer extended leave opportunities	Workplace Culture		✓
Define career path and advancement opportunities	Workplace Culture	✓	✓

Use Case

- Gainesville has posted positions based off the Guidebook guidance and best practices
 - [ITS and CV/AV Technician Lead](#)
 - [ITS and CV/AV Program Manager](#)
- Adjusted the job descriptions appropriately, tailoring them to local agency needs

Additional Information

- Google: “TSMO Workforce Guidebook”
- Direct Link to **TSMO Workforce Guidebook** (see chat)
 - <https://transportationops.org/sites/transops/files/TSMO%20Workforce%20Guidebook%20NCHRP.pdf>
- National Operations Center of Excellence (NOCoE) distilled many aspects of the Guidebook onto their website:
 - [TSMO Workforce Development | National Operations Center of Excellence \(transportationops.org\)](https://transportationops.org)

TSMCA Updates

Jeremy Dilmore, District Five TSM&O

Looking Ahead – Traffic Signals

- Traffic Signal Maintenance and Compensation Agreement between FDOT and local agencies
- Traffic Signals and Devices is defined as follows: all signals, interconnected and monitored traffic signals systems (defined as central computer, cameras, message signs, communication devices, interconnect/network, vehicle, bicycle & pedestrian detections devices, traffic signal hardware and software, preemption devices, and uninterruptible power supplies(“UPS”)), control devices (defined as intersection control beacons, pedestrian crossing beacons, illuminated street name signs, pedestrian flashing beacons (i.e., school zone flashing beacons, pedestrian crossing beacons, and Rectangular Rapid Flashing Beacons)), blank out signs, travel time detectors, emergency/fire department signals, speed activated warning displays, and other types of traffic signals and devices specifically identified with Exhibit A.
- The Maintaining Agency shall be responsible for the maintenance and continued operation of the Traffic Signals and Devices.
- Pay for the electricity...

How our Business is Changing

- Signal Performance Measures
- ICMS
- SunStore / Data Picker
- Computer Vision
- Connected Vehicle Technologies (RSU, EVP)
- Planning and Operations driven by data
- Increased need for uptime/availability
- Higher standard for accuracy
- Increased complexity

How are we going to respond?

- No one-size-fits-all solution
- Need to maintain a high level of performance
- Need to know where agencies feel comfortable
- Clarify the expectation of the TSMCA to be fair, but reflect unique conditions to every area

Initial Discussions

- One-on-one discussions held with maintaining agencies in May/June 2021
 - Explained need to clarify TSMCA and clearly define roles
- Developed spreadsheet of anticipated maintenance efforts for existing and upcoming devices

Category	Preventative Maintenance	Frequency of Inspection / Preventative Maintenance	Break/Fix (Routine / Emergency Repairs)	Targeted Downtime (max. period between issue identification and repair)	Responsible Agency (FDOT or LOCAL AGENCY)	Review Notes
ATMS	Verify all detection equipment (e.g., pedestrian push buttons, vehicle detection systems) is communicating health status information to the central control software. Ensure devices report alarms and failures in real-time.	Weekly	Configure the device and the management software to provide alerts and alarms to DOT.	48 Hours		
ATMS	Verify all license subscriptions—including central software and supplemental modules—are paid for and active.	Once every 6 months	Update licenses subscription information.	2 Weeks		
ATMS	Verify all signalized intersections are configured into the appropriate operational groups and sub-groups in conjunction with the District, as appropriate.	Once every 6 months	Update and/or create operational group and sub-groups.	4 Weeks		
ATMS	Verify Transportation Management Data Dictionary (TMDD) module is operational and is reporting data to the central control software (e.g., SunGuide).	Once every 3 months	Enable and/or configure TMDD to SunGuide.	1 Week		
	Verify role-based permissions are activated and		Configure role-based permissions within the			

★ Asked maintaining agency staff to **identify preferred responsibilities for each task**, based on their agency's specific circumstances ★

Results of Maintaining Agency Responses*

>60% majority

Maintenance Tasks	FDOT	LOCAL	UNDECIDED
ATMS (6 related tasks)	55%	39%	6%
Bluetooth Reader (10)	57%	42%	1%
Cabinet (30)	1%	86%	13%
CCTV (9)	38%	56%	6%
CV RSU (11)	80%	20%	0%
Detection (17)	12%	79%	10%
DMS (10)	61%	38%	1%
End Devices (8)	58%	42%	0%
EVP / TSP (4)	22%	72%	6%
Metadata (7)	89%	10%	1%
Midblock Detection (MVDS) (12)	71%	28%	1%
Network (7)	38%	57%	5%
Pedestrian (10)	6%	82%	13%
Signal Infrastructure (20)	8%	79%	13%
Signing (6)	9%	78%	13%

*Note: Percentages reflect the average of all maintenance task responses under each category

Next Steps

- 1) Follow-up 1-on-1 meetings (August/September) to discuss spreadsheet responses and any comments/concerns
- 2) Additional conversations, as needed, to finetune TSMCA clarification
- 3) Finalize language with staff
- 4) Council/Board approvals
- 5) TSMCA update executed and “complete”

- 6) Update TSMCA language, as needed, to accommodate changing agency needs and/or technology**

Questions

Current Initiatives

Jeremy Dilmore, District Five TSM&O

THANK YOU!

Next Consortium – September 23, 2021



Transportation Systems Management & Operations



Wejo Traffic Data

Jeremy Dilmore, FDOT District Five TSM&O

Wejo Traffic Data

- Traffic-related data services using CV data
 - Coverage of 95% of roadways in USA
 - CV data transmitted from vehicles every 1-3 seconds
 - 95% of that data will reach data customers within 32 seconds
 - Accurate to within a 3-meter radius (size of a typical car)
 - Up to 650,000 data points per second
- Public Sector use cases:
 - Identify travel patterns through “key driving event data”
 - Harsh braking, speeding, ignition on/off
 - Vehicle location data
 - Wejo data science and analytics products

Wejo Traffic Data

- Is anyone looking to purchase?
- How much?
- Purpose?
- Suggesting coordinating a purchase to improve regional pricing
- Potential to get from CO purchase

Looking Ahead: Traffic Signals

Jeremy Dilmore, FDOT District Five TSM&O

Looking Ahead – Traffic Signals

- Traffic Signal Maintenance and Compensation Agreement between FDOT and local agencies
- Traffic Signals and Devices is defined as follows: all signals, interconnected and monitored traffic signals systems (defined as central computer, cameras, message signs, communication devices, interconnect/network, vehicle, bicycle & pedestrian detections devices, traffic signal hardware and software, preemption devices, and uninterruptible power supplies(“UPS”)), control devices (defined as intersection control beacons, pedestrian crossing beacons, illuminated street name signs, pedestrian flashing beacons (i.e., school zone flashing beacons, pedestrian crossing beacons, and Rectangular Rapid Flashing Beacons)), blank out signs, travel time detectors, emergency/fire department signals, speed activated warning displays, and other types of traffic signals and devices specifically identified with Exhibit A.
- The Maintaining Agency shall be responsible for the maintenance and continued operation of the Traffic Signals and Devices.
- Pay for the electricity...

What Devices?

- Signal
- TMC
- Camera
- DMS
- Network
- Detection
- Ped Buttons
- Street Signs
- Blank Out Signs
- Beacons of all sorts
- AVI's like Bluetooth
- Speed activated warning signs
- Preempt devices
- Other...

Changes in our Business in Production

- Signal Performance Measure
- Integrated Corridor Management Software
- Data Picker

Changes in our Business in the Pipeline

- Computer Vision
 - Detection
 - Surrogate Safety Measures
 - CV Emulation
- Connected Vehicle
 - RSU
 - EVP

How our Business is Changing

- Driven by data
- Increase need for uptime/availability
- Higher standard for accuracy
- New devices
- Increased complexity

Making the Case for Increased Complexity

- NOEMI data management
- SCMS interaction
- MAP verification
- Cyber Security Risks
- ...

How are we going to respond?

- No one-size-fits-all solution
- Need to maintain a high level of performance
- Need to know where agencies feel comfortable
- Clarify the expectation of the TSMCA to be fair, but reflect unique conditions to every area

Steps

- FDOT – Upfront work
 - Establish standard for maintenance and ops all inclusive and forward looking
 - Look at ways work can be divided
- One on One Discussions
 - Thoughts on standard – it will be different and higher
 - How can we move forward with your agency
- FDOT present findings
 - Next Consortium – aggregate what we heard
 - Open discussion
 - Allow agencies to reach out about what we got wrong
- TSMCA Rider
 - Develop language
 - Pilot some different approach this year with some agencies
- Continue the conversation... What is and isn't working?

Looking Ahead

- Signal Maintenance Agreement – Update Schedule
 - April 2021 – multiple conversations throughout update schedule
 - May 2021 – Available for staff review
 - June 2021 – Council approvals in June
 - July 2021 – Update executed in Signal Maintenance Agreement

Questions



TSM&O Consortium Meeting

MEETING AGENDA

Teleconference

August 5, 2021

10:00 AM-12:00 PM

- 1) WELCOME
- 2) LOCAL AGENCY UPDATES
 - Brevard County – Rich Ataman
 - City of Altamonte – Brett Blackadar
- 3) GIS INITIATIVES
 - Anne Allan, InNovo Partners
- 4) EMERGING TSM&O POSITIONS – NATIONAL OPERATIONS CENTER OF EXCELLENCE
 - David Williams, VHB
- 5) TSMCA UPDATES
 - Jeremy Dilmore, District Five TSM&O
- 6) CURRENT INITIATIVES
 - Jeremy Dilmore, District Five TSM&O