

# NDOT TSMO Workforce Development Program



By Nevada Department of Transportation

8/15/2024

## Benefits Statement

The NDOT (Nevada Department of Transportation) TSMO Program Plan enhances safety, efficiency, and cost-effectiveness in Nevada's transportation systems. By recruiting and training specialized TSMO positions, NDOT improves traffic incident response, reduces congestion, and ensures timely infrastructure maintenance, saving lives and time. The program's focus on data-driven decisions and sustainability lowers operational costs and secures necessary funding, making the transportation system safer, faster, and more financially sustainable.

## In this case study you will learn:

1. How NDOT used a phased plan to focus on recruiting, training, and retaining a TSMO workforce, integrating TSMO into education.
2. How effective communication and stakeholder engagement were key in aligning the workforce plan and securing funding.
3. How successful TSMO recruitment improved traffic management, safety, and inspired further statewide TSMO expansion.

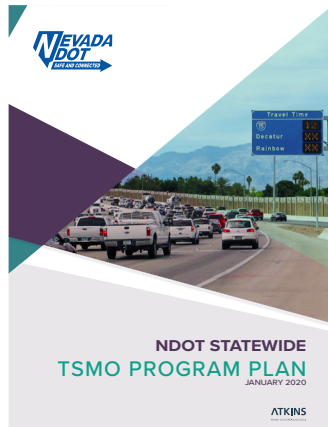


## Case Study #185

Version Number: 1



# BACKGROUND



The NDOT Statewide TSMO Program Plan was developed and formally adopted in early 2020. Per the 2014 Capability Maturity Model (CMM) assessment results, 'Organizational Structure' and 'Staffing and Workforce Development' were two of the key topics assessed as part of the program planning efforts.

Nevada Department of Transportation (NDOT)  
**Statewide CMM Assessment Workshop**  
 Carson City, NV  
 December 3, 2024

| BUSINESS PROCESSES  |   |   |  |   |
|---|---|---|--|---|
| Strengths Cited   |   | Weaknesses Cited  |  |   |
| <ul style="list-style-type: none"> <li>Design has made strides in incorporating operations into their process</li> <li>Funds set aside for ITS deployment</li> <li>Some effort in communicating project priorities</li> <li>Governing board has been more engaged with a strong desire to understand NDOT in the past</li> <li>Collaboration with safety on ITS</li> <li>Good grasp on ITS standards, currently updating</li> <li>I-80 Coalition. Good communications with freight (multi-state)</li> <li>Good working relationship with local agencies on signal timing</li> <li>MPO includes NDOT in CMP Process</li> <li>Successes in TMC training and coalition. Good communication with NHP</li> <li>Some use of traffic analysis tools</li> <li>ITS included in TAMP</li> </ul> |   | <ul style="list-style-type: none"> <li>Ensure that senior leadership and other colleagues in NDOT does not fully understand what the Traffic Operations section is trying to accomplish</li> <li>Difficulty in communicating accomplishments and benefits of traffic operations to senior leaders and elected officials</li> <li>Challenge in integrating TSMO in planning processes</li> <li>ITS has historically been cut or projects if budgets decrease</li> <li>No process in identifying the right TSMO strategy</li> <li>WFO stations not communicating with operations center</li> <li>Many TSMO strategies have been deployed but not utilized to its full potential</li> <li>Local agencies have not had much focus on TSMO</li> <li>Some departments have been reactive, not proactive, in bringing in operations</li> <li>While NDOT has many tactics, it is unsure what their strategies are</li> <li>Political decisions have significantly impacted operations and maintenance, has created roadblocks that they must adjust to (RIS)</li> <li>Informing the governor and state legislature on the benefits of operations</li> <li>Internal B/C process on operations/ITS</li> <li>ITS Strategic Plan has not been updated in many years, led to diminished opportunity for federal funds</li> <li>Communications in rural areas not reliable</li> <li>Confusion with UP on rail crossing ITS</li> <li>Challenge in understanding how changing trucking laws can affect operations</li> <li>No money budgeted for ITS maintenance</li> </ul> |  |   |
| Level   | 1 — Performed   | 2 — Managed   | 3 — Integrated   | 4 — Optimized   |
| Criteria  | Processes related to TSMO activities ad hoc and un-integrated | Multi-year statewide TSMO plan and program exists with deficiencies, evaluation, and strategies   | Programming, budgeting, and project development processes for TSMO standardized and documented | Processes streamlined and subject to continuous improvement |
| Consensus   | 1+  |   |  |   |
| Workshop Actions to Advance to the Next Level   |   |   |  |   |
| <b>Actions Items:</b> <ul style="list-style-type: none"> <li>Establish and formalize an ITS/TSMO plan</li> <li>Process to prioritize and communicate on TSMO projects</li> <li>Process to link TSMO plan to other plans</li> <li>Plan to educate on TSMO</li> </ul>   |   |   |  |   |

Adjustments were identified based on specific requirements, including 1) anticipated changes in the workforce, 2) emerging needs in skills for TSMO, 3) statewide integration of TSMO, 4) stakeholder coordination, and 5) TSMO program sustainability. As part of the program plan, NDOT developed a phased approach, establishing a step-by-step process to enable a smooth transition to a TSMO-centric organizational structure that includes immediate, short, and long-term

**ATKINS**

### 4. SUMMARY OF RESULTS

Results considered in this summary include responses from three virtual workshops, which included 28 participants during Workshop 1, 21 participants during Workshop 2, and 18 participants during Workshop 3. Additionally, results provided compare 2020 CMM workshop findings against the agency's 2024 CMM assessment.

#### 4.1 CMM Questionnaire

Nationally, it was found that most participants will rate themselves at a higher level of maturity because they view the maturity levels to be like a grade or score of completing activities. To eliminate this perception during the 2020 CMM assessment, 69 of 75 questions included in the questionnaire were formatted such that the levels of maturity were not referenced. These questions focused on whether specific activities were being performed or if processes to support TSMO implementation were identified, documented, standardized and implemented or maintained.

These 69 questions were summarized by response and then translated to four levels of maturity, shown in Figure 3.

**FIGURE 3 TSMO CMM LEVELS OF MATURITY**

Distribution of responses per dimension and level of maturity is shown in Table 1 and Figure 4.

**TABLE 1 QUESTIONNAIRE DISTRIBUTION OF RESPONSES**

|                            | < Level 1 | Level 1 | Level 2 | Level 3 | Level 4 |
|----------------------------|-----------|---------|---------|---------|---------|
| Business Processes         | 27%       | 22%     | 23%     | 5%      | 1%      |
| Systems and Technology     | 48%       | 34%     | 15%     | 4%      | 1%      |
| Performance Measurement    | 37%       | 32%     | 18%     | 8%      | 5%      |
| Culture                    | 25%       | 13%     | 20%     | 37%     | 0%      |
| Collaboration              | 39%       | 25%     | 23%     | 6%      | 0%      |
| Organization and Workforce | 40%       | 27%     | 18%     | 17%     | 0%      |

action items. In mid-2020 and following the completion of a second CMM assessment, NDOT refined these action items and initiated the development of the NDOT TSMO Staffing and Workforce Development Plan (SWDP). The SWDP was completed and formally adopted in 2023, and NDOT began its implementation in 2024. The four key components of the SWDP implementation include 1) Recruiting a TSMO Workforce, 2) Training a TSMO Workforce, 3) Retaining a TSMO Workforce, and 4) Integration of TSMO in Educational Institutions.



## TSMO PLANNING, STRATEGIES AND DEPLOYMENT

Recognizing the need to integrate TSMO skills, NDOT began restructuring its organizational framework during the TSMO Program planning process. In 2018, the TSMO Champion Team (TCT) was established to formalize TSMO engagement within NDOT, involving internal stakeholders. From 2018 to 2020, NDOT and the TCT reviewed the existing organization structure and identified action items for alignment in preparation for developing the TSMO Staffing and Workforce Development Plan (SWDP).

The 2020 CMM assessment refined the action items using the Organization and Staffing dimension, which was crucial in developing the TSMO SWDP. By 2021, the TCT transitioned into the TSMO Steering Committee (TSC) and expanded participation to include both internal and external stakeholders. NDOT held quarterly TSC meetings during the planning process to gather stakeholder feedback.

Between 2021 and 2023, NDOT completed and adopted the TSMO SWDP. This plan provided a detailed overview of national practices and assessed NDOT’s existing conditions—covering organizational charts, roles and responsibilities, training programs, and recruitment processes. The outcomes of the SWDP were agreed-upon strategies for recruitment, training, retention, and integration of TSMO into educational institutions. The SWDP’s recommendations were summarized into a roadmap outlining short, mid, and long-term action items.

As of 2024, NDOT has been actively implementing the SWDP with the TSC. Significant progress includes the rollout of the TSMO training plan and the recruitment of five TSMO-specific positions: **TSMO Program Manager, TSMO Performance Manager, TSMO Engineer, TSMO Modeling Specialist, and TSMO Data Analyst.**



|          |                                | Positions     |                          |                                    |                   |                          |
|----------|--------------------------------|---------------|--------------------------|------------------------------------|-------------------|--------------------------|
|          |                                | TSMO Engineer | TSMO Modeling Specialist | TSMO Program Manager / Coordinator | TSMO Data Analyst | TSMO Performance Manager |
| INTERNAL | Construction                   | ●             | ●                        | ●                                  | ●                 | ●                        |
|          | Design                         | ●             | ●                        | ●                                  | ●                 | ●                        |
|          | Planning                       | ●             | ●                        | ●                                  | ●                 | ●                        |
|          | Maintenance & Asset Management | ●             | ●                        | ●                                  | ●                 | ●                        |
|          | Operations                     | ●             | ●                        | ●                                  | ●                 | ●                        |
|          | IT/IS                          | ●             | ●                        | ●                                  | ●                 | ●                        |
|          | Safety                         | ●             | ●                        | ●                                  | ●                 | ●                        |
|          | Environment                    | ●             | ●                        | ●                                  | ●                 | ●                        |
|          | NDOT Districts                 | ●             | ●                        | ●                                  | ●                 | ●                        |
| EXTERNAL | MPOs                           | ●             | ●                        | ●                                  | ●                 | ●                        |
|          | Local Agencies                 | ●             | ●                        | ●                                  | ●                 | ●                        |



| Training Title                            | Targeted Audience                       | Delivery Method   | Training Material   | Reference to research findings |
|---|---|---|---|--------------------------------|
| <b>TSMO 101–NDOT Employee Orientation</b> | New Hires and current team members*     | On-Line Module  | TSMO 101 Training Module – Orientation  | CITE, FDOT                     |
| <b>TSMO 102–NDOT Employee Orientation</b> | New Hires and current team members*     | On-Line Module  | TSMO 102 Training Module – NDOT TSMO Program  | CITE                           |
| <b>Hands-On TSMO Training</b>             | New Hires (Traffic Operations Division) | Combination of On-Line Module and Site Visit  | TSMO Training Modules, as well as visiting TMC/ ROC   | CITE, TNDOT                    |
| <b>NDOT Traffic Operations Forum</b>      | New Hires (Traffic Operations Division) | On-Line Modules or In-Person Lectures on advanced TSMO topics by Subject Matter Experts (SME)/ Project Lead | One-hour lecture and site visits as applicable (such as TIM, CAV, Smart Work Zone, etc.)                        | CITE, FHWA, Minnesota DOT      |
| <b>New Hires Rotational Program</b>       | New Hires (Traffic Operations Division) | Combination of In-Person and Experimental Training  | Rotational Program in Collaboration with other Divisions (Planning, Design, Construction, Traffic Safety, etc.) | Virginia DOT (VDOT), VTrans    |

\*Refers to Engineering, Operations, Planning, and HR

| Training Title  | Targeted Audience   | Delivery Method  | Training Material   | Reference to research findings  |
|---|---|--|---|---------------------------------|
| <b>TSMO 201–Advanced Orientation</b>                              | Current Team members in Traffic Operations Division, and other NDOT divisions' team members as applicable | On-Line Module or In-Person Lecture on Current TSMO Topics           | TSMO 201 Training Module – NDOT TSMO Business Cases                                     | CITE, NHI                       |
| <b>TSMO 202–Basic Practitioner Training</b>                       | Current Team members in Traffic Operations Division   | On-Line Module or In-Person Lecture                                  | TSMO 202 Training Module – TSMO Coordination Plan with Stakeholders                     | CITE, NHI, TxDOT                |
| <b>TSMO 203–TSMO Tools Training</b>                               | Current Team members in Traffic Operations Division, and other NDOT divisions' team members as applicable | Combination of In-Person and Group Exercises                         | TSMO 203 Training Module – IPT and Evaluation Tool                                      | FHWA, NHI                       |
| <b>TSMO 204–Advanced Practitioner Training/ Cross-training</b>    | Current Team members in Traffic Operations Division, and other NDOT divisions' team members as applicable | On-Line Module or In-Person Lecture                                  | An overview of latest updates with TSMO topics in alignment with NDOT's TSMO activities | FHWA, Oregon DOT, Minnesota DOT |
| <b>National Operations Academy Trainings, Partnered Trainings</b> | Current Team members in Traffic Operations Division   | Combination of In-Person Lectures, Group Exercises, and Field Visits | To be determined / subject to availability  | FHWA, Caltrans, WSDOT           |

| Suggestions   | Category                |
|---|-------------------------|
| Provide recurring training and professional development opportunities (such as conferences, seminars, national trainings, etc.).                    | <b>Training</b>         |
| Offer mentorship programs and opportunities. This can be through rotational programs, cross-functional interactions, and a TSMO rotational program. | <b>Training</b>         |
| Provide leadership training and opportunities.  | <b>Training/Culture</b> |
| Develop and implement a voluntary rotational training program as a pilot.   | <b>Training</b>         |
| Offer performance-based incentives based on the position's Work Performance Standards (employee recognition, certificates of achievement, bonuses). | <b>HR</b>               |
| Provide regular and effective feedback through frequent anonymous employee satisfaction surveys.  | <b>HR</b>               |
| Modify traditional certification and licensure requirements for recruitment and advancement opportunities in TSMO positions.                        | <b>HR/Culture</b>       |
| Clearly articulate the relationships between TSMO positions and the agency mission and vision.  | <b>HR/Culture</b>       |
| Increase gender and professional diversity in recruitment.  | <b>HR/Culture</b>       |
| Provide clear definition and expectations for internal and external communication and collaboration.  | <b>Culture</b>          |
| Support professional organization involvement and encourage participation in local and national TSMO dialogues.                                     | <b>Culture</b>          |
| Offer extended leave opportunities.   | <b>Culture</b>          |

## COMMUNICATIONS PLANNING AND EXECUTION

Communications planning and execution of the SWDP involved several key steps to ensure effective messaging and desired outcomes. In collaboration with the stakeholders, NDOT defined specific objectives for TSMO workforce development and identified the target areas for the required TSMO skillset. NDOT selected structured communication methods to engage decision-makers and developed a strong business case highlighting the benefits and requirements for recruiting, training, and retaining a TSMO workforce. NDOT then created a roadmap of action items and began implementing the plan while ensuring the TSC's participation in the implementation process through quarterly meetings. Key items that were communicated and discussed with the stakeholders include:

### Recruitment Plan:

- Where and when to recruit – identifying triggers for TSMO-specific positions, using the CMM framework to highlight needs based on dimensions with lower maturity from the 2020 assessment.
- Coordination with the Department of Human Resource Management (DHRM) – developing KSAs for each TSMO position and assisting DHRM with the classification process. The collaboration with DHRM addressed challenges related to the lack of TSMO roles and responsibilities that do not have equivalent representation in traditional KSAs.
- Incentives – developing incentives such as accelerated salaries and trainings to assist with the recruitment of TSMO resources.
- Analysis of TSMO positions – demonstrating 1) the extent of contribution in which each position will have to achieve the next level of TSMO maturity, and 2) relationships between the new positions and internal and external stakeholders/ disciplines.

## OUTCOME, BENEFITS AND LEARNINGS

Within the initial six months of the SWDP implementation, NDOT recruited all five TSMO positions and rolled out the training plans. This led to the following outcomes, benefits, and learnings:

- All existing job descriptions within NDOT's Traffic Operations Division were updated to integrate TSMO-specific roles and enhance TSMO advancement.
- Close collaboration between NDOT and statewide stakeholders was critical in identifying new TSMO roles, necessary KSAs, and relationships with other disciplines, which benefited statewide stakeholders.
- Utilizing the CMM dimension as a framework for defining the five TSMO position roles and responsibilities was a **huge** success because it supported the business case for requesting funding, demonstrating each position's contribution to advancing transportation systems across the state.
- Leadership support resulted in the statewide advancement of TSMO culture, highlighting the TSMO program's importance and recognizing it as a core value of NDOT in addressing the public's needs and expectations.
- The development of the SWDP assisted NDOT in crafting a strong business case and securing funding for all TSMO positions recommended in this plan.
- NDOT has successfully rolled out both basic and advanced TSMO training packages within the Traffic Operations Division. The online modules created as part of the SWDP are published on the NDOT TSMO website and are accessible by **all** partnering agencies. Some partnering agencies have adopted these trainings for their internal team members.
- The success achieved from this plan is assisting NDOT with identifying additional TSMO positions to further expand the org chart and develop a new phase, advancing the TSMO organizational structure within the agency.
- TSMO positions have:
  - Assisted NDOT with streamlining operations and enhancing the efficiency of the transportation systems, reducing congestion and travel times.
  - Led to better monitoring of, quicker response to, and improvements in traffic incidents, enhancing overall safety for the traveling public.
  - Provided NDOT with additional resources for timely maintenance and improvements to TSMO infrastructure that lead to smoother and safer roads.
  - Assisted NDOT with a greater focus on sustainable practices and reducing environmental impacts of the transportation systems.
  - Enabled efficient development and implementation of TSMO strategies.
  - Improved implementation of data-driven and performance-based decision-making processes that lead to continuous improvements.
- Adjustments and changes implemented during screening, interview, and recruitment of the TSMO positions assisted NDOT with identifying and addressing gaps to modernize HR business processes.
- Successes in recruiting TSMO positions motivated partnering agencies to identify and plan for their own TSMO hires.