



White Paper

Innovative Practices in Transportation Organizations to Support Transportation Systems Management and Operations (TSMO) Workforce Development

AUTHOR
Pat Noyes

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Highlights

- NOCoE held a TSMO Workforce Development Peer Exchange in May 2022, focused on workforce trends, challenges, and success stories shared by State and local transportation agencies to address the challenges.
- Several critical challenges are defined related to rapidly evolving TSMO requirements, inconsistencies across agency hiring and development, compensation, diversity, equity and inclusion initiatives, and labor shortages.
- Success stories shared during the Peer Exchange are summarized and several key takeaways are provided related to the critical challenges.

IN THIS WHITE PAPER YOU WILL LEARN:

1. About the critical challenges facing the TSMO industry related to attracting talent that is required to have a broader set of skills than in the past.
2. What are some of the elements that are foundational in building successful TSMO workforce programs.
3. About the range of opportunities that can improve and expand practices for recruiting, hiring, onboarding, training, and retaining employees.

Introduction

The workforce landscape is changing rapidly in terms of worker expectations, workforce needs and availability, and trends in organizational practices. (See more information in [Workforce Trends and Practices Applicable to TSMO](#)) NOCoE held a Workforce Development Peer Exchange in May 2022, focused on workforce trends, challenges, and success stories shared by State and local transportation agencies to address the challenges. This white paper looks at human resource (HR) practices implemented by transportation agencies to evolve the TSMO workforce and meet current trends and challenges, highlighting effective practices to improve recruiting, onboarding, and retention.

Critical Challenges

State and local transportation agencies face a number of critical challenges in recruiting, retaining, and developing a strong TSMO workforce. These challenges include the evolving and emerging capabilities needed to support TSMO programs and initiatives; inconsistencies within agencies in how they address workforce challenges; structural, policy, and culture issues related worker compensation; sustaining a diverse, equitable, and inclusive work environment; and the impacts of the current labor shortage on the TSMO workforce. Each challenge is discussed briefly below.

EVOLVING TSMO REQUIREMENTS

The field of TSMO is rapidly evolving, with emerging technologies and expanding requirements for workforce capabilities. This requires reaching new pools of qualified workers and continued training and development of existing staff.

INCONSISTENCIES ACROSS ORGANIZATION

A common challenge in geographically dispersed agencies such as State DOTs is the variation in hiring and developing the TSMO workforce. These inconsistencies can create issues with worker satisfaction, capabilities, and retention, and limit the agency's ability to meet the demands of effectively managing and operating the system.

COMPENSATION

Public sector transportation agencies often struggle to attract and recruit qualified workers due to salary structures and inflexible compensation policies. This may be even more pronounced in TSMO when trying to attract and hire workers with technical knowledge, skills, and abilities in demand across a wide range of industries.

SUPPORTING DEI

Transportation agencies are increasingly interested in supporting a diverse, equitable, and inclusive workforce that represents the communities they serve. This requires not only hiring diversity, but it also requires creating an organizational culture that is inclusive and supportive to a diverse workforce.

LABOR SHORTAGES

The current labor market with historically low levels of unemployment makes recruiting and retaining employees challenging. This is aggravated by compensation levels and a limited supply of potential employees with the requisite knowledge, skills, and abilities for TSMO positions. New sources and approaches for recruiting and retaining a TSMO workforce is essential to overcoming these challenges.

Success Stories from Peer Exchange

The following success stories were shared by State and local transportation agencies participating in the 2022 Workforce Development Peer Exchange. In addition to formal presentations by agencies during the peer exchange, several agencies submitted short writeups on practices they are implementing to address TSMO workforce challenges. These serve as the basis for the success stories provided here.

NORTH CAROLINA DOT – SUSTAINING AND ADVANCING TSMO PROGRAM

North Carolina DOT is facing a workforce challenge with the loss of expertise through retirement, inconsistent documentation, and communication of TSMO roles and responsibilities across the state, and inconsistency in staffing levels, positions, and skills identified to deliver the TSMO program. The DOT has taken a three-pronged approach to sustain and advance its TSMO program. These include mitigate knowledge loss driven by staff turnover; gain commitment to TSMO from divisions across the State through defined expectations, performance measures, and staffing levels; and grow “thinkers” to drive the program to the next iteration. The DOT has taken specific actions, including:

- Revisiting the DOT’s TSMO and CMM assessments every 4-5 years to refocus the program’s direction
- Leveraging staffing contracts to augment the TSMO program
- Partnering with private sector for training and documentation, including peer-to-peer exchanges and developing manuals, processes, and procedures
- Working with professional organizations and resources to develop a North Carolina version of the Operations Academy, sponsor staff to attend the National Operations Academy, and coordinate technical training with subject matter experts across the country
- Institute new approaches to staffing, such as recruiting through professional organizations and listservs, personal recruiting, leveraging contracts to provide broader and nontraditional skill sets, and recruiting retired highway patrol and military
- Implementing training programs for TMC operators and to certify IMAP Program users

These actions focus on assessing capabilities; developing capabilities through training and peer exchanges; and implementing new approaches to recruiting, contracting, and procedures. Through these efforts they have created consistent job descriptions and performance metrics, developed teams of TSMO personnel across the state, and continue to build on the training program based on observed successes.

NORTH DAKOTA DOT – NEW HIRE ORIENTATION AND ONBOARDING

To make new employee onboarding and orientation more consistent and engaging, the North Dakota DOT enhanced its procedures to create greater consistency for new hires. It conducts new hire orientation once a quarter and new employee onboarding twice a month. The focus is to make these experiences engaging and provide consistent information to all employees. The all-day onboarding session, held at the start of each timesheet period, includes a tour of the work facility, introductions to coworkers and the employee’s workspace, and completion of online, new-hire paperwork. The sessions are offered virtually for employees outside the Central Office. New employee orientation is a four-hour session that includes a career fair type expo where division and central office staff meet with new hires, a central office tour, group photo, an executive office visit for a welcome and conversation, a trip to a district shop, and a tour of the materi-

als and research lab. The new hire orientation and onboarding approach provides crucial information in a timely manner, consistent information statewide, and an opportunity to address new hire questions.

NEVADA DOT – REORGANIZATION AND STAFFING

Nevada DOT is working to identify how its workforce needs to adapt to meet the obligation of its TSMO Program Plan. The DOT is developing a Staffing and Workforce Development Plan that supports the reorganization of the traffic operations division. This planning effort includes previous work to define TSMO job elements and is intended to assist the DOT in recruiting, training, and retaining team members dedicated to advancing TSMO.

IOWA DOT – ATTRACTING AND RETAINING EMPLOYEES

To address the challenge of pay in attracting and retaining qualified employees, Iowa DOT reviewed compensation options within their Administrative Code and developed a resource guide to support pay requests. A Compensation Program Manager centralizes the requests and verifies them against the guidelines. To date, the program has resulted in increased base wages on over a third of new hires, retention incentives to mission critical positions, and shifting incentives to third-shift highway maintenance employees in critical areas.

CATT LABORATORY – RECRUITMENT AND RETENTION

The University of Maryland Center for Advanced Transportation Technology (CATT) Laboratory implemented practices to introduce greater consistency in the hiring process, reduce the effort needed to hire new employees, improve the quality of hires, and reduce attrition. They improved their performance review process to be more efficient and provide actionable 360-degree feedback in an environment of growth. They also established a high school internship program with several local schools to get young people interested in transportation and introduce them to broad opportunities in the field. The results of these efforts include a higher quality of employees and higher retention than in the past, despite organizational growth challenges. Employees are more satisfied with the more efficient and comprehensive performance review process, understand expectations, and see direct outcomes from the process. The success of the high school internship program includes giving back to the community, attracting students to the University of Maryland, and placing interns in successful positions outside the CATT Laboratory.

MARICOPA COUNTY DOT/AZTECH

AZTech is a regional partnership in the Phoenix Metropolitan Area led by the Maricopa County DOT. To support recruiting, hiring, and retention of its workforce, AZTech developed a job description tool to guide the development of new or updated job descriptions for transportation operations, maintenance, and incident management positions. The tool is an Excel spreadsheet used to generate job descriptions and requirements for TSMO-based positions. The description generator includes recommended education, recommended experience, a general salary range, and key roles and responsibilities. It provides information on TSMO certifications and how they can be obtained, as well as TSMO training resources.

MICHIGAN DOT – DIVERSITY RECRUITMENT PROGRAM

Michigan DOT is committed to optimizing its organizational culture, aligning equity and inclusion goals with business outcomes, and responding to policies that affect their employees. The DOT created an executive-level position to incorporate equity and inclusion in all aspects of the business. The Chief Culture, Equity, and Inclusion Officer (CCEIO) position was designed to optimize the DOT's organizational culture by developing and supporting change and culture management initiatives through education and collaboration on equity and inclusion initiatives across the agency. The position supports the DOT's [Transportation Diversity Recruitment Program](#) to educate and inspire a new generation of transportation engineers.

Key Takeaways

Current workforce challenges have led transportation agencies to identify and address critical challenges and look for opportunities to improve and expand their practices for recruiting, hiring, onboarding, training, and retaining their employees. The range of activities and successes illustrated in the above examples shows the ability of agencies to rise to TSMO workforce challenges. Several themes can be found in these examples and are highlighted here.

DEVELOP A PLAN FOR RECRUITING AND RETAINING WORKFORCE

As with other aspects of transportation agency initiatives, developing a plan for meeting the changing workforce needs in TSMO is essential to successful workforce recruitment and retention. This includes understanding the current and emerging needs; defining or redefining positions; determining the knowledge, skills, and abilities essential to a successful program; identifying training needs; and looking for new opportunities to attract and retain employees.

EXPAND TRAINING OPPORTUNITIES

Training plays a key role in workforce development, supporting recruitment, retention, career advancement and satisfaction, and worker capabilities that match the evolving nature of TSMO. Because TSMO is a fairly new area for many transportation agencies, ensuring that existing employees understand what TSMO is and how it can support the different functional areas of the agency is important to take full advantage of the benefits of TSMO. TSMO also utilizes a wide range of technologies that require specialized training. Emerging technologies and new sources of data require increased training to fully benefit from their application. A comprehensive, consistent training program for existing personnel, new hires, and TSMO-specific employees is critical to workforce development and retention.

USE INTERNSHIPS TO SUPPORT RECRUITMENT

To support the growth and development of TSMO professionals, it is essential to reach potential employees early in their education process to introduce the opportunities and benefits of working in a transportation agency. Partnerships with universities, colleges, and trade schools to implement internship programs and other initiatives that bring hands-on experiences to students can create interest in trans-

portation and pave the way to a future career. TSMO builds on a wide range of skills and abilities and may not be on the radar of students in complementary fields, such as system engineering, data science, statistics, or electrical engineering. Offering internships in an expanded set of study areas can enhance the field and broaden the potential labor pool.

DEVELOP CONSISTENT JOB DESCRIPTIONS, ONBOARDING, AND TRAINING PROGRAMS ACROSS THE ORGANIZATION

Transportation agencies report inconsistencies in recruiting, onboarding, and training across the agency. State DOTs are usually divided into regions to address the challenges of geographic area and diversity. To create a consistent approach to hiring and developing a TSMO workforce, it is essential the agency develop consistency across the organization. This consistency supports the application of TSMO initiatives agencywide and it provides greater clarity and defined expectations for TSMO employees, supporting workforce retention.

EXPLORE COMPENSATION OPPORTUNITIES

Public sector transportation agencies often struggle to attract the best talent due to salary limitations. It is important that compensation be considered holistically to take advantage of the full range of benefits and to revisit pay ranges appropriate to expanding and evolving job responsibilities. Regular review of job descriptions to reflect changing responsibilities, training requirements, technical capabilities, and other factors is important in a rapidly changing field like TSMO. Working closely with agency HR professionals, TSMO leaders can ensure that the compensation of their workforce is as competitive as possible.

BUILD A CULTURE OF DIVERSITY, EQUITY, AND INCLUSION

Transportation agencies that put diversity, equity, and inclusion as a strategic initiative build a more cohesive workforce that brings a variety of perspectives and experiences to solving problems and managing the system. Programs and initiatives that support DEI develop a workforce that is more representative of their customers and attract a broader pool of potential employees. DEI initiatives help retain workers and attract interest from traditionally overlooked education and labor pools.