

Context and Relevance of TSMO Program Planning for WSDOT

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How TSMO 'thinking' evolved in WSDOT

Capability Maturity Model (CMM) Assessments. (2014 Original. 2017 Reassessment.)

- **Business Processes:**

Ensure TSMO is included into future planning/scoping of projects. Revisit previously scoped projects to ensure its inclusion.

- **Systems and Technology:**

Establish asset management plan for TSMO systems.

- **Performance Measurement:**

Complete development of a performance measurement framework.

- **Culture:**

Develop an internal and external communications accountability process regarding the expectation of TSMO first inclusion. Highlight TSMO successes in the agency.

- **Organization and Staffing:**

Develop statewide TSMO training program.

- **Collaboration:**

Improve state and regional collaboration efforts that have a shared understanding and managed expectations.

A few highlights

How WSDOT defined TSMO was evolving too

What is the goal of TSMO?



Maximize the safety and efficiency of existing infrastructure and systems

- Focus on reliability
- Aim to defer roadway expanding projects
- Implement strategies quickly at relatively low cost
- Regard **existing capacity as an asset** that needs to be managed and preserved
- **Maximize safety performance of existing system**
- Utilize strategies that are **multimodal, intermodal and cross-jurisdictional**

Transportation Systems Management & Operations (TSMO)

Managing safety and capacity as an asset

EXAMPLE STRATEGIES

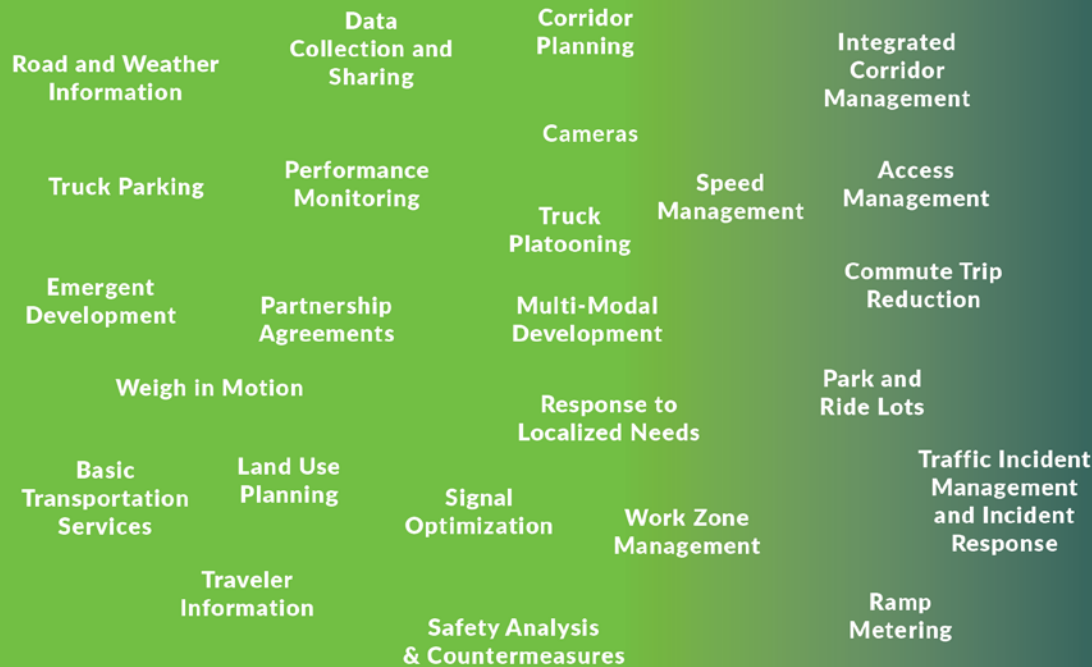
PLANNING, PARTNERING, AND POLICY DEVELOPMENT	ITS IMPROVEMENTS	TRAVEL DEMAND MANAGEMENT	COOPERATIVE AUTOMATED TRANSPORTATION	TRADITIONAL TRAFFIC OPERATIONS
<p>Land Use Planning</p> <p>Utilization of Regional Trails, Sidewalks, and Roadway Network</p> <p>Policy Implementation</p> <p>Agreement Development</p> <p>Data Sharing</p> <p>System and Corridor Planning</p> <ul style="list-style-type: none"> - Multi-Modal - Corridor Sketch Maintenance - Joint Planning - State Facility Action Plan <p>Integrated Scoping</p> <p>Community Engagement</p>	<p>Road Weather Information Systems</p> <p>Ramp Metering</p> <p>Traffic Incident Management/IRT</p> <p>Wrong-way Driver Notifications</p> <p>Regionwide Communications</p> <p>Work Zone Management</p> <p>Adaptive Signals</p> <p>Intersection Conflict and Trail Crossing Warning Systems</p> <p>Weigh in Motion</p> <p>Online Truck Permitting</p>	<p>Multi-Modal Development</p> <ul style="list-style-type: none"> - Transit - Bicycle - Pedestrian - Ferries - Freight - Rail <p>Commute Trip Reduction</p> <p>Managed Lanes</p> <ul style="list-style-type: none"> - High Occupancy Vehicle - Tolloed - Multi-Modal Shoulder Driving <p>High Occupancy Tolling/Express Toll Lanes</p> <p>Land Use Development</p> <p>Integrated Multi-Modal Traveler Information and Fare Collection Systems</p>	<p>Traffic Signal Communications to Vehicles</p> <p>Truck Platooning</p> <p>Autonomous Truck Mounted Attenuators</p> <p>Work Zone Warning and Management</p> <p>Tolling Vehicle Occupancy Detection</p> <p>Rest Area Truck Parking Applications</p> <p>Winter Operations and Rural Traveler Information</p> <p>Pedestrian in Crosswalk Warning</p>	<p>Access Management</p> <p>Signal Operations/Optimization</p> <p>Safety Analysis/Countermeasures</p> <p>Signage & Striping</p> <p>Speed Management</p> <p>Minor Geometric Modifications</p> <ul style="list-style-type: none"> - Channelization - Pedestrian Island - Compact Roundabouts <p>Multi-Modal System Enhancement</p> <p>At-Grade Rail Crossings</p>
CORRIDOR AND SYSTEM MANAGEMENT				

Transportation Systems Management & Operations (TSMO)

Integration of strategies

PASSIVE MANAGEMENT

ADDITIONAL CAPACITY STILL AVAILABLE THROUGH OPTIMIZATION OF THE SYSTEM. ROADWAY EXPANSION NOT CONSIDERED FOR VEHICLES.



ACTIVE MANAGEMENT

SYSTEM FULLY OR NEARLY OPTIMIZED. NO ADDITIONAL CAPACITY AVAILABLE. PERSON THROUGHPUT MAXIMIZED. STRATEGIC ROADWAY EXPANSION CONSIDERED.



OPERATE

MANAGE DEMAND

EXPAND

NOTE: AS THE LEVEL OF TSMO DEVELOPMENT INCREASES WITHIN A CORRIDOR, LEVELS OF INVESTMENT, COORDINATION, TECHNOLOGY, AND MANAGEMENT ALSO INCREASE. THE LESS REACTIVELY AND MORE PRO-ACTIVELY TSMO STRATEGIES ARE DEPLOYED, THE GREATER THE POTENTIAL AMOUNT OF IMPROVED MOBILITY AND SAFETY PERFORMANCE.

Overview of Current State of TSMO Program Planning

Within Traffic Operations, planning efforts include program planning:

- ITS
- Low Cost Enhancements
- Incident response

But there is no overarching strategic plan for Traffic Operations that links programs, workforce, performance management, etc.

Moreover, no formal relationship of TSMO Program Planning related to Statewide Plans and Programs exists:

- Moving Washington
- Corridor Sketch Initiative
- Practical Solutions

Emerging TSMO-related Activities in WSDOT

- Workforce Development
 - TSMO Website
 - TSMO Curriculum Development
 - Statewide TSMO Working Group
- Business Processes
 - Integrated Scoping
- Collaboration
 - Community Involvement
- Performance Measurement
 - Mobility Performance Framework

Why TSMO Program Planning Now

Strategic planning is needed to:

1. More effectively deliver current funding with existing resources
 - Tie on-going efforts together, working synergy
 - Identify need for new ones
2. Allow us to identify and leverage for additional resources needed

Challenges with TSMO Program Planning

- Maintaining on-going efforts while forging new directions requires lots of resources, focus and endurance
Example – Balancing focus on established programs like Incident Response versus new efforts like corridor operational planning with local agencies.
- How to incorporate the various levels of maturity that TSMO integration is at within the agency
Example – Within Traffic Operations versus Project Development
- Resource availability
- Commitment not only to development of the plan but most importantly implementation of the plan which includes continued planning efforts

WSDOT Program Planning going forward

- June: TSMO Program Planning Workshop held
- July/August: Research completed on other DOT related efforts, aligning expectations and establishing resource commitment
- September: RFP development
Phased development and implementation
- Beginning of 2019: WSDOT program planning effort kicked off



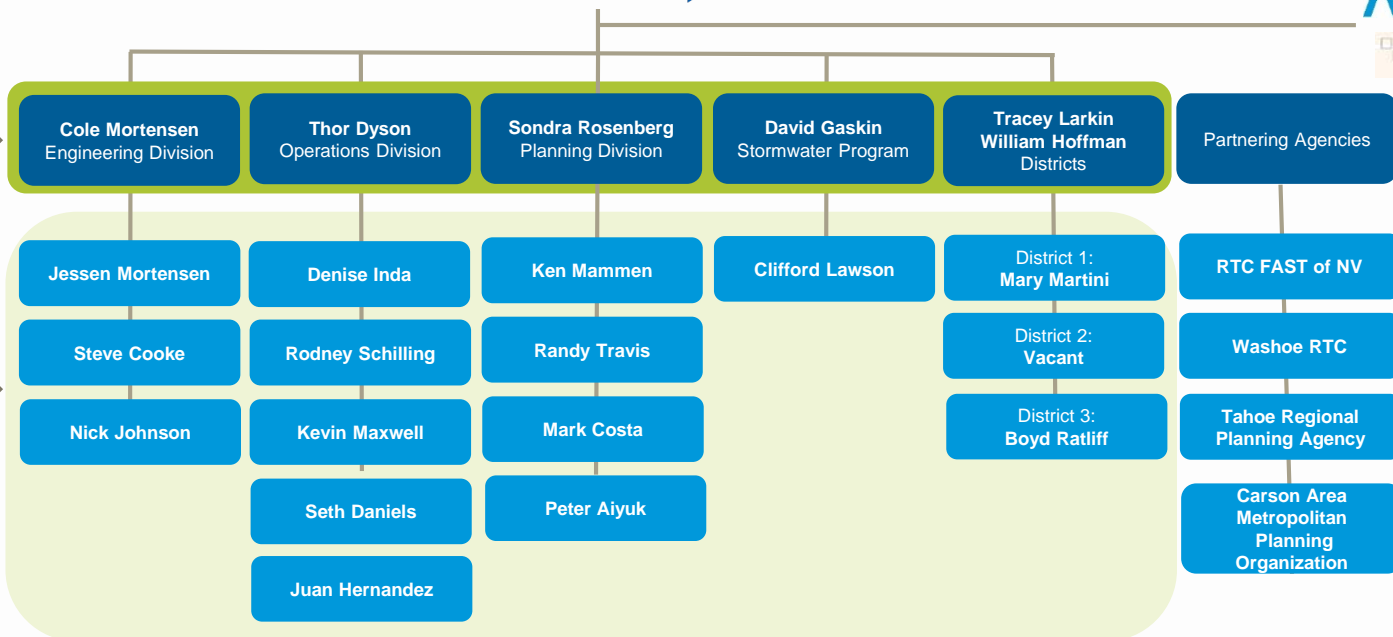
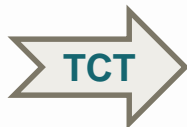


Our Team



ATKINS

Pat Noyes & Associates





TSMO Program Planning Efforts

- **TSMO Program Plan Development**

- Engaged Senior NDOT Leadership
- Working with a TSMO Champions Team (TCT)
- Completed Business Case with by-in from TCT
- Will soon complete the Program Plan (Strategic, Tactical and Programmatic Elements)

- **Next Steps – Engagement and Integration**





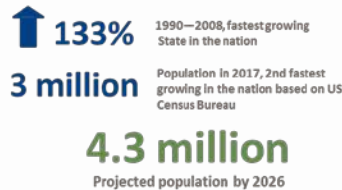
Our Business Case

WHY TSMO

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Current Challenges

Populations



Need:

- Increase in demand, congestion and delay
- Reduction of capacity, transportation safety and reliability

Benefit: Implement solutions on existing roadways and collaboration within NDOT to include TSMO strategies such as Traffic Incident Management, Work Zone Management, Special Event Management and Road Weather Management as well as the design of new infrastructure that can increase efficiency, reduce congestion and crashes and increase the reliability of NDOT roadways to help to accommodate this growing population.

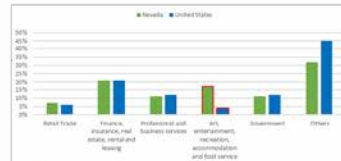
Ohio—Kentucky—Indiana Regional Council of Government benefits from TSMO strategies:

- Advanced Regional Traffic Interactive Management and Information System (ARTIMIS) program yielded a benefit of 12:1, while the capacity adding project would have had a benefit of only 1:1:1.
- Additionally, the ARTIMIS program cost was 1/20 the cost of the capacity adding project.

Tourism-based Economy

Service sector employs about **half of Nevada's workers**

17.5% of Nevada GDP



Need:

- NDOT must provide, maintain and operate a safe, reliable and efficient transportation network for its workers and tourists.

Benefit: Easily implementable and cost effective TSMO strategies, such as real-time traffic information to plan efficient and reliable work trips, encouraging ridership on public transportation to reduce the number of vehicles on the road and providing safe alternatives such as connected pedestrian and bike paths will help to reduce congestion and subsequent crashes.

The **Colorado DOT** benefits from TSMO strategies:

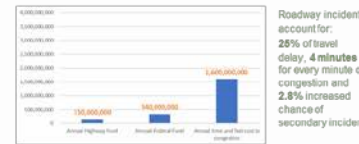
- High-benefit cost ratios typically 10:1 and as much as 40:1.
- Readily implementable in less time (usually within 12 months) and for less money than adding lanes.
- Highly visible, many times but not always, and noticeable improvements
- Quantifiable reduction in delay and improvement in travel time reliability.
- Measurable safety related improvements, and
- Improvements that continue to provide value even when long-term construction projects are completed.

Congestion and Associated Costs

\$121 B In wasted time and fuel cost in US per year

\$1,400/60hrs Cost of congestion to average driver in Nevada annually

\$1.6 billion Value of lost time and fuel in Nevada



Roadway incidents account for: **25%** of travel delay, **4 minutes** for every minute of congestion and **2.8%** increased chance of secondary incident.

Need:

- Billions in wasted time and Vehicle Operating Cost
- Hundreds of lost lives
- Increased chance of secondary accidents

Benefit: TSMO focuses on easily implementable and cost-effective solutions that have measurable benefits to existing roadways and maximizes the efficiency of new infrastructure. Solutions such as Traffic Responsive Freeway Ramp metering can decrease delay and increase trip reliability which in turn reduces traffic crashes.

The **Pennsylvania DOT** benefits from TSMO strategies:

- Through Incident Response Management, reduced incident response times by 8.7 minutes, incident clearance times by 6.3 minutes, and hours of delay by 547,000 hours per year, with a total monetary savings of \$6.5 million per year.

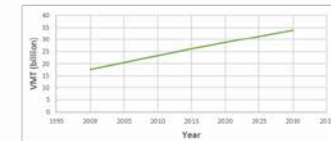
Nevada Waycare pilot program:

- WayCare Pilot Project aims to reduce incident response times by leveraging real-time predictive analytics to identify high-risk incident locations so that agencies such as NDOT, DPS-NHP, and RTC FAST can take proactive preventative measures accordingly.

Vehicle Miles Traveled (VMT)

↑ 48% From 17.6 billion in 2000 to 26.1 billion in 2015

Projected increase of **30%** by the year 2030 to: **34 billion** VMT



Need:

- With VMT demands increasing at an alarming rate, the need for efficient and reliable roads to accommodate this demand is paramount.

Benefit: Improvements to non-motorized facilities (pedestrian and bike paths) to reduce the demand on motorized facilities, switching mode choices (bus rider or ride share) to reduce the number of vehicles on the roadway, real Time Traffic Information to help with trip pre-planning, trip rerouting due to congestion or incidents will help to make the roadway more efficient and reduce the potential for traffic crashes.

Washington DC Multimodal Transportation:

- Washington DC area decreased daily VMT by approximately 14,000 miles through the use of TSMO strategies such as Multimodal Transportation Management.

NDOT Advanced Traffic Management:

- NDOT is currently implementing an Advanced Traffic Management System on I-15 as part of Project Neon. This system will inform drivers of incidents on the corridor, help them make informed decisions to choose a safer and shorter route to their destination and therefore reduces the chance of secondary crashes. Similar systems have seen a reduction in secondary accidents of up to 20%.

TSMO's Contribution



Why TSMO and Why Now?

- **Future of the DOT**
 - All future gains **MUST** include operations & management
- **Support from upper management and an appetite for change**
- **Current synergy with NDOT Planning and Performance based decisions making**
- **User Focused Approach**





Opportunities and Challenges

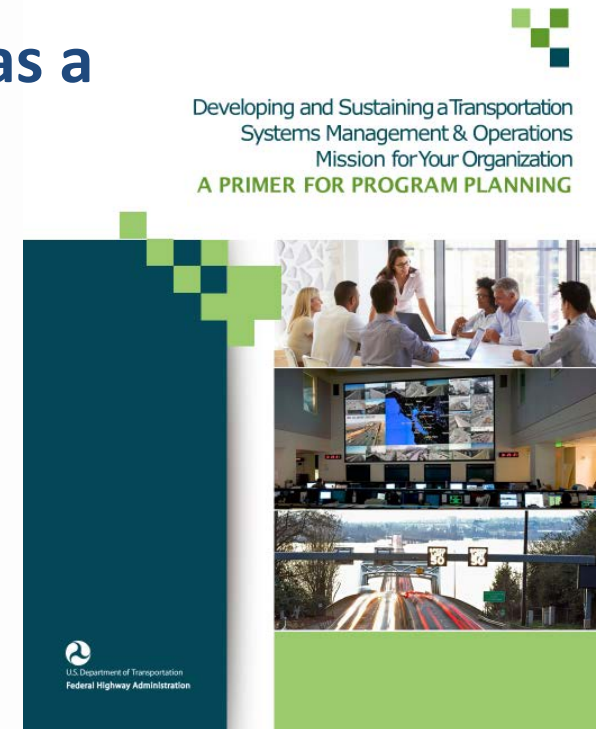
- **Current synergy with NDOT Planning**
 - One Nevada Plan and Integration with MODA
 - Performance based decisions making
 - Help to better position operations projects/programs
- **Collaboration and Consensus has been tough**
 - Engagement of the TCT has been mixed
 - Change is always difficult





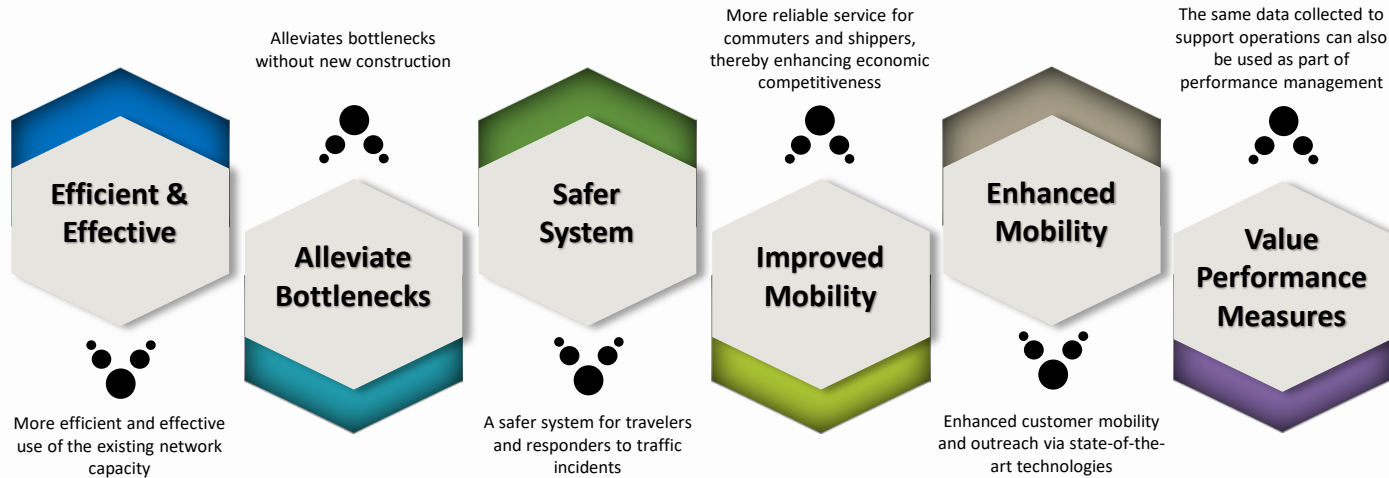
FHWA Primer Workshop Goals and Takeaways

- **Educate Traffic Operations and NDOT as a whole**
 - You don't know what you don't know
 - Helped to open our eyes
- **Understand TSMO on a Federal Level**
- **The need for collaboration is essential**
- **Buy-in of the TSMO plan**
- **Flexible upon DOT's specific needs**
- **TSMO Success Stories**





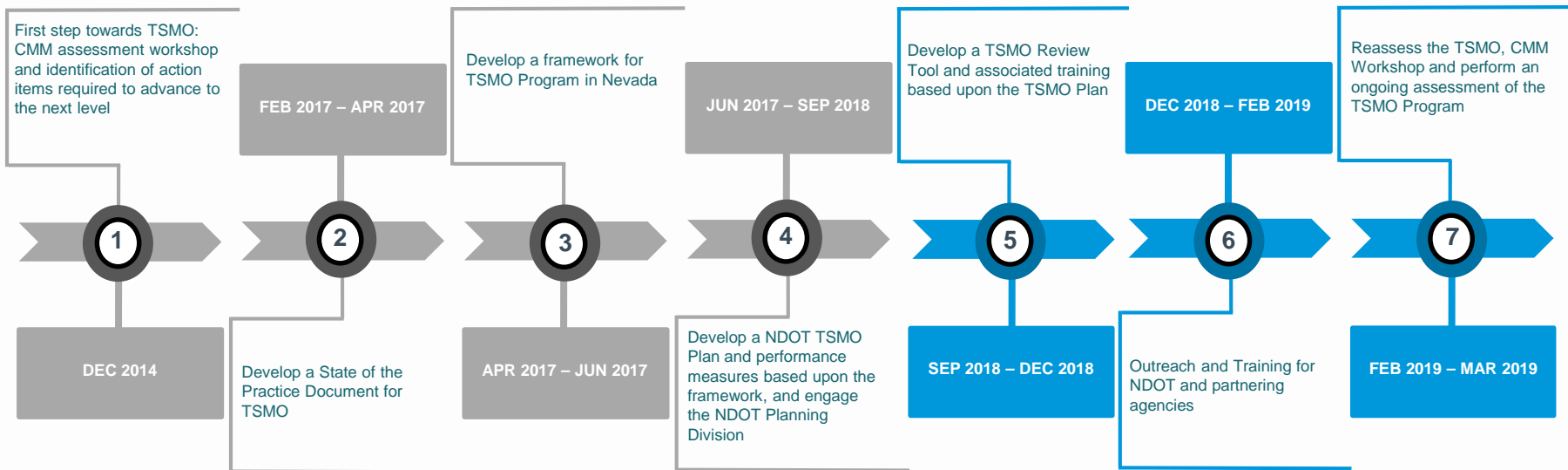
Putting TSMO into Practice



- **Case Study from Iowa DOT was compelling.**
 - Brought back Scott Marler, Director of Operations, for a TCT meeting.
- **Focused Business Case is essential to success**
- **Tactical Elements alone do not make a plan.**
- **Program Plan allows TSMO to grow and integrate throughout the DOT**



How we are going to get there





Thank You

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