



Advancing TSMO in Iowa

Session 1A - On Your Mark, Get Set, Go
TUESDAY, April 26, 2022
10:30 AM - Noon

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Overview



1. TSMO Plan History
2. Process for Updating the TSMO Plan
3. What's TSMO/Benefits of TSMO
4. Strategic Direction
5. Organizing for TSMO
6. Advancing TSMO at Iowa DOT
7. Performance Management & Decision Support
8. Recommended Projects Services and Activities



TSMO Plan History



- ▶ Original Plan Completed early 2016
- ▶ One of the first in the Country
- ▶ The “Iowa Model”
- ▶ Used by many other states



TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS (TSMO) STRATEGIC PLAN

February 2016





TSMO Plan History

Original scoring, part of day-long workshop held by SHRP2 Contractors

2013

2015

Scoring completed by project team overseeing development of TSMO Plan

2016

TSMO Strategic and Program Plan Published

TSMO Plan "Launch" Workshop held in coordination with FHWA

2017

Traveler Information Service Layer Plan Published

First TIM CMF completed using modified Self-Assessment

First Work Zone Management CMF Scoring

2018

ITS and Communication Service Layer Plan Published

TIM Service Layer Plan Published

Work Zone management Service Layer Plan Published

TMC CMF completed as part of TMC Service Layer Plan

CAT CMF completed

2019

Second TIM CMF Scoring

Second Work Zone Management CMF Scoring

Emergency Management Service Layer Plan Published

CAT Service Layer Plan Published

2020

Work Zone Management Service Layer Update

TMC Service Layer Plan Published

CMM Scoring Workshop as part of TSMO Steering Committee

Third TIM CMF Scoring

2021

TIM CMF

Work Zone Management CMF

2022

ATDM Service Layer Plan

TSMO Plan Update

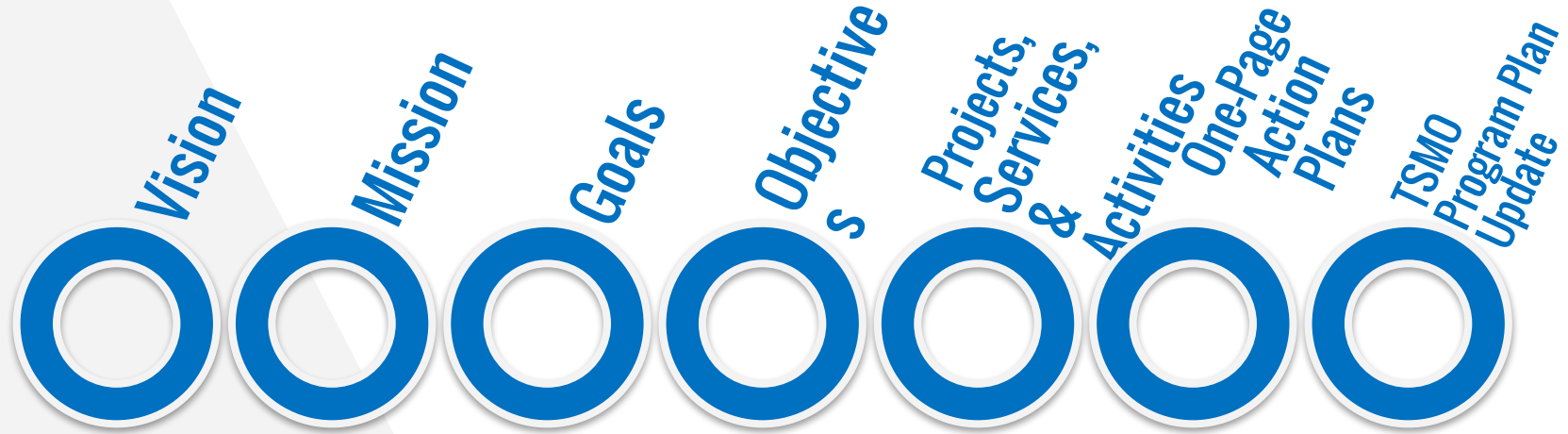
Major Accomplishments



- ▶ 24 Projects, Services or Activities completed with 15 more underway
- ▶ 7 of 8 Service Layer Plans completed
- ▶ Multiple TMSO-focused positions:
- ▶ Elevation of Operations Division
- ▶ Internal and External TSMO-Oriented Groups



Plan Update Process



What's TSMO?

Integrated strategies to optimize the performance of existing infrastructure through implementation of multimodal and intermodal, cross-jurisdictional systems, services, and projects designed to preserve capacity and improve security, safety, and reliability of the transportation system.

Benefits of TSMO

- ▶ Safer Roads
- ▶ Efficient & Reliable Trips
- ▶ Cost Effective
- ▶ Quick Turnaround

Aligning with DOT Business Plan



Goal 1. Improve Transportation System Safety & Performance

Outcomes include: zero fatalities in work zones, total traffic fatalities significantly reduced, increased efficiency, reliability, and condition of our transportation system



Goal 2. Improve Customer Service

Outcomes include: greater levels of customer satisfaction across all programs and services



Goal 3. Advance Workforce for Future Challenges & Opportunities

Outcomes include: engaged and empowered employees, increased diversity, equity, and inclusion, and steady reductions in turnover rate (non-retirement)



Goal 4. Secure Stable & Sustainable Funding

Outcomes include: implemented funding strategies, ensured diversified funding mechanisms, and reduced technical debt

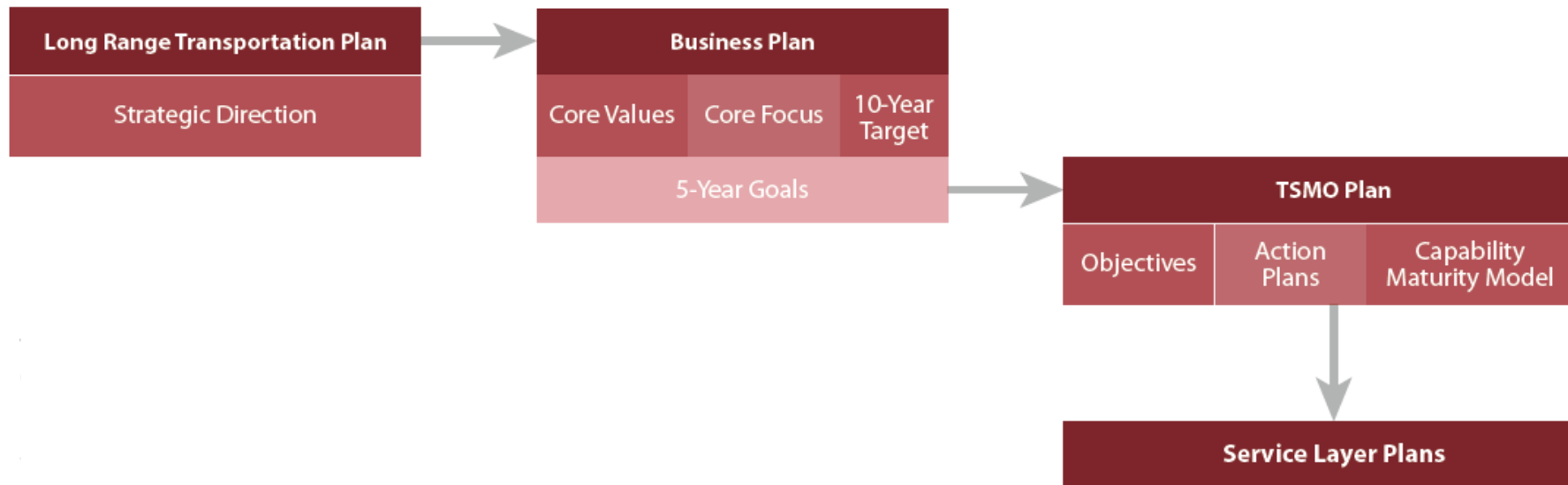


Goal 5. Grow Innovation

Outcomes include: adopted smart technologies, culture of innovation, and modernized systems



How do the Pieces Fit Together?



Business Case Data Updated for:

- ▶ Movement of Goods
- ▶ Travel Trends
- ▶ Jobs
- ▶ Delay Costs
- ▶ Road Condition Costs
- ▶ Safety Costs
- ▶ Time Costs

Challenges to Iowa's Transportation System

\$465 MILLION
was the cost of
congestion to
urban Iowans
in 2017

**9.4 MILLION
GALLONS**
of extra fuel
burned

**\$336 PER
MOTORIST**
of cost (car
repairs,
extra fuel
consumption,
etc.) due to
deteriorated
roads

- Traffic fatalities
- Outdated systems & processes
- Changing workforce
- Maintaining mobility
- Growing the economy
- Tech disruption
- Increasingly distracted drivers
- Aging infrastructure

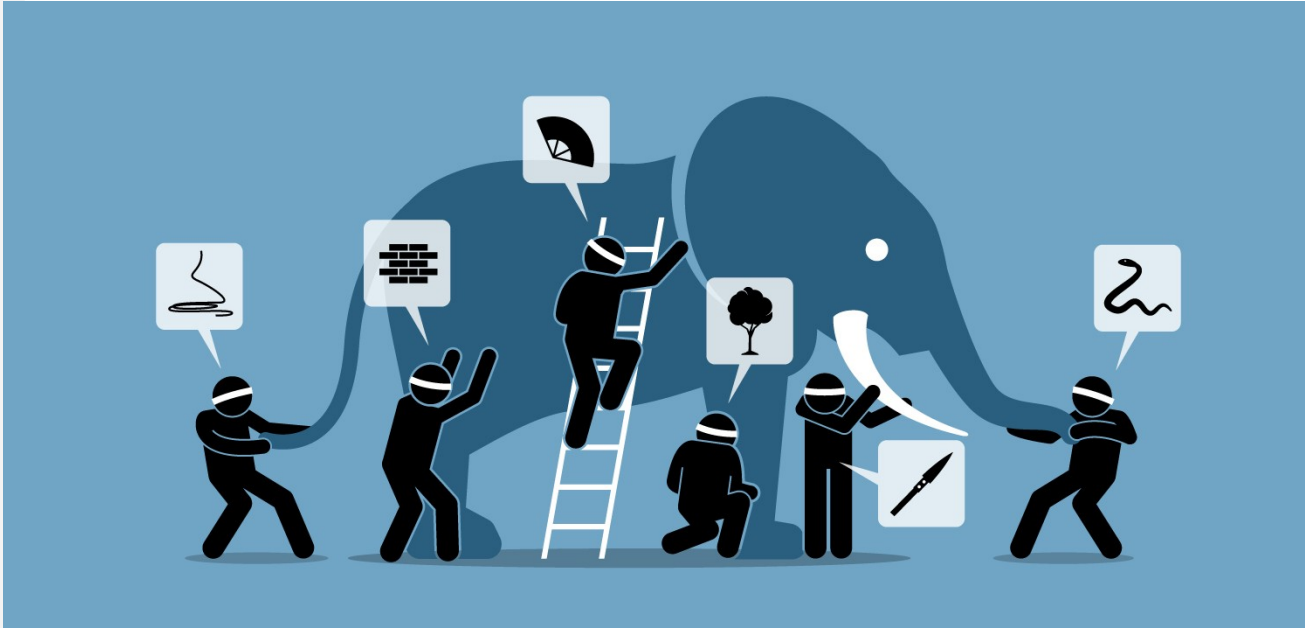
Goal

Objective

1. Improve Transportation System Safety and Performance	<ul style="list-style-type: none"> • Reduce the number of fatal and severe crashes • Reduce the number of secondary crashes caused by traffic incidents • Reduce the number of work zone (and maintenance) related traffic incidents • Improve travel time reliability • Increase the resilience of the transportation system to floods, winter weather, and other extreme weather events • Improve level of service on major freight corridors • Maximize use of existing roadway capacity • Respond to and clear traffic incidents as quickly as possible • Minimize the environmental impacts of the transportation system • Integrate TSMO into existing Iowa DOT policies, plans and procedures
2. Improve Customer Service	<ul style="list-style-type: none"> • Provide timely, accurate and comprehensive information to customers • Allow no unplanned road closures or restrictions due to conditions within Iowa DOT's control • Accommodate bike, pedestrian, transit, and commercial vehicles in transportation management and operations • Build coalitions that improve TSMO (e.g., Statewide TIM, Automated Transportation Council, etc.) • Proactively coordinate responses to large scale traffic incidents with adjacent states
3. Advance Workforce for Future Challenges and Opportunities	<ul style="list-style-type: none"> • Provide staff knowledge and management resources to enable adaptation to rapidly changing technology • Define TSMO workforce (position types) of the future • Develop strategies to attract and retain new types of positions to support TSMO
4. Secure Stable and Sustainable Funding	<ul style="list-style-type: none"> • Develop cost sharing models for integrated corridor management • Consistently pursue grant opportunities
5. Grow Innovation	<ul style="list-style-type: none"> • Provide high quality, high fidelity data in standards-based formats for partner collaboration • Use proven and emerging technologies to improve performance management and decision support systems • Implement integrated corridor management strategies to manage traffic across multiple jurisdictions and modes • Develop highway automation Infrastructure in coordination with Industry trends • Leverage university partnerships to innovate • Engage Iowa's entrepreneur network to improve TSMO



TSMO Understanding



TSMO Understanding



Organizing for TSMO



Lead: Operations Division

- ▶ Traffic Operations
- ▶ Traffic & Safety
- ▶ Maintenance
- ▶ Construction & Materials
- ▶ Motor Vehicle Enforcement
- ▶ TraCS

Field Operations Division

Support

- ▶ System Planning
- ▶ Strategic Communications
- ▶ Location and Environment
- ▶ Design
- ▶ Modal Transportation
- ▶ Project Management
- ▶ Research and Analytics

Others

- ▶ Universities
- ▶ DPS
- ▶ HSEMD
- ▶ Iowa Communications Network (ICN)
- ▶ Cities and MPOs



Internal TSMO-Oriented Groups

- ▶ **TSMO Steering Committee**
- ▶ **Work Zone Council**
 - ▷ **WZ Management & Traffic Operations Subcommittee**
- ▶ **District TSMO Users Group**

External TSMO-Oriented Groups

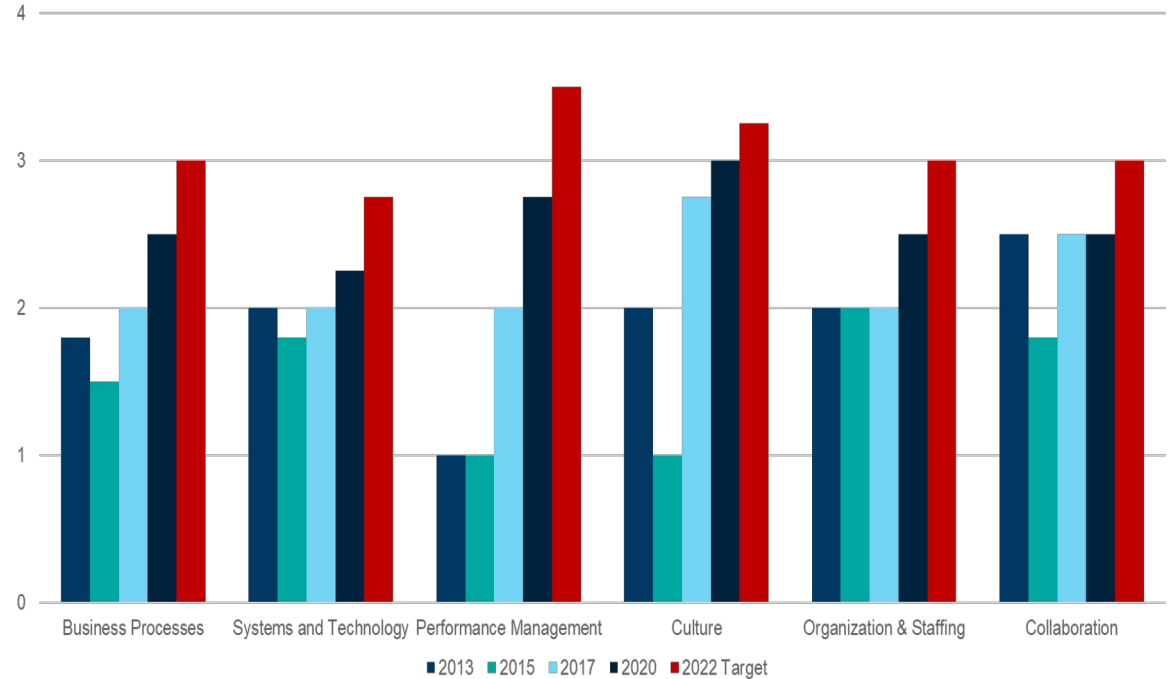
- ▶ **Statewide TIM Committee**
- ▶ **MDSTs**
- ▶ **Iowa Advisory Council on Automated Transportation**

Advancing TSMO through Continuous Improvement



FHWA CMM/CMF

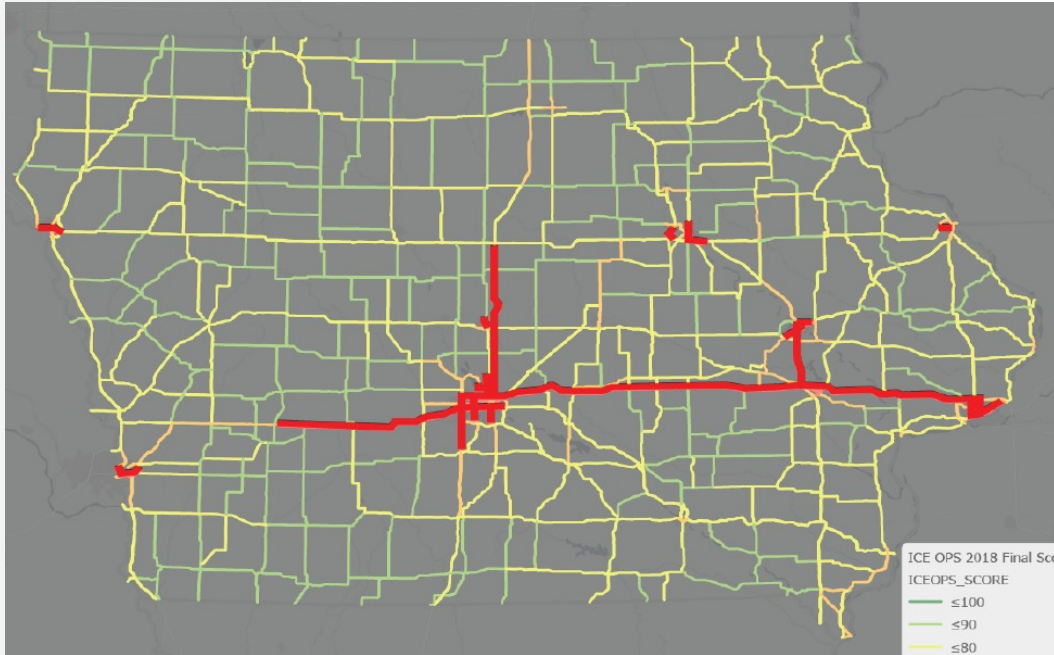
- ▶ Level 1 Ad-Hoc
- ▶ Level 2 Managed
- ▶ Level 3 Integrated
- ▶ Level 4 Optimized



Performance Management & Decision Support



ICE-Ops



Criteria	Weight
AADT	20%
Annual Bottleneck Duration	15%
Incident Density	15%
Crash Rate	15%
Buffer Time Index	10%
Event Center Proximity	5%
Flood Event Density	5%
Winter Weather Sensitive Mileage	5%
Freight Network Mileage	5%
ICE Infrastructure Score	5%
	100%

Recommended Projects, Services and Activities



- ▶ **Based on:**
 - ▷ **Keep, Kill, Combine Exercise**
 - ▷ (items remaining from 2016)
 - ▷ **Gap Analysis - How do we reach targets?**
 - ▷ **CMM National Guidance**
 - ▷ **Mural Ideation Exercise**
 - ▷ **TAC Guidance**
 - ▷ **Municipal focus groups**

Recommended Projects, Services, and Activities



31 to consider over 5 years

Examples:

- ▶ **Develop Ops-Oriented Resiliency Index**
- ▶ **Integrate TSMO into DOT Policies & Guidance**
- ▶ **Enhance joint agency traffic operations performance agreements**
- ▶ **Integrate TSMO into MPO and RPA plans**
- ▶ **Expand statewide video sharing**



Action Plan “One-Pagers”



Business Processes BP1: Integrate TSMO into DOT Policies and Guidance

Associated Goals:	✓ Safety & Perf	Cust Service	Workforce	Funding	Innovation
Benefits, Impacts, Outcomes					
<ul style="list-style-type: none"> Helps ensure gaps and oversights about operations are filled in guidance. Broadens consideration of TSMO throughout all programs and locations for additional safety and performance benefits. 					
Lead Unit(s) Design Location & Environment Maintenance	Description <ul style="list-style-type: none"> This action centers directly on the Priority Goal for Iowa DOT is to Improve Transportation System Safety and Performance. A key part of improving outcomes on the transportation system is applying TSMO wherever beneficial. Ensuring that TSMO is integrated into DOT policy and planning is essential for mainstream TSMO adoption. TSMO principles should be more broadly integrated into DOT funding streams, policies, programming, design, construction, and maintenance documents. 				
Supporting Unit(s) Traffic Operations Construction & Materials Bridges & Structures Contracts & Specifications Districts Program Mgmt	Critical Steps <ol style="list-style-type: none"> Review major policies and guidance documents to see whether TSMO is sufficiently included. Identify gaps or oversights about operations that need to be filled in guidance. Recommend or make updates as soon as possible, referencing the TSMO Program Plan and TSMO benefits wherever helpful. For key documents on a longer update cycle (e.g., every 3 or 5 years), ensure that TSMO integration is in the queue. 				
Implementation FY22+					
Resources Needed Staff time					
Dependencies Document update cycles					
How do we know if we are done?					
<ul style="list-style-type: none"> Policy and guidance documents including associated tools have been updated to better integrate TSMO. TSMO has become a more common consideration in new functional areas. TSMO projects are considered objectively along with traditional infrastructure projects. 					

DOT Bus. Plan

Benefits, Impacts, Outcomes

Lead Units

Supporting Units

Timeline

Resources

Dependencies

Description

Critical Steps

How do we know if we are done?

TSMO Annual Accomplishment Plan



Priorities determined annually by TSMO Steering Committee

- ▶ Previously 20-25 Tasks
- ▶ Reprioritized to 6 Cross-Bureau/Cross-Division
- ▶ Plus 10 “Monitor-Only”



Biggest TSMO Challenge



TSMO in Project Development

- ▶ Alternatives Analysis
- ▶ Project Prioritization
- ▶ Funding
- ▶ Champions

Questions?



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Advanced Mobility Group Manager
Gannett Fleming



Tim Simodynes, PE

State TSMO Engineer
Iowa DOT

Projects, Services, and Activities - Collaboration



- ▶ **Integrate TSMO into Multi-Disciplinary Safety Team Meetings**
- ▶ **Enhance multi-disciplinary/multiagency TSMO Training and capacity building**
- ▶ **Integrate TSMO into MPO and RPA Plans**
- ▶ **Enhance joint agency traffic operations performance agreements**
- ▶ **Enhance TSMO Communication with Local Organizations**
- ▶ **Establish TSMO Policy Stakeholder Group with External Partners**

Develop and Maintain Open Contracts Clearinghouse

Projects, Services, and Activities - Culture



- ▶ **Add Access Management to TSMO Processes**
- ▶ **Add Maintenance Operations to TSMO Processes**
- ▶ **Share TSMO and ITS Benefits Within and Beyond the Iowa DOT**
- ▶ **Integrate TSMO into Existing Conferences and Meetings in Iowa**

Projects, Services, and Activities - Systems and Technology



- ▶ **Improve Traveler Info for Transit & Rideshare**
- ▶ **Improve Connectivity and Interoperability between State and Locally Managed Systems**
- ▶ **Establish ITS Configuration Control Board**
- ▶ **Establish Systems Engineering Guidelines & Repository**
- ▶ **Develop Approaches to Better Leverage Ops Data**
- ▶ **Implement ICM Concepts**
- ▶ **Expand Statewide Video Sharing Strategy**

Projects, Services, and Activities - Performance Measures



- ▶ **Develop Ops-Oriented Resiliency Index**
- ▶ **Develop B/C Estimates for Key TSMO Applications**
- ▶ **Increase Frequency of Performance Reporting**

Projects, Services, and Activities - Business Processes



- ▶ **Integrate TSMO into DOT Policies & Guidance**
- ▶ **Integrate TSMO deployment planning and the Five-Year Program**
- ▶ **Develop District-Level TSMO Plans**
- ▶ **Ensure adequate access to funding for TSMO projects through existing and/or new budget categories**
- ▶ **Streamline TSMO Procurement Processes**
- ▶ **Establish Innovative Funding Team**

Projects, Services, and Activities - Organization & Staffing



- ▶ **Increase direct Iowa DOT staffing in TMC**
- ▶ **Develop a TSMO training rotation program**
- ▶ **Conduct Systems Operations Division staffing assessment**
- ▶ **Enhance GIS capabilities and resources to support operations**