Transportation Systems Management and Operations (TSMO)
Launch Workshop
WEDNESDAY, April 13, 2016
9:00 AM- 3:30 PM
Gateway Hotel and Conference Center
2100 Green Hills Drive, Ames 50014

AGENDA

1. Welcome and Charge from the Management Team – Paul Trombino (15 minutes)

2. Workshop Overview and Executive Briefing Outcomes – Mitch Dillavou and Lee Wilkinson (20 minutes)

3. TSMO Program Planning as a Business Discipline – FHWA-Resource Center and Todd Szymkowski
   - TSMO Program Planning Background and what’s being done at the National Level (15 minutes)
   - The Iowa TSMO Program Plan (30 minutes)

4. BREAK (15 minutes)

5. Why TSMO Matters in Iowa and How it fits – Scott Marler and Garrett Pedersen (20 minutes)

6. Orientation to the TSMO Culture – FHWA Resource Center and Pat Noyes (60 minutes)
   - What Are Other States Doing?
   - Transportation Industry Challenges
   - What does it mean to you?

7. LUNCH

8. Service Layers Overview and Break-out Discussion (120 minutes: 15 min. overview, 45 min. breakout, 60 min. report)
   - Traffic Management Center
   - ITS and Communications
   - Traveler Information
   - Traffic Incident Management
   - Emergency Transportation Operations
   - Work Zone Management
   - Active Transp. and Demand Mgmnt.
   - Connected and Autonomous Vehicle

9. Summary of Outcomes and Next Steps (15 minutes)
TRANSPORATION SYSTEMS
MANAGEMENT AND OPERATIONS
(TSMO) PLAN IMPLEMENTATION

Launch Workshop
April 13, 2016
Two-Part Workshop

1. Executive Briefing – March 24
   - Why TSMO, overview of the TSMO Program Plan, define corporate opportunities and priorities

2. TSMO Launch Workshop – April 13
   - Charge from the Management Team
   - The Iowa TSMO Program Plan Model
   - Why TSMO matters in Iowa
   - TSMO Culture
   - Service Layers and Operational Strategies
Workshop Purpose

- **Engage Leadership**
  - Demonstrate FHWA/DOT support and involvement

- **Orient and educate the Iowa DOT Team on TSMO**
  - Define what TSMO is and what it means to you
  - Knowledge transfer into and within Iowa DOT
  - Create strong organizational capabilities for TSMO
  - Provide tools for performance measurement and decision-making/support
  - Identify strategies for traffic management

- **Initiate the Vision**
  - Incorporate workshop outcomes into Iowa DOT corporate activities and functions
01 Welcome and Management Charge
02 Workshop Overview and Executive Briefing Overview
03 TSMO Program Planning as a Business Discipline
04 Break
05 Why TSMO Matters in Iowa and How it Fits
06 Orientation to the TSMO Culture
07 Lunch
08 Service Layers Overview and Break-out Discussion
09 Summary of Outcomes and Next Steps
01 Welcome and Management Charge
Workshop Overview and Executive Briefing Outcomes
OPERATIONS DEFINED

Optimizing the performance of the transportation system
HOW TO IMPROVE OPERATIONS

- Prioritize projects and operational strategies
- Deploy technology and strategies designed to:
  - Improve mobility
  - Enhance public safety
  - Reduce traveler delay
  - Improve information access
- Focus on performance
- Focus on customer service/outreach
- Invest strategically
I-680 in Western Iowa

Receding water reveals damage
Iowa DOT Website: Multi-state Global Detour June 17 – October 8
March 24 Executive Briefing Outcomes

- Integrate TSMO across several planning initiatives
- Staffing Capabilities
- TSMO Awareness Across Divisions
- Be More Visual
- Link TSMO activities to Capability Maturity Modeling
- Support Transportation Demand Management Activities
- More extensive Data Analysis for Oversize/Overweight Permit Transport Times
- TSMO impact on the Districts
03 TSMO Program Planning as a Business Discipline
TSMO Program Planning
Background and what’s being done at the National Level
Origins of TSMO Program Planning

- Strategic Highway Safety Plans
- Congestion Management Plans
- ITS Deployment Plans
- Regional & Statewide ITS Architectures
- Regional Concepts of Transportation Ops
- Strategic TIM Programs
- AASHTO Guide to SOM
- ...
Performance Based Planning & Programming

PLANNING
Strategic Direction
Where do we want to go?
- Goals and Objectives
- Performance Measures

Analysis
How are we going to get there?
- Identify Trends and Targets
- Identify Strategies and Analyze Alternatives
- Develop Investment Priorities

DATA INVOLVEMENT

PUBLIC INVOLVEMENT

Programming
What will it take?
- Investment Plan
- Resource Allocation
- Program of Projects

Implementation and Evaluation
How did we do?
- Monitoring
- Evaluation
- Reporting
Impetus for TSMO Program Planning
1. Penetrating the Planning Process(es)
2. Institutionalizing Systems Engineering Principles
3. “Programmatizing” Operations & Transcending Champions
4. Accommodating Dynamic Public-Private Business Models
5. Recognizing Organizational Culture as the Challenge
6. “Systematizing” TSMO Organizational Development (...beyond CMM)
TSMO Program Planning Purpose

A. Define (or clarify) **program mission, vision, goals, objectives, and performance measures**

B. Describe, contextualize, & interconnect **program components** and subcomponents

C. Establish (or clarify) organizational **roles, responsibilities**, & strategic relationships (internal/external)

D. Recommend and **prioritize actions** to improve program components and commit resources

E. **Inform and influence** internal stakeholders, TSMO partners, policy-makers, and customers

F. Facilitate **change management** in refining the DOT’s roles and responsibilities
### Some TSMO Program Planning Outputs

<table>
<thead>
<tr>
<th>Question</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Where are we today?”</td>
<td>Motivation</td>
</tr>
<tr>
<td>“Where do we want to be?”</td>
<td>Goals and Objectives</td>
</tr>
<tr>
<td>“How do we get there?”</td>
<td>Approach</td>
</tr>
<tr>
<td>“How do we measure and sustain progress?”</td>
<td>Feedback</td>
</tr>
</tbody>
</table>
Some TSMO Program Planning Outcomes

**Business Environment**
Institutional arrangements, memoranda of understanding (MOU), protocols, information sharing, etc.

**Resource Allocation**
Sources and use of funding, staff, equipment, etc. to support and sustain TSMO capabilities

**System Improvements**
Investments for facilities, equipment, services, etc. needed to support and sustain TSMO functionality
TSMO Program Planning Core Elements

Strategic Business Case
Organizational & Geo-Political Context for TSMO

Programmatic
Business Structure & Capability
How to "go about the business" of TSMO

Deployment
Infrastructure & Service Delivery
Investment Priorities & Resource Management

Strategic Business Case
Organizational & Geo-Political Context for TSMO
Related Initiatives & Critical Issues

- Advancing TSM&O through Scenario Planning
- Planning for TSM&O within Corridors: Desk Reference
- TSMO Program Planning Primer
- Planning for Resilience through Operations (Synthesis)

- Continuous Improvement & Lean Processes
- Innovation Initiatives & Programs
- TSMO Decision Support Systems

- Transportation Performance Management
- Transportation Asset Management Plan(ning)
- Connected Vehicle Deployment Planning
- State Freight Plan(ning)
- Strategic Highway Safety Plan(ning)
Key
A Fully Integrated Plan
Connects with

Regional/Statewide Architectures

Internal/Department Plans
- UPWP, HSIP, Asset Management Plan, Freight Plan, etc.

Processes/Programs Required by Law
- CMP, LRTP, Statewide Transportation Plan, TIP/STIP

Supports agency with advancing capabilities to plan, design, procure, implement, manage, maintain, and monitor TSMO strategies and approaches
The Iowa TSMO Plan
The Iowa TSMO Plan
aka “The Iowa Model”
A National Best Practice for TSMO Program Planning
## TSMO Capability Maturity

<table>
<thead>
<tr>
<th>Business Processes</th>
<th>LEVEL 1</th>
<th>LEVEL 2</th>
<th>LEVEL 3</th>
<th>LEVEL 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="level1" alt="Arrows" /></td>
<td><img src="level2" alt="Arrows" /></td>
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<tr>
<td>Systems and Technology</td>
<td><img src="level1" alt="Arrows" /></td>
<td><img src="level2" alt="Arrows" /></td>
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<tr>
<td>Performance Management</td>
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<td>Culture</td>
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<td><img src="level2" alt="Arrows" /></td>
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<tr>
<td>Organization/Staffing</td>
<td><img src="level1" alt="Arrows" /></td>
<td><img src="level2" alt="Arrows" /></td>
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<tr>
<td>Collaboration</td>
<td><img src="level1" alt="Arrows" /></td>
<td><img src="level2" alt="Arrows" /></td>
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</tr>
</tbody>
</table>

1.5
Who did we meet with?

- 2 Capability Maturity Workshops
- 14 One-on-One internal Interviews
- 2 Internal TSMO Workshops

**INTERNAL WORKSHOPS**

<table>
<thead>
<tr>
<th>• Office of Traffic Operations</th>
<th>• Office of Systems Planning</th>
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</thead>
<tbody>
<tr>
<td>• Office of Traffic and Safety</td>
<td>• Organizational Improvement</td>
</tr>
<tr>
<td>• Office of Strategic</td>
<td>• Districts 1,2,3,4,5, and 6</td>
</tr>
<tr>
<td>Communications</td>
<td>• Office of Motor Vehicle</td>
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<tr>
<td>• Office of Maintenance</td>
<td>Enforcement</td>
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<tr>
<td>• Office of Construction and</td>
<td></td>
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<tr>
<td>Materials</td>
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</tbody>
</table>
Who did we meet with?

- 2 Operations-Focused Sustainability Workshops (INVEST)
- 1 External Partner and 1 External Stakeholder Focus Group

<table>
<thead>
<tr>
<th>EXTERNAL FOCUS GROUPS</th>
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</thead>
<tbody>
<tr>
<td>• ABATE of Iowa</td>
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<tr>
<td>• Associated General Contractors (AGC) of Iowa</td>
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<tr>
<td>• Agribusiness Association of Iowa</td>
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<tr>
<td>• Iowa Association of Business and Industry (ABI)</td>
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<td>• Petroleum Marketers &amp; Convenience Stores of Iowa (PMCI)</td>
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<tr>
<td>• Iowa Tourism Office, Iowa Economic Development Authority</td>
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<tr>
<td>• International Traders of Iowa (ITI)</td>
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<tr>
<td>• Des Moines West Side Chamber of Commerce</td>
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<td>• Iowa Emergency Management Association</td>
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<tr>
<td>• Corridor MPO – Cedar Rapids area</td>
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<tr>
<td>• Iowa Chapter of the American Traffic Safety Services Association (ATSSA)</td>
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<td>• Iowa EMS Association</td>
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<td>• Iowa Northland Regional Council of Governments (INRCOG) – Waterloo/Cedar Falls MPO</td>
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<tr>
<td>• City of Ames and Ames Area MPO</td>
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<tr>
<td>• Des Moines Area Metropolitan Planning Organization (DMAMPO)</td>
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<td>• Highway 61 Coalition</td>
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</tbody>
</table>
Three Levels of the TSMO Plan

- TSMO Strategic Plan
  - The “What”
  - The “Why”

- TSMO Program Plan – The Details
  - The “What” for broad agency leadership, the structure for TSMO, the “Guide”
  - The “How”

- TSMO Service Layer Plans
  - The TSMO tools
Three Levels of the TSMO Plan

TSMO Strategic Plan
- Components:
  - Iowa’s Challenge
  - The Case for TSMO
  - Mission and Vision
  - Strategic Goals and Objectives
  - Program Plan Overview
- Audience: All Levels of DOT

TSMO Program Plan
- Components:
  - Program Objectives
  - TSMO Integration with other DOT Programs
  - Leadership and Organization
  - Business Processes and Resources
  - Performance Management and Decision Support Assessment
  - 5-Year TSMO Program
  - Interstate Conditions Evaluation-Traffic Operations (ICE-OPS) Analysis
  - Activities to meet Goals and Objectives
  - Budget
  - Service Layer Overview
- Audience: Agency Leadership

TSMO Service Layer Plans
- Components:
  - Opportunities and Challenges
  - Description of Services, Activities, and Projects
  - Existing Conditions
  - Gap Analysis
  - Recommendations
  - 5-Year Service Layer Cost Estimate
- Audience: Staff involved with TSMO

Strategic → Programmatic → Tactical
TSMO Strategic Plan Sections

- Iowa's Challenge
- The (Business) Case for TSMO
- TSMO Strategic Direction
- Program Plan Overview
Iowa’s Challenge

Iowa Sources of Congestion 2013-2015
- Recurring Congestion: 23%
- Non-Recurring Congestion: 77%
- Bottlenecks: 23%
- Poor Signal Timing: 5%
- Special Events: 5%
- Bad Weather: 28%
- Work Zones: 12%
- Traffic Incidents: 27%

National Sources of Congestion 2005
- Recurring Congestion: 62%
- Non-Recurring Congestion: 38%
- Bottlenecks: 40%
- Poor Signal Timing: 5%
- Special Events: 5%
- Bad Weather: 28%
- Work Zones: 12%
- Traffic Incidents: 27%
TSMO VISION

Iowa’s transportation system is safe, efficient and reliable, supporting the state’s environmental and economic health as a result of TSMO

TSMO MISSION

To get you there safely and reliably by proactively managing the transportation system
1. Interstate Highways
   782 Miles

2. Urban Primary Network
   1,144 Miles

3. Rural Primary Network
   6,956 Miles

4. Border Bridges
   26 Locations

* Ramp mileage not included

Source: Iowa DOT, Miles of Public Roads In Iowa by Surface Type, 2013.
## TSMO Strategic Goals & Objectives

<table>
<thead>
<tr>
<th>Strategic Goal</th>
<th>Strategic Objective</th>
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<tbody>
<tr>
<td>1. Safety</td>
<td>Reduce crash frequency and severity</td>
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<tr>
<td>2. Reliability</td>
<td>Improve transportation system reliability, increase system resiliency, and add highway capacity in critical corridors</td>
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<tr>
<td>3. Efficiency</td>
<td>Minimize traffic delay and maximize transportation system efficiency to keep traffic moving</td>
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<td>4. Convenience</td>
<td>Provide ease of access and mobility choices to customers</td>
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<tr>
<td>5. Coordination</td>
<td>Engage all DOT disciplines, and external agencies and jurisdictions to proactively manage and operate the transportation system</td>
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<td>6. Integration</td>
<td>Incorporate TSMO strategies throughout DOT’s transportation planning, design, construction, maintenance, and operations activities</td>
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TSMO Program Plan Sections

Part 1 – Introduction
Part 2 – TSMO Program Introduction
Part 3 – Leadership and Organization
Part 4 – Business Processes and Resources
Part 5 – Performance Mgmt. and Decision Support Assessment
Part 6 – TSMO 5-Year Program
Part 7 – Service Layers Overview
Leadership and Organization

- Best Practices from NCHRP Report 20-7/345, “Program Planning and Development for TSMO in State Departments of Transportation”
- Department-wide integration of TSMO concepts and principles
- Development of an organizational unit(s) with lead responsibility for TSMO
- Relative responsibilities of headquarters and region/district offices
- Responsibilities for TSMO deployment planning
- Interaction with external stakeholders, expanding coordination and collaboration to enhance existing relationships and building new partnerships
- Reducing organizational dependence on champions and sponsors
Business Processes and Resources

- Staffing Expertise
- Budgeting, Accounting, Procurement and Contract Management
- Project Programming
- Systems Engineering
- Collaboration with External Partners
- Sustainability and Resiliency
- Communication, Marketing and Outreach
- Data Management
- Continuous Improvement (including Capability Maturity evaluation)
- Research and Development
Business Process Example
<table>
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<tr>
<th>Plan Description</th>
<th>FY16</th>
<th>FY17</th>
<th>FY18</th>
<th>FY19</th>
<th>FY20</th>
<th>FY21</th>
<th>FY22</th>
<th>FY23</th>
<th>FY24</th>
<th>FY25</th>
<th>FY26</th>
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<td>TSMO Strategic and Program Plans</td>
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<td>Accomplishment Year Plan</td>
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<td>5-Year Annual Budget Forecast w/ ICE-OPS</td>
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<td>INVEST Sustainability Assessment</td>
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<td>CMM Self-Assessment</td>
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<td>SL3. Traveler Information</td>
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<td>SL5. Emergency Transportation Operations</td>
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<td>SL7. Active Transportation and Demand Management</td>
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<td>SL8. Connected and Autonomous Vehicle</td>
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ICE-OPS Analysis
# 5-Year Program Activities, Policies and Procedures

## TABLE 33. 5-YEAR PROGRAM ACTIVITIES, POLICIES AND PROCEDURES

<table>
<thead>
<tr>
<th>Activities, Policies, and Procedures</th>
<th>FY16</th>
<th>FY17</th>
<th>FY18</th>
<th>FY19</th>
<th>FY20</th>
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<tbody>
<tr>
<td>LEADERSHIP AND ORGANIZATION (LOD)</td>
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<tr>
<td>LOD1. Integrate TSMO principles more broadly into the Department’s policies and procedures</td>
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<tr>
<td>LOD2. Integrate TSMO into the Department’s Strategic and Long Range Plans</td>
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<td>LOD3. Clearly articulate OTO’s roles and responsibilities to internal and external audiences</td>
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<tr>
<td>LOD4. Create appropriate management layers to provide 24/7 on-call mgmnt. access and to develop the next TSMO leaders of the organization</td>
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<tr>
<td>LOD5. Rename Systems Operations Bureau to “Systems Management &amp; Operations Bureau”</td>
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<td>LOD6. Designate TSMO responsibilities in each District to the Assistant District Engineers or similar level of District management</td>
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<td>LOD7. Designate at least one person in each District to serve as TSMO or Operations Engineer</td>
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<td>LOD8. Develop an internal forum/committee for District TSMO representatives to share successes and lessons learned</td>
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<td>LOD9. Engage Districts in planning and implementing the TSMO Program</td>
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<td>LOD10. Elevate Districts to serve as leader for MDST meetings where appropriate, in concert with InTrans, Systems Planning, and Traffic &amp; Safety</td>
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<td>LOD11. Establish virtual TMC technologies in each District</td>
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<tr>
<td>LOD12. Develop system performance measurements in concert with each District</td>
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5-YEAR COST FORECAST
TSMO Services
- Systems and Tech. Services
- TIM/ETO
- Research and Decision Support
- TMC Services

Construction Projects
- ITS Project Design and Deployment
- Highway Improvement Projects
TSMO Capability Maturity

GOAL: 3.0
05 Why TSMO Matters in Iowa and How it Fits
Long Range Transportation Plan
Strategic Highway Safety Plan
Transportation Asset Management Plan
Statewide Transportation Improvement Program
Transportation Improvement Program
5-Year Program
Highway Performance Management System

MAP-21 Performance Metrics

Freight Management Plan

FHWA/DOT Stewardship & Oversight Agreement
Required by Federal Law?
<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>U.S. Fatalities in 2014</td>
<td>32,675</td>
</tr>
<tr>
<td>Fatalities in Iowa in 2015</td>
<td>320</td>
</tr>
<tr>
<td>Average incidents per month</td>
<td>1,400</td>
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<tr>
<td>Average minutes lanes blocked</td>
<td>52</td>
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<tr>
<td>Ratio of lane blockage delay</td>
<td>1:4</td>
</tr>
<tr>
<td>Per minute likelihood of a crash</td>
<td>2.8%</td>
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</tbody>
</table>
1 vehicle collision, 234, 13%
Debris in Roadway, 187, 10%
Road Work, 407, 23%
Slow Traffic, 50, 3%
Stalled Vehicle, 769, 43%

2 vehicle collision, 82, 4%
3+ vehicle collision, 36, 2%
Emergency Vehicles, 31, 2%
Winter Closure, 4, 0%
Flooding, 2, 0%
People are safer when we keep traffic moving
<table>
<thead>
<tr>
<th>BY THE NUMBERS</th>
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</thead>
<tbody>
<tr>
<td><strong>$406 B</strong></td>
</tr>
<tr>
<td><strong>Value of goods moving through Iowa</strong></td>
</tr>
<tr>
<td><strong>$380 M</strong></td>
</tr>
<tr>
<td><strong>Lost time and delay costs on 380 in July 2015</strong></td>
</tr>
</tbody>
</table>
Bottlenecks, 23%
Traffic Incidents, 27%
Work Zones, 12%
Bad Weather, 28%
Special Events, 5%
Poor Signal Timing, 5%

Non-recurrent Congestion
Recurrent Congestion
NATIONWIDE MOBILITY
The transportation system is more efficient when we keep traffic moving.
TSMO Relationship to Planning

- New plans being developed (TSMO Plan, Interstate Corridor Plan, State Freight Plan, TAMP, etc.)
- Some required; all good practice
- Need to explore plan relationships
- Iterative/cyclical process
- More definition with next SLRTP update
ICE-OPS Development

- Need for screening tool to inform use of limited resources
- Systems Planning development of Infrastructure Condition Evaluation (ICE)
- Developed parallel tool with similar structure, but with operations focus
- Information summarized to 21 corridors defined in Interstate Corridor Plan (2013)
ICE-OPS Structure

- Uses nine operations-oriented criteria:
  - All bottleneck occurrences per mile (10%)
  - Freight bottleneck occurrences per mile (10%)
  - Traffic incident frequency per mile (15%)
  - Crash rate (15%)
  - Planning time index (10%)
  - Event center buffer index (5%)
  - Weather-sensitive corridor mileage (10%)
  - Average annual daily traffic (20%)
  - ICE rating (5%)
ICE-OPS Structure cont.

- Each criteria assigned a normalized value (1-10 scale) based on range of observed values.
- Calculates composite score after applying weighting to each normalized value (max 100).
- Ranks interstate corridors from an operational perspective.

*Table 28: Overall ICE-OPS Corridor Ranking*

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Centerline miles</th>
<th>Composite Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-235 (full route)</td>
<td>13.2</td>
<td>31.0</td>
<td>1</td>
</tr>
<tr>
<td>I-35/80 (east junction of I-80/I-235 to west junction of I-80/I-235)</td>
<td>13.7</td>
<td>37.5</td>
<td>2</td>
</tr>
<tr>
<td>I-29 (junction of US 20 to South Dakota state line)</td>
<td>7.7</td>
<td>39.0</td>
<td>3</td>
</tr>
<tr>
<td>I-380 (junction of US 30 to junction of IA-100)</td>
<td>7.9</td>
<td>58.5</td>
<td>4</td>
</tr>
<tr>
<td>I-80 (east junction of I-80/I-235 to junction of I-380)</td>
<td>100.5</td>
<td>59.5</td>
<td>5</td>
</tr>
<tr>
<td>I-74 (full route)</td>
<td>6.0</td>
<td>59.5</td>
<td>5</td>
</tr>
<tr>
<td>I-35 (east junction of I-80/I-235 to junction of US 30)</td>
<td>23.9</td>
<td>62.0</td>
<td>7</td>
</tr>
<tr>
<td>I-129 (full route)</td>
<td>0.9</td>
<td>63.0</td>
<td>8</td>
</tr>
<tr>
<td>I-480 (full route)</td>
<td>0.8</td>
<td>69.0</td>
<td>9</td>
</tr>
<tr>
<td>I-80 (junction of I-380 to Illinois state line)</td>
<td>68.1</td>
<td>72.0</td>
<td>10</td>
</tr>
<tr>
<td>I-380 (junction of I-80 to junction of US 30)</td>
<td>16.4</td>
<td>74.0</td>
<td>11</td>
</tr>
<tr>
<td>I-29 (east junction of I-29/I-80 to junction of I-680)</td>
<td>22.6</td>
<td>78.5</td>
<td>12</td>
</tr>
<tr>
<td>I-35 (junction of US 30 to junction of US 20)</td>
<td>30.9</td>
<td>83.5</td>
<td>13</td>
</tr>
<tr>
<td>I-380 (junction of IA 100 to Waterloo)</td>
<td>48.7</td>
<td>84.5</td>
<td>14</td>
</tr>
<tr>
<td>I-35 (junction of US 20 to Minnesota state line)</td>
<td>75.7</td>
<td>86.5</td>
<td>15</td>
</tr>
<tr>
<td>I-29 (Missouri state line to east junction of I-29/I-80)</td>
<td>48.2</td>
<td>86.5</td>
<td>15</td>
</tr>
<tr>
<td>I-80 (Nebraska state line to west junction of I-80/I-235)</td>
<td>118.4</td>
<td>88.5</td>
<td>17</td>
</tr>
<tr>
<td>I-29 (junction of I-680 to junction of US 20)</td>
<td>72.2</td>
<td>89.0</td>
<td>18</td>
</tr>
<tr>
<td>I-35 (Missouri state line to west junction of I-80/I-235)</td>
<td>72.4</td>
<td>89.0</td>
<td>19</td>
</tr>
<tr>
<td>I-680 (full route)</td>
<td>16.0</td>
<td>90.0</td>
<td>20</td>
</tr>
<tr>
<td>I-280 (full route)</td>
<td>9.8</td>
<td>92.5</td>
<td>21</td>
</tr>
</tbody>
</table>
What Are Other States Doing?
Capability Maturity Model Elements

1. Business Processes
   - Planning, programming, budgeting, implementation

2. Systems & Technology
   - Systems engineering, standards and technology interoperability

3. Performance Measurement
   - Measures, data & analytics and utilization

4. Culture
   - Technical understanding, leadership, outreach, and program authority

5. Organization/Workforce
   - Organizational structure and workforce capability development

6. Collaboration
   - Partnerships among levels of government and with public safety agencies and private sector
Levels of Agency Capability Maturity

**LEVEL 1: Performed**
- Activities & relationships ad hoc
- Champion-driven

**LEVEL 2: Managed**
- Processes developing
- Staff training
- Limited accountability

**LEVEL 3: Integrated**
- Process documented
- Performance measured
- Organization/partners aligned
- Program budgeted

**LEVEL 4: Optimized**
- Performance-based improvement
- Formal program
- Formal partnerships

*Goal for the Future*

Most Agencies Today
CMM Score - Culture

Level 4.0: 0
Level 3.5: 0
Level 3.0: 3
Level 2.5: 5
Level 2.0: 12
Level 1.5: 6
Level 1.0: 7
Level 0: 0

Scores:
- Level 0: 0
- Level 1.0: 7
- Level 1.5: 6
- Level 2.0: 12
- Level 2.5: 5
- Level 3.0: 3
- Level 3.5: 0
- Level 4.0: 0

Legend:
- Collaboration
- Organization/Work Force
- Culture
- Systems & Technology
- Performance Measurement
- Business Processes
Averages/Dimension - Culture

- Business Processes & Programming
- Systems & Technology
- Performance Measures
- Culture
- Organization & Staffing
- Collaboration
Implementation Plans Capability Improvement Actions - Shifting the Culture

- Develop TSM&O outreach/communications material
- Develop TSM&O business case to various audiences
- Institute TSM&O knowledge sharing (e.g., through identified experts and peer exchanges)
- Develop proactive relationship with public service agencies
- Develop executive policy/directives in support of TSM&O/ITS/total system management
- Establish TSM&O executive steering committee to set vision and strategic priorities
- Recruit and select TSM&O advocates beyond headquarters to facilitate education
- Identify team of TSM&O champions at senior management and division head levels.
Arizona’s Approach - Culture

- Organize a communications campaign/strategy to educate staff about TSM&O, both internally at ADOT, and externally for partner
- Develop business case material in support of external outreach to decision-makers and the public
- Perform a TSM&O assessment of initiatives/efforts within each division
- Develop a statewide concept of operations for TSM&O.
- Expand the TIM for Responders effort to include any staff member who may be working on the ADOT right-of-way, even in permitted situations.
New Hampshire’ Approach

- Develop and communicate the TSMO Story benefits internally – including leverage, payoffs, and cost-benefit compared to other investments
- Develop and institutionalize in-house training/courses for younger staff
- Brief elected officials and policymakers on the business case for TSMO
- Consider contact with external stakeholders regarding TSMO – especially tourism industry (year-round)
- Leverage products of major project specific outreach (I-93), augment updates of construction updates/progress with TSM&O strategies/activities
- Consider greater sharing of camera feeds with media, with credit to NHDOT as PR for program
Ohio’s Approach - Culture

- Make the business case for operations and rationalize approach to defining and communicating its “value”
- Study peer state best practice for ITS/operations program branding (e.g. MD CHART)
- Revisit request to communication staff for improved branding of TMC/OHGO to better establish its recognition/use; if unsuccessful, identify alternative resource to establish branding

Tennessee’s Approach - Culture

- Increasing awareness among TDOT staff regarding what each division/department does within the organization.
- Use the TSM&O Committee to develop marketing resources that spread awareness of TSM&O among TDOT management, local/regional agencies, TPOs, and RPOs.
- Publish an annual/quarterly report describing recent TSM&O success stories and outcomes.
Peer Exchanges

- Sites Visited
  - Wisconsin
  - Minnesota
  - Oregon
  - Washington
  - Utah
  - Colorado
  - Pennsylvania
  - Maryland

- Sites Visited
  - Indiana DOT
  - City of John’s Creek, GA
  - Utah DOT
Culture – Synergy with other Dimensions
Transportation Industry Challenges
Catalysts & Implications
Catalysts

- Demographic Trends
- Technology
  - Vehicle
  - Infrastructure
  - Smart Community
- Freight
- Funding
Funding “Need”
www.strongtowns.org

Federal Gas Tax

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>18.4</td>
</tr>
<tr>
<td>Inflation</td>
<td>29.7</td>
</tr>
<tr>
<td>GDP Growth</td>
<td>30.1</td>
</tr>
<tr>
<td>Traffic Growth</td>
<td>23.8</td>
</tr>
<tr>
<td>Funding Needed</td>
<td>77.7</td>
</tr>
</tbody>
</table>
Implications

- Economic Infrastructure Fusion
- Decision Support Systems Emphasis
- Reliable (Resilient) Connectivity Objective
- Institutional Evolution
  - Public Agency Adaptation – Facilitative Collaborator
  - Government-University-Industry
  - Megaregional/Multi-state “Entity”
What does it mean to you?
THIS AFTERNOON: Break Out Groups

- **Group 1**: Traffic Management Center, ITS and Communications; Traveler Information – Facilitators: Todd Szymkowski, Bonnie Castillo and Daniel Grate

- **Group 2**: Traffic Incident Management; Emergency Transportation Operations; Work Zone Management – Facilitators: Eric Rensel, John Wilson and Paul LaFleur

- **Group 3**: Active Transportation and Demand Management; Connected and Autonomous Vehicle – Facilitators: Pat Noyes, Mike Jackson and John Corbin
08 Service Layers Overview and Break-out Discussion
TSMO Service Layers

- Traffic Management Center
- ITS and Communications
- Traveler Information
- Traffic Incident Management
- Emergency Transportation Operations
- Work Zone Management
- Active Transp. and Demand Management
- Connected and Autonomous Vehicle
@iowadot reports partially & completely covered roads in eastern Iowa. Blowing snow is a factor this AM. #kcrgwx
<table>
<thead>
<tr>
<th>Service Layer</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Management Center</td>
<td>The round-the-clock hub of traffic coordination and management activities throughout the state. The Traffic Management Center recently relocated from Ames to a newly remodeled facility in the Iowa Motor Vehicle Division Building in Ankeny.</td>
</tr>
<tr>
<td>ITS and Communications</td>
<td>Fixed and mobile traffic sensors, non-enforcement traffic cameras, dynamic message signs, highway advisory radio transmitters, and supporting communications infrastructure.</td>
</tr>
<tr>
<td>Traveler Information</td>
<td>Traveler information tools that communicate planned and prevailing traffic conditions, such as Iowa 511 and various social media.</td>
</tr>
<tr>
<td>Traffic Incident Management</td>
<td>The coordination of Iowa DOT and its partners’ response to routine highway traffic incidents.</td>
</tr>
<tr>
<td>Emergency Transportation Operations</td>
<td>The coordination of Iowa DOT and its partners’ response to large scale incidents (not necessarily highway related), such as flooding, tornadoes, epidemics, etc.</td>
</tr>
<tr>
<td>Work Zone Management</td>
<td>The planning and deployment of various strategies to maintain traffic flow and safety through highway work zones.</td>
</tr>
<tr>
<td>Active Transportation and Demand Management</td>
<td>Innovative strategies to maximize available capacity of roadways, such as ramp metering, variable speed limits, lane control signing, active signal control, and time-of-day shoulder use.</td>
</tr>
<tr>
<td>Connected and Autonomous Vehicle</td>
<td>While still an emerging technology, this service layer considers the challenges and opportunities of vehicle-to-vehicle and vehicle-to-infrastructure connectivity and autonomous vehicles to improve vehicle safety and efficiency.</td>
</tr>
</tbody>
</table>
Service Layer Plans Will Address

- **Opportunities and Challenges** – Includes a mapping of relevant Strategic Goals and Program Objectives. Develop Service Layer Objectives that support the Strategic Goals and Program Objectives.

- **Description of Existing Services, Activities and Projects** – Provides a detailed description of existing services, activities and completed deployment projects.

- **Existing Conditions** – An assessment of related existing conditions.

- **Gap Analysis** – Develop and apply analysis criteria to identify where services and other needs are unmet.
Service Layer Plans Will Address (cont.)

- **Action Recommendations** – Provides a list of actionable recommendations by Fiscal Year, categorized by Services, Policies and Procedures, ITS Deployment Projects and Highway Improvement Projects. The action recommendations are expected to be reflected upwards in future TSMO Program Plan updates.

- **Performance Management** – Develop specific measures for each Service Layer Objective and a process for evaluating and correcting actions to meet the objectives.

- **5-Year Service Layer Cost Estimate** – A detailed cost estimate by fiscal year that will be used to refine the TSMO Program Plan budget estimates.
Break Out Groups

- **Group 1**: Traffic Management Center; ITS and Communications; Traveler Information – Facilitators: Todd Szymkowski, Bonnie Castillo and Daniel Grate

- **Group 2**: Traffic Incident Management; Emergency Transportation Operations; Work Zone Management – Facilitators: Eric Rensel, John Wilson and Paul LaFleur

- **Group 3**: Active Transportation and Demand Management; Connected and Autonomous Vehicle – Facilitators: Pat Noyes, Mike Jackson and John Corbin
Break Out Discussion

Each group will consider the following for each of the 2 or 3 service layers assigned to the group:

- What do you see as the opportunities presented by this service layer?
- What do you see as the major challenges to be addressed in this service layer?
- How does the development of this service layer support what you do?
- What do you think should be considered as key indicators of success in this service layer?

Spend 15 minutes discussing the questions for each service layer (20 minutes each for group 3). Be prepared to report back to the whole group.
Summary of Outcomes and Next Steps
Next Steps & Wrap Up

- Expect Engagement via Service Layers, Annual Accomplishment Plan
- Starting 3 Service Layers
  - ITS and Communications
  - Traveler Information
  - Traffic Incident Management
- TSMO Roadshow by OTO
- Follow-up District TSMO Awareness Training
- 2nd Annual TIM Conference – May 16 at Scheman Building

www.iowadot.gov/tsmo