State-of-Practice in Mainstreaming TSM&O in the Project Development Process

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Presented by:
Dr. Thobias Sando, P.E., PTOE
Dr. Priyanka Alluri, P.E.
Larry Hagen, P.E., PTOE
Presentation Outline

- State-of-the-Practice of TSM&O in Florida
- Benefits of Mainstreaming TSM&O in the Project Development Process
- TSM&O in Other States
- TSM&O Examples in Florida
State-of-the-Practice

Current Project Development Process
Traditional planning and design processes often consider few (if any) elements of TSM&O.

Operations and Management (O&M) of existing infrastructure are gaining in significance.

FDOT moving forward toward mainstreaming TSM&O throughout Department processes and procedures.
Benefits of TSM&O

Consideration during the Planning Phase:

- Identify potential TSM&O strategies to meet future travel demand in Long Range Transportation Plans (LRTPs)

- Reduce costs for future ITS deployments through:
  - Installation of fiber optic conduit during planned improvements
  - Installation of sensor/camera poles for future data collection

Source: electrical-engineering-portal.com and recorder.com

Source: Google Maps ©2013
Benefits of TSM&O

Consideration during the Design Phase:

- Reduce costs for future ITS deployments through:
  - *Mast arms designed for future camera installation*
  - *Traffic signal controllers that can be later used for integrated corridor management*

- Increase safety and travel reliability for road users in work zones
Research

Collaborative research effort by:

**Principal Investigator:** Dr. Thobias Sando, P.E., PTOE
University of North Florida

**Co-Principal Investigator:** Dr. Priyanka Alluri, P.E.
Florida International University

**Project Manager:** Dr. Raj Ponnaluri, P.E., PTOE
FDOT

**Co-Project Manager:** Melissa Ackert, P.E.
FDOT

**Consultant:** Larry Hagen, P.E., PTOE
Hagen Consulting Services, LLC
Conducted to determine the current state-of-the-practice of TSM&O in the Department

Included:

- Comprehensive review of current guidelines
- Two (2) FDOT District surveys
  - TSM&O/ITS and Traffic Operations project managers
  - Project managers and staff in other disciplines
- Nationwide TSM&O survey
- Review of TSM&O projects in Florida
State-of-the-Practice of TSM&O in Florida
State-of-the-Practice

FDOT District Survey - TSM&O Project Managers

Level of interaction with TSM&O officials is inconsistent statewide

- Planning Officials
- PD&E Officials
- Design Officials
- Construction Officials

Degree Project Development Officials Work with TSM&O Officials

<table>
<thead>
<tr>
<th>Interaction Level</th>
<th>Planning Officials</th>
<th>PD&amp;E Officials</th>
<th>Design Officials</th>
<th>Construction Officials</th>
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</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Very little</td>
<td>55</td>
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<td>Somewhat</td>
<td>45</td>
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<tr>
<td>Always</td>
<td>18</td>
<td>18</td>
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</table>
State-of-the-Practice

FDOT District Survey - TSM&O and Traffic Ops Engineers

- Involvement of TSM&O in the project development process is limited
- Traffic operations engineers involved more often than TSM&O officials

![Chart showing involvement in project development process](chart.png)
FDOT District Survey - Non-TSM&O Project Managers (PMs)

**PMs outside of TSM&O/ITS and Traffic Operations have limited understanding of TSM&O**

![Bar Chart]

- None at all: 0%
- A little: 45%
- A moderate amount: 45%
- A lot: 0%
- A great deal: 9%

Overall Level of Understanding of TSM&O
TSM&O is rarely to only sometimes considered in the project development phase PMs are most involved in
State-of-the-Practice

Current TSM&O Challenges

- *No formal process exists for reviewing potential projects for TSM&O possibilities*
- *TSM&O is often involved too late in the project development process*
- *Difficulties in executing TSM&O contracts*
- *Lack of expertise in the industry with ITS components*
FDOT Goals

- Incorporate TSM&O in existing planning and design processes
- Better accommodate TSM&O components
- Develop procurement framework for TSM&O projects
- Explore the use of processes such as the Agile Framework in lieu of conventional methods
TSM&O in Other States
## Leading challenges with TSM&O implementation

<table>
<thead>
<tr>
<th>Challenge</th>
<th>No. of Responses</th>
<th>Percentage of Responding DOTs (%)</th>
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<tbody>
<tr>
<td>Business Process</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Culture/Awareness/Understanding</td>
<td>18</td>
<td>62</td>
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<tr>
<td>Integration</td>
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<td>Workforce</td>
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<td>Budgetary</td>
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<tr>
<td>Consideration</td>
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<tr>
<td>Coordination</td>
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<td>17</td>
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<tr>
<td>Guidelines</td>
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</tbody>
</table>

* 29 DOTs responding
Maryland (MDOT/SHA)

Recently established a formalized TSM&O program and developed a TSM&O Strategic Implementation Plan, August 2016.

TSM&O program aligns with MDOT/SHA programmatic goals and ties State programs and plans into the TSM&O program.

Implementation Plan identifies goals and strategies to accomplish each goal.

Sets aggressive implementation objectives with integration into key procedures and practices by 2018.
Other States: Best Practices

Maryland (MDOT/SHA)

- TSM&O program provides TSM&O representation at all levels of planning and operations.

Source: Maryland TSM&O Strategic Implementation Plan, August 2016
TSM&O Examples in Florida
Integrated Corridor Management

Philips Highway (US 1): District 2

- Adjacent to I-95
- To mitigate congestion along I-95 resulting from an incident
- Detours traffic around and back onto the Interstate
- Revised timing plan developed to be activated as needed
- Upgraded traffic signal controllers, signage, and Closed Circuit Television (CCTV)
- TSM&O Involved in all phases of the project

Source: North Florida TPO, www.floridatpo.com
Congestion Management During Construction

Pensacola Bay Bridge: District 3
- Heavily traveled corridor
- Existing bridge structurally deficient
- Solution: Replacement with congestion management
- Robust incident management plan during construction and after completion
- Cameras, Bluetooth sensors, Infrared camera, and active monitoring
- Strong TSM&O Language in the RFP

Source: Google Maps, 2017
Express Lanes

I-95 Express Lanes: District 6

- Converted High Occupancy Vehicle (HOV) lanes to High Occupancy Toll (HOT) lanes
- Involvement of Operations officials in all project development stages
- Heavy involvement of Central office officials
- New initiative for FDOT
- Led to development of the Express Lane Handbook

Source:
www.95express.com
www.wlrn.org

I-95 Express Lane Entrance and Dynamic Pricing Example
Express Lanes

I-4 Express Lanes: District 5

- The “I-4 Ultimate” project
- Part of a 21-mile improvement/reconstruction effort
- TSM&O officials involved in all phases of project development
- Scheduled to open to the public by 2021

Source: www.i4ultimate.com
Florida Turnpike Interchanges: District FTE

- Signing and Pavement Marking revisions to reduce run-off-the-road crashes at interchange exit ramps
- Chevron signs, advance speed advisory signs and curve warning signs
- A marked reduction in crashes at locations where these safety modification have been installed

Source: Google Maps, 2017
Questions