Leveraging Performance Measures to Justify TMC Staffing and Funding Levels

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Florida Department of Transportation
District Four ITS Program Manager
Overview of TMC Operations

- Number of TMCs statewide: **10 FDOT TMCs + city/county TMCs**
- Number of TMC employees (statewide or locally): **65 locally, covering both freeway and arterials.**
- Approximate % of agency vs. contract employees: **8%**
- Agencies that co-locate with your TMC: **The local County Traffic Engineering Division**
- Do these agencies directly coordinate with TMC staff? **Yes**
- Does your TMC directly manage a freeway service patrol? **Yes**
- Freeway management only, or freeways and arterials? **Both**
About District Four
District Four Arterial Management Program

October 2016
- Monitored 402 incidents
- 75 signal timing changes were made
- Total delay savings = 11,879 veh/hrs
- B/C of efforts = 5.53
District Four Arterial Management Program

October 2016
- 106 CCTVs
- 14 ADMS
- 48 MVDS
- 53 Bluetooth
- 50 miles fiber
  - Project in purple adding more devices and approx. 20 miles of fiber

Broward County Arterials Managed
District Four Arterial Management Program

October 2016

- Monitored 226 incidents
- 312 signal timing changes were made
- Total delay savings = 3,603 veh/hrs
- B/C of efforts = 2.04
District Four Arterial Management Program

October 2016

- County maintains in managed network
  - 46 CCTVs
  - 31 Bluetooth devices
  - 7 MVDS
  - 130 Traffic Signals
  - Appox. 50 miles of fiber

- Countywide totals not included

Palm Beach County Arterials Managed
District Four FMS Program

• The Freeway Management Program supports and promotes the use of integrated and coordinated freeway systems and proactive freeway management to improve the safety efficiency and reliability of travel on the nation's freeway facilities.
District Four FMS Coverage

241 Miles of Fiber Optic Cable
## District Four FMS Coverage

<table>
<thead>
<tr>
<th>Highways</th>
<th>Express Lanes (Completed)</th>
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</thead>
<tbody>
<tr>
<td>I-75</td>
<td>595 Express</td>
</tr>
<tr>
<td>I-95</td>
<td>95 Express Phase 2</td>
</tr>
<tr>
<td>I595</td>
<td></td>
</tr>
<tr>
<td>US 27</td>
<td>Express Lanes (Under Construction)</td>
</tr>
</tbody>
</table>

- I-75 Express
- I-95 Express Phase 3
FMS Performance Measures

• Roadway Clearance ------------------------ 37.6 minutes
• Incident Clearance ------------------------ 58.5 minutes
• Open Road Duration ---------------------- 31.7 minutes
• Road Ranger Assists --------------------- 859 assists

** Statistics are based on October Performance Measures **

Reports are completed weekly, monthly, quarterly and yearly. Performance measures are available online
http://www.smartsunguide.com/PerformanceMeasures.aspx
FMS ITS Devices

• Closed Circuit Television Cameras (CCTV) ------ 207
• Dynamic Message Signs (DMS)------------------- 56
• Highway Advisory Radio ------------------------ 20
• Vehicle Detection System ---------------------- 420
• Variable Speed Limit Signs (VSL)-------------- 28
• 511 Traveler Information

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Overview of the FDOT District 4 TMCs

Palm Beach County Vista Center

Broward SMART SunGuide Regional Traffic Management Center
Control Room Renovation Improvements (Broward)

• 44 LED Rear Projection Screens
• Upgraded operator consoles
• Supported 1080p HD cameras
• Transition to informational dashboard
Control Room Renovation

Before
Control Room Renovation

After
District Four TSM&O Program

TMC Staffing
**FDOT TSM&O Staff**

- **TSM&O Operations and Maintenance**
  - **Incident Management Program Manager (1)**
    - FMS/AMS Specialist IV
    - Manages 12 contracts, with about 100 deliverables associated with these contracts.
    - Will have the most center lane miles to provide incident management, expansion to arterials
  - **Project Deployment (1)**
    - FMS/AMS Specialist III
    - Manages TSM&O ITS/ATMS Replacement Plan
  - **TSM&O Operations Manager (1)**
    - FMS/AMS Specialist III
    - Manages the operators who monitor and manage real time events on arterials, express lanes and general purpose freeway lanes.
    - Manages 1 contract with 29 deliverables, approx. 50 staff in the TMC.
  - **TSM&O Maintenance Manager (1)**
    - Vacant FMS/AMS Specialist III
    - ELs, TSMA, Field Inventory management, QA maintenance contractor, budget planning

- **TSM&O Program Development and Analysis**
  - **TSM&O Program Engineer**
    - PEA-SES
  - **Traffic Signal Operations Manager (1)**
    - FMS/AMS Engineer PE I
    - Manages Traffic Signal Retiming studies and consultants
    - Oversees and implements arterial operations strategies
    - Manages 2 Signal Retiming Contracts and 1 Operations Contract providing 2 full time staff and operators

- **Traffic Operations**
  - **TMC Manager (1)**
    - TSM&O Engineer- Freeways and Arterials PE II - SES
    - Supervises TMC staff at the TMC and manages the TMC Facility

- 10 FDOT positions in TSM&O unit.
- 6 work primarily in Operations and Maintenance at the TMC.
- 3 work in Developing the Program
FDOT TSM&O Staff

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TSM&O Operations and Maintenance

TSM&O Program Development and Analysis

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• 6 work primarily in Operations and Maintenance at the TMC.
• 3 work in Developing the Program
Transportation Management Center Staff

**Freeway Management Program**

- 7 days / 24 hours
- 1 Full Time IT Manager and 5 Full Time Technicians
- 1 TMC Manager and Assistant Manager
- 3 Full Time Floor Managers
- 30 Operators overseeing 5 countries (Broward, Palm Beach and Treasure Coast) and 8 Express Lanes operators
- 1 Managed Lanes Engineer

**Arterial Management Program**

- 7am to 7pm, Monday thru Friday
- 1 Full Time Floor Manager
- 1 Full Time IT Manager
- Operators for two arterial management deployments (Palm Beach and Broward)
- 2 full time Traffic Signal Timing Engineers in PBC and 1 in Broward
Future Integrated Corridor Management in District 4
Integrated Corridor Management in District 4

- Freeway Management System
  - Incident management
  - Traveler information
  - Managed lanes
  - Ramp Signals
  - ITS devices

- Arterial Management System
  - Active Arterial Management
  - Transit Signal Priority
  - Queue Jump
  - Pedestrian and Bicycle features
  - Traveler Information
  - Dynamic Signal Retiming
  - Adaptive Traffic Control
  - ATMS devices

- Rail Systems

Goal: Transportation system is managed as an integrated system.
ICM High Level Concept of Operations

- Current Systems Description
- Justification and Nature of Changes
- Decision Support System (DSS)
- Operational Scenarios
  - Daily Operation
  - Freeway Incident Scenario
  - Arterial Incident Scenario
  - Transit Incident
  - Planned or Special Events
  - Disaster Response
ICM High Level Concept of Operations
Operational Scenarios – Transit Incident

Timeline for a representative incident is as follows:

9:15AM  A vehicle queued at the eastbound approach of the intersection of Cypress Creek Rd and Andrews Ave is struck by southbound SFRTA (Tri-Rail) commuter train. The crash disables the vehicle and its occupants suffer non-life-threatening injuries. The locomotive sustains damage but no injuries are reported on the train.
ICM High Level Concept of Operations

Operational Scenarios – Transit Incident

- Incident is detected and verified by TMC at 9:20am
- FT. Lauderdale PD and Emergency Responders arrive at scene & upstream 9:30am
- 9:35am: SFRTA Operations Center alerts customers and sends technicians to the scene, BCT sends alerts to drivers and customers, FDOT posts event information to 511 and DMS
ICM High Level Concept of Operations

Operational Scenarios – Transit Incident

- 9:45am Broward County Traffic initiates signal timing plans to accommodate traffic affected by closure
ICM High Level Concept of Operations

Operational Scenarios – Transit Incident

- 10:00am Emergency responders and rail technicians at the scene provide updates to the ICM Decision Support System
- 10:10am Rail Passengers disembark and a bus bridge is provided
- 10:45 am – Train is towed to nearest station and roadway scene clearance begins
- 11:30 am – Cypress Creek Rd. is reopened to traffic and normal arterial operations resume
ICM High Level Concept of Operations

6.6.2 ICM Strategies and Agency Roles & Responsibilities

<table>
<thead>
<tr>
<th>ICM Strategies</th>
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<tbody>
<tr>
<td>• Common incident reporting system</td>
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<tr>
<td>• Automated information sharing &amp; distribution through ICM System</td>
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<tr>
<td>• Emergency roadway and/or on-ramp closure</td>
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<tr>
<td>• Emergency vehicle signal pre-emption</td>
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<tr>
<td>• Notification to transit users via app</td>
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<tr>
<td>• Provide info or connection (bus-bridge) to alternate transit service</td>
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<table>
<thead>
<tr>
<th>Agency</th>
<th>Roles &amp; Responsibilities</th>
</tr>
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<tbody>
<tr>
<td>FDOT/Freeway</td>
<td>• Monitor corridor performance (TMC)</td>
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<tr>
<td></td>
<td>• Provide info via freeway devices for off-ramp/arterial blockages</td>
</tr>
<tr>
<td>FDOT/Arterial</td>
<td>• Monitor arterial conditions (TMC, ATMS)</td>
</tr>
<tr>
<td></td>
<td>• Coordinate response plans with Broward Co Traffic (e.g., diversion timing plans)</td>
</tr>
<tr>
<td></td>
<td>• Provide info via arterial devices (GPSD)</td>
</tr>
<tr>
<td>Broward Co Traffic</td>
<td>• Verify incidents on signal detected elements</td>
</tr>
<tr>
<td></td>
<td>• Coordinate response plans with FDOT</td>
</tr>
<tr>
<td>BCT</td>
<td>• Implement signal timing adjustments for diverted traffic</td>
</tr>
<tr>
<td></td>
<td>• Monitor bus service &amp; reroute if necessary</td>
</tr>
<tr>
<td>SFRTA</td>
<td>• Notify customers of service delays &amp; disruptions</td>
</tr>
<tr>
<td></td>
<td>• Provide info or accommodate affected passengers on all transit service</td>
</tr>
<tr>
<td>Emergency Response (Agencies in TIM Team)</td>
<td>• Respond to incident &amp; provide medical, fire suppression, scene clearance, and road closure assistance</td>
</tr>
<tr>
<td></td>
<td>• Provide updates on closure information</td>
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</tbody>
</table>

Table 6: Transit Incident Scenario Strategies, Roles and Responsibilities

![Figure 7: Information Flow Diagram – Transit Incident]
Traffic Management Center Staff: Future Needs

FDOT Staff
• Upgrade current staff positions to account for growing complexity
• Add new in house IT manager position to manage the IT aspects of the TSM&O program
• Add new in house staff for managing the data and performance measures program

Non FDOT Staff
• More traffic signal timing engineers
• Experts in multimodal operations
  • Consultants and agency staff
• Participating ICM agencies
  • Local PD, local Fire Rescue, Rail operators, Cities
Questions?

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