Transportation Systems Management & Operations Implementation Plan

Florida Department of Transportation District 5

PREPARED FOR

FDOT

FDOT District 5
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Preface

The purpose of this initial distribution of the working Implementation Plan is to gain consensus and feedback on the following elements of the Implementation Plan:

a) Goals and Objectives of TSM&O in District Five.
b) Purpose and goals of the Implementation Plan.
c) Does the Implementation Plan address the right questions?
d) Do you agree with the goals and objectives of advancing each of the six program dimensions?
e) Do you agree with the Task Action Items identified to achieve those objectives?

This draft is intended to be a framework for the final document. It is not representative of a complete and finished product by FDOT. Not all content has been included in this iteration, but will be further implemented upon gaining consensus regarding the general purpose and structure of the document. Similarly, please disregard any grammar or spelling errors within the document. While a brief quality assurance review was conducted, this draft may still include errors that will be removed prior to the adoption of the Implementation Plan.

FDOT understands it is appropriate and necessary to provide an opportunity for local stakeholders to offer feedback regarding a document as comprehensive as the Implementation Plan. Please forward any comments, questions, or concerns regarding this draft to Demond Hazley at DHazley@VHB.com or Todd Davis at TSDavis@VHB.com. In your response, please provide the necessary details to ensure the project team can efficiently incorporate your feedback into the document.
TSM&O Implementation Plan Summary

UNDER DEVELOPMENT
Introduction

The Florida Department of Transportation’s (FDOT) primary statutory responsibility is to coordinate the planning and development of a safe, viable, and balanced multimodal state transportation system, and to assure the compatibility of the transportation network, including multimodal facilities. This primary responsibility coincides with the objectives of an effective Transportation Systems Management and Operations (TSM&O) practice. The Federal Highway Administration defines TSM&O as "an integrated program to optimize the performance of existing multimodal infrastructure through implementation of systems, services, and projects to preserve capacity and improve the security, safety, and reliability of our transportation system."

In simpler terms, TSM&O is a program based on measuring performance, actively managing the multimodal transportation network, streamlining/improving the existing system, and delivering positive safety and mobility outcomes to the travelling public in Florida.

With fewer funds available to build our way out of congestion, improving our current roadways has become critical. In addition to creative financing alternatives, the national transportation bill, Moving Ahead for Progress in the 21st Century Act (MAP-21), requires that Metropolitan Planning Organizations (MPO) consider projects and strategies as part of a planning process that promotes efficient system management and operations. An effective TSM&O Practice improves mobility for all roadway users through an emphasis on real-time active management and operation of the existing
transportation system. TSM&O strategies also address non-recurring congestion with cost-effective investments to our existing infrastructure.

The FDOT Board has endorsed the working definition of TSM&O, the TSM&O Business Plan, and the outline of a Strategic Plan. In addition, within District Five, the Department has set the following goals for the TSM&O practice:

- Utilize a management and operations approach combined with a set of cost-effective strategies;
- Develop and continuously upgrade a well-maintained district-wide intermodal system; and
- Support mode choice, minimization of connection gaps and full system reliability.

The purpose of this document is to build on previous progress and identify an implementation plan which promotes program maturity and sets the foundation for an effective TSM&O practice.

1.1 TSM&O Program Goals and Objectives

From FDOT TSM&O strategic plan:

**Vision:** To operate our transportation system at the highest level of cost effective performance.

**Mission:** To deploy a customer-driven TSM&O program focused on mobility outcomes through real-time and effective management of the existing transportation system toward its maximum efficiency.

1.2 Capability Maturity Framework (CMF) Overview

In 2014, the FDOT District Five was awarded a Strategic Highway Research Program 2 (SHRP2) grant to aid in the implementation of the TSM&O Practice through the Capability Maturity Framework (previously known as the Capability Maturity Model).
The SHRP2 program requires support of all District units, MPOs, Transit Agencies, and local governments within the District.

The SHRP2 implementation efforts were designed to assist the Department to:

- Enhance SIS benefit/cost tools
- Test enhanced tools in project prioritization process
- Application of SHRP2 LO8 Tool
- Revision of FDOT Planning and Programming Process

Within this implementation plan, FDOT District Five's progress in each of these areas will be documented in greater detail.

Based on the CMF process, in order to develop an effective districtwide TSM&O practice, it is necessary to first assess the current status of TSM&O within the District. A CMF assessment workshop, sponsored by FHWA and AASHTO, was conducted to gain consensus on the state of TSM&O within District Five and to identify next steps in advancing the districtwide TSM&O efforts. The workshop participants, which included representatives from the FDOT, MPOs, agencies, and local governments within the District identified the current levels of capability regarding six major dimensions on the following basis:

**1.2.1 Key Dimensions of Capability**

Six critical dimensions are identified by FHWA and are closely associated with the more effective TSM&O activities, including:

1) *Business processes* – including formal scoping planning, programming, and budgeting;

2) *Systems and technology* – including systems architecture, standards, interoperability, and standardization and documentation;

3) *Performance measurement* – including measures definition, data acquisition, analysis, and utilization;

4) *Culture* – including technical understanding, leadership, policy commitment, outreach, and program authority;

5) *Organization and workforce* – including organizational structure, staff capacity, development, and retention; and

6) *Collaboration* – including relationships with public safety agencies, local governments, MPOs, and the private sector.

**1.2.2 Levels of Agency Capability**

For each of the six dimensions there are discrete levels of agency capability – observed in actual agency practice. These levels range from “ad hoc” activities to more
"integrated" program levels. Four incremental levels of capability are used to assess current state and improvement targets for each dimension. They are defined as "doable" steps, each building on the one before: The relationships among the levels are illustrated in Figure X (under development).

1.2.3 District Five Self-Assessment

The resulting District Five assessment is provided below in Figure 1. Based on this self-assessment, the FHWA-recommended priority action items are also provided below.

Priority Action Items

Business Processes (Planning and Programming): Develop a regional TSM&O program with consideration for a District wide approach that would include all key inter-modal planning and programming steps.

Organization and Staffing: Establish an organized and integrated TSM&O program that provides consolidated benefit to FDOT, and the participating MPOs / local municipalities. The collaborative organizational structure shall include the utilization of the Team of Champions for facilitating all facets into the TSM&O program (roadway, freight, multi-modal and transit).

Culture: Develop a regional cultural awareness program for informing and educating the MPOs and local agencies on the benefits of the TSM&O program, the direction of the Department with the TSM&O program and the success stories associated with the TSM&O program throughout the state and country.
1.3 Planning Consistency Overview with Local Agencies

Each MPO and/or local municipality is uniquely different, however, to implement an optimized TSM&O Practice, some planning consistencies must be present. MAP 21 establishes national performance goals for federal highway programs:

- **Safety** - To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
- **Infrastructure condition** - To maintain the highway infrastructure asset system in a state of good repair.
- **Congestion reduction** - To achieve a significant reduction in congestion on the National Highway System (NHS).
- **System reliability** - To improve the efficiency of the surface transportation system.
- **Freight movement and economic vitality** - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
- **Environmental sustainability** - To enhance the performance of the transportation system while protecting and enhancing the natural environment.
- **Reduced project delivery delays** - To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

Both state departments of transportation and metropolitan planning organizations (MPO) must consider projects and strategies as part of a planning process that promotes efficient system management and operations. Within the District, there are five (5) MPOs/TPOs, representing nine (9) counties. Through review of current planning procedures, it was determined that most agencies have established management and operations (M&O) techniques and programs, however the guidelines and performance measures for the overall intermodal transportation system (TS) was not thoroughly established. **This implementation plan will address these gaps within the districtwide TSM&O Practice.** Figure 2 on the following page.
illustrates how the Transportation System will be combined with the Management and Operation strategies to reach the TSM&O practice goal.

Figure 2: Reaching TSM&O Program Goals
Business Process

The Business Processes dimension focuses on the formal scoping, planning, programming, and resource allocation for TSM&O. To successfully implement TSM&O within the District, programs must be planned and executed based on mobility needs. Capital, operation and maintenance cost should be properly allocated to ensure that systems operations and management has its appropriate place in the District’s overall improvement programs.

2.1 TSM&O Business Process Goals and Objectives

Based on the identified strengths and weaknesses of the 2014 Business Process Dimension of the TSM&O Program, and the desired capability and maturity framework, a series of goals and objectives of this dimension have been developed in order to define necessary task action items for the District.

Table 1: Business Dimension Goals and Objectives

<table>
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<tr>
<th>Goals</th>
<th>Objectives</th>
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<tbody>
<tr>
<td>Consensus on a regional approach regarding TSM&amp;O project identification process/system-wide evaluation procedure</td>
<td>Consensus on a plan to uniformly identify network goals, deficiencies, B/C, networks, strategies and common priorities by 2018</td>
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<tr>
<td><strong>Regional program integrated into jurisdictions' overall multimodal transportation plans with related staged program</strong></td>
<td><strong>Coordination plan for future updates to regional and local transportation plans by 2018</strong></td>
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<tr>
<td><strong>Consensus on a standardized and documented TSM&amp;O project development life cycle to include template, project schedules, scoping language and requirements (NEPA, SYS engineering, FTA)</strong></td>
<td><strong>Detail a cradle-to-grave project development process for all FDOT projects by 2018</strong></td>
</tr>
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<td></td>
<td><strong>Identify requirements associated with different improvement strategies (i.e. transit improvements, ITS deployment, environmental impacts) by 2018</strong></td>
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<td></td>
<td><strong>Clearly define roles and responsibilities of different functional units within the project development life cycle as illustrated in the Organization &amp; Staffing Dimension</strong></td>
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<td></td>
<td><strong>Gain consensus on scoping language and standardized project schedules for different project types (i.e. transit improvements, ITS deployment, environmental impacts)</strong></td>
</tr>
<tr>
<td><strong>Develop a programming and budgeting processes for TSM&amp;O</strong></td>
<td><strong>Identify potential TSM&amp;O program funding source(s) by 2020</strong></td>
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<td></td>
<td><strong>Gain consensus on system-wide evaluation procedure from regional partners by 2018</strong></td>
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<td><strong>Provide guidance and assistance to regional partners for needs assessment and system-wide evaluation by 2019</strong></td>
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### 2.2 Existing Process

The existing processes include long range planning and system-wide evaluations to identify and prioritize transportation projects. These are primarily handled by the MPO/TPOs, and the prioritization process is followed by project development (i.e., concept development, PD&E, ROW, design), which is primarily handled by FDOT and/or local agencies.

#### 2.2.1 MPO/TPO Prioritization Process

The MPO/TPO system-wide planning process begins with the Long Range Transportation Plan (LRTP) and filters through multiple steps to produce a prioritized project list and the 5-year TIP. The TIP may include funding for project development phases, construction, or maintenance and operations of particular projects or programs.
2.2.1.1 Long Range Transportation Plan (LRTP)

Every five years, a system-wide network evaluation is conducted during the LRTP to identify congestion problem areas in the base year condition and in the planning horizon year (typically 30 years out for long range studies). The congestion problem areas are typically identified using a travel demand model and a volume-to-capacity (v/c) ratio, so naturally many of the projects identified in the Needs Plan are road widening, road extensions, or other capacity-based projects. The LRTP also incorporates other modes via projects identified in various master plans (e.g., bike/ped master plans, transit master plans). The Cost Feasible Plan is developed from the identified Needs projects by committee selection.

2.2.1.2 Prioritized Project Lists

Projects from the Cost Feasible Plan are ranked and prioritized by the MPO/TPOs to create a list of prioritized projects. These projects are candidates for funding and can move onto the 5-year Transportation Improvement Program (TIP) list once funding is committed. The 5-year TIP can also include projects submitted by local agencies, which are scored based on varying criteria within each MPO/TPO. Criteria used to score candidate projects may include project type (e.g., highway, TSMO, ped-bike), project benefit, project cost, ROW needs, local support, construction-readiness, funding availability, etc. Prioritized project lists are updated annually and can be amended throughout the year, providing the MPO/TPOs flexibility to react to changing conditions or funding scenarios.

2.2.1.3 Congestion Management Program

Each MPO/TPO maintains a Congestion Management Program (CMP) according to federal requirements. The CMP typically includes an annual study to report the “state of the system” within each MPO/TPO’s planning area. The content of the CMP report varies widely for each MPO/TPO within District Five, but it provides an annual opportunity to check the issues identified throughout the system against the 5-year TIP, the prioritized project list, and the LRTP Cost Feasible Plan.

2.2.2 FDOT Project Development Process

The FDOT project development process typically begins with a planning study and goes through multiple phases including concept development, design, and construction. Complex projects and other projects needing ROW will typically go through PD&E and ROW phases as well. The existing process is described in more detail in the FDOT District Five Multimodal Corridor Planning Guidebook.

The Work Program is a 5-year plan developed and maintained to maximize the department’s production and service capabilities. The Work Program incorporates the MPO/TPO 5-year TIP and DOT internal project. Internal projects may include safety projects, operational projects, RRR projects, bridge maintenance, and others. Projects requested through the MPO/TPO go through the 4P process, and new projects on the prioritized list are submitted with a Project Information Application Form, which
includes basic project information as well as scope, schedule, cost estimate, and location map for each project.

2.2.3 Strengths and Weaknesses

During the 2014 CMF workshop, the strengths and weaknesses for the Business Process dimension were documented as follows:

**Strengths**

• MPO long-range plans include TSM&O in form of intersection improvements in collaboration with other local organizations.
• Projects are being identified and prioritized according to a process driven by data (volumes and bottleneck analyses), for some MPOs/TPOs, not politics.
• Projects take into consideration the impacts on other adjacent intersections and facilities.
• Some MPOs are earmarking funds specifically for signal coordination programs and other TSM&O projects.
• Some MPOs have Management Operations subcommittees that rank projects according to agency priorities.
• MPOs, TPOs, and FDOT coordinate on regional transportation needs when travel patterns transcend several jurisdictional lines (e.g., the Villages). There is also an integrated effort on the funding side, where financial resources of different agencies are pooled to accomplish projects that serve all of the involved agencies.
• TPOs are starting to develop TSM&O master plans.
• Central FDOT office has a 10-year old M&O strategic plan that it uses to allocate TSM&O funds across the districts.
• This funding can be applied to equipment replacement and maintenance needs.
• Funds are also available for freight movement, including TSM&O improvements that facilitate last-mile transport.
• A higher-level planning document for 2030 evaluates and compares several project plan alternatives, but does not break down the costs of each alternative.

**Weaknesses**

• Currently, there is uncertainty regarding where TSM&O fits in the planning process.
• The project development process does not include a formally defined step for considering TSM&O—specifically, how the project can incorporate current TSM&O strategies already deployed, and what new TSM&O programs could be added to the project as well. This results in poor coordination of upcoming projects with current TSM&O operations, and limited checking of compatibility issues between the proposed project and existing TSM&O.
• Technology maintenance and upgrades largely absent from planning and budgeting.
• Planning tools have not been widely developed to properly capture TSM&O project impacts.
• Analyses frequently focus on individual pieces of the network instead of corridor-wide or network-wide traffic flow.
• TSM&O projects may be dropped from MPO plans due to lack of feasible funding sources.
• FDOT plans are well developed for the coming two years, but no detailed long-term plans are clearly defined.
• FDOT funds are insufficient to fully cover district equipment maintenance costs that are necessary to maintain target levels of service.
• The 10-year M&O Strategic Plan used by Central FDOT office is outdated. District 5 deployed earlier, so funds are now being used in other parts of the state.
• Previous activities that may be categorized as TM&O focus on highways with less emphasis on operational improvements for transit and other modes. Transit improvements are not always considered as alternatives, and are treated in an unstructured, non-systematic way when included. No sustainable budget exists for transit operations.
• TSM&O arterial plans are not holistic and may fail to consider pedestrian safety among other factors – which may vary according to local context (e.g., pedestrian needs in areas with high transit use).

Figure 3: 2014 CMF Self-Assessment Business Process Dimension Strengths and Weaknesses
2.3 CMF Level

Based on the strengths and weaknesses of the District and progress through March 2014, the consensus capability level for the Business Process Dimension was 1.5.

Identification of Desired Outcomes and Products

The desired outcome of the Business Processes dimension is to develop a regional TSM&O program with consideration for a District wide approach that would include all key inter-modal planning and programming steps.

The efforts of the implementation plan will focus on reaching a target capability level of 3.0 - Integrated. The levels and corresponding criteria for the Business Process dimension are summarized below in Table 22. The key action items to achieve this level will be discussed within.

Table 2: 2014 CMF Assessment - Business Process Dimension

<table>
<thead>
<tr>
<th>Level</th>
<th>1 — Performed</th>
<th>2 — Managed</th>
<th>3 — Integrated</th>
<th>4 — Optimized</th>
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</thead>
<tbody>
<tr>
<td>Criteria</td>
<td>Each jurisdiction operating independently according to individual priorities and capabilities</td>
<td>Consensus on a regional approach developed regarding TSM&amp;O goals, deficiencies, B/C, networks, strategies and common priorities</td>
<td>Regional program integrated into jurisdictions’ overall multimodal transportation plans with related staged program</td>
<td>TSM&amp;O integrated into jurisdictions’ multi-sectoral plans and programs, based on a formal, continuing planning processes</td>
</tr>
<tr>
<td>Consensus</td>
<td></td>
<td></td>
<td>1.5</td>
<td>Target Capability Level: 3.0</td>
</tr>
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2.4 Proposed Process Updates

Efforts within this implementation plan will focus on the improvement from a Level 2 to a Level 3. As outlined in the AASHTO Guidance, the improvement from Level 2 to Level 3 can be summarized as follows:
From | Multiyear statewide TSM&O plan and program with deficiencies, evaluation, and strategies (L2)
---|---
To | Programming, budgeting, and project development processes for TSM&O standardized and documented (L3)
By | Developing multiyear statewide TSM&O plan and related process improvements

The corresponding key action items developed through the CMM and AASHTO guidance are as follows:

- Planning Process Action Plan
- Programming/Budgeting Action Plan
- Project Development/Procurement Action Plan

2.4.1 MPO/TPO Prioritization Process

MPO/TPO processes can be enhanced with more data-driven decision-making. The data-driven shift can be supported by better use of metadata and the development of tools designed to provide the appropriate level of analysis at each step in the process.

Performance measures are fundamental to the project identification and prioritization process, providing an underlying foundation to what we do and why we do it. FHWA continues to finalize its rulemaking regarding MAP-21/FAST Act performance measures. MPOs will be required to set targets and report on these performance measures related to congestion, reliability, and safety. As the MPOs revisit their performance measures to ensure consistency with new federal requirements, there is an opportunity to also adjust their goals and objectives to be more outcome-oriented and tie-in directly to their stated performance measures and performance targets.

2.4.1.1 Long Range Transportation Plan

Proposed short-term and long-term changes are suggested for the LRTP. In the short-term, a reduced planning horizon of 15 years is suggested with an emphasis on risk-based planning. A list of candidate corridors can be identified from the adopted travel demand model meeting the following criteria:

- Constrained corridors with capacity issues (v/c greater than 1.0), or
- Severely congested corridors (v/c greater than 1.1)

A corridor plan can be developed for each candidate corridor to identify opportunities to implement TSMO strategies and maximize efficiency in the short-term. The following levels for TSMO strategy consideration and implementation are suggested as a guide:
<table>
<thead>
<tr>
<th>Level 1</th>
<th>Consider Transit Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ensure pedestrian and bicycle connectivity</td>
</tr>
<tr>
<td></td>
<td>Staff for maintenance of signal system</td>
</tr>
<tr>
<td></td>
<td>Start reporting metrics for signal system</td>
</tr>
<tr>
<td></td>
<td>Consider investments in Alternative Intersection Design</td>
</tr>
<tr>
<td>Level 2</td>
<td>Establish communication to roadside</td>
</tr>
<tr>
<td></td>
<td>Provide enhanced controllers and detection</td>
</tr>
<tr>
<td></td>
<td>Count Pedestrians and Bikes</td>
</tr>
<tr>
<td></td>
<td>Calibrate Demand Model for features during updates</td>
</tr>
<tr>
<td>Level 3</td>
<td>Staff for operations</td>
</tr>
<tr>
<td></td>
<td>Outfit buses with AVL and APCs</td>
</tr>
<tr>
<td>Level 4</td>
<td>Add cameras</td>
</tr>
<tr>
<td></td>
<td>Improve Transit Coverage</td>
</tr>
<tr>
<td></td>
<td>Improve Ped/Bike OoS</td>
</tr>
<tr>
<td></td>
<td>Add pre-emption via CV</td>
</tr>
<tr>
<td>Level 5</td>
<td>Add AVI for vehicles likely CV</td>
</tr>
<tr>
<td></td>
<td>Implement Integrated Corridor Management</td>
</tr>
<tr>
<td>Level 6</td>
<td>Consider DMS</td>
</tr>
<tr>
<td></td>
<td>Consider Adaptive Signal Control</td>
</tr>
<tr>
<td></td>
<td>Consider TMC</td>
</tr>
</tbody>
</table>

**In the long-term**, the travel demand model should be enhanced to incorporate nonrecurring congestion and multimodal measures of effectiveness. Quality of service and multimodal measures of effectiveness will need to be developed. Incorporating the SHRP2 C11 module into the CFRPM is one opportunity to incorporate nonrecurring congestion (i.e., reliability) into the next round of LRTP updates. This has been done successfully in Hillsborough County as described in the [FDOT SHRP 2](#).
Travel Time Reliability Analytical Product Implementation report. An enhanced, multimodal travel demand model would provide the opportunity to identify areas of concern regarding mobility, and analytics can be run to overlay areas of opportunity for economic development, social improvement, and environmental stewardship.

2.4.1.2 Prioritized Project Lists

As mentioned above, project scoring criteria varies for each MPO/TPO. Each MPO/TPO should revisit their project prioritization process to ensure the process is data-driven and aligns well with their stated objectives and performance measures. As part of the implementation plan, FDOT is offering to assist each MPO/TPO in developing a project scoring tool to incorporate individual metrics or a single scoring metric to provide consistency in its prioritization process. The tool should be capable of capturing the benefits of TSMO strategies to provide an unbiased comparison with other projects.

2.4.1.3 Congestion Management Program

The CMP provides a valuable opportunity to verify (or to challenge) the need for the projects on the prioritized list. As part of the implementation plan, FDOT is offering to assist each MPO/TPO in developing a CMP tool with the potential to consider multiple performance dimensions, including:

- **Mobility** – use metadata (HERE and/or INRIX) to quantify non-recurring congestion.
- **Environmental** – (Soraya to provide existing effort at FTE)
- **Land Use** – supplement comprehensive plan data with real-time permit information and construction status.
- **Economic Impact** – data analytics to measures changes in new business, residential values, income, etc.
- **Social Impact** – data analytics to measure walkability, downtown creation, improved population diversity, reduced crime, improve education, etc.

2.4.2 FDOT Project Development Process

UNDER DEVELOPMENT

2.5 Task Action Matrix

Tables # - # illustrate the Action Plans and task action item matrices to support the development of the three key action items listed above.
Table 3: Business Process Task Action Matrix

UNDER DEVELOPMENT
Organization & Staffing

The Organization and Staffing dimension was identified as a priority action item for FDOT District 5 by the FHWA through the CMM process. Strengthening the District’s Organization and Staffing will provide for an efficient execution of processes supporting effective programs and it requires appropriate combination of coordinated organizational functions and technical qualified staff with clear management authority and accountability.
### 3.1 CMF Existing Level

Based on the strengths and weaknesses of the District and progress through March 2014, the consensus capability level for the FDOT was a 2.0. The efforts of the implementation plan will focus on reaching a target capability level of 4.0 - Optimized. The levels and corresponding criteria for the Organization and Staffing dimension are summarized in Table 4 below.

**Table 4: 2014 CMF Assessment – Organization & Staffing Dimension**

<table>
<thead>
<tr>
<th>Level</th>
<th>1 — Performed</th>
<th>2 — Managed</th>
<th>3 — Integrated</th>
<th>4 — Optimized</th>
</tr>
</thead>
</table>
| Criteria | TSM&O added to units within existing structure and staffing -- dependent on technical champions | TSM&O-specific organizational concept developed within/among jurisdictions with core capacity needs identified, collaboration takes place | Program includes TSM&O Managers which have direct access to top management; Job specs, certification and training for core positions  
• Key staff positions identified | TSM&O senior managers at equivalent level with other jurisdiction services and staff professionalized  
• Key staff positions filled |
| Consensus | 1 for MPOs and Counties | 2 for FDOT | Target Capability Level: 3.0 |
During the 2014 CMF workshop, the strengths and weaknesses for the Organization & Staffing dimension were documented as follows:

**Strengths**

- Some districts and MPOs/TPOs recognize the value of dedicating staff to TSM&O.
- District 5 has the largest FDOT ITS-related staff.
- Funding is available to provide new FDOT staff members with training on department systems.
- Several department functions have been outsourced, with public-private partnerships being used to bridge staffing gaps within FDOT.
- Procedures are in place to ensure that FDOT core competencies are retained even as critical functions are outsourced.
- Increased outsourcing of functions has placed additional management responsibilities on FDOT staff members, who now have broader knowledge about effective management methods.
- FDOT personnel are also becoming familiar with several different business/operational lines within the department, as a consequence of their contract maintenance responsibilities.
- Agencies are becoming increasingly efficient by consolidating more functions to fewer positions, and increasing compensation to those staffers accordingly.

**Weakness**

- A lack of redundancy in staff functions leads to service disruptions when personnel depart the agency.
- There is a steep learning curve associated with outsourcing department functions to contractors, as they must become familiar with agency plans, agency policies, and the local context/environment before they can begin.
- This process must be repeated every time a staffing change occurs for an outsourced position, creating even greater inefficiency.
- FDOT District representatives, at the state-wide level, have strong engineering backgrounds, but have limited planning knowledge and experience.
- There is uncertainty regarding where TSM&O fits into the organizational structure of the department.
- Reduced staffing levels make it difficult to establish dedicated staff positions for TSM&O within the department. In many circumstances, these functions end up among those outsourced.

**Identification of Desired Outcomes and Products**

The desired outcome of the Organization and Staffing is to establish an organized and integrated TSM&O program that provides consolidated benefit to FDOT, and the participating MPOs / local municipalities. The collaborative organizational structure shall include the utilization of the Team of Champions for facilitating all facets into the TSM&O program (roadway, freight, multi-modal and transit).
As outlined in the AASHTO Guidance, the improvement from Level 2 to Level 3 can be summarized as follows:

<table>
<thead>
<tr>
<th>From</th>
<th>Relationship among roles and units rationalized and core staff capacities identified (L2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To</td>
<td>Top level management position and core staff for TSM&amp;O established in central office and districts (L3)</td>
</tr>
<tr>
<td>By</td>
<td>Integrating TSM&amp;O organization and staff into overall agency structure and clarifying reporting relationships</td>
</tr>
</tbody>
</table>

### 3.2 TSM&O Organization & Staffing Goals and Objectives

Based on the identified strengths and weaknesses of the 2014 Organization & Staffing Dimension of the TSM&O Program, and the desired capability and maturity framework, a series of goals and objectives of this dimension have been developed in order to define necessary task action items for the District.

**Table 5: Organization & Staffing Goals and Objectives**

<table>
<thead>
<tr>
<th>Goals</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSM&amp;O-specific organizational concept developed within/among jurisdictions with core capacity needs identified, collaboration takes place</td>
<td>Establish TSM&amp;O program organizational chart as a resource for local agencies by 2018</td>
</tr>
<tr>
<td></td>
<td>Identify opportunities for resource-sharing within the region on personnel and infrastructure by 2018</td>
</tr>
<tr>
<td>Program includes TSM&amp;O program organizational chart for the District with direct access to top management</td>
<td>Establish FDOT District Five TSM&amp;O program Organization and Staffing structure by 2018</td>
</tr>
<tr>
<td></td>
<td>Establish job specifications, certifications and qualifications for each TSM&amp;O program position by 2018</td>
</tr>
<tr>
<td></td>
<td>Establish clearly defined roles and responsibilities within the project development life cycle by 2018</td>
</tr>
</tbody>
</table>

**Identification of Desired Outcomes and Products**

The desired outcome of the Organization and Staffing is to establish an organized and integrated TSM&O program that provides consolidated benefit to FDOT, and the participating MPOs / local municipalities. The collaborative organizational structure shall include the utilization of the Team of Champions for facilitating all facets into the TSM&O program (roadway, freight, multi-modal and transit).
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<tr>
<td>To</td>
<td>Top level management position and core staff for TSM&amp;O established in central office and districts (L3)</td>
</tr>
<tr>
<td>By</td>
<td>Integrating TSM&amp;O organization and staff into overall agency structure and clarifying reporting relationships</td>
</tr>
</tbody>
</table>

### 3.3 Proposed Roles & Responsibilities

Multidisciplinary collaboration is key to the success of a TSM&O program. As with most transportation programs, different parties are primarily responsible for different deliverables at various stages of a project. The expected level of involvement for each role throughout the process is illustrated in Figure 5.

![Figure 5: Functional Unit Levels of Involvement in Project Life Cycle](image)

Additional detail on the proposed roles and responsibilities are summarized in Table 6 and in the subsequent sections.
Table 6: Functional Unit Levels of Involvement in Project Life Cycle

<table>
<thead>
<tr>
<th>Role</th>
<th>System Wide Planning</th>
<th>Planning Study</th>
<th>Concept Development</th>
<th>Design</th>
<th>Construction</th>
<th>Testing</th>
<th>O&amp;M</th>
<th>Monitoring</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td><strong>Lead</strong></td>
<td><strong>Lead</strong></td>
<td><strong>Lead</strong></td>
<td>Engaged</td>
<td>Engaged</td>
<td>Engaged</td>
<td><strong>Lead</strong></td>
<td>Engaged</td>
<td>Engaged</td>
</tr>
<tr>
<td>Traffic Operations</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Engaged</td>
<td>Support</td>
<td><strong>Lead</strong></td>
<td>Support</td>
<td>Engaged</td>
</tr>
<tr>
<td>ITS</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Engaged</td>
<td>Support</td>
<td><strong>Lead</strong></td>
<td>Support</td>
<td>Engaged</td>
</tr>
<tr>
<td>Right-of-Way</td>
<td>Engaged</td>
<td>Support</td>
<td>Support</td>
<td>Support</td>
<td>Engaged</td>
<td>Engaged</td>
<td>Engaged</td>
<td>Engaged</td>
<td>Engaged</td>
</tr>
<tr>
<td>Design</td>
<td>Engaged</td>
<td>Support</td>
<td>Support</td>
<td><strong>Lead</strong></td>
<td>Support</td>
<td>Support</td>
<td>Engaged</td>
<td>Engaged</td>
<td>Engaged</td>
</tr>
<tr>
<td>Construction</td>
<td>Engaged</td>
<td>Engaged</td>
<td>Engaged</td>
<td><strong>Lead</strong></td>
<td><strong>Lead</strong></td>
<td>Engaged</td>
<td>Engaged</td>
<td>Engaged</td>
<td>Engaged</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Engaged</td>
<td>Engaged</td>
<td>Engaged</td>
<td>Engaged</td>
<td>Engaged</td>
<td>Engaged</td>
<td>Support</td>
<td><strong>Lead</strong></td>
<td></td>
</tr>
</tbody>
</table>
3.3.1 Planning

The transportation planner is involved at both the systems and project levels. Planning at the systems level is usually led by an MPO or TPO, with input from local municipal planning departments, and support from the state planning agency. Systems level planning involves the development of system-wide evaluations, long range plans, and congestion management plans.

Planners also fulfill key roles at the project level by supporting planning-level traffic studies, concept development, Concepts of Operations, Systems Engineering Management Plans, ITS Master Plans, or the development of the performance metrics for monitoring purposes.

Data collection has historically been done by Planners to support system-wide evaluations and project-specific planning studies. However, with the dawn of big data, ITS and traffic engineers are increasingly collecting and using real-time data for operations and maintenance. A concentrated effort is needed to provide Planners with training and access to the real-time data to enhance their performance monitoring and system-wide evaluation functions.

Because the Planner takes the lead role at the front end (system-wide evaluation and project identification) and the back end (performance monitoring) of the project lifecycle, the Planner is uniquely positioned to assemble the stakeholder team and play the role of Project Champion. A Project Champion is needed to ensure smooth transitions between phases and maintain the project’s purpose and need throughout the project lifecycle. The stakeholder team should consist of various FDOT experts as well as representative from the local maintaining agency at an early stage to ensure consistency with other planned projects and to head off potential pitfalls in design or implementation.

**DO’s**
- Base prioritization decisions on agreed-upon goals and objectives, expected outcomes, and known constraints
- Provide continuity throughout the TSM&O lifecycle by making data and communication available to all experts
- Monitor performance beyond the end of the TSM&O lifecycle to estimate project- and system-level payoffs

**DON’Ts**
- Prioritize projects based solely on stakeholder pressure or anecdotal evidence
- Forget about the project after the planning-led efforts are complete
- Skip performance monitoring at the end of a project
### 3.3.2 ITS Engineering

The TSM&O program considers projects of different types and varying levels of complexity. For projects that incorporate ITS elements, the involvement of ITS engineers early in the process will help to identify implementable alternatives that are consistent with the Regional ITS Architecture (RITSA). During the early system planning stage, ITS engineers can also provide valuable access to data, lend their expertise on technology, and assist in the establishment of performance measures to be carried forward in the TSM&O lifecycle.

In the project development process, ITS engineers work with planners to develop feasibility assessments and Concepts of Operations (ConOps) reports, and ITS engineers work with transportation planners on the system verification and validation process that follows the completion of a project. ITS engineers also play a lead role in facility operations where ITS is involved.

**DO’s**

- Be engaged in the systems- and project- level planning efforts
- Provide timely and clear input on the advantages and disadvantages of different ITS technologies
- Encourage the use of the systems engineering approach to develop a management plan for the project
- Incorporate data quality control and assurance as part of ITS deployments
- Share data with other units

**DON’Ts**

- Wait for projects to be handed down from planning—by which time input would be less likely to be considered
- Let sporadic errors in the data prevent data sharing—simply document and caveat the inconsistencies
- Confuse data ownership with data integration—data can be stored in a central location yet the owner can maintain control over it

### 3.3.3 Traffic Operations

The TSM&O program requires involvement and coordination from traffic operations in the planning phase. At the systems level, traffic operations staff can provide valuable access to data, provide technical assistance on system wide improvements, and assist in the establishment of performance measures to be carried forward in the TSM&O lifecycle.

In the planning phase, traffic operations professionals can provide input as a stakeholder and technical advisor. In the project development process, traffic operations professionals can coordinate with transportation planners on the assumptions of the project prior to the design and implementation process. Similar to
the planning phase, traffic operations professionals can work with transportation planners to monitor performance after a project is implemented, and they take the lead role in operations of the facility.

**DO’s**
- Be engaged in the systems- and project- level planning efforts
- Use data analysis skills to compute and communicate performance measures that can inform the selection of alternatives
- Participate in performance monitoring activities after projects are implemented.

**DON’Ts**
- Wait for projects to be handed down from planning—by which time input would be less likely to be considered
- Neglect to consider a wide range of future scenarios when calculating performance measures
- Discard operational data—it can be valuable in future studies

### 3.3.4 Right of Way (ROW)

ROW staff do not typically provide input at the systems level. However, ROW staff will typically be involved at the project level during the conceptual plan development as well as the project development phase. During conceptual plan development, ROW staff are consulted to determine the potential risk of various alternatives. In addition, ROW staff is significantly engaged during design for more detailed assessment of the ROW cost and acquisition implications.

**DO’s**
- Provide early input to planners and engineers to help estimate the ROW costs of different alternatives
- Perform ROW analyses at different levels of detail and accuracy to match the needs of different stages of the TSM&O lifecycle

**DON’Ts**
- Wait until the alternative selection process is complete to evaluate ROW impacts
- Forget about the project once the ROW-led parts are complete

### 3.3.5 Design

Design professionals play a key role in the project development process and lead the design stage. However, they should be consulted early in the process to inform the identification of alternatives and feasibility of projects under consideration.

Similarly, design professionals can continue to contribute to a TSM&O program beyond the completion of final design plans. Providing support to the construction and maintenance roles can make their jobs easier—and can result in valuable feedback on the actual performance of a design.
3.3.6 Construction

The construction professional should be involved in a minor role as a stakeholder during early planning and concept development. It is important on critical projects for construction engineers to review project concepts for constructability concerns. Construction takes center stage during the build and implementation phase of the TSM&O lifecycle. The construction role is primarily responsible for implementing the design plans and/or the Systems Engineering Management Plan.

Note that the construction role is not limited to the construction of roadway infrastructure but may include the installation of ITS equipment, the development of ITS software applications, or signal re-timing. This role includes testing or inspecting the newly-built project to ensure that it performs as expected.

**DO’s**
- Share hands-on expertise with planners and traffic operations/design engineers early on
- Review the work done in the feasibility and concept exploration stages
- Adhere to principles of Systems Engineering: performing decomposition and definition first, and integration and verification afterwards

**DON’Ts**
- Wait until the final design plans arrive to provide constructability advice
- Wait until the work is fully finished to start testing; unit testing can catch errors when they are still easy to address

3.3.7 Maintenance

The maintenance role is critical in both the system and project levels of the TSM&O program. As a stakeholder at the system level, maintenance staff can provide valuable information on the state of the physical system.

At the project level, it is critical to engage maintenance staff in the planning phase to understand maintenance and regional architecture from a condition and asset management perspective. The maintenance role then takes the lead in keeping the newly built facilities in optimal conditions, working in tandem with traffic operations and ITS professionals. Lessons learned by maintenance staff can also be valuable to future decision-makers as they seek to select the most cost-effective alternatives over a project’s lifecycle.
DO’s
- Provide input on maintenance costs during the alternative analysis and feasibility stages
- Use asset management knowledge to improve understanding of existing conditions

DON'Ts
- Discard maintenance data—it can be valuable in future studies
- Let sporadic errors in the data prevent data sharing—simply document and caveat the inconsistencies
- Confuse data ownership with data integration—data can be stored in a central location yet the owner can maintain control over it

3.3.8 Task Action Matrix
As previously mentioned, the district is aiming to improve from a 2.0 to 4.0 capability level. Therefore, the key tasks must be broken down from a level 2.0 to 3.0 and level 3.0 to 4.0. For any given dimension, each new level of capability is designed to establish the basis for the subsequent step and therefore must be fully implemented before taking actions related to the next level. After initial implementation of the action, time is needed for the required arrangements to “settle in,” so that processes and roles become routine. Agency experience determined through research suggests that after a significant change is made, 12-15 months are needed for the change to be mainstreamed. Therefore, this implementation plan will identify the District efforts to achieve a 3.0 capability level and the necessary next steps to reach the target 4.0 capability level.

District 5 has the largest FDOT ITS-related staff. Funding is available to provide new FDOT staff members with training on department systems. There is uncertainty regarding where TSM&O fits into the organizational structure of the department.

Table 7: Organization & Staffing Task Action Matrix
UNDER DEVELOPMENT

The corresponding key action items developed through the CMM and AASHTO guidance are as follows:
- Program Status Action Plan
- Organization and Structure Action Plan
- Staff Development Action Plan
- Staff Recruitment and Retention Action Plan
3.4 Program Status Action Plan

*Task Action Item 1*: Develop a case for top level organizational unit status appropriate to formal program of equal importance to mission.

*Sub Task A*: Identify key features of responsibility and authority, including span of control and reporting/accountability that are essential to a formal agency program that is expected to make explicit and accountable contributions to agency mission.

*Status summary:*

*Task Action Item 2*: Develop systems for accountability appropriate to unit responsibilities for TSM&O-related outputs or outcomes.

*Sub Task A*: Identify performance measures for both activity effectiveness (outputs and outcomes) and unit effectiveness, with appropriate level of accountability at the unit level.

*Status summary:*

*Task Action Item 3*: Establish the appropriate process for responding to MPO and local municipality questions.

*Status summary:*

3.5 Organization and Structure Action Plan

*Task Action Item 1*: Clarify and/or establish central office vs. regional/district roles and establish regular process for internal accountability.

*Sub Task A*: Identify key features of responsibility and authority, including span of control and reporting/accountability that are essential to a formal agency program that is expected to make explicit and accountable contributions to agency mission.

*Status summary:*

*Task Action Item 2*: Develop systems for accountability appropriate to unit responsibilities for TSM&O-related outputs or outcomes.

*Sub Task A*: Determine the allocation of functions that can be efficiently centralized vs. dispersed to districts/regions, based on the existing “organizational concept of operations” (see L1-L2, Action A). In most cases responsibility for real-time TSM&O activities and the related local partnerships will be at the regional or corridor level. The organization structure and reporting relationships may be consolidated or decentralized depending on the scope of regional programs and the value of consolidation for shared function.

*Status summary:*

*Task Action Item 7*: Investigate an internal online forum as a means for sharing information and asking questions about TSM&O.
4 Culture

Culture is defined as “the combination of values, assumptions, knowledge and expectations of the agency in the context of its institutional and operating context, and expressed in its accepted mission and related activities.” Culture is also the combination of values, assumptions, knowledge and expectations of the agency in the context of its institutional and operating context, and expressed in its accepted mission and related activities. District Five has embarked on several tasks to solidify the Culture of TSM&O both internally, and when governing agencies within District Five. Within this chapter, the existing CMF Level, as self-assessed by the District and corresponding Culture implementation tasks are presented.

4.1 CMF Existing Level

During the CMF workshop, the existing 2014 capability level for the Culture Dimension was identified as level 1.5 for MPOs, FDOT, and Transit Agencies, and 1.0 for Counties. Through the efforts of this implementation plan, the target capability level of the Culture dimension is level 3.0. A description of each level for the Culture dimension can be found below.
Table 8: 2014 CMF Assessment – Culture Dimension

<table>
<thead>
<tr>
<th>Level</th>
<th>1 — Performed</th>
<th>2 — Managed</th>
<th>3 — Integrated</th>
<th>4 — Optimized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria</td>
<td>Individual Staff champions promote TSM&amp;O</td>
<td>Jurisdictions’ senior management understands TSM&amp;O business case and educates decision makers/public</td>
<td>Jurisdictions’ mission identifies TSM&amp;O and benefits with formal program and achieves wide public visibility/understanding. Funding focus shifts from constructing new facilities to more efficiently operating existing ones.</td>
<td>Customer mobility service commitment accountability accepted as formal, top level core program of all jurisdictions</td>
</tr>
<tr>
<td>Consensus</td>
<td>1.5 for MPOs, FDOT, transit</td>
<td>1 for Counties</td>
<td>Target Capability Level: 3.0</td>
<td></td>
</tr>
</tbody>
</table>

The current level is indicative of the 2014 progress, such as the development and executive board review of the TSM&O Strategic Plan and Central office TSM&O workshops with all districts focused on improving understanding and the roles of various units. As indicated in a level 1 capability, TSM&O efforts within the district are championed by individuals, however, there is no formal, institutional treatment of TSM&O with respect to funding within FDOT. As of the CMF self-assessment in 2014, capacity improvement projects were generally considered first, with TSM&O being taken to an afterthought. Participating agencies also noted that maintenance and operations are not as interesting to the public as capital projects, making sustained TSM&O difficult to fund unless service is becoming visibly degraded.

A full list of the documented strengths and weaknesses for the Culture dimension is provided in Figure 6, on the subsequent page:
TSM&O Culture Goals and Objectives

Based on the identified strengths and weaknesses of the 2014 Culture Dimension of the TSM&O Program, and the desired capability and maturity framework, a series of goals and objectives of this dimension have been developed in order to define necessary task action items for the District.
Table 9: Culture Goals and Objectives

<table>
<thead>
<tr>
<th>Goals</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>To establish a formal TSM&amp;O program within the District</td>
<td>Obtain FDOT leadership buy-in on the TSM&amp;O Implementation Plan by 2018</td>
</tr>
<tr>
<td>To establish the regional mission to identify TSM&amp;O and its benefits by utilizing a formal program.</td>
<td>Obtain regional stakeholder buy-in on a TSM&amp;O program by 2018 - Obtain MOU’s from regional stakeholders by 2018 (measure)</td>
</tr>
<tr>
<td></td>
<td>Support regional partners to develop their own TSM&amp;O program/process by 2018</td>
</tr>
<tr>
<td>To achieve wide public visibility/understanding of TSM&amp;O program benefits within the District.</td>
<td>Producing materials for both leadership and public to illustrate benefit-cost of the TSM&amp;O program and network-operational improvements by 2018</td>
</tr>
<tr>
<td>Funding focus shifts from constructing new facilities to more efficiently operating existing ones</td>
<td>Obtain a dedicated funding source for operational improvements by 2020</td>
</tr>
<tr>
<td></td>
<td>Implement the TSM&amp;O checklist in all planning projects</td>
</tr>
</tbody>
</table>

### 4.3 Proposed Education and Outreach

The desired outcome of the Culture dimension is to implement a TSM&O program which is supported by Senior Management, familiar to all stakeholders within the District, and provides continuous education and outreach for maximum exposure of its benefits. The District’s proposed plan includes a methodology which coordinates with the MPOs/TPOs to familiarize board members about TSM&O, gradually exposing them to the relevant concepts and payoffs, thus enabling them to make informed decisions about future projects. In addition, building upon the efforts, within the District, the proposed Culture outreach includes the preparation of statewide materials to provide a persuasive “business case” for TSM&O. These materials would include local and statewide examples, but would need to be designed to keep expectations realistic. The following should be considered in the development of the materials:

- Develop materials to address different audiences, such as engineering staffs, the public and political leaders.
- Develop guidance regarding the use of the materials, so that they are focused on the local context when they are distributed.
- Include examples of the impacts it would have on the lives of the people in the area of the proposed project.
- Discuss the impacts and implications of not doing the project as well.

Throughout the implementation process, the District will build the Culture of the District’s TSM&O practice by examining agencies that are deploying TSM&O effectively, and identifying ways to emulate their successes within FDOT.
4.4 Task Action Matrix

As outlined in the AASHTO Guidance, the improvement from Level 2 to Level 3 can be summarized as follows:

<table>
<thead>
<tr>
<th>From</th>
<th>Agency-wide appreciation of the value and role of TSM&amp;O (L2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To</td>
<td>TSM&amp;O accepted as a formal core program (L3)</td>
</tr>
<tr>
<td>By</td>
<td>Establishing TSM&amp;O with a formal core business program status equivalent to other major programs</td>
</tr>
</tbody>
</table>

The corresponding key action items developed through the CMM are provided in Table 10.
Table 10: Culture Task Action Matrix

UNDER DEVELOPMENT
5

Collaboration

The FDOT District 5 TSM&O Implementation effort is supported by the SHRP2 grant. As identified in the SHRP2 requirements, a successful implementation requires the support of all District units, MPOs, Transit Agencies, and local governments, hence, the necessity of a collaborative approach. The effectiveness of most strategies is dependent on improving the coordinated performance of each partner.

5.1 CMF Existing Level

Based on the strengths and weaknesses of the District and progress through March 2014, the consensus capability level for the FDOT was a 2.0.

Identification of Desired Outcomes and Products

The desired outcome of the Collaboration dimension is to establish a working plan which makes the best use of unique and shared resources to overcome technical, staffing and financial constraints of TSM&O implementation.

The efforts of the implementation plan will focus on reaching a target capability level of 3.0 - Integrated. The levels and corresponding criteria for the Collaboration dimension are summarized in Table 11 on the following page. The key action items to achieve this level will be discussed within.
### Table 11: 2014 CMF Assessment – Collaboration Dimension

<table>
<thead>
<tr>
<th>Level</th>
<th>1 — Performed</th>
<th>2 — Managed</th>
<th>3 — Integrated</th>
<th>4 — Optimized</th>
</tr>
</thead>
</table>
| Criteria | TSM&O added on to units within existing structure and staffing -- dependent on technical champions | TSM&O-specific organizational concept developed within/among jurisdictions with core capacity needs identified, internal and external collaboration takes place | TSM&O Managers have direct access to top management; Job specs, certification and training for core positions. Operations and Planning work cohesively in the TSM&O Program  
- Organization/partners aligned | TSM&O senior managers at equivalent level with other jurisdiction services and staff professionalized |
| Consensus | 2 | Target Capability Level: 3.0 | | |

A full list of the documented strengths and weaknesses for the Collaboration dimension is provided in Figure 7 on the subsequent page:
Collaboration

Figure 7: 2014 CMF Self-Assessment Collaboration Dimension Strengths and Weaknesses

5.2 TSM&O Collaboration Goals and Objectives

Based on the identified strengths and weaknesses of the 2014 Collaboration Dimension of the TSM&O Program, and the desired capability and maturity
framework, a series of goals and objectives of this dimension have been developed in order to define necessary task action items for the District.

Table 12: Collaboration Goals and Objectives

<table>
<thead>
<tr>
<th>Goals</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSM&amp;O Managers have direct access to District leadership</td>
<td>Formalize a communication plan between District leadership and TSM&amp;O Management Team by 2018</td>
</tr>
<tr>
<td>Ensure coordination between different functional units within the Department</td>
<td>Establish a communication process consistent with the TSM&amp;O project development life cycle by 2018 Establish clearly defined roles and responsibilities of functional units by 2018</td>
</tr>
<tr>
<td>Identify job specifications, certification and training for core positions.</td>
<td>TSM&amp;O program job specifications, certifications, and training identified within the Organization &amp; Staffing Dimension</td>
</tr>
<tr>
<td>Establish regular communication and collaboration between the District and regional/local agencies (i.e. MPOs/TPOs, counties, cities, transit agencies, emergency responders, safety officers)</td>
<td>Establish a plan for regional collaborative meetings on a bi-monthly or quarterly basis by 2017 Establish a resource-sharing forum for education and guidance materials on the Department's website by 2018</td>
</tr>
<tr>
<td>Identify opportunities to share communication infrastructure between the District and local agencies</td>
<td>Identify District and local agency needs for data and communication infrastructure by 2018 Identify opportunities for resource-sharing within the region on personnel and infrastructure by 2018</td>
</tr>
</tbody>
</table>

5.3 Proposed Districtwide Collaboration (TSM&O Consortium/Regional Working Group)

As outlined in the AASHTO Guidance, the improvement from Level 2 to Level 3 can be summarized as follows:

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular collaboration at regional level (L2)</td>
<td>Collaborative interagency adjustment of roles/responsibilities by formal interagency agreements (L3)</td>
<td>Executing formal interagency agreement for cooperative approach</td>
</tr>
</tbody>
</table>

The corresponding key action items developed through the CMM are as follows:

Hold workshops with DOT to discuss roadway operational factors that may impact transit service.

- Organize a consortium to identify components of ICM that can be pursued without waiting on outside funding.
- Formalize agreements for the sharing of communications infrastructure between the state and local agencies.
- Conduct a comprehensive inventory of equipment (including communications infrastructure) develop a strategy for making the business case to upper management funding for asset management efforts
• Provide ongoing training for emergency responders regarding congestion mitigation and traffic management, to address the loss of this knowledge and experience through staff turnover. Possible channels for this training include CTST, quarterly leadership meetings, and biweekly incident management outreach meetings.

• Develop a “forum” with appropriate participants (building on CMM workshop attendance) to consider broad regional TSM&O issues

5.4 Task Action Matrix

Table 13: Collaboration Task Action Matrix
UNDER DEVELOPMENT

5.5 Overview of Progress to Date

5.5.1 TSM&O Consortium
• Purpose and History
• Frequency
• Attendees

5.5.2 Regional Working Group
• Purpose and History
• Frequency
• Attendees

5.5.3 ITS Master Plan
• Purpose and History
• MOU’s

5.5.4 Next Steps
6 Systems and Technology

The Systems and Technology dimension focuses on the use of the appropriate processes for design and implementation of TSM&O systems to ensure that the needs of the region are appropriately addressed, that systems are implemented in an efficient manner, and interoperability with other systems is achieved.

6.1 CMF Existing Level

Based on the strengths and weaknesses of the District and progress through March 2014, the consensus capability level for the FDOT was a 1.0 for transit and 1.5 for arterials and highways.

Identification of Desired Outcomes and Products

The desired outcome of the Systems and Technology dimension is an update to the regional /district architecture through the ITS Florida and MIMS initiatives. The updated plans should support a standardized district wide resource with consistent district-wide arterial management.

The efforts of the implementation plan will focus on reaching a target capability level of 3.0 - Integrated. The levels and corresponding criteria for the Systems and Technology dimension are summarized in Table 14 on the subsequent page. The key action items to achieve this level will be discussed within.
Table 14: 2014 CMF Assessment - Systems & Technology Dimension

<table>
<thead>
<tr>
<th>Level</th>
<th>1 — Performed</th>
<th>2 — Managed</th>
<th>3 — Integrated</th>
<th>4 — Optimized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria</td>
<td>Ad hoc approaches to system implementation without consideration of systems engineering and appropriate procurement processes</td>
<td>Regional con-ops and architectures developed and documented with costs included; appropriate procurement process employed</td>
<td>Systems &amp; technology standardized and integrated on a \textit{districtwide} basis (including arterial focus) with other related processes and training as appropriate</td>
<td>Architectures and technology routinely upgraded to improve performance; systems integration/interoperability maintained on continuing basis</td>
</tr>
<tr>
<td>Consensus</td>
<td>1 for transit [1.5 for highways ]</td>
<td>Target Capability Level: 3.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Although the District was previously self-assessed at a 1.0 transit / 1.5 highways, through review of the current status of Systems and Technologies within District 5, it is recognized that the District is currently operating at a Level 2 for this dimension.

A full list of the documented strengths and weaknesses for the Systems and Technology dimension is provided on the following page in Figure 8:
**6.2 TSM&O Systems and Technology Dimension Goals and Objectives**

Based on the identified strengths and weaknesses of the 2014 Systems and Technology Dimension of the TSM&O Program, and the desired capability and maturity framework, a series of goals and objectives of this dimension have been developed in order to define necessary task action items for the District.

**Table 15: Systems & Technology Goals and Objectives**

<table>
<thead>
<tr>
<th>Goals</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional con-ops and architectures developed and documented with costs included; appropriate procurement process employed</td>
<td>Produce a districtwide vision for ITS infrastructure goals and objectives.</td>
</tr>
<tr>
<td></td>
<td>Follow evolving and emerging technology and the applications to the transportation network</td>
</tr>
</tbody>
</table>
Manage ITS assets and infrastructure proactively

Establish asset management strategies for asset inventory and maintenance records.

<table>
<thead>
<tr>
<th>Systems and technology standardized, documented and trained statewide, and new technology incorporated (L3)</th>
<th>Provide consistency across the district on ITS infrastructure connections across jurisdictions and ensure interoperability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset management strategies will provide considerations for asset life cycle to include maintenance and replacement cost.</td>
<td>To provide training as need to local agencies on emerging transportation related technology, processes, or requirements.</td>
</tr>
<tr>
<td>Streamline the systems engineering process and provide districtwide consistency with ConOps and SEMP documentation</td>
<td></td>
</tr>
</tbody>
</table>

### 6.3 Proposed Districtwide Vision (ITS Master Plan, RITSA, etc.)

Efforts within this implementation plan will focus on the improvement from a Level 2 to a Level 3. As outlined in the AASHTO Guidance, the improvement from Level 2 to Level 3 can be summarized as follows:

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems engineering employed and consistently used for ConOps, architecture and systems development (L2)</td>
<td>Systems and technology standardized, documented and trained statewide, and new technology incorporated (L3)</td>
</tr>
<tr>
<td>By</td>
<td>Developing tools, procedures and training to support standardized systems engineering process</td>
</tr>
</tbody>
</table>

The corresponding key action items developed through the CMM and AASHTO guidance are as follows:

- Update regional/district architecture as required by emerging plan implications
- Update standards regularly to stay on the forefront of quickly evolving technologies, with interoperability as the motivating goal.
- Establish a TSM&O asset management strategy that includes life cycle considerations for maintenance and replacement.
- Provide outreach for new streamlined System Engineering Management Plan (SEMP), perform SEMP process sufficiently in advance of project submittal
deadlines for funding. Agree upon an appropriate time to start SEMP in the project planning framework, and educate staff on the process.

6.4 Task Action Matrix

Tables # - # illustrate the Action Plans and task action item matrices to support the development of the three key action items listed above.

Table 16: Systems & Technology Task Action Matrix
UNDER DEVELOPMENT

6.5 Identification of Roles and Responsibilities in the Systems Engineering Process

ITS / Traffic Ops section from Chapter 2 of the Guidebook
Information from Chapter 4 on roles and responsibilities
Performance Measures

It is a common saying, what gets measured, gets improved. Performance measurement is essential as the means of determining program effectiveness, determining how changes are affecting performance, and guiding decision-making. In addition, operations performance measures demonstrate the extent of transportation problems and can be used to “make the case” for operations within an agency and to decision-makers and the traveling public, as well as to demonstrate to them what is being accomplished with public funds on the transportation system.

7.1 CMF Existing Level

During the CMF workshop, the existing 2014 capability level for the Performance Measurement Dimension was identified as level 1 for arterials and level 2 for freeways. Through the efforts of this implementation plan, the target capability level of the Performance Measurement dimension is level 3.0. A description of each level for the Performance Measurement dimension can be found on the subsequent page.
### Table 17: 2014 CMF Assessment - Performance Measures Dimension

<table>
<thead>
<tr>
<th>Level</th>
<th>1 — Performed</th>
<th>2 — Managed</th>
<th>3 — Integrated</th>
<th>4 — Optimized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criteria</td>
<td>Some outputs measured and reported</td>
<td>Output used directly for after-action debriefings and improvements; data easily available and dashboarded</td>
<td>Outcome measures identified (networks, modes, impacts) and routinely utilized for objective-based program improvements</td>
<td>Performance measures reported internally for utilization and externally for accountability and program justification</td>
</tr>
<tr>
<td>Consensus</td>
<td>1 for arterials (not all are instrumented)</td>
<td>2 for freeways</td>
<td>Target Capability Level: 3.0</td>
<td></td>
</tr>
</tbody>
</table>

Key factors identified by stakeholders which lead to the self-assessment within the District was performance metrics are being collected and archived, but those related to reliability are not analyzed, reported, and utilized. There was also limited staff available for processing these metrics. A full list of the documented strengths and weaknesses for the Performance Measurement dimension is provided in Figure 9 on the subsequent page.
### Strengths

- Statewide Annual reports are published on travel times and Interstate performance (some districts publish district-level SunGuide reports)
- Orange County provides performance measures for several travel modes.
- Travel time information is provided to MPOs through the statewide transportation statistics program.
- The centralized database (RITIS) is being developed to house probe-based travel time data that can be used for performance analysis and will be accessible to cities and other agencies.
- At the district level, as part of Transportation Incident Management program, major incident debriefings are held with involved entities to improve their response to similar events in the future. Detailed data, including arrival times for emergency responders, is available to assist with these post-incident performance evaluations.
- The MPO project prioritization process takes performance measures into account – as well as local priority projects.
- Bluetooth tracking is being explored as a means for obtaining automated travel time data.

### Weaknesses

- Budgetary constraints preclude deeper performance reporting.
- Available performance data is largely output focused – rather than outcomes.
- Comparisons regarding the performance of the commuter assistance program from one district to another are difficult to make due to the inconsistent use of performance measures across the districts.
- Data provided by FHWA and FDOT is focused on major highways; but MPOs need data for arterials and other modes.
- Performance measures for non-auto modes are difficult to quantify due to lack of data.
- Performance measures are designed for project-level analyses, and are not currently structured for planning and programming needs. Measures are needed both for reporting and managing.
- No formal structured process exists for tracking performance before and after the deployment of a project, resulting in inconsistent forms of analyses among different projects.

Figure 9: 2014 CMF Self-Assessment Performance Measures Dimension Strengths and Weaknesses

### 7.2 TSM&O Performance Measures Goals and Objectives

Based on the identified strengths and weaknesses of the 2014 Performance Measures Dimension of the TSM&O Program, and the desired capability and maturity framework, a series of goals and objectives of this dimension have been developed in order to define necessary task action items for the District.
Table 18: Performance Measures Goals and Objectives

<table>
<thead>
<tr>
<th>Goals</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify program performance measures</td>
<td>Establish performance measures for each FDOT Unit which accomplish the overall TSM&amp;O program goals and objectives by year 2018</td>
</tr>
<tr>
<td></td>
<td>Obtain consensus on District 5 performance measures for system, corridor, and intersection level analyses by year 2018.</td>
</tr>
<tr>
<td></td>
<td>Utilize Map 21 Performance measures, in which data is readily available, or can be efficiently obtained, to provide consistency with statewide performance measurement initiatives.</td>
</tr>
<tr>
<td>Utilize TSM&amp;O Performance measure for objective-based program improvements</td>
<td>Develop a system wide evaluation tool, which is suitable and customizable for all District stakeholders by YR 2018.</td>
</tr>
<tr>
<td>Utilize Performance measures to enhance the District Five roadway operating conditions</td>
<td>Improve the safety on the District Five roadway network by decreasing the overall crash rate by x percent by year x</td>
</tr>
<tr>
<td></td>
<td>Manage the congestion on the District Five roadway network by decreasing the congested lane-miles by x percent by year x</td>
</tr>
<tr>
<td></td>
<td>Improve the District Five network reliability by reducing the network travel time delay by x percent by year x</td>
</tr>
<tr>
<td></td>
<td>Maximize the District Five return on investment by achieving a total cost/benefit of x by year x</td>
</tr>
</tbody>
</table>

7.3 Proposed System-wide Evaluation (Chapter 3 from Guidebook)

Consistent with FHWA planning initiatives, specifically, the Congestion Management Process (CMP), the District Five TSM&O process proposes a system-wide planning process, which utilizes multimodal performance measures and considers TSM&O strategies at critical decision points in the planning process.

The system planning process is the first step of a comprehensive TSM&O program. The purpose of the process is to identify locations experiencing congestion, safety, or reliability issues. By benchmarking system conditions against agreed upon performance measures, a system can be classified by its ability to meet desired performance targets.
The system-wide planning step is identified below in Figure 10.

Figure 10: System-wide Planning in the V-Diagram

To date, 4 of the 5 MPO/TPO’s within the District have established a system-wide planning process through an established CMP. The status, utilization, and associated performance measures for each agency is provided in

Table 19:

<table>
<thead>
<tr>
<th>Planning Organization</th>
<th>CMP Established?</th>
<th>Utilization</th>
<th>Performance Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake-Sumter MPO</td>
<td>Yes</td>
<td>LRTP, LOPP prioritization</td>
<td>Analysis Provided: Volume to Capacity, Person-Throughput Utilization, Average Delay, Average Crash Rate, Cost of Congestion</td>
</tr>
<tr>
<td>MetroPlan Orlando</td>
<td>Yes</td>
<td>Prioritize funding for TIP</td>
<td>Annual Average Serious Injuries and Fatalities (by Safety Emphasis Area), Vehicle Miles Traveled, Percent of Travel in Generally Acceptable Operating Conditions (Peak Hour), Delay, Travel Time Reliability, Percent Miles Severely Congested (Based on V/C Ratio), Combination Truck Miles, Combination Truck</td>
</tr>
</tbody>
</table>
The performance measures dimension of the District Five TSM&O program must support the existing local system-wide evaluation processes and provide for regional consistency by identifying performance measures for each FDOT unit and travel mode which may also be in-line with local agency priorities.

While it is envisioned that the system-wide planning process will include an evaluation tool, which allows each local agency to adjust performance measures to reflect local priorities, utilizing the statewide MAP 21 performance measures, provides a
comprehensive long list, in which the District may implement with a sufficient data collection plan. The MAP 21 performance measures are provided below.

**FAST Act Performance Measures**

(insert)

The draft performance measures per unit can be found in Table X above.

The District Five TSM&O system-wide planning process and performance measures should continue the efforts within the region of assessing multimodal performance measures that accomplish the following:

- Performance Measures beyond v/C
- Collection of Data (Environmental, Mobility, Land Use)
- Baseline data for future projections
- Operational needs (short term)
- Tool development for long term needs (CMP tool with additional dimensions)
- Data collection plan for various modes and data sets

The appropriate utilization of FDOT System-wide Planning Process is as follows:

![Figure 11: FDOT System-wide Planning Process](image-url)
7.3.1 Big Data
- Planning business case
- Data discovery

7.3.2 Planning Dashboard
- Result of big data pilot project
- Working on performance measures

7.4 Task Action Matrix
As outlined in the AASHTO Guidance, the improvement from Level 2 to Level 3 can be summarized as follows:

<table>
<thead>
<tr>
<th>From</th>
<th>TSM&amp;O strategies measurement largely via outputs, with limited after-action analysis (L2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>To</td>
<td>Outcome measures identified and consistently used for TSM&amp;O strategies improvement (L3)</td>
</tr>
<tr>
<td>By</td>
<td>Developing data collection and management plan to support utilization of outcome performance measures</td>
</tr>
</tbody>
</table>

The corresponding key action items developed through the CMM are provided in Table 20.

Table 20: Performance Measurement Task Action Matrix

UNDER DEVELOPMENT