



Transportation Systems Management and Operations (TSM&O)

The 2017 Traffic Operations Program Plan

What is TSM&O?

The TDOT Traffic Operations Program Plan

The Plan has been developed to support the advancement of TSM&O strategies within the State of Tennessee.

These strategies directly support TDOT's operational goals for system operation and preservation.

Transportation Systems Management and Operations (TSM&O)

An integrated program to optimize the performance of existing infrastructure through the implementation of systems, services, and projects designed to preserve capacity of roadways, increase reliability of the system, and improve safety and efficiency, for travelers.

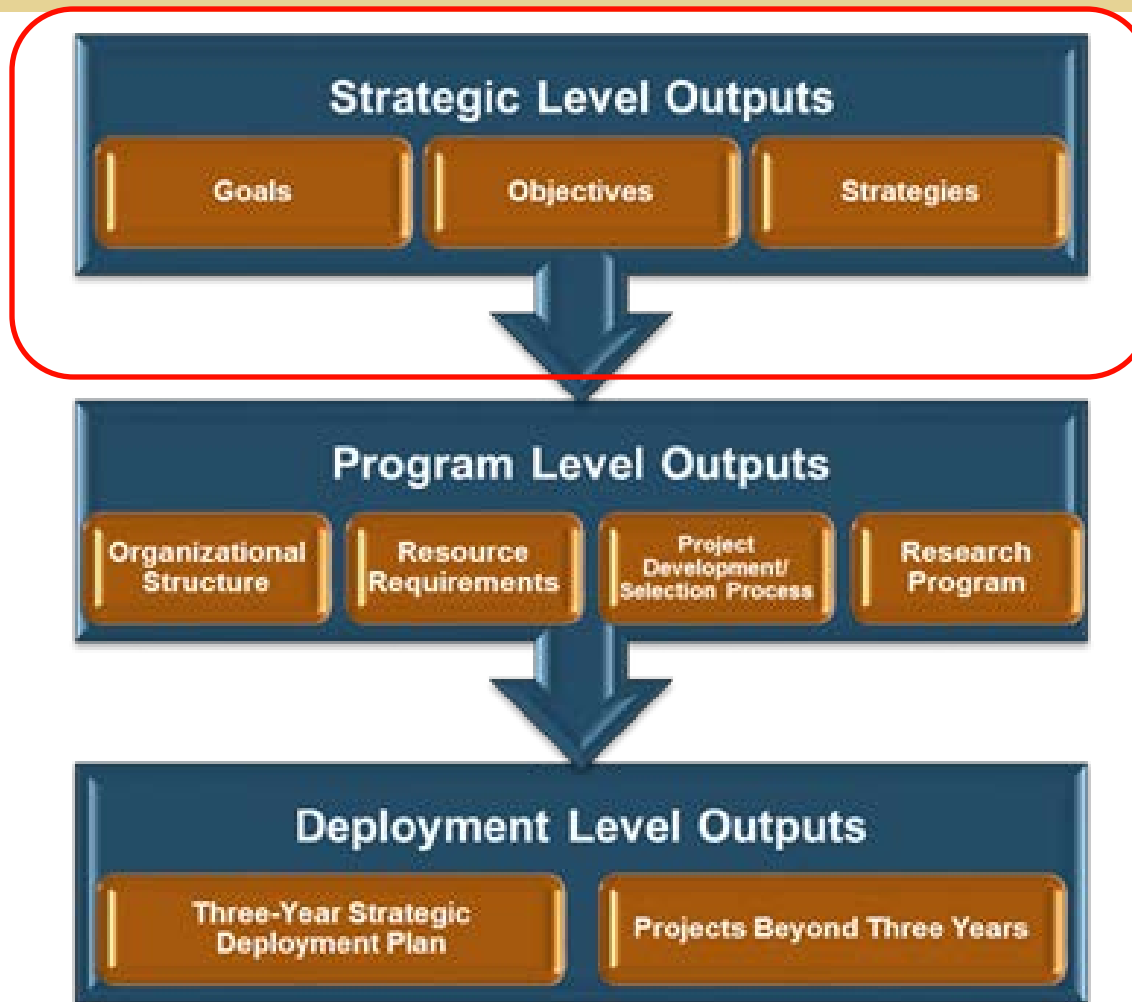
TDOT Traffic Operations Program Plan

Revised Draft Report
May 2017

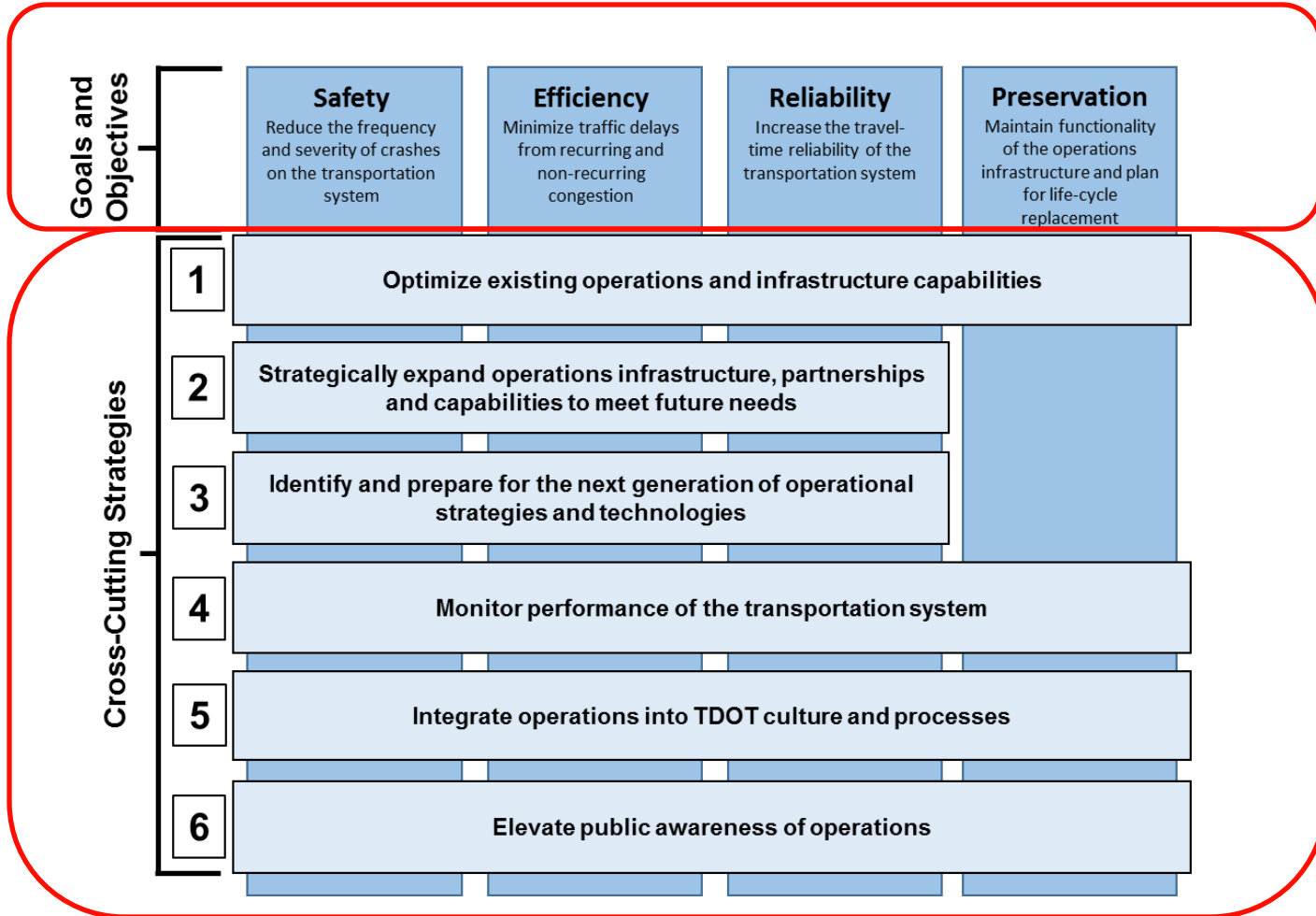
TN TDOT
Department of Transportation

Kimley-Horn

The “Flow-Chart.” What are we doing?



Content of the Program Plan



Cross-cutting Strategies in Action

- Upgrade TMC operations platforms - Working
- Fully staff TMC's – Currently hiring
- Advanced TIMs Training – First class April
- Life-cycle replacement plans – being developed
- APL and QPL – being developed

- Develop a statewide ITS master plan
- Develop TSM&O Strategic Deployment Plan with short, medium and long range goals.
- Data driven decisions
- Expanded partnerships with local and regional agencies
- JOPs “Joint Operations Protocols” – developed/under review
- ROFs “Regional Operations Forums” - Rolling out in Autumn

Cross-cutting Strategies in Action

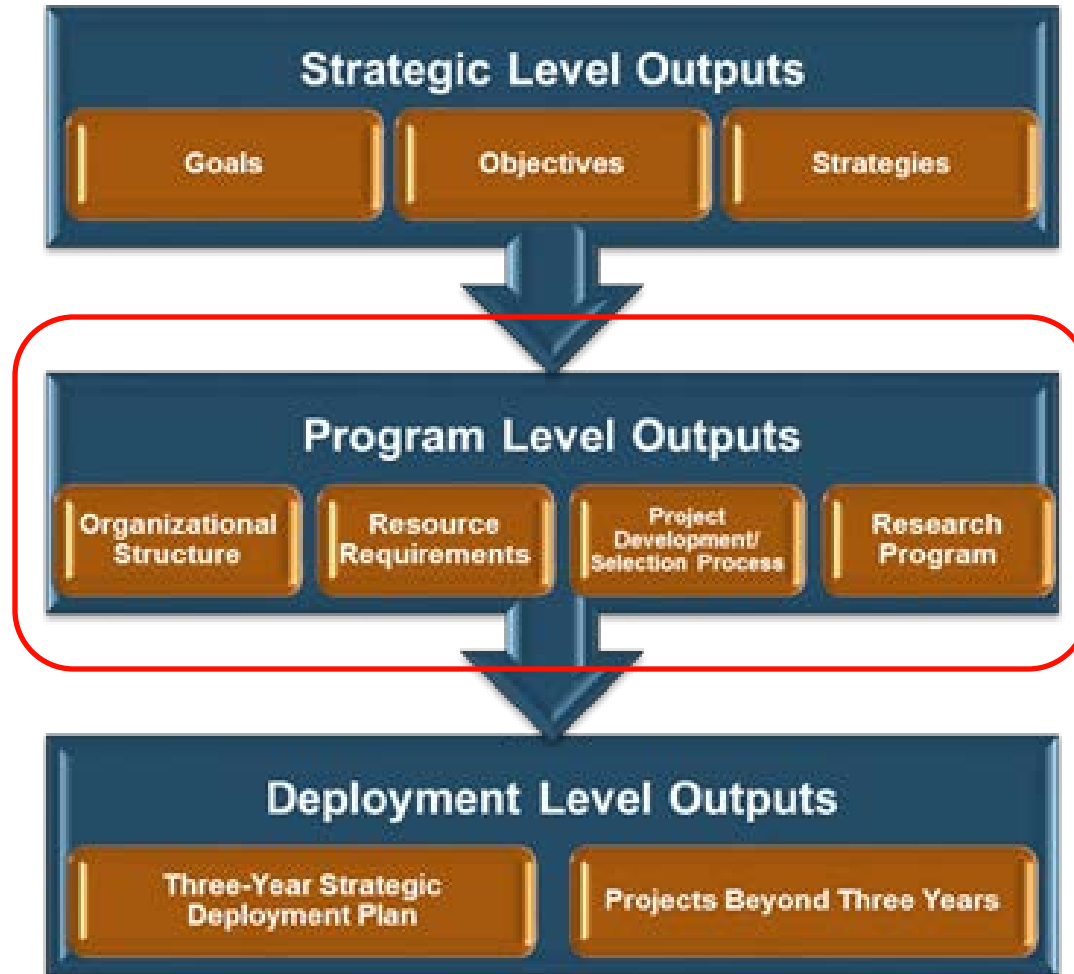
- Support research and testing of new strategies and technologies
- Prioritize in coordination with our local and regional partners
- Identify sources of funding for next generation deployments

- Identify and implement performance measures
- Use of PM's in quantifying projects
- Performance Reporting

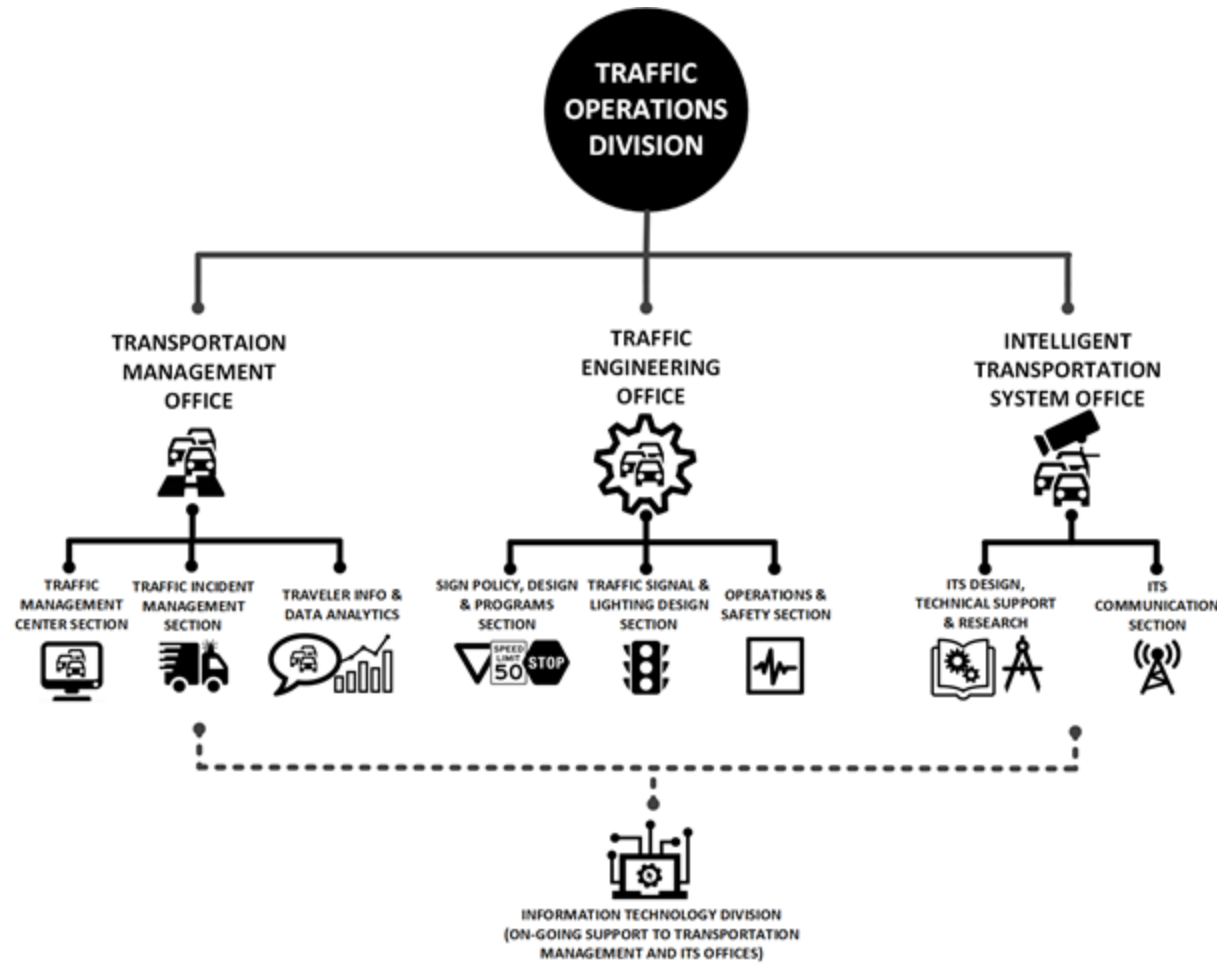
- Integration of TSM&O into Long Range Planning
- Raise awareness of TSM&O within TDOT's various divisions

- Consistent branding of SmartWay and HELP programs
- Publication of TSM&O success stories and activities

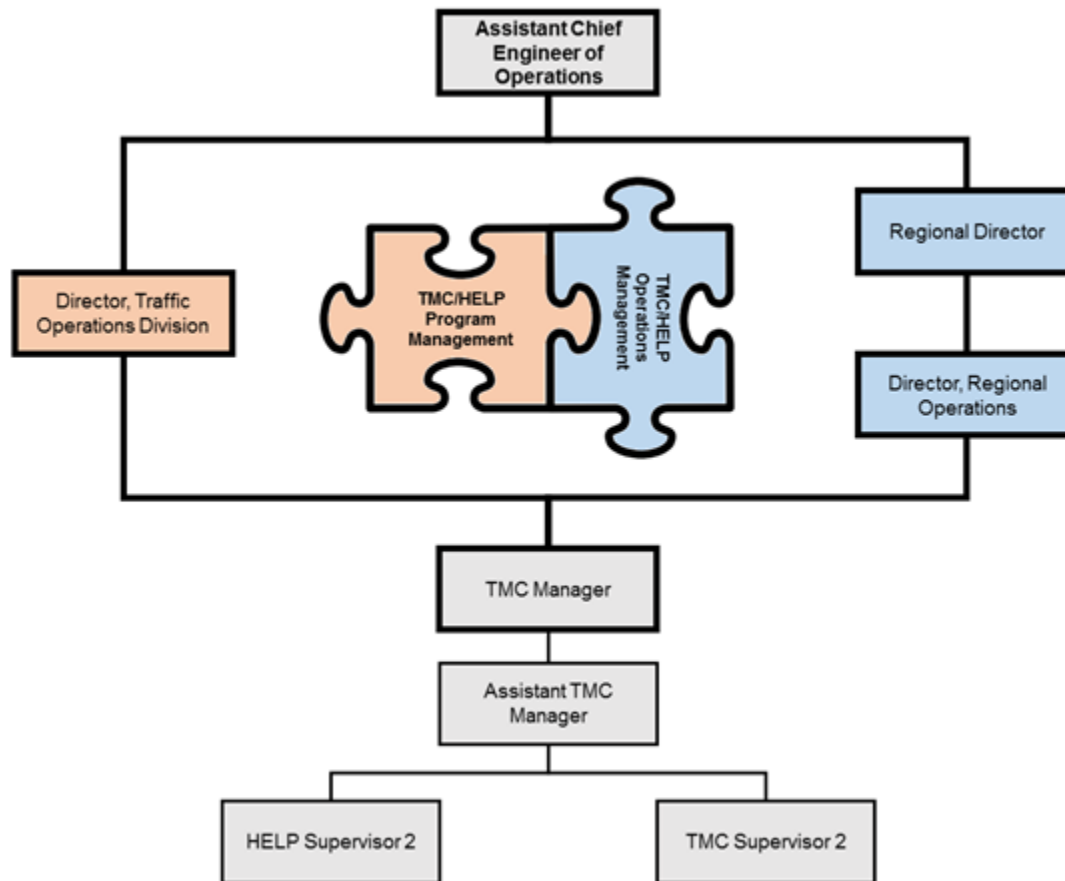
The “Flow-Chart.” Who is helping us?



The Org Chart at HQ



HQ/Region Working Relationship



Resource Requirements

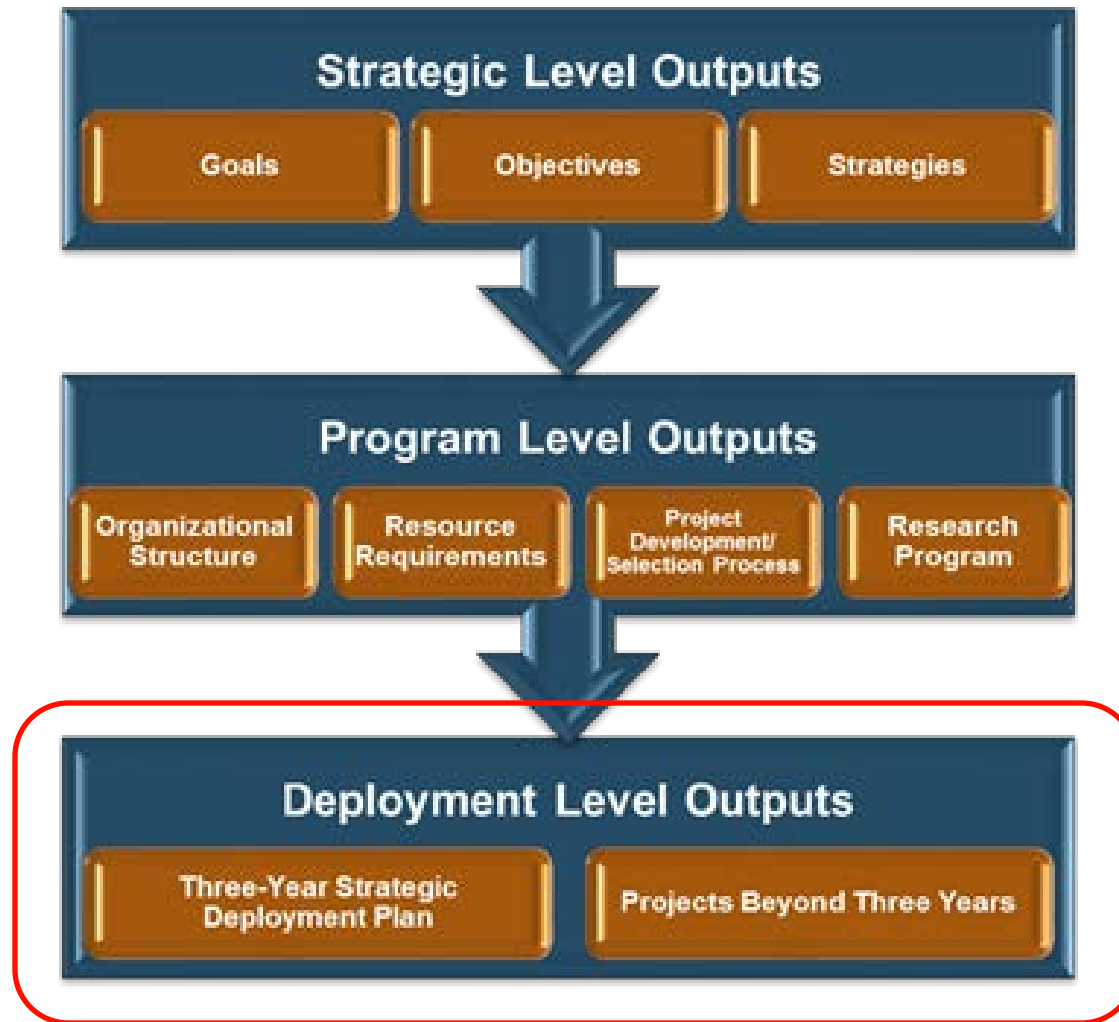
TDOT Divisions and Units that Provide Planning and Strategy Support.

- Long Range Planning
- Strategic Planning
- Strategic Transportation Investments Division (STID)
- Multimodal
- Program Development
- Regional Project Development
- Roadway Design

TDOT Divisions and Units that Provide Deployment and Operations Support.

- Construction
- Information Technology
- Materials & Testing
- Regional Operations
- Community Relations
- Maintenance
- Occupational Health & Safety
- Central Services

The “Flow-Chart.” The Plan!

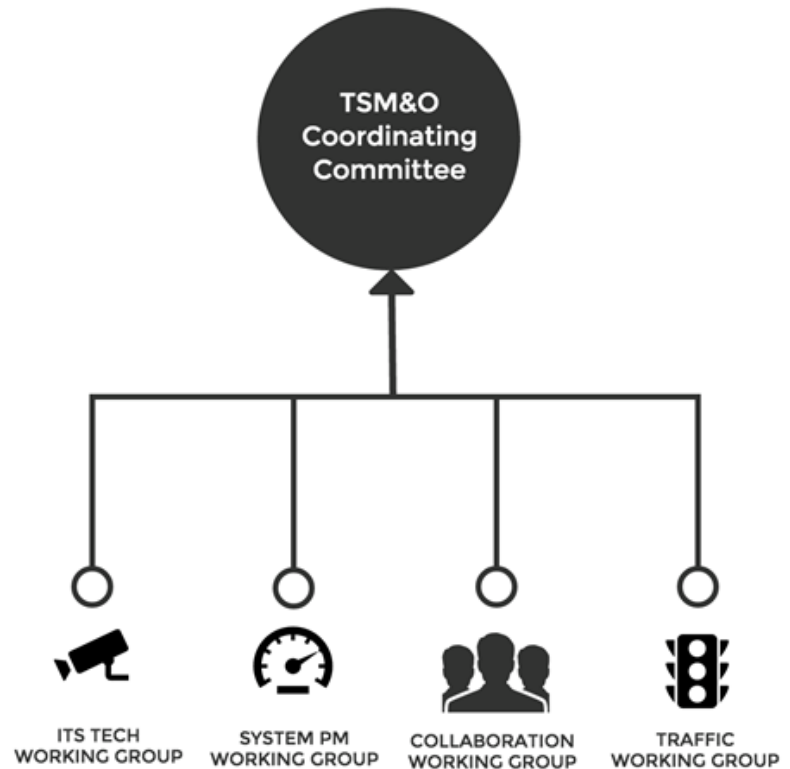


Where to start?

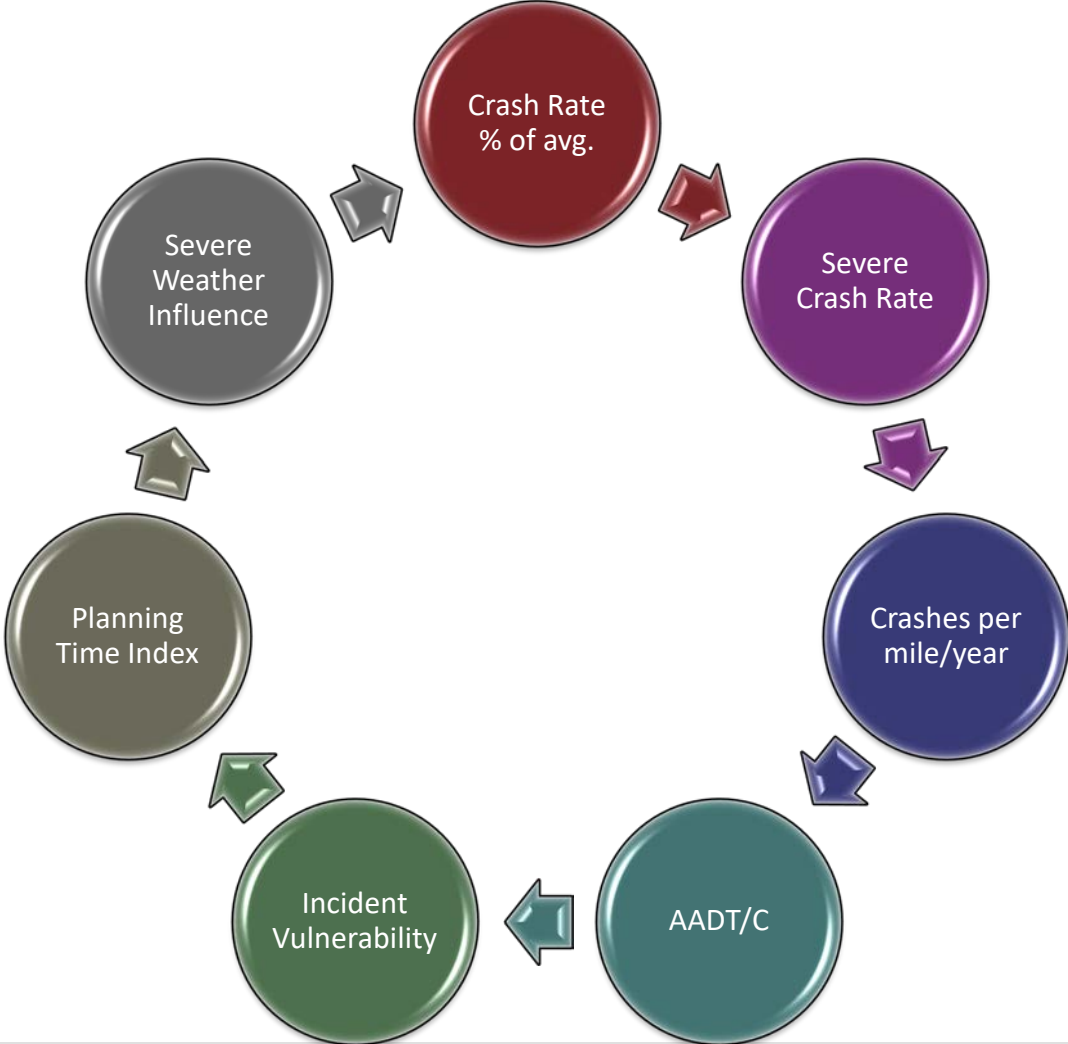
TSM&O Coordinating Committee:

- ITS Technical Working Group
- Systems Performance Measures Working Group
- Collaboration Working Group
- Traffic Working Group

Each Working Group will consist of TOD Staff with Regional Office representation and key divisions/departments within TDOT.



Step 1: Quantifying the Corridor Priority Levels



Step 2: Screening Priority Corridors

Screening for potential applications will take place in the following two stages:

1. Conventional TSM&O:

- a. Incident Management
- b. Ramp Metering
- c. DMS
- d. Signal Timing Optimization

2. Advanced TSM&O:

- a. Active Traffic Management (ATM) –
 - i. Adaptive Ramp Metering
 - ii. Adaptive Traffic Signal Control
 - iii. Transit Signal Prioritization
 - iv. Dynamic Speed Limits
- b. Integrated Corridor Management (ICM) -

Step 2: Screening Priority Corridors

The FHWA guide states:

*Just because a roadway segment is experiencing significant congestion, safety, and/or environmental problems, it does not necessarily mean that ATM strategies are the optimum solution. Before considering advanced TSM&O approaches such as ATM, the more conventional operations strategies and supporting ITS technologies should already be in place and thoroughly used. Implementing or enhancing the more conventional TSM&O strategies, such as incident management and enhanced traveler information, may be more appropriate before implementing ATM strategies. In other words, **the deployment of ATM strategies should represent the “next step” rather than a “quantum leap” for managing congestion and enhancing safety.***

Step 2: Screening Priority Corridors

The Checklist

- Is the TSM&O project redundant: are there other projects planned that deal with the same problems?
- Can the TSM&O project be combined with other planned projects into a single project, and would doing so affect the timing?
- Is the TSM&O project consistent with the regional ITS architecture?
- Is the TSM&O project consistent with local planning agencies' goals and objectives?
- Has the project location been identified by operations staff as being affected abnormally by incidents, weather, or geometric conditions?

Step 3: Detailed Engineering Study

A detailed engineering study will be conducted to estimate the benefits and costs of the strategies that were identified as strong candidates during the previous priority corridor screening phase. At a minimum, the study will assess the following:

- Impacts to corridor operations (travel time savings, delay reduction, mode switch, etc.)
- Impacts to corridor safety (crash frequency, crash severity, etc.)
- Benefit-cost ratio

Step 4: Regional Priority Level Ranking

Once the impacts for an individual corridor project deployment are fully estimated through an engineering study, a ranking system will be implemented using a composite project score.

This scoring methodology will show strong preference to benefit-cost ratio, but operational and safety impacts, as well as subjective regional and local partner ranking will be factored in.

The weighting of each element of the composite score will be an iterative process and undertaken once several deployments have been studied.

Discrete Deployments

There will always be a need to perform a discrete deployment addressing a specialty need and not primarily focused on maximizing efficiency.

These have included:

- Freight Smart Parking
- Fog Zone Detection/Warning Systems
- Wrong way Detection

Discrete Deployments will be ranked against one another according to the following factors: benefit-cost ratio, safety impacts, and operational impacts. The ranking process will consider these estimated benefits and the potential for emerging funding opportunities in order to prioritize Discrete Deployments.

TSM&O Research

TSM&O is an evolving program. TDOT works closely with research institutions across the state providing guidance and funding support through programs like the Strategic Highway Research Program (SHRP).

Some current activities include:

- SHRP2 Work Zone Impact and Strategies Estimator (WISE) Tool (R11)
- SHRP2 Reliability Data and Analysis Tool (L38)
- SMARTPARK
- Traffic Incident Management Decision Support System

Relationship with Other Plans

As mentioned in the Screening Priorities above, this plan looks at its relationship with other plans.

- TDOT 25-Year Long-Range Transportation Policy Plan (2015)
- TDOT State Transportation Improvement Program (STIP) (2016)
- TDOT Statewide ITS Architecture (2006)
- Regional Congestion Management Processes (Various)
- Tennessee Statewide Multimodal Freight Plan
- Tennessee Strategic Highway Safety Plan (2014)
- TDOT Transportation Asset Management Gap Analysis and Implementation Plan (2015)

Deployment Level Perspective

The ranked projects will become the Three-Year Strategic Deployment Plan and organized in one of the three deployment areas (Programs, People or Projects) and by location (Statewide or Regions 1-4)

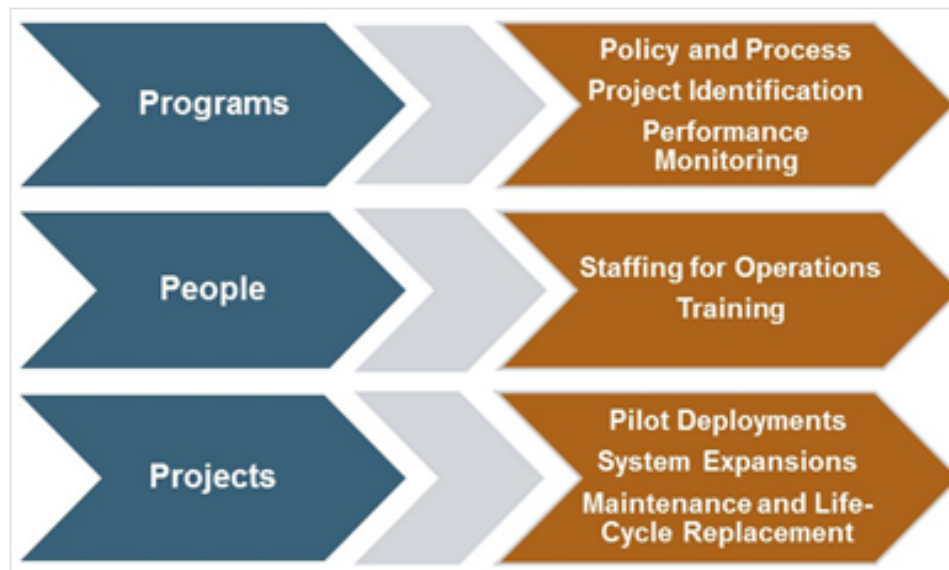


Figure 15 – Deployment Types

Deployment Level Perspective

Beyond the Three-Year Strategic Deployment Plan, TDOT is considering projects and programs that will allow for cost-effective operational improvements in the future.

These include:

- CV/AV
- Active Traffic Management
- Integrated Corridor Management

These technologies will be rolled out as pilot deployments (test beds) in the Three-Year Strategic Deployment Plan, and are expected to play an increasingly significant role in future.

Performance Measures

The Traffic Operations Division will use its existing and proposed deployments to collect data that serves as performance measures to track progress toward the four identified TSM&O goals and objectives identified earlier.

Examples:

- Traffic Management Center Operations Activity Measures
- Traffic Incident Management Operations Activity Measures
- ITS Maintenance Measures
- Protect the Queue Measures
- Collaboration Measures
- Work Zone Operations Measures
- Traffic Engineering Activity Measures
- ITS and IT Project Measures

Results Management

TDOT has made significant investments in operations. The significant focus on operations has led to a safer and more reliable transportation system. However, there is much work to be done as Tennessee grows and the capacity of the transportation system is continually stretched to keep up with demands.

As part of TDOT's tracking and monitoring of its operations program, a formal review of the Traffic Operations Program Plan should be conducted each year by the TSM&O Coordinating Committee.

- Continuous Monitoring and Tracking Progress
- Updating the Traffic Operations Program Plan as needed.
 - Annual Updates to the Strategic Deployment Plan
 - Full Traffic Operations Program Plan 3-Year Updates

Thank You

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