

FDOT TSM&O Software Program



By Florida Department of Transportation

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Benefits Statement

The Florida Department of Transportation's TSM&O Software Program, centered around SunGuide, saves lives by enhancing road safety with features like Wrong Way Driver detection and connected vehicle applications. It saves time through efficient communication, quicker incident responses, and travel time alerts. The program also saves money by cost-effective development, interoperability, and generic APIs. Recent enhancements, including a Smart Phone App for Road Rangers and automated video stream checks, exemplify its effectiveness in improving safety, efficiency, and cost-effectiveness in transportation operations.

In this case study you will learn:

1. How FDOT established a safety-focused TSM&O Software Program, driven by SunGuide, enhancing safety measures, including wrong-way detection.
2. How stakeholder groups like SSUG and CMB collaborate to prioritize safety initiatives and share lessons, improving transparency and device integration.
3. How the program's recent enhancements, like SPARR and real-time dashboards, promote efficient communication and proactive safety measures, benefiting transportation in Florida.

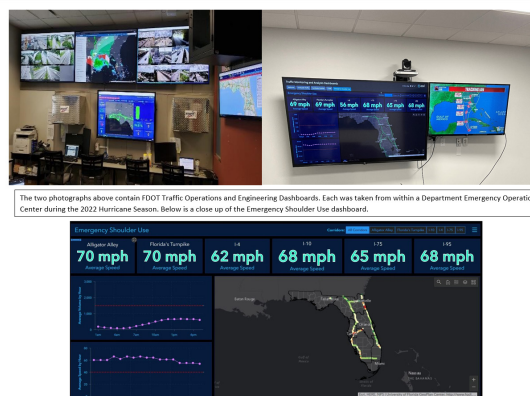
BACKGROUND

While the Florida Department of Transportation (FDOT) has a vibrant and dedicated Safety Office, it also believes in weaving safety into every aspect of every project. The effectiveness of implementing transportation systems management and operations (TSM&O) strategies to improve safety, mobility, and reliability is undeniable. As is the critical role that intelligent transportation system (ITS) devices play in deploying, measuring, and evaluating those strategic goals. However, as software continues to permeate all aspects of Operations, the FDOT's Traffic Engineering and Operations (TEO) Office concluded that a TSM&O Software Program was needed. The Program would be built around the Department's flagship program – SunGuide. SunGuide is an Advanced Transportation Management System (ATMS) that ingests data from thousands of roadside devices and converts that data into actionable information for the Transportation Management Centers (TMCs), FDOT Leadership, and the traveling public. In recent years, The program has made great strides in improving safety with enhancements pertaining to Wrong Way Driver (WWD) detection, dynamic messaging plans, and emergency response.



TSMO PLANNING, STRATEGIES AND DEPLOYMENT

Florida's TSM&O Software Program is continuously expanding to add more goals and services. One of the ways Florida is striving towards its goal of reducing the number of transportation-related serious injuries and deaths is by adopting FHWA's "Safe System Approach" to address all elements of a safe transportation system in an integrated manner.



The FDOT TSM&O Software Program took several steps to engage its users and stakeholders such as establishing a SunGuide Software User's Group (SSUG), TMC Working-Group, and SunGuide Change Management Board (CMB). The members of the aforementioned groups come from every FDOT District and can range from TMC Operators to TSM&O Engineers. This multilayered approach allows a wide array of safety initiatives to be brought forward. Those safety initiatives – which can range from physical and cybersecurity to wrong way vehicle detection and connected vehicle safety applications – are discussed, voted on, and prioritized by the various groups before they are deployed as future TSM&O software enhancements. This planning has led to a transparent Department process which engages stakeholders and ensures everyone's safety needs are heard. It also allows for members to share project pitfalls and lessons learned so the entire State can benefit.

Some of the strategic choices the Department made in planning and deploying its TSM&O Software Program were:

- Having its Software Team act as pseudo-code-translators by converting the Districts' safety needs into "user stories" which would then be used to build features, enhancements, and test cases.
- Inviting the Districts to participate in the thorough, hands-on software testing process to ensure interoperability between districts, compatibility with ITS devices, and a frictionless experience for TMC Operators.
- Developing generic Application Programming Interfaces (APIs) for SunGuide, resulting in getting safety devices operational more quickly and at lower cost.

COMMUNICATIONS PLANNING AND EXECUTION

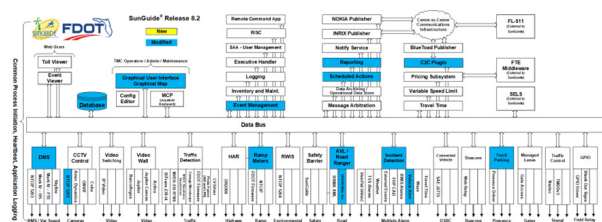
With FDOT's decentralized governance structure, it is very important that each district maintains its autonomy while trusting that the State TSM&O Software Program is there to support both individual districts and statewide concerns. The Department accomplishes this by maintaining open communication with its SunGuide end-users. SunGuide is used in 15 organizations throughout Florida - including District TMCs, regional tolling and expressway authorities, local transportation agencies, and universities.

A great example of how TSM&O Software Team handles communication, planning, and execution can be found in how it implemented its SunGuide WWD enhancement. The Team received feedback from multiple Districts that having WWD alerts in several different programs caused delays in identifying and responding to wrong-way incidents. The Team then channeled the feedback into a user story from the TMC operator's perspective, framed

the needs in a way that could be addressed via software, and presented it to the SSUG and CMB where it was discussed, voted on, and approved. This communication and planning resulted in a SunGuide Wrong Way Vehicle Detection System API allowing for WWD alerts to appear natively within SunGuide; as well as an Alert Viewer that will send WWD alerts directly to FDOT's safety partner, the Florida Highway Patrol, for even faster trooper dispatch. These more efficient operations will translate to faster communications to the travelling public and expedited emergency responses in safety scenarios where every second counts.

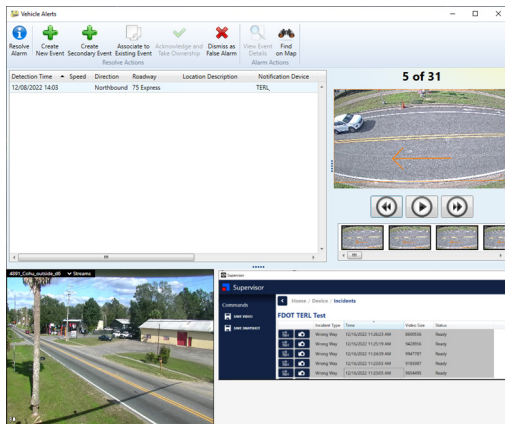
OUTCOME, BENEFITS AND LEARNINGS

With safety being at the heart of FDOT's TSM&O software applications, it's beneficial to view the outcome of the Department's TSM&O Software Program as a centralized place where existing safety applications can grow, and new uses for TSM&O data can flourish. Below is a list of recent FDOT TSM&O Software enhancements:



- Smart Phone Application for Road Rangers (SPARR): Allows for more efficient coordination and communication between Road Rangers, FDOT's traffic incident management and motorist assistance unit. Valuable information about the incident and their activities can be updated quickly and easily. SPARR even allows Road Rangers to enter a more accurate location for the incident, pinpointing the exact location that can be used in case safety countermeasures are needed at that location.

- **Automated Video Stream Checks:** Used to validate video streams from the nearly 7,000 CCTV cameras managed through SunGuide. This application allows FDOT to quickly identify cameras with maintenance needs in advance of hurricane season. One of the Safe System Approach principles is “Safety is Proactive”. The Automated Video Stream Check application is Florida proactively addressing maintenance issues that could impede emergency operations.



- **Travel Time Alerts:** Call the attention of TMC operators to higher-than-normal travel times which may signal a possible traffic disruption has occurred. This saves time in getting the right response to an incident, and in disseminating advance warning to motorists to prevent secondary crashes.

- **Traffic Monitoring and Analysis Dashboards:** Efficiently and effectively communicate up-to-the-minute information with FDOT and State Leadership in order to support data-based decision making. The interactive dashboards managed by the TSM&O Software Program include:

- o **Emergency Shoulder Use Dashboard.** The ESU Dashboard is a decision support tool used by FDOT Leadership when making decisions on whether or not to implement Emergency Shoulder Use evacuation countermeasures. It monitors speeds on

the six ESU approved corridors and was used as recently as last year’s Hurricane Ian.

- o **SunGuide Speed and Traffic Data Dashboards.** These dashboards use real-time TSM&O data to provide statewide visibility into operational status of the state roadway system. They can be used to improve work zone safety as it lists active construction projects in each District, as well as important metrics like speed, volume, and device availability of the surrounding area. High-speed and crash-prone areas can be identified through the dashboards, and communicated for staging of emergency response activities. The dashboards are fully interactive, and the displayed data may be filtered or queried.

- o **SunGuide Crash Data Dashboard.** This dashboard may be used to measure and evaluate the effectiveness of various TSM&O safety strategies as it provides historical crash data and is updated daily. The dashboard provides the number and severity of crashes which can be filtered by time, county, or District.

FDOT’s TSM&O Software Program has helped deliver FHWA’s goal of reducing traffic-related fatalities and serious injuries by providing intelligent tools that were developed through collaborative communication with stakeholders, and are efficient, user-friendly, and improve daily transportation safety.