

eTraffic - Traffic Signals and Control Strategies Inventory



By Florida Department of Transportation

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Benefits Statement

The eTraffic system by Florida DOT (FDOT) improves traffic signal management, saving lives, time, and money. It enhances safety with real-time updates, wrong-way driving countermeasures, and faster emergency response. The platform streamlines operations with automated reporting, centralized data management, and rapid deployment, cutting down decision-making and administrative delays. By leveraging existing technology and automating financial tracking, eTraffic reduces maintenance costs and ensures efficient resource allocation. This data-driven approach optimizes safety, efficiency, and cost-effectiveness, revolutionizing Florida's transportation network.

In this case study you will learn:

1. How FDOT's eTraffic application has revolutionized traffic signal management, improving safety, efficiency, and operational response, particularly during emergencies.
2. How key technologies like wrong-way driving countermeasures and pedestrian beacons have enhanced safety and mobility.
3. How FDOT coordinated efforts between local agencies and technology teams to ensure accurate, real-time data and continuous system updates.

BACKGROUND

Historically, maintaining an accurate inventory of traffic signal control devices and ensuring efficient operations created significant challenges, especially with the advent of connected vehicles and ITS devices. The Florida Department of Transportation (FDOT) recognized an urgent need for a robust Transportation Systems Management and Operations (TSMO) solution to address immense complexity of managing traffic signals statewide. Operating under the Traffic Signal Compensation and Maintenance Agreement (TSMCA) statewide. In 2018, FDOT developed the eTraffic GIS and web-based application, which has become a centralized hub for managing over 20 TSMO strategies deployed by different FDOT stakeholders.

eTraffic enhances FDOT's eSTORM application, improving situational awareness and enabling swift restoration of traffic signals post-hurricane through real-time updates from field staff. This innovative tool streamlines the tracking of strategies and facilitates comprehensive before-and-after analyses to evaluate their benefits. eTraffic has revolutionized FDOT's ability to manage and optimize traffic infrastructure, marking a significant leap forward in transportation management and operational efficiency.

TSMO PLANNING, STRATEGIES AND DEPLOYMENT



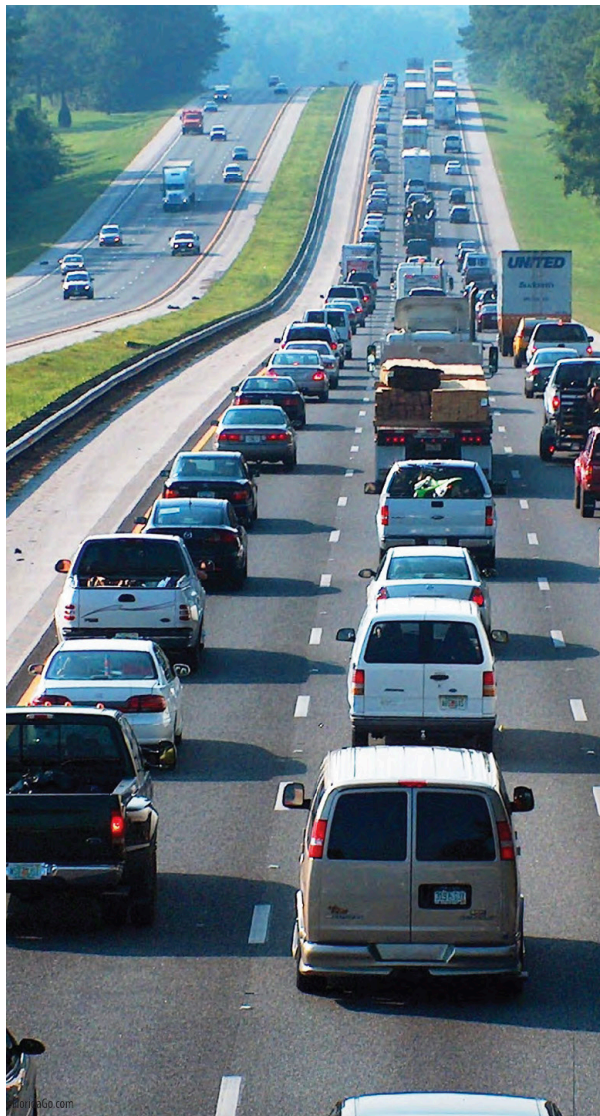
The planning for a robust Traffic Signal database began in 2018. FDOT undertook the labor-intensive task of entering all hard copy agreements into a GIS platform, covering over 8,600 traffic signals and related ITS components on the state system. This meticulous process required extensive desktop validation to ensure accuracy. This system is developed in-house with consultant and IT support.

eTraffic was designed to support various innovative TSMO strategies, including diverging diamond interchanges, pedestrian hybrid beacons, wrong-way driving (WWD) countermeasures, signal backplates, roadside unit (RSU) deployments, leading pedestrian intervals, and other critical safety and mobility measures. These locations are derived using sophisticated network screening processes, enhancing FDOT's ability to manage operational, maintenance, and emergency response activities effectively.

eTraffic leverages FDOT's ESRI enterprise licensing to build in-house applications without requiring additional software installations on individual machines. It allows authorized users to edit data seamlessly via a web map. Changes made in the editable layers are automatically replicated in the non-editable views, ensuring

data consistency across both internal and external eTraffic applications.

The internal eTraffic system includes all layers available in the public version, such as Request to Experiment (RTE) and Interim Approvals (IA) for FHWA purposes. It also features layers for highway signs, traffic signals, mid-block crossings, Intersection Control Evaluations (ICE), innovative interchanges. Additional features include tracking lane eliminations, network screening corridors, emphasis areas, Traffic Engineering Manual (TEM) variation compliance, and ramps and curves. Access is restricted to users with established credentials, ensuring secure and efficient data management.



COMMUNICATIONS PLANNING AND EXECUTION

Effective communication and coordination were crucial in implementing eTraffic. FDOT began with internal agency and leadership communications to build this system, then reached out to FDOT Districts for the latest data collection and training. The platform fosters a collaborative environment by enabling FDOT and local traffic signal operators to communicate and update traffic signal data seamlessly via a web-based platform. Significant coordination with the FDOT technology team was essential for deploying this application within six months of its conception.

Additionally, a public information view was created for eTraffic to display all traffic signals and other control strategies deployed in the state. This view ensures transparency and keeps all parties informed about the latest updates. The TSMCA Exhibit A Report Widget automates the creation of Exhibit A agreements and cost summaries, speeding up the agreement process and reducing discrepancies. This automation ensures all parties have access to consistent information, streamlining the maintenance and financial tracking of traffic signals.

The following flow of information is created for planning and operations and maintenance:

1. Internal FDOT Communication (2018 - 2020)

- **Leadership Initiation**
 - FDOT Leadership
 - Internal Agency Communication
- **FDOT Technology Team**
 - Coordination with the Technology Team
 - System Development and Testing

2. Coordination with FDOT Districts (2018 - Current)

- **Data Collection**
 - Communication to Eight FDOT Districts

- Collection of Latest Data (1000+ Data Points annually)

- **Training**

- Training Sessions for 65+ Local Agencies (Five Annually)
- Feedback and Support

3. Local Agencies Communication (2019 - Current)

- **Collaboration**

- Web-Based Platform for Traffic Signal Operators
- Seamless Data Updates and Communication (1000+ Data Points annually)

- **System Deployment**

- Deployment within Six Months

4. Web-based Public Information View (launched in 2019)

- **Transparency**

- Public Information View Creation (200K+ Public Views)
- Display of Traffic Signals and Control Strategies
- Keeping All Parties Informed

5. TSMCA Exhibit A Report Widget (2020 – Current)

- **Automation**

- Creation of 65+ Exhibit A Agreements
- Generation of Cost Summaries for 65+ agreements
- Speeding Up the Agreement Process
- Reducing Discrepancies
- Ensuring Consistent Costs and Device-level Information

6. Ongoing Maintenance and Updates (Ongoing)

- **Regular Updates**

- Continuous Communication between

FDOT and Local Agencies

- Maintenance and Financial Tracking
- Quarterly Updates

OUTCOME, BENEFITS AND LEARNINGS

The implementation of the eTraffic application has improved traffic signal management across Florida, resulting in enhanced safety and operational efficiency. During emergencies, such as Hurricane Sally in September 2020 and Hurricane Ian in September 2022, the system enabled FDOT to quickly access and verify the status of traffic signals, improving emergency response. The integration with the eSTORM application allowed for comprehensive monitoring and data-driven decision-making, demonstrating the system's effectiveness in real-world scenarios.

Key Learnings:

- Data Strategy and SOPs: Establishing and following standard operating procedures (SOPs) for data entry and validation is crucial to reduce redundancies and enhance operational efficiency. The eTraffic and eSTORM applications implemented various internal procedures, including limited editing access, prioritizing important data fields, distinguishing between optional and mandatory data, and logging the date of data edits and entries.
- Meticulous Data Collection and QC: Ensuring accurate and reliable data is paramount. This involved thorough data collection and desktop validation of each location. In addition to data entry, a separate complimentary dashboard application was developed to ensure the data quality check is in place to ensure missing/wrong data elements are identified, corrected, and entered.
- Empowering Field Staff: Enabling field staff to identify and add missing locations for approval helps maintain a comprehensive and current inventory.

- **Ground-Up Communication:** Effective feedback from field operations is essential for the success of large-scale TSMO projects. Regular district-level meetings and training sessions on eTraffic fostered this vital communication, allowing for the development of tools that aggregate data while considering on-the-ground limitations.
- **Seamless Technology Integration:** Leveraging existing ITS technologies and frameworks, such as FDOT's ArcGIS Enterprise plan and Microsoft Azure, streamlined the development and deployment of the eTraffic application, avoiding the need for entirely new systems.

By leveraging advanced technologies and fostering collaborative efforts, eTraffic has set a new standard for traffic signal management and operational excellence in Florida. The lessons learned from this implementation highlight the importance of innovation, coordination, and data-driven decision-making in achieving a safer and more efficient transportation network.

eTraffic has revolutionized traffic signal management in Florida by blending advanced technologies and collaborative efforts. This innovative approach emphasizes data-driven decision-making and coordination, setting a new standard for operational excellence. By transforming manual processes into a streamlined, transparent operation, eTraffic has improved stakeholder coordination transparency and signal maintenance efficiency.

This platform not only tracks the progress of TSMO strategies but also enables real-time updates on traffic signals and maintenance records and contributes to a safer transportation network. Launched in 2020, eTraffic has garnered over 200,000 public views, showcasing its popularity and effectiveness in enhancing Florida's transportation infrastructure.

