2023

TSM&O Strategic Business Plan Update

Florida Department of Transportation
District Four

June 2020

SUNGUIDE

Travel within Southeast Florida in the Year 2023

At the end of the day, Lila leaves her office in Pompano Beach to go home to Miramar. She has an important dinner meeting scheduled at 6:30 p.m. so she takes Atlantic Boulevard to the 95 express lanes to ensure she arrives on time. Traffic along Atlantic Boulevard is congested due to a multi-car accident blocking two lanes; fortunately, the arterial dynamic message signs along Atlantic Avenue advise her of the delays so she uses the in-vehicle traveler information system to navigate around the congestion and seek an alternate route with less congestion. She enters I-95 at the Cypress Creek Road interchange where the ramp signal is turned on causing a slight delay. However, the travel time savings along I-95, resulting from the ramp signal system, more than offsets the delay at the ramp.

The traffic control coordinator at the Regional Transportation Management Center in Broward County (RTMC) detects the lane blockage along Atlantic Boulevard via information received from a combination of the police computer aided dispatch system and Bluetooth readers that show travel speeds on a traffic flow map. He takes immediate action by confirming the incident using Closed Circuit Television (CCTV) cameras; notifying the appropriate emergency responders; and posting messages on Dynamic Message Signs (DMS) and 511 along with plausible alternative detour routes, as well as sharing this information with the media. In addition, he activates the adaptive mode for the traffic signals along Cypress Creek Road and parallel roads to minimize delays.

As Lila approaches the entry point to the 95 express lanes at Commercial Boulevard, she acknowledges the toll rate sign indicating that her trip to the I-595 exit will cost $2.00. She travels the express lanes and as she approaches the I-595 interchange, she sees that the toll to her ultimate exit point, I-75 at Miramar Parkway, will cost an additional $2.50 using the I-595 reversible express lanes in combination with the I-75 express lanes. While on other days, she is more selective on which express lane segments are used as part of her trip, she decides to use all segments today because of her scheduled dinner meeting. The tolls are automatically deducted from her SunPass account as she drives under the overhead gantries without stopping.

Meanwhile, control room operators at the SMART SunGuide Regional Transportation Management Center (RTMC) continue to monitor performance of the express and general use lanes, and with predictive models for travel during that time-of-day on the video wall to ensure that express lanes are reaching the minimum 45 mph travel speed. If the speed is detected to be less than 45 mph, the tolls are automatically adjusted by the dynamic pricing system in order to discourage motorists from using the express lanes. Lila knows that the tolls cannot exceed the rates posted on the toll rate signs she saw before entering the express lanes. She arrives home in time for her dinner meeting and even has time to drop off her kids at soccer practice.

The SMART SunGuide RTMC has evolved by taking on a multi-dimensional role in managing the transportation system more efficiently and safely while providing travelers with mobility choices. This evolution has been made possible by advancements in technology applications and by transportation agencies adopting a unified approach to Transportation Systems Management and Operations (TSM&O). The “2023 TSM&O Strategic Business Plan Update” provides the strategies and framework to prepare for next generation innovations to enable our commuters, visitors and freight operators to travel smarter, safer, and with more choices.

Travel within Southeast Florida in the Year 2023

TABLE OF CONTENTS

Acronyms

AMS	Arterial Management System
ATMS	Advanced Traffic Management Systems
ATSPM	Automated Traffic Signal Performance Measures
BCT	Broward County Transit
BCTED	Broward County Traffic Engineering Department
CBR	Case Based Reasoning
CAD	Computer Aided Dispatch
CCTV	Closed Circuit Television
DHS	Department of Homeland Security
DMS	Dynamic Message Signs
DSS	Decision Support Systems
FDOT	Florida Department of Transportation
FHP	Florida Highway Patrol
FMS	Freeway Management System
GIS	Geographic Information Systems
GPS	Geographic Positioning System
GUI	Graphical User Interface
HAR	Highway Advisory Radio
ICM	Integrated Corridor Management
IT	Information Technology
ITS	Intelligent Transportation Systems
iVDS	Interagency Video Distribution System
JOP	Joint Operation Policy
MIMS	Maintenance Information Management System
MOT	Maintenance of Traffic
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
P3	Public Private Partnership
PIA	Post Incident Analysis
RITIS	Regional Integrated Transportation Information System
RISC	Rapid Incident Scene Clearance
RTMC	Regional Transportation Management Center
RWIS	Road Weather Information System
SFRTA	South Florida Regional Transportation Authority
SIRV	Severe Incident Response Vehicle
SOG	Standard Operating Guidelines
SPaT	Signal Phase and Timing
TIM	Traffic Incident Management
TMC	Transportation Management Center
TSM&O	Transportation Systems Management & Operations
TZD	Towards Zero Deaths
V2I	Vehicle to Infrastructure
VID	Video Incident Detection

1.0 Introduction

The initial FDOT District Four "ITS Strategic Business Plan" was prepared during 2006 with a vision to "*become the best TMC in the nation by 2010.*" This plan provided a roadmap that included specific actions to support this vision. During 2015, the "2020 ITS Strategic Business Plan Update" was prepared providing strategies that continued the momentum in achieving the vision for the next five years.

The "2023 TSM&O Strategic Business Plan Update", presented herein, is an update to the 2020 ITS Strategic Business Plan with a focus on expanding the scope of the program from "ITS" to "TSM&O." TSM&O provides a higher level of operational integration among freeway, arterial, and transit systems aligned with achieving selected performance measures.

The "2023 TSM&O Strategic Business Plan Update" will continue to use the building blocks from the "2020 ITS Strategic Business Plan", with the goal of taking the program to the next level. Specifically, this includes:

- Decision Support Systems (DSS) – Developing effective DSS that provide real-time route guidance strategies to help manage congestion effectively within District Four. Data generated by TSM&O devices along the transportation network are utilized to develop real-time route guidance strategies to optimize system capacity. Case-Based Reasoning (CBR) processes are applied. CBR is an emerging artificial intelligence paradigm where traffic congestion is addressed by reusing solutions of similar past problems. At the core of the CBR process is a case-base that stores previous instances of problems and their proven solutions. When faced with a new problem, the system first accesses the case-base and retrieves the case(s) most similar to the new one. During the reuse process, the solution of the retrieved case is adapted to address the current problem more efficiently. The DSS approach, based on the CBR process, enhances the effectiveness of Integrated Corridor Management (ICM) deployments along Freeway Management Systems (FMS), Arterial Management Systems (AMS), as well as integrated FMS/AMS networks.
- Data Visualization Tools – Critical traffic flow data generated from the SunGuide system (i.e., crash data, traffic volumes, and travel speeds) are used to develop actionable responses. Trends based on historical patterns of traffic flow and crashes are analyzed to create predictive algorithms to support proactive traffic management.
- Signal Phasing and Timing (SPaT) – Knowing the status of traffic signal controllers can benefit travelers in planning their commute, improve roadway safety by reducing vehicular crashes at the intersections, and improve pedestrian safety. It also supports the future Connected Vehicles deployments by facilitating V2I capabilities within District Four, where on-board units can be used to generate dynamic route assignments.
- Automated Traffic Signal Performance Measures (ATSPM) - ATSPMs consist of a high-resolution data-logging capability added to existing traffic signal infrastructures and data analysis techniques. Implementation of ATSPMs will provide local traffic signal maintaining agencies with the information needed to proactively identify and correct deficiencies with the existing signal timing plans. The agencies can then better manage traffic signal maintenance and operations in support of their safety and mobility goals. It is a cost effective strategy as it is applied to a wide range of signalized intersections and to a large extent use existing infrastructure. ATSPMs also support the validation of other technologies and operational strategies, such as adaptive signal control and emerging connected vehicle applications.

- Smart Cities – TSM&O is envisioned to play an important role in developing Smart Cities in consultation with participating municipalities.
- Towards Zero Deaths (TZD) – Partnering with local municipalities within District Four in applying TSM&O strategies to achieve traffic safety goals of the national "Towards Zero Deaths" program. This is a national strategy on highway safety that uses a unified approach to change driver behavior and improve highway safety with a goal of ultimately reducing the number of traffic-related serious injuries or deaths to zero.
- Express Lanes – Operating express lanes as part of a regional network along I-95, I-595 and I-75 that will be integrated with other express lane facilities operated by FDOT District Six and Florida's Turnpike.
- Ramp Signals – Applying ramp signal systems along I-95, and possibly I-75 and I-595, to improve system-wide traffic flow within the corridors without degrading operations at nearby signals along arterials.
- Integrated Corridor Management (ICM) – Advancing the concept of an ICM program along I-95 within Broward and Palm Beach Counties to apply dynamic decision support tools to improve the efficiency of moving people and goods within the corridor using the full range of transportation assets.
- Active Transportation & Demand Management (ATDM) – Considering ATDM strategies along selected corridors. Examples include: using the shoulder as an additional lane during peak periods; speed harmonization via variable speed limits; dynamic merge control that changes lane allocation at interchanges based on mainline and entering or exiting ramp volumes; and queue warning systems via lane-use control signs.
- Connected Vehicles and Automated Vehicles – Preparing for future Connected Vehicles and Automated Vehicles programs by providing the systems and operational tools to facilitate applicable functions at the SMART SunGuide RTMC (herein referred to as RTMC).

The FDOT District Four TSM&O work program continues to address the needs to support the vision and mission in all aspects of planning, design, systems integration, construction, operations, incident management and maintenance.

The current number of ITS devices managed by FDOT District Four includes 68 Dynamic Messages Signs (DMS) along the freeways, 48 Arterial Dynamic Message Signs (ADMS) approaching the interstates and 27 as part of the arterial management system, 20 Express Lanes status DMS, 31 Express Lanes toll rate DMS, 518 CCTV cameras (330 freeway and 188 arterial), 594 vehicle detectors (535 freeway and 59 arterial), 102 Bluetooth Traffic Origin and Destination (BlueTOAD) traffic sensors, 9 Highway Advisory Radio (HAR) transmitters, 20 HAR beacons, 7 Road Weather Information (RWIS) stations, 28 Variable Speed Limit (VSL) signs, 13 Permanent Traffic Management Sites (PTMS), 27 generators and 369 miles of fiber optic cable (241 freeway and 128 arterial). Additional ITS devices will be deployed as part of the I-95 and I-75 ramp signal projects through 2023.

The table below summarizes the current work plan as of December 2018 focusing on the phased implementation of the express lanes and ramp signal deployments.

FDOT District Four ITS Work Program

Financial No.	Contract Name	Completion
421707-2,3,8	I-75 Express Lanes, Segments A&B, NW 170 St to South of Miramar Pkwy	2019
433108-5	I-95 Express Lanes, Phase 3A-2, N. of Commercial Blvd to SW 10th Street	2019
NA	I-95 Express Lanes, Phase 3B, SW 10th St to Linton Boulevard	2021
NA	I-95 Express Lanes, Phase 3C, Linton Rd to Indiantown Rd	2023
433108-4	I-95 Ramp Signals, Hallandale Bch Blvd to Commercial Blvd, Part of I-95 3A-1	2019

433108-5	I-95 Ramp Signals, Cypress Creek Road to SW 10th Street, Part of I-95 3A-2	2019
439891-1	SR 869/SW 10th Street, W. of Powerline Road to W. of Military Trail – Managed Lanes	2023
409354-2	I-95 / I-595 Express Lanes Direct Flyovers, I-95 Phase 3C	2024

FDOT District Four continues to take a proactive approach in managing every aspect of the TSM&O program including planning, design, deployment, operations, maintenance, systems integration, traveler information, traffic incident management and public outreach.

The Department has contracted with Florida International University to conduct a comprehensive analysis of the return on investment for the District Four TSM&O program. The findings indicate that during 2016, the benefit cost ratio was 10 (and a Net Present Value of approximately $2 billion). In other words, for every dollar invested in the District Four TSM&O program, approximately ten dollars is being returned in terms of travel time savings, road-user cost savings, crash savings as well as other environmental emission savings.

The purpose of this "2023 TSM&O Strategic Business Plan Update" is to continue the advancement of the District Four TSM&O program in maintaining its position as an industry leader and offering the public benefits in terms of mobility, safety and travel time reliability. The contents of this report include the following:

- Introduction – Discussion of the background and purpose of the "2023 TSM&O Strategic Business Plan Update" and its contents.
- Strategic Plan – Development of a vision reflecting the desired status of the TSM&O program in the year 2023. This vision will address each facet of the program including: integration of FMS & AMS networks and functions, development of data visualization tools, data sharing, and real-time dashboard reports, TSM&O deployment, TSM&O operations, TSM&O maintenance, Road Ranger operations, traffic incident management, IT/ITS systems, partnering, traveler information, public outreach and new initiatives.
- Business Plan – The Business Plan provides recommendations for each of the above categories on a year-by-year basis, 2019 – 2023.
- Report Card – Performance measures are reported to track the progress and effectiveness of the TSM&O program on an annual basis.
- Image Building – A proposed structure is presented for achieving peer recognition in terms of presentations at professional conferences as well as publications and awards.
- Beyond the Year 2023 – This section provides a list of initiatives that should be addressed to position District Four to continuously improve the TSM&O program in preparing for the next generation of transportation needs and technologies.

The "2023 TSM&O Strategic Business Plan Update" provides specific recommendations on the projects, processes and strategies needed to achieve the vision and mission of the District Four TSM&O program. These recommendations are incorporated into current and future contracts, as well as work program updates, then tracked using the Annual Report to ensure that they are being accomplished and demonstrate a reasonable return on investment. Furthermore, these recommendations are revisited during the preparation of annual reports to address refinements as necessary.

2.0 Strategic Plan

While strategic plans are traditionally prepared with a long-term vision of 20-30 years, the TSM&O Strategic Business Plan presented in this document was developed for a five-year time frame and is an update to the 2020 ITS Strategic Business Plan. This is in recognition that ITS has been expanded to a more comprehensive TSM&O Program and that the time frame beyond five years may be significantly influenced by major initiatives and emerging technologies outside the control of the department (e.g., Connected Vehicles and Automated Vehicles). Therefore, this Strategic Business Plan was developed to cover the years 2019 – 2023 for District Four. **The strategic vision below presents the desired status of each key component of the TSM&O program in 2023.**

TSM&O Planning, Design & Deployment

- Planning – TSM&O components are considered during the early planning stages of transportation improvement projects. Coordination is conducted among the various departments including modal development, project development, environmental, as well as traffic operations.
- Integration – Freeways and the core arterial network are beginning to operate as an integrated system. Interagency agreements are used to procure and share hardware, software and communications equipment as one system instead of two systems resulting in cost savings.
- Express Lanes – Express lanes have been built along I-95 between downtown Miami and Palm Beach County; along I-75 between the Miami-Dade / Broward County Line and I-595; as well as along I-595 between I-75 and Florida's Turnpike. Express lanes are available in both the northbound and southbound directions along I-95 and I-75 and reversible east/west directions along I-595, applying dynamic pricing to maintain operating speeds at a minimum threshold of 45 mph. Future extension of the 95 express lanes north to Indiantown Road in Palm Beach County has advanced from the planning to the deployment phase. Automatic gates are present at locations having direct connection ramps. Continuous upgrades of TSM&O strategies and technologies are implemented with a focus on how to manage the express lanes network efficiently as operational experience is obtained.

- Ramp Signals – Ramp signals (also known as ramp meters) are installed along I-95 at each ramp from the Hallandale Beach Boulevard interchange to Palm Beach County. The ramp signals are integrated with the Broward County and Palm Beach County Signal Systems as well as the FDOT District Six ramp signal system. Future extension of the I-95 ramp signals north to Indiantown Road in Palm Beach County will advance in parallel with the I-95 Express Lanes construction within the same project limits.
- Arterial Management Program (AMP) – AMP systems along arterials within Broward and Palm Beach County, including Boca Raton, are well advanced towards buildout. These systems include Arterial Dynamic Message Signs (ADMS), CCTV cameras, BlueTOAD travel-time data collection systems, and Microwave Vehicle Detection Systems (MVDS) along arterials. They are connected to the RTMC using fiber optics and wireless communications.

- Telecommunications – The telecommunications infrastructure along freeways has grown to 10 gigabits to provide sufficient fiber optic capacity, flexibility and redundancy to support existing and future video and data transmission needs to support next generation TSM&O programs. The arterial network communicates on 1 gigabit per second speeds on router-to-router links.
- Safety – TSM&O safety improvements have begun to be deployed along freeways and state arterials to complement traditional traffic safety improvements. This includes Wrong Way Detection and Prevention systems at high risk locations. Additionally, data visualization tools and predictive algorithms are becoming more important in supporting daily RTMC operations.
- Automated Traffic Signal Performance Measures (ATSPM) – ATSPM is becoming a standard tool used to improve signal timing along the AMP corridors within Broward and Palm Beach Counties. AMP traffic engineers and RTMC operators are becoming familiar with the performance measures and begin realizing operational benefits in using ATSPMs.
- Traffic Adaptive Signal Control – Traffic Adaptive Signal Control has been implemented along selected corridors, including Okeechobee Boulevard, PGA Boulevard, Northlake Boulevard, Glades Road, and Pines Boulevard. Several new projects are in construction along Halladale Beach Blvd and US 1, in the vicinity of Southeast 17th Street, as part of the signal system programs within Palm Beach and Broward Counties.
- Active Transportation and Demand Management (ATDM) – ATDM projects are being implemented as pilot programs along selected segments of I-95 and I-75. These ATDM pilot projects are focused on hard shoulder running and use of lane control signals to support speed harmonization and incident management functions.
- Integrated Corridor Management –The Federal Highway Administration (FHWA) ICM Planning Grant, awarded to the Broward Metropolitan Planning Organization, is being used to advance the I-95 ICM system. The system is anticipated to extend to Miami-Dade and Palm Beach Counties in the future.
- Signal Phasing and Timing (SPaT) – Traffic signal maintaining agencies have begun to provide real-time signal timing information to vehicles in motion. This has provided these vehicles with advanced information to improve intersection safety.
- Connected Vehicles – In coordination with local traffic signal maintaining agencies, a limited number of Dedicated Short-Range Communications (DSRC) antennas are being embedded within existing controllers to begin support for Connected Vehicle programs.
- Funding – New TSM&O projects are being planned with due consideration of funding requirements for operations and maintenance as well as exploring the potential for partnering with municipalities in sharing these costs.

TSM&O Operations

- Integrated Operations – The core freeway, express lanes and arterial systems, commonly known as major east/west and north/south roads, are operated in a more integrated manner to provide more reliable access to the interstate highways.
- Express Lanes Operations – Express Lanes are operational along I-95, I-595 and I-75. RTMC Operations staff has developed Standard Operating Guidelines (SOG) and training

programs, in collaboration with District Six, to address express lanes operations. The SOGs and training program consider both FDOT District Four's role and responsibilities as well as the adopted business rules of the regional express lanes network.

- Ramp Signaling Operations – Ramp signals along I-95, from Hallandale Beach Boulevard to Palm Beach County, are operational. While ramp signal rates are controlled by SunGuide software, the turn on/off function, which has been controlled manually, has transitioned to an automated system. RTMC Operations staff has developed SOGs and training programs, in collaboration with District Six, to address ramp signal operations.
- Arterial Management Program (AMP) – FDOT District Four uses consultant staff to provide on-site traffic engineers and operators to support the AMP programs within Broward and Palm Beach Counties. They also report performance measures on a monthly basis and use these reports to improve operations (e.g., special signal timing plans). Live dashboard reports for AMP become available for the benefit of tracking performance measures in real-time.
- I-595 – RTMC Operations control dynamic pricing and confirm DMS messages on open/closed status changes during reversible operations. The RTMC also audits operations performance metrics of the concessionaire.
- Wrong Way Detection and Prevention Operations – These systems are being deployed at selected ramps within District Four. RTMC Operations staff developed SOGs and training programs to detect wrong way driving incidents in real-time, confirm, and communicate to the law enforcement agencies, and advise motorists using DMS. The SOGs and training program are being used to monitor selected ramps where these systems have been deployed and activate notification procedures in a timely manner.
- Transportation Management (TM) Academy – The TM Academy continues to evolve in adding modules pertaining to new functions. These functions include: express lanes, ramp signals, arterial management program, ATDM, ICM, connected vehicles, and automated vehicles.
- Training Room – Upgrades to the RTMC training room include all the required training modules and equipment to support traditional RTMC operations training needs for orientation and refresher training as well as new requirements imposed by the regional express lanes network, ramp signals, wrong way detection and prevention systems, and connected vehicles. Training will transition to a hybrid automated / classroom training program over time.
- Performance Measures – Performance measures applicable to operations are integrated with the TSM&O program to yield network measures. Initially, the "outcome" performance measures were developed to address incident duration, travel time reliability and customer satisfaction. A "count down graphic" tool has been installed on workstations to make operators aware that they are approaching performance metric thresholds. These metrics will be seen as green, yellow and red on the visual count down meter. Other performance measures and supporting data streams have been established and used as analytical tools to continuously improve every facet of operations and maintenance. Weekly results continue to be posted on the SMART SunGuide website.
- Center-to-Center Interfaces – With the build-out of the telecommunications infrastructure within the District, center to-center interfaces among the various TMCs within the South Florida region (i.e., FDOT Districts One, Four, Six, Florida's Turnpike) are more reliable; have sufficient bandwidth to share video and data in real-time; and provide flexibility for redundancy. The Traffic Incident Management Satellite Office (TIMSO) continues to serve as the backup center during emergencies. Operational exercises are conducted at this facility on a regular basis.

- Automation – Data sharing and quality control are more of an automated process, thereby relieving RTMC operators of the more routine functions of data entry and sharing. During this transition, RTMC operators are cross-trained on higher-level functions to optimize operations and take on secondary functions such as data analysis, construction coordination and quality control auditing.
- Information Sharing – The RTMC continues to serve as the central focal point for sharing traffic information with the following public agencies: Florida Highway Patrol, County Sheriff Departments, 911, 511, airports, seaports, transit, District Four Management and Departments, other FDOT Districts and Department of Homeland Security. The RTMC also shares traffic information with private sector partners such as television/radio stations and smartphone app developers. TMCs within Southeast Florida continue information sharing and coordination through the Southeast Florida Regional TMC Operations Committee (SEFRTOC).
- Video Wall – The video wall management system integrates information and system analytics to provide a more comprehensive picture of the status of freeways, express lanes, ramp signals, arterials and transit systems. The video wall has evolved into a "situational awareness" wall where Geographic Information System (GIS)-based maps are posted as defaults when incident activity is light. A regional express lanes network map is posted on the video wall indicating the I-595 direction of reversible lanes status, current toll rates, and hot spots indicating congestion. Hot spots are analyzed by traffic engineers to correct traffic operations and safety deficiencies.
- Incident Detection – RTMC operators have become more reliant on vehicle detectors and CCTV cameras for incident detection as system deployments along the freeways and strategic arterials are completed.
- Traffic Engineering – Video and data collected by the RTMC are shared with traffic engineers to support traffic safety and operations studies and to conduct simulations of diversion route scenarios. This data is also used to conduct analyses of RTMC operations to improve quality and efficiency. Furthermore, RTMC operator training includes a module on the basic principles of traffic engineering so operators can better appreciate their role in traffic management.
- Operations & Maintenance (O&M) Interface – Interaction between operators and maintenance staff is more streamlined by automated systems as well as coordinated training programs.
- Broward Signal System Operations – Utilization of the four consoles dedicated to the Broward County Traffic Engineering Department (BCTED) has increased as more TSM&O devices are deployed along the arterials as part of the signal system buildout. The RTMC consultants' role in actively managing arterials has increased significantly sharing access to ATMS.now. These operators provide proactive traffic management to complement the Information System Analysts who continue to monitor the signal system and coordinate with maintenance technicians and traffic engineers responsible for signal timing updates.
- DMS Messaging – FDOT District Four TSM&O staff, in collaboration with Central Office and Manual of Uniform Traffic Control Devices (MUTCD) guidelines, is researching and applying innovative messaging in terms of format and content (e.g., automated queue detection leveraging new color DMSs).
- Regional Integrated Transportation Information System (RITIS) – RITIS is a situational awareness, data archiving, and analytics platform used to fuse data from multiple agencies, many systems, and the private sector. This enables effective decision making for incident response and planning. RTMC Operations staff have begun to use RITIS to

establish realistic performance targets based on actual data (e.g., travel speeds by time of day) to compare against real-time data. This provides a more useful tool in identifying atypical congestion "hotspots."

ITS Maintenance

- Asset Management – FDOT District Four is focusing on providing efficiencies in staff time and resources by applying effective asset management systems. A mobile app was

developed to enable maintenance technicians to call up inventories in the field. All ITS equipment is barcoded and secured to prevent loss and address audit requirements.

- Generators – FDOT District Four has effectively used generators to maintain TSM&O system availability. The number of generators has significantly increased to maintain the reliability of the express lanes and ramp signal systems. These generators are tested on a regular basis and their operational status is monitored on work stations and the video wall.

- Training – Training for contractors is provided to improve their understanding of the success factors in building and maintaining a reliable TSM&O infrastructure. These training sessions address lessons learned including best practices as they apply to express lanes and ramp signal systems.

- Storage – Additional storage facilities have been identified and are being used to accommodate the increased demands of additional TSM&O equipment and generators required by the express lanes projects.

- Maintenance Management – The Maintenance Information Management System (MIMS) is integrated into SunGuide software to provide a more robust asset management system, as well as an effective tool to monitor performance. The MIMS software module has evolved to apply more data mining to make better decisions regarding replacement versus repair of TSM&O devices. The system is used to integrate SunGuide with TSM&O maintenance, inventories, trouble ticketing and tracking. Furthermore, MIMS has evolved into a self-learning software that monitors the TSM&O system and identifies potential problems based on historical device failures. This facilitates predictive analysis to improve the efficiency of maintenance activities. TSM&O assets are mapped to a comprehensive database combined with other departments.

- Geographic Information Systems (GIS) – GIS as-built drawings have been developed for all TSM&O infrastructure within District Four. Furthermore, each TSM&O field device is GIS tagged and installed with trace wires on fiber optic runs.

- Mobility – Maintenance technicians are now using Voice over Internet Protocol (VoIP) to communicate in the field. Mobile testing labs are used to diagnose, troubleshoot and repair systems remotely with due consideration to security vulnerability.

- Working Group – A working group – consisting of TSM&O Maintenance, SunGuide and RTMC Operations – meets on a regular basis to develop and implement consistent policies, procedures and training.

- "End-of-Service Life" Issues – Obsolescence issues for technology have been addressed, particularly as it pertains to long lead times in receiving spares.

- Vandalism – Procedures have been developed and implemented to prevent vandalism of

TSM&O assets in the field. These procedures include the following: (1) vigilance and security awareness of law enforcement (FHP), Road Rangers and maintenance personnel working along the corridors; (2) clearing vegetation for clear sight line for observation from roadway and via CCTV camera monitoring; (3) installation of a monitoring and alarm system with alerts to the RTMC of gate/door and proximity alarms; (4) providing real-time monitoring of alarms which may indicate theft/tampering rather than a maintenance issue, and a timely response; (5) concealing the location of the power pull boxes with grass cover; (6) installing locator devices inside pull boxes at select locations; (7) installing security cages over air conditioning units with alarms to indicate tampering; and (8) adding the adopted theft prevention measures to future TSM&O procurements.

Road Rangers

- Road Rangers Operations – Road Ranger operations contracts have been transferred to District Four's Asset Maintenance companies. These contracts are performance based with no requirements for patrolling or towing. Road

Ranger vehicles comply with the statewide specifications developed by Central Office. Road Rangers are responsible for debris cleanup on shoulders as well as travel lanes, providing Maintenance of Traffic (MOT) support for maintenance activities, as well as providing motorist assistance and incident management. Road Rangers continue to be dispatched by RTMC Operators and are required to respond within 15 minutes after notification. The RTMC conducts performance audits of Road Rangers (quarterly inspections) operations using SunGuide information.

- Automated Vehicle Location (AVL) – AVL is provided for all Road Rangers and Severe Incident Response Vehicles (SIRV) and is compatible with SunGuide software to facilitate dispatching functions.
- Audits – Performance reviews of Road Rangers and SIRV Operations are conducted before and after major lane closure incidents. Corrective actions are made based on deficiencies. Incident management within the express lanes is carefully monitored to ensure that operations are not degraded.
- Mobile CCTV Cameras – CCTV cameras and mobile internet routers have been installed on selected Road Ranger and SIRV vehicles. Flexible camera mounts facilitate the repositioning of the cameras outside the vehicle. The cameras wirelessly feed back to the RTMC so operators can provide support in improving Road Ranger safety.
- Funding – Presentations to the Metropolitan Planning Organization (MPO) are made on a regular basis to secure funding to support Road Ranger and SIRV operations.

Traffic Incident Management (TIM)

- TIM Strategic Plan – The FDOT District Four TIM Strategic Plan, prepared in 2006, is updated to cover the timeframe between 2019 and 2023.

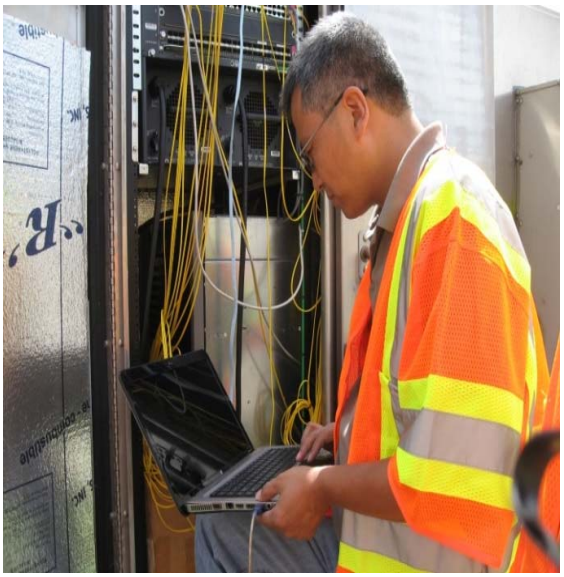
This update considers improvements needed to address deficiencies noted in the FHWA Annual Self-Assessments as well as new initiatives that have been added to the TSM&O Program (i.e., express lanes, ramp signals, arterial management program). This document is used to provide structure on how to conduct the TIM program focusing on outcomes and using these outcomes to request funding for new initiatives (e.g., reference markers, FHP paved turnarounds, fire hydrant signs along interstates that have sound walls, signs and temporary lighting for trucks to park during smoke/fog events). These funding requests consider maintenance costs by Asset Maintenance contractors.

- Deficiencies – Annual FHWA Self-Assessment surveys continue to be used to identify deficiencies in the TIM program and develop corrective actions. Secondary crash data is pulled from SunGuide software to conduct analyses when developing alternative strategies. This effort is utilized for end of queue management with the use of Road Rangers arrow boards.
- Interagency Video Distribution System (iVDS) – The iVDS usage is expanded in providing emergency responders with real-time access to CCTV camera images generated by the RTMC. This is useful in providing police, fire and rescue with an aerial view of incidents to manage their resources more efficiently, while making better incident command decisions in the field. Through data sharing of iVDS video, two-way communication is enhanced by providing center-to-center communications with Public Safety Answering Points (PSAPs) within the region. Fiber optic connectivity exists between the RTMC and law enforcement dispatch centers (i.e., FHP and Broward Sheriff's Office) to allow sharing of CCTV camera images as well as police generated Computer Aided Dispatch (CAD) data.
- Rapid Incident Scene Clearance (RISC) – FDOT District Four continues to activate RISC events in collaboration with FHP. Negotiations with Central Office have been completed to make contractor incentives more attractive while reducing onerous administrative requirements. As RISC activations may be made by RTMC Operations staff as well as FHP, the RISC program is used more often.
- FHP Communications Center – RTMC staff is rotated through shifts at the Lake Worth FHP Communication Center, and vice versa, to build stronger operational relationships between RTMC Operators and FHP Dispatchers.
- Interagency Agreements – Over the years, there has been a transition in using the signed Memorandum of Understanding (MOU) to develop more specific Joint Operating Policies (JOP) among the key TIM Team partner agencies.
- TIM Team Meetings – TIM Team meetings have transitioned from an institutional format to an operational format. The focus is on implementing recommendations from past discussions. TIM Team members review multiagency performance measures to identify areas of improvement. TIM presentations are more focused on topics important to emergency responders such as on-scene lighting, maintenance of traffic, traffic safety, major events and use of lights and sirens.
- Arterials – Over the years, closer coordination with the local traffic signal maintaining agencies has been achieved in providing incident management along arterials and freeways.
- Performance Measures - TIM team partners, fire rescue, police and towing agencies, established performance measures to track incident durations. These performance measures are used to implement incremental changes to improve efficiency in procedures.
- Post Incident Analyses (PIA) – A procedure has been developed and is implemented to utilize CCTV cameras in conducting PIAs and RISC assessments. CCTV cameras are used to monitor follow-up actions to determine if recommended changes are being implemented.

- Video Sharing – CCTV monitors are located in TIM Team members' facilities, so they can monitor their own staff and resources during incidents. This also makes them appreciate the extent of delays and is used as a training tool.
- Diversion Routes – A library of diversion route/ signal timing plans for all major incidents have been developed and are being implemented for significant closures along the freeways. In addition, DMS message templates in SunGuide have been updated to include the appropriate messages integrated in SunGuide software.
- Accident Records – A communication bridge has been developed and implemented in linking police CAD systems with FDOT District Four in sharing accident reports, so traffic engineers have immediate access to this information in conducting traffic safety studies.

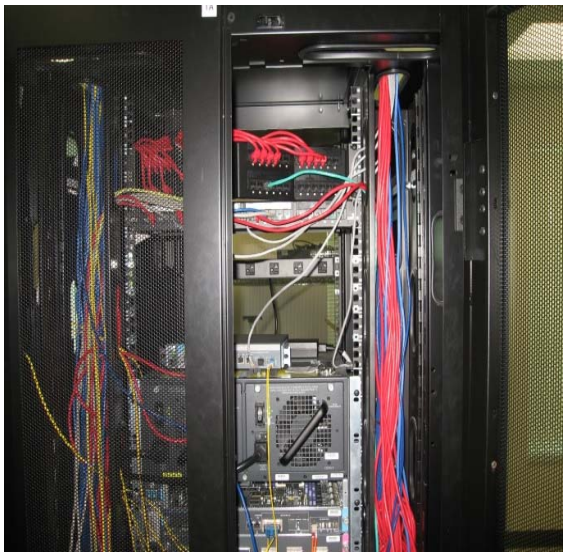
IT / ITS Systems

- Inventory Management – FDOT District Four has structured procedures in place to manage the inventory of IT/ITS equipment. Each piece of equipment is barcoded and scanned quarterly. This is an ongoing task.



- Security – A network electronic locking system provides a controlled procedure to track who is opening and closing controller cabinets with passwords lasting only 24 hours. CCTV cameras monitor and record room entries for up to 15 months. While the focus in the past has been on ITS equipment along freeways, ITS assets along arterials are also being secured. There is also an electronic monitoring system for copper theft prevention.
- Video Wall – The video wall is being used for system wide maps to generate hot spots regarding congestion, incidents and safety problems. Travel speed data triggers hot spots to pan-tilt-zoom CCTV cameras automatically. The video wall has transformed into a "situational awareness" wall with more detailed operations information on the workstation (e.g., maintenance issues, emergency generator status, incidents). Confirmation of messages has transitioned to being performed automatically rather than through CCTV camera confirmation. This is an ongoing task.
- Virtual Video Wall – The video wall system is evolving to allow greater usage and collaboration to external stakeholders within District Four and the entire State. Using middleware applications, sections of information that are part of the Distributed Video Wall system will be available across external WAN and internet resources to first responders as well as external stakeholders. This information will be used for situational awareness and include the information as part of their own decision making process.
- Data Storage – As the RTMC continues to collect massive amounts of data, alternative strategies are being explored such as leasing space on an offsite facility, or data in the cloud, which is set up for data farming. Mission critical data systems continue to be stored on RTMC servers; however, archived data may be stored offsite with network access to this information when needed.

- Centralization – IT equipment is centralized where ITS systems can be easily integrated. New contracts include specifications to simplify integration and configuration. Commercial software tools are being used to provide health status of equipment as well as status of messaging.



- Connected Vehicles – IT systems will be able to integrate any Connected Vehicle data (e.g., active wiper blades, wrong way detection, car disabled on side of road).

- Predictive Analytics – Predictive analytic tools are being developed to enable operations to be more proactive. Data analytic systems are being used to predict lane closures, and corresponding length of queues, or other system anomalies in advance to take corrective action before issues occur. These data analytic systems use a combination of RTMC generated and connected vehicle information to feed into predictive models. For example, predictive models are developed for weather applications indicating expected higher crash rates for certain roadway segments and strategies to avoid primary and secondary crashes as well as to generate automated pan-tilt-zoom of CCTV cameras to focus on anticipated hot spots.

- Private Cloud – A RTMC private cloud has been established and system processes have been standardized. All available and useful field information have been centralized to reduce maintenance site visits as well as bringing intelligence into the systems to be used for automation and predictability purposes. Real time knowledge and control information is used for inventory management of virtually all assets.

- Automation – RTMC systems are automated to the practical extent feasible, to optimize operational processes. For example, information exchange between Road Rangers, RTMC staff and field devices rely less on human interface and more on sharing information electronically. This enables operators to work at a higher level of incident, traffic and emergency management.

- Computer Aided Dispatch (CAD) Integration – CAD data from FHP, Broward Sheriff Office, 911 and Department of Homeland Security has been integrated into the RTMC's incident detection systems.

- Data Analyses – As the RTMC becomes more data rich, this data is being analyzed to better understand the roadway system in terms of traffic safety, queue dissipation, incident hot spots, diversion routes, speed harmonization, posting safety messages on DMSs, and Road Ranger dispatching. Partnerships are being formed with local universities to analyze this information, leading to better analytical tools. Better estimation of travel times are realized using predictive algorithms.

- SunGuide Software - Over the years, enhancements to SunGuide have included powerful CAD integration to better track incident detection, verification, notification and update of events. In addition, enhancements have been made to Road Ranger mobile applications, automation of dynamic pricing, reversible lanes operations and maintenance integration.

- Geographic Information System (GIS) – GIS modules have been integrated with SunGuide and other traffic simulation tools to display the

impacts of incidents and their "shock wave" effects on traffic flow.

- Vendor Products – FDOT District Four, in collaboration with Central Office, is proactive in encouraging vendors with new products to be added to the Approved Product List and Qualified Product List.
- Ramp Signals – Smarter software applications are being used to manage individual ramps within zones as well as multiple zones within the system.
- Express Lanes – New systems are provided to push real-time information to the public on dynamic pricing. In addition, alerts are provided to management regarding events that result in lost revenue.
- Big Data – Big data is being centralized in a data warehouse (or in the cloud) and is used to receive and push out data for other applications (e.g., arterial management program).
- Smarter Algorithms – New algorithms are used to harness data and video analytics to analyze traffic patterns and generate decision support systems in making optimum timely decisions to address congestion management.
- Dashboards – Dashboards are flexible to operate on video walls, workstations, tablets, smartphones and websites with a wide range of performance metrics, namely benefit-cost ratios, Road Ranger and SIRV performance, incident clearance times, equipment trouble tickets, number of incidents, activated generators and fiber cuts. Benefit-cost ratios are calculated more frequently using automated systems to estimate benefits while using trend analyses to estimate costs.
- MIMS – A newer version of MIMS enables it to run on smartphones as well as using the integrated camera to read barcodes on ITS devices.
- Workstations – Operators use their bank of ten monitors to create customized video walls to focus on specific functions including regional express lanes and ramp signal management.

Partnering

- Maintenance – Interagency agreements with municipalities are being used to cost-share for maintenance programs of the combined TSM&O infrastructure.
- Airport – The RTMC is monitoring 32 CCTV cameras and four DMSs at the Fort Lauderdale International Airport tunnel along US-1. The ITS devices are being used primarily for incident management.
- Florida Highway Patrol – FDOT District Four provides an operator within the Lake Worth Regional Communications Center, and vice versa, to provide more effective agency integration among FHP, FDOT and Florida's Turnpike in managing incidents within the region. CCTV camera images provided by both FDOT and Florida's Turnpike are viewed on the video wall within the FHP Communications Center.
- Fiber Sharing – FDOT District Four and Florida's Turnpike share fiber with each of the counties in building out the countywide TSM&O system programs.
- Diversion Routes – As TSM&O deployments are approaching completion, an aggressive outreach program is being conducted with municipalities to obtain their concurrence in using designated arterials as diversion routes during major incidents. Several of these routes are being equipped with electronic trailblazer signs to provide positive guidance to motorists.
- Service Provider – The RTMC has become a service provider to other departments within District Four including planning, traffic operations, design, construction, maintenance as well as with selected external stakeholders (e.g., MPOs).
- Agency Collaboration – Maintaining agencies meet on a regular basis to address operations and maintenance issues. This has been

effective in developing and jointly implementing projects that are evolving into agency partnerships with more aggressive goals (e.g., integrated corridor management).

- Team-Building – Cross-training programs are being implemented to have FHP spend shifts inside the RTMC and have RTMC operators ride along with FHP troopers. Also, joint training is being conducted with FHP, RTMC Operators, Road Rangers and SIRV staff.

- University Partnerships – A TSM&O curriculum has been developed in partnership with universities to teach the concept of TSM&O from a practical perspective. FDOT District Four staff and consultants teach courses on various TSM&O subject areas, including TSM&O planning, design, construction, operations, maintenance, systems, traffic incident management, TMCs and new initiatives including express lanes, ramp signals, connected vehicles, and automated vehicles. In addition, internship programs are in place with local universities.
- Data Mining – FDOT District Four is coordinating with Central Office in developing standard formats for sharing RTMC data with other research, planning, design, construction, operations, and maintenance departments.
- Mainstreaming – Close coordination is maintained with FDOT District Four Planning and Design to include TSM&O devices in future roadway improvement projects.
- Agency Partnerships – A working group between FDOT and BCTED was developed to provide synergies in implementing and integrating a system of freeways and arterials. Initially, the working group focused on small demonstration projects then gradually applied these successes in incrementally growing an Integrated Corridor Management system along congested corridors. Quarterly meetings are held with FDOT District Four and BCTED management to discuss operational issues and resolve disputes. A semi-annual staff meeting is also conducted among staff in the RTMC building to improve coordination and working relationships.
- Transit – FDOT is coordinating with transit agencies to assist them in providing predictive operations for buses and trains. Transit signal priority is being implemented at selected intersections along the state road system to support reliability of bus operations.

- Bus Operations - Closer operational coordination is provided with Broward County Transit (BCT), Palm Tran and Miami-Dade Transit in operating buses along express lanes within the region. BCT has completed the transition to the new and more robust AVL system. The new system includes a comprehensive maintenance diagnostics module that generates maintenance alarms, tickets and status reports. All buses are equipped with automated passenger counters, automated vehicle annunciators, CCTV cameras

and dual mode radio to improve passenger safety and security. Approximately 10 percent of all bus stops are equipped with passenger advisory signs which post the estimated times of arrival as well as providing an audible announcement of the same information. Meanwhile, Palm Tran has installed AVL, automated passenger counter and automated vehicle annunciator systems in their fleet of buses.

- Rail Operations – The South Florida Regional Transportation Authority (SFRTA) has replaced their legacy AVL system with a more robust and non-proprietary system that provides improved accuracy and reliability on train tracking, passenger information and public information. This system provides the following information on their passenger advisory signs: date, time, track assignment, estimated time of arrival and emergency information. They operate a single system to monitor security on trains and at stations with wireless communications.
- TSM&O Partnerships – More effective partnering with other transportation agencies in Broward and Palm Beach Counties has resulted in more efficient management of the total transportation system including freeways, express lanes, arterials, buses, trains as well as airport and seaport access.
- Smart Cards - A common electronic fare payment system is used for transit passengers riding Tri Rail and Miami-Dade Transit, Broward County Transit and Palm Tran buses. Research continues in developing interoperability with SunPass.

Traveler Information

- Express Lanes – A simplified messaging system has been established and implemented in posting real-time toll rates to enable travelers to navigate through the regional express lanes network when traveling from one express lane segment to another (e.g., I-95 to I-595 to I-75). This is also supported by third-party route navigation systems found with in-vehicle systems and smartphone apps.
- Private Sector – Initially, the public sector played a lead role in building the traveler information systems that are used today: DMSs, Highway Advisory Radios (HAR) and 511. Over the years, the private sector has leveraged this investment in developing smartphone apps that have advanced traveler information to address individual traveler needs in real-time. Therefore, it is anticipated that limited investments will be made in this area by FDOT District Four during this strategic plan time frame.
- Graphics – Color DMSs will begin posting diagrammatic graphics to simplify the conveyance of complex messages resulting from express lanes projects and other complex scenarios (e.g., complicated interchanges).
- Broadcasts – The media begins to provide live broadcasts at the RTMC during peak periods.
- Mobility on Demand Apps – FDOT is collaborating with private firms to develop Mobility on Demand apps to provide trip planning and integrated fare payment including dynamic pricing of express lanes.
- Media Partnerships – Web based tools are being used to share incident information with the media to broadcast traveler information using 511 information as input. FDOT continues to promote using 511 traveler information by the media to improve the accuracy of their reports.
- Multimodal Applications – Multimodal applications are being implemented to enhance real-time traveler information systems (and security) for transit, airports and seaports within the region. Passenger advisory systems have been installed at many of BCT's bus stops and at Palm Tran's critical intermodal hubs.

Public Outreach

- Express Lanes – The RTMC Public Outreach Coordinator provides support to the FDOT District Four Public Information Officer (PIO) in educating the public on the use of the regional express lanes network from a TSM&O perspective.

- Ramp Signals - The RTMC Public Outreach Coordinator provides support to the FDOT District Four PIO in educating the public on the use of the I-95 ramp signal system.
- Media Events – Major media events are conducted in conjunction with the completion of TSM&O deployments within District Four including express lanes and ramp signal projects.
- Diversion Routes - Diversion and evacuation routes are shared with the public and traffic signal maintaining agencies to improve their effectiveness during incident and emergency events.
- Media Integration - CCTV cameras are shared with the media so that they may use them as part of their traffic reports.
- Move Over Law – FDOT District Four collaborates with other FDOT Districts to increase the "Move Over Law" campaign's objective of eliminating incidents involving emergency responders being struck.
- Website – The SMART SunGuide website is refreshed to be more user-friendly and concise, including express lanes information (e.g., toll rates in real-time). Monthly reports are created using Google Analytics to track website impressions.
- RTMC Tours – RTMC tour materials are refreshed to simplify materials that apply to young school-age children and adults while still having content that addresses the interests of professional visitors. The RTMC video was updated to include segments on express lanes, ramp signals, I-595 reversible lanes, arterial management program, and simulations of event management, reversible lanes, express lanes posted on the video wall and at workstations. RTMC tours also include interactive techniques at workstations. For example, visitors may use joystick controls to receive a better hands-on experience. The RTMC tours have also been expanded to include other agencies so they can learn how to benefit from RTMC operations (e.g., FHP, Fire-Rescue).
- Customer Inquiries – FDOT District Four, in collaboration with District Six, continues to respond to customer inquiries regarding the express lanes network (i.e., 75 Express, 95 Express, and 595 Express.) Inquiries are regionally tracked through IssueTrak. The RTMC Public Outreach Coordinator and FDOT managers have access to submit, edit and view all inquiries received.
- Performance Metrics – In addition to the FDOT Central Office ITS Customer Survey, conducted every two years, the SMART SunGuide website is also used to conduct customer surveys focusing on travelers within Southeast Florida.

New TSM&O Initiatives

- Traffic Safety – FDOT District Four is becoming a "TSM&O Traffic Safety Research Center" in taking a leadership role in the research and field operational tests of TSM&O safety applications. TSM&O applications are being developed to address selected traffic safety issues.
- Dynamic Pricing – Dynamic pricing is evolving from being applied on a corridor basis to being

deployed on a system basis. FDOT District Four is coordinating with FDOT Central Office in developing, implementing, operating and maintaining a dynamic pricing software system used for operations of regional express lanes networks.

- Security – FDOT has clear policies, procedures and protocols in interfacing with the Department of Homeland Security (DHS) to provide required support. This support includes sharing video feeds as well as supplementing current deployments with fixed cameras at a limited number of sites selected by DHS.
- Rest Areas – Wireless communication has been implemented to provide rest areas with connectivity to the RTMC's traffic information. Display monitors are used to post real-time travel information as well as express lanes and other next generation initiatives. Interactive tools are being developed for truckers to provide alternative route information and expected drayage delay information at their destinations. This will offer them the choice to extend their stay at the rest area or use a different route.
- Connected Vehicles – District Four begins to instrument the appropriate components of the TSM&O infrastructure to support future Connected Vehicles initiatives.
- Automated Vehicles – FDOT District Four is evaluating potential corridor(s) for Automated Vehicles testbed applications. Central Office takes the lead role in determining the possibility of using District Four's transportation systems as a testbed.
- Airport / Seaport Intermodal Center – Passenger information systems are being planned to support development of the proposed Fort Lauderdale Airport / Port Everglades Seaport Intermodal Center to provide efficient transfers between the Airport, Seaport, Tri-Rail, buses, shuttles, vans, taxis, transportation network companies, and proposed FEC commuter rail and people mover systems.
- Active Transportation & Demand Management (ATDM) - FDOT District Four is evaluating potential corridors for ATDM applications. This may include hard shoulder running, lane control signals, speed harmonization, dynamic lane assignment systems, queue warning systems, etc.

- Lessons Learned Database – A "lessons learned" database is developed and is being maintained to apply to all aspects of the TSM&O program. This is particularly important as FDOT District Four will be one of the earliest operators of next generation TSM&O programs in the state.
- Best Practices Workshop – FDOT District Four is taking a leadership role in facilitating best practices workshops among other TMCs within the state as well as with TMC managers from other states and countries through the FHWA TMC Pooled Fund Study.

3.0 Business Plan

The Business Plan provides a series of recommended strategies to be implemented for each year during the time frame of 2019 to 2023. These recommended strategies support the Strategic Plan presented in the previous section of this report.

FDOT District Four TSM&O Business Plan

2019	2020	2021	2022	2023
TSM&O Planning & Design				
Conduct operational planning for **EL Network** Operations	Conduct operational start-up for **I-95 Express Phases 3C, 3A-1, 3A-2**	Conduct operational start-up for **I-95 Express Phase 3B**	Conduct operational start-up for **I-95 Express Phase 3B-1**	Conduct operational planning for **I-95 Express 3B-2**
Include TSM&O components in the Design-Build **SW 10th Street Connector**	Include TSM&O components in the Design-Build **SW 10th Street Connector**	Include TSM&O components in the Design-Build **SW 10th Street Connector**	Include TSM&O components in the Design-Build **SW 10th Street Connector**	Include TSM&O components in the Design-Build **SW 10th Street Connector**
Develop **Ramp Signals** SOGs and training	Conduct operational start-up of **Ramp Signals along I-95**	Conduct feasibility study of other corridors (I-75 and I-595) for **Ramp Signals**	Conduct feasibility study of other corridors (I-75 and I-595) for **Ramp Signals**	Conduct feasibility study of other corridors (northern Palm Beach County) for **Ramp Signals**
Conduct feasibility study for **Wrong Way Detection System**	Develop **Wrong Way Detection (mainline and ramps)** SOGs	Conduct training for **Wrong Way Detection**	Conduct operational start-up for **Wrong Way Detection**	Assess the effectiveness **Wrong Way Detection**
Add EL module to **TM Academy**	Add Ramp Signals module to **TM Academy**	Add AMS Operations module to **TM Academy**	Add ATDM/ICM modules to **TM Academy**	Add CV/AV modules to **TM Academy**
Add Express Lanes module to **Training Room**	Add Ramp Signals module to **Training Room**	Add AMS module to **Training Room**	Add ATDM/ICM modules to **Training Room**	Add CV/AV modules to **Training Room**
Align **Performance Measures (PMs)** with TSM&O program	Begin to report refined **PMs**	Apply **Refined PMs** to improve integrated operations	Continue to improve **Integrated Operations** based on analysis of PMs	Continue to improve **Integrated Operations** based on analysis of PMs
Strengthen **TMC C2C** interfaces within D4	Develop SOGs to support **Regional C2C** interfaces	Strengthen **TMC C2C** interfaces within the State	Develop **SOGs** to support statewide **C2C** interfaces	Exercise **C2C** operations at district, regional and state levels
	Assist the FDOT with **ICM** workshops and Partnering Agencies	Develop system requirements for **ICM**	Design-Build **ICM** ITS components for initial deployment phase	Expand **ICM** to other corridors within D4 as well as Miami-Dade & Palm Beach County
	Identify ITS needs for **Connected Vehicles (CV)**	Develop ConOps for ITS components to support **CV Needs**	Develop system requirements for ITS components to support **CV Needs**	Design-Build ITS components to support **CV Needs**
		Identify ITS needs for **Automated Vehicles (AV)**	Develop ConOps for ITS components to support **AVs**	Develop system requirements for ITS components to support **AVs**
Develop **FMS & AMS Integration Strategies**	Implement **FMS & AMS Integration Strategies** along selected corridor(s)	Expand **FMS & AMS Integration Strategies** to other corridors	Measure the effectiveness of **FMS & AMS Integration** along implemented corridors	Continue to develop and refine **FMS & AMS Integration Strategies**

Develop **TMC Operations Checklists** to measure and improve efficiency	Implement tools to promote **Operator Efficiency and Cross Training**	Fine-tune operation strategies to improve **Workflow** between various functions, if needed	Update **TMC Operations Checklists** to address Express Lanes, Ramp Signals, ATDM, and ICM	Fine-tune operation strategies to improve **Workflow** between various functions and stakeholders, if needed
TSM&O - ITS Deployments and FMS & AMS Integration				
Build **ITS Components of I-95/I-75 Express Lanes**, as needed	Build **ITS Components of I-95 Express Lanes**, as needed	Build **ITS Components of I-95 Express Lanes,** as needed	Build **ITS Components of I-95 Express Lanes**, as needed	Build **ITS Components of I-95 Express Lanes**, as needed
Design-Build **I-95 Ramp Signal** system	Design-Build **I-95 Ramp Signal** system	Design-Build **I-95 Ramp Signal** system	Conduct feasibility study for expanding **Ramp Signal** to I-75 and I-595	Design-Build **I-75 and I-595 Ramp Signal**, if feasible
Design-Build **AMS System** components	Design-Build **AMS System** components	Design-Build **AMS System** components	Design-Build **AMS System** components	Design-Build **AMS System** components
	Implement FMS & AMS integrated corridors including **Active Ramp Signal** strategies	Implement FMS & AMS integrated corridors **i**ncluding **Active Ramp Signal** strategies	Begin Operations of FMS & AMS integrated corridors including **Active Ramp Signal** strategies	Continue operations and refine FMS & AMS integrated corridors including **Active Ramp Signal** strategies
Develop **AMS Diversion Signal Timing Plans**	Deploy **AMS Diversion Signal Timing Plans,** as needed	Continue to build **AMS Diversion Signal Timing Plans Library**	Continue to build **AMS Diversion Signal Timing Plans Library**	Continue to build **AMS Diversion Signal Timing Plans Library**
Develop ConOps for shared use of **ATMS.now** systems with the local agencies	Continue to explore methods to integrate **ATMS.now** data into AMP process	Support local agencies in **Managing Arterial Network**	Continue to support local agencies in **Managing Arterial Network**	Continue local agencies in **Managing Arterial Network**
Assess performance of **Traffic Adaptive Control Systems**	Implement additional **Traffic Adaptive Control Systems**, as needed	Implement additional **Traffic Adaptive Control Systems**, as needed	Implement additional **Traffic Adaptive Control Systems**, as needed	Implement additional **Traffic Adaptive Control Systems**, as needed
Develop Concept of Operations for deploying **ATSPM** in coordination with local maintaining agencies	Deploy **ATSPM** in coordination with local maintaining agencies	Investigate new technology deployments including **SPaT**	Investigate necessary infrastructure upgrades to support **CV/AV**	Deploy **CV/AV** applications on arterials, as needed
Develop new **Dashboard Reports** (version 2.0) for AMS	Develop **Travel-Time projections** on FMS and AMS as part of the live Dashboard Reports	Continue to assess the needs of AMS applying findings from **Dashboard Reports**	Continue to assess the needs of AMS applying findings from **Dashboard Reports**	Continue to assess the needs of AMS applying findings from **Dashboard Reports**
	Identify potential **ATDM Pilot Project(s)** along I-95, I-75, and/or I-595	Design-Build **ATDM Pilot Project(s)**, if feasible	Develop SOGs and begin operations of **ATDM Pilot Project(s)**	Assess effectiveness of **ATDM Pilot Project(s)**
ITS Maintenance				
Continue to Implement **MIMS** upgrades	Continue to automate **MIMS** functions	Apply **MIMS** to support ITS replacement program	Incorporate emerging technologies into **MIMS**	Incorporate emerging technologies into **MIMS**
Continue to maintain **GIS Databases** for ITS assets	Continue to maintain **GIS Databases** for ITS assets	Continue to maintain **GIS Databases** for ITS assets	Continue to maintain **GIS Databases** for ITS assets	Continue to maintain **GIS Databases** for ITS assets

Develop **Mobile Test Labs** for remote maintenance	Use **Mobile Test Labs** for remote maintenance	Use **Mobile Test Labs** for remote maintenance	Use **Mobile Test Labs** for remote maintenance	Use **Mobile Test Labs** for remote maintenance
Develop **ITS Equipment Replacement Plan**	Incrementally implement **ITS Replacement Plan**	Incrementally implement **ITS Replacement Plan**	Incrementally implement **ITS Replacement Plan**	Incrementally implement **ITS Replacement Plan**
Develop procedures to prevent **ITS Vandalism**	Implement procedures to prevent **ITS Vandalism**	Continue to implement procedures to prevent **ITS Vandalism**	Continue to implement procedures to prevent **ITS Vandalism**	Continue to implement procedures to prevent **ITS Vandalism**
Identify additional **Storage for ITS Devices**	Improve organization of **Storage for ITS Devices**			
Road Rangers (RR) / Severe Incident Response Vehicles (SIRV)				
Audit performance of **RR / SIRV** operations quarterly and make recommendations	Transition **RR Operations to Asset Maintenance Contractor** in Palm Beach County	Improve performance of **RR/SIRV** operations by tracking B/C, RTMC data	Begin to specify requirements for **New Asset Maintenance Contracts** with the approval of Central Office	Continue to improve performance of **RR/SIRV** Operations; by tracking B/C and RTMC data
	Asset Maintenance Contractor to begin Road Ranger operations along I- 95 EL 3A	**Asset Maintenance Contractor** to begin Road Ranger operations along I- 95 EL 3B	**Asset Maintenance Contractor** to begin Road Ranger operations along I-95 EL 3C	
			Investigate mounting **CCTV Camera on Selected Road Ranger v**ehicles as part of new Asset Maintenance contract	Assess ROI in mounting **CCTV Camera on Road Ranger** vehicles under new Asset Maintenance contract
Present B/C of **RR/SIRV to MPOs** to secure funding	Present B/C of **RR/SIRV to MPOs** to secure funding	Present B/C of **RR/SIRV to MPOs** to secure funding	Present B/C of **RR/SIRV to MPOs** to secure funding	Present B/C of **RR/SIRV to MPOs** to secure funding
	Evaluate **Technology Upgrades** necessary on RR/SIRV vehicles for real-time communication	Investigate methods to provide **Real-time Feeds** of incidents to RR/SIRV		
Traffic Incident Management				
Develop & implement **TIM SOGs** for I-75 EL & I-95 EL Phase 3	Implement **TIM SOGs** for 95 EL Phase 3A	Develop **ICM Routes of Significance** in coordination with the local maintaining agencies	Develop and implement **ICM Routes of Significance** in coordination with the local maintaining agencies	Develop and implement **ICM Routes of Significance** in coordination with the local maintaining agencies
Restructure **TIM** to be more outcome based	Address **FHWA Self-Assessment** deficiencies	Address **FHWA Self-Assessment** deficiencies	Address **FHWA Self-Assessment** deficiencies	Address **FHWA Self-Assessment** deficiencies
Develop procedure to apply **Post Incident Analysis** findings	Identify improvements by **TIM Partners**	Assess improvement strategies by **TIM Partners**	Assess improvement strategies by **TIM Partners**	Refine improvement strategies by **TIM Partners**
Develop policy and procedure to display/communicate **Executive Notifications**	Display **Executive Notifications** on the TMC Video Wall and to share with TIM Partners	Estimate **Losses Due to Delays** from lane closure incidents		

Develop / Execute **JOPs**, as required	Develop / Execute **JOPs,** as required	Develop / Execute, **JOPs,** as required	Develop / Execute **JOP**s, as required	Develop / Execute **JOPs, a**s required
Improve C2C integration with **PSAPs** within D4	Improve C2C integration with **PSAPs** within D4	Improve C2C integration with **PSAPs** within D4	Improve C2C integration with **PSAPs** within D4	Improve C2C integration with **PSAPs** within D4
Develop SOGs for **IM as part of FMS/AMS** integration in Palm Beach and Broward Counties	Assess performance of **FMS/AMS** integration	Expand IM functions on **Integrated FMS/AMS** segments Districtwide	Improve IM operations of integrated sections of **FMS/AMS**	Continue to improve IM operations on integrated sections of **FMS/AMS**
IT/ITS Systems				
Implement **IT/ITS Security Systems** (Field & RTMC)	Continue to develop and implement **IT/ITS Security Systems** (Field & RTMC)	Continue to develop and implement I**T/ITS Security Systems** (Field & RTMC)	Continue to develop and implement **IT/ITS Security Systems** (Field & RTMC)	Continue to develop and implement **IT/ITS Security Systems** (Field & RTMC)
Improve configuration of **Video Wall** to serve NextGen ITS Needs	Integrate EL system maps into **Video Wall**	Integrate AMS info with **Video Wall**	Integrate AMS info with **Video Wall**	Transform video wall to **TSM&O Situation Awareness Wall**
Develop **Private Cloud** for RTMC systems	Apply **Private Cloud** to improve automation	Apply Software Defined Data Center **(SDDC)** to improve automation	Continue to apply **SDDC** to improve automation	Continue to apply **SDDC** to improve automation
Develop Concept for **Data Sharing** systems	Apply **Data Sharing** systems at workstations	Apply **Data Sharing** systems on video wall	Apply **Data Sharing** systems to support ICM	Begin development of **ICM Decision Support System**
Support **SunGuide CMB** to develop new modules, as needed	Support **SunGuide CMB** to develop new modules, as needed	Support **SunGuide CMB** to develop new modules, as needed	Support **SunGuide CMB** to develop new modules, as needed	Support **SunGuide CMB** to develop new modules, as needed
Support FDOT CO to improve **Ramp Signal** functions	Support FDOT CO to improve **Ramp Signal** functions	Centralize **Big Data** for new applications	Develop **Predictive Models**	Develop **Decision Support Systems**
Develop **EL Alerts** to management indicating significant revenue loss	Continue to develop **EL Functional** upgrades	Continue to develop **EL Functional** upgrades	Continue to develop **EL Functional** upgrades	Continue to develop **EL Functional** upgrades
Investigate **RITIS** integration in RTMC operations	Implement **RITIS** integration in RTMC operations	Continue **RITIS** integration in RTMC operations	Apply **RITIS** to improve RTMC operations	Apply **RITIS** to improve RTMC operations
Enable **MIMS access** on multiple devices	Enable **Dashboards** on multiple devices	Enable **Video Streaming** of wall content for external parties on Internet	Continue to **Develop and Expand Content** for external stakeholders on the Internet	Continue to **Develop and Expand Content** for external stakeholders on the Internet
FMS & AMS Network Merging; Server Upgrades	RTMC **Equipment Upgrades** for integrated TSM&O network			

Partnering				
	Part-time **Collocation** of RTMC Operators & FHP	Assess ROI in part-time RTMC Operators/**FHP Collocation**	Increase hours of **FHP Collocation,** if warranted	Increase hours of **FHP Collocation**, if warranted
Conduct workshops to address **Inter-Agency** issues	Conduct workshops to improve **Capability Maturity**	Address institutional issues to support **ICM** strategies	Develop MOUs and JOPs to support **ICM** strategies	Develop Inter-Agency SOGs to support **ICM** strategies
Help develop traffic engineering programs at the **Universities** focusing on RTMC Operations	Help develop traffic engineering programs at the **Universities** focusing on Ramp Signal and Express Lanes operations	Help develop traffic engineering programs at the **Universities** focusing on TSM&O	Help develop traffic engineering programs at the **Universities** focusing on ATDM and ICM	Help develop traffic engineering programs at the **Universities** focusing on CV/AV systems
Serve as **Adjunct ITS Instructor** at FAU and FIU	Help develop **ITS Curriculum f**or FAU and FIU	Rotate FDOT D4 ITS Consultant, and Contractor staff as **Instructors**	Continue innovations via **University Research**	Convert a workstation into an **ITS Simulator**
Develop concept to post **Partner Info** on video wall	Develop SOGs to post **Partner Info** on video wall	Post **Real-time BCT/Palm Tran Data** on video wall	Post **Real-time Tri-Rail and Brightline** data on video wall	Post **Real-time FEC/CSX** data on video wall
Investigate methods to incorporate **ITSDCAP** features into RTMC Operations	Make ITSDCAP more **User Friendly and Intuitive** to be used by RTMC staff	Integrate ITSDCAP in RTMC operations by developing **Predictive Models**	Integrate ITSDCAP in RTMC Operations by developing **Decision Support Systems**	Continue to expand ITSDCAP **Decision Support Systems**
Partner with **FAU & FIU** in developing new RTMC operations tools	Continue to partner with **FAU & FIU** in developing new RTMC operations tools	Continue to partner with **FAU & FIU** in developing new RTMC operations tools	Continue to partner with **FAU & FIU** in developing new RTMC operations tools	Continue to partner with **FAU & FIU** in developing new RTMC operations tools
Traveler Information				
Expand Mobile Apps to include I-95 EL Phase 2 information	**Expand Mobile Apps** to include I-75 EL, 3A information	Conduct study to determine feasibility in adding **Graphics** on Color DMSs	Begin posting **Graphics** on DMSs, as appropriate	Increase posting **Graphics** on DMSs, as appropriate
		Conduct study to begin **Live Media Broadcasts** at the RTMC during peak periods and special events	Begin conducting **Live Media Broadcasts** at RTMC, as appropriate	Support development of a **Traffic Channel** on Digital Sub-Channel Broadcast or Cable TV
Public Outreach				
Support D4 PIO in **Ramp Signals Education and Outreach Program**	Support D4 PIO in delivering **Ramp Signals Presentations** to affected municipalities along the I-95 corridor	Continue to support D4 PIO in **Express Lane / Ramp Signals Education and Outreach Program**	Support D4 PIO in **ICM /ATDM Education and Outreach Program**	Support D4 PIO in **CV/AV Education and Outreach Program**
Support D4 PIO in **Ramp Signals** media events	Support D4 PIO for **I-95 EL** media events	Support D4 PIO for **I-95 EL** media events	Support D4 PIO for **I-95 EL** media events	Support D4 PIO for **I-95 EL** media events
Update RTMC tours to display **NexGen ITS Applications**	Assign a workstation to display **NexGen ITS Applications**	Develop a video wall demo for **RTMC Tours**	Develop simulations to **Demo ICM and ATDM**	Develop simulations to **Demo CV/AV Systems**
Continue to collaborate with D6 to respond to **EL Inquiries**	Continue to collaborate with D6 to respond to **EL Inquiries**	Update **RTMC Outreach video** to include TSM&O initiatives	Continue to improve **Customer Service**	Continue to improve **Customer Service**

Partner with D6 to create regional **TSM&O Brochure**	Expand content featured in **TSM&O Brochure** for Treasure Coast	Refresh **SmartSunguide Website for** next generation TSM&O applications	Update **SmartSunGuide Website** to reflect advancements in ATDM and ICM programs	Update **SmartSunGuide Website** to reflect advancements in CV/AV programs
New Initiatives				
Assess using SunGuide data to develop **Data Visualization** tools	Apply **Data Visualization** tools to Identify and mitigate traffic operations and safety hotspots	Apply **Data Visualization** tools to manage hotspots in real-time	Apply **Data Visualization** tools to predict hotspots and implement strategies to improve safety	Apply **Data Visualization** tools to improve multimodal connectivity and efficiency
Identify **Data Sharing Needs** of other departments	Develop SOGs to **Share Data** with other departments	Identify **Data Sharing Needs** of other agencies	Develop SOGs to **Share Data** with other agencies	Identify **Automated Data Sharing** systems
Develop **Trend Analysis** tools	Conduct RTMC operations audit to identify **Automation** opportunities	Begin to **Automate** selected processes	Begin to apply **Machine Learning**	Begin to apply **Artificial Intelligence**
Explore strategies to increase value of **Video Wall**	Apply new strategies to improve the value of the video wall for effective **TSM&O Situational Awareness**	Investigate strategies to mirror **Video Wall Displays** from other RTMCs throughout the state	Apply new strategies to mirror **Video Wall Displays** from other RTMCs throughout the state	Identify and resolve **Hotspots** at the interface between District Four and other Districts
Begin Using **GIS Maps** as part of video wall	Develop **Video Wall Management Protocols**	Include **Ramp Signal Performance** as part of video wall	Include **ATDM/ICM** as part of video wall	Continue upgrades of **Video Wall** display layouts
Develop **TSM&O Performance Measures** for FMS & AMS with targets	Continue to refine **TSM&O Performance Measures**	Implement **Interactive Live Dashboards** for RTMC Managers, and remote users	Develop concepts for **New Version of RTMC**	Develop concept for **Mobility on Demand**
	Develop concept for **Towards Zero Deaths**	Develop **Towards Zero Deaths** implementation strategies	Phased implementation of **Towards Zero Deaths** strategies	Phased implementation of **Towards Zero Deaths** strategies
	Develop **Smart Cities Integration** concept from the perspective of RTMC operations	Develop RTMC system requirements for **Smart Cities Integration**	Phased implementation of RTMC components of **Smart Cities Integration**	Phased implementation of RTMC components of **Smart Cities Integration**
Develop concept of **ITS Safety Research Center**	Apply ITS to address **Traffic Safety** issues	Pilot test innovative ITS **Safety** solutions	Conduct before & after study of ITS **Safety** applications	Align ITS **Safety Applications** with CV/AV initiatives
Begin posting traveler information displays at **Rest Areas**	Update **Rest Area Displays** for Express Lanes	Provide **Interactive Tools** for truckers	Update **Rest Area Displays** for ICM/ATDM	Update **Rest Area Displays** for CV/AV
	Develop a concept for ITS to support **CV/AV**	Develop ITS functional requirements to support **CV/AV**	Develop ITS system requirements to support **CV/AV**	Design-build ITS to support **CV/AV**
Use FDOT D4 ATM Guidelines to Identify **ATDM Pilot Projects**	Develop **ATDM Pilot ConOps** document	Develop system requirements for **ATDM Pilot Project**	Design-Build **ATDM Pilot Project(s)**, if warranted	Design-Build **ATDM Pilot Project(s)**, if warranted

Conceptualize **SunGuide Data Dashboards** for planning, design, construction, operations, and maintenance needs	Provide/share **SunGuide Data** links to other departments to improve safety and operations			
Develop **Lessons Learned Database** for NexGen ITS	Update **Lessons Learned Database** for NexGen ITS	Update **Lessons Learned Database** for NexGen ITS	Conduct **Best Practices Workshop** with other RTMCs	Continue to **Innovate**

4.0 Report Card

Performance measures are developed in order to track the progress and effectiveness of the TSM&O program on an annual basis. The performance measures are consistent with the previous FDOT District Four ITS Strategic-Business Plans. Performance measures are converted to a letter grade, "A" representing the highest and "F" representing the lowest.

TSM&O Strategic Business Plan Report Card

Performance Measure	Metric	A	B	C	D	F
TSM&O Planning, Design & Deployment						
% Completion of System Build Out	Actual # miles built per yr/ Planned # miles build per yr	90-100	80 -89	70 -79	60-69	< 60
TSM&O Operations FMS						
Benefit / Cost Ratio	BCR (Bi-annual Report)	> 15	10-15	6-9	1-5	< 1
TSM&O Operations AMS						
Benefit / Cost Ratio	BCR (Bi-annual Report)	> 10	7-9	4-6	1-3	< 1
ITS Maintenance						
System Reliability – Field Devices	% Time Operational	> 98	96-98	91-95	85-90	< 85
Road Rangers						
Customer Satisfaction	% Respondents Satisfied with Service	95-100	90-94	80-89	70-79	< 70
Traffic Incident Management						
Incident Clearance Time	Overall Time to Clear Incidents (minutes)	< 60	60-75	76-90	91-120	> 120
IT/ITS Systems						
System Reliability – RTMC	% Time RTMC Systems are Operational	> 98	96-98	91-95	85-90	< 85
Partnering						
Number of Public / Private Partners	Number of Partners Collaborating with Daily	≥ 7	6	5	4	3
Traveler Information						
Travel Time Accuracy	% Accuracy = Posted vs Actual Travel Times	96-100	91-97	86-90	75-85	< 75
Public Outreach						
Satisfaction with ITS Program	Customer Survey (Scale of 1 to 10)	≥ 9	8-9	7-8	6-7	< 6
New TSM&O Initiatives						
Number of New Initiatives	Number of New Initiatives	≥ 4	3	2	1	0

5.0 Image Building

While the focus of the TSM&O Strategic Business Plan is correctly on *"measurable outputs and outcomes,"* the perception of being a leader among peers is also important. This section provides a structured plan for improving the image of the program in terms of publications and presentations at professional conferences.

Recommended topics to present at Professional Conferences

2019	2020	2021	2022	2023
ITS America				
Transportation Management Academy	Real Time RTMC Performance Mgmt	Ramp Signal System Operations	Dynamic Pricing for Express Lane Networks	I-95 Integrated Corridor Management
TRB Meeting				
N/A	TSM&O Partnerships within the Control Room	RTMC Decision Support Systems	Preparing RTMCs for Connected Vehicles	Preparing RTMCs for Automated Vehicles
ITS Florida (or ITS 5C Summit)				
Arterial Mgmt Program Lessons Learned	ITS Maintenance Management System	RTMC System Security	TSM&O Traffic Safety Applications	Next Generation Traffic Incident Mgmt

In addition, District Four should continue to apply and earn awards in recognition of their continuous accomplishments. Furthermore, articles should be placed in professional publications as well as providing local news media with press releases and feature stories on the benefits of the program.

6.0 Beyond the Year 2023

The focus of the TSM&O Strategic Business Plan is on the years 2019 – 2023. Toward the end of this time frame, the following initiatives should be considered in continuing to improve the program and making it ready for the next generation of transportation needs.

- Operational Integration – Operations should transition from a sub-area / corridor level to a system-wide level covering the core arterial networks of Broward County and Palm Beach County. This will require a higher level of technical, operational and institutional integration in managing the regional multi-modal transportation system more effectively and efficiently. Once completed, this will lend itself to ICM within District Four as well as the Tri-County region.
- Multimodal Applications – Legacy ITS systems should be integrated with multimodal partners such as transit, airports, seaports and multimodal centers; parking information systems should be implemented for downtown cities; and monitoring information systems should be deployed for movable bridges.
- Connected Vehicles and Automated Vehicles – As the national program of Connected Vehicles and Automated Vehicles evolve, FDOT District Four should be prepared to provide the needed infrastructure and systems to utilize and leverage these programs.
- Smart Cities – The TSM&O program - combined with connected vehicles, automated vehicles and other emerging technologies – will play an integral role in the development of smart cities by enhancing system connectivity through the Internet of Things. The RTMC should begin to integrate these systems as part of operations.
- Funding – Reauthorization of the federal Fixing America's Surface Transportation (FAST) Act is anticipated to increase funding for America's highways and transit systems, encourage new

innovation, and leverage TSM&O to improve mobility. This reauthorization recognizes the critical role of technology and innovation in making transportation safer and more convenient while laying the groundwork to build a smarter transportation system of the future. Locally, the Broward County "Penny Tax for Transportation" will provide needed funding for modernization of the traffic controllers and communications infrastructure to support new initiatives such as ATSMPs, SPaT, and emerging technologies.

As technologies evolve to become more advanced and Connected Vehicles and Automated Vehicles take on a more important role in traffic safety and sharing real time information among vehicles, it is tempting to focus on continuing deployment. However, we must not lose sight of the target – *"to continuously provide TSM&O services to internal and external customers."* Therefore, the focus beyond the year 2023 should continue to provide a balance between deployment, operations, maintenance, system integration and asset management.

Summary

The TSM&O Strategic Business Plan provides numerous recommendations distributed over the five years between 2019 and 2023 for TSM&O planning, design, deployment, operations, maintenance, Road Rangers, traffic incident management, IT/ITS systems, partnering, traveler information, public outreach and new initiatives. The next steps in implementing this plan are the following:

- FDOT District Four Management Endorsement – Present the TSM&O Strategic Business Plan to FDOT District Four Management to obtain acceptance of the recommendations and strategies depicted in this plan.

- Implementation – Implement recommended strategies as part of existing and new contracts.

- Performance Assessment – Utilize the Annual Report as a method to track performance of the proposed recommendations as well as need for further refinement.

In summary, the TSM&O Strategic Business Plan provides a roadmap for achieving the District Four TSM&O mission and vision. While consistent performance measures are not currently in place to compare the District Four TSM&O Program with other similar programs throughout the state and nation, the Strategic Business Plan provides the ingredients to maintain itself as a national leader in setting the bar for other programs to emulate in the future.

Update to 2019-2023 TSM&O Strategic Business Plan – June 30, 2020

Updates to the TSM&O Strategic Business Plan as identified in Section 3.0 of the document 2023 TSM&O Strategic Business Plan are as shown highlighted below:

FDOT District Four TSM&O Business Plan

2019	2020	2021	2022	2023
TSM&O Planning & Design				
Conduct operational planning for **EL Network** Operations In Progress	Conduct operational start-up for **I-95 Express Phases 3A-1, 3A-2** 3A-2 has been completed	Conduct operational start-up for **I-95 Express Phases 3A-1 & 3B-1**	Conduct operational start-up for **I-95 Express Phase 3B-2**	Conduct operational planning for **I-95 Express 3C**
SW 10th Street Connector to I-95 PD&E	**SW 10th Street Connector to I-95** Public Outreach in Progress	**Design-Build SW 10th Street Connector to I-95**	**Procurement & Bid Package for SW 10th Street Connector to I-95**	**Construction of SW 10th Street Connector to I-95**
Develop **Ramp Signaling** Config files & templates In Progress	Develop **Ramp Signaling** SOGs and training In Progress	Construct & Conduct operational start-up of **Ramp Signaling along I-95**	Construct & Conduct operational start-up of **Ramp Signaling along I-95**	Construct & Conduct operational start-up of **Ramp Signaling along I-95**
Conduct feasibility study for **Wrong Way Detection System** D4 concept was tested at TERL	Develop **Wrong Way Detection (mainline and ramps)** SOGs Module developed	Conduct training for **Wrong Way Detection** In Progress	Conduct operational start-up for **Wrong Way Detection** Being Tested	Assess the effectiveness and lessons learned from **Wrong Way Detection**
Add EL module to **TM Academy** Being Planned	Add Ramp Metering module to **TM Academy** Being Planned	Add AMS Operations module to **TM Academy**	Add ATDM/ICM modules to **TM Academy**	Add CV/AV modules to **TM Academy**
Align **Performance Measures (PMs)** with TSM&O program Process Started	Begin to report refined **PMs** AMS Dashboards have been designed	Apply **Refined PMs** to improve integrated operations	Continue to improve **Integrated Operations** based on analysis of PMs	Continue to improve **Integrated Operations** based on analysis of PMs
Strengthen **TMC C2C** interfaces within D4	Develop SOGs to support **Regional C2C** interfaces	Strengthen **TMC C2C** interfaces within the State	Develop **SOGs** to support statewide **C2C** interfaces	Exercise **C2C** operations at district, regional and state levels
	Assist D4 with **ICM** workshops and Partnering Agencies ICM in Broward being planned	Develop system requirements for **ICM**	Design-Build **ICM** ITS components for initial phase	Expand **ICM** to other corridors within D4 as well as Miami-Dade & Palm Beach County

	Identify ITS needs for **Connected Vehicles (CV)** Connected Freight Priority System on SR 710 being pursued	Develop ConOps for ITS components to support **CV Needs**	Develop system requirements for ITS components to support **CV Needs**	Design-Build ITS components to support **CV Needs**
		Identify ITS needs for **Automated Vehicles (AV)**	Develop ConOps for ITS components to support **AVs**	Develop system requirements for ITS components to support **AVs**
Develop **FMS & AMS Integration Strategies** In Progress as part of I-95 IM	Implement **FMS & AMS Integration Strategies** along selected corridor(s) In Progress as part of I-95 IM	Expand **FMS & AMS Integration Strategies** to other corridors	Measure the effectiveness of **FMS & AMS Integration** along implemented corridors	Continue to develop and refine **FMS & AMS Integration Strategies**
Develop **TMC Operations Checklists** to measure and improve efficiency In Progress	Implement tools to promote **Operator Efficiency and Cross Training** Cross-training in progress	Fine-tune operation strategies to improve **Workflow** between various functions, if needed	Update **TMC Operations Checklists** to address Express Lanes, Ramp Metering, ATDM, and ICM.	Fine-tune operation strategies to improve **Workflow** between various functions and stakeholders, if needed
TSM&O - ITS Deployments and FMS & AMS Integration				
Build **ITS Components of I-95/I-75Express Lanes**, as needed Integration on I-75 has been completed	Build **ITS Components of I-95 Express Lanes**, as needed In Progress	Build **ITS Components of I-95 Express Lanes,** as needed	Build **ITS Components of I-95 Express Lanes**, as needed	Build **ITS Components of I-95 Express Lanes**, as needed
Design-Build **I-95 Ramp Signaling** system as part of EL In Progress	Design-Build **I-95 Ramp Signaling** system as part of EL In Progress	Design-Build **I-95 Ramp Signaling** system as part of EL	Conduct feasibility study for expanding **Ramp Signaling** to I-75 and I-595	Design-Build **I-75 and I-595 Ramp Signaling**, if feasible
Design-Build **AMS System** components In Progress	Design-Build **AMS System** components In Progress	Design-Build **AMS System** components	Design-Build **AMS System** components	Design-Build **AMS System** components
	Implement FMS & AMS integrated corridors including **Active Ramp Metering** strategies Two I-95 ramps in BC to be activated initially	Implement FMS & AMS integrated corridors **i**ncluding **Active Ramp Metering** strategies	Begin Operations of FMS & AMS integrated corridors including **Active Ramp Metering** strategies	Continue operations and refine FMS & AMS integrated corridors including **Active Ramp Metering** strategies
Develop **AMS Diversion Signal Timing Plans** In Progress	Deploy **AMS Diversion Signal Timing Plans,** as needed In Progress	Continue to build **AMS Diversion Signal Timing Plans Library**	Continue to build **AMS Diversion Signal Timing Plans Library**	Continue to build **AMS Diversion Signal Timing Plans Library**

	Develop ConOps for shared use of **ATMS.now** systems with the local agencies In Progress	Continue to explore methods to integrate **ATMS.now** data into AMP process In Progress	Support local agencies in **Managing Arterial Network** In Progress	Continue to support local agencies in **Managing Arterial Network**
Assess performance of **Traffic Adaptive Control Systems** Earlier deployments in PBC have been assessed; In-Sync has been de-activated due to maintenance issues	Implement additional **Traffic Adaptive Control Systems**, as needed Deployment in BC continues to meet the expectations	Implement additional **Traffic Adaptive Control Systems**, as needed	Implement additional **Traffic Adaptive Control Systems**, as needed	Implement additional **Traffic Adaptive Control Systems**, as needed
Develop Concept of Operations for deploying **ATSPM** in coordination with local maintaining agencies SR 706 (Indiantown Rd) in PBC in construction	Continue to Develop & Deploy **ATSPM** in coordination with local maintaining agencies	Investigate new technology deployments including **SPaT** TTS and Connected Signals packages for SpaT will be evaluated in coordination with PBC in 2020	Investigate necessary infrastructure upgrades to support **CV/AV**	Deploy **CV/AV** applications on arterials, as needed
Develop new **Dashboard Reports** (version 2.0) for AMS New Dashboard 2.0 Report in use for BC. Report for PBC being developed.	Implement new **Dashboard Reports** for AMS in BC & PBC New Dashboards in use	Continue to assess the needs of AMS applying findings from **Dashboard Reports**	Continue to assess the needs of AMS applying findings from **Dashboard Reports**	Continue to assess the needs of AMS applying findings from **Dashboard Reports**
	Identify potential **ATDM Pilot Project(s)** along I-95, I-75, and/or I-595	Design-Build **ATDM Pilot Project(s)**, if feasible	Develop SOGs and begin operations of **ATDM Pilot Project(s)**	Assess effectiveness of **ATDM Pilot Project(s)**
ITS Maintenance				
Continue to Implement **MIMS** upgrades In Progress	Continue to automate **MIMS** functions In Progress	Apply **MIMS** to support ITS replacement program	Incorporate emerging technologies into **MIMS**	Incorporate emerging technologies into **MIMS**
Continue to maintain **GIS Databases** for ITS assets In Progress	Continue to maintain **GIS Databases** for ITS assets In Progress	Continue to maintain **GIS Databases** for ITS assets	Continue to maintain **GIS Databases** for ITS assets	Continue to maintain **GIS Databases** for ITS assets
Develop **Mobile Test Labs** for remote maintenance	Use **Mobile Test Labs** for remote maintenance	Use **Mobile Test Labs** for remote maintenance	Use **Mobile Test Labs** for remote maintenance	Use **Mobile Test Labs** for remote maintenance

Develop **ITS Equipment Replacement Plan** Completed	Incrementally implement **ITS Replacement Plan** Plan in Review	Incrementally implement **ITS Replacement Plan**	Incrementally implement **ITS Replacement Plan**	Incrementally implement **ITS Replacement Plan**
Develop procedures to prevent **ITS Vandalism**	Implement procedures to prevent **ITS Vandalism**	Continue to implement procedures to prevent **ITS Vandalism**	Continue to implement procedures to prevent **ITS Vandalism**	Continue to implement procedures to prevent **ITS Vandalism**
Identify additional **Storage for ITS Devices**	Improve organization of **Storage for ITS Devices**			
Road Rangers (RR) / Severe Incident Response Vehicles (SIRV)				
Audit performance of **RR / SIRV** operations quarterly and make recommendations Being Planned	Transition **RR Operations** to Asset Management Contractor in Palm Beach County	Improve performance of **RR/SIRV** operations by tracking B/C, RTMC data	Begin to specify requirements for **New Asset Management Contracts** with the approval of Central Office	Continue to improve performance of **RR/SIRV** Operations; by tracking B/C and RTMC data
	Asset Management Contractor to begin Road Ranger operations along I- 95 EL 3A	**Asset Management Contractor** to begin Road Ranger operations along I- 95 EL 3B	**Asset Management Contractor** to begin Road Ranger operations along I-95 EL 3C	
			Investigate mounting **CCTV Camera on Selected Road Ranger v**ehicles as part of new Asset Management contract	Assess ROI in mounting **CCTV Camera on Road Ranger** vehicles under new Asset Management contract
Present B/C of **RR/SIRV to MPOs** to secure funding	Present B/C of **RR/SIRV to MPOs** to secure funding	Present B/C of **RR/SIRV to MPOs** to secure funding	Present B/C of **RR/SIRV to MPOs** to secure funding	Present B/C of **RR/SIRV to MPOs** to secure funding
	Evaluate **Technology Upgrades** necessary on RR/SIRV vehicles for real-time communication New Radio Communications System in use	Investigate methods to provide **Real-time Feeds** of incidents to RR/SIRV		
Traffic Incident Management				
Develop & implement **TIM SOGs** for I-75 EL & I-95 EL Phase 3	Implement **TIM SOGs** for 95 EL Phase 3A	Develop **ICM Routes of Significance** in coordination with the local maintaining agencies	Develop and implement **ICM Routes of Significance** in coordination with the local maintaining agencies	Develop and implement **ICM Routes of Significance** in coordination with the local maintaining agencies
	Restructure **TIM** to be more outcome based Being Planned	Address **FHWA Self-Assessment** deficiencies	Address **FHWA Self-Assessment** deficiencies	Address **FHWA Self-Assessment** deficiencies

Develop procedure to apply **Post Incident Analysis** findings	Identify improvements by **TIM Partners**	Assess improvement strategies by **TIM Partners**	Assess improvement strategies by **TIM Partners**	Refine improvement strategies by **TIM Partners**
Develop policy and procedure to display/communicate **Executive Notifications** Completed	Display **Executive Notifications** on the TMC Video Wall and to share with TIM Partners	Estimate **Losses Due to Delays** from lane closure incidents		
Develop / Execute ability to **video sharing with TIM Partners**	Develop / Execute ability to **video sharing with TIM Partners**	Develop / Execute ability to **video sharing with TIM Partners**	Develop / Execute ability to **video sharing with TIM Partners**	Develop / Execute ability to **video sharing with TIM Partners**
Improve C2C integration with **PSAPs** and **TIM Partners** within D4	Improve C2C integration with **PSAPs** and **TIM Partners** within D4	Improve C2C integration with **PSAPs** and **TIM Partners** within D4	Improve C2C integration with **PSAPs** and **TIM Partners** within D4	Improve C2C integration with **PSAPs** and **TIM Partners** within D4
Develop SOGs for **IM as part of FMS/AMS** integration in Palm Beach and Broward Counties SRIV operations on arterials has begun in BC	Assess performance of **FMS/AMS** integration	Expand IM functions on **Integrated FMS/AMS** segments Districtwide	Improve IM operations of integrated sections of **FMS/AMS**	Continue to improve IM operations on integrated sections of **FMS/AMS**
IT/ITS Systems				
Implement **IT/ITS Security Systems** (Field & RTMC) Equipment currently on order	Continue to develop and implement **IT/ITS Security Systems** (Field & RTMC) Equipment being procured	Continue to develop and implement **IT/ITS Security Systems and Procedures** (Field & RTMC)	Continue to develop and implement **IT/ITS Security Systems and Procedures** (Field & RTMC)	Continue to develop and implement **IT/ITS Security Systems and Procedures** (Field & RTMC)
Improve configuration of **Video Wall** to serve NextGen ITS Needs Started Virtual Information Wall Sharing	Integrate EL system maps into **Video Wall** Video Wall upgrades being procured	Integrate AMS info with **Video Wall** Joysticks for AMP consoles are being added	Integrate AMS info with **Video Wall**	Transform video wall to **TSM&O Situation Awareness Wall**
Develop **Private Cloud** for RTMC systems Hardware currently being staged	Apply **Private Cloud** to improve automation Integrating into DOT email system and cloud	Apply Software Defined Data Center **(SDDC)** to improve automation Equipment being procured	Continue to apply **SDDC** to improve automation	Continue to apply **SDDC** to improve automation
Develop Concept for **Data Sharing** systems Released Data Sharing Concepts to rest of State via ITS WAN	Apply **Data Sharing** systems at workstations Integration with DOT state email system and cloud data sharing started	Apply **Data Sharing** systems on video wall	Apply **Data Sharing** systems to support ICM	Begin development of ICM **Decision Support System**

Support **SunGuide CMB** to develop new modules, as needed In Progress	Support **SunGuide CMB** to develop new modules, as needed In Progress	Support **SunGuide CMB** to develop new modules, as needed	Support **SunGuide CMB** to develop new modules, as needed	Support **SunGuide CMB** to develop new modules, as needed
Support CO to improve **Ramp Signal** functions	Support CO to improve **Ramp Signal** functions	Support the process to Centralize **Big Data** for new applications	Support the process to develop **Predictive Models**	Support the process to develop **Decision Support Systems**
Develop **EL Alerts** to management indicating significant revenue loss	Develop **EL Alerts** to management indicating significant revenue loss Being Planned	Continue to develop **EL Functional** upgrades	Continue to develop **EL Functional** upgrades	Continue to develop **EL Functional** upgrades
Investigate **RITIS** integration in TMC operations Hardware Staging Equipment Ordered	Continue **RITIS** integration in TMC operations In Progress	Integrate new radio communication systems into RTMC that can interface with other agencies Completed	Continue to develop relationships and procedures with partner agencies using this new system	
Enable **MIMS access** on multiple devices Available on all mobile devices	Enable **Dashboards** on multiple devices	Enable **Video Streaming** of wall content for external parties on Internet	Continue to **Develop and Expand Content** for external stakeholders on the Internet	Continue to **Develop and Expand Content** for external stakeholders on the Internet
FMS & AMS Network Merging; Server Upgrades Hardware procured	TMC **Equipment Upgrades** for integrated TSM&O network Hardware currently being installed	Continue to upgrade **TMC Equipment** for integrated TSM&O network	Upgrade **TMC Equipment** for integrated TSM&O network as needed	Continue to upgrade **TMC Equipment** for integrated TSM&O network as needed
Partnering				
	Part-time **Collocation** of RTMC Operators & FHP Colocation at FHP has been implemented at 5x10 schedule at Lake Worth	Assess ROI in part-time RTMC Operators/**FHP Collocation**	Increase hours of **FHP Collocation,** if warranted	Increase hours of **FHP Collocation**, if warranted
Conduct workshops to address **Inter-Agency** issues Conducted TSM&O Workshop for Martin, St. Lucie, and IRC	Conduct workshops to improve **Capability Maturity**	Address institutional issues to support **ICM** strategies	Develop MOUs and JOPs to support **ICM** strategies	Develop Inter-Agency SOGs to support **ICM** strategies
Help develop traffic engineering programs at the **Universities** focusing on ITS operations	Help develop traffic engineering programs at the **Universities** focusing on Ramp Metering and Express Lanes operations	Help develop traffic engineering programs at the **Universities** focusing on TSM&O	Help develop traffic engineering programs at the **Universities** focusing on ATDM and ICM	Help develop traffic engineering programs at the **Universities** focusing on CV/AV systems

Serve as **Adjunct ITS Instructor** at FAU and FIU	Help develop **ITS Curriculum f**or FAU and FIU	Rotate FDOT D4 ITS Consultant, and Contractor staff as **Instructors**	Continue innovations via **University Research**	Convert a workstation into an **ITS Simulator**
Develop concept to post **Partner Info** on video wall	Develop SOGs to post **Partner Info** on video wall	Post **Real-time BCT/Palm Tran Data** on video wall	Post **Real-time Tri-Rail and Brightline/Virgin Trains** data on video wall	Post **Real-time FEC/CSX** data on video wall
Investigate methods to incorporate **ITSDCAP** features into TMC Operations	Make ITSDCAP more **User Friendly and Intuitive** to be used by TMC staff	Integrate ITSDCAP in TMC operations by developing **Predictive Models**	Integrate ITSDCAP in TMC Operations by developing **Decision Support Systems**	Continue to expand ITSDCAP **Decision Support Systems**
Partner with **FAU & FIU** in developing new TMC operations tools In Progress	Continue to partner with **FAU & FIU** in developing new TMC operations tools	Continue to partner with **FAU & FIU** in developing new TMC operations tools	Continue to partner with **FAU & FIU** in developing new TMC operations tools	Continue to partner with **FAU & FIU** in developing new TMC operations tools
Traveler Information				
Expand Mobile Apps to include I-95 EL Phase 2 information	**Expand Mobile Apps** to include I-75 EL, 3A information	Conduct study to determine feasibility in adding **Graphics** on Color DMSs Completed	Begin posting **Graphics** on DMSs, as appropriate In Use	Increase posting **Graphics** on DMSs, as appropriate
		Conduct study to begin **Live Media Broadcasts** at the RTMC during peak periods and special events	Begin conducting **Live Media Broadcasts** at RTMC, as appropriate	Support development of a **Traffic Channel** on Digital Sub-Channel Broadcast or Cable TV
Public Outreach				
Support D4 PIO in **Ramp Signaling Education and Outreach Program** In Progress	Support D4 PIO in delivering **Ramp Signaling Presentations** to affected municipalities along the I-95 corridor Completed	Continue to support D4 PIO in **Express Lane / Ramp Signaling Education and Outreach Program** In Progress	Support D4 PIO in **ICM /ATDM Education and Outreach Program**	Support D4 PIO in **CV/AV Education and Outreach Program**
Support D4 PIO in **Ramp Signaling** media events Completed	Support D4 PIO for **I-95 EL** media events	Support D4 PIO for **I-95 EL** media events	Support D4 PIO for **I-95 EL** media events	Support D4 PIO for **I-95 EL** media events
	Assign a workstation to display **NexGen ITS Applications**	Develop a video wall demo for **RTMC Tours**	Develop simulations to **Demo ICM and ATDM**	Develop simulations to **Demo CV/AV Systems**

Continue to collaborate with D6 to respond to **EL Inquiries** In Progress	Continue to collaborate with D6 to respond to **EL Inquiries** In Progress	Update **RTMC Outreach video** to include TSM&O initiatives	Continue to improve **Customer Service**	Continue to improve **Customer Service**
Partner with D6 to create regional TSM&O Brochure Completed	Expand content featured in TSM&O Brochure for Treasure Coast In Progress	Refresh **SmartSunguide Website for** next generation ITS applications In Progress	Update **SmartSunGuide Website** to reflect advancements in ATDM and ICM programs	Update **SmartSunGuide Website** to reflect advancements in CV/AV programs
New Initiatives				
Assess SunGuide data, validate, develop **Data Visualization** tools In Progress	Apply **Data Visualization** tools to Identify and mitigate traffic operations and safety hotspots In Progress	Apply **Data Visualization** tools to manage hotspots in real-time	Apply **Data Visualization** tools to predict hotspots and implement mitigation strategies to avoid traffic congestion and safety problems	Apply **Data Visualization** tools to improve multimodal connectivity and efficiency
Identify **Data Sharing Needs** of other departments In Progress	Develop SOGs to **Share Data** with other departments	Identify **Data Sharing Needs** of other agencies	Develop SOGs to **Share Data** with other agencies	Identify **Automated Data Sharing** systems
Develop **Trend Analysis** tools In Progress	Conduct TMC operations audit to identify **Automation** opportunities	Begin to **Automate** selected processes	Begin to apply **Machine Learning**	Begin to apply **Artificial Intelligence**
Explore strategies to increase value of **Video Wall** In Progress	Apply new strategies to improve the value of the video wall for effective **TSM&O Situational Awareness**	Investigate strategies to mirror **Video Wall Displays** from other TMCs throughout the state	Apply new strategies to mirror **Video Wall Displays** from other TMCs throughout the state	Identify and resolve **Hotspots** at the interface between District Four and other Districts
Begin Using **GIS Maps** as part of video wall	Develop **Video Wall Management Protocols**	Include **RM Performance** as part of video wall	Include **ATDM/ICM** as part of video wall	Continue upgrades of **Video Wall** display layouts
Develop **TSM&O Performance Measures** for FMS & AMS with targets	Continue to refine **TSM&O Performance Measures** In Progress	Implement **Interactive Live Dashboards** for TMC Managers, and remote users In Progress	Develop concepts for **New Version of TMC**	Develop concept for **Mobility on Demand**
	Develop concept for **Towards Zero Deaths**	Develop **Towards Zero Deaths** implementation strategies	Phased implementation of **Towards Zero Deaths** strategies	Phased implementation of **Towards Zero Deaths** strategies
	Develop **Smart Cities Integration** concept	Develop system requirements for implementation of **Smart Cities Integration**	Phased implementation of **Smart Cities Integration**	Phased implementation of **Smart Cities Integration**

Develop concept of **ITS Safety Research Center**	Apply ITS to address **Traffic Safety** issues	Pilot test innovative ITS **Safety** solutions	Conduct before & after study of ITS **Safety** applications	Align ITS **Safety Applications** with CV/AV initiatives
Develop TSM&O conceptual procedure for improving **safety** at **R/R crossings** In Progress	Implement TSM&O strategies for improving **safety at R/R crossings** In Progress			
	Develop and implement TSM&O for Smart Work Zones In Progress	Continue to develop and implement TSM&O for Smart Work Zones	Continue to implement TSM&O for Smart Work Zones	Continue to implement TSM&O for Smart Work Zones
	Develop TSM&O concepts for Traffic Management Zones on arterials Being Planned	Develop & Implement TSM&O concepts for Traffic Management Zones on arterials	Continue to implement TSM&O concepts for Traffic Management Zones on arterials	Continue to implement TSM&O concepts for Traffic Management Zones on arterials
	Begin posting traveler information displays at **Rest Areas**	Update **Rest Area Displays** for EL	Provide **Interactive Tools** for truckers	Update **Rest Area Displays** for ICM/ATDM
	Develop a concept for ITS to support **CV/AV**	Develop ITS functional requirements to support **CV/AV**	Develop ITS system requirements to support **CV/AV**	Design-build ITS to support **CV/AV**
	Use D4 ATM Guidelines to Identify **ATDM Pilot Projects**	Develop **ATDM Pilot ConOps** document	Develop system requirements for **ATDM Pilot Project**	Design-Build **ATDM Pilot Project(s)**
Conceptualize **SunGuide Data Dashboards** for planning, design, construction, operations, and maintenance needs In Progress	Continue to conceptualize **SunGuide Data Dashboards** for planning, design, construction, operations, and maintenance needs In Progress	Provide/share **SunGuide Data** links to other departments to improve safety and operations		
Develop **Lessons Learned Database** for NexGen ITS	Update **Lessons Learned Database** for NexGen ITS	Update **Lessons Learned Database** for NexGen ITS	Conduct **Best Practices Workshop** with other RTMCs	Continue to **Innovate**

Additional updates to the tasks above are listed by the category as follows:

TSM&O Planning & Design:

- I-95 Express Phase 3A2 was accepted in 2019 and Phase 3A1 is scheduled to be completed in late 2021. Phase 3B2 is likely to be ready for acceptance in late 2023 and Phase 3C is scheduled to be final accepted in late 2023/early 2024.
- Current schedule for the SW 10th St Connector to I-95 project: Public Outreach Plan to continue through September 2020; Public Hearing with Location Design Concept Acceptance scheduled for

April 2021; Design Build procurement process is scheduled for RFQ by September 2021. The procurement will be completed in July 2022 and Construction to begin by July 2023.

- Smart Workzone concept with CV component is being planned for SW 10th Street Connector to I-95 project as a standalone project to be in place prior to the beginning of construction.
- Incident Management (IM) plans to detour I-95 traffic are being developed in Broward and Palm Beach Counties.
- AMS Dashboard Reports for Broward and Palm Beach Counties have been redesigned to add performance measures on AMS corridors.
- CAV Deployment on SR 710 in Palm Beach County for Connected Freight Priority System is being developed.

Traffic Incident Management:

- Dashboard Reports for Performance Evaluation of RISC Events and Incident Management Program are being developed.

IT/ITS Systems:

- Network switches, routers and related equipment required for the upgrades are currently being procured.
- Upgrades to Video Wall Configuration are being pursued. Additional layouts are being incorporated with the view of developing it into a situational awareness display wall. AMS congestion maps and camera feeds have been incorporated into the display layout. Also the video wall layout view is being shared with the offices outside RTMC.
- Created an auditable system for ordering network equipment for all users, including maintenance and operations.
- Solarwinds Trouble Ticket program has been added to better manage trouble tickets and new requests.
- Remote Terminal Server System has been added to facilitate remote monitoring of the RTMC cameras. This enhancement will enable remote operations in case of hurricanes or emergency situations.

New Initiatives – Upcoming:

- Henry Kinney Tunnel Monitoring with ITS Deployments.
- Interagency Coordination and Participation in AMS expansion for Lockhart Stadium in Ft. Lauderdale.