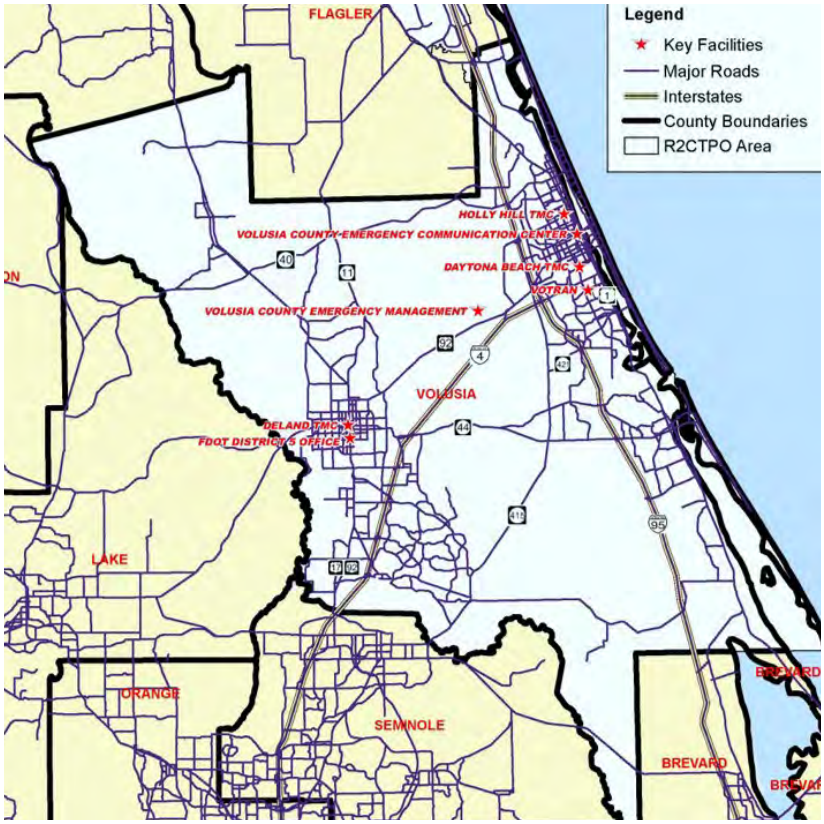

RIVER TO SEA TPO TSM&O MASTER PLAN PHASE 2

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List of Acronyms

AM ..... Amplitude Modulation

ADMS ..... Arterial Dynamic Message Sign

APC ..... Automatic Passenger Counter

AVL ..... Automatic Vehicle Location

ATDM ..... Active Transportation Demand Management

ATIS ..... Advanced Traveler Information System

ATS ..... Adaptive Traffic Signal

ATMS ..... Advanced Traffic Management Systems

CBRAS ..... Citizens Band Radio Advisory System

CCTV ..... Closed Circuit Television

CONOPS ..... Concept of Operations

DDI ..... Diverging Diamond Interchange

DMS ..... Dynamic Message Sign

ECOC ..... Emergency Communications and Operations Center

EMS ..... Emergency Medical Service

FDOT ..... Florida Department of Transportation

FHWA ..... Federal Highway Administration

FM ..... Frequency Modulation

FRATIS ..... Freight Advanced Traveler Information System

GIS ..... Geographic Information System

GPS ..... Global Positioning Systems

HAWK ..... High Intensity Activated Crosswalk

HAR ..... Highway Advisory Radio

IEEE ..... Institute of Electrical and Electronics Engineers

ITS ..... Intelligent Transportation Systems

LED ..... Light Emitting Diode

LOS ..... Level of Service

LOTTR ..... Level of Travel Time Reliability

LRTP ..... Long Range Transportation Plan

MAP-21 ..... Moving Ahead for Progress in the 21st Century Act

MAV ..... Maximum Acceptable Volume

MIMS ..... Maintenance and Inventory Management System

MVMT ..... Million Vehicle Miles of Travel

MPO ..... Metropolitan Planning Organization

RISC ..... Rapid Incident Scene Clearance

RITSA ..... Regional ITS Architecture

RRFB ..... Rapid Rectangular Flashing Beacon

RTMC ..... Regional Transportation Management Center

SIS ..... Strategic Intermodal System

TIM ..... Traffic Incident Management

TMC ..... Traffic Management Center

TMS ..... Transportation Management System

TSP ..... Transit Signal Priority

TSM&O ..... Transportations Systems Management and Operation

1. Executive Summary

1.1. Background Information

The River to Sea Transportation Planning Organization (TPO) is the duly designated and constituted body responsible for carrying out the urban transportation planning and programming process for the designated Metropolitan Planning Area (MPA). The TPO's MPA includes all of Volusia County and the developed areas of eastern Flagler County, including Beverly Beach and Flagler Beach as well as portions of the cities of Palm Coast and Bunnell; with a population of over 600,000 people.

The TPO serves as the primary forum within which member local governments and citizens voice concerns, identify priorities and plan for transportation improvements for all modes of transportation – roadway, public transit and bicycle and pedestrian facilities. Seaports and airports are also considered in the TPO activities, and detailed planning for these modes is typically handled by their respective authorities.

The Federal Highway Administration (FHWA) has been promoting the approach of using TSM&O to improve the overall performance of the transportation network (Freeway and Arterial). TSM&O is a performance driven approach for solving traffic related problems and minimizing congestion through the utilization of ITS, signal system control, and other management and operational strategies to locate and minimize the causes of delays in real-time. The objective of the TSM&O program is to improve the efficiency of the existing transportation network through performance monitoring and coordinating freeway and arterial management strategies, such as incident management. The TSM&O Program also considers future technologies and the importance of improving the overall efficiency of the transportation network.

R2CTPO is actively laying the groundwork for a plan implementing advanced technologies through a robust Intelligent Transportation System (ITS). Strategies identified in the R2CTPO's ITS Master Plan support improving the efficiency of the transportation system. These strategies support a safer roadway system and reducing congestion

R2CTPO'S VISION STATEMENT:

Our transportation system will provide a safe and accessible range of options that enhances existing communities while providing mobility in a fiscally responsible, energy efficient, and environmentally compatible manner. This integrated system will support economic development, allowing for the effective movement of all people, goods, and services necessary to maintain and enhance our quality of life.

through the improvement of vehicle travel times, incident reduction and response, and performance monitoring.

The R2CTPO ITS Master Plan Vision takes into consideration the R2CTPO's 2040 Long Range Transportation Plan (LRTP) Vision Statement. In addition to creating consistency with the LRTP Vision statement, the vision, goals and objectives of other agencies were also reviewed for incorporation into the ITS Master Plan. This process included reviewing documents from Volusia and Flagler Counties, the FDOT ITS program, and the FDOT TSM&O program. The resulting Vision, related Goals, and supporting Objectives were vetted with the ITS Technical Working Group.

1.2. Causes of Congestion

A main goal of this Master Plan effort was effective stakeholder input. One-on-one interviews were held with all R2CTPO stakeholders to determine their assets and individual needs. These stakeholders were also invited to periodic meetings to hear the progress of the Master Plan and provide input regarding their individual needs. Across the board, it was determined that inadequate funding for Operations and Maintenance (O&M) of individual stakeholder assets is a critical concern.

1.3. Recommendations

After consulting with stakeholders and identifying the causes of congestion, a summary of all TSM&O strategies, both recommended and optional, have been proposed as a part of this Master Plan, including recommended early deployments and optional expansion tactics. *These are detailed in Section 7.*

1.4. Opportunity Cost

The previously described shortage of O&M resources has generated costs to the motorists that can otherwise be avoided. In addition, several arterials identified in **Appendix J** would benefit from added TSM&O improvements. The absence of these resources can be considered an Opportunity Cost, meaning how much the traveling public will pay if improvements are not made. It has been determined that should the improvements recommended by this Master Plan not be put in place, the cost incurred by the residents of R2CTPO will be an estimated $63.2 million per year.

1.5. Cost of Improvements/Solutions

To identify what size of an investment will be required, a high-level cost analysis was performed to estimate the capital investments required and the amount of O&M funding required for each deployment. These investments aim to bolster the TSM&O infrastructure for R2CTPO to accommodate inevitable population growth that will come as the region becomes more developed. The estimated cost to build out the recommended deployments and operate and maintain them adequately for 10 years is $57.5 million. *See Section 4.1 for a detailed breakdown of this cost.*

1.6. Benefit/Cost Analysis

Because the TSM&O improvements will be funded via taxpayer funds, a Benefit/Cost Analysis was performed in order to demonstrate how much benefit would be brought to motorists for every public dollar spent. This analysis was performed by comparing the 10-year opportunity cost of not implementing TSM&O improvements (see Section 6) to the 10-year improvement cost, and representing this as a ratio. The total benefit/ratio for the Master Plan is estimated to be 12.04:1. Ultimately, this ratio demonstrates that TSM&O improvements are an extremely effective investment of funding for transportation purposes.

1.7. TSM&O Benefits

TSM&O improvements will allow RTCTPO to increase return on large investments already put in place (i.e. roadway network, traffic signals, etc.). They will also allow for increased coordination between user agencies due to the increase in communications and surveillance technologies that will be deployed. These factors will lead to the following potential benefits:

- Increased safety for motorists
- Increased safety for first responders
- Increased real-time management of roadway network
- Reduced motorist delays
- Greater travel time reliability
- Fewer secondary incidents
- Fuel savings/reduced negative environmental impacts

2. Transportation TSM&O Needs

This section's primary purpose is to identify TSM&O solutions that may provide the optimum return on investment, by targeting the specific strategies and deployment locations which best fulfill the insufficiencies in the R2CTPO's transportation system. Preceding documents have established TSM&O Visions, Goals, and Objectives, and provided an existing conditions summary. These findings, along with other transportation system performance measures, will be used to rank roadway segments where the application of TSM&O solutions will have the most significant positive impact. Utilization of effective TSM&O strategies will allow the R2CTPO to realize increased performance of Volusia and Flagler County's multimodal infrastructure through the use of systems, services, and projects that preserve capacity, improve safety, improve security, and provide increased travel reliability.

2.1 Overview of TSM&O Strategies

The R2CTPO is faced with the challenge of increasing the movement of people and goods in the area, while under financial and geographical restrictions. Consequently, it is becoming more difficult to increase transportation system capacity through traditional methods, such as roadway widening. Application of TSM&O strategies provide an alternative means to meet the transportation system challenges the R2CTPO faces; through the use of cost-effective advanced technologies that maximize the capacity and efficiency of roadways without increasing the roadway footprint. The remainder of this section summarizes TSM&O strategies in use today and in the foreseeable future.

2.1.1 Transportation Management Center

Transportation Management Centers (TMCs) serve as the nerve center of the transportation management system. Data collected from ITS field devices is sent back to the TMC, where it is processed and joined with operational and control data, and distributed as necessary. From the TMC, roadway performance can be monitored, and control systems can be activated accordingly with the goal of improving traveler mobility and safety. TMCs can act as a hub where numerous agencies work together with the common goal of improving transportation system performance. *A full description of potential TMC locations, equipment, and operational needs can be found in Section 2.5.*

2.1.2 Communications System

Communication systems unlock potential for numerous ITS technology deployments, and information sharing between stakeholders. The National Transportation Communications for ITS Protocol (NTCIP) Framework provides a layered approach to communications standards for the transportation industry to foster compatible communications and working interconnections

between devices and applications. Interconnection of Traffic Signals, CCTV video and pan-tilt-zoom control signal transmission, DMS message transmission, and Vehicle Detection System data transmission are all example uses for transportation agency communication systems.

The most common physical media used for ITS communications is fiber optic cabling, which uses thick flexible fibers with glass cores to transmit light pulses with very little signal degradation over distance: light pulses are converted to electrical signals at the end of fiber optic links. A common alternative to fiber optics is microwave based communication links between sites. With this approach, directional antennas are placed on ITS or Traffic Signal poles, that form links between locations over which data can be transmitted. Both technologies provide distinct pros and cons, but ultimately serve the same purpose.

Public agencies in the region use both fiber optic cables and microwave links as part of their communication systems. As previously mentioned, improvement of the area's communication system unlocks the potential to expand the ITS capabilities in the region; therefore, while not directly fulfilling a TSM&O Objective, an expanded communication system is a worthwhile investment that facilitates the attainment of said objectives. Many of the agencies in the region stated during stakeholder meetings that expansion of their communication systems is a goal moving forward, in order to accomplish objectives like increasing the number of connected traffic signals and interconnecting remote facilities for data sharing.

2.1.3 Visual Surveillance

Closed-Circuit Television Cameras (CCTVs) provide a means to visually monitor traffic in real-time. Visual monitoring of traffic, weather conditions, work zones, and incidents allow transportation agencies to collect valuable information not provided by Vehicle Detection Systems. An example is the ability for TMC operators to determine the severity of a crash, how many lanes are affected, and the types of vehicles involved, then relay this information to emergency responders so that the level of response can be determined before they arrive on scene. Another benefit is the ability of maintenance personnel to remotely confirm the functionality of Dynamic Message Signs, Traffic Signals, and other field equipment; resulting in decreased troubleshooting response times. Sharing of roadway surveillance CCTV streams with the media is a common practice in the State of Florida.

By far the most common types of CCTV cameras used for public roadway surveillance are pan-tilt-zoom capable cameras in dome-style housings, which allow for 360-degree viewing from a single camera location. In some instances, static cameras are used to monitor locations of particular interest and to confirm equipment functionality. TMC operators can access CCTV cameras at their workstation and, if an event of note is occurring, project the video stream to the

TMC video wall for review. In specific circumstances, such as areas with high probability of fog or areas with little night-time illumination, thermal imaging or infrared capable cameras are deployed.

2.1.4 Vehicle Detection Systems

Vehicle Detection Systems are an overarching category of equipment including an assortment of functional types and technologies that collect real-time traffic data and perform vehicle presence detection. This section will focus on the traffic data detection and probe data detection functional types, whereas the vehicle presence technologies will be discussed in the subsequent Traffic Signal System section. Traffic data detection and probe data detection systems work in concert to provide an accurate picture of transportation system performance.

Traffic data detection systems provide presence, volume, occupancy, and speed data for the lanes they monitor. Common types of traffic data detection technologies include: microwave vehicle detectors, inductive loop detectors, video detectors, and wireless magnetometers. These detectors collect instantaneous spot readings of prevailing traffic conditions at the sensor location, and do not perform unique vehicle identification. Traffic data detection systems strive to detect 100% of vehicles within the lanes they monitor.

Probe data detection systems provide speed and travel time information for a road segment. Common types of probe data detection technologies include: MAC address based device identification using Bluetooth and Wi-Fi capable devices; vehicle identification using RFID transponders mounted to vehicles; and license plate recognition. Probe data detection systems detect and record the exact time a unique vehicle passes a sensor location. Once the vehicle passes two such sensor locations, the detection system software determines segment travel time and average speed, by comparing the distance between probe sensors and respective vehicle passing times. Probe data detection systems typically only capture a fraction of the vehicles that pass by the sensor, then create approximations of the prevailing traffic conditions.

Information gathered by these sensors may be used to identify incidents within a roadway segment—if a freeway segment commonly operates at an average speed of 55 miles per hour at a given time of day, but is operating at 10 miles per hour at that time today, a signal can be sent to TMC operators notifying them of a potential problem, allowing them to react by instituting changes to the freeway management system. Recently, vehicle detection systems have been used to feed information to adaptive transportation control systems, permitting these systems to adapt in real-time; an example is automated activation of freeway ramp meters and adaptive metering rate adjustments.

2.1.5 Advanced Traveler Information Systems (ATIS)

ATIS are a collection of equipment and technologies that updates drivers on current roadway conditions, allowing them to make informed travel decisions about travel modes, route selection, and departure times. Better informed drivers tend to more efficiently utilize existing surface transportation system capacity, through avoidance of congested areas and use of underutilized routes or travel modes. This section will describe a handful of ATIS technologies.

Dynamic Message Signs (DMS)

DMS are roadway sign panels, of various shapes and sizes that display changeable messages. The message on display is typically controlled from the TMC, and can range from estimate travel times between interchanges to upstream incident warning and alternative route guidance. DMS are also used as part of dynamic toll pricing systems to display current toll rates—express lane systems in the State of Florida rely on DMS panels for this and other purposes. FDOT operates and maintains a large number of DMS located on arterials, where they are commonly referred to as Arterial DMS (ADMS), and on highways and freeways. During stakeholder meetings, the City of Daytona Beach expressed interest in the installation of additional ADMS signs in the City.

Highway Advisory Radio (HAR)

HAR systems broadcast AM and FM radio messages regarding current travel conditions to the traveling public. Messages to be broadcasted are created at the TMC, then uploaded to transmitter locations in the field for broadcasting. Since AM and FM radios are standard features in vehicles, the potential for a high percentage of travelers to listen to the message exists. To alert drivers that an important message is being broadcast, HAR systems employ static signs displaying the frequency information fitted with flashing beacons that are activated to bring attention to the sign.

Citizens Band Radio Advisory System (CBRAS)

CBRAS are similar in function to HAR systems, but use Citizens Band (CB) radio frequencies (channels) to broadcast travel condition information. CB radios are commonly found within semi-tractor trailers, so these systems are particularly useful in areas with high percentages of such vehicles.

FL511 Traveler Information System

FL511 is a system that provides travel information collected by ITS to travelers via phone, web site, and mobile applications. FDOT operates FL511, which is fed data collected by FDOT's Vehicle Detection System, the TMC and third-party sources. Historically this service has primarily been used for freeway travel information, but is being expanded to arterial roadways.

In-Vehicle Dynamic Route Guidance

A combination of in-vehicle navigation systems and dynamic traffic information, that adapts the recommended travel route based on real-time travel conditions, selecting alternate routes on the fly to decrease travel times. Examples of such systems are Google Maps and Waze mobile applications.

2.1.6 Incident Management & Highway Assistance

A coordinated effort by numerous parties—law enforcement agencies, medical personnel, towing companies, hazardous material clean-up companies, contracted service providers, and roadway maintenance crews—to quickly and effectively respond to incidents and clear disabled vehicles, debris, and cargo from the roadway.

Traffic Incident Management (TIM)

FDOT's TIM teams bring together all agencies involved in responding to and clearing incidents from the roadway; working together to reduce the impacts of incidents on motorists and increasing incident management safety. TIM teams are active in all FDOT Districts—these teams conduct monthly meetings and educational seminars to improve team synergy. In the past, TIM teams have focused their efforts on the State Highway System, in support of the *State of Florida Open Road Policy Agreement*[1].

Road Ranger Service Patrols

Road Ranger Patrols provide free highway assistance services during incidents with the goal of reducing delay and improving safety for the motoring public and incident responders. The program was started in 2000, and has since made over 4.3 million service assists. Road Rangers are vehicles that patrol congested areas and high incident locations, and also respond to specific service calls, providing an array of services including: tire change assistance, providing a limited amount of fuel, incident clearance, and performing other minor emergency repairs to vehicles. The historical focus area of Road Rangers has been freeways.

Rapid Incident Scene Clearance (RISC)

RISC is an initiative by FDOT to provide monetary incentives for private partners, through the auspices of contracted services, to clear major incidents quickly in support of the *State of Florida Open Road Policy Agreement*. Activation of RISC is primarily reserved for incidents of complete roadway closures on limited access highways, where typical wreckers are incapable of clearing

[1] An agreement between Florida Highway Patrol (FHP) and FDOT that establishes a policy for FHP and FDOT personnel to expedite the removal of vehicles, cargo, and debris from the State Highway System.

the incident. Florida's Turnpike Enterprise was the first FDOT District to implement RISC. Due to the program's success, FDOT expanded the practice statewide, allowing each FDOT District to implement their own RISC program at their discretion.

Emergency Preparation, Security, Response & Recovery

There exists an assortment of TSM&O strategies to use prior to, during, and after emergency events to improve evacuation procedures, permit supply deliveries to reach areas in need, expedite clean-up, and repair or protect infrastructure. Examples of such strategies include: pre-designated evacuation routes supported by special signal timings and reversible lanes to improve traffic flow away from the evacuated area; during emergency events, using roadway CCTV cameras to gather valuable information about the event to the benefit of response personnel; and after an emergency, using CCTVs to assess damage to the transportation infrastructure quickly and enable determination of necessary repair response scope and prioritization of repair resources.

2.1.7 Traffic Signal Systems

While electrical Traffic Signal Systems have been in operation in the United States for nearly 100 years, these systems have seen a continual increase in complexity and operational efficiency. The remainder of this section will discuss a handful of modern TSM&O techniques and technologies used to improve the operation of Traffic Signal Systems.

Traffic Signal Retiming and Coordination

Traffic signal coordination is a tool that provides a means to synchronize multiple intersections to enhance the operations of one or more directional movements along a corridor. Adjustment to traffic signal timings enable optimization of performance for traffic patterns that change over time—a process conducted on a periodic basis for heavily traveled signalized corridors. Connecting area traffic signals to a Communications System allows the controlling jurisdiction the ability to monitor performance, adjust timings and implement different timing plans remotely, monitor equipment failures, and assess performance measures.

Adaptive Traffic Signal (ATS) Control Systems

Conventional Traffic Signal Systems utilize pre-programmed timing plans, selected based on time-of-day and day of the week. ATS systems allow Traffic Signal Systems to modify signal timings in real-time to accommodate changing traffic patterns, resulting in reduced congestion and decreases in travel time. These systems are best suited for arterials with unpredictable traffic demand or that experience large variations in traffic demand, where conventional timing plans fall short. Volusia County Traffic Engineering has expressed a desire to implement ATS systems

on key signalized corridors in Volusia County area. Daytona currently uses an ATS. The River to Sea TPO is currently in the planning stages of expanding ATS in the region.

Traffic Signal Vehicle Detection

These sensors detect the passing or presence of vehicles for use by actuated traffic signals. Common technologies used for this type of detection include: inductive loops, magnetic sensors, microwave vehicle detectors, radar detection, video image processors, wireless magnetometers, ultrasound vehicle detectors, and infrared vehicle detectors. The most common detector technologies in use in the R2CTPO area today are inductive loops, video image processors, and microwave vehicle detectors. Detector inputs are used by the traffic signal controller to truncate or extend green intervals, and determine which movements need to be served. Vehicle detectors in advance of signalized intersections can also be used to provide dilemma zone protection. Recent advances in detector technology have seen the advent of vehicle detectors that track estimated time of arrival for oncoming individual vehicles and provide enhanced dilemma zone protection beyond what older systems were capable of.

Traffic Signal Preemption

A method that allows normal operation of traffic signals to preempt normal traffic signal operations; the most ubiquitous use is to alter traffic signal timings for the approach of trains, marine vessels, and emergency vehicles to clear cars from their path. In the case of emergency vehicles these systems result in reduced response times and increased safety for first responders when traveling to an incident scene.

Typically, marine and train preemption use wired connections to drawbridge control houses and rail crossing controllers respectively. Upon the approach of a marine vessel or train, an electrical signal is sent to the traffic signal controller, activating a specific preemption phase that clears vehicles from the draw bridge or railroad tracks. The most common types of preemption devices for emergency vehicles are infrared and radio/GPS based, with the latter being the modern incarnation capable of additional features. Emergency vehicle preemption systems are currently in operation on select signal systems within the River to Sea region.

Transit Signal Priority (TSP)

A set of operational strategies that reduce transit vehicle travel time by holding green signal indications longer, or shortening red intervals, upon the approach of transit vehicles. It is important to note the differences in operation between TSP and Traffic Signal Preemption systems. TSP systems can be implemented at isolated intersections, or across an entire region's traffic signals. TSP systems require four major components: emitter mounted on transit vehicles; on-vehicle or centrally located priority request generator; priority request strategy; and a TSP management system. Two System Architectures exist for TSP systems: Centralized where a central system organizes and manages priority request from many vehicles; and distributed

where all priority decisions are made at the intersection level. Currently, Lynx buses in the City of Orlando use TSP at numerous intersections. VoTran has expressed a desire to implement TSP in the Volusia County area during Phase 1 stakeholder meetings.

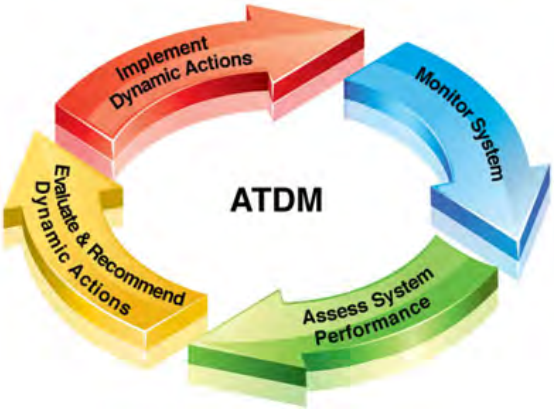
2.1.8 Advanced Railroad-Highway Intersections (Grade Crossings)

Recently, new methods and protocols have been developed to improve the performance of traffic signal train preemption systems, the most notable of which is the IEEE 1570 Protocol. This protocol provides connection between grade crossing active warning systems and the traffic signal controller using serial communications, and ensures that both equipment sub-systems speak a common language. Support for four different types of messages is provided:

- Operational state of the rail crossing
    - Train presence, entrance and exit gate status, warning system activation
- Approaching train information
    - Train classification, time of arrival and departure, train length, direction of travel
- Railroad and Traffic Signal equipment status
- Obstacles in the roadway where is crosses the railroad tracks
- User specified messages

2.1.9 Active Transportation and Demand Management (ATDM)

FHWA defines ATDM as: "the dynamic management, control, and influence of travel demand, traffic demand, and traffic flow of transportation facilities." To achieve this, the transportation system is continuously monitored, then using archived data and/or predictive models, control actions are performed to improve system performance. The remainder of this section will describe a series of common ATDM systems and strategies.



Managed Lanes

Managed lanes differ from other traditional forms of freeway lane management, in that they employ the use of active management strategies. The operating agency proactively manages system demand, and available capacity. From the outset, an agency defines the operational objectives for the managed lanes, along with what actions to take once the pre-defined performance thresholds are met. An example of a managed lane strategy in use in the State of Florida are express lanes—optional tolled lanes, that run alongside traditional non-tolled lanes, which statically limit vehicle eligibility and access while dynamically adjusting toll rates as a means

to proactively manage demand. Currently, express lanes are operational on I-95 and I-595 in South Florida, while some express lanes projects, like I-4 Ultimate, are under construction. FDOT is actively funding design and construction of express lanes throughout the State of Florida.

Ramp Metering

Traffic signals installed on freeway on-ramps that control the rate at which vehicles enter the freeway traffic flow. Ramp metering results in reduced congestion on the freeway by both breaking up the on-ramp merging platoons and managing the number of vehicles entering the freeway. When ramp metering is activated on an on-ramp, vehicles enter the on-ramp from an arterial, queue at the ramp meter stop bar, and then are released, either individually or in pairs, at a rate typically dependent on freeway traffic conditions and ramp queue length.

Historically, areas that have implemented ramp metering have seen beneficial results for the following metrics: freeway average travel speed, freeway travel time reduction, collision reduction on the freeway and ramp merge area, and reduction in freeway vehicular emissions. Ramp meters have been installed on I-95 in South Florida, and are planned for installation on I-4 as part of the I-4 Ultimate project.

Wrong Way Driving Detection

Wrong way driving related crashes often result in head-on collisions with a high level of severity. Wrong way driving detection systems provide a means to detect vehicles traveling in the wrong direction, then warn and deter these drivers and notify the TMC of the event, allowing TMC operators to initiate the appropriate responses before collisions occur. Warning and deterring the wrong way drivers is often achieved through the use of flashing beacons activated upon detection of wrong way vehicles. These systems are especially beneficial when installed on freeway on-ramps in an attempt to prevent wrong way access to the freeway mainline. The Central Florida Expressway Authority has deployed wrong way driving detection systems on a number of on-ramps leading to facilities they operate and maintain.

Variable Speed Limits

Provide a means to change the roadway speed limit based on upstream traffic conditions. When upstream congestion is detected, the variable speed limit system provides a slower but overall more consistent speed limit in an attempt to eliminate the cumulative ripple effect—also known as the “accordion effect.” The accordion effect results in decreased roadway throughput, and increased frequency of read-end collisions. A variable speed limit system was deployed on I-4 in Orange County in 2008.

Real-time Ridesharing

Real-time ridesharing services provide an automated system that matches drivers and riders on a one-time basis with short notice or en-route. Real-time ridesharing enables and promotes

ridesharing without the need to pre-plan commutes or travel arrangements. These services are typically through the use of mobile phone applications—with the three most notable services being Uber, Lyft, and Sidecar. The goal of ridesharing is to reduce the total number of vehicle trips, by maximizing the occupancy and utilization of vehicles.

2.1.10 Passive Demand Management

An umbrella term for the application of strategies and policies that reduce or redistribute the demands placed on a transportation system in a passive manner, where the management and control of travel demands are not dynamically managed: an example is FDOT's reThink service, which provides resources for commuter options in the Central Florida area. This section describes a few passive demand management strategies.

Passive Ridesharing

The sharing of vehicles by passengers to reduce the total number of vehicle trips, resulting in less congestion and vehicular emissions. To support passive ridesharing, regional public parking lots, such as park and ride facilities, are often employed to serve as a meeting place for drivers to rideshare.

Encouragement of Alternative Travel Modes

Alternative travel modes reduce the number of cars using the roadway transportation system, by redistributing the demand to other modes, such as public transportation systems, bicycle, and pedestrian facilities. By encouraging travelers through incentives, clear information sharing, advertisement campaigns, and improved facilities, the use of alternative travel modes can be promoted.

2.1.11 Work Zone Management

Effective management of work zone traffic during roadway construction helps to reduce congestion, minimize delays, promote worker and traveler safety, and maintain access for businesses and residents. Development of strategies for reducing work zone impacts begins with assessing the anticipated impacts, then developing solutions in a Transportation Management Plan (TMP)—FHWA's Work Zone Safety and Mobility Rule requires TMPs for all Federal-aid highway projects. Utilization of TSM&O technologies for work zone management can improve travel conditions and safety in and around work zones. Example TSM&O solutions include notifying the traveling public about upcoming work zone delays and providing alternative routes. Temporary work zone ITS equipment can be installed to supplement the existing ITS infrastructure as needed to support work zone management objectives. FDOT currently posts construction information to the public using FL511.

2.1.12 Integrated Corridor Management (ICM)

ICM allows transportation agencies to maximize utilization of existing infrastructure by redistributing travelers to areas with underutilized capacity in a transportation corridor: travelers are encouraged to change transportation route or mode choice in response to changing traffic conditions. Strategies such as modal choice suggestion, ramp metering rate adjustment, and traffic signal timing adjustment support ICM by accounting for fluctuations in demand. ICM systems are generally multijurisdictional partnerships between agencies, who come together to create a collaborative and multimodal system. The FDOT is currently implementing ICM on the I-4 corridor in the downtown Orlando area.

2.1.13 Active Parking Management

Active parking management systems are particularly helpful in urban areas with limited parking, during special events, for public parking (such as park and ride), for public transportation parking facilities (bus stations, train stations, etc.), and for freight facilities. These systems provide better utilization of parking capacity, improved driver guidance, automatic ticket dispensing and payment systems, and many other benefits.

Dynamic Parking Guidance and Reservation

Helps to maximize parking facility utilization, and improve travel demand through reductions in parking space search times by providing dynamic management of parking facilities. Dynamic parking guidance, also known as dynamic wayfinding, provides automated guidance of drivers to parking facilities with open spaces. Dynamic parking reservation allows drivers to reserve a parking space in advance to guarantee availability. For both of these systems, parking availability is constantly monitored by a central management system, which then facilitates dynamic guidance and reservation functions.

Another beneficial application of dynamic parking guidance and reservation is for truck parking management systems. Truckers can determine if spaces are available, or reserve a space in advance, prior to exiting the freeway. Since semi-tractor trailers create a large amount of wear and tear on the roadway surface, and contribute substantially to carbon emissions, large benefits can be reaped from efficiency improvements in parking space locating. FDOT's "Truck Parking Availability System" is in the design phase, but is expected to be deployed on I-10, I-75, I-4 and I-95—the system is anticipated to distribute parking space availability information to truckers using DMS panels, in-cab equipment, FL511, as well as third party data feeds. Parking space occupancy will be monitored using in-pavement sensors, and CCTV cameras will be used for system monitoring.

Dynamic Overflow Transit Parking

Dynamic Overflow Transit Parking opens overflow parking facilities in the vicinity of transit stations when the standard parking areas are at or near capacity. Overflow parking areas are typically underutilized parking lots, such as large shopping map parking lots, for which transit agencies enter into an agreement with the proprietor for occasional use of designated areas. Transit station parking capacity is constantly monitored by a central control system, which dynamically opens overflow parking spaces when required.

Dynamically Priced Parking

Dynamically calculated parking fees based on demand and availability in order to influence arrival time choice and parking facility selection to maximize parking utilization, reduce peak period trips, and reduce impacts of parking spot searching by drivers. Space occupancy is constantly monitored, and prices are adjusted as a means to dynamically manage demand and influence parking facility choice.

2.1.14 Public Transportation Management

Public transport can benefit from ITS technologies to be more accessible, secure, and convenient. This section includes a series of ITS technologies applicable to improving public transportation.

Automatic Vehicle Locations (AVL) and Automatic Passenger Counter (APC)

AVL and APC systems allow transit agencies to precisely track the location and ridership of their vehicles. Using this information, transit agencies can provide optimized routing and scheduling. Security of the transit system is also improved when the location of all vehicles is known at all times. Activation of TSP is contingent upon information provided by AVL and APC systems. Votran currently uses AVL systems on their buses.

Transit Traveler Information

A means to disseminate transit related travel information to the public, such as current vehicle locations, occupancy levels, routes, stops, schedules, and travel options. AVL and APC systems allow up-to-date information to be collected for use by transit traveler information systems. Examples of such systems include mobile applications and websites.

Personalized Public Transit

Personalized Public Transit offers on-demand, flexibility routed, transit vehicles. Passengers place reservations with the transit agency, who dispatches a vehicle. Through the use of ITS, the transit agency attempts to optimize the number of passengers per transit vehicle per trip. Reservations are placed using web services or mobile phone applications. Personalized public transit is particularly useful for passengers that have difficulties using traditional transit systems, due to physical disabilities. Uber and Lyft are examples of this type of service.

2.1.15 Public Travel Security

Overarching category of technologies and strategies that provide increased levels of security for the traveling public. Components commonly used include motion detectors, CCTV cameras, explosion sensors, and AVL devices that generate alarms when certain events occur. An example system is the I-4 St. Johns River Bridge Security System, for which upgrades are currently being designed, where thermal imaging cameras are deployed to establish a secure perimeter around sensitive bridge elements, that when crossed will notify the FDOT District 5 RTMC of a breach event.

2.1.16 Electronic Payment Services

Regional Payment Systems

Allows regional travelers to remit payment for transit tickets, parking fees and tolls through a common mean without the use of cash. Payment methods such as mobile phone applications, RFID toll tags, and smart cards are used to improve efficiency and traveler convenience. In the State of Florida, the SunPass program is an example of such a system that permits all electric tolling without the need to stop and pay at a toll booth**.**

Electronic Transit Ticketing

A means for transit passengers to take a defined number of pre-purchased trips, or unlimited trips within a fixed period of time, through the use of a mobile phone application or electronic card. Such ticketing systems increase customer convenience for buying and displaying tickets and passes, and decrease ticket sales personnel burden for the transit agency. New Jersey Transit operates the MyTix mobile application, which allows passengers to purchase and display tickets from their mobile phones.

2.1.17 Connected, Automated, & Autonomous Vehicle

The field of connected, automated, and autonomous vehicles is one of the most researched fields in the automotive technologies sphere. Some connected and automated vehicle technologies are in use today, examples include self-parking functions and auto-collision avoidance; however, in the future these technologies are expected to see widespread deployment and significant

improvements in capabilities. It is important to understand the distinction between the three terms connected, automated, and autonomous as they apply to vehicles; therefore, brief definitions have been provided below:

- **Connected Vehicles** – use a range of technologies and systems to communicate with the driver, to other vehicles (vehicle-to-vehicle or V2V), to roadside infrastructure (vehicle-to-infrastructure or V2I), and to the cloud. The vehicle does not make choices for the driver, instead it supplies information to the driver, allowing the driver to make more informed decisions.
- **Automated Vehicles** – vehicle operation occurs without direct driver input. The National Highway Traffic Safety Administration (NHTSA) has adopted SAE International's automated vehicle classification standard:
    - Level 0: Automated system has no vehicle control, but may issue warnings.
    - Level 1: Driver must be ready to take control at any time. Automated system may include features such as Adaptive Cruise Control (ACC), Parking Assistance with automated steering, and Lane Keeping Assistance (LKA) Type II in any combination.
    - Level 2: The driver is obliged to detect objects and events and respond if the automated system fails to respond properly. The automated system executes accelerating, braking, and steering. The automated system can deactivate immediately upon takeover by the driver.
    - Level 3: Within known, limited environments (such as freeways), the driver can safely turn their attention away from driving tasks, but must still be prepared to take control when needed.
    - Level 4: The automated system can control the vehicle in all but a few environments such as severe weather. The driver must enable the automated system only when it is safe to do so. When enabled, driver attention is not required.
    - Level 5: Other than setting the destination and starting the system, no human intervention is required. The automatic system can drive to any location where it is legal to drive and make its own decision. This level is also referred to as Autonomous Vehicles.
- **Autonomous Vehicles** – the definition of autonomous: acting independently or having the freedom to do so. In the context of vehicles, autonomous vehicles are "driverless"

and therefore meet the Level 5 classification of automated vehicles defined above. It is important to note that connected vehicle technologies are required for autonomous vehicles to function, so there is overlap between to two technologies.

The implications of the beginning stages of these technologies can be seen today, but the full impact will likely have widespread profound affects and is difficult to quantify. FHWA recommends agencies prepare for these technologies, at this time, in the following ways:

- Begin to incorporate the concept of Connected Vehicles in the planning process.
- Upgrade Regional ITS Architecture (RITSA)
- Upgrade existing systems (such as communication systems), and consider making them connected vehicle ready. Buy US DOT connected vehicle certified equipment.
- Consider how automated vehicles may enter your system: platoons, low speed urban, etc.
- Participate in the V2I Deployment Coalition, Connected Vehicle pooled fund study, and other similar ways to influence deployment path.

2.1.18 Freight Advanced Travler Information Systems (FRATIS)

FRATIS uses ITS strategies to facilitate more efficient movement of goods. This section provides two major FRATIS applications.

Freight-Specific Dynamic Travel Planning and Performance

Provides freight specific enhancements to traveler information systems; provides enhanced communication between drayage companies, drivers, and intermodal facilities; and provides real-time travel information and dynamic rerouting for drivers.

Drayage and Truck Routing Optimization

Optimizes truck and load movements between freight facilities, by assigning optimal time windows for pick-up and drop-off. Also, uses port terminal and travel information to optimize operations and provide best route guidance to freight facilities for drivers.

2.1.19 Traffic Data Information Management

ITS components generate data that can be used for a number of beneficial purposes from future planning to deployed system validation. This strategy uses transportation data analytics, archived data, and data management technologies to the benefit of transportation agencies in determining results proven improvements and to effectively guide future planning. FDOT District 5 and FDOT Central Office are in the process of studying the use of data analytics techniques in the transportation sphere.

2.1.20 Event Management

Event Management uses ATDM, traveler information system, and parking management strategies to optimize surface transportation system performance during special events with large attendance numbers. Generally, pre-determined event management plans are developed and implemented during the special event—with oversight and active management occurring from a TMC. Daytona Beach and the City of Orlando are examples of Florida cities that institute special event management procedures.

2.1.21 Asset Management

With increasing transportation system scope and complexity comes a need to optimize and automate management of inventory and maintenance requests. ITS requires perpetual maintenance following deployment, up until system retirement, to ensure proper system functionality; therefore, it is critical to protect the investment in ITS by ensuring that good maintenance practices are implemented. FDOT has its own such system: Maintenance and Inventory Management System (MIMS).

2.1.22 Innovative Bicycle & Pedestrian ITS Solutions

Technologies that target improving bicycle and pedestrian safety. This section includes brief descriptions of two such technologies. The Complete Streets policy requires streets to be planned in a manner that allows safe travel for those walking and bicycling; ITS solutions can be deployed to assist in meeting this objective.

Pedestrian Crosswalk Systems

Typically deployed at mid-block crossings to provide high intensity flashing lights or beacons that alert drivers to the presence of crossing pedestrians. Examples of such systems include High Intensity Activated Cross Walk (HAWK), in-pavement flashing LED lights, and rapid rectangular flashing beacons (RRFB). Activation of such systems can be manual, through the use of pushbuttons, or automatic, by using microwave, infrared, or pressure sensing pedestrian detectors.

Accessible Pedestrian Signals

Accessible Pedestrian Signals provide audible tones to aid hearing impaired pedestrians in crossing signalized intersections. The audible tone can either be “beeps” or spoken word. Deployment of these systems has occurred throughout the State of Florida.

Bicycle Warning System

Bicycle warning systems use bicycle detectors to detect bicycle traffic in advance of a roadway crossing, and then notify motorists that a bicyclist is approaching the crossing. Motorist notification is typically automated and achieved through electronic signs activated by the bicycle detectors.

2.1.23 Alternative & Innovative Intersection Designs

Today's ever-increasing traffic volumes and demands on the roadway network have led to increased congestion and safety problems that can be improved through innovative intersection designs. This section provides a brief overview of two such intersection designs that are becoming increasingly prevalent in modern roadway networks.

Diverging Diamond Interchanges (DDI)

DDI's are a type of diamond interchange where the two directions of travel on the intersecting arterial are crossed to the opposite side of the roadway prior to the freeway overpass bridge. The novelty of the design, as compared to traditional diamond interchanges, is that vehicles traveling on the intersecting arterial are temporarily diverted to the opposite side of the roadway from the traditional traffic patterns for the area.

A primary benefit of this configuration is that a two-phase traffic signal phasing scheme may be implemented, which eliminates the need for left turn phases. Left turn movements entering the freeway on-ramp are instead "free"; crossing no opposing traffic stream and requiring no dedicated left turn phase movement. The DDI has been shown to provide improved turning movement operations to and from the freeway and significantly reduce the number of vehicular conflict points. Compared to other interchange geometry conversions, modifying an existing conventional diamond interchange to a DDI is inexpensive. While DDIs are not always the best solution, they do provide unique benefits for certain interchanges and traffic patterns. I-75 and University Boulevard in Sarasota/Bradenton is the State of Florida's first operational DDI; however, FDOT is actively funding the design and construction of DDIs throughout the State.

Modern Roundabouts

FHWA has identified modern roundabout intersections as a proven roadway safety improvements strategy. For certain intersections, roundabouts offer significant safety and operational benefits over signalized or stop controlled intersections. Roundabouts are circular intersections, where traffic flows counter-clockwise around a center island, entering traffic yields to vehicles circulating, and vehicles make free flowing right turns to exit. The vast majority of existing roundabouts are single-lane, but two and three lane roundabouts have been successfully constructed in the U.S. FDOT's *Intersection Design Guide* requires that roundabouts be considered for any new

intersection construction or reconstruction project. There are numerous roundabouts in operation in the State of Florida, and the number of roundabouts is expected to grow substantially in the future.

2.1.24 Capacity Constrained Roadways

Constrained roadways cannot be expanded due to physical or policy constraints and often exhibit less than ideal operating conditions. TSM&O improvements can be particularly effective in improving operating conditions on constrained roadways because they can typically be accommodated within the existing roadway envelope. The R2CTPO 2040 LRTP does not specifically identify constrained roadways; however, constrained roadways do exist within the TPO planning area (e.g. US 1 in eastern Volusia County, US 17/92 in downtown DeLand, SR A1A along eastern Volusia and Flagler Counties, etc.). It is recommended that the next LRTP effort identify constrained roadways within the planning area such that constrained roadways are appropriately prioritized for TSM&O improvements.

2.2 Regional ITS Needs

Using the Vision, Goals, and Objectives identified during Phase 1 of the R2CTPO TSM&O Master Plan, **Table 1** was generated to summarize the transportation system related concerns and objectives for which TSM&O strategies may be effective.

Table 1 – Summary of TSM&O Objectives and Applicable Strategies

Goals	Objectives	Applicable TSM&O Strategies
Goal 1 - Improve safety and security for all modes	Objective 1.1 - Reduce crashes	• Provide a means to change the roadway speed limit based on upstream traffic conditions • Deploy wrong way driving detection system
	Objective 1.2 - Reduce incident clearance time	• Gather data for baseline incident clearance time and develop strategies to improve • Provide automated incident detection, and expand ITS communications network in support • Connect local TMCs to improve interagency coordination • Provide additional emergency vehicle pre-emption systems at signalized intersections
	Objective 1.3 - Share ITS data	• Coordinate with River to Sea TPO agencies for data collection and sharing • Coordinate with FDOT District 5 for data sharing • Increase scope of Traffic Data Collection System • Increase scope of existing ITS communications network to enable improved data collection and sharing capabilities
Goal 2 - Provide real-time and accurate user information to make informed travel decisions	Objective 2.1 - Provide pre-trip planning information and traveler information	• Connect real time information to In-vehicle Dynamic Route Guidance • Provide real time information to Highway Advisory Radio (HAR) • Encourage the use of the 511 Traveler Information System

Table 1 (Continued)

Goals	Objectives	Applicable TSM&O Strategies
Goal 2 - Provide real-time and accurate user information to make informed travel decisions	Objective 1.3 and 2.2 - Provide route guidance and information on travel during adverse weather or evacuation	• Develop specialized response plans for evacuation operations of transportation system: reversible lanes, special traffic signal timings, etc. • Provide improved guidance to travelers during evacuations using Advanced Traveler Information Systems to steer travel mode selection and provide route guidance
	Objective 2.3 and 2.4 - Use mobile applications to support multi-modal trip planning	• Deploy app to disseminate transit related travel information to the public, such as current vehicle locations, occupancy levels, routes, stops, schedules, and travel options
Goal 3- Facilitate the efficient movement of goods and people	Objective 3.1 - Support efficient intermodal transfer of people and goods	• Increase number of park-and-ride facilities and parking spaces • Improve mobility along SIS corridors and arterials feeding major transit facility locations
	Objective 3.2 - Improve multimodal travel time reliability and predictability	• Deploy additional Traffic Data Collection Systems for performance monitoring • Periodic evaluation and retiming of traffic signals, especially along high-volume corridors • Deployment of Adaptive Signal Control Systems along high-volume corridors where conventional coordination falls short • Increase scope of existing signal interconnect and ITS communication network to facilitate traffic signal coordination and active management of corridors

Table 1 (Continued)

Goals	Objectives	Applicable TSM&O Strategies
Goal 3- Facilitate the efficient movement of goods and people	Objective 3.3 - Efficiently accommodate special event traffic	• Deploy pre-determined event management plans • Use ATDM and traveler information systems to provide drives with informed knowledge • Develop parking management strategies during special events with large attendance numbers
	Objective 3.4 - Reduce delays caused by predictable non-recurring congestion	• Deployment of Adaptive Traffic Signal Control Systems along high-volume corridors with unpredictable and non-uniform traffic conditions • Increase number of coordinated traffic signal corridors, and perform periodic retiming • Connect TMCs so that the overall transportation system can be monitored and actively managed; serving as a central hub for response efforts • Utilize innovative intersection designs, such as DDIs and roundabouts, to improve capacity and safety
Goal 4 - Preserve and enhance access to multimodal choices and facilitate connections	Objective 4.1 - Provide traveler information with local and regional route and mode choice information	• Increase scope of Advanced Traveler Information Systems in the area: DMS, FL 511, In-vehicle Dynamic Route Guidance. • Increase scope of existing ITS communications system for connections to Advanced Traveler Information Systems field devices. • Improve data collection and performance monitoring to support real time mobility suggestions to travelers.
	Objective 4.2 - Improve transit travel time reliability	• Deploy Transit Signal Priority Systems on signalized corridors with high transit vehicle volumes • • Continue and expand Automatic Vehicle Location and Automatic Passenger Count capabilities

Table 1 (Continued)

Goals	Objectives	Applicable TSM&O Strategies
Goal 6 - Protect the environment by improving efficiency and reducing congestion and emissions with technology	Objective 6.1 - Reduce the need for roadway widening by maximizing the use of technology	• Support alternative modes of travel to reduce number of vehicles on the road • Provide accommodations for fuel efficient and electric vehicles: compact vehicle spaces, charging stations, etc. • Reduce frequency of vehicle stops: coordinated traffic signals, Adaptive traffic Signal Systems, roundabouts, etc.
Goal 7 - Collect, monitor, and report transportation data to support informed transportation policy decisions	Objective 7.1 - Deploy technology for travel-time and reliability data collection	• Increase percentage of corridors actively monitored and managed • Increase data collection, archiving, and performance measurement capabilities
	Objective 7.2 - Collect multimodal traffic counts	• Deploy pedestrian count devices in areas of high pedestrian activity • Deploy bike counters along routes where there are cyclists
	Objective 7.4 - Develop data warehouse	• Create data management technologies • Archive ITS data • Use transportation data analytics

2.3 Segment Scoring Methodology

In order to determine where TSM&O strategies are expected to provide the greatest benefit, a segmentally based scoring methodology was developed to rank the roadway segments defined in the R2CTPO's Long Range Transportation Plan (LRTP).

Figure 1 displays the roadway segments within the LRTP network that were analyzed for the TSM&O rankings. Transportation data for each segment was used to assign a score for a series of categories related to operational importance and performance measures; the category scores were then totaled. This total score was used to prioritize the segments, where the segments with higher total scores obtained higher priority. The segments were further categorized by roadway classification in order to help the TPO identify needs that would align with potential funding sources. The remainder of this section provides a description of the roadway classification, scoring categories, and a table outlining the specific scoring methodology.

2.3.1 Roadway Classification

In order to have an "apples to apples" scoring comparison for roadways with different functions, each roadway analyzed for the TSM&O rankings was classified as either a SIS, regional, non-regional, or local roadway. A list of the classifications and the characteristics that categorize them is provided below and displayed in **Figure 1**:

- **SIS or SIS Connector** – Given the highest priority for their role in connecting Volusia and Flagler County with intermodal hubs while aiding in the statewide movement of goods and people. These roadways included I-4, I-95, US 17, US 17/92, SR 15A, SR 40, and SR 100. Note: I-4 and I-95 were removed from analysis because these roadways are largely built out, with regards to TSM&O, when compared to other SIS arterial facilities within the network.
- **Regional Roadway** – Aid inter-county travel or travel between major population centers within Volusia and Flagler Counties. Most State highways are on the regional roadway list. Examples include US 1, US 92/International Speedway Boulevard, SR A1A, SR 5A/Nova Road, SR 44, and Belle Terre Parkway.
- **Non-Regional Roadway** – Aid intra-county travel but may not connect major population centers. Any State highways not on the regional roadway list were classified as non-regional roadways. Examples include SR 400, SR 421, Clyde Morris Boulevard, LPGA Boulevard, Saxon Boulevard, Matanzas Woods Parkway, Palm Coast Parkway, and Old Kings Road.

- **Collectors** – Roadway providing land access and traffic circulation with residential, commercial, and industrial areas. Any roadways not classified in the above three categories were classified as collector roadways.

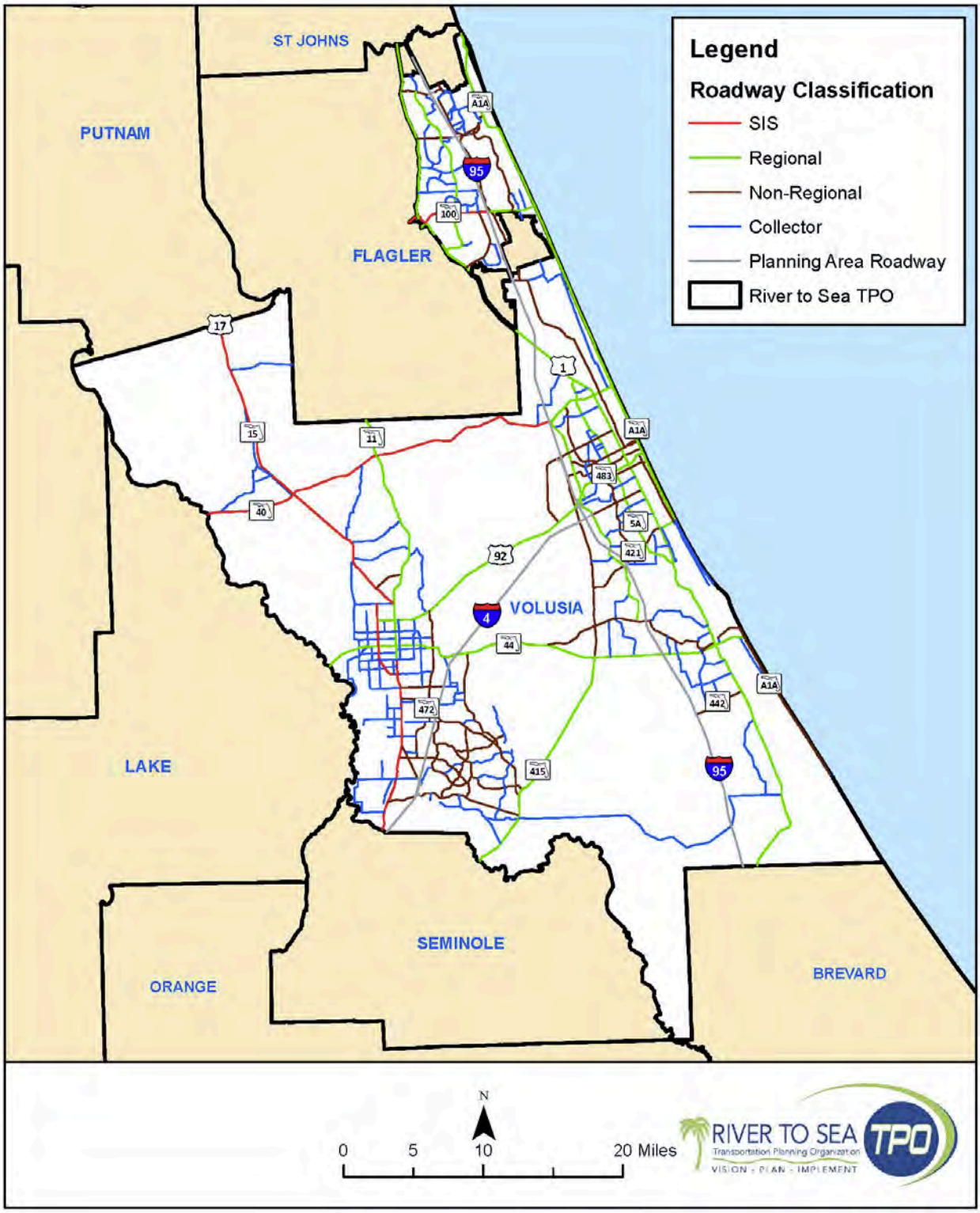


Figure 1 – Roadway Segments Analyzed

2.3.2 Maximum Acceptable Volume (MAV) Ratio

TSM&O solutions can be effective in relieving recurring congestion along a corridor. The existing volume to maximum acceptable volume (MAV) ratio (also known as the v/c ratio) is one way to identify recurring congestion, and as such, is given the highest weight in the scoring system. This performance measure score is calculated by considering the corridor's v/c ratio. Corridors were scored in the following fashion:

- 2.5 points for segments with v/c less than 0.60
- 5 points for segments with v/c 0.60 to 0.80
- 10 points for segments with v/c 0.81 to 1.00
- 5 points for segments with v/c 1.01 to 1.20
- 2.5 points for segments with v/c greater than 1.20

Existing year AADT's and capacities were obtained from the following sources:

- 2016 AADT's and capacities for Volusia County roads obtained from Volusia County Public Works;
- 2017 AADT's for Palm Coast roads obtained from the City of Palm Coast;
- 2016 AADT's for Flagler County roads obtained from FDOT annual traffic counts; and
- Capacities for Palm Coast and Flagler County roads obtained from the LOS tables from the *FDOT Quality LOS Handbook*.

Note that in some cases a roadway did not have a current 2016 or 2017 AADT; thus, the most recent historical data was utilized for the analysis.

Figure 2 displays the v/c ratios for the segments analyzed.

2.3.3 Existing Volume

Improvements on high volume segments will benefit a larger number of motorists; therefore, an existing volume category was developed to favor such segments. Two sets of volume ranges, one for two lane rural facilities and one for all other facilities, were used in the calculation of the score for this category. See **Table 2** for a summary of the existing volume breakdown and scoring. AADT values were obtained from the sources noted in the MAV section.

Figure 3 and **Figure 4** display the existing volumes for the rural two-lane and urban/four+-lane rural segments analyzed.

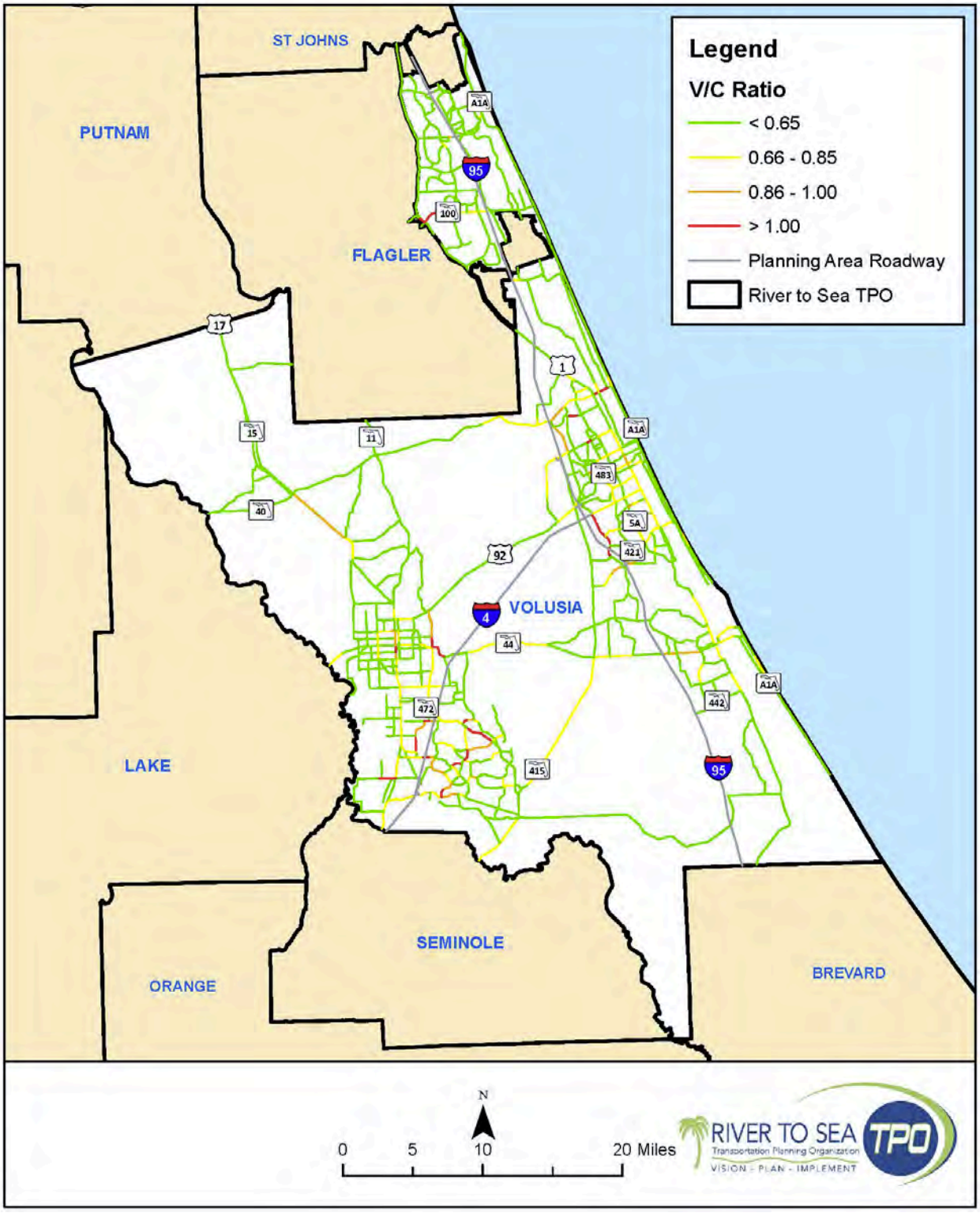


Figure 2 – V/C Ratios for Roadway Segments Analyzed

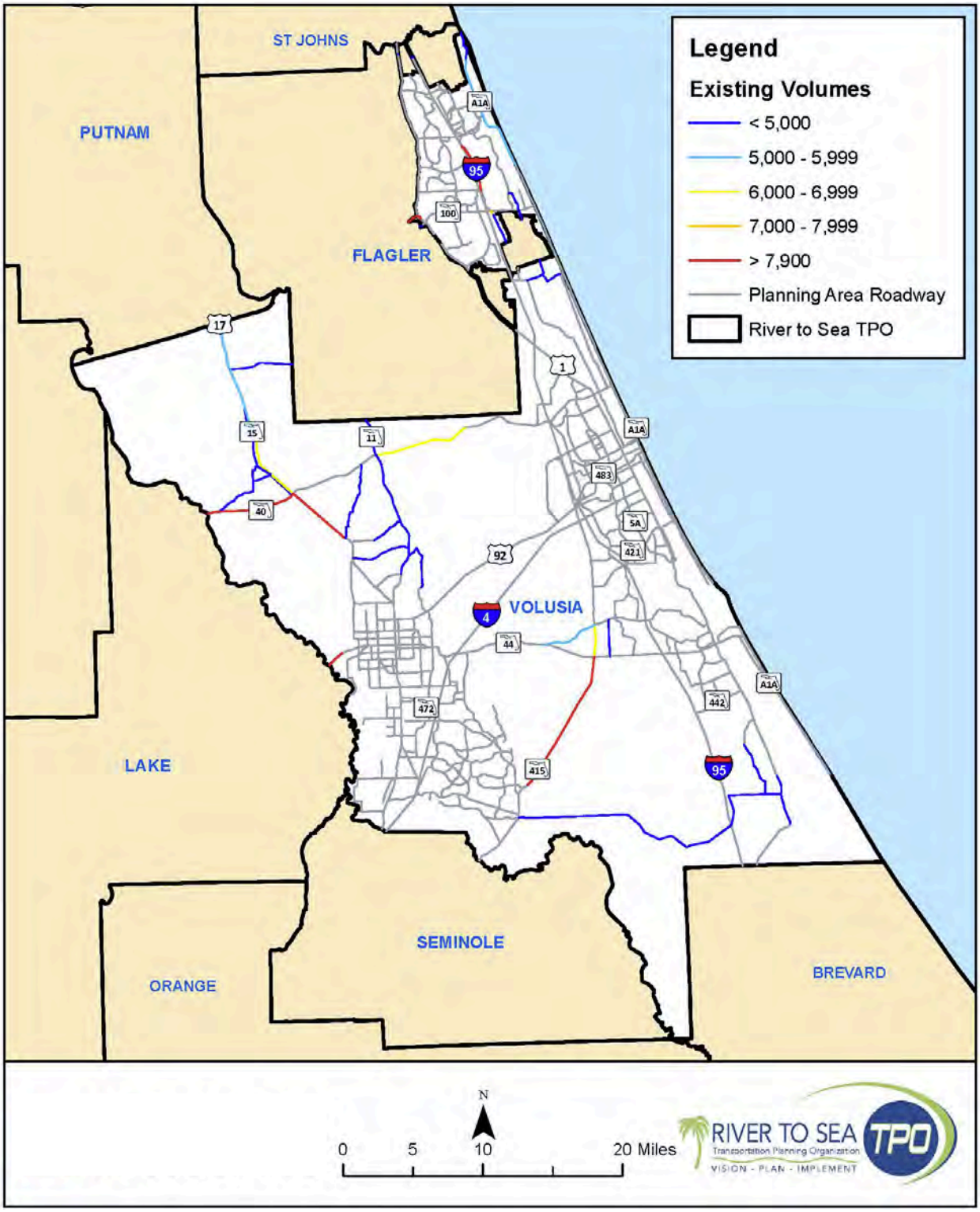


Figure 3 – Existing Volumes for Two-Lane Rural Roadways Analyzed

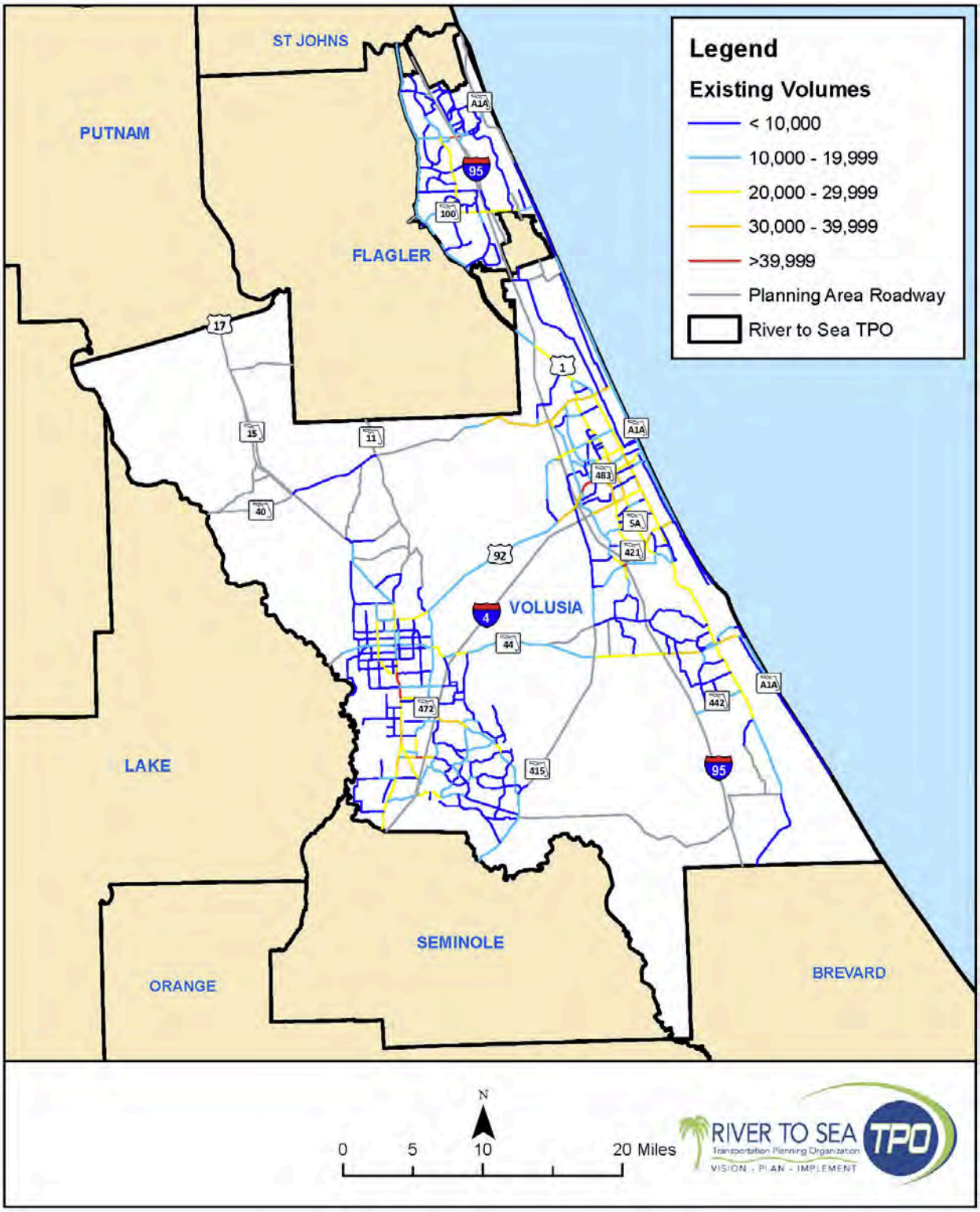


Figure 4 – Existing Volumes for Urban and 4+ Lane Rural Roadways Analyzed

2.3.4 Safety

The MAV ratio and existing volume sections directly relate to recurring congestion while the safety portion of the TSM&O scoring correlates to non-recurring congestion. If a crash does occur, TSM&O technology has historically proven to help alleviate congestion caused by the incident. Better incident detection systems can facilitate local emergency response to the incident site and more efficiently clear the incident. Dynamic Message Signs (DMS) and other points of information dissemination provide advanced notice to travelers to influence their choice on potential alternate routes, minimizing congestion at the crash site. Crash data was obtained from the University of Florida's Signal Four Analytics Database for the most recent five calendar years 2012 through 2016 and mapped using GIS. Segment length was obtained from the GIS analysis and traffic volumes were obtained from the sources noted in Section 2.3.2. The safety scoring takes into consideration two different elements:

- Crashes per year per mile greater than 14.5; and
- Crashes per million vehicle miles traveled (MVMT) greater than 3.5.

Each of the above categories was given a maximum of 5 points and if both conditions were true, the segment would receive a total of 10 points. If a condition is not met, the segment would be given 0 points for that specific category. The thresholds of 14.5 crashes/year/mile and 3.5 crashes/MVMT are the 70th percentile values of the data set. Thus, the top 30 percent of segments within each respective category will receive safety scoring. Typically, the top 30 percent represent the highest crash segments in the planning area.

Figure 5 and **Figure 6** display the crashes/year/mile and crashes/MVMT that received scoring.

2.3.5 Evacuation Significance

TSM&O strategies can help better manage congestion and traffic during times of emergency and help direct travelers to identify hurricane evacuation routes and inform travelers of changes to travel routes. Segments having been identified by FDOT, Volusia County, and Flagler County were mapped and given points based on the following:

- A primary hurricane evacuation route was given 10 points;
- A secondary hurricane evacuation route was given 5 points; and a segment not designated as a hurricane evacuation route was given 0 points.

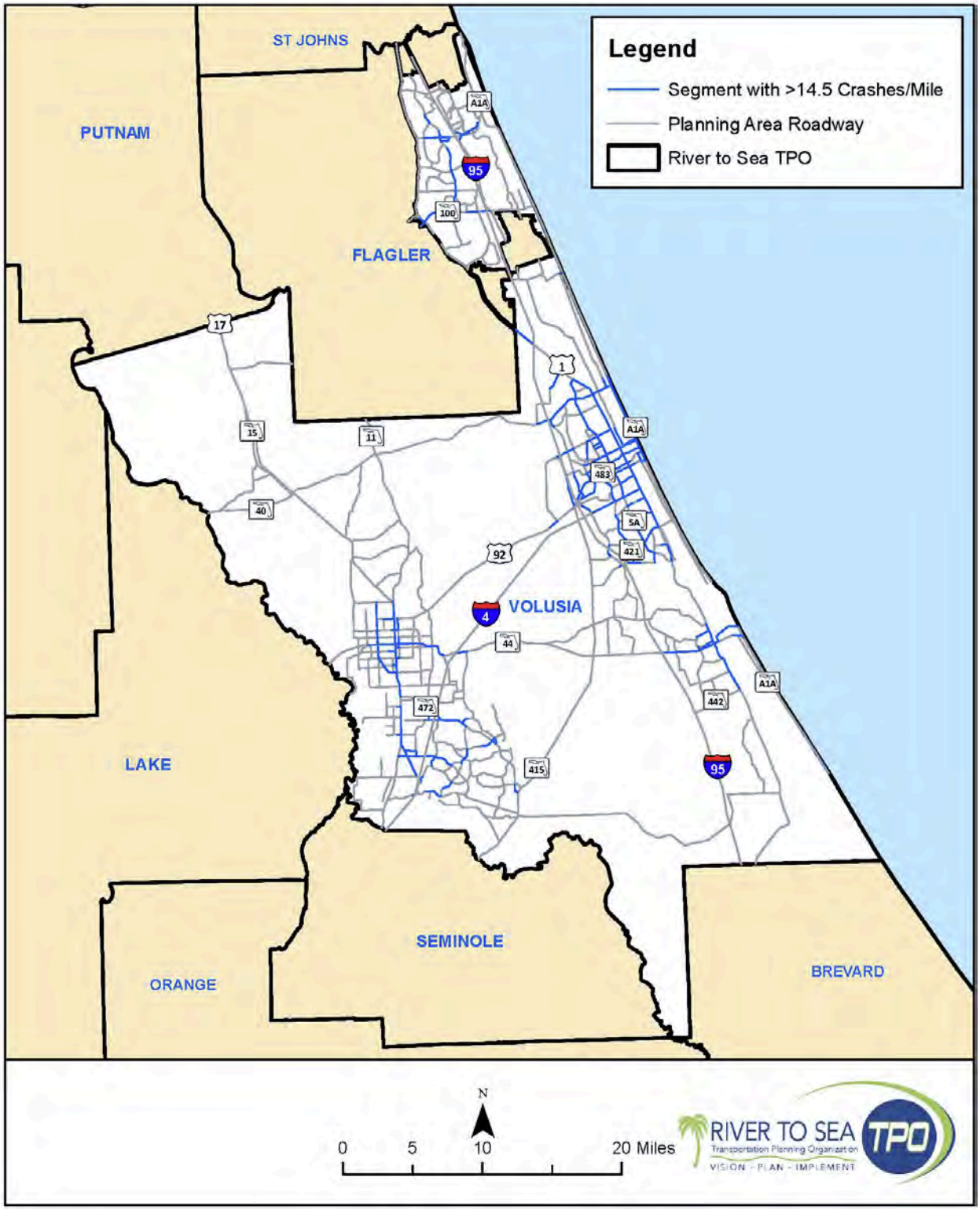


Figure 5 – Top 30 Percent Crashes/Mile Segments

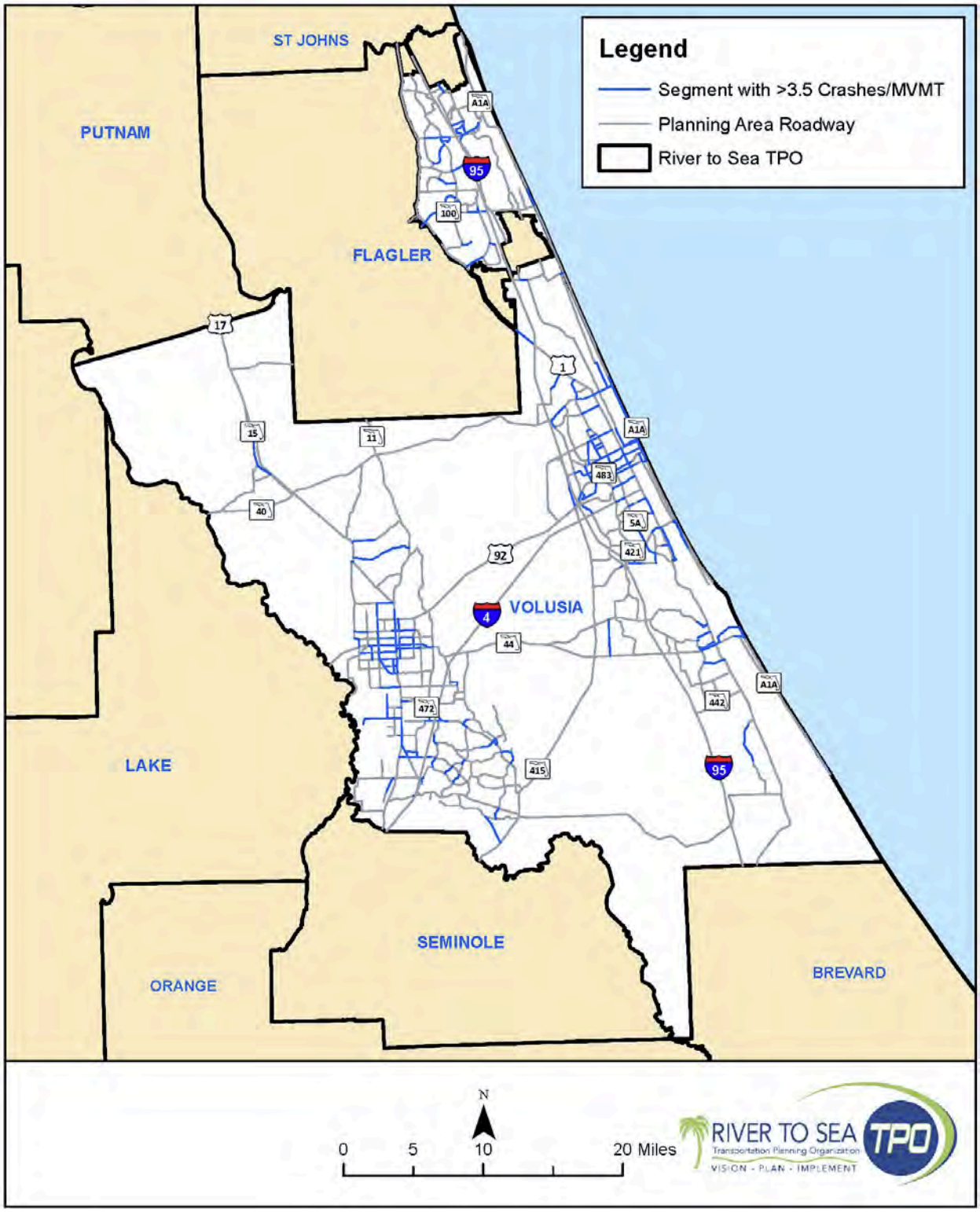


Figure 6 – Top 30 Percent Crashes/MVMT Segments

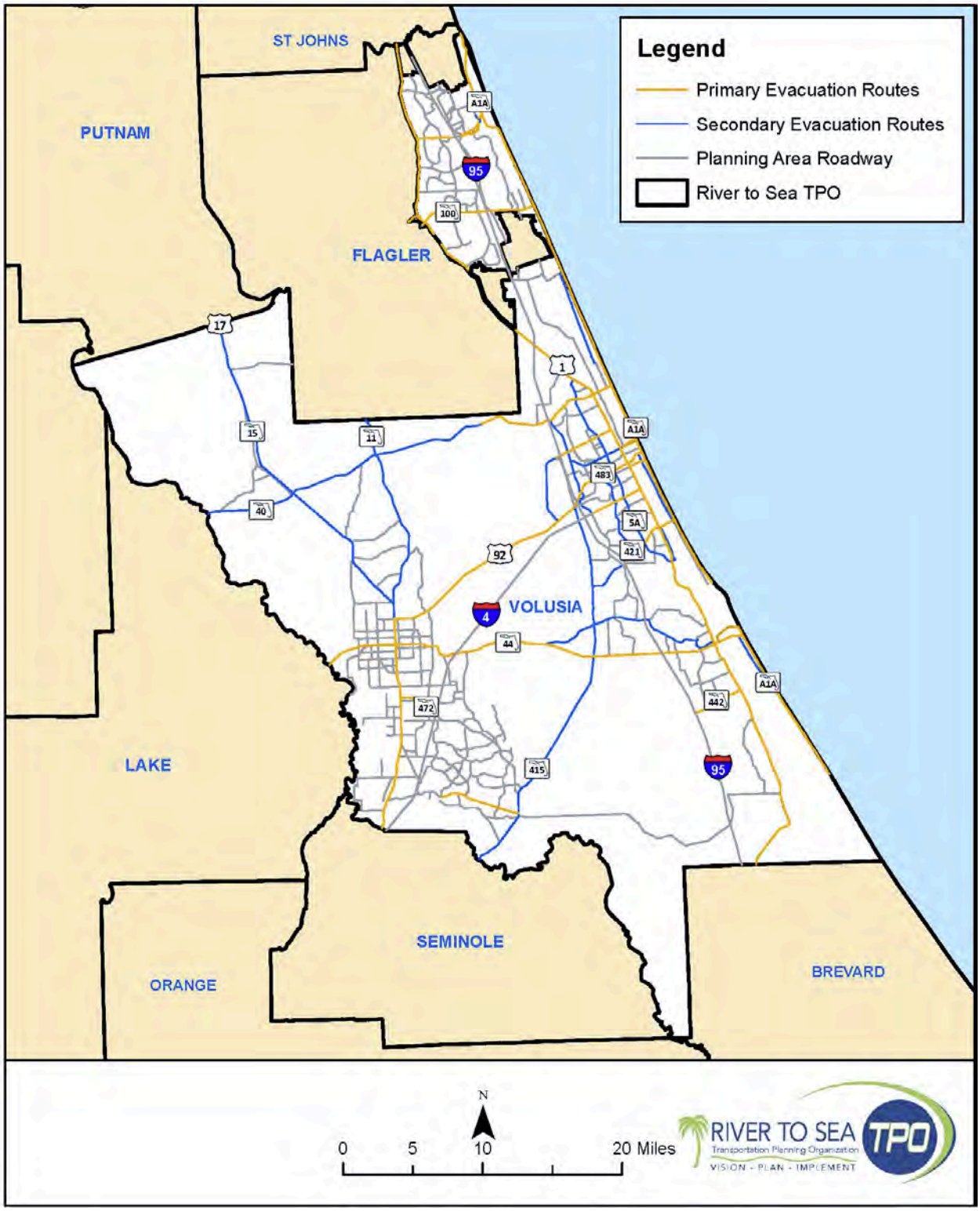


Figure 7 – Hurricane Evacuation Routes

I-4 and I-95 were classified as primary hurricane evacuation routes due to their Statewide importance to overall hurricane evacuation route procedures. If a major arterial connected to one of these facilities, served a major population center, or was the primary parallel route, they were also classified as primary routes. Examples of these primary routes include US 1, US 17/92, SR 400/Beville Road, LPGA Boulevard, and Palm Coast Parkway. Beachside roadways and connector roadways, such as SR A1A, SR 44, SR 421, US 92/ISB, SR 40, and SR 100 were also included as primary hurricane evacuation routes. Secondary hurricane evacuation routes were any designated hurricane evacuation routes that were not previously classified as a primary route.

2.3.6 Transit Significance

Segments were awarded points based on the number of transit routes traversing a segment. TSM&O strategies such as automatic vehicle location (AVL) and transit signal priority (TSP) could help improve transit reliability along these corridors while making the intermodal hubs more accessible. TSP improves the reliability of transit service with minimal impacts to passenger vehicles. VoTran route maps were reviewed to determine which segments include two or more transit routes (10 points), one transit route (5 points), or no transit routes (0 points).

Figure 8 displays the segments with transit routes within the planning area.

2.3.7 Beach Connector Significance

During the summer beach season, Volusia and Flagler Counties see heavy non-peak hour weekend traffic to and from the various beaches along the coast. Similar to the evacuation route significance, TSM&O strategies can help better manage this weekend congestion and traffic during peak beach season and help inform travelers of travel times to various Volusia and Flagler County beaches. For this category, beach connectors were determined as any roadway having a bridge connection to the beach or a roadway that parallels the beach. Examples of beach connectors include SR A1A, SR 44, SR 421, US 92/ISB, SR 40, and SR 100. If a roadway was not a beach connector, it did not receive any points for this category.

Figure 9 displays the beach connectors receiving points.

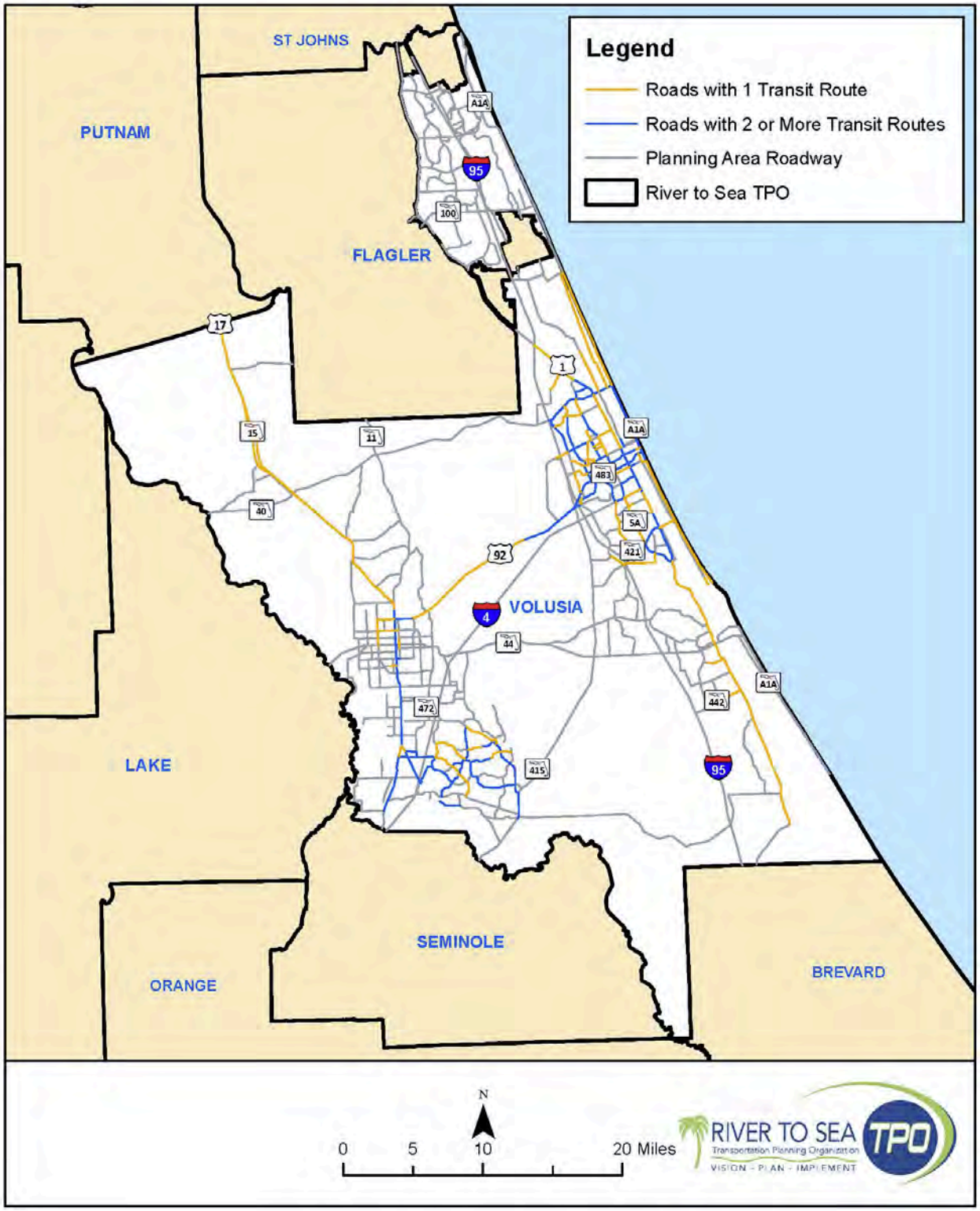


Figure 8 – Transit Routes

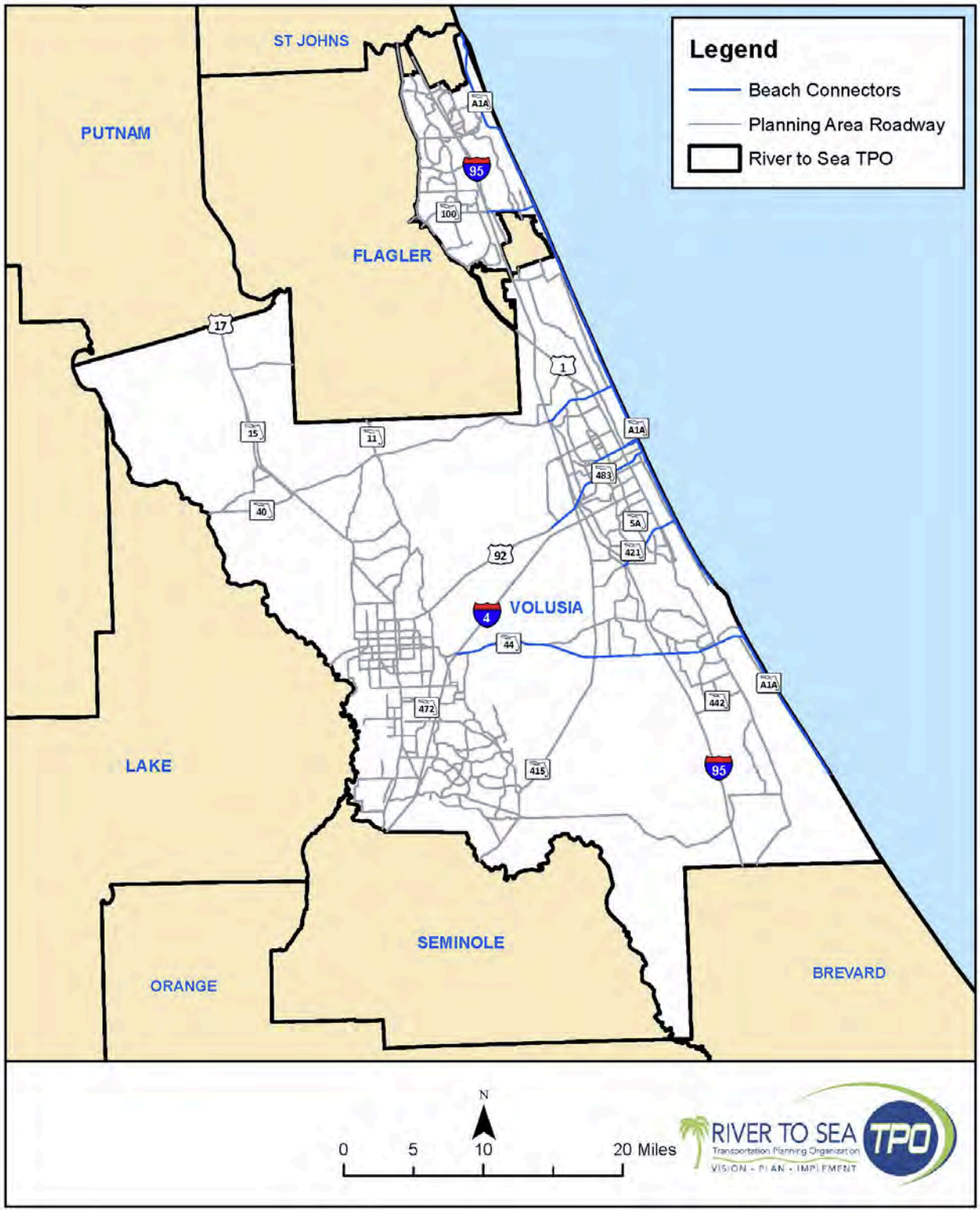


Figure 9 – Beach Connectors

2.3.8 Existing ITS Significance

A significant capital investment has already been made in Volusia and Flagler Counties to provide existing closed-circuit televisions (CCTVs) and construct existing trunk fiber lines. To further identify roadways where TSM&O strategies could be implemented while also seeing where gaps were located in the existing network, these existing facilities were given the following scoring criteria:

- Existing Fiber – if the roadway segment has an existing fiber network in place, it was given 7.5 points;
- Intersecting Fiber – if the roadway segment intersects another roadway with existing fiber, it was given 5 points;
- Within ¼ Mile of Fiber – if the roadway segment did not intersect a roadway with existing fiber but was within ¼ of a roadway with fiber, it was given 2.5 points; and
- Existing CCTVs – if the roadway segment has a CCTV located within a ¼ mile, it was given 2.5 points.

The theory behind this scoring is that roadways with existing fiber, intersecting existing fiber, or are within ¼ mile of fiber may have a much lower cost to implement TSM&O strategies than roadways with no fiber and are further than ¼ mile away from existing fiber. Note that if a roadway has existing fiber and CCTV, it could receive a maximum of 10 points. The same would be true for intersecting segments (max of 7.5 points) or segments within ¼ mile (max of 5 points). **Figure 10** displays the segments with existing ITS in the region.

2.3.9 Travel Time Reliability

Objective 3.2 of Phase 1 of the master plan is to "Improve multimodal travel time reliability and predictability." To assess what areas of need should be addressed to meet this objective, a travel time reliability analysis was performed. FHWA and USDOT established a final rule regarding performance assessment of the roadway network per Moving Ahead for Progress in the 21st Century Act (MAP-21) requirements[2]. According to this rule, reliability assessment is measured using the following values: (1) Percent of Person-Miles Traveled on the Interstate System That Are Reliable (the Interstate Travel Time Reliability measure); and (2) Percent of Person-Miles Traveled on the Non-Interstate NHS That Are Reliable (the Non-Interstate NHS Travel Time Reliability measure). Together they are the Travel Time Reliability measures. Both of these

[2]https://www.federalregister.gov/documents/2017/01/18/2017-00681/national-performance-management-measures-assessing-performance-of-the-national-highway-system#p-131

measures assess Level of Travel Time Reliability (LOTTR), defined as the ratio of the 80th percentile travel time to a “normal” travel time (50th percentile).

Having performed an analysis, it was determined that (with a few exceptions regarding likely tourist activity near the Daytona Beach International Airport and on Beach Street with minimal effect on roadway performance), all roadways in the region are currently meeting the reliability performance measure requirements established by the final rule.

2.3.10 Scoring Methodology Matrix

Table 2 outlines the method and values used for segment scoring for each of the previously described categories. Note that travel time reliability is absent from the scoring table as the travel time reliability analysis established that all roadways are currently meeting the reliability performance measure requirements established by the MAP-21 final rule.

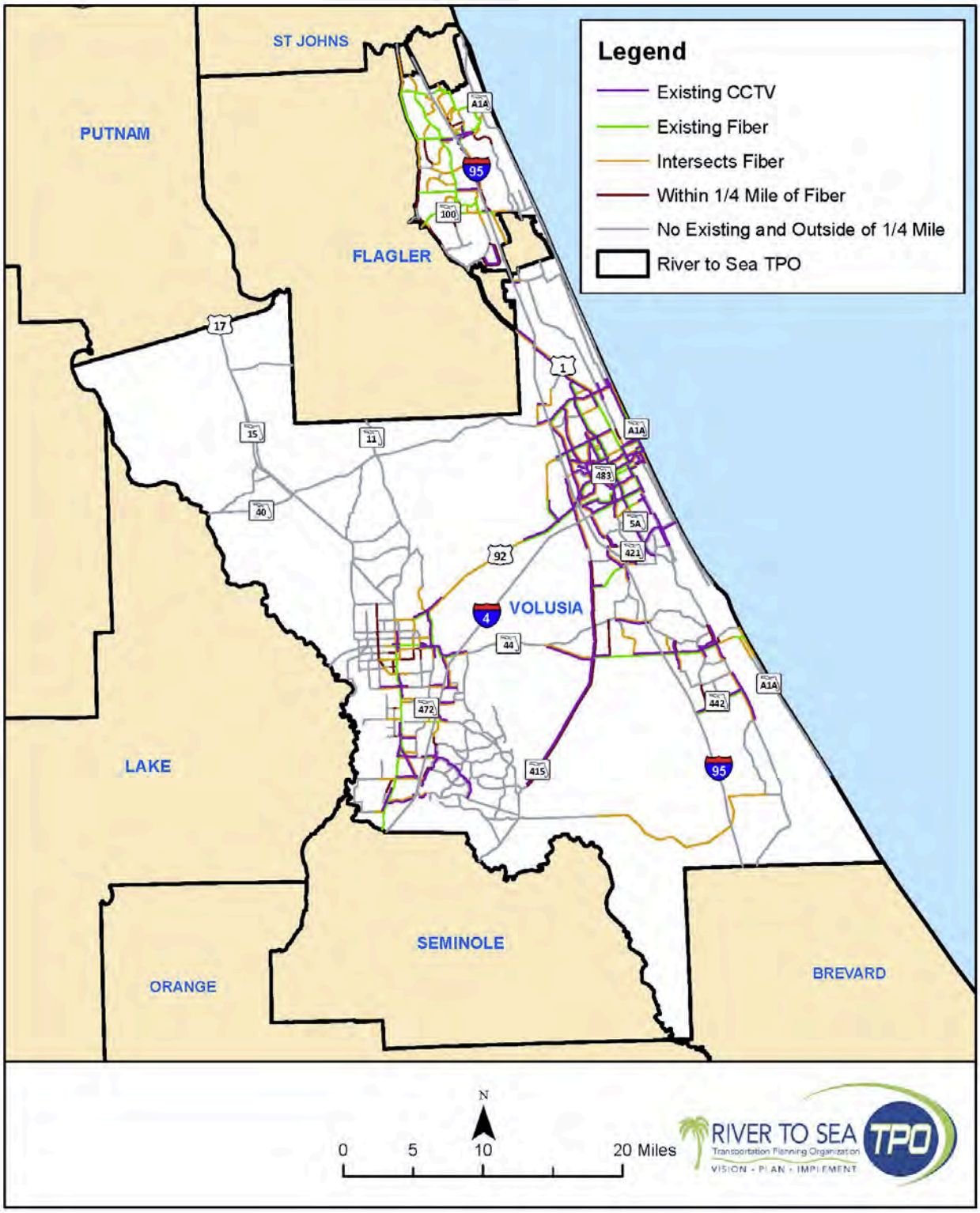


Figure 10 – Existing ITS

Table 2 – Scoring Methodology Matrix

Prioritization Category	Description	Data Inputs	Scoring Methodology	
Maximum Acceptable Volume (MAV) Ratio	A measure of existing congestion severity	2016 and 2017 Volumes and Capacities from Various Sources	Existing Volume ÷ MAV – Less than 0.60 = 2.5 0.60 to 0.80 = 5 0.81 to 1.00 = 10 1.01 to 1.20 = 5 Greater than 1.20 = 2.5	
Existing Volume	A measure of the number of vehicles along roadway segments	2016 and 2017 Volumes from Various Sources	Two Lane Rural Facilities 4,999 or less = 0.0 5,000 to 5,999 = 2.5 6,000 to 6,999 = 5.0 7,000 to 7,999 = 7.5 8,000 or greater = 10.0	All Other Facilities 9,999 or less = 0.0 10,000 to 19,999 = 2.5 20,000 to 29,999 = 5.0 30,000 to 39,999 = 7.5 40,000 or greater = 10.0
Safety	A measure incorporating corridor crash density and frequency	Signal 4 Analytics (annual average of 2012-2016 data)	Crashes per mile >= 14.5 = 5 points Crashes per million VMT >= 3.5 = 5 points Both conditions True = 10 points	
Evacuation Significance	Designation as an evacuation route	FDOT Evacuation Routes Map	Primary evacuation route = 10 points Secondary Evacuation Route = 5 points Not a designated Evacuation Route = 0 points	
Transit Significance	A measure of the number of transit routes on a segment	Number of transit routes from VoTran Route Maps	2 or more transit routes = 10 points 1 transit route = 5 points No transit routes = 0 points	
Beach Connector	A measure of heavily traveled beach routes during off-peak periods	N/A	Beach connector = 10 points Not a beach connector = 0 points	
Existing ITS Infrastructure	A measure of existing facilities in place and opportunities for expansion	Phase 1 of R2CTPO TSM&O Master Plan	Existing fiber – 7.5 points Intersecting fiber – 5 points Within ¼ mile of fiber – 2.5 points Existing CCTV – 2.5 points	

2.4 Top Ranking Segments for TSM&O Improvements

Table 3 through **Table 6** summarize the Top 25 scoring roadway segments for SIS, Regional, Non-Regional, and Collector roadways when using the scoring methodology described in Section 2.3. A full listing of all R2CTPO roadway segment rankings, in alphabetical order, is provided in **Appendix A**. **Figure 11** provides a graphical representation of the Top 25 scoring roadway segments for **all** the various roadway classifications. These segments represent the locations where the deployment of TSM&O strategies is expected to provide the optimum return on investment in improving the R2CTPO's roadway network. As stated earlier, please note that I-4 and I-95 were excluded from the rankings.

Table 3 – Top 25 Ranked SIS Segments

Priority Rank	Road Name	From	To	MAV Ratio	Existing Volume	Safety	Evacuation Route	Transit	Beach Connector	ITS	Total Score
1	US 17/92	Graves Ave.	Rhode Island Ave.	5.0	7.5	10.0	10.0	10.0	0.0	10.0	52.5
2	US 17/92	Rhode Island Ave.	Enterprise Rd.	5.0	7.5	10.0	10.0	10.0	0.0	10.0	52.5
3	US 17/92	Beresford Ave.	SR 15A (Taylor Rd.)	5.0	7.5	10.0	10.0	10.0	0.0	7.5	50.0
4	US 17/92	SR 15A (Taylor Rd.)	SR 472	5.0	10.0	5.0	10.0	10.0	0.0	10.0	50.0
5	US 17/92	Saxon Blvd.	DeBary Plantation Blvd	10.0	7.5	0.0	10.0	10.0	0.0	7.5	45.0
6	US 17/92	New York Ave.	Graves Ave.	5.0	5.0	5.0	10.0	10.0	0.0	7.5	42.5
7	US 17/92	Dirksen	Ft. Florida Rd.	5.0	5.0	0.0	10.0	10.0	0.0	10.0	40.0
8	SR 40	Tymber Creek Rd.	I-95	10.0	7.5	5.0	10.0	0.0	0.0	7.5	40.0
9	State Road 100	I-95	Memorial Medical Parkway	5.0	5.0	10.0	10.0	0.0	0.0	10.0	40.0
10	US 17/92	SR 472	New York Ave.	5.0	5.0	0.0	10.0	10.0	0.0	7.5	37.5
11	US 17/92	DeBary Plantation Blvd	Highbanks Rd.	5.0	5.0	0.0	10.0	10.0	0.0	7.5	37.5
12	US 17/92	Highbanks Rd.	Valencia Rd	5.0	5.0	0.0	10.0	10.0	0.0	7.5	37.5

Table 3 (Continued)

Priority Rank	Road Name	From	To	MAV Ratio	Existing Volume	Safety	Evacuation Route	Transit	Beach Connector	ITS	Total Score
13	US 17/92	Valencia Rd.	Dirksen Dr.	2.5	5.0	0.0	10.0	10.0	0.0	10.0	37.5
14	State Road 100	Landings Blvd.	Belle Terre Parkway	5.0	5.0	10.0	10.0	0.0	0.0	7.5	37.5
15	State Road 100	Seminole Woods Pkwy	Bulldog Drive	5.0	5.0	10.0	10.0	0.0	0.0	5.0	35.0
16	US 17/92	Enterprise Rd.	Saxon Blvd.	2.5	5.0	0.0	10.0	5.0	0.0	10.0	32.5
17	State Road 100	Belle Terre Parkway	Palm Coast City Limits	2.5	2.5	10.0	10.0	0.0	0.0	7.5	32.5
18	SR100	SR100 & Commerce Pkwy	SR100 & US1	2.5	2.5	10.0	10.0	0.0	0.0	7.5	32.5
19	US 17/92	Ft. Florida Rd.	Barwick Rd	5.0	5.0	0.0	10.0	0.0	0.0	7.5	27.5
20	US 17/92	Barwick Rd.	Seminole Co.	5.0	5.0	0.0	10.0	0.0	0.0	7.5	27.5
21	SR 40	Rima Ridge Rd	Tymber Creek Rd.	10.0	7.5	0.0	10.0	0.0	0.0	0.0	27.5
22	State Road 100	Memorial Medical Pkwy	Seminole Woods Parkway	5.0	5.0	0.0	10.0	0.0	0.0	7.5	27.5
23	State Road 100	Bulldog Drive	Landings Blvd.	5.0	5.0	0.0	10.0	0.0	0.0	7.5	27.5
24	US 17	SR 40	Lake Winona Rd.	5.0	10.0	0.0	5.0	5.0	0.0	0.0	25.0
25	US 1	US 1 & Heritage Crossroads Hwy	US 1 & SR 100	5.0	2.5	5.0	10.0	0.0	0.0	2.5	25.0

Table 4 – Top 25 Ranked Regional Segments

Priority Rank	Road Name	From	To	MAV Ratio	Existing Volume	Safety	Evacuation Route	Transit	Beach Connector	ITS	Total Score
1	SR 40	I-95	Clyde Morris Blvd.	10.0	7.5	10.0	10.0	10.0	10.0	10.0	67.5
2	US 92	SR 483/Clyde Morris Blvd.	SR 5A/Nova Rd.	5.0	10.0	10.0	10.0	10.0	10.0	10.0	65.0
3	SR 40	Clyde Morris Blvd.	SR 5A/Nova Rd.	10.0	7.5	5.0	10.0	10.0	10.0	10.0	62.5
4	US 92	I-95	Williamson Blvd.	2.5	7.5	10.0	10.0	10.0	10.0	10.0	60.0
5	US 92	Williamson Blvd.	Bill France Blvd.	5.0	10.0	5.0	10.0	10.0	10.0	10.0	60.0
6	US 92	Bill France Blvd.	SR 483/Clyde Morris Blvd.	2.5	7.5	10.0	10.0	10.0	10.0	10.0	60.0
7	US 92	SR 5A/Nova Rd.	Martin Luther King Blvd.	5.0	5.0	10.0	10.0	10.0	10.0	10.0	60.0
8	US 92	Martin Luther King Blvd.	US 1	5.0	5.0	10.0	10.0	10.0	10.0	10.0	60.0
9	US 92	US 1	Beach St.	5.0	5.0	10.0	10.0	10.0	10.0	10.0	60.0
10	SR 40	SR5A/Nova Rd.	US 1	5.0	7.5	10.0	10.0	10.0	10.0	7.5	60.0
11	SR 40	US 1	Halifax Ave.	5.0	7.5	10.0	10.0	10.0	10.0	7.5	60.0
12	US 1	Fairview/Main St.	US 92/ISB	10.0	7.5	10.0	10.0	10.0	0.0	10.0	57.5
13	US 1	US 92/ISB	Orange Ave.	10.0	7.5	10.0	10.0	10.0	0.0	10.0	57.5
14	US 92	LPGA Blvd.	I-95	10.0	7.5	0.0	10.0	10.0	10.0	10.0	57.5
15	US 1	SR 430 (Mason Ave.)	Fairview/Main St.	10.0	5.0	10.0	10.0	10.0	0.0	10.0	55.0
16	SR A1A - Atlantic Ave. North	Harvard Dr.	SR430/Seabreeze Blvd.)	2.5	2.5	10.0	10.0	10.0	10.0	10.0	55.0
17	SR A1A - Atlantic Ave. North	SR 430/Oakridge Blvd.	US 92/ISB	2.5	2.5	10.0	10.0	10.0	10.0	10.0	55.0
18	US 1	Bellevue Ave.	SR 400/Beville Rd.	10.0	7.5	5.0	10.0	10.0	0.0	10.0	52.5
19	SR A1A - Atlantic Ave. North	SR 40	Harvard Dr.	2.5	2.5	10.0	10.0	10.0	10.0	7.5	52.5

Table 4 (Continued)

Priority Rank	Road Name	From	To	MAV Ratio	Existing Volume	Safety	Evacuation Route	Transit	Beach Connector	ITS	Total Score
20	SR A1A - Atlantic Ave. South	US 92	Silver Beach Ave.	2.5	2.5	10.0	10.0	10.0	10.0	7.5	52.5
21	SR 40	Halifax Ave.	SR A1A	2.5	2.5	10.0	10.0	10.0	10.0	7.5	52.5
22	SR 44	I-95	Mission Dr	5.0	5.0	10.0	10.0	10.0	10.0	2.5	52.5
23	US 17/92	Plymouth Ave.	SR 44 (New York Ave.)	10.0	7.5	5.0	10.0	0.0	10.0	10.0	52.5
24	US 92	I-4 EB Ramp	LPGA Blvd.	10.0	2.5	10.0	10.0	10.0	0.0	7.5	50.0
25	US 92	SR 441/Peninsula Dr.	SR A1A/Atlantic	2.5	2.5	5.0	10.0	10.0	10.0	10.0	50.0

Table 5 – Top 25 Ranked Non-Regional Segments

Priority Rank	Road Name	From	To	MAV Ratio	Existing Volume	Safety	Evacuation Route	Transit	Beach Connector	ITS	Total Score
1	SR 430 - Mason Ave.	SR 483/Clyde Morris Blvd.	SR 5A/Nova Rd.	10.0	5.0	10.0	5.0	10.0	10.0	10.0	60.0
2	SR 400 - Beville Rd.	SR 483/Clyde Morris Blvd.	SR 5A/Nova Rd.	10.0	7.5	10.0	10.0	10.0	0.0	10.0	57.5
3	SR 421 - Dunlawton Ave.	Williamson	Clyde Morris Blvd.	5.0	10.0	5.0	10.0	10.0	10.0	7.5	57.5
4	SR 421 - Dunlawton Ave.	Clyde Morris Blvd.	SR 5A/Nova Rd.	5.0	10.0	10.0	10.0	10.0	10.0	2.5	57.5
5	SR 421 - Dunlawton Ave.	Spruce Creek Rd.	US 1	5.0	5.0	10.0	10.0	10.0	10.0	2.5	52.5
6	SR 421 - Dunlawton Ave.	SR5A/Nova Rd.	Spruce Creek Rd.	5.0	7.5	5.0	10.0	10.0	10.0	2.5	50.0

Table 5 (Continued)

Priority Rank	Road Name	From	To	MAV Ratio	Existing Volume	Safety	Evacuation Route	Transit	Beach Connector	ITS	Total Score
7	Taylor Rd. (CO)	Williamson Blvd.	I-95 (at Dunlawton Ave.)	10.0	10.0	10.0	5.0	5.0	0.0	10.0	50.0
8	SR 430 - Mason Ave.	SR 5A/Nova Rd.	US 1	10.0	5.0	10.0	5.0	0.0	10.0	5.0	45.0
9	Clyde Morris Blvd./SR 483	US 92	Beville Rd.	10.0	7.5	5.0	5.0	10.0	0.0	7.5	45.0
10	Dirksen/DeBary/Doyle	I-4	Deltona Blvd.	10.0	5.0	10.0	10.0	0.0	0.0	10.0	45.0
11	LPGA Blvd. (DB)	Williamson Blvd.	Clyde Morris Blvd.	5.0	5.0	5.0	10.0	10.0	0.0	10.0	45.0
12	Palm Coast Parkway	Cypress Point Parkway	I-95 South Bound Ramps	10.0	10.0	5.0	10.0	0.0	0.0	10.0	45.0
13	SR 430 - Seabreeze Bridge - WB	Beach St.	Peninsula Dr	2.5	0.0	10.0	10.0	0.0	10.0	10.0	42.5
14	SR 430 - Seabreeze Bridge - WB	Peninsula Dr	SR A1A/Atlantic	2.5	0.0	10.0	10.0	0.0	10.0	10.0	42.5
15	Orange/Silver Beach Ave.	US 1	Beach St.	2.5	0.0	10.0	10.0	10.0	0.0	10.0	42.5
16	Orange/Silver Beach Ave.	Beach St.	City Island Pkwy.	2.5	2.5	10.0	10.0	10.0	0.0	7.5	42.5
17	Saxon Blvd.	I-4	Finland Dr.	5.0	7.5	10.0	0.0	10.0	0.0	10.0	42.5
18	SR 400 - Beville Rd.	SR 5A/Nova Rd.	US 1	5.0	5.0	5.0	10.0	5.0	0.0	10.0	40.0
19	SR 430 - Mason Ave.	US 1	Beach St.	5.0	5.0	5.0	5.0	0.0	10.0	10.0	40.0
20	SR 430 - Oakridge Blvd. - EB	Beach St.	Peninsula Dr	2.5	0.0	10.0	10.0	0.0	10.0	7.5	40.0
21	unn/George Engram/Fairview/Ma	Bill France Blvd.	Clyde Morris Blvd.	10.0	2.5	10.0	0.0	10.0	0.0	7.5	40.0
22	LPGA Blvd. (DB)	Tomoka Farms Rd	Williamson Blvd	5.0	5.0	5.0	10.0	5.0	0.0	10.0	40.0

Table 5 (Continued)

Priority Rank	Road Name	From	To	MAV Ratio	Existing Volume	Safety	Evacuation Route	Transit	Beach Connector	ITS	Total Score
23	LPGA Blvd. (HH)	SR5A/Nova Rd.	US 1	5.0	2.5	10.0	10.0	5.0	0.0	7.5	40.0
24	Saxon Blvd.	VMP	FDOT Park & Ride	10.0	10.0	10.0	0.0	10.0	0.0	0.0	40.0
25	Palm Coast Parkway	I-95 South Bound Ramps	I-95 North Bound Ramps	5.0	10.0	5.0	10.0	0.0	0.0	10.0	40.0

Table 6 – Top 25 Ranked Collector Segments

Priority Rank	Road Name	From	To	MAV Ratio	Existing Volume	Safety	Evacuation Route	Transit	Beach Connector	ITS	Total Score
1	Atlantic Ave. (DBS)	Phillis Ave.	Marcelle Ave.	10.0	2.5	0.0	10.0	5.0	10.0	0.0	37.5
2	Bellevue Ave. Extension	CR 415/Tomoka Farms Rd	Williamson Blvd.	2.5	0.0	10.0	5.0	10.0	0.0	10.0	37.5
3	Harley Strickland Blvd. (OC)	Enterprise Rd.	Veteran's Memorial Pkwy.	10.0	2.5	10.0	0.0	10.0	0.0	5.0	37.5
4	Cypress Point Parkway	Cypress Edge (N)	Palm Coast Parkway	10.0	7.5	10.0	0.0	0.0	0.0	10.0	37.5
5	Big Tree Rd.	Nova Rd.	Magnolia Ave.	10.0	2.5	10.0	0.0	5.0	0.0	7.5	35.0
6	Taylor Rd. (PO)	Dunlawton Ave.	Clyde Morris Blvd.	10.0	2.5	10.0	0.0	5.0	0.0	7.5	35.0
7	Bellevue Ave. (DAY)	Nova Rd.	US 1	5.0	0.0	10.0	0.0	10.0	0.0	7.5	32.5
8	Beresford Ave.	US 17/92	Amelia Ave	5.0	2.5	10.0	0.0	10.0	0.0	5.0	32.5
9	Bill France Blvd. (DAY)	Dunn Ave.	US 92	2.5	2.5	10.0	0.0	10.0	0.0	7.5	32.5

Table 6 (Continued)

Priority Rank	Road Name	From	To	MAV Ratio	Existing Volume	Safety	Evacuation Route	Transit	Beach Connector	ITS	Total Score
9	Deltona Blvd. (DEL)	Cloverleaf Blvd./Anderson Dr.	Enterprise Rd.	2.5	2.5	10.0	0.0	10.0	0.0	7.5	32.5
10	Atlantic Ave. (DBS)	SR A1A/Dunlawton Ave.	Phillis Ave.	2.5	2.5	0.0	10.0	5.0	10.0	0.0	30.0
11	Atlantic Ave. (DBS)	Marcelle Ave.	Major St	5.0	0.0	0.0	10.0	5.0	10.0	0.0	30.0
12	Graves Av/CR 4145	Kentucky Ave.	Howland Blvd.	10.0	2.5	10.0	0.0	0.0	0.0	7.5	30.0
13	Midway Ave.	Williamson Blvd.	US 92	2.5	0.0	10.0	0.0	10.0	0.0	7.5	30.0
14	Atlantic Ave. (PI)	Major St	Beach St.	2.5	0.0	0.0	10.0	5.0	10.0	0.0	27.5
15	Derbyshire Rd.	LPGA Blvd.	SR 430/Mason Ave.	2.5	0.0	5.0	0.0	10.0	0.0	10.0	27.5
16	Plymouth Ave.	Clara Ave.	US 17/92	10.0	2.5	10.0	0.0	5.0	0.0	0.0	27.5
17	6th St.	Derbyshire Rd.	SR 5A/Nova Rd	2.5	0.0	10.0	0.0	5.0	0.0	7.5	25.0
18	Amelia Ave.	Ohio Ave.	SR 44	2.5	2.5	10.0	0.0	5.0	0.0	5.0	25.0
19	Amelia Ave. (DL)	SR 44	Voorhis Ave.	2.5	0.0	10.0	0.0	5.0	0.0	7.5	25.0
20	Deltona Blvd. (DEL)	Enterprise Rd.	DeBary Ave	5.0	0.0	10.0	0.0	0.0	0.0	10.0	25.0
21	Jimmy Ann Dr. (DAY)	LPGA Blvd.	Clyde Morris Blvd.	2.5	0.0	10.0	0.0	5.0	0.0	7.5	25.0
22	Riverside Dr. (NSB)	SR 44 (N. Causeway)	SR A1A (S. Causeway)	2.5	0.0	10.0	10.0	0.0	0.0	2.5	25.0
23	Deltona Blvd. (DEL)	Cloverleaf Blvd./Anderson Dr.	Enterprise Rd.	2.5	2.5	10.0	0.0	10.0	0.0	7.5	32.5

Table 6 (Continued)

Priority Rank	Road Name	From	To	MAV Ratio	Existing Volume	Safety	Evacuation Route	Transit	Beach Connector	ITS	Total Score
24	Cypress Point Parkway	Cypress Edge (S)	Cypress Edge (N)	2.5	2.5	10.0	0.0	0.0	0.0	10.0	25.0
25	8th St. (DAY)	Derbyshire Rd.	SR 5A/Nova Rd	2.5	0.0	10.0	0.0	5.0	0.0	5.0	22.5

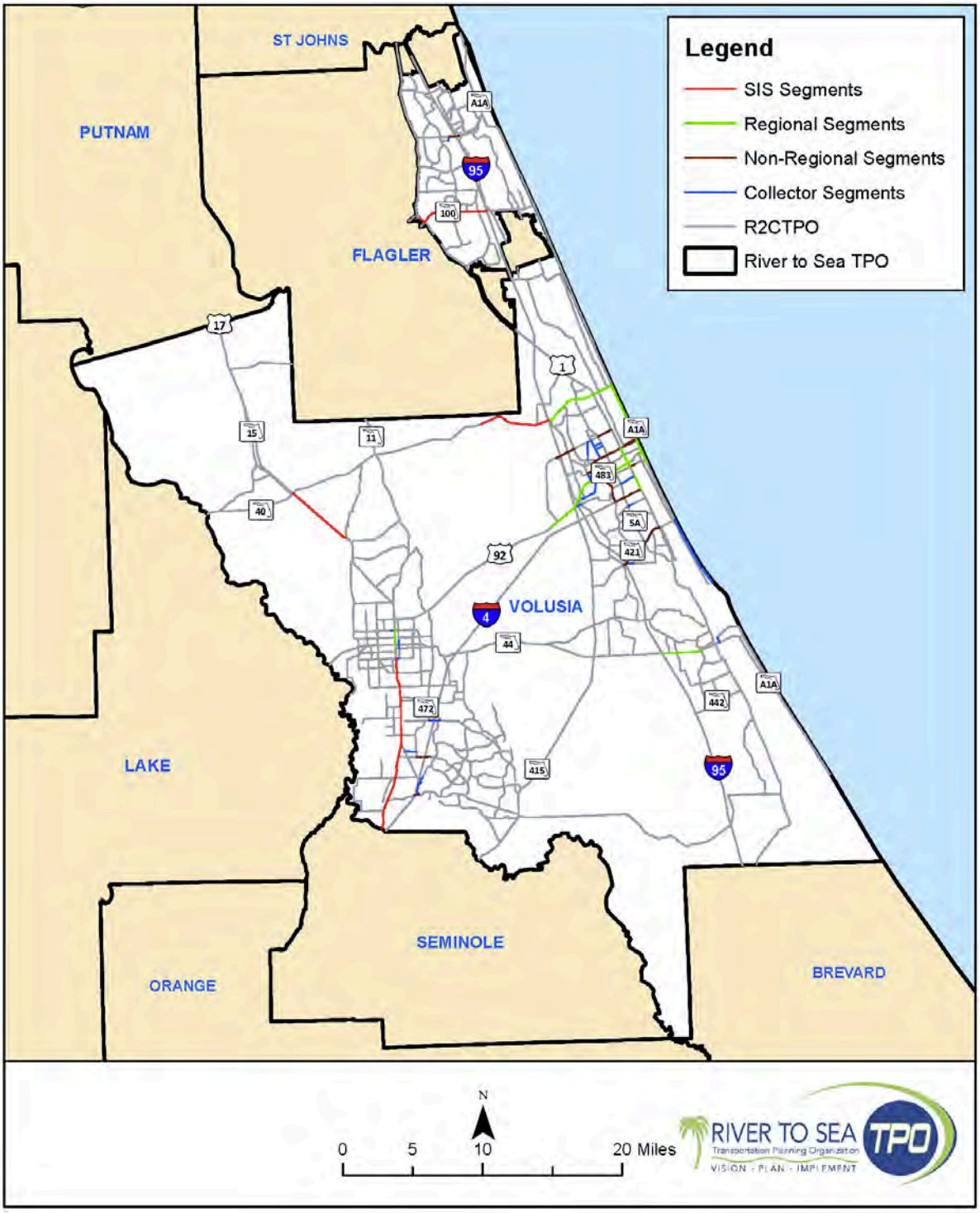


Figure 11 – Top 25 Ranked Segments

2.5 Traffic Management Center (TMC) Options

At this time, there are three separate TMC facilities located within the River to Sea TPO management area: one managed by Volusia County Traffic Engineering at the Volusia County Public Works Facility in DeLand, one managed by Daytona Beach Traffic Engineering at the City of Daytona Beach Public Works Facility, and one managed by Palm Coast Traffic Engineering at the City of Palm Coast City Hall. The TMCs located in Palm Coast and Daytona Beach maintain the signals within their city limits, while the Volusia County TMC manages all other signals within the Volusia County.

Existing City of Daytona Beach TMC

The current TMC operated by the City of Daytona Beach currently monitors and controls all signals within the City of Daytona Beach. The TMC consists of 2 workstations equipped with computer monitors, 6 Samsung wall monitors, and its own virtual server (housed at the Daytona Police Department Headquarters which is a Category 3 Hurricane rated facility). These TMC elements can be seen in **Figure 12**. In addition to this equipment, there is another video wall displaying CCTV footage of I-95 and I-4. FDOT representatives use this video wall to monitor the interstates during event management activities (primarily races at the Daytona International Speedway). This can be seen in **Figure 13**. All workstations operate ATMS.now to operate the traffic signals, and Genetch software to view and operate all CCTVs.

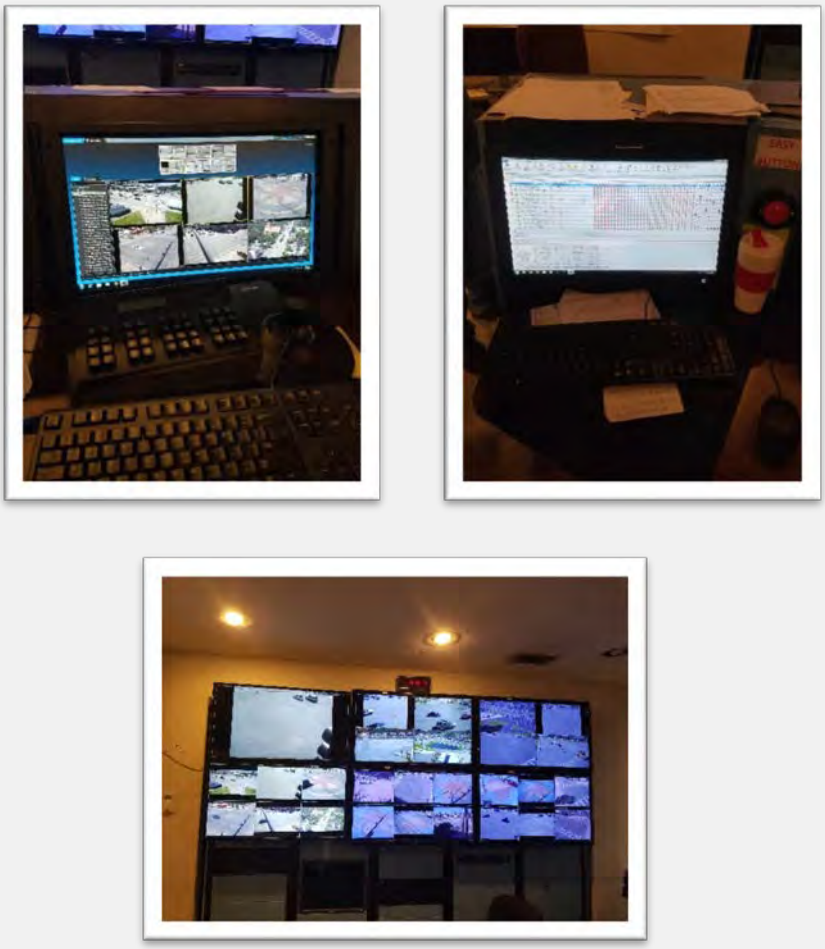


Figure 12 – Daytona Beach TMC

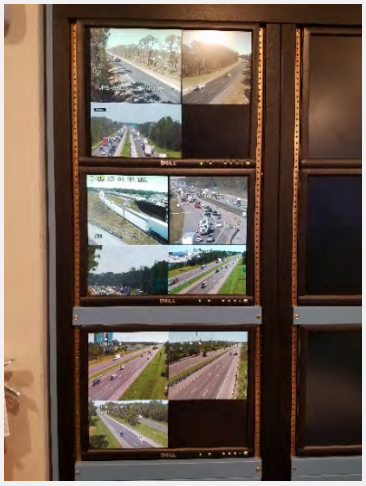


Figure 13 – FDOT Video Wall

Existing Palm Coast TMC

The TMC operated by the City of Palm Coast has the ability to monitor and control all signals within Flagler County, although not all signals are currently connected to the TMC. In addition, four signals are maintained and operated by Flagler County, but the City has expressed a desire to take over operations and maintenance of those signals. The TMC consists of a workstation (a duplicate workstation is located at the Public Works facility) equipped with 2 Dell computer monitors, 2 Sharp wall monitors, and its own server. It utilizes ATMS.now to manage signals and the free version of Bosch CCTV Display software to monitor the limited number of CCTVs currently in use. Pictures of the TMC in its current form can be seen in **Figure 14**.

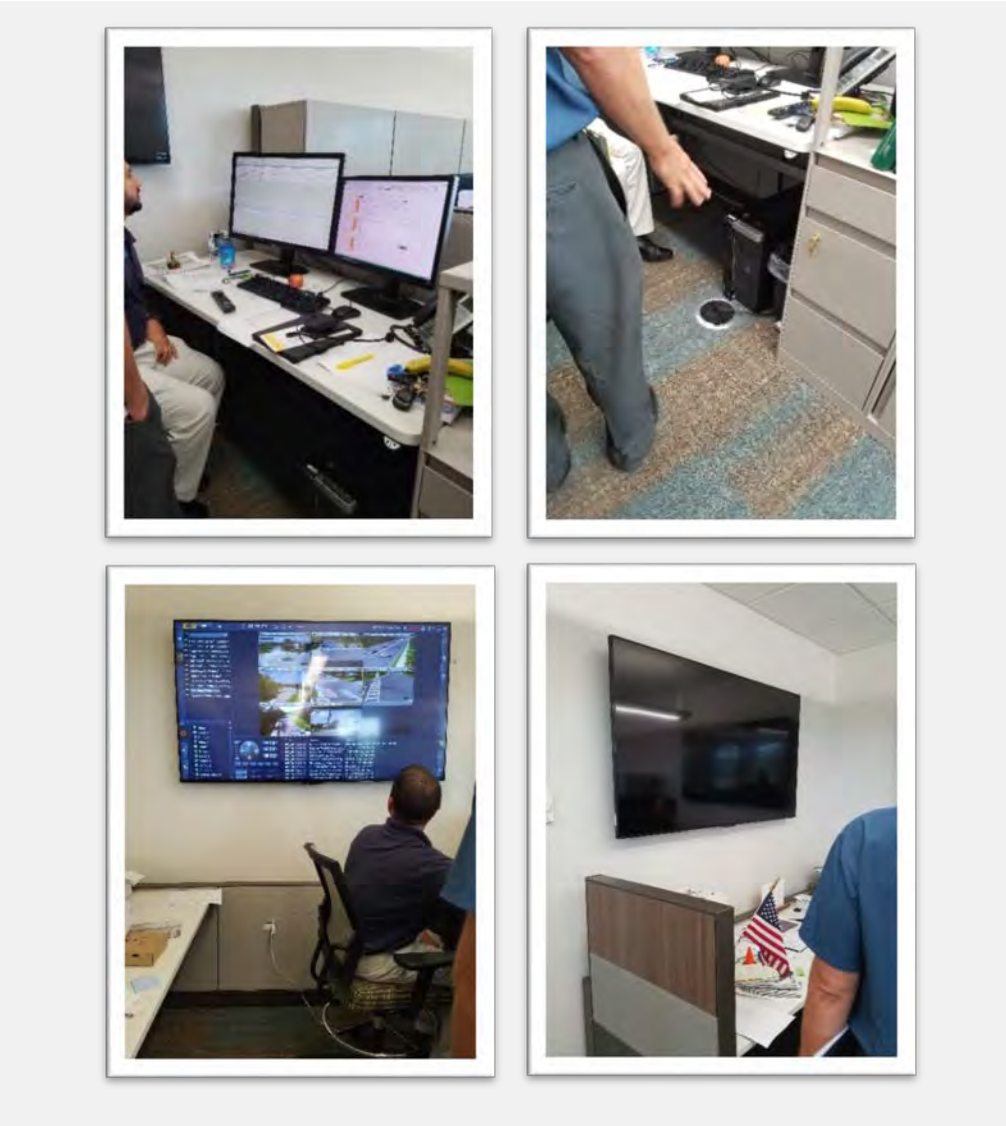


Figure 14 – Palm Coast TMC

Existing Volusia County TMC

The current TMC operated by Volusia County monitors and controls all signals within Volusia County not controlled by the City of Daytona Beach. It currently consists of one workstation equipped with 2 HP computer monitors, 2 larger Samsung monitors and its own server. Pictures of the TMC in its current form can be seen in **Figure 15**. It utilizes Centracs ATMS to manage signals and the Lucity software for asset management and data sharing purposes. A relocation of the TMC to a shared Public Works Facility called the Public Works Services Center is currently in the planning stages. This project would involve the co-location of several individual Public Works agencies such as Road & Bridge, Mosquito Prevention, and Traffic Engineering from several municipalities in the region.

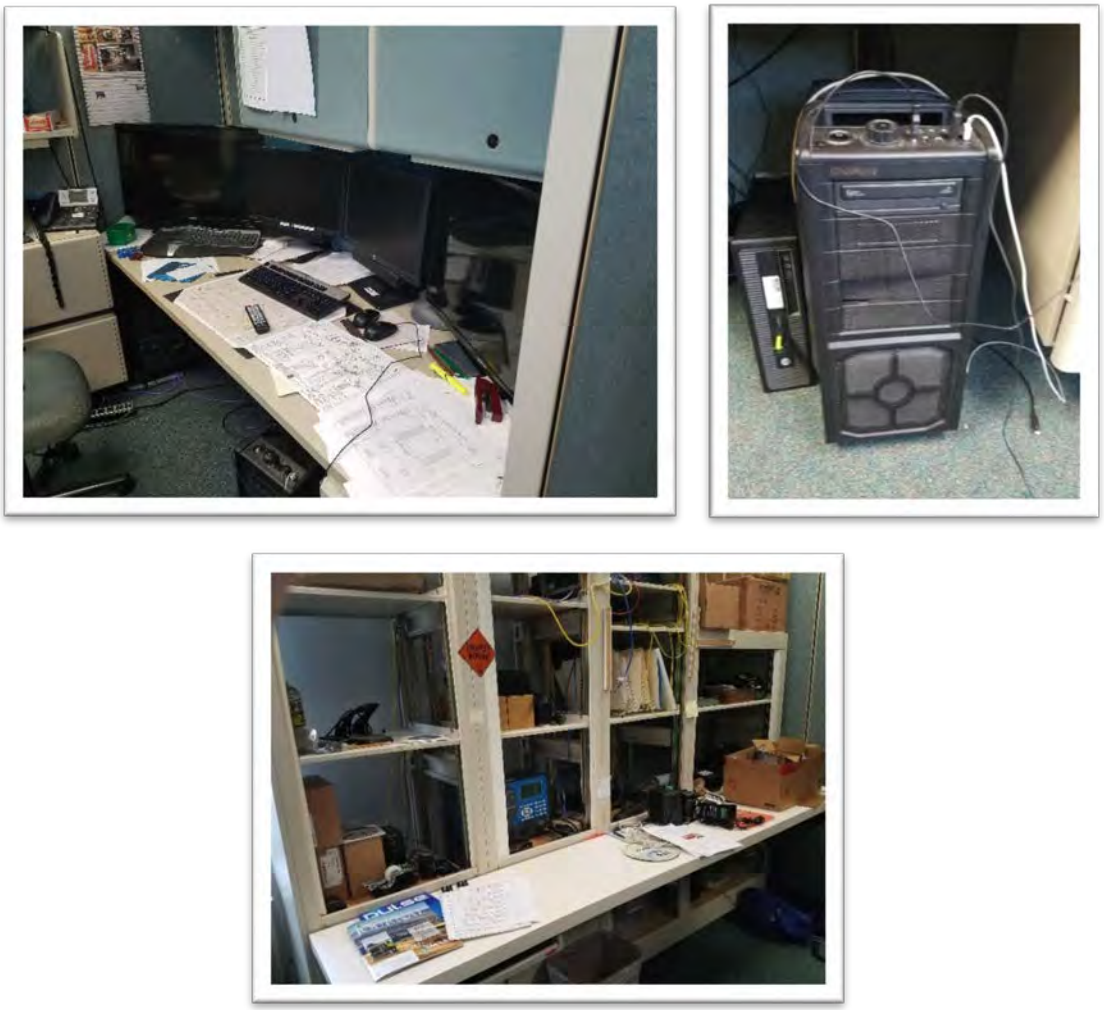


Figure 15 – Volusia County TMC

TMC Staffing for Operations

Due to costs, the staffing of a TMC should be appropriate to maximize the overall return on investment. The following are some possible recommendations:

- 7:00 AM – 7:00 PM Monday through Friday
    - Weekend hours as needed
    - Can be increased/decreased depending on:
        - Peak and off-peak times of day
        - Special events
            - Festivals
            - Evacuations
            - Races (Daytona)
        - Number of monitored roadways

In initial stakeholder meetings, TMC staffing has been identified as a need for all TMCs. With proper staffing, each TMC will be able to maximize the surveillance, response, and analysis capabilities of the investments (both in facilities and field devices) already in place

3. Identification of Applicable TSM&O Strategies and Projects

With roadway corridors identified in Section 2 as being primary candidates for Transportation Systems Management and Operations (TSM&O) improvements this section will identify which of the improvements described in Section 2 will provide the most benefit, and will also provide a framework for potential deployments of TSM&O improvements.

3.1 Transportation Network Deficiency Causes

In addition to the traffic generated by the two major highways, I-4 and I-95, which are located within the jurisdiction of the River to Sea Transportation Planning Organization (R2CTPO), the existing conditions analysis discussed performed in Section 2 of the Master Plan revealed numerous major arterials that generate significant traffic, creating widespread congestion throughout the region. Through individual stakeholder meetings it was determined that operations of these corridors are primarily split between Volusia County Traffic Engineering, the City of Daytona Beach Traffic Engineering, and the City of Palm Coast Traffic Engineering. This split coordination of all signal operations in the region can prove to be a difficult task. Therefore, continuing to improve coordination between the Traffic Management Centers of these agencies would be of benefit.

In addition, having met with stakeholders and consulted with the already adopted Florida Department of Transportation (FDOT) District 5 Intelligent Transportation Systems (ITS) Master Plan, the following factors are the main reasons for recurring and non-recurring congestion:

- Peak hour traffic
  - Morning and evening rush hours
- Traffic incidents
- Special events
  - Daytona International Speedway events
  - Beach traffic
  - Motorcycle events
  - Spring break
- Motorist distractions
- Work zone closures
- Seasonal population changes
  - “Snowbirds”
  - Weekend/tourist traffic

When paired with the insufficient staffing levels and a gap in Operations and Maintenance (O&M) funding levels, as identified by the major stakeholders during the coordination phase, these factors have left the region in a position where infrastructure investments are not being utilized to their fullest. In general, the transportation system will benefit from improved operations and maintenance to ensure that the significant investments on the roadways can be maximized. Therefore, it is recommended that the following factors be addressed to ensure a high Return on Investment (ROI):

- Close gaps in the communications network throughout the region
- Replace any outdated TSM&O infrastructure
- Expand TSM&O infrastructure as appropriate
- Fund gaps in O&M
- Continue to improve coordination and between roadway operating agencies
- Use system performance measures to measure and improve overall performance

According to the 2015 Urban Mobility Report published by the Texas A&M Transportation Institute, motorists nationally in 2014 experienced 6.9 billion hours in travel delays, leading to an estimated 3.1 billion dollars in "wasted" fuel. This translates to a total congestion cost of 160 billion dollars. The areas under the jurisdiction of the R2CTPO are particularly susceptible to these traffic delay costs due to frequent recurring and non-recurring congestion, which are certain to increase with time without proper TSM&O improvements. According to Section 3.1 of the R2CTPO 2040 Long Range Transportation Plan (LRTP), the population within the R2CTPO Metropolitan Planning Area (MPA) is 602,972 people (503,851 within Volusia County, 99,121 within Flagler County). The region has seen an increase in population due to economic recovery and increases in development and tourism. This is expected to lead to a steady increase in population for the foreseeable future. Should transportation network deficiencies not be addressed, it is likely that the increase in population will lead to greater congestion, placing increased strain on an already overburdened transportation network.

3.2 Applicable TSM&O Infrastructure Expansion

Capital TSM&O improvements rely on proper O&M resources and protocols. In meeting with the primary stakeholders in the region, there was a consensus that properly operating and maintaining the TSM&O network is critical to the success of the transportation system, but proper funding (particularly for staffing) is not available. With this in mind, it is recommended that increased O&M funding for the proposed TSM&O infrastructure be made a priority. For many years in the State of Florida, the standard practice for traffic operations improvements was to design and construct new roads and then to allocate O&M resources after the fact; often resulting in a shortfall to support these capital improvements. Therefore, in addition to closing

the existing funding gap, it is recommended that funding, standards, and O&M resources should be put in place ***in conjunction*** with any deployments.

An important point of emphasis in this section is interagency cooperation, particularly among the various TMCs deployed in the region. This cooperation will be beneficial in allowing limited resources to be allocated and shared in ways that will benefit all agencies. It is recommended that a clear understanding be reached among operating agencies as to who will have access to other agencies' assets, what information can be shared, and where demarcation points will be. This can be achieved in a variety of fashions, including interlocal agreements, Joint Participation Agreements (JPA), and Memorandums of Understanding (MOU).

The following TSM&O improvements have been identified as overall strategies to allow the R2CTPO to improve traffic operations within their jurisdiction:

- Traffic Operations/Management
- System Communications and Interconnectivity
- Maintenance and Construction
- Incident Management
- Emergency Management
- Traveler Information
- Public Transportation Management
- Information Management
- Emerging Technologies

3.2.1 Traffic Operations/Management

Roadway Surveillance Coverage

Objective 7.1 of the TSM&O Master Plan Phase 1 addresses the region's need for implementing technology for travel-time and reliability data collection. It is recommended that roadway surveillance be expanded on the arterials in order to bolster the surveillance capabilities of all roadway operating agencies. All roadway operating agencies (FDOT on highways, Volusia County/Daytona Beach/Palm Coast on the arterials) currently operate an extensive number of Closed Circuit Television (CCTV) cameras throughout the portions of Volusia and Flagler Counties currently under the jurisdiction of the R2CTPO. It is recommended that any gaps in coverage be filled in; specifically, all signals within the deployment areas that do not have CCTVs. This will allow the operating agencies to better assess traffic

conditions in real time, allowing for more active management of the roadway network. **Figure 16** shows all CCTVs that are recommended to be installed (204 in total) in future deployments as a part of this Master Plan.

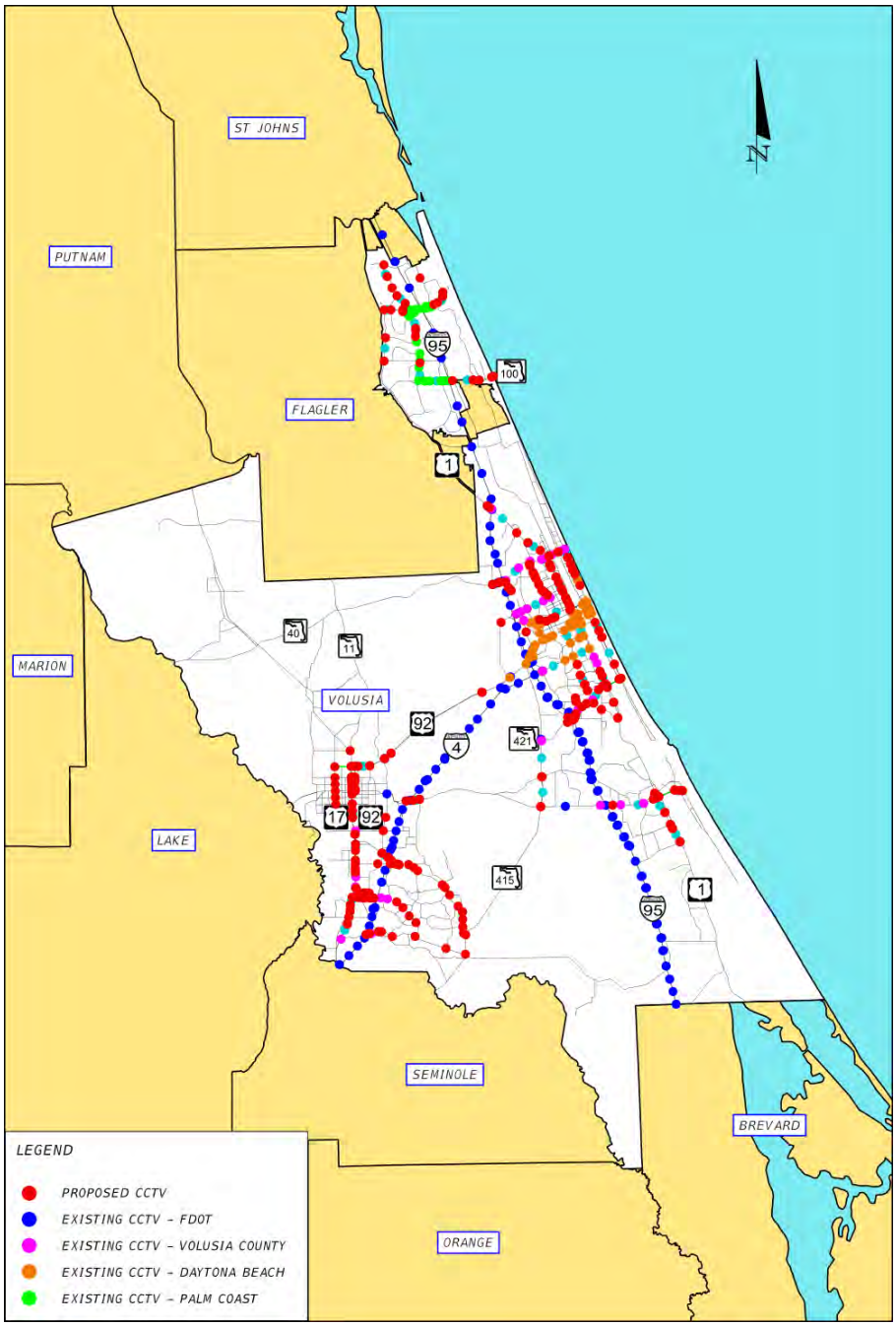


Figure 16 – Overall Proposed CCTVs

Travel Time Information

To further realize Objective 7.1 of the TSM&O Master Plan Phase 1, the Master Plan recommends the region collect travel time information. Accurate travel time information will allow for proper performance review of the system, and can also be the data that would alert potential TMC operators of slowing traffic, indicating that alternative signal timings/traffic diversions may be necessary. It is recommended that BlueTooth technology be used to collect this information. BlueTooth travel time information systems operate by collecting data from motorists as they pass by BlueTooth sensors. When a motorist with a BlueTooth enabled device passes by a sensor in the field, a unique ID for the traveler is created, and he/she is tracked as they move through the system. This is known as point-to-point travel time information. This technology has already been deployed on US 92, and the City of Daytona Beach Traffic Engineering has expressed interest in this information as well.

Gathering this information aids in understanding the traffic conditions in real-time, allowing operators to make informed decisions as needed. **Figure 17** shows all BlueTooth devices that are recommended to be installed (71 in total) in future deployments as a part of this Master Plan. The BlueTooth detectors have been placed midblock, meaning between signals, approximately every 2 miles. They have been placed in this fashion to ensure the most accurate travel time readings as the accuracy of BlueTooth detectors decreases at intersections.

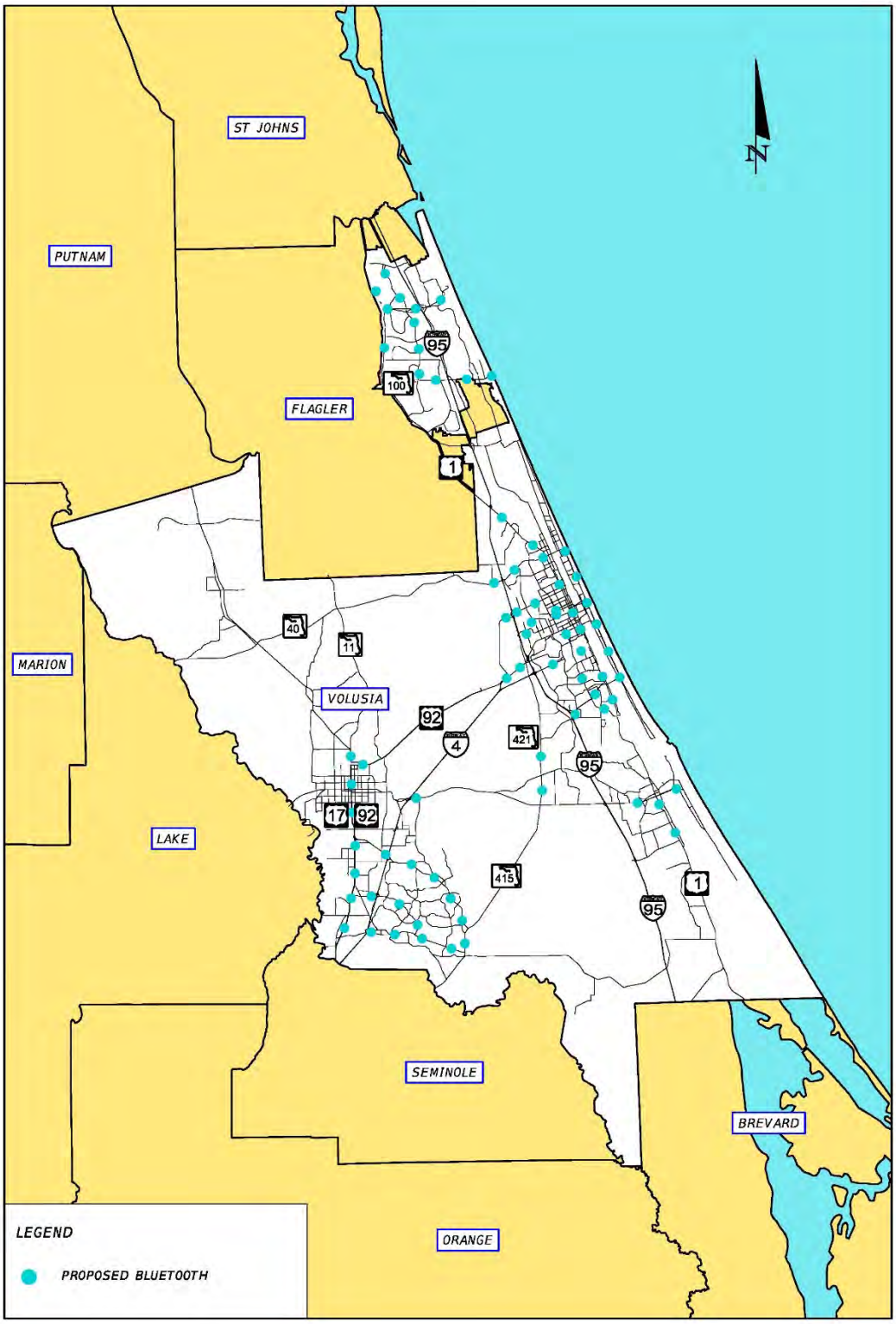


Figure 17 – Overall Proposed BlueTooth

Traffic Signal Detection

There are two primary forms of traffic detection used at signals: inductive loops and video detection. These technologies allow for minimized traffic signal delay, as they can detect when vehicles arrive at traffic signals. However, when the detectors are not functional, unnecessary delay is caused since the signal then accommodates the maximum amount of green time whether it is required or not; thus, lowering the efficiency of the entire transportation system. Based on this need, the following procedures regarding signal detection are recommended:

- Regular maintenance of detection equipment
- A communication link to the controllers to ensure that the detectors remain functional using constant monitoring of the detection equipment

There are several strengths and weaknesses of both inductive loops and video detection. Inductive loops are installed in the pavement itself meaning that that the loop is vulnerable to sustain damage if roadway conditions are less than ideal. Video detectors, while easier to maintain and easier to install due to minimal Maintenance of Traffic (MOT) requirements, can be rendered ineffective by occlusion of the lens by the rising and setting of the sun. It is recommended that this information be considered when choosing to install any new detection systems.

Based on information gathered from the FDOT Six Month Moving Statewide Average prices, **Table 7** shows a comparison between the initial theoretical costs of loop detection and video detection assuming maintenance costs are minimal. The average lifetime of loop time between failures suggests a 10-year expected life.

	Inductive Loop Detectors	**Video Detection**
Equipment Cost (per unit)	$830 – 1,370	$4,500 – 5,100
User Cost	$1,260 – 3,380	N/A (No lane closures for maintenance)
Total Cost (per unit)	$2,090 – $4,750	$4,500 – 5,100

Table 7 – Traffic Signal Vehicle Detection Installation Cost

Adaptive Traffic Signal (ATS) System

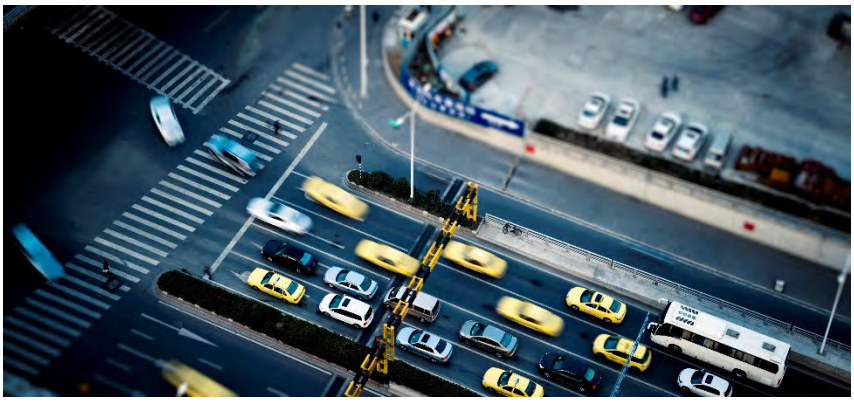
An additional tool for traffic signal detection is the ATS system. ATS systems utilize specialized cameras installed at intersections pointing in all directions that aim to optimize traffic flow by measuring queues at traffic signals and altering signal timings to push as much traffic through the signal as possible. This technology allows corridors that are particularly susceptible to recurring congestion to increase throughput of traffic going in the most heavily used directions. This technology uses software proprietary to the chosen vendor that inputs queue data gathered by the cameras into an algorithm that alters the signal timings as it deems necessary. Like the use of video detection, these cameras are susceptible to occlusion, sometimes creating the need for sunshields that are not always effective.

Pedestrian Detection

When considering the safe and efficient operation of the roadway network, all users must be considered, not simply motorists. Technologies such as High Intensity Activated Crosswalks (HAWK) and Rapid Rectangular Flashing Beacons (RRFB) alert motorists in advance of pedestrians in the roadway. These technologies can either be triggered manually (pushbuttons) or automatically (microwave, infrared, or pressure sensors).

Signal Retiming

Objective 4.1 of the TSM&O Master Plan Phase 1 is to, "Reduce delays caused by predictable non-recurring congestion." A powerful tool for reducing known corridor delay is signal retiming. Periodic signal retiming has proven to be a basic and cost-effective method of optimizing the entirety of a signal system. Any new construction, major or minor (i.e. new developments, shopping developments, schools, etc.), along a roadway can contribute to traffic volume increases. Retiming proactively mitigates the long-term effects of these additions by updating signal timings as appropriate. Prepared by a Professional Engineer (PE), signal retiming optimizes signalized intersections by studying current patterns, finding weaknesses, and adjusting phases as necessary.



According to the Institute of Transportation Engineers (ITE), signal retiming can create a 7-13% reduction of overall travel times, and 15-37% reduction in delay, resulting in 6-9% fuel savings. Performance measurement for the signals is essential as well. It is recommended that

signal retiming be performed every 3 years. This retiming is reflected in the recommended O&M funding later within this document.

Event Management

The Daytona Area Event Management project recently completed design and is currently under construction. It aims to improve the capabilities of the roadway system during major events such as races at the Daytona International Speedway. It includes the introduction of major TSM&O infrastructure that will allow roadway operators to direct traffic in real time. The system includes Blank Out Signs (BOS) that will be able to rotate between fixed diagrammatic signs that direct traffic to proper areas, including parking lots, handicap accessible areas, and proper egress routes; as well as detours for incidents during normal operations. To further the capabilities of this system, this Master Plan recommends the expansion of this Event Management system with a second phase that will include expanding to areas east of US 1 that could not be included in Phase 1 for budgetary reasons. This system is integral to the region as it can also be utilized during evacuation times as well, such as during major hurricanes/flooding events. Any improvements discussed later in this section should be considered as part of any plans to expand the Event Management system.

Planned Advanced Traffic Management System (ATMS) (Signal Equipment and Communication Infrastructure)

During stakeholder coordination, the three primary operating agencies in the R2CTPO region, Volusia County Traffic Engineering, the City of Daytona Beach Traffic Engineering, and the City of Palm Coast Traffic Engineering, detailed how they control and actively manage the signals within their regions. Both the City of Daytona Beach and the City of Palm Coast utilize the ATMS.now software to monitor their ATMS (see **Appendix C** for ATMS.now capabilities), and Volusia County utilizes the Centracs software to monitor their ATMS (see **Appendix D** for Centracs capabilities). The following information regarding expansion of their respective ATMSs was gathered from the three agencies:

<u>Volusia County Traffic Engineering</u>

- Creation of new redundant fiber route on Tomoka Farms Road
- Expansion of Adaptive Signal technology on LPGA Boulevard and Saxon Boulevard
- New signals on LPGA Boulevard

The City of Daytona Beach Traffic Engineering

- Improvements to the Adaptive System with an emphasis on improved detection
- Connection to FDOT District 5
    - The City of Daytona Beach is currently undergoing an upgrade to their network that involves re-IP'ing the TSM&O devices currently on their network to match the scheme set up by FDOT District 5. This is an important step toward connecting the City more fully to FDOT District 5.

The City of Palm Coast Traffic Engineering

- Expansion of the fiber network to connect all signals within their jurisdiction
- Improved utilization of ATMS.now software

Several of these planned expansions are reflected in the deployments later in this document (see **Section 4.1**). During said stakeholder coordination, several other opportunities for TSM&O improvements were discussed and the following additional improvements were agreed upon:

- Upgrade of the Daytona Beach TMC
- Upgrade of the Palm Coast TMC
- Relocation (see **Section 2.5**) and upgrade of the Volusia County TMC
- A connection between all three TMCs for resource sharing purposes. A lack of funding for dedicated staffing for operations and data resource managing purposes was a common concern among the three stakeholders. To address this need, an interim solution is to connect the TMCs and allow a representative from one of the TMCs to monitor the network of all three agencies. It is recommended that an MOU or JPA be agreed to that outlines the responsibilities of each agency and the desired reporting process
- Installation of temporary workstations at their presiding Emergency Operations Centers (EOC) to monitor traffic during large scale evacuation events.

Further, a concern brought up during stakeholder meetings was the rapid amount of development occurring on LPGA Boulevard. This is a primary East/West travel route in Volusia County that intersects with several large arterials that service Daytona Beach. Stakeholders are concerned that the amount of traffic generated by development could have a negative effect on the transportation network. An Interchange Modification Report (IMR) is currently being created by Kittelson and Associates that will examine the long-term effects of development in the area on the I-95/LPGA Blvd. Interchange. A potential solution that is currently being reviewed by FDOT is Ramp Metering for all of the I-95 interchanges.

3.2.2 System Communications and Interactivity

The concept of Active Arterial Management (AAM) is very wide reaching, but essentially boils down to using TSM&O tools detailed in Section 2 to make real time decisions about how to optimize the transportation system as it currently is, and evaluating any changes after the fact to determine their success. This is not possible without connected signals and TSM&O devices. Operators in the region's TMCs have the ability to detect both major and minor traffic incidents, make remote timing adjustments, and dispatch any required first responders in a timely fashion. Deployments identified in this Master Plan will identify the recommended future infrastructure.

Proposed Fiber and Wireless Systems

The region under the R2CTPO's jurisdiction currently has a mature TSM&O system. FDOT is well built out on the Interstates and some arterials; Volusia County has Fiber Optic Cable (FOC) and wireless systems throughout the County, and both the City of Daytona Beach and the City of Palm Coast have FOC connecting a majority of signals within their jurisdiction.

Therefore, it is recommended to install/upgrade to a 96-single mode fiber optic cable throughout strategic parts of the region, filling in connectivity gaps on crucial corridors such as US 92, US 1, SR A1A, SR 40, SR 44, SR 100, SR 400, SR 42.1, SR 442, Nova Road, Clyde Morris Boulevard, and LPGA Boulevard. It is recommended that any other fiber deployments separate from those mentioned within this Master Plan be 96 single mode fiber as well in order to maintain continuity throughout the region. It is also recommended that, when deemed appropriate by overseeing agencies, this FOC network be used to connect the three major TMCs in operation in the region to allow more efficient resource usage, and connect the TMCs to the District 5 Regional Traffic Management Center (RTMC). **Figure 18** shows all fiber optic cable that is recommended to be installed as a part of future deployments identified in this Master Plan.

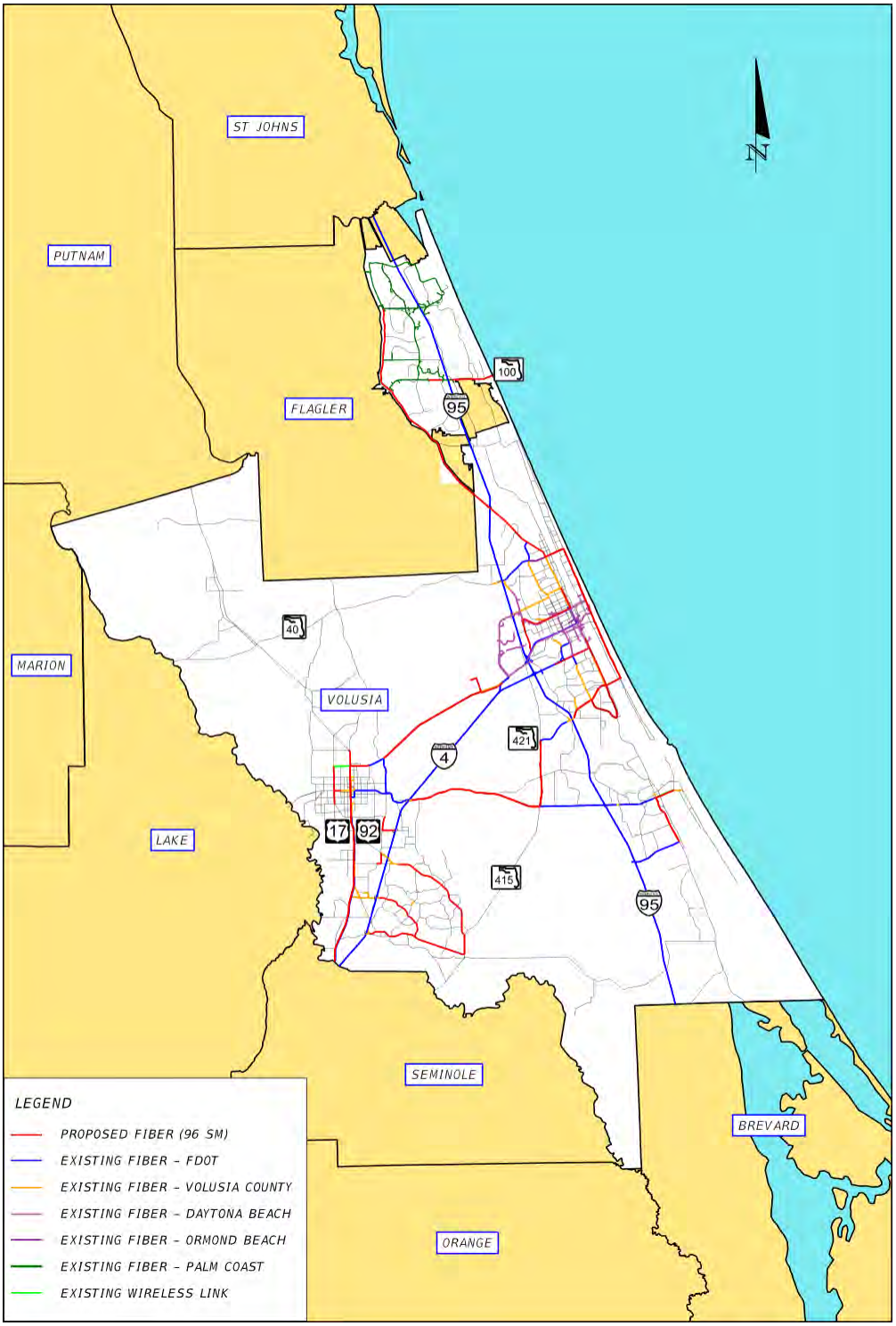


Figure 18 – Proposed Overall Communications

ITS Standards

As part of the District 5 ITS Master Plan, mandatory ITS standards were agreed upon during stakeholder coordination. These standards were deemed necessary to ensure property network security and scalability. The security of the network is crucial as any attack on the system could not only bring down the efficiency of the system, but also endanger other users of the system. The following ITS standards are from the D5 ITS Master Plan and should be adhered to when implementing new TSM&O infrastructure:

- Communications
  - Adopt the hub and spoke topology with FDOT (see **Figure 19**)
    - Firewall or a Service Level Agreement (SLA) that gives FDOT the right to manage
    - Firewall at the D5 Carrier Ethernet Switch
  - Static routing for now; gradually migrate to Border Gateway Protocols (BGP) with unique Autonomous System Numbers (ASN)
  - Fiber connection between agency router and D5 Carrier ethernet switch (Master Hubs)
  - Use of Multiprotocol Label Switching (MPLS)
  - Unique assigned Internet Protocol (IP) address ranges
  - Use of Multicast Service Discovery Protocol (MSDP)

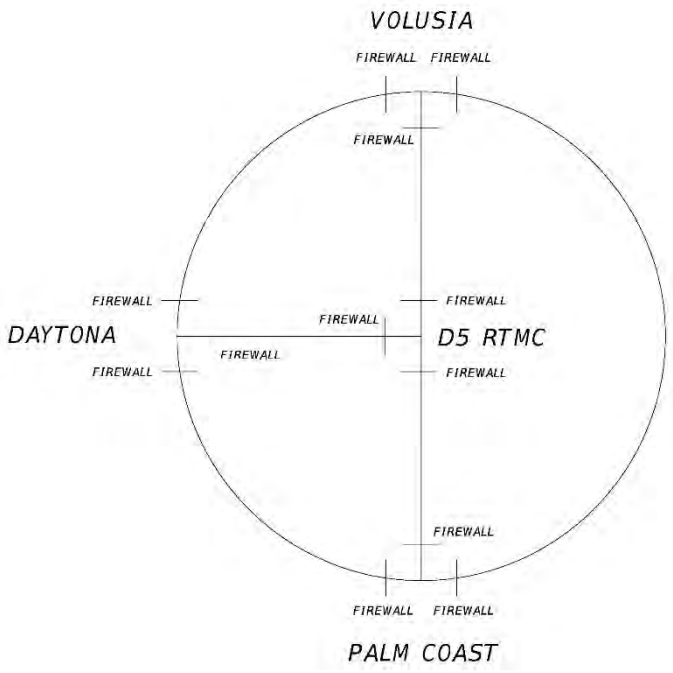


Figure 19 – Hub and Spoke Topology

- Security
  - Firewall at the D5 Carrier Ethernet Switch or a Service Level Agreement (SLA) that gives FDOT the right to manage
  - Each stakeholder to centrally manage user account database (i.e. Microsoft Active Directory)
  - Authentication, Authorization, and Accounting (AAA)
    - Remote Authentication Dial-in User Service (RADIUS) or Terminal Access Controller Access-Control System Plus (TACACS+)
- Data
  - Format - JSON or XML
  - District 5 will be the sole source of regional data
  - Access to a partner's data to be read only
  - For 3rd party - Data would be published through the Department
- Common clock
  - Allows for ease of signalization coordination across jurisdictional boundaries
  - Ensures that all systems can be tied to a common sync point
- Discontinued use of #2 keys on cabinets with network communications
  - #2 keys can be easily obtained by other parties
  - Should be replaced with Cyberlocks or padlocks

3.2.3 Maintenance and Construction

As has already been emphasized, having proper O&M procedures and resources will be imperative to the success of TSM&O strategies already in place, as well as any proposed improvements. **Dedicated funding** should be secured so that consistent and repeatable protocols can be supplemented (or put in place if a maintaining agency is currently only fixing infrastructure as it breaks). A common occurrence statewide, a lack of dedicated funding has prevented the region from utilizing the investments already in place to their fullest potential.

Preventative maintenance, whether performed by dedicated agency maintain staff or by a maintenance contract, should continue be the standard practice for all agencies in the region. This practice can be made difficult if minimal resources for preventative maintenance are available. As one of the main focuses of this Master Plan is the effective management of all TSM&O infrastructure, existing and proposed alike, it is recommended that adequate funding for preventative maintenance for both the existing infrastructure and the proposed infrastructure be made a priority. Special attention should be paid to all detection systems (i.e. loop detectors, ATS, CCTVs, BlueTooth detectors, etc.), as they are the tools that specifically alert traffic signal operators of changing traffic conditions in real time, which is a critical piece of AAM. If failures can be detected as they occur, they can be repaired faster and improve the efficiency of the

traffic signal system. This will contribute to the realization of Objective 3.2, which is to improve multimodal travel time reliability and predictability.

To promote the well-being of all parts of the roadway system, not necessarily only TSM&O elements, it also recommended that all maintaining agencies perform periodic reviews on non-TSM&O roadway characteristics, such as signage, striping, and markings. As the goal of the Master Plan is to improve the overall efficiency of the transportation network, any maintenance funds gathered can be contributed to these types of basic roadway needs if they will contribute to better service for motorists.

Work Zone Management

Work zone management is the practice of utilizing effective Standard Operating Procedures (SOP) already in place as maintenance is required. These SOPs can utilize existing TSM&O equipment or temporary equipment for the purpose of managing traffic during times when construction/maintenance is occurring. This can be accomplished by actively monitoring travel times in work zones and altering timings as needed. Additional work zone management equipment can be procured in one of the following ways: either rented as needed and included by contractors in construction costs, or purchased by the maintaining agency and stored so it is available at any time. It is recommended that each individual maintaining agency evaluate their maintenance of traffic needs and determine if the investment of purchasing their own equipment would be reasonable. **Figure 20** shows an example of a temporary Dynamic Message Sign (DMS) with a CCTV attachment. However, construction Variable Message Signs, temporary CCTVs mounted on existing structures, and/or temporary vehicle detection can also be used.

Figure 20 – Temporary DMS with CCTV Attachment

3.2.4 Incident Management

Traffic Incident Management (TIM)

The Federal Highway Administration (FHWA) has defined TIM as a "planned and coordinated process to detect, respond to and remove traffic incidents and restore traffic capacity as safely and quickly as possible." The goal of this program is to promote increased communication, coordination, and cooperation between agencies that respond to traffic incidents. Improved communications between these agencies has been proven to reduce congestion due to quick clearances of accident scenes, leading to reduced secondary crashes and first responder injuries. All FDOT districts currently have TIM programs in operation, with one for Volusia and Flagler Counties (the two Counties under the jurisdiction of the R2CTPO) meeting quarterly. While all Traffic Operations agencies are currently involved in the program to some degree, with the increased emphasis of management of the arterials, it is recommended that additional stakeholders (including Sheriffs' Departments and Fire Rescue agencies) take a more active role if they are not already involved. In addition, after discussing with operational stakeholders, it is recommended that FDOT TIM messaging be sorted and only information pertinent to each agency be delivered, meaning that each agency will only see information relevant to the areas under their jurisdiction. This will allow the agencies to more efficiently manage this information and enact any necessary changes decisively.

According to FDOT, participants in the TIM program "strive to make incident management safer for the responders and motorists, and work to reduce the time needed to reopen travel lanes and get traffic moving again." Stakeholders actively working together toward these goals is integral to the success of the program. In addition to lowering the efficiency of the roadway network, traffic incidents can lead to injuries, deaths, and destruction of personal property or commercial goods. Loss of property or commercial goods can lead to delays, lost productivity, and wasted fuel. All of these effects will actively detract from the realization of several goals of the Master Plan.

Bicycle/Pedestrian Safety

There are numerous bicycle and pedestrian trails located throughout the Region that come into close proximity with vehicles. This has the potential to create unsafe situations for bicyclists and pedestrians which could lead to accidents or fatalities. To mitigate this possibility, it is recommended that safety agencies identify potential problem spots throughout the Region (beach traffic, remote trails, etc.) and monitor any changes in the number of incidents that occur. Should a high number of incidents be identified in remote areas of the region, it is recommended that the viability of additional surveillance and/or "help" call boxes be explored.

Rapid Incident Scene Clearance (RISC)

RISC is defined by FDOT as a program that "supports Florida's Open Roads policy goal of safely clearing major highway incidents and commercial vehicle crashes in 90 minutes or less." The program was started in 2008, and provides incentives for clearance of accident scenes of a more serious nature within 90 minutes of a Notice to Proceed (NTP), including removal of all damaged vehicles, debris, and non-hazardous vehicle fluids from all travel lanes, and having full roadway capacity restored. FDOT pays a flat rate Emergency Response and Mobilization Payment of $2,500 to qualified vendors. Additional incentives or penalties can be applied depending on time of clearance and type of incident. Currently, RISC is not used on the arterial system, but could be used in the future, with properly modified requirements and expectations due to the nature of clearing arterial incidents versus highway incidents, if deemed appropriate. **Figure 21** shows the approved RISC timeline approved by FDOT.

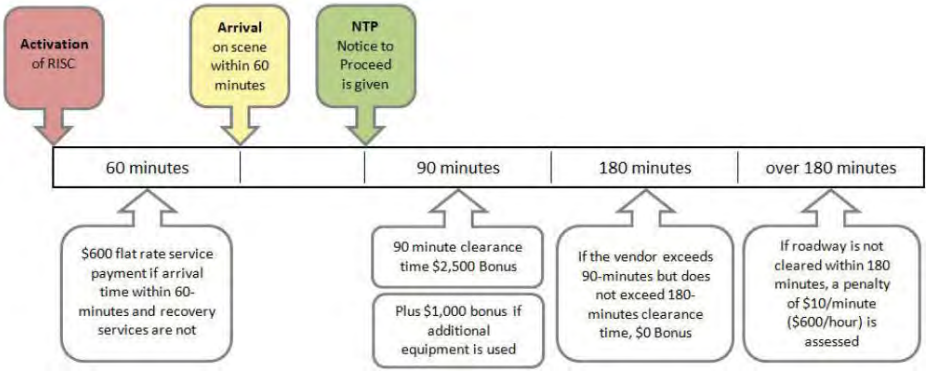


Figure 21 – RISC Timeline

3.2.5 Emergency Management

Road Rangers (Service Patrols)

The Road Rangers program is a free service provided by the Florida Department of Transportation (FDOT) to motorists in need. They provide basic roadside assistance such as tire replacement, incident clearance, and roadway debris clearance. Currently, the Road Rangers are deployed on Interstate 4, but are not deployed on all of I-95. While Road Ranger services currently are only available on limited access facilities, their services could prove beneficial to motorists using the arterials. In addition, the common issue of it being difficult for Road Rangers to reverse travel directions would not be an issue on the arterials. Stranded motorists could potentially block much needed lanes, lowering the efficiency of the system. The Road Rangers could aid in getting the stranded motorists out of the travel lanes, preserving the flow of traffic. In the future, I-95, as well as higher capacity arterial roads such as US 17/92, US 92, US 1, SR A1A, SR 100, SR 40 and LPGA Boulevard could be considered as potential Road Ranger patrol routes. The following

operational parameters should be considered (see **Appendix E** for an example Road Ranger Scope of Services):

- Active time – Road Rangers currently deployed on 73 Centerline Miles in FDOT District 5, with 27 Centerline Miles within Volusia County. They are currently active 6:00 AM to 12:00 AM Monday through Thursday, and 6:00 AM to 3:30 AM Friday through Sunday. It is recommended that Road Rangers be deployed on I-95 with the same operating schedule, and on the arterials in Volusia and Flagler Counties operating from 6:00AM to 10:00 PM, 7 days a week, 365 days a year.
- Services – It is recommended that basic vehicle assistance should be provided (i.e. tire replacement, low fluids, out of gas, etc.).
- Patrol area – It is recommended that this service be expanded to include services on I-95 in both Volusia and Flagler Counties
- Patrol area – It is recommended that, if deemed appropriate, areas of most need on major facilities such as US 17/92, US 92, US 1, SR A1A, SR 100, SR 40 and LPGA Boulevard are identified and appropriate patrol limits are put in place.

Emergency Vehicle Signal Preemption

Signal preemption for emergency vehicles allows chosen emergency vehicles (police vehicles, fire trucks, ambulances, HAZMAT vehicles, etc.) to override/interrupt signal timings as they approach traffic signals. Sensors installed at the traffic signals detect approaching equipped vehicles and adjust the signal phasing/timings to extend green times as necessary to allow the approaching emergency vehicle to proceed through the intersection without delay. Use of this technology will aid in accomplishing Objective 1.2 of Phase 1 of the Master Plan, which is to reduce incident clearance times. It is recommended that, should traffic operating agencies decide to install preemption technologies at signals, they should be installed on corridors with higher incident rates only where the agency feels appropriate so as not to affect the normal flow of traffic; as preemption technologies cause traffic signals to fall out of step. It is further recommended that 2 mode emitters that include both optical and GPS emitters be used in case it should be deemed appropriate to include transit signal priority in the future (to be discussed later in this document).

3.2.6 Traveler Information

Florida 511

Florida 511 is traveler information service used primarily to provide motorists with information regarding incidents/congestion on the state highways. The online portal shows incident locations and congestion information in real-time, and allows site visitors to view screenshots of CCTVs currently on the system. While the 511-traveler information service is mostly known for its use on freeways, it is not currently in use on many arterials in the region. As a primary goal of this

Master Plan is to empower motorists with more on-demand traffic information data, it is recommended that all operating agencies in the region incorporate the use of 511 in its information dissemination strategies, including making their CCTVs viewable in the 511 portal. To accomplish this, operators should have the ability to both report incident information gathered by their respective TMCs and send out push notifications to the 511 app. In addition, the 511 app disseminates information to a Center to Center (C2C) publisher to post event details to the Florida Advanced Traffic Information System (FL-ATIS), where information can also be displayed. The recommended information to be sent out to motorists includes location, incident type, time and date, lane blockage, severity, weather, and notifying agency. The data collected by the TMC will need to be compatible with the existing 511 system (roadways, counties, direction, cross streets, etc.). This will allow all gathered information to be compatible with the data exchange schemas of FDOT's SunGuide C2C infrastructure. A plug-in for each agency can be developed to accomplish this. SunGuide, among other FDOT software, should be available to the operating agencies should they decide to connect directly with the FDOT RTMC. See **Appendix F** for example screenshots of the 511 interface.

The 511 system can also provide useful data for TMC operators. The following types of reports can be provided:

- Weekly/monthly performance measure reports
- Chronology report
  Performance measure report for any time span

Arterial Dynamic Message Signs (ADMS)

An additional way to provide travel time information and incident information directly to motorists traveling on the region's arterials is through the use of ADMS. Please note that ADMS and DMS provide information that, more and more, will be sent to phones and the car in the future. Therefore, given the costs involved, the applicability should be considered on a case-by-case basis.

ADMS are generally smaller than highway DMS, and are typically installed on major arterials approaching highways. These DMS provide motorists with travel time/incident information collected in real time by the agency that operates the ADMS. Motorists can use this information to decide whether or not the use of the highways is the best choice for them. ADMS can also be used during special events (races, concerts, etc.) and evacuations to direct travelers to the nearest route of egress. ADMS (as well as blank-out signs) are currently being installed on US 92 in Daytona Beach as part of the previously described Event Management project. The installation of additional ADMS has not been considered as a part of this Master Plan, but should be considered as a part of the Phase 2 for Event Management if a Phase 2 has been deemed appropriate. **Figure 22** shows an example of an ADMS.

Figure 22 – Arterial Dynamic Message Sign

Parking Information Services

TSM&O technologies can greatly reduce congestion by providing parking availability information in advance of parking structures such determining if a level is full, the number of open spots on a level, and indicators above parking spots that show if they are vacant or occupied, thereby reducing the number of vehicles looking for spots. This technology could be beneficial in highly trafficked garages such as the Ocean Center Garage, which services several attractions along SR A1A. Recent successful examples of this technology include the Geico Garage in downtown Orlando, and the two new parking garages recently opened in Disney Springs. **Figure 23** shows examples of how parking information is disseminated to motorists. This technology could also be applied in a limited capacity for beach parking. If it is deemed in appropriate to install this infrastructure on the beach directly, it is recommended that ADMS be installed in advance of beach parking lots. This will give motorists the information in advance if a beach is full and alternate beaches should be sought out, including recommendations for which beach should be used.

Figure 23 – Parking Information Examples

3.2.7 Public Transportation Management

TSM&O improvements should not be limited to only aid in the movement of single motorists. Transit efficiency can be noticeably increased using technologies such as automatic fare payment, route information dissemination, Automatic Vehicle Location (AVL), Automatic Passenger Counting (APC), Transit Signal Priority (TSP) and bus collision avoidance technology. This increased efficiency can lead to an increase in ridership and customer satisfaction. Currently, Votran, Volusia County's primary transit service (fixed route and para-transit), already utilizes APC, AVL, and Vehicle Logistical Units (VLU) that provide GPS locations of several buses. This information is displayed in real time on the Votran website and on the My Stop mobile app.

Votran currently offers 42 fixed bus routes in more populated regions of Volusia County, including Daytona Beach, Deland, Ormond Beach, Holly Hill, Port Orange, New Smyrna Beach, Edgewater, Deltona, and Orange City (see **Figures 24-26**). The service currently utilizes 76 fixed route vehicles (19 hybrid electric) and 67 para-transit vehicles (7 hybrid electric). These services operate 5 days a week, from approximately 5:30 AM to 8:00 PM, with limited additional routes later in the night and on weekends, excluding certain federal holidays. According to the October 2016 Transit Development Plan (TDP) Annual Update, ridership was at 3,586,556 for Fiscal Year (FY) 2015.

TSP is a potential applicable TSM&O Strategy that would allow equipped buses to communicate with traffic signals that have also been equipped with TSP technology. Sensors (preferably optical and GPS sensors to accommodate for both TSP and emergency preemption) installed at the traffic signal sense when a bus that is behind schedule (a function called conditional TSP) is

approaching and alter the signal timings as necessary to allow the approaching bus enough green time to make it through the intersection. This contributes to the overall efficiency of the transportation system, as it will determine if a bus is on schedule, and if it isn't, it will aid in getting the bus back on schedule. TSP has been identified as a part of FDOT District 5's regional TSP study for Volusia County. However, funding for operations and maintenance of the equipment must be identified before any deployment can be considered.

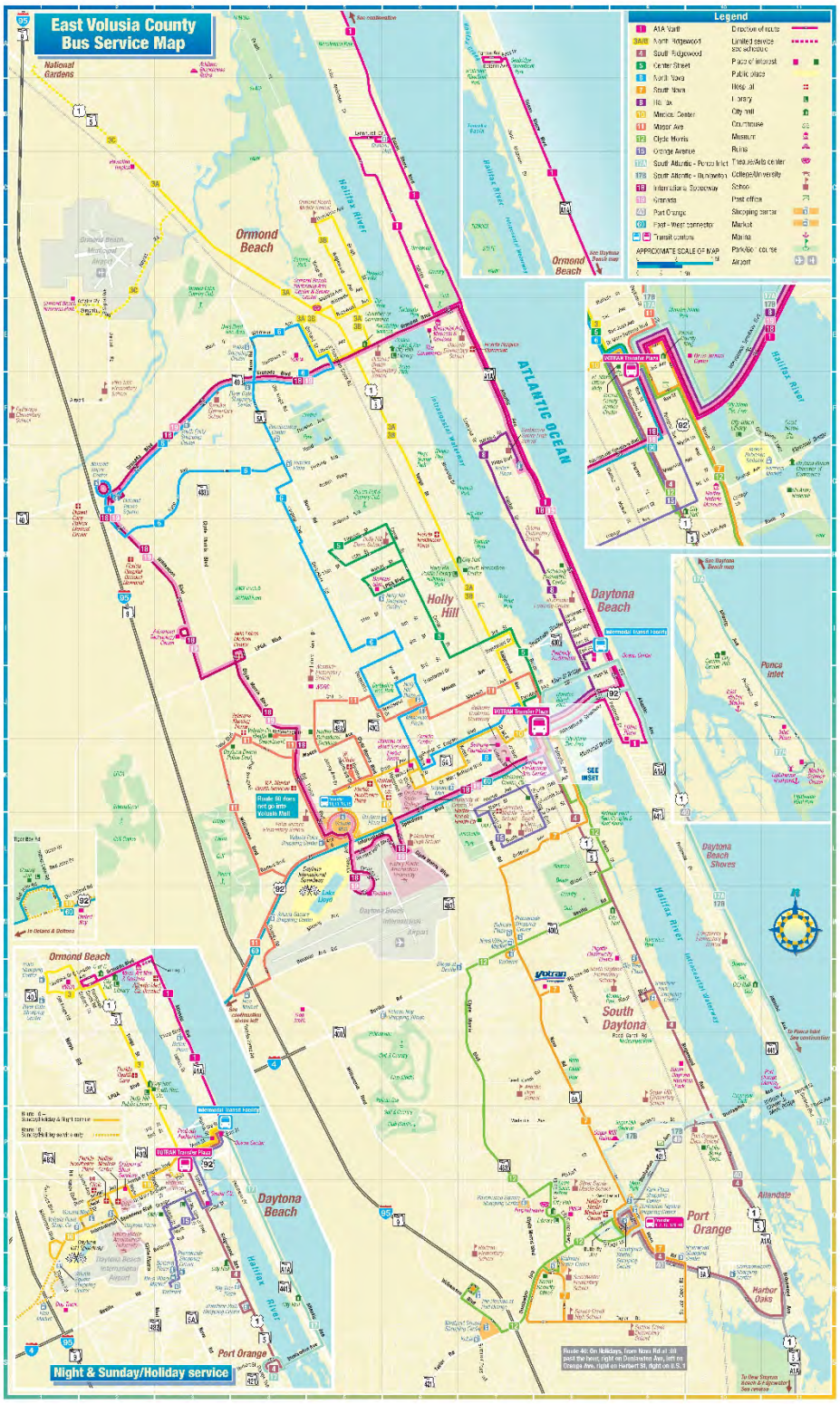


Figure 24 – Votran East Volusia Service Map

Figure 25 – Votran Southeast Volusia Service Map

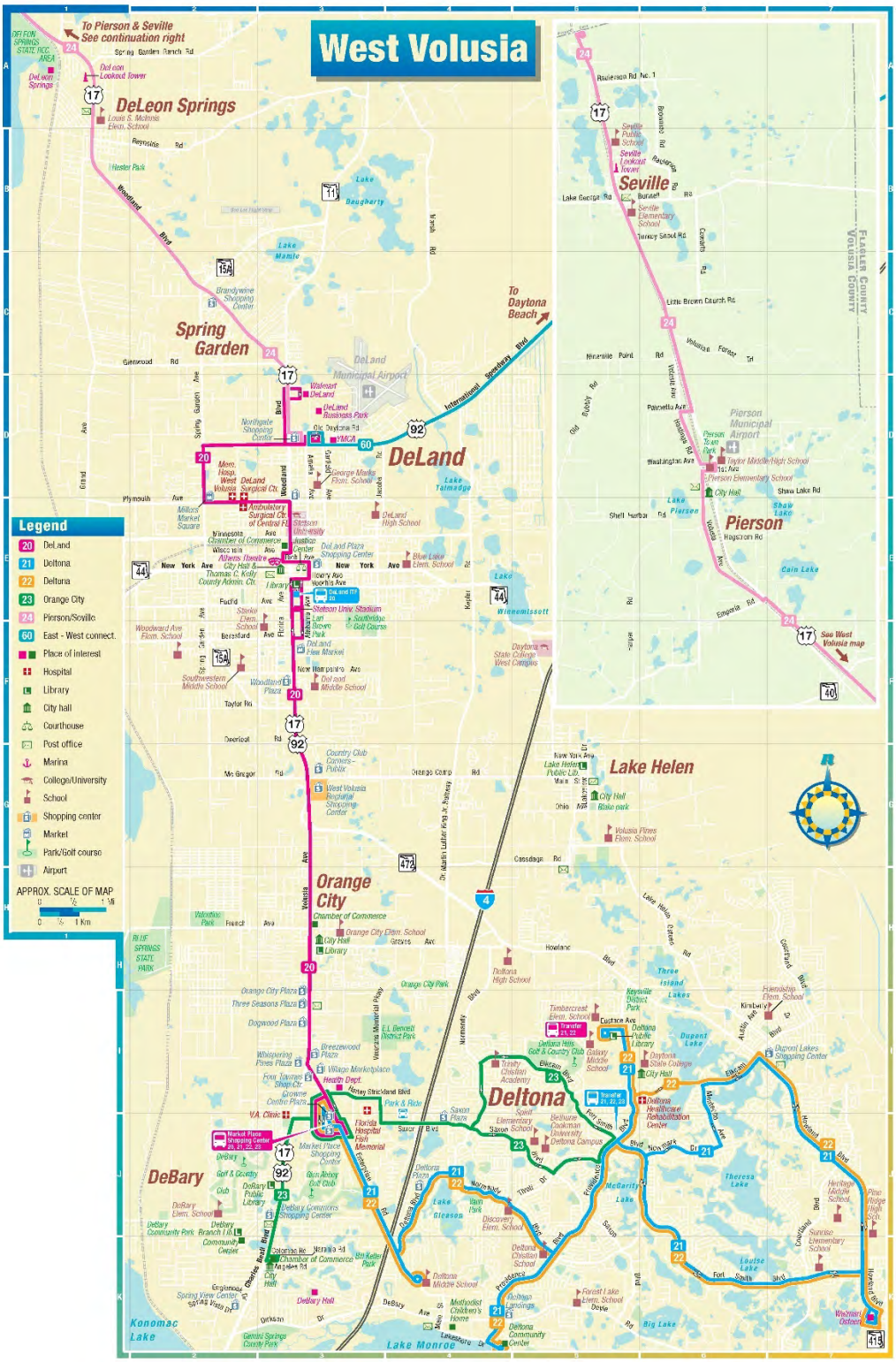


Figure 26 – Votran West Volusia Service Map

3.2.8 Information Management

Data sharing amongst traffic operations agencies and other transportation stakeholders will prove to be essential to the overall success of the Master Plan. If costs can be shared among all stakeholders, data sharing will prove to be low maintenance and will benefit all users due to the ability to access crucial information. It is recommended that, at minimum, primary transportation stakeholders (TMCs) meet to coordinate the possibility of sharing data storage information and the creation of database(s) of all pertinent transportation information. All stakeholders should have access to this database so it can be updated as new deployments occur. The following are some database software that is currently available to the region for use at their discretion.

One database software made available by FDOT District 5 is the FDOT ITS Facility Management (ITSFM) software. This software shows the latitude and longitude of deployed TSM&O/ITS equipment (i.e. pull boxes, traffic controller cabinets, structures, etc.) using GIS information. This software can also store information for all existing communications and power infrastructure. The software can give all pertinent details regarding stored infrastructure data such as manufacturer, installation date, model number, and warranty information. All ITS groups in each FDOT district currently use the software, and local agencies can use the software for an initial cost of $4,000 with estimated O&M costs of $5,000 per year.

An additional potential software for data sharing is the Interagency Video and Event Data Distribution Software (iVEDDS). iVEDDS is a software created with capabilities that allow it to provide access to video streams of multiple CCTV cameras on a roadway network, while also providing a list of all active and recently active network events and all pertinent details. This product is recommended as it presents this information on an easily accessible webpage. The program can be accessed, monitored, configured, and back ended using Coder-Decoder (CODEC) data compression software. The following are the main capabilities of iVEDDS:

- Provides real-time video stream of individual or multiple CCTVs
- Allows administrators to customize if and how each stream is accessed
- Supports maximum viewing periods
    - Configurable at user group level
- Displays CCTV information in map form
- Activity reports describing system usage in a chosen timeframe

The typical development, installation, configuration, integration, and testing cost including video transcoding is approximately $120,000. O&M costs are approximately $2,000 a month. It should be noted the District 5 is currently using this technology.

3.2.9 Emerging Technologies

The field of automotive technologies is complex and wide reaching. There are three primary types of innovative automotive technologies that will prove to be the focus for the foreseeable future: connected vehicles, automated vehicles, and autonomous vehicles. It is recommended that the R2CTPO embrace this concept as it an integral point of focus of the recently completed District 5 ITS Master Plan, and it will contribute to the increased safety and reliability of the transportation system, two major goals of this Master Plan. Below is a brief description of each technology (refer to Section 2 for a more complete explanation).

- Connected vehicles – vehicles that communicate directly with other vehicles, roadside infrastructure, or a cloud. The purpose of this technology is to allow motorists to make more informed decisions with roadway condition information provided in real time.
- Automated vehicles – vehicles that operate in some capacity without driver input, but still require a driver to oversee.
    - Adaptive Cruise Control (ACC)
    - Lane Keeping Assistance (LKA)
- Autonomous Vehicles – Effectively, “driverless” vehicles. Vehicles that can operate without any human interaction other than starting the vehicle and setting the destination

In accordance with the recommendations made by FHWA, it is recommended that the R2CTPO take the following steps to prepare for the application of these technologies:

- Begin to incorporate the concept of Connected Vehicles in the planning process.
- Upgrade Regional ITS Architecture (RITSA).
- Upgrade existing systems (such as communication systems), and consider making them connected vehicle ready (i.e. higher fiber accounts to support CV infrastructure). Buy USDOT connected vehicle certified equipment.
- Consider how automated vehicles may enter your system: platoons, low speed urban, etc.

4. TSM&O Strategies Cost Requirements

High-level cost analyses have been performed to determine approximate funding requirements for all deployments detailed in this Master Plan. Included in these analyses were capital costs, O&M costs, and lifecycle replacement costs. It is recommended that the R2CTPO implement a policy requiring developers to contribute (either monetarily or by installing equipment themselves) to TSM&O infrastructure improvements, thereby reducing the monetary burden of individual operating agencies.

4.1 Capital Improvements

TSM&O Infrastructure and Equipment

Due to the breadth of the recommended TSM&O improvements throughout the areas under the jurisdiction of the R2CTPO, the Master Plan has recommended four deployments of varying sizes and costs. There are a number of items included regarding capital improvements to make sure all deployments function as efficiently as possible. The capital cost unit prices used for these calculations were obtained using the FDOT Six Month Moving Statewide Average prices (06/01/2017 – 11/30/2017). In addition, as a part of the capital cost, a 5% cost of mobilization for the early deployment, 10% for all subsequent deployments, a 5% cost for MOT for the early deployment, 10% for all subsequent deployments, a 10% cost of design, and a 10% contingency for the early deployment was included, with a 20% contingency for all subsequent deployments. See **Appendix G** for cost estimates for all deployments. The list below details the primary considerations of each deployment:

- Fiber Equipment Infrastructure (FOC, conduit, pull boxes, etc.)
- Power service system (power service, service wires, grounding, etc.)
- CCTV Cameras (digital)
- Travel Time System (TTS) – BlueTooth system
- Ethernet Switches
- Additional required ITS cabinets

Early Deployment

The Early Deployment includes the following recommended improvements:

- Fill in fiber gaps on US 92 in Deland and on SR 100 in Palm Coast, installation of underground fiber on US 1 in Holly Hill, and replacement of existing fiber on Beville Road and US 1 in Daytona Beach (See **Figure 29**)
- Upgrades to the City of Daytona Beach TMC
- Upgrades to the City of Palm Coast TMC and ATMS.now grooming

- Relocation and upgrades to the Volusia County TMC
- Overall connection between the three TMC's
- Tie-ins to Volusia and Flagler County EOCs
- Connection to Daytona Speedway for video sharing purposes

These improvements will allow Volusia County and Palm Coast to complete fiber rings and replace non-functioning fiber in advance of larger recommended FOC deployments (see Deployments 1, 2, and 3), and allow Volusia County, the City of Daytona Beach, and the City of Palm Coast to more functionally operate their TMCs, as newer equipment will allow the agencies to better manage their systems with newer technological capabilities. **Figure 27** shows the existing City of Daytona Beach TMC.

Figure 27 – City of Daytona Beach TMC Set Up

Recommended Deployments

In addition to the Early Deployment project, three additional large-scale deployments are recommended in strategic parts of the region that, through the scoring results in Section 2, were determined to be good candidates for TSM&O improvements: the Daytona Beach area, the Deland area, and the Palm Coast area. **Figure 28** represents the overall recommended TSM&O infrastructure for the R2CTPO region. See **Appendix B** for a detailed representation of the overall TSM&O network that will be created and all key locations that will be connected Below are descriptions of the limits of each project and what will be deployed in each area:

- **Deployment 1 – East Volusia (Figure 30):**
  - Project limits:
    - US 1 from Washington St. to SR 442
    - SR 44 from US 1 to S Atlantic Ave.
    - SR 421/SR A1A from Taylor Road to SR A1A
    - SR A1A from SR 421/SR A1A to SR 40
    - SR 40 from S Tymber Creek Rd. to SR A1A
    - Clyde Morris Blvd. from Bill France Blvd. to Mason Ave.
    - Williamson Blvd. from Mason Ave. to US 92
    - Mason Ave. from Williamson Blvd. to US 1
    - US 92 from Indian Lake Rd. to SR A1A
    - S Clyde Morris Blvd. from SR 421 to Herbert St.
    - SR 5A from SR 40 to US 1
    - US 1 from SR 40 to SR 5A
  - TSM&O Equipment installed:
    - 96 count FOC
    - 24 count FOC for drop cables
    - CCTVs at most signals
    - BlueTooth detectors (approximately every 2 miles) – midblock

- **Deployment 2 – West Volusia (Figure 31):**
  - Project limits:
    - US 17/92 from the Seminole County Line to US 92
    - US 17 from US 92 to Glenwood Rd.
    - Spring Garden Ave. from US 92 to Beresford Ave.
    - Debary Ave. from the I-4 WB ramps to SR 415
    - Saxon Blvd. from US 17/92 to the Park and Ride
    - Saxon Blvd. from the I-4 EB ramps to Debary Ave.
    - Veterans Memorial Pkwy. From Saxon Blvd. to Harley Strickland Blvd.
    - Harvey Strickland Blvd. from Enterprise Rd. to Veterans Memorial Pkwy.

        - SR 472/Howland Blvd. from Dr. Martin Luther King Beltway to SR 415
        - Graves Ave. from Normandy Blvd. to Howland Blvd.
        - Graves Ave. from Veterans Memorial Pkwy. to Kentucky Ave.
        - Dr. Martin Luther King Jr. Beltway from Graves Ave. to SR 472
        - Dr. Martin Luther King Jr. Beltway from Orange Camp Rd. to Taylor Rd.
        - Orange Camp Rd. from Dr. Martin Luther King Beltway to I-4
        - SR 44 from I-4 to CR 415
        - CR 415 from Debary Ave. to Howland Blvd.
        - CR 415/Tomoka Farms Rd. from SR 44 to SR 421
        - SR 44 from US 17/92 to Amelia Ave.
        - Amelia Ave. from SR 44 to Rich Ave.
        - Plymouth Ave. from US 17/92 to Amelia Ave.
        - US 92 from US 17 to Indian Lake Rd.
    - TSM&O Equipment installed:
        - 96 count FOC
        - 24 count FOC for drop cables
        - CCTVs at most signals
        - BlueTooth detectors (approximately every 2 miles) – midblock

- **Deployment 3 – Flagler (Figure 32)**:
    - Project limits:
        - US 1 from SR 40 to Matanzas Woods Pkwy.
        - SR 100 from Belle Terre Blvd. to SR A1A
        - Belle Terre Blvd. from SR 100 to Matanzas Woods Pkwy
        - Palm Coast Pkwy. from US 1 to Palm Harbor Pkwy.
        - Palm Harbor Pkwy. from Palm Coast Pkwy. to Matanzas Woods Pkwy.
        - Cypress Point Pkwy. From Palm Coast Pkwy. to Cypress Edge Dr.
        - Old Kings Rd. from Palm Coast Pkwy. to Kings Way
    - TSM&O Equipment installed:
        - 96 count FOC
        - 24 count FOC for drop cables
        - CCTVs at most signals
        - BlueTooth detectors (approximately every 2 miles) – midblock

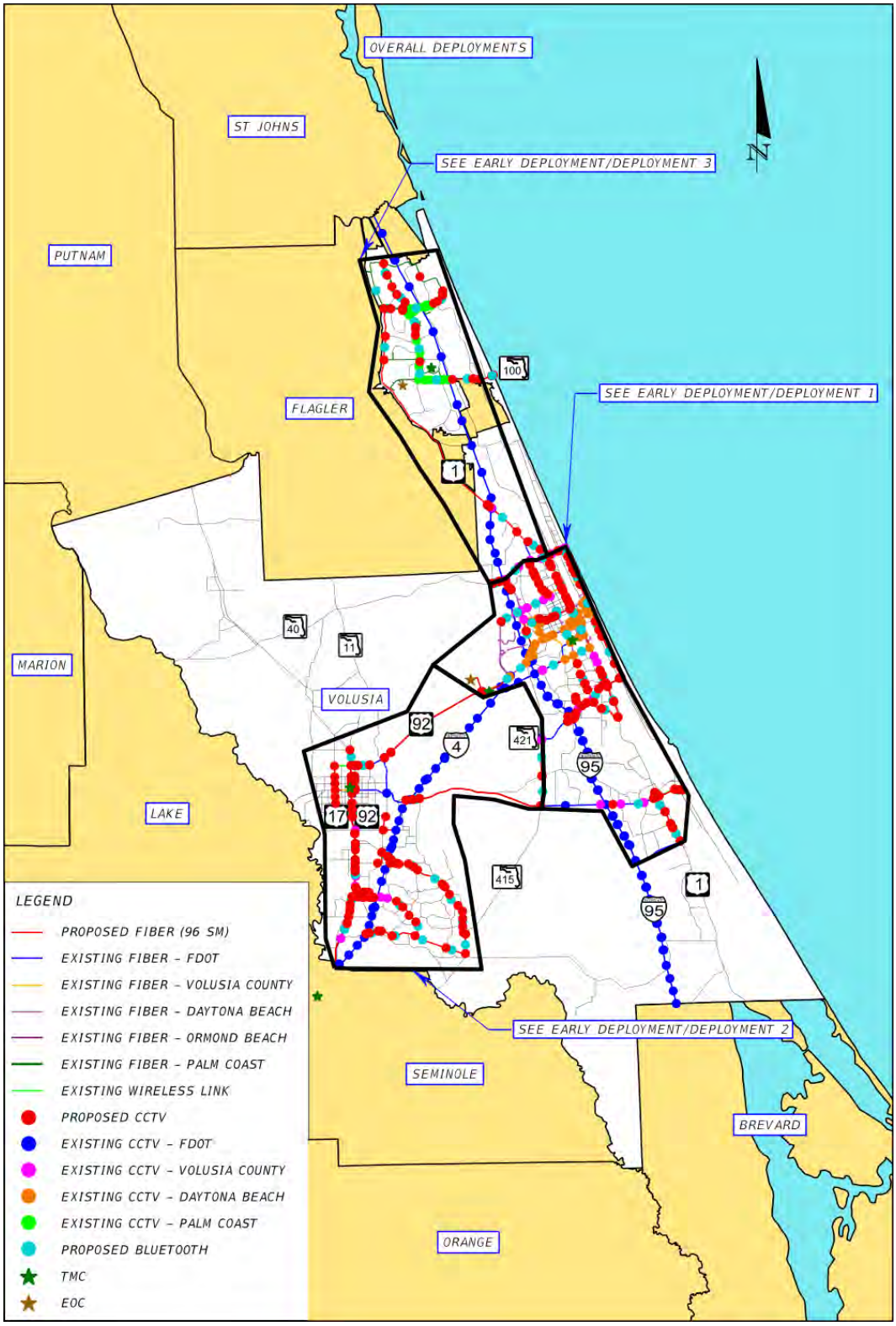


Figure 28 – Overall Deployments

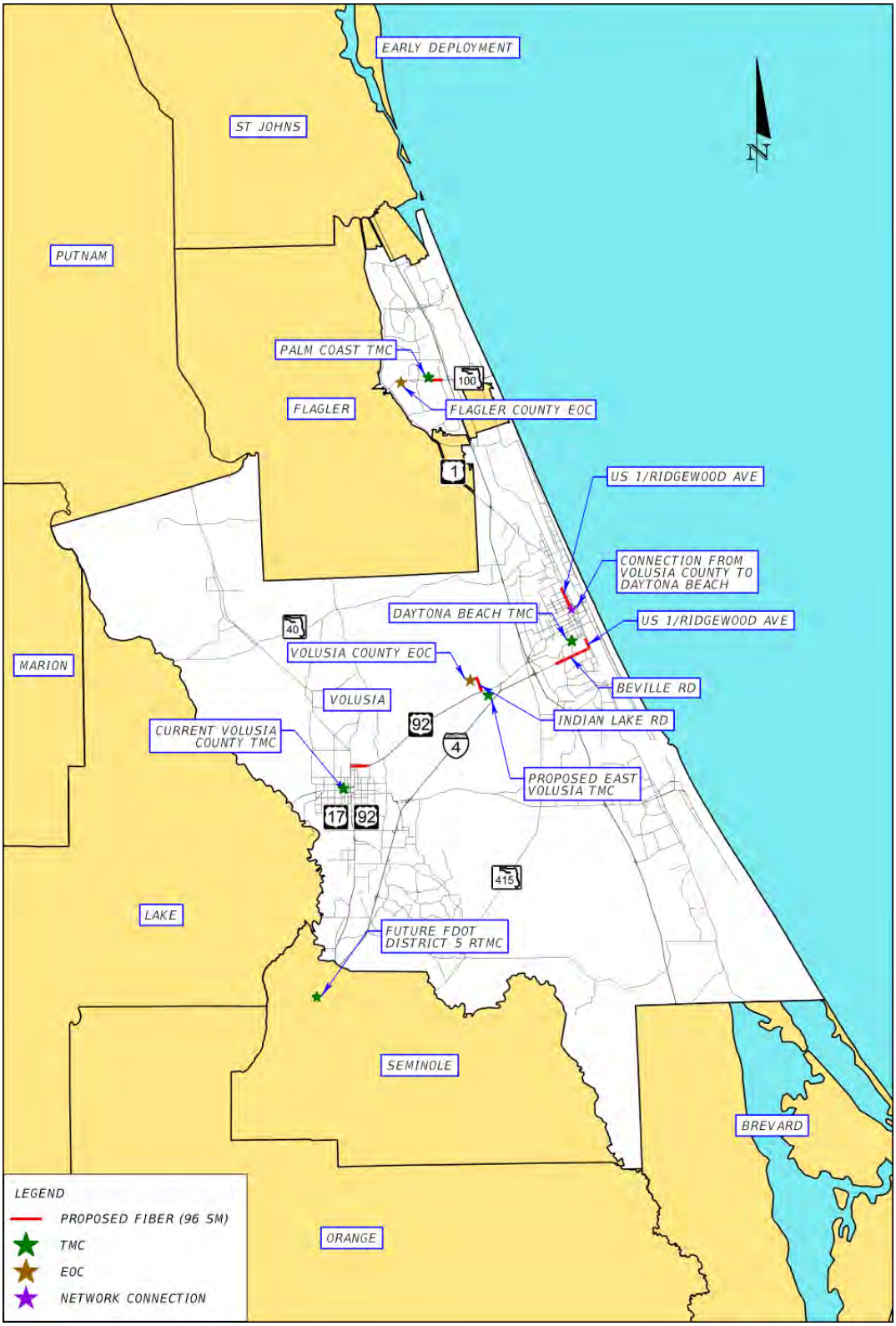


Figure 29 – Early Deployment Fiber

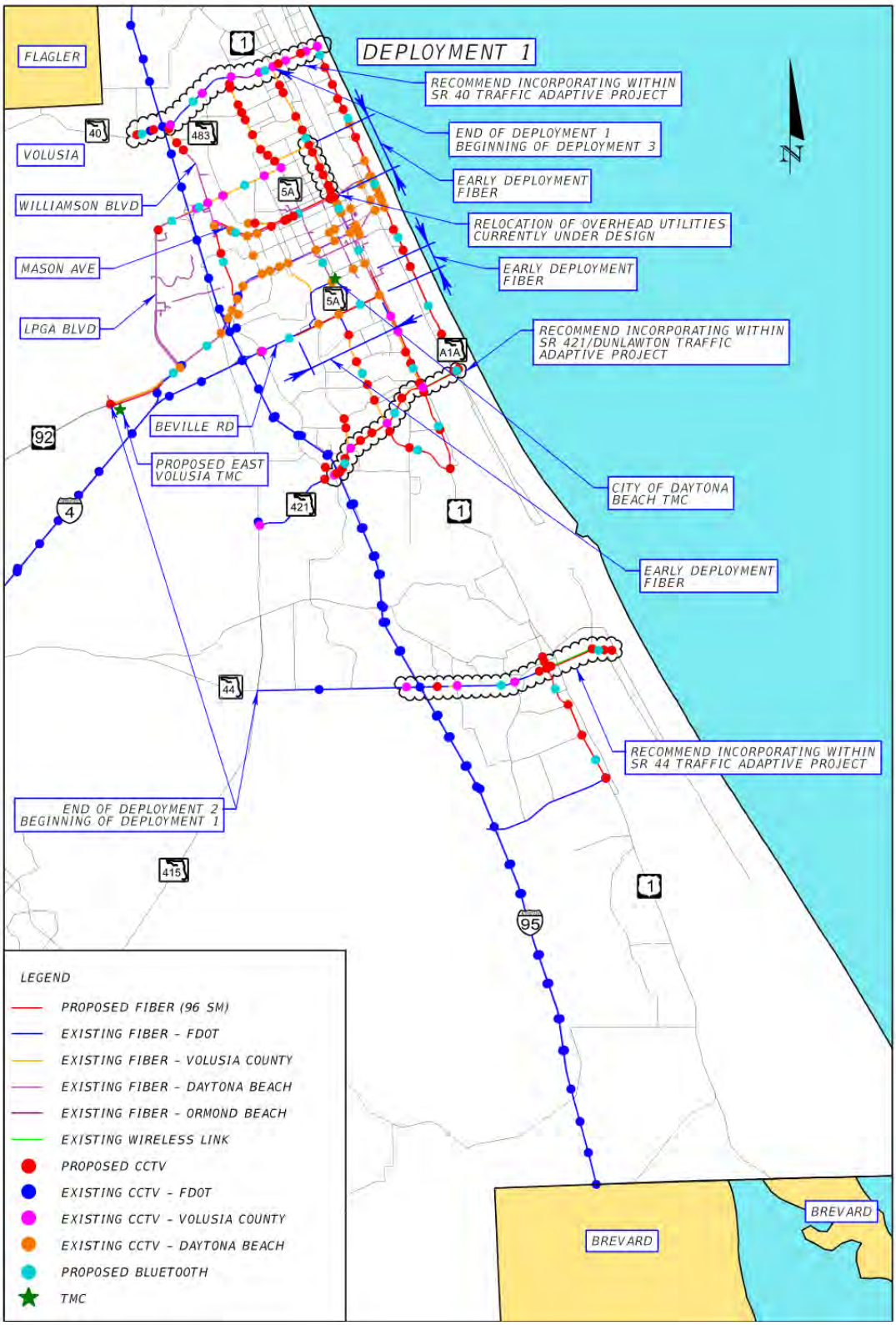


Figure 30 – Deployment 1

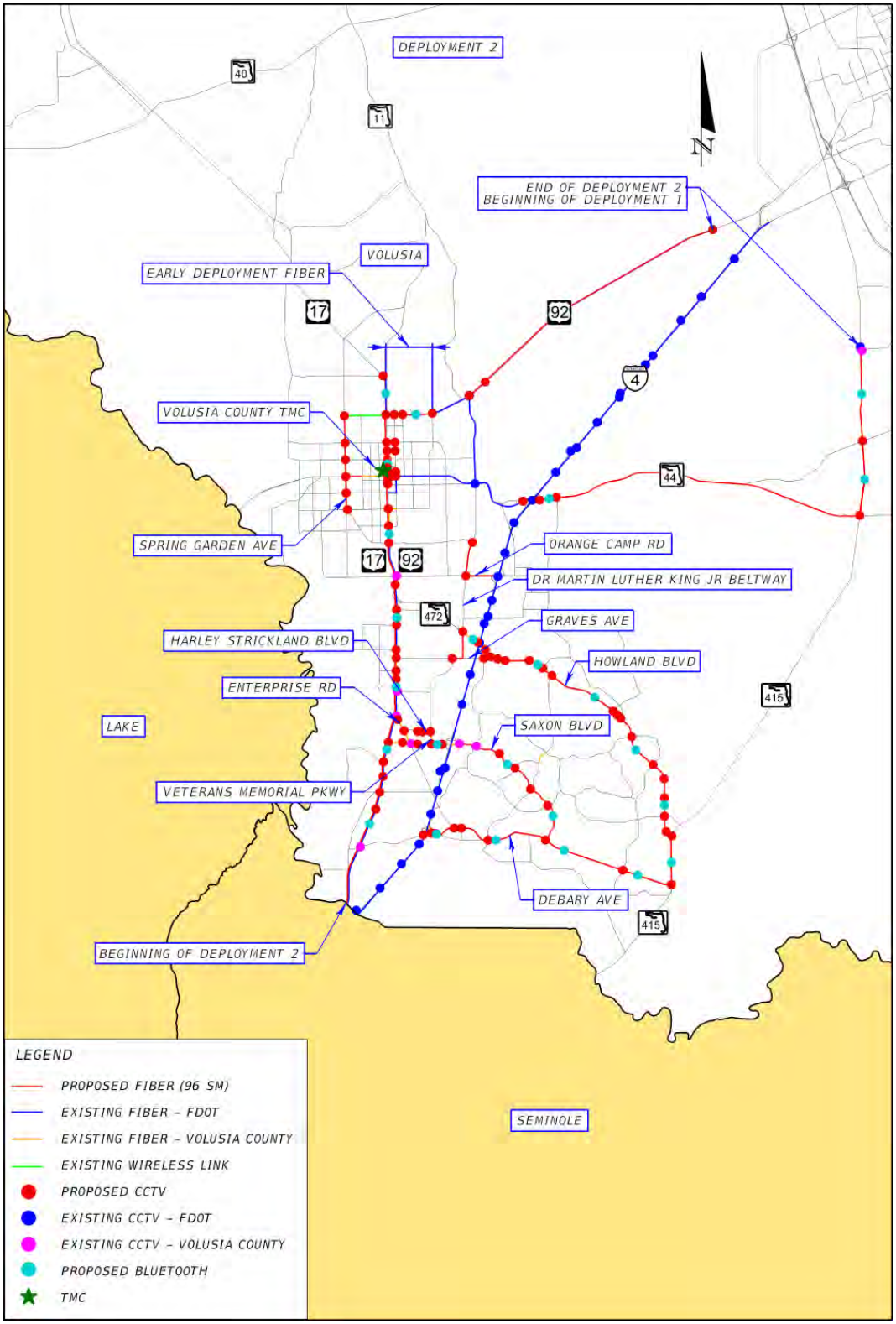


Figure 31 – Deployment 2

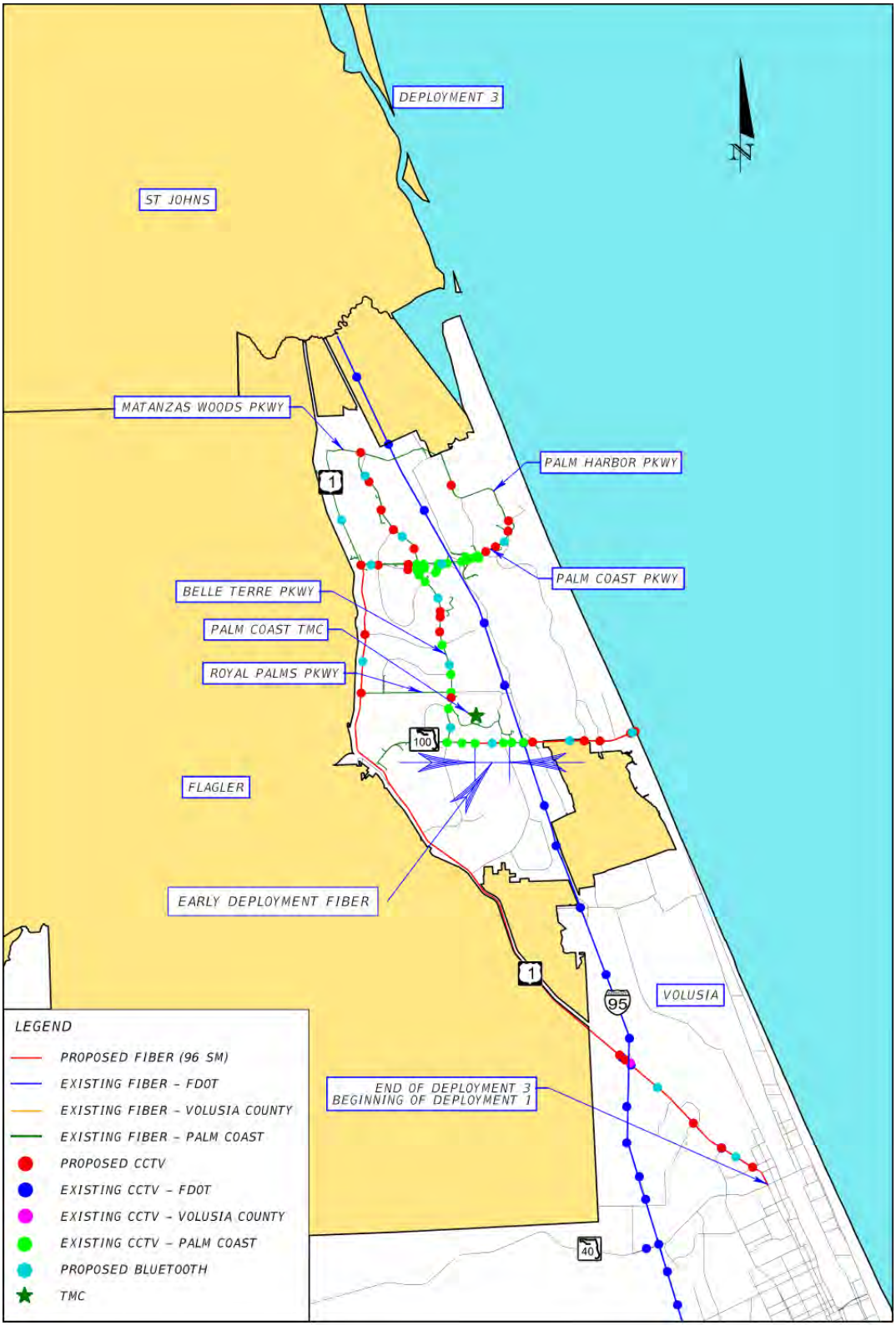


Figure 32 – Deployment 3

Life Cycle Replacement Costs

Optimal efficiency of all TSM&O equipment is essential to the success of a transportation network. As such, it is necessary for the region to plan for technology upgrades as they become available. For the purposes of this Master Plan, a lifecycle of 10 years will be assumed for all TSM&O devices.

Table 8 shows a summary of all costs associated with the various deployments.

Deployment	Capital Costs	O&M Costs Per Year	Total 10 Year O&M Cost	Life Cycle Replacement Cost
Early Deployment	$ 2,362,945.78	$215,155.85	$2,355,896.48	$0.00
1 - East Volusia	$ 7,183,119.65	$1,019,670.53	$11,165,107.87	$2,111,250.00
2- West Volusia	$10,375,898.04	$855,136.17	$9,363,502.51	$2,073,750.00
3 - Flagler	$ 4,507,241.15	$467,274.65	$5,116,527.00	$865,500.00
Totals	**$24,429,204.61**		**$28,001,033.86**	**$5,050,500.00**

Table 8 – Overall Deployment Costs

The total cost of the deployments recommended by this Master Plan, including capital costs, O&M, and life cycle replacement costs over a period of ten years is **$57,480,738.47**.

Operations and Maintenance

A goal of all primary traffic operating agencies is to ensure that the roadway system be properly operated and maintained. The best way to ensure the realization of this goal is to have proper O&M staffing and procedures in place when deploying TSM&O improvements. For the purposes of this Master Plan, operations costs to be considered are software, signal retimings, active arterial management, staffing costs, and data management costs. Maintenance costs considered are preventative maintenance and repair.

Staffing guidelines were created as part of the FDOT D5 ITS Master Plan. The information following is taken from that Master Plan, as the R2CTPO falls under the jurisdiction of FDOT D5.

The USDOT FHWA June 2008 Signal Timing Manual[3] provides general guidelines on staffing requirements for a traffic signal system as it relates to signal retiming. This information can be found in the **Table 9** and forms a portion of the basis for the needs analysis identified in the following tables.

[3] http://www.ops.fhwa.dot.gov/publications/fhwahop08024/fhwa_hop_08_024.pdf

Position	<50 Signals	<100 Signals	<200 Signals	<500 Signals	<1000 Signals
Traffic Signal Engineer	0 to 1	1	1 to 2	2 to 5	5 to 10
Traffic Signal Analyst/Technician	0 to 1	0 to 1	1	1 to 3	3 to 5
ITS Engineer	-	-	0 to 1	1	1 to 3
Traffic Signal Maintenance Technician	1 to 2	2 to 4	4 to 7	7 to 17	17 to 33
Electronic Specialists	1	1	1 to 2	2 to 4	4 to 9
TMC Operators	-	-	2	2 to 4	4 to 9

Table 9 – USDOT Recommended Staffing Guidelines

Therefore, for agencies that do not currently have a TMC or ITS end devices and are exclusively maintaining traffic signals and traffic signal systems, the following staffing guidelines in **Table 10** apply:

Position	<50 Signals	<100 Signals	<200 Signals
Traffic Engineering Operations Manager	0	0	1
Traffic Signal Engineer	0.5	1	1
Traffic Signal Analysts/Technician	0.5	0-1	1
Traffic Signal Maintenance/ITS Fiber Technician	1-2	2-4	4-7
Network Specialist	*	*	0-1
Electronics Specialist (L2 Network Tech)	0-1	0-1	1

Table 10 – Current Needed – Recommended Staffing Guidelines (Signal Systems Only)

* This position is desirable, but not necessarily required in a signal only environment for smaller agencies.

For agencies that currently operate and maintain both traffic signal systems and ITS end devices with a TMC, the following recommendation criteria was established. It is important to note that at this point in time, there are no USDOT recommended staffing guidelines for ITS operations and maintenance. Therefore, it was necessary to glean this information by interviewing the FDOT and Maintaining Agencies, which was conducted as a part of the Statewide Active Arterial Needs Plan[4] as well as separate interviews as a part of the FDOT District 5 ITS Master Plan. Based on these interviews, it was determined that employing two TMC monitoring personnel per 350 signals and/or end devices (i.e. CCTVs, DMSs, etc.) was a reasonable staffing level. By combining the information from **Tables 9 and 10** and incorporating this premise, **Table 11** was developed.

Position	Number of Signals + ITS End Devices				
	<100	<200	<350	<700	<1400
Traffic Engineering Operations Manager	0	0-1	1	1	1
Traffic Signal Engineer	0-1	0-1	1-2	2-3	3-6
Traffic Signal Analysts/Technician	0-1	1	1-2	2-4	2-5
Traffic Signal Maintenance/ITS Fiber Technician	1-3	3-5	4-10	8-16	15-30
Network Specialist	*	0-1	1	1-2	2-3
Electronics Specialist (L2 Network Tech)	0-1	0-1	1	1-3	2-7
TMC Manager	*	0-1	1	1	1-2
Supervisor**	*	0-1	1	1-2	2-3
TMC Operators**	0-1	1	1	2-4	4-6

Table 11 – Current Needed – Recommended Staffing Guidelines (Signal Systems, ITS, and TMC)

* This position is desirable, but not necessarily required.

** This position is required 14 hours a day (Weekdays Only).

[4] Statewide Active Arterial Management Needs Plan, Metric Engineering, Inc. July 2013.

Using the guidelines detailed in **Table 11** and salary guidelines established later in the FDOT D5 ITS Master Plan, **Tables 12 - 14** detail the recommended staffing for the agencies within the R2CTPO**.** Please note that Volusia County and Palm Coast maintain signals for multiple agencies, and the staffing recommendations reflect the appropriate workloads.

Position	Existing Staff	Current Recommended Staff	Current Additional Staff Needed	Average Pay (with 2.15 multiplier)	Total Proposed Cost
Traffic Engineering Operations Manager	1.0	1.0	0.0	$268,750	$0
Traffic Signal/ITS Engineer	1.0	2.0	1.0	$201,240	$201,240
Traffic Signal Analyst/Technician	0.25	2.0	1.75	$134,160	$234,780
Traffic Signal Maintenance/ITS Fiber Technician	7.0	10.0	3.0	$112,226	$336,678
Network Specialist	1.0	1.0	0.0	$182,750	$0
Electronics Specialist (L2 Network Tech)	0.0	1.0	1.0	$115,581	$115,581
TMC Manager	0.5	1.0	0.5	$172,000	$86,000
TMC Supervisor	1.0	1.0	0.0	$80,625	$0
TMC Operator	0.25	1.0	0.75	$53,750	$40,312.50
				Total	**$1,014,591.50**

Table 12 – Recommended Annual Volusia County O&M Staffing

Position	Existing Staff	Current Recommended Staff	Current Additional Staff Needed	Average Pay (with 2.15 multiplier)	Total Proposed Cost
Traffic Engineering Operations Manager	1	1	0	$268,750	$0
Traffic Signal/ITS Engineer	0	0	0	$201,240	$0
Traffic Signal Analyst/Technician	0.5	1	0.5	$134,160	$67,080
Traffic Signal Maintenance/ITS Fiber Technician	2.5	5	2.5	$112,226	$280,565
Network Specialist	0	0.5	0.5	$182,750	$91,375
Electronics Specialist (L2 Network Tech)	0.5	0.5	0	$115,581	$0
TMC Manager	0	1	1	$172,000	$172,000
TMC Supervisor	0	1	1	$80,625	$80,625
TMC Operator	0.5	1	0.5	$53,750	$26,875
				Total	**$718,520**

Table 13 – Recommended Annual City of Daytona Beach O&M Staffing

Position	Existing Staff	Current Recommended Staff	Current Additional Staff Needed	Average Pay (with 2.15 multiplier)	Total Proposed Cost
Traffic Engineering Operations Manager	1	1	0	$268,750	$0
Traffic Signal/ITS Engineer	0	0	0	$201,240	$0
Traffic Signal Analyst/Technician	0	0	0	$134,160	$0
Traffic Signal Maintenance/ITS Fiber Technician	3	3	0	$112,226	$0
Network Specialist	0	0	0	$182,750	$0
Electronics Specialist (L2 Network Tech)	0	0.5	0.5	$115,581	$57,790.50
TMC Manager	0	0	0	$172,000	$0
TMC Supervisor	0	0	0	$80,625	$0
TMC Operator	0	0	0	$53,750	$0
				Total	**$57,790.50**

Table 14 – Recommended Annual City of Palm Coast O&M Staffing

According to the Statewide AAM Needs Plan, signal maintenance costs range anywhere between $2,700 and $6,000 per intersection. For the estimates included as a part of this Master Plan, a price of $5000 per intersection was assumed. This price includes preventative maintenance, as well as any necessary repairs. In addition, signal retiming every three years will be included, at an estimated cost of $3,000 per signal.

As mentioned previously, the recommended software for data management and day-to-day operations is SunGuide. The Early Deployment cost, which includes all server needs (Activu),

computers, and miscellaneous TMC equipment for the City of Daytona Beach TMC is $726,705.53. This cost can potentially be reduced significantly should a physical connection to FDOT D5 be established as this may allow the City gain access to SunGuide at no cost (a potential savings of approximately $400,000). Finally, there are anticipated additional data management/archiving costs of $200 per centerline mile per year.

Road Rangers

The costs for deploying additional Road Rangers have been divided into two portions: the recommended expansion onto I-95 and the optional expansion onto the arterials.

- 2 Road Rangers patrolling I-95
  - 6:00 AM to 12:00 AM Monday through Thursday, and 6:00 AM to 3:30 AM Friday through Sunday
- 4 Road Rangers patrolling 4 different arterial paths (optional)
  - Potential paths include US 17/92, US 92, US 1, SR 40, SR A1A, SR 100, and LPGA Boulevard
  - 6:00 AM-10:00 PM, 7 days a week, 365 days a year

See the equations below for a breakdown of the projected costs. See **Appendix H** for a full explanation of methodology.

$$\frac{Cost\ of\ 2\ RR\ on\ I-95\ in\ Volusia\ and\ Flagler}{week} = \frac{\$56.16}{hour}\left(\frac{136.5\ hrs}{week}\right) = \frac{\$7{,}665.84}{week}$$

$$\frac{Cost\ of\ 2\ RR\ on\ I-95\ in\ Volusia\ and\ Flagler}{year} = \frac{\$7{,}665.84}{week}\left(\frac{52\ weeks}{year}\right) = \frac{\$398{,}623.68}{year}$$

$$\frac{Cost\ of\ 4\ RR\ on\ Arterials\ in\ Volusia\ and\ Flagler}{week} = \frac{\$112.32}{hour}\left(\frac{112\ hrs}{week}\right) = \frac{\$12{,}579.84}{week}$$

$$\frac{Cost\ of\ 4\ RR\ on\ Arterials\ in\ Volusia\ and\ Flagler}{year} = \frac{\$12{,}579.84}{week}\left(\frac{52\ weeks}{year}\right) = \frac{\$654{,}151.68}{year}$$

Figure 33 – Road Ranger Cost Equations

Transit Costs (Optional)

One of the primary technologies proposed to improve the performance of the transit system is TSP. Information regarding TSP improvements discussed in this section was gathered from recent studies in Tampa, Jacksonville, and Orlando.

In order for buses to be able to be compatible with a TSP system, AVL must be installed. Votran has installed AVL on all buses in their fleet. According to information from Space Coast Area Transit (SCAT), the approximate cost of upgrading buses with AVL equipment that is compatible with a TSP system is $5,500 per bus. Assuming all 76 fixed route buses will need to be equipped with new uniform equipment, the total cost will be $418,000.

All traffic controllers would need to be upgraded to be able to implement TSP technology. The TSP equipment will need to be installed, new controller firmware will need to be integrated, and TSP timing plans will need to be generated. The total estimated cost for these improvements is $15,000 per intersection. It has been recommended earlier that the County install dual emitters at all traffic signals within deployment areas to accommodate both emergency vehicle signal preemption (if desired) and TSP where needed. It is recommended that dual receivers be installed over the road for optimal reception. For ease of this estimate, it is assumed that 200 intersections throughout the region (if it is determined that TSP is desired, this estimate should be updated to reflect how many actual intersections will be upgraded). The cost to upgrade all of the intersections and buses will be approximately $3,000,000.

For monitoring and maintenance purposes, the operating agencies will need to utilize a Central Management Software (CMS). It is recommended that the agencies utilize both the Opticom CMS and a Naztec TSP module (Palm Coast and Daytona Beach), for which the costs are $57,500 (including a $15,000 dedicated server) and $125,000 respectively. Potential additional O&M costs include the following:

- Additional signal retiming work beyond the initial TSP signal retiming
- Equipment replacement due to age/wear and tear
- Replacement of TSP equipment at intersection due to lightning damage

It is recommended that, should TSP be deemed appropriate, O&M costs be shared between the Votran and the operating agencies, due to the necessity of installing new equipment on both buses and traffic signal controllers. Maintenance on TSP equipment can be done during normal equipment maintenance for both the buses and signals. The anticipated O&M costs are $1,000 per intersections, and $500 per bus.

A best practice for any technology is to replace the technology as it becomes outdated. It is recommended that Votran begin generating funding approximately equal to the initial capital

improvement costs ($3,600,500) to replace the equipment after 10 years. The following future worth equation was used to provide a yearly savings benchmark Votran:

$$A = \frac{F \times i}{(1+i)^n - 1}$$

Where:

- A = Annual Payment Cost
- F = Future Value = $3,600,500
- I = Interest Rate = 4% (from FDOT PPM Volume 1, Chapter 23, Section 5.y)
- n = number of years = 10

The above results in a 10-year replacement cost of $2,998,890.45, which equates to an annual cost of $299,889.05. **Table 15** shows a summary of all costs associated with a potential TSP upgrade for Votran.

Transit Item	Approximate Cost per Item
Equip TSP on buses with AVL already installed (76 total)	$418,000 ($5,500/bus)
Equip TSP at intersections (200 assumed)	$3,000,000 ($15,000/intersection)
CMS (optional)	
Opticom CMS and server	$57,500
Naztec ATMS TSP module	$125,000
Initial Deployment Total	**$3,600,500**
Annual O&M Costs (Buses)	$38,000 ($500/bus)
Annual O&M Costs (Intersections)	$200,000 ($1,000/intersection)
Annual Funding for 10-Yr Replacement	$299,889.05
Annual Cost Total	**$537,889.05**

Table 15 – Estimated TSP Upgrade Cost

511 (Optional)

As detailed earlier in this report, it is recommended that traffic operating agencies consider utilizing 511 as a way to disseminate travel time information to motorists. To accomplish this, each agency will require a "plug-in" to be used by TMC operators to update the information to be disseminated. The information will then be sent out to motorists, SunGuide, and the Road Rangers (should FDOT decide to expand the program onto the arterials). The following information is recommended to be disseminated to motorists: location, incident type, time and date, lane blockage, severity, weather, and notifying agency. **Table 16** shows an example of a scope and estimate used to implement a 511 plug-in. It should be noted, that although 511 is available, there is the potential to leverage FDOT's relationship with 3rd parties to disseminate information (i.e. WAZE).

Scope of Services	Project Manager		Programmer		Total per Activity
	Staff Hours	Hourly Rate	Staff Hours	Hourly Rate	
Project Initiation - Gather Information	16	$108.35	16	$100.97	$3,349.12
Theme and Workflow for Front End UI	8	$108.35	32	$100.97	$4,097.84
Design & Develop Back End UI	8	$108.35	32	$100.97	$4,097.84
Logic for Assessment/Questions	0	$108.35	20	$100.97	$2,019.40
Customize data preprocessing	0	$108.35	20	$100.97	$2,019.40
Customize the Reporting	0	$108.35	40	$100.97	$4,038.80
Customize the User Authentication	0	$108.35	16	$100.97	$1,615.52
Review and Edit Features	0	$108.35	16	$100.97	$1,615.52
Feedback Collection & Revision	32	$108.35	16	$100.97	$5,082.72
System Integration	16	$108.35	40	$100.97	$5,772.40
User Support/Training	40	$108.35	0	$100.97	$4,334.00
QA Analyst	0	$108.35	8	$60.56	$484.48
				Total	**$38,527.04**

Table 16 – Example 511 Plug-in Scope and Estimate

5. Opportunity Costs

To demonstrate the powerful effects of TSM&O improvements, an opportunity cost has been calculated. Opportunity cost is defined as the cost of NOT implementing the recommendations. In this case, the opportunity cost will be the cost should none of the deployments be carried out. This will represent the cost to the travel public should TSM&O improvements not be put into place or, alternatively, the savings that will be created by avoiding effects of congestion. The following opportunity costs were considered in this Master Plan (See **Appendix I** for a complete explanation of all opportunity cost considerations):

- Traffic Signal Detector Failure Opportunity Cost
- Signal Retiming Opportunity Cost
- Arterial Management Opportunity Cost
- Adaptive Signal Opportunity Cost
- Crash Reduction Opportunity Cost

Table 17 shows each of the calculated opportunity costs (rounded to the nearest $10).

Opportunity Cost Type	Calculated Cost
Traffic Signal Detector Failure	$16,534,920
Signal Retiming	$3,057,720
Arterial management	$283,960
Adaptive	$57,330
Crash Reduction	$43,262,160
Total	**$63,196,090**

Table 17 – Opportunity Costs

The total opportunity cost (without rounding) for all users of the transportation system is $63,196,107.71, which equates to a 10-year cost to the public of $691,979,747.74 (includes 2% inflation per year). See **Appendix J** for a full breakdown of the opportunity costs.

6. Benefit/Cost Ratio

A benefit to cost ratio demonstrates the public benefit of all deployments. This measure quantifies the benefit to the traveling public in dollars. This represents the dollar benefit the public receives for every public dollar spent, meaning the dollar amount saved by the taxpayers for every tax dollar spent. This ratio is essential in demonstrating how vast the positive effects of the TSM&O improvements are when lining up funding for capital improvements, and, most importantly, O&M funding. It is calculated by dividing the 10-year opportunity cost by the total Master Plan cost. The River to Sea TSM&O Master Plan Phase 2 benefit/cost ratio is shown in the equation below:

$$\frac{\$691{,}979{,}747.74}{\$57{,}480{,}738.47} = \mathbf{12.04}$$

Ultimately, this ratio demonstrates that TSM&O improvements are an extremely effective investment of funding for transportation purposes.

7. Summary of Recommendations

The list below provides a summary of all TSM&O strategies, both recommended and optional, that have been proposed as part of this Master Plan:

Recommended

Early Deployment

- Filling in of fiber gaps on US 92 and SR 100, new underground fiber on US 1 in Holly Hill, and new fiber on Beville Rd. and US 1 in Daytona Beach
- Upgrades of the City of Daytona Beach TMC and the City of Palm Coast TMC
- Grooming of ATMS.now in Palm Coast
- Upgrade and relocation of the Volusia County TMC
- Connection between all three TMCs
- Connections between TMCs and their respective County EOCs
- Connection to the Daytona International Speedway for video sharing purposes

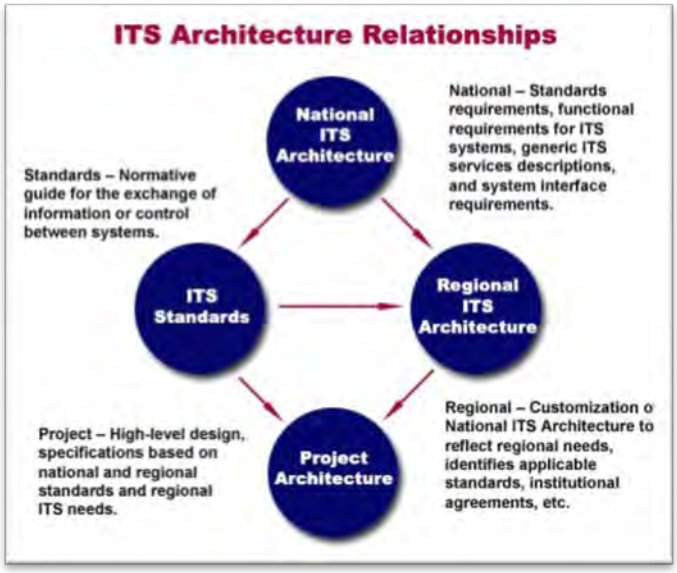
- Deployment 1 – Daytona Beach area
  - See **Section 4.1**
- Deployment 2 – DeLand area
  - See **Section 4.1**
- Deployment 3 – Palm Coast area
  - See **Section 4.1**
- Proper O&M funding for all agencies operating the transportation network
- Expansion of Road Rangers onto I-95 in Volusia and Flagler Counties

Optional

- Expansion of Road Rangers onto the major arterials in the region
- TSP implementation
- Utilization of 511 service

8. Regional ITS Architecture (RITSA)

8.1 Background



The National ITS Architecture (NITSA), also known as the Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT), is a nationwide tool that is used as framework for planning, defining, and integrating ITS for all agencies that utilize Transportation Systems Management and Operations (TSM&O). It defines the following functions: subsystem functions, where the functions reside (in vehicle, Traffic Management Center (TMC), or field), how the subsystems interface and communications requirements of the subsystems. It is a mature product that has been developed through extensive cooperation and participation of many different types of agencies that contribute to the TSM&O network. The NITSA reflects the contributions of a broad cross-section of the Intelligent Transportation Systems (ITS) community, including systems engineers, system developers, transportation professionals, and technology specialists.[5] A key benefit of utilizing the NITSA is the definition of key interfaces for standardization. ITS standards are crucial as they detail how ITS systems, products, and components can interconnect, exchange information and interact to deliver services within a transportation network. The use of standards encourages industry growth by minimizing development costs, increasing compatibility and interoperability, and increasing buyer and seller confidence in products. This is accomplished by allowing both like and different ITS devices and equipment to exchange and interpret data directly through a common communications interface. This exchange and recognition of data can take place between devices located within a single system or between devices operating in different systems. By using standards-based agencies can join forces to extend the reach and capabilities of their ITS infrastructure investments.[6]

[5] https://www.standards.its.dot.gov/LearnAboutStandards/NationalITSArchitecture

[6] https://www.standards.its.dot.gov/LearnAboutStandards/ITSStandardsBackground

The Florida Department of Transportation (FDOT) Regional ITS Architecture (RITSA) represents a portion of the NITSA, that has been designed to show how transportation systems are integrated within the State of Florida. The Code of Federal Regulations Part 940 (CFR 940) requires a RITSA conforming to the NITSA for all ITS projects receiving federal funding. The FDOT architecture was developed in 2005 and updated in 2016 with input from the transportation network stakeholders within each District. The FDOT District 5 architecture represents a shared vision of how each agency's systems will work together in the future to enable sharing of information and resources to provide a safer, more efficient, and more effective transportation system for travelers in the Central Florida region.

This section of the River to Sea Transportation Planning Organization (R2CTPO) TSM&O Master Plan Phase 2 is included to ensure that all TSM&O infrastructure (both existing and proposed) conforms to the FDOT District 5 RITSA and that all planned deployments will be eligible for federal funding.

In order to assist states with the conformance to the NITSA, the USDOT ITS Joint Program Office (JPO), created a software application called Turbo Architecture in 2012.[7] The Turbo Architecture software is an application that supports development of regional and project ITS architectures using the National ITS Architecture as a reference. However, from the national perspective the need to consider new service packages and standards to support the rapidly developing connected and automated vehicle technologies brought the rise of a second architecture, the Connected Vehicle Reference Implementation Architecture (CVRIA). The CVRIA project was completed in 2014, and developed a website that hosts the architecture viewpoints for 88 connected vehicle safety, mobility, environmental, and support applications.[8] One thing that became apparent between the NITSA 7.1 and the CVRIA architecture sets was that there was a great deal of overlap of planning information between them but they contained service package and flow names of different naming conventions and definitions. This has led to the integration of the National ITS architecture, version 7.1 with the CVRIA architecture, version 2.2 into one overarching architecture, the ARC-IT version 8.0. ARC-IT version 8.0 is a major upgrade that fully incorporates connected vehicle capabilities to the NITSA in detail that was released in July 2017.

The FDOT regional architecture for the state was created in Turbo Architecture and is currently in version 7.1. All deployments recommended as a part of the R2CTPO Master Plan Phase 2 have been input into the FDOT RITSA in this electronic format as well. This architecture has not been migrated to ARC-IT version 8, in order to maintain consistency with the existing architecture of the overall state of Florida.

[7] https://www.its.dot.gov/press/2012/turbo_architecture7.htm

[8] https://www.standards.its.dot.gov/DevelopmentActivities/CVReference

8.2 R2CTPO Existing Service Packages in the RITSA

A review of the service packages included in the existing District 5 RITSA was performed to determine what portions of the Master Plan recommendations are already included as a part of the RITSA. The existing service packages and their accompanying flow diagrams can all be found online at http://www.consystec.com/florida/d5/web/servstake.htm. **Tables 18 - 20** shows a list of the existing applicable service packages in the R2CTPO region which includes those used by the City of Daytona Beach Traffic Engineering, Volusia County Traffic Engineering, and the R2CTPO.

Service Package Name - Description
AD1 - ITS Data Mart - MetroPlan Transportation Data Collection System (1 of 2)
AD1 - ITS Data Mart - R2CTPO Data System
AD2 - ITS Data Warehouse - Central Florida Data Warehouse (1 of 2)
APTS02 - Transit Fixed-Route Operations - School District Transportation Dispatch
APTS02 - Transit Fixed-Route Operations - VOTRAN Transit Dispatch
APTS09 - Transit Signal Priority - VOTRAN Transit Dispatch
ATIS01 - Broadcast Traveler Information - Florida 511 / Private ISPs (3 of 3)
ATIS02 - Interactive Traveler Information - Virtual Travel Planning Center (1 of 2)
ATIS06 - Transportation Operations Data Sharing - Private Sector ISPs (2 of 2)
ATMS01 - Network Surveillance - City of Daytona Beach
ATMS03 - Traffic Signal Control - City of Daytona Beach
ATMS06 - Traffic Information Dissemination - City of Daytona Beach
ATMS07 - Regional Traffic Management - FDOT Districts (2 of 3)
ATMS07 - Regional Traffic Management - Seminole County / Volusia County
ATMS08 - Traffic Incident Management System - Municipal Traffic Operation Centers (TM to EM)
ATMS08 - Traffic Incident Management System - County Emergency Operations Center (TM to EM)
ATMS08 - Traffic Incident Management System - Local Traffic Management Centers (TM to MCM)
ATMS13 - Standard Railroad Grade Crossing - City of Daytona Beach / City of Orlando / Osceola County
ATMS16 - Parking Facility Management - Parking Facility Operators
ATMS20 - Drawbridge Management - City of Daytona Beach Traffic Management Center
EM02 - Emergency Routing - City of Daytona Beach
EM06 - Wide-Area Alert - County EOCs (1 of 3)
EM07 - Early Warning System - County EOCs (2 of 3)
EM08 - Disaster Response and Recovery - County EOCs (2 of 4)
EM09 - Evacuation and Reentry Management - County EOCs (2 of 3)
EM09 - Evacuation and Reentry Management - Central Florida Traffic Management Agencies
MC03 - Road Weather Data Collection - City of Daytona Beach / Osceola County
MC07 - Roadway Maintenance and Construction - Counties and Cities (2 of 2)
MC08 - Work Zone Management - Counties and Cities (2 of 3)
MC08 - Work Zone Management - Counties and Cities (3 of 3)
MC09 - Work Zone Safety Monitoring - Counties and Cities
MC10 - Maintenance and Construction Activity Coordination - Counties and Cities (2 of 4)

Table 18 – Existing City of Daytona Beach Service Packages in the RITSA

Service Package Name - Description
AD1 - ITS Data Mart - MetroPlan Transportation Data Collection System (1 of 2)
AD1 - ITS Data Mart - MetroPlan Transportation Data Collection System (2 of 2)
AD1 - ITS Data Mart - R2CTPO Data System
AD2 - ITS Data Warehouse - Central Florida Data Warehouse (1 of 2)
AD2 - ITS Data Warehouse - Central Florida Data Warehouse (2 of 2)
AD2 - ITS Data Warehouse - Local Archives (1 of 2)
APTS02 - Transit Fixed-Route Operations - LYNX Operations Center
APTS02 - Transit Fixed-Route Operations - School District Transportation Dispatch
APTS02 - Transit Fixed-Route Operations - VOTRAN Transit Dispatch
APTS07 - Multi-modal Coordination - VOTRAN Transit Dispatch
APTS09 - Transit Signal Priority - LYNX (4 of 5)
APTS09 - Transit Signal Priority - VOTRAN Transit Dispatch
ATIS01 - Broadcast Traveler Information - Florida 511 / Private ISPs (3 of 3)
ATIS02 - Interactive Traveler Information - Virtual Travel Planning Center (1 of 2)
ATIS06 - Transportation Operations Data Sharing - Private Sector ISPs (2 of 2)
ATMS01 - Network Surveillance - Volusia County
ATMS02 - Traffic Probe Surveillance - Volusia County / County and Local
ATMS03 - Traffic Signal Control - Volusia County
ATMS06 - Traffic Information Dissemination - Volusia County
ATMS07 - Regional Traffic Management - FDOT Districts (2 of 3)
ATMS07 - Regional Traffic Management - Seminole County / Volusia County
ATMS08 - Traffic Incident Management System - Volusia County (TM to EM)
ATMS08 - Traffic Incident Management System - County Emergency Operations Center (TM to EM)
ATMS08 - Traffic Incident Management System - County Traffic Management Centers (TM to MCM)
ATMS13 - Standard Railroad Grade Crossing - Orange County / Seminole County / Volusia County
ATMS20 - Drawbridge Management - Volusia County Traffic Management Center
EM02 - Emergency Routing - Volusia County
EM06 - Wide-Area Alert - County EOCs (1 of 3)
EM07 - Early Warning System - County EOCs (2 of 3)
EM08 - Disaster Response and Recovery - County EOCs (2 of 4)
EM09 - Evacuation and Reentry Management - County EOCs (2 of 3)
EM09 - Evacuation and Reentry Management - Central Florida Traffic Management Agencies
MC03 - Road Weather Data Collection - Seminole County / Volusia County
MC07 - Roadway Maintenance and Construction - Counties and Cities (2 of 2)
MC08 - Work Zone Management - Counties and Cities (2 of 3)
MC08 - Work Zone Management - Counties and Cities (3 of 3)
MC09 - Work Zone Safety Monitoring - Counties and Cities
MC10 - Maintenance and Construction Activity Coordination - FDOT District 5 (4 of 4)
MC10 - Maintenance and Construction Activity Coordination - Counties and Cities (2 of 4)
MC10 - Maintenance and Construction Activity Coordination - Counties and Cities (4 of 4)

Table 19 – Existing Volusia County Service Packages in the RITSA

Service Package Name - Description
AD1 - ITS Data Mart - R2CTPO Data System
AD3 - ITS Virtual Data Warehouse - FDOT Statewide OIS Enterprise Databases

Table 20 – Existing R2CTPO Service Packages in the RITSA

8.3 Required Changes

A review of the existing service packages in the R2CTPO region, showed that most of the service packages that are applicable to the deployments recommended as a part of the R2CTPO TSM&O Master Plan Phase 2 are already included in the current FDOT District 5 RITSA. The only items identified as missing were the inclusion of service packages for the Palm Coast TMC and data flows to and from the TMCs in the region to the FDOT District 5 Regional Traffic Management Center (RTMC). As such, the only changes needed to the RITSA were to incorporate the Palm Coast TMC, missing data flows, and to show the expansion of the areas covered by service packages ATMS01, ATMS03, and ATMS06 in the East Volusia, West Volusia and Flagler County areas.

A total of five projects have been developed electronically in Turbo 7.1 detail the improvements recommended by the Master Plan. **Figure 34** shows a screen shot of those five projects in .tbo format.

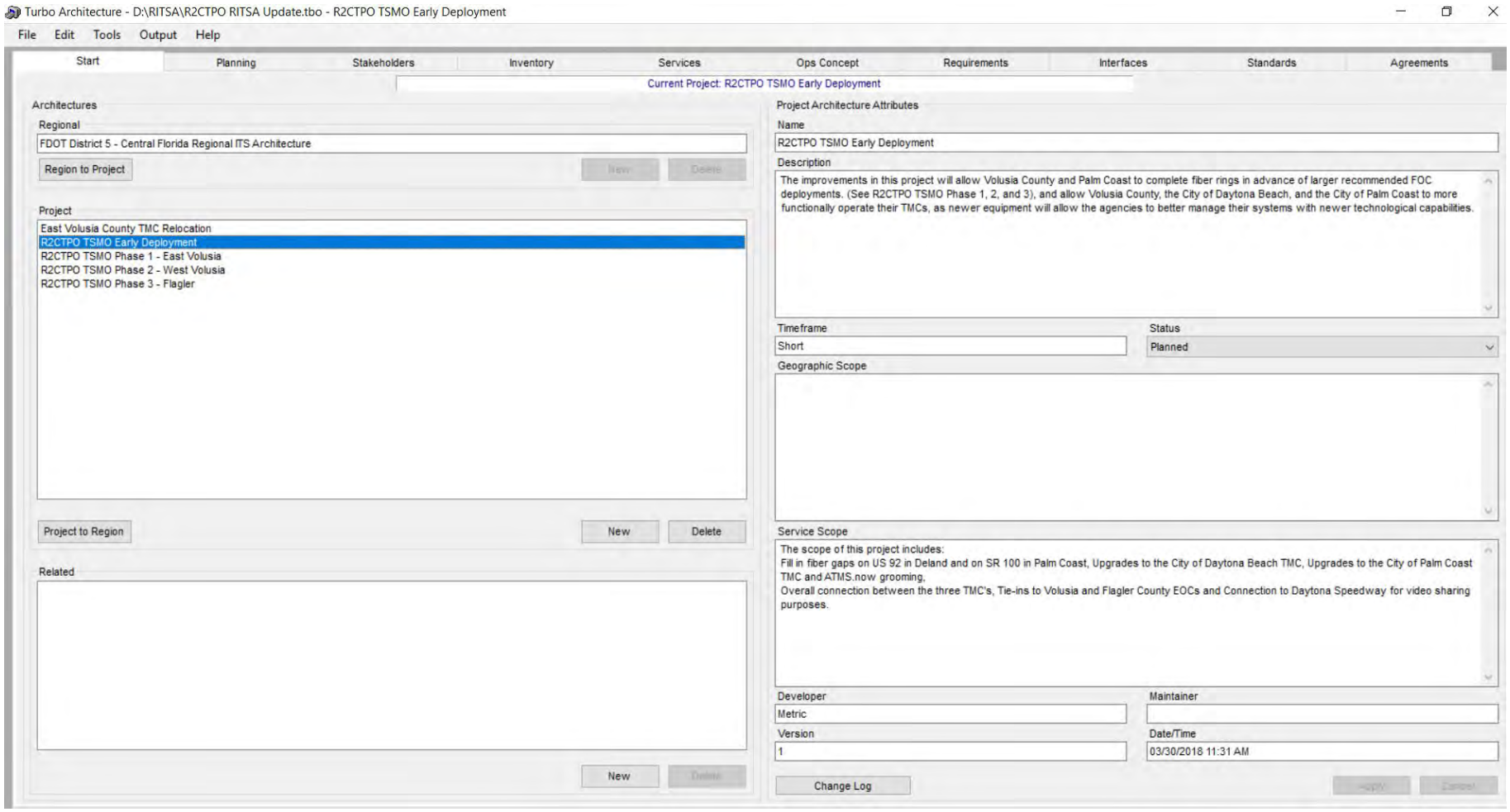


Figure 34 – River to Sea RITSA Update.tbo

A brief description for each of the projects is shown below:

Volusia County TMC Relocation

Updates the existing TMC for Volusia County located at the Volusia County Traffic Engineering offices. This project upgrades the equipment in the TMC to replace any aging equipment and relocate to the new planned shared use public works facility (location currently being discussed). Currently, all signals in Volusia County outside the City of Daytona Beach are operated and maintained by Volusia County Traffic Engineering. Volusia County Traffic Engineering will monitor and control all signalized intersections through the use of the FOC network that will be controlled using the Centracs software currently in use by the city.

Early Deployment

The early deployment project fills in identified gaps in Fiber Optic Cable (FOC), installs new FOC in Holly Hill, replaces existing FOC in Daytona Beach provides upgrades to the TMCs currently in use in the region, creates connections between the TMCs, connections from the TMCs to the appropriate County Emergency Operations Centers (EOCs), and a connection to the Daytona International Speedway for video sharing purposes. The list below briefly details each of these components that will require an update to the RITSA:

- Palm Coast TMC - Updates the existing TMC for the City of Palm Coast located at Palm Coast City Hall. This project upgrades the equipment in the TMC to increase the operating capabilities of the City. Currently all signals in the City of Palm Coast (and some additional signals outside the City limits) are operated and maintained by the City of Palm Coast Traffic Engineering. The City of Palm Coast Traffic Operations will monitor and control all signalized intersections through the use of the Fiber Optic Cable (FOC) network that will be controlled using the ATMS.now software currently in use by the city.
- Daytona Beach TMC - Updates the existing TMC for the City of Daytona Beach located at Daytona Beach Public Works. This project upgrades the equipment in the TMC to replace the aging equipment. Currently all signals in the City of Daytona Beach are operated and maintained by the City of Daytona Beach Traffic Engineering. The City of Daytona Beach Traffic Operations will monitor and control all signalized intersections through the use of the FOC network that will be controlled using the ATMS.now software currently in use by the city.
- Connection between TMCs and their respective EOCs – Creates connections to the Volusia County EOC from the Volusia and Daytona TMCs and to the Flagler County EOC from the Palm Coast TMC. By streamlining the capabilities of the EOCs to monitor the traffic

conditions during evacuation events and by simplifying data sharing capabilities to review transportation system performance during said events, these connections will allow for the more efficient operation of the roadway network during periods where the EOCs are activated.

- Connection between the three TMCs – Creation of connections between the three TMCs to allow for one TMC to monitor the performance of all roadways under the jurisdiction of Volusia County TMC, the City of Daytona Beach, and the City of Palm Coast. This will include the capability to monitor all signals and field devices.
- Connection to the Daytona International Speedway – Creation of a connection from the Volusia and Daytona TMCs to the International Speedway to allow all entities to monitor CCTVs that cover the facilities impacted by events at the Speedway.

R2CTPO TSM&O Phase 1 – East Volusia Area

Phase 1 of the upgrade of the R2CTPO Advanced Traffic Management System (ATMS) is located in the East Volusia region and includes the installation of the following TSM&O Equipment - 96 count FOC, 24 count FOC for drop cables, Closed Circuit Television (CCTV) cameras at most signalized intersections that are without them currently, and BlueTooth detectors (approximately every 2 miles).

Project limits include:

- US 1 from Washington St. to SR 442
- SR 44 from US 1 to S Atlantic Ave.
- SR 421/SR A1A from Taylor Road to SR A1A
- SR A1A from SR 421/SR A1A to SR 40
- SR 40 from S Tymber Creek Rd. to SR A1A
- Clyde Morris Blvd. from Bill France Blvd. to Mason Ave.
- Williamson Blvd. from Mason Ave. to US 92
- Mason Ave. from Williamson Blvd. to US 1
- US 92 from Indian Lake Rd. to SR A1A
- S Clyde Morris Blvd. from SR 421 to Herbert St.
- SR 5A from SR 40 to US 1
- US 1 from SR 40 to SR 5A

R2CTPO TSM&O Phase 2 – West Volusia Area

Phase 2 of the upgrade of the R2CTPO ATMS is located in the West Volusia region and includes the installation of the following TSM&O Equipment - 96 count FOC, 24 count FOC for drop cables, CCTVs at most signalized intersections that are without, BlueTooth detectors (approximately every 2 miles).

Project limits include:

- US 17/92 from the Seminole County Line to US 92
- US 17 from US 92 to Glenwood Rd.
- Spring Garden Ave. from US 92 to Beresford Ave.
- Debary Ave. from the I-4 WB ramps to SR 415
- Saxon Blvd. from US 17/92 to the Park and Ride
- Saxon Blvd. from the I-4 EB ramps to Debary Ave.
- Veterans Memorial Pkwy. From Saxon Blvd. to Harley Strickland Blvd.
- Harvey Strickland Blvd. from Enterprise Rd. to Veterans Memorial Pkwy.
- SR 472/Howland Blvd. from Dr. Martin Luther King Beltway to SR 415
- Graves Ave. from Normandy Blvd. to Howland Blvd.
- Graves Ave. from Veterans Memorial Pkwy. to Kentucky Ave.
- Dr. Martin Luther King Jr. Beltway from Graves Ave. to SR 472
- Dr. Martin Luther King Jr. Beltway from Orange Camp Rd. to Taylor Rd.
- Orange Camp Rd. from Dr. Martin Luther King Beltway to I-4
- SR 44 from I-4 to CR 415
- CR 415 from Debary Ave. to Howland Blvd.
- CR 415/Tomoka Farms Rd. from SR 44 to SR 421
- SR 44 from US 17/92 to Amelia Ave.
- Amelia Ave. from SR 44 to Rich Ave.
- Plymouth Ave. from US 17/92 to Amelia Ave.
- US 92 from US 17 to Indian Lake Rd.

R2CTPO TSM&O Phase 3 – Flagler County Area

Phase 3 of the upgrade of the R2CTPO ATMS is located in the Flagler County Area and includes the installation of the following TSM&O Equipment - 96 count FOC, 24 count FOC for drop cables, CCTVs at most signalized intersections that are without, BlueTooth detectors (approximately every 2 miles).

Project limits include:

- US 1 from SR 40 to Matanzas Woods Pkwy.
- SR 100 from Belle Terre Blvd. to SR A1A
- Belle Terre Blvd. from SR 100 to Matanzas Woods Pkwy
- Palm Coast Pkwy. from US 1 to Palm Harbor Pkwy.
- Palm Harbor Pkwy. from Palm Coast Pkwy. to Matanzas Woods Pkwy.
- Cypress Point Pkwy. From Palm Coast Pkwy. to Cypress Edge Dr.
- Old Kings Rd. from Palm Coast Pkwy. to Kings Way

9. Concept of Operations Summary

For any project that will require federal funding, FHWA requires that a Concept of Operations (ConOps) be created. This document details the expansion of TSM&O strategies within the River to Sea TPO's jurisdiction, including a discussion of how the transportation network in the region currently operates, a description of the new technologies that will be introduced, and a discussion of the roles and responsibilities of user agencies will interact with system and utilize data generated by the system. This section provides a summary of the ConOps, while the full document can be found in **Appendix K**.

The purpose of the ConOps is to provide user agencies a framework of all aspects of the TSM&O network, as well as provide information regarding all stakeholders in the project and in what capacity they will interact with the system. It details existing conditions and proposed changes. The ConOps was prepared in accordance with guidelines set forth by the FDOT Systems Engineering Management Plan website.

Similar to **Section 4**, the ConOps describes all improvements that will be put in place by all deployments. These improvements will come in the form of expanded FOC, interconnected TMCs and EOCs, CCTVs at most intersections within each deployment area, and a BlueTooth travel time system. These improvements will allow user agency operators to actively view the roadway system in real-time, allowing them to more quickly and accurately respond to any incidents that may occur.

Currently, operations of traffic signals within the River to Sea TPO region are split among three main agencies: Volusia County Traffic Engineering, the City of Daytona Beach Traffic Engineering, and the City of Palm Coast Traffic Engineering. Additional agencies/stakeholders have been identified as candidates to have access to the region's TSM&O network. **Table 21** shows what user agencies will have access to the TSM&O devices and the extent of their control of the devices.

Agency	Signals	CCTVs	Travel Time System
Volusia County Traffic Operations	• Observe • Control	• Observe • Control	• Observe • Disseminate information
Daytona Beach Traffic Operations	• Observe • Control	• Observe • Control	• Observe • Disseminate information
Palm Coast Traffic Operations	• Observe • Control	• Observe • Control	• Observe • Disseminate information
FDOT District 5 RTMC	• None	• Observe	• Observe
Daytona International Speedway (During Events)	• None	• Observe	• Observe
Votran	• None	• Observe	• Observe
Volusia County EOC	• Observe	• Observe	• Observe
Flagler County EOC	• Observe	• Observe	• Observe
Volusia County Fire Rescue	• None	• Observe	• Observe
Flagler County Fire Rescue	• None	• Observe	• Observe

Table 21 – Agency TSM&O Access Permissions

In addition, the ConOps provides operational scenarios that are a framework that can be used to guide TSM&O user agencies in proper ways to operate the system under several different conditions. The scenarios described include normal operations, peak traffic times, incident operations, event operations, and maintenance operations. The ConOps is a living document that will evolve as the Region identifies any additional agencies that should have access to the TSM&O network or any additional pertinent information becomes available. Should any changes be necessitated, these operational scenarios should be updated as new information becomes available, and updated to include any new scenarios that are deemed important enough to be added to the ConOps.

10. Conclusion

Through understanding the existing transportation system and available technology options, changes can be planned to provide enhanced mobility of people and goods. A significant capital investment has already been made to the existing traffic signal system. This plan recommends additional capital improvements to enhance the system performance. It is understood that the lack of funding, resources, and consistency in operations and maintenance is a major concern to the R2CTPO region. Dedicated funding for maintenance, operations, and capital improvements is recommended to be increased and tied to performance measures. This will create the necessary baseline to provide consistency in the system's performance. Increased dedicated funding will allow the arterial network to reach its optimum utilization. By identifying funding sources, the applicable ITS strategies can be implemented within the guidelines of the ConOps.

This document has recommended 4 TSM&O deployments throughout the region: the Early Deployment, Deployment 1 – East Volusia, Deployment 2 – West Volusia, and Deployment 3 – Flagler. The overall capital cost for these deployments (including construction, O&M, and life-cycle replacement costs) is $57,480,738.47. However, the 10-year opportunity cost of not implementing the recommended improvements is calculated to be $691,979,747.74. These values have been used to calculate a projected benefit-cost ratio of **12.04:1**, which demonstrates how effective the proposed TSM&O improvements can be.

Through the development of this Master Plan, the R2CTPO, with support from the FDOT and local agencies, has positioned itself to satisfy the vision of improving safety; facilitating the movement of goods and people; and enhancing the transportation system's efficiency, sustainability, and reliability through deployment of advanced technology and interagency coordination to maximize the transportation system's utilization. Ideally, the R2CTPO would introduce dedicated funding for the operations and maintenance of the arterial network in order to successfully implement, operate, and maintain the ITS Master Plan within the R2CTPO region.

As a general guideline, this TSM&O Master Plan is a dynamic document and it is recommended for update once every 2-3 years.

Appendix A – Full Segment Scoring Results

Road ID	Roadway	From	To	Length	# of Lanes	Roadway Classification	Road Class for Ranking	Functional Classification	Rural/Urban	Adopted LOS Standard	Existing Volumes	Roadway Capacity	V/C Scoring Final	Final Existing Scoring	Crashes/Year/Mile	Crashes/Year/Mile Scoring	Crashes/MVMT	Crashes/MVMT Scoring	Total Safety Scoring	Primary Scoring	Secondary Scoring	Total Evac Scoring	# of Transit Routes	Transit Scoring	Beach Connector?	Beach Scoring	CCTV Scoring	Existing Fiber Scoring	Touch Fiber Scoring	1/4 Fiber Scoring	Total ITS Scoring	Total Scoring
211	13th St.	Derbyshire Rd.	SR 5A/Nova Rd	0.50	2	Collector	4	Minor Collector - Urban	Urban		1,660	13,640	2.5	0	7.6	0	12.67	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
209	6th St.	Derbyshire Rd.	SR 5A/Nova Rd	0.50	2	Collector	4	Minor Collector - Urban	Urban		2,870	13,640	2.5	0	16.8	5	16.15	5	10	0	0	0	1	5		0	0.0	7.5	0	0	7.5	25.0
210	8th St. (DAY)	Derbyshire Rd.	SR 5A/Nova Rd	0.50	2	Collector	4	Minor Collector - Urban	Urban		2,300	13,640	2.5	0	18.4	5	21.9	5	10	0	0	0	1	5		0	0.0	0.0	5	0	5.0	22.5
911	A1A	A1a& Driftway Terrace	A1A & Merrimac Drive	0.83	2	Regional	2		Rural	D	5,600	14,800	2.5	2.5	2.7	0	1.29	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	25.0
904	A1A	A1A & Old Wash. State Park	A1A & S. of Old Wash. St Park	1.82	2	Regional	2		Rural	D	5,600	17,700	2.5	2.5	2.9	0	1.4	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	25.0
908	A1A	A1a & S. of Old Wash. St Park	A1A & St. Johns Ave	3.03	2	Regional	2		Rural	D	5,600	17,700	2.5	2.5	4.1	0	2.01	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	25.0
914	A1A	A1A & St Johns Ave	A1A & Driftway Terrace	3.18	2	Regional	2		Rural	D	5,600	17,700	2.5	2.5	1.3	0	0.65	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	25.0
902	A1A	Old A1A & A1a	A1A & Wash. Oaks State Park	0.55	2	Regional	2		Rural	D	4,800	17,700	2.5	0	1.8	0	1.04	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	22.5
920	A1A	North Flagler Boarder & A1A	Beach Haven Pkwy & A1A	1.14	2	Regional	2		Rural	D	4,800	17,700	2.5	0	1.7	0	1	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	22.5
915	A1A	Beach Haven Pkwy & A1A	Old A1A and A1A	0.94	2	Regional	2		Rural	D	4,900	39,800	2.5	0	1.9	0	1.07	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	22.5
215	Air Park Rd.	Ragis Rd.	SR 442	0.55	2	Collector	4	Minor Collector - Urban	Urban		2,350	24,975	2.5	0	1.5	0	1.67	0	0	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	5.0
214	Air Park Rd.	Park Ave.	Ragis Rd	0.87	2	Collector	4	Minor Collector - Urban	Urban		2,500	24,975	2.5	0	1.1	0	1.25	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
221	Airport Rd. (NSB)	Luna Bella Ln	SR 44	3.30	2	Collector	4	Major Collector - Urban	Urban		4,780	34,965	2.5	0	2.3	0	1.32	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
220	Airport Rd. (NSB)	Pioneer Tr.	Luna Bella Ln	3.30	2	Collector	4	Major Collector - Urban	Urban		4,570	34,965	2.5	0	0.8	0	0.51	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
218	Airport Rd. (OB)	Sunshine Blvd.	US 1	0.30	2	Collector	4	Major Collector - Urban	Urban		8,350	24,975	2.5	0	36	5	11.74	5	10	0	0	0	1	5		0	0.0	0.0	0	0	0.0	17.5
216	Airport Rd. (OB)	Tymber Creek Rd.	Pineland Tr.	2.05	2	Collector	4	Major Collector - Urban	Urban		6,400	24,975	2.5	0	0.8	0	0.33	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	10.0
217	Airport Rd. (OB)	Pineland Tr.	Sunshine Blvd.	1.40	2	Collector	4	Major Collector - Urban	Urban		5,530	24,975	2.5	0	2	0	0.99	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
219	Airport Rd. (PO)	Williamson Blvd	Pioneer Tr.	2.50	2	Collector	4	Major Collector - Urban	Urban		8,430	33,300	2.5	0	3.5	0	1.14	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
224	Amelia Ave.	Minnesota Ave.	Ohio Ave.	0.15	2	Collector	4	Major Collector - Urban	Urban		11,630	13,640	10	2.5	40	5	9.38	5	10	0	0	0	0	0		0	0.0	0.0	0	0	0.0	22.5
225	Amelia Ave.	Ohio Ave.	SR 44	0.15	4	Collector	4	Major Collector - Urban	Urban		10,990	22,820	2.5	2.5	126.7	5	31.67	5	10	0	0	0	1	5		0	0.0	0.0	5	0	5.0	25.0
223	Amelia Ave.	Plymouth Ave.	Minnesota Ave.	0.50	2	Collector	4	Major Collector - Urban	Urban		11,890	14,040	10	2.5	11.2	0	2.59	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	12.5
222	Amelia Ave.	US 92	Plymouth Ave.	0.85	2	Collector	4	Major Collector - Urban	Urban		7,430	14,040	2.5	0	17.6	5	6.52	5	10	0	0	0	0	0		0	0.0	0.0	0	0	0.0	12.5
226	Amelia Ave. (DL)	SR 44	Voorhis Ave.	0.25	4	Collector	4	Major Collector - Urban	Urban		9,669	22,820	2.5	0	30.4	5	8.64	5	10	0	0	0	1	5		0	0.0	7.5	0	0	7.5	25.0
227	Amelia Ave. (DL)	Voorhis Ave.	Beresford Ave.	0.75	2	Collector	4	Major Collector - Urban	Urban		6,940	13,640	2.5	0	9.3	0	3.68	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
230	Arredondo Grant Rd.	Spring Garden Ranch Rd.	James St.	0.60	2	Collector	4	Major Collector - Urban/Rural	Rural		1,030	6,300	2.5	0	0.7	0	1.82	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
231	Arredondo Grant Rd.	James St.	SR 11	2.00	2	Collector	4	Major Collector - Rural	Rural		700	6,300	2.5	0	0.2	0	0.77	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
233	Atlantic Ave. (DBS)	Phillis Ave.	Marcelle Ave.	0.75	2	Collector	4	Minor Collector - Urban	Urban		12,920	14,740	10	2.5	0.3	0	0.06	0	0	10	0	10	1	5	Y	10	0.0	0.0	0	0	0.0	37.5
234	Atlantic Ave. (DBS)	Marcelle Ave.	Major St	1.30	2	Collector	4	Minor Collector - Urban	Urban		9,670	13,640	5	0	4.2	0	1.18	0	0	10	0	10	1	5	Y	10	0.0	0.0	0	0	0.0	30.0
232	Atlantic Ave. (DBS)	SR A1A/Dunlawton Ave.	Phillis Ave.	0.40	4	Collector	4	Minor Collector - Urban	Urban		15,190	30,420	2.5	2.5	2.5	0	0.45	0	0	10	0	10	1	5	Y	10	0.0	0.0	0	0	0.0	30.0
235	Atlantic Ave. (PI)	Major St	Beach St.	2.80	2	Collector	4	Minor Collector - Urban	Urban		3,310	13,640	2.5	0	2.9	0	2.37	0	0	10	0	10	1	5	Y	10	0.0	0.0	0	0	0.0	27.5
238	Atlantic Ave/Turtle Mound Rd.	27th Ave.	Hiles Blvd.	1.55	2	Non-Regional	3	Principal Arterial - Other - Urban	Urban		11,630	17,050	5	2.5	6.5	0	1.52	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	27.5
237	Atlantic Ave/Turtle Mound Rd.	6th Ave.	27th Ave.	1.45	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		12,070	37,970	2.5	2.5	8.3	0	1.88	0	0	10	0	10	0	0	Y	10	0.0	0.0	5	0	5.0	30.0
239	Atlantic Ave/Turtle Mound Rd.	Hiles Blvd.	Saxon Dr	0.45	2	Non-Regional	3	Principal Arterial - Other - Urban	Urban		7,300	17,050	2.5	0	2.2	0	0.83	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	22.5
240	Atlantic Ave/Turtle Mound Rd.	Saxon Dr.	Turtle Mound Rd.	1.60	2	Non-Regional	3	Principal Arterial - Other - Urban	Urban		6,690	17,050	2.5	0	1.5	0	0.62	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	22.5
241	Atlantic Ave/Turtle Mound Rd.	Turtle Mound Rd.	Canaveral Nat'l Park	7.65	2	Non-Regional	3	Principal Arterial - Other - Urban	Urban		3,050	13,640	2.5	0	0.3	0	0.26	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	22.5
236	Atlantic Ave/Turtle Mound Rd.(NSB)	Flagler Ave. (N. Causeway)	6th Ave.	1.25	2	Non-Regional	3	Principal Arterial - Other - Urban	Urban		2,550	14,740	2.5	0	9.1	0	9.83	5	5	10	0	10	0	0	Y	10	0.0	0.0	5	0	5.0	32.5
249	Beach/Riverside/Beach (HH)	5th St	SR 430/Mason	0.20	4	Non-Regional	3	Major Collector - Urban	Urban		5,150	22,820	2.5	0	29	5	15.26	5	10	0	0	0	2	10		0	0.0	0.0	5	0	5.0	27.5
248	Beach/Riverside/Beach (HH)	LPGA Blvd.	5th St	0.20	4	Non-Regional	3	Major Collector - Urban	Urban		5,150	13,640	2.5	0	15	5	7.89	5	10	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	15.0
247	Beach/Riverside/Beach (HH)	Division Ave.	LPGA Blvd.	1.60	2	Non-Regional	3	Major Collector - Urban	Urban		4,950	13,640	2.5	0	4	0	2.21	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
245	Beach/Riverside/Beach (OB)	Wilmette Ave.	SR 40	0.70	2	Non-Regional	3	Major Collector - Urban	Urban		9,310	13,640	5	0	7.1	0	2.1	0	0	0	0	0	1	5		0	2.5	0.0	0	0	2.5	12.5
246	Beach/Riverside/Beach (OB)	SR 40	Division Ave.	0.60	2	Non-Regional	3	Major Collector - Urban	Urban		8,530	13,640	5	0	8	0	2.58	0	0	0	0	0	0	0		0	2.5	0.0	0	0	2.5	7.5
244	Beach/Riverside/Beach (OB)	Inglesa Ave.	Wilmette Ave.	2.55	2	Non-Regional	3	Major Collector - Urban	Urban		6,250	13,640	2.5	0	3.5	0	1.55	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	7.5
243	Beach/Riverside/Beach (OB)	Pine Tree Dr	Inglesa Ave.	1.10	2	Non-Regional	3	Major Collector - Urban	Urban		2,160	13,640	2.5	0	2.2	0	2.79	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
250	Beacon Light Rd.	Volco Rd.	Ariel Rd.	1.25	2	Collector	4	Minor Collector - Rural	Rural		500	6,300	2.5	0	0.6	0	3.64	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
251	Beacon Light Rd.	Ariel Rd.	Halifax Ave.	2.75	2	Collector	4	Minor Collector - Rural	Rural		240	6,300	2.5	0	0.2	0	2.5	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
762	Belle Terre Blvd.	SR 100	Zebulas Trail	0.21	2	Regional	2		Urban	D	8,400	24,200	2.5	0	4.8	0	1.56	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
763	Belle Terre Blvd.	Zebulas Trail	Zaun Trail	0.84	2	Regional	2		Urban	D	6,600	24,200	2.5	0	4.5	0	1.88	0	0	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	5.0
764	Belle Terre Blvd.	Zaun Trail	Citation Parkway	1.37	2	Regional	2		Urban	D	4,000	24,200	2.5	0	1.8	0	1.2	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
765	Belle Terre Blvd.	Citation Parkway	US 1	1.31	2	Regional	2		Urban	D	3,800	24,200	2.5	0	1.2	0	0.88	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
753	Belle Terre Parkway	Palm Coast Parkway (WB)	Palm Coast Parkway (EB)	0.22	4	Regional	2		Urban	D	24,700	39,800	5	5	85.5	5	9.49	5	10	0	0	0	0	0		0	0.0	7.5	0	0	7.5	27.5
755	Belle Terre Parkway	Cypress Point Parkway	Pine Lakes Parkway (South)	0.27	4	Regional	2		Urban	D	34,000	39,800	10	7.5	2.2	0	0.18	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	25.0
754	Belle Terre Parkway	Palm Coast Parkway (EB)	Cypress Point Parkway	0.13	4	Regional	2		Urban	D	21,100	39,800	2.5	5	196.9	5	25.6	5	10	0	0	0	0	0		0	0.0	7.5	0	0	7.5	25.0
759	Belle Terre Parkway	Rymfire Drive	Royal Palms Parkway	0.53	4	Regional	2		Urban	D	25,700	39,800	5	5	15.5	5	1.65	0	5	0	0	0	0	0		0	0.0	7.5	0	0	7.5	22.5
760	Belle Terre Parkway	Royal Palms Parkway	East Hampton Boulevard	0.52	4	Regional	2		Urban	D	25,400	39,800	5	5	30.8	5	3.32	0	5	0	0	0	0	0		0	0.0	7.5	0	0	7.5	22.5
758	Belle Terre Parkway	White View Parkway	Rymfire Drive	0.92	4	Regional	2		Urban	D	23,500	39,800	2.5	5	16.1	5	1.87	0	5	0	0	0	0	0		0	0.0	7.5	0	0	7.5	20.0
757	Belle Terre Parkway	Parkview Drive	White View Parkway	1.02	4	Regional	2		Urban	D	22,800	39,800	2.5	5	15.7	5	1.89	0	5	0	0	0	0	0		0	0.0	7.5	0	0	7.5	20.0
761	Belle Terre Parkway	East Hampton Boulevard	SR 100	1.04	4	Regional	2		Urban	D	22,000	39,800	2.5	5	18.3	5	2.27	0	5	0	0	0	0	0		0	0.0	7.5	0	0	7.5	20.0
756	Belle Terre Parkway	Pine Lakes Parkway (South)	Parkview Drive	1.03	4	Regional	2		Urban	D	26,300	39,800	5	5	1.4	0	0.14	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	17.5
752	Belle Terre Parkway	Bellaire Drive	Palm Coast Parkway(WB)	0.48	4	Regional	2		Urban	D	17,400	39,800	2.5	2.5	18.8	5	2.96	0	5	0	0	0	0	0		0	0.0	7.5	0	0	7.5	17.5
750	Belle Terre Parkway	Bird of Paradise Drive	Pine Lakes Parkway (North)	0.71	4	Regional	2		Urban	D	14,100	39,800	2.5	2.5	17.5	5	3.39	0	5	0	0	0	0	0		0	0.0	7.5	0	0	7.5	17.5
751	Belle Terre Parkway	Pine Lakes Parkway (North)	Bellaire Drive	0.85	4	Regional	2		Urban	D	14,700	39,800	2.5	2.5	10.1	0	1.89	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	12.5
749	Belle Terre Parkway	Matanzas Woods Parkway	Bird of Paradise Drive	1.86	4	Regional	2		Urban	D	6,600	39,800	2.5	0	2.2	0	0.89	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
255	Bellevue Ave. (DAY)	Nova Rd.	US 1	1.20	2	Collector	4	Major Collector - Urban	Urban		7,000	10,660	5	0	23.8	5	9.35	5	10	0	0	0	2	10		0	2.5	0.0	5	0	7.5	32.5
254	Bellevue Ave. (DAY)	Clyde Morris Blvd.	Nova Rd.	0.70	2	Collector	4	Major Collector - Urban	Urban		7,640	10,660	5	0	11.1	0	3.98	5	5	0	0	0	0	0		0	2.5	7.5	0	0	10.0	20.0
252	Bellevue Ave. Extension	CR 415/Tomoka Farms Rd	Williamson Blvd.	0.50	2	Collector	4	Minor Collector - Urban	Urban		5,520	13,640	2.5	0	22	5	11	5	10	0	5	5	2	10		0	2.5	7.5	0	0	10.0	37.5
253	Bellevue Ave. Extension	Williamson Blvd	SR 483/Clyde Morris Blvd.	2.50	2	Collector	4	Minor Collector - Urban	Urban		3,250	13,640	2.5	0	1.6	0	1.35	0	0	0	0	0	0	0		0	2.5	7.5	0	0	10.0	12.5
259	Beresford Ave.	US 17/92	Amelia Ave	0.25	2	Collector	4	Major Collector - Urban	Urban		10,410	14,740	5	2.5	68	5	18.09	5	10	0	0	0	2	10		0	0.0	0.0	5	0	5.0	32.5
258	Beresford Ave.	SR 15A	US 17/92	1.75	2	Collector	4	Major Collector - Urban	Urban		4,780	13,640	2.5	0	6.2	0	3.53	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
260	Beresford Ave.	Amelia Ave.	Hill Ave.	1.00	2	Collector	4	Major Collector - Urban	Urban		5,710	17,900	2.5	0	3.8	0	1.83	0	0	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	5.0
257	Beresford Ave.	Fatio Rd.	SR 15A	1.30	2	Collector	4	Major Collector - Urban	Urban		3,440	13,640	2.5	0	1.4	0	1.1	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
256	Beresford Ave.	Beresford Rd.	Fatio Rd	0.70	2	Collector	4	Major Collector - Urban	Urban		1,560	13,640	2.5	0	1.1	0	2	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
267	Beresford Rd.	Spring Garden Ave.	SR 15A	0.40	2	Collector	4	Major Collector - Urban	Urban		3,520	13,640	2.5	0	0	0	0	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
264	Beresford Rd.	Old New York Ave.	Beresford Ave.	0.30	2	Collector	4	Major Collector - Urban	Urban		2,640	13,640	2.5	0	1.3	0	1.43	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
265	Beresford Rd.	Beresford Ave.	Fatio Rd.	1.30	2	Collector	4	Major Collector - Urban	Urban		1,370	13,640	2.5	0	1.1	0	2.12	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
266	Beresford Rd.	Fatio Rd.	Spring Garden Ave.	0.75	2	Collector	4	Major Collector - Urban	Urban		850	13,640	2.5	0	0.3	0	0.83	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
269	Big Tree Rd.	Nova Rd.	Magnolia Ave.	0.40	2	Collector	4	Minor Collector - Urban	Urban		13,740	14,740	10	2.5	25.5	5	5.1	5	10	0	0	0	1	5		0	0.0	7.5	0	0	7.5	35.0
270	Big Tree Rd.	Magnolia Ave.	Kenilworth Ave.	0.45	3	Collector	4	Minor Collector - Urban	Urban		12,190	14,740	10	2.5	9.3	0	2.1	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	17.5
271	Big Tree Rd.	Kenilworth Ave.	US 1	0.55	3	Collector	4	Minor Collector - Urban	Urban		8,880	14,740	5	0	42.5	5	13.15	5	10	0	0	0	0	0		0	2.5	0.0	0	0	2.5	17.5
268	Big Tree Rd.	Clyde Morris Blvd.	Nova Rd.	1.10	2	Collector	4	Minor Collector - Urban	Urban		8,750	13,640	5	0	7.1	0	2.22	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	10.0
274	Bill France Blvd. (DAY)	Dunn Ave.	US 92	0.60	4	Collector	4	Minor Collector - Urban	Urban		11,270	27,700	2.5	2.5	57	5	13.9	5	10	0	0	0	4	10		0	2.5	0.0	5	0	7.5	32.5
273	Bill France Blvd. (DAY)	Mason Ave.	Dunn Ave.	0.63	4	Collector	4	Minor Collector - Urban	Urban		8,160	35,820	2.5	0	10.8	0	3.62	5	5	0	0	0	3	10		0	2.5	0.0	0	0	2.5	20.0
272	Bill France Blvd. (DAY)	Clyde Morris Blvd.	Mason Ave.	0.38	4	Collector	4	Minor Collector - Urban	Urban		5,030	35,820	2.5	0	3.2	0	1.71	0	0	0	0	0	3	10		0	2.5	0.0	0	0	2.5	15.0
766	Bird of Paradise Drive	Matanzas Woods Parkway	Birchwood Drive	1.31	2	Collector	4		Urban	D	2,900	24,200	2.5	0	1.4	0	1.3	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
767	Bird of Paradise Drive	Birchwood Drive	Belle Terre Parkway	1.01	2	Collector	4		Urban	D	3,000	24,200	2.5	0	3.6	0	3.27	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
275	Blackburn Rd.	CR 3	Emporia Rd	1.25	2	Collector	4	Minor Collector - Rural	Rural		650	6,300	2.5	0	0	0	0	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
278	Blue Lake Ave.	Minnesota Ave.	SR 44	0.55	2	Collector	4	Major Collector - Urban	Urban		4,200	13,640	2.5	0	2.2	0	1.43	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
279	Blue Lake Ave.	SR 44	Voorhis Ave.	0.25	2	Collector	4	Major Collector - Urban	Urban		3,570	13,640	2.5	0	2.4	0	1.88	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
277	Blue Lake Ave.	Plymouth Ave.	Minnesota Ave.	1.00	2	Collector	4	Major Collector - Urban	Urban		5,790	13,640	2.5	0	2.2	0	1.04	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
281	Blue Lake Ave.	Beresford Ave..	Taylor Rd.	1.05	2	Collector	4	Major Collector - Urban	Urban		5,770	13,640	2.5	0	0.2	0	0.09	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
280	Blue Lake Ave.	Voorhis Ave.	Beresford Ave.	0.75	2	Collector	4	Major Collector - Urban	Urban		4,420	13,640	2.5	0	1.3	0	0.83	0	0	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	5.0
282	Blue Lake Ave.	Taylor Rd.	Orange Camp Rd.	1.05	2	Collector	4	Major Collector - Urban	Urban		4,660	17,050	2.5	0	0.8	0	0.45	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
283	Blue Springs Av (West)	Sparkman Dr	Lawton Dr	0.60	2	Collector	4	Minor Collector - Urban	Urban		4,200	13,640	2.5	0	2.7	0	1.74	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
768	Bulldog Drive	SR 100	Central Avenue	0.54	2	Collector	4		Urban	D	2,800	14,800	2.5	0	1.9	0	1.79	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
288	Cardinal Blvd.	Demotte Ave.	Marcelle Ave	0.15	2	Collector	4	Minor Collector - Urban	Urban		7,190	13,640	2.5	0	1.3	0	0.5	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
287	Cardinal Blvd.	SR 421/Dunlawton Ave.	Demotte Ave	0.15	2	Collector	4	Minor Collector - Urban	Urban		1,690	13,640	2.5	0	4	0	6	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
291	Cassadaga Rd.	W. Volusia Bltwy.	Macy Ave.	1.80	2	Collector	4	Major Collector - Urban	Urban		2,200	13,640	2.5	0	1.6	0	1.94	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	10.0
293	Catalina Blvd. (DEL)	Howland Blvd.	Sixma Rd.	0.50	2	Collector	4	Major Collector - Urban	Urban		12,590	10,660	5	2.5	21.6	5	4.7	5	10	0	0	0	0	0		0	0.0	0.0	0	0	0.0	17.5
294	Catalina Blvd. (DEL)	Sixma Rd.	Lake Helen-Osteen Rd.	0.40	2	Collector	4	Major Collector - Urban	Urban		10,630	10,660	10	2.5	4.5	0	1.15	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	12.5
774	Central Avenue	Landings Blvd	Park Street	0.33	2	Collector	4		Urban	D	3,300	14,800	2.5	0	1.8	0	1.5	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
775	Central Avenue	Park Street	Bulldog Drive	0.16	2	Collector	4		Urban	D	3,100	14,800	2.5	0	0	0	0	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
776	Central Avenue	Bulldog Drive	Brookhaven Drive	0.29	2	Collector	4		Urban	D	2,300	14,800	2.5	0	0.7	0	0.83	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
777	Central Avenue	Brookhaven Drive	Town Center Blvd.	0.41	2	Collector	4		Urban	D	1,900	14,800	2.5	0	1.5	0	2.14	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
772	Central Avenue	Market Avenue	Lake Avenue	0.11	4	Collector	4		Urban	D	3,500	32,400	2.5	0	0	0	0	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
773	Central Avenue	Lake Avenue	Landings Blvd.	0.23	4	Collector	4		Urban	D	3,600	32,400	2.5	0	0	0	0	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
771	Central Avenue	Belle Terre Parkway	Market Avenue	0.35	4	Collector	4		Urban	D	3,200	32,400	2.5	0	2.9	0	2.5	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
779	Citation Parkway	Seminole Woods Parkway	Sesame Boulevard	0.41	2	Collector	4		Urban	D	3,000	24,200	2.5	0	7.3	0	6.82	5	5	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	10.0
778	Citation Parkway	Belle Terre Parkway	Laguna Forest Lane	0.77	2	Collector	4		Urban	D	600	24,200	2.5	0	2.9	0	13.75	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
295	Clara Ave.	Beresford Ave.	New Hampshire Ave.	0.50	2	Collector	4	Major Collector - Urban	Urban		2,350	13,640	2.5	0	3.6	0	4.29	5	5	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	10.0
296	Clara Ave.	New Hampshire Ave.	SR 15A	0.50	2	Collector	4	Major Collector - Urban	Urban		1,820	13,640	2.5	0	2.4	0	3.53	5	5	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	10.0
780	Club House Drive	Palm Harbor Parkway	Palm Coast Parkway (WB)	1.65	2	Collector	4		Urban	D	3,400	14,800	2.5	0	0	0	0	0	0	0	5	5	0	0		0	0.0	7.5	0	0	7.5	15.0
781	Club House Drive	Palm Coast Parkway (WB)	Palm Coast Parkway (EB)	0.15	2	Collector	4		Urban	D	3,400	14,800	2.5	0	2.7	0	2.22	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	10.0
308	Clyde Morris Blvd.	Willow Run Blvd.	SR 421/Dunlawton Ave.	0.65	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		21,990	37,970	2.5	5	38.2	5	4.75	5	10	0	5	5	1	5		0	2.5	0.0	0	0	2.5	30.0
305	Clyde Morris Blvd.	Beville Rd.	Big Tree Rd.	0.90	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		23,500	37,970	5	5	8.9	0	1.04	0	0	0	5	5	1	5		0	2.5	0.0	5	0	7.5	27.5
309	Clyde Morris Blvd.	SR 421/Dunlawton Ave	Taylor Rd.	0.95	2	Non-Regional	3	Minor Arterial - Urban	Urban		11,220	17,050	5	2.5	17.5	5	4.26	5	10	0	0	0	1	5		0	2.5	0.0	0	0	2.5	25.0
307	Clyde Morris Blvd.	Madeline Ave.	Willow Run Blvd.	1.30	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		22,480	37,970	2.5	5	26.2	5	3.19	0	5	0	5	5	1	5		0	0.0	0.0	0	0	0.0	22.5
306	Clyde Morris Blvd.	Big Tree Rd.	Madeline Ave.	1.00	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		20,770	37,970	2.5	5	21.8	5	2.88	0	5	0	5	5	1	5		0	0.0	0.0	0	0	0.0	22.5
300	Clyde Morris Blvd.	Hand Ave.	LPGA Blvd.	1.50	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		15,250	37,970	2.5	2.5	8.3	0	1.49	0	0	0	0	0	2	10		0	2.5	0.0	5	0	7.5	22.5
301	Clyde Morris Blvd.	LPGA Blvd.	Bill France Blvd.	1.25	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		13,480	37,970	2.5	2.5	3	0	0.62	0	0	0	0	0	2	10		0	2.5	0.0	5	0	7.5	22.5
299	Clyde Morris Blvd.	SR 40	Hand Ave	0.80	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		12,130	30,420	2.5	2.5	7.5	0	1.69	0	0	0	0	0	1	5		0	2.5	0.0	5	0	7.5	17.5
302	Clyde Morris Blvd.	Bill France Blvd.	Mason Ave.	0.60	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		14,960	37,970	2.5	2.5	5.3	0	0.98	0	0	0	0	0	1	5		0	2.5	0.0	5	0	7.5	17.5
304	Clyde Morris Blvd./SR 483	US 92	Beville Rd.	2.00	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		32,000	37,800	10	7.5	23.3	5	1.99	0	5	0	5	5	2	10		0	2.5	0.0	5	0	7.5	45.0
303	Clyde Morris Blvd./SR 483	SR 430/Mason Ave.	US 92	1.20	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		20,000	37,800	2.5	0	44.7	5	6.12	5	10	0	5	5	2	10		0	2.5	0.0	5	0	7.5	35.0
782	Colbert Lane	Palm Coast Parkway (WB)	Palm Coast Parkway (EB)	0.20	2	Non-Regional	3		Urban	D	5,500	14,800	2.5	0	1	0	0.5	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
783	Colbert Lane	Palm Coast Parkway (EB)	Waterside Parkway (N)	1.70	2	Non-Regional	3		Urban	D	7,900	24,200	2.5	0	4	0	1.39	0	0	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	5.0
785	Colbert Lane	Waterside Park (S)	South Park Road	0.60	2	Non-Regional	3		Urban	D	6,300	24,200	2.5	0	0.3	0	0.14	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
786	Colbert Lane	South Park Road	Roberts Road	1.87	2	Non-Regional	3		Urban	D	6,200	24,200	2.5	0	0.1	0	0.05	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
784	Colbert Lane	Waterside Parkway (N)	Waterside Park (S)	1.40	2	Non-Regional	3		Urban	D	5,500	24,200	2.5	0	1.4	0	0.71	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
787	Colbert Lane	Roberts Road	SR 100	1.29	2	Non-Regional	3		Urban	D	4,500	24,200	2.5	0	5.4	0	3.3	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
311	Commonwealth Blvd.	Orange Ave.	US 1	0.35	2	Collector	4	Minor Collector - Urban	Urban		3,920	13,640	2.5	0	20	5	14	5	10	0	0	0	0	0		0	0.0	0.0	0	0	0.0	12.5
310	Commonwealth Blvd.	Spruce Creek Rd.	Orange Ave.	0.55	2	Collector	4	Minor Collector - Urban	Urban		5,450	13,640	2.5	0	1.8	0	0.91	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
329	Courtland Blvd. (DEL)	India Blvd.	Ft Smith Blvd	0.70	2	Collector	4	Major Collector - Urban	Urban		8,550	10,660	5	0	7.1	0	2.29	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	5.0
328	Courtland Blvd. (DEL)	Howland Blvd.	India Blvd	1.20	2	Collector	4	Major Collector - Urban	Urban		6,690	10,660	5	0	2.8	0	1.16	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	5.0
330	Courtland Blvd. (DEL)	Ft Smith Blvd.	Doyle Rd	1.80	2	Collector	4	Major Collector - Urban	Urban		6,570	12,740	2.5	0	2.1	0	0.88	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
327	Courtland Blvd. (DEL)	Newmark Dr.	Howland Blvd	1.00	2	Collector	4	Minor Collector - Urban	Urban		2,400	10,660	2.5	0	6.2	0	7.05	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
324	Courtland Blvd. (DEL)	Captain Dr.	Elkcam Blvd	1.50	2	Collector	4	Minor Collector - Urban	Urban		4,620	12,740	2.5	0	4.1	0	2.46	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
331	Courtland Blvd. (DEL)	Doyle Rd.	Enterprise-Osteen Rd.	0.90	2	Collector	4	Major Collector - Urban	Urban		1,760	10,660	2.5	0	2.4	0	3.79	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
323	Courtland Blvd. (DEL)	Beckwith St.	Captain Dr.	1.00	2	Collector	4	Minor Collector - Urban	Urban		2,600	12,740	2.5	0	1.6	0	1.7	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
325	Courtland Blvd. (DEL)	Elkcam Blvd.	end of road (Puerto Rico Dr.)	0.75	2	Collector	4	Minor Collector - Urban	Urban		1,500	10,660	2.5	0	1.3	0	2.38	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
326	Courtland Blvd. (DEL)	Tallwood Dr.	Newmark Dr.	0.25	2	Collector	4	Minor Collector - Urban	Urban		1,440	10,660	2.5	0	1.6	0	2.86	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
317	CR 15A	US 17	Airport Rd.	0.90	2	Non-Regional	3	Minor Arterial - Urban	Urban		4,770	24,975	2.5	0	1.3	0	0.77	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
318	CR 15A	Airport Rd.	SR 11	1.25	2	Non-Regional	3	Minor Arterial - Urban	Urban		2,680	24,975	2.5	0	0.8	0	0.82	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
313	CR 3	Washington Ave.	Emporia Rd	1.20	2	Collector	4	Minor Collector - Rural	Rural		2,190	12,300	2.5	0	3.5	0	4.38	5	5	0	0	0	1	5		0	0.0	0.0	0	0	0.0	12.5
312	CR 3	US 17	Washington Ave.	2.20	2	Collector	4	Minor Collector - Rural	Rural		1,330	12,300	2.5	0	1.1	0	2.26	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	7.5
314	CR 3	Emporia Rd	SR 40	3.40	2	Collector	4	Minor Collector - Rural	Rural		890	12,300	2.5	0	0.6	0	2	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
321	CR 305 (Bunnell Rd.)	US 17	Cowart Rd.	1.50	2	Collector	4	Major Collector - Rural	Rural		1,790	6,300	2.5	0	0.3	0	0.41	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
322	CR 305 (Bunnell Rd.)	Cowart Rd.	Flagler Co.	3.00	2	Collector	4	Major Collector - Rural	Rural		1,370	6,300	2.5	0	0.5	0	0.93	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
320	CR 92 (Intn'l Spdwy Blvd.)	Stone St.	US 17/92	0.75	4	Regional	2	Principal Arterial - Other - Urban	Urban		16,440	30,420	2.5	2.5	18.9	5	3.16	0	5	0	0	0	1	5		0	0.0	0.0	0	0	0.0	15.0
319	CR 92 (Intn'l Spdwy Blvd.)	SR 15A	Stone St.	0.25	4	Regional	2	Principal Arterial - Other - Urban	Urban		14,620	37,970	2.5	2.5	8.8	0	1.64	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	10.0
791	Cypress Point Parkway	Cypress Edge (N)	Palm Coast Parkway	0.12	4	Collector	4		Urban	D	31,100	32,400	10	7.5	315	5	27.79	5	10	0	0	0	0	0		0	2.5	7.5	0	0	10.0	37.5
790	Cypress Point Parkway	Cypress Edge (S)	Cypress Edge (N)	0.16	4	Collector	4		Urban	D	16,900	32,400	2.5	2.5	87.5	5	14.29	5	10	0	0	0	0	0		0	2.5	7.5	0	0	10.0	25.0
788	Cypress Point Parkway	Belle Terre Parkway	Pine Cone Drive	0.22	4	Collector	4		Urban	D	19,000	32,400	2.5	2.5	32.7	5	4.74	5	10	0	0	0	0	0		0	0.0	0.0	5	0	5.0	20.0
789	Cypress Point Parkway	Pine Cone Drive	Cypress Edge (S)	0.29	4	Collector	4		Urban	D	18,100	32,400	2.5	2.5	31	5	4.69	5	10	0	0	0	0	0		0	0.0	0.0	5	0	5.0	20.0
334	Daugharty Rd.	SR 11	Marsh Rd.	0.95	2	Collector	4	Minor Collector - Rural	Rural		760	6,300	2.5	0	0.2	0	0.77	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
337	Deltona Blvd. (DEL)	Cloverleaf Blvd./Anderson Dr.	Enterprise Rd.	0.50	4	Collector	4	Major Collector - Urban	Urban		14,990	29,160	2.5	2.5	20.8	5	3.8	5	10	0	0	0	2	10		0	2.5	0.0	5	0	7.5	32.5
338	Deltona Blvd. (DEL)	Enterprise Rd.	DeBary Ave	0.85	2	Collector	4	Major Collector - Urban	Urban		9,670	13,990	5	0	27.1	5	7.67	5	10	0	0	0	0	0		0	2.5	7.5	0	0	10.0	25.0
336	Deltona Blvd. (DEL)	Normandy Blvd.	Cloverleaf Blvd./Anderson Dr.	1.25	4	Collector	4	Major Collector - Urban	Urban		11,510	29,160	2.5	2.5	5.3	0	1.25	0	0	0	0	0	3	10		0	2.5	0.0	0	2.5	5.0	20.0
339	Demotte Ave.	Peninsula Dr.	Cardinal Blvd	0.20	2	Collector	4	Minor Collector - Urban	Urban		6,270	13,640	2.5	0	7	0	3.04	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
341	Derbyshire Rd.	LPGA Blvd.	SR 430/Mason Ave.	1.45	2	Collector	4	Major Collector - Urban	Urban		6,590	13,640	2.5	0	12.3	0	5.11	5	5	0	0	0	2	10		0	2.5	7.5	0	0	10.0	27.5
340	Derbyshire Rd.	Flomich St.	LPGA Blvd.	0.75	2	Collector	4	Major Collector - Urban	Urban		8,020	13,640	2.5	0	10.1	0	3.45	0	0	0	0	0	1	5		0	2.5	0.0	5	0	7.5	15.0

Road ID	Roadway	From	To	Length	# of Lanes	Roadway Classification	Road Class for Ranking	Functional Classification	Rural/Urban	Adopted LOS Standard	Existing Volumes	Roadway Capacity	V/C Scoring Final	Final Existing Scoring	Crashes/Year/Mile	Crashes/Year/Mile Scoring	Crashes/MVMT	Crashes/MVMT Scoring	Total Safety Scoring	Primary Scoring	Secondary Scoring	Total Evac Scoring	# of Transit Routes	Transit Scoring	Beach Connector?	Beach Scoring	CCTV Scoring	Existing Fiber Scoring	Touch Fiber Scoring	1/4 Fiber Scoring	Total ITS Scoring	Total Scoring
345	Dirksen/DeBary/Doyle	I-4	Deltona Blvd.	0.10	4	Non-Regional	3	Minor Arterial - Urban	Urban		27,550	30,420	10	5	130	5	13	5	10	10	0	10	0	0		0	2.5	7.5	0	0	10.0	45.0
343	Dirksen/DeBary/Doyle	Sunrise Blvd	WB I-4 Ramps	0.20	2	Non-Regional	3	Minor Arterial - Urban	Urban		14,400	13,640	5	2.5	30	5	5.66	5	10	0	0	0	0	0		0	2.5	0.0	5	0	7.5	25.0
344	Dirksen/DeBary/Doyle	WB I-4 Ramps	EB I-4 Ramps	0.20	4	Non-Regional	3	Minor Arterial - Urban	Urban		22,090	30,420	5	5	12	0	1.48	0	0	10	0	10	0	0		0	2.5	7.5	0	0	10.0	30.0
349	Dirksen/DeBary/Doyle	Providence Blvd.	Garfield Rd.	1.20	2	Non-Regional	3	Minor Arterial - Urban	Urban		13,670	13,640	10	2.5	9.7	0	1.94	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	22.5
347	Dirksen/DeBary/Doyle	Enterprise St.	Main St.	0.15	4	Non-Regional	3	Minor Arterial - Urban	Urban		27,050	30,420	10	5	17.3	5	1.76	0	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	20.0
350	Dirksen/DeBary/Doyle	Garfield Rd.	Saxon Blvd.	1.50	2	Non-Regional	3	Minor Arterial - Urban	Urban		10,300	13,640	5	2.5	2.8	0	0.74	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	17.5
348	Dirksen/DeBary/Doyle	Main St.	Providence Blvd.	0.80	4	Non-Regional	3	Minor Arterial - Urban	Urban		24,850	30,420	10	5	24.8	5	2.73	0	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	20.0
346	Dirksen/DeBary/Doyle	Deltona Blvd.	Enterprise St.	0.65	4	Non-Regional	3	Minor Arterial - Urban	Urban		20,870	30,420	5	5	6.2	0	0.81	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	17.5
342	Dirksen/DeBary/Doyle	US 17/92	Sunrise Blvd.	1.75	2	Non-Regional	3	Minor Arterial - Urban	Urban		10,270	13,640	5	2.5	3.9	0	1.04	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	15.0
351	Dirksen/DeBary/Doyle	Saxon Blvd.	Courtland Blvd.	2.55	2	Non-Regional	3	Minor Arterial - Urban	Urban		8,910	13,640	5	0	2.1	0	0.65	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	15.0
352	Dirksen/DeBary/Doyle	Courtland Blvd.	SR 415	1.50	2	Non-Regional	3	Minor Arterial - Urban	Urban		6,770	13,640	2.5	0	3.3	0	1.35	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	12.5
355	Dunn/George Engram/Fairview/Main	Bill France Blvd.	Clyde Morris Blvd.	0.85	2	Non-Regional	3	Minor Arterial - Urban	Urban		12,880	14,040	10	2.5	17.4	5	3.7	5	10	0	0	0	2	10		0	2.5	0.0	5	0	7.5	40.0
359	Dunn/George Engram/Fairview/Main	Beach St.	Peninsula Dr.	0.60	2	Non-Regional	3	Minor Arterial - Urban	Urban		7,190	14,040	2.5	0	29.3	5	11.14	5	10	0	0	0	6	10		0	2.5	0.0	5	0	7.5	30.0
357	Dunn/George Engram/Fairview/Main	Nova Rd.	US 1	1.20	4	Non-Regional	3	Minor Arterial - Urban	Urban		10,550	30,420	2.5	2.5	25.3	5	6.58	5	10	0	0	0	2	10		0	2.5	0.0	5	0	7.5	32.5
360	Dunn/George Engram/Fairview/Main	Peninsula Dr.	SR A1A	0.35	2	Non-Regional	3	Minor Arterial - Urban	Urban		6,540	13,640	2.5	0	44	5	18.33	5	10	0	0	0	1	5		0	2.5	7.5	0	0	10.0	27.5
358	Dunn/George Engram/Fairview/Main	US 1	Beach St	0.40	2	Non-Regional	3	Minor Arterial - Urban	Urban		5,350	14,040	2.5	0	16.5	5	8.46	5	10	0	0	0	4	10		0	2.5	0.0	5	0	7.5	30.0
356	Dunn/George Engram/Fairview/Main	Clyde Morris Blvd.	Nova Rd.	1.00	4	Non-Regional	3	Minor Arterial - Urban	Urban		10,870	37,970	2.5	2.5	17.8	5	4.49	5	10	0	0	0	2	10		0	0.0	7.5	0	0	7.5	32.5
354	Dunn/George Engram/Fairview/Main	Williamson Blvd.	Bill France Blvd.	1.00	2	Non-Regional	3	Minor Arterial - Urban	Urban		8,380	17,050	2.5	0	10.8	0	3.53	5	5	0	0	0	1	5		0	2.5	0.0	0	0	2.5	15.0
353	Dunn/George Engram/Fairview/Main	Tomoka Farms Rd.	Williamson Blvd.	0.75	2	Non-Regional	3	Major Collector - Urban	Urban		3,720	17,050	2.5	0	4.3	0	3.14	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
901	Easthampton Blvd	Easthampton Blvd & Belle Terre	Easthampton Blvd & Terminus	1.52	2	Collector	4		Urban	D	5,900	17,700	2.5	0	7.9	0	3.66	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
364	Elkcam Blvd. (DEL)	Montecito Ave.	Howland Blvd.	1.00	2	Non-Regional	3	Major Collector - Urban	Urban		10,230	10,660	10	2.5	16.2	5	4.33	5	10	0	0	0	2	10		0	0.0	0.0	0	0	0.0	32.5
365	Elkcam Blvd. (DEL)	Howland Blvd.	Lake Helen-Osteen Rd	0.15	2	Non-Regional	3	Minor Collector - Urban	Urban		10,750	13,990	5	2.5	60	5	15.52	5	10	0	0	0	1	5		0	0.0	0.0	0	0	0.0	22.5
363	Elkcam Blvd. (DEL)	Providence Blvd.	Montecito Ave.	1.05	2	Non-Regional	3	Major Collector - Urban	Urban		10,170	10,660	10	2.5	10.7	0	2.87	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	17.5
361	Elkcam Blvd. (DEL)	Normandy Blvd.	Ft. Smith Blvd.	1.50	2	Non-Regional	3	Major Collector - Urban	Urban		7,850	10,660	5	0	5.3	0	1.86	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	10.0
366	Elkcam Blvd. (DEL)	Lake Helen-Osteen Rd	Courtland Blvd	0.70	2	Non-Regional	3	Minor Collector - Urban	Urban		7,190	10,660	5	0	6.9	0	2.61	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	5.0
362	Elkcam Blvd. (DEL)	Ft. Smith Blvd.	Providence Blvd.	1.00	2	Non-Regional	3	Major Collector - Urban	Urban		6,280	10,660	2.5	0	4.4	0	1.91	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
369	Emporia Rd.	Peterson/Blackburn	US 17	1.45	2	Collector	4	Minor Collector - Rural	Rural		1,250	6,300	2.5	0	1	0	2.12	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
368	Emporia Rd.	SR 40	Peterson/Blackburn	3.00	2	Collector	4	Minor Collector - Rural	Rural		910	6,300	2.5	0	0.9	0	2.8	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
370	Enterprise Ave. (NSB)	Pioneer Tr.	Halleck St.	0.10	2	Collector	4	Major Collector - Urban	Urban		8,550	13,640	5	0	12	0	3.75	5	5	0	5	5	0	0		0	0.0	0.0	0	0	0.0	15.0
372	Enterprise Rd.	Harley Strickland Blvd.	Saxon Blvd.	0.50	4	Non-Regional	3	Minor Arterial - Urban	Urban		23,900	37,970	5	5	38.4	5	4.4	5	10	0	0	0	5	10		0	2.5	0.0	5	0	7.5	37.5
371	Enterprise Rd.	US 17/92	Harley Strickland Blvd.	0.50	4	Non-Regional	3	Minor Arterial - Urban	Urban		21,370	30,420	5	5	55.6	5	7.13	5	10	0	0	0	1	5		0	2.5	7.5	0	0	10.0	35.0
373	Enterprise Rd.	Saxon Blvd.	Highbanks Rd.	1.55	4	Non-Regional	3	Minor Arterial - Urban	Urban		20,510	37,970	2.5	5	16	5	2.14	0	5	0	0	0	3	10		0	2.5	0.0	5	0	7.5	30.0
374	Enterprise Rd.	Highbanks Rd.	Deltona Blvd.	0.50	4	Non-Regional	3	Minor Arterial - Urban	Urban		14,130	30,420	2.5	2.5	4.8	0	0.93	0	0	0	0	0	2	10		0	2.5	7.5	0	0	10.0	25.0
376	Enterprise-Osteen Rd.	Providence	Garfield Rd	1.50	2	Collector	4	Minor Collector - Urban	Urban		3,110	10,220	2.5	0	0.3	0	0.24	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	12.5
377	Enterprise-Osteen Rd.	Garfield Rd	Reed Ellis Rd.	1.70	2	Collector	4	Minor Collector - Urban	Urban		2,400	10,220	2.5	0	2.5	0	2.84	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
378	Enterprise-Osteen Rd.	Reed Ellis Rd.	SR 415	2.50	2	Collector	4	Minor Collector - Urban	Urban		1,480	10,220	2.5	0	1.2	0	2.21	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
383	Euclid Ave.	Adelle Ave.	US 17/92	0.50	2	Collector	4	Minor Collector - Urban	Urban		2,260	13,640	2.5	0	22.4	5	26.67	5	10	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	15.0
382	Euclid Ave.	SR 15A	Adelle Ave.	0.75	2	Collector	4	Minor Collector - Urban	Urban		2,830	13,640	2.5	0	4.5	0	4.36	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
380	Euclid Ave.	Fatio Rd.	Woodward Ave.	0.25	2	Collector	4	Minor Collector - Urban	Urban		1,390	13,640	2.5	0	4	0	8.33	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
379	Euclid Ave.	Grand	Fatio Rd.	0.25	2	Collector	4	Minor Collector - Urban	Urban		1,190	13,640	2.5	0	1.6	0	4	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
381	Euclid Ave.	Woodward Ave.	SR 15A	0.50	2	Collector	4	Minor Collector - Urban	Urban		2,320	13,640	2.5	0	2	0	2.38	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
792	Farmsworth Drive	Old Kings Road	Florida Park Drive	0.90	2	Collector	4		Urban	D	1,700	24,000	2.5	0	2	0	3.21	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
793	Farragut Drive	Old Kings Road	Florida Park Drive	0.97	2	Collector	4		Urban	D	400	24,000	2.5	0	0.8	0	5.71	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
385	Flagler Ave. (NSB)	N. Causeway	Peninsula Ave.	0.40	2	Non-Regional	3	Minor Arterial - Urban	Urban		10,090	13,640	5	2.5	1.5	0	0.41	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	17.5
386	Flagler Ave. (NSB)	Peninsula Ave.	Atlantic Ave.	0.40	2	Non-Regional	3	Major Collector - Urban	Urban		6,100	13,640	2.5	0	75.5	5	33.56	5	10	10	0	10	0	0		0	0.0	0.0	0	0	0.0	22.5
794	Fleetwood Drive	Old Kings Road	Florida Park Drive	0.94	2	Collector	4		Urban	D	1,000	24,000	2.5	0	1.5	0	4.12	5	5	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	10.0
387	Flomich St.	Derbyshire Rd.	SR 5A/Nova Rd.	0.30	2	Collector	4	Major Collector - Urban	Urban		5,300	13,640	2.5	0	13.3	0	6.9	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
798	Florida Park Drive	Farragut Drive	Palm Coast Parkway (WB)	0.63	2	Collector	4		Urban	D	8,100	14,800	2.5	0	10.8	0	3.66	5	5	0	0	0	0	0		0	2.5	7.5	0	0	10.0	17.5
797	Florida Park Drive	Fleetwood Drive	Farragut Drive	0.25	2	Collector	4		Urban	D	8,100	14,800	2.5	0	4.8	0	1.62	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
799	Florida Park Drive	Palm Coast Parkway (WB)	Palm Coast Parkway (EB)	0.08	2	Collector	4		Urban	D	5,600	14,800	2.5	0	5	0	2.5	0	0	0	0	0	0	0		0	2.5	7.5	0	0	10.0	12.5
795	Florida Park Drive	Palm Harbor Parkway	Forest Hill Drive	0.32	2	Collector	4		Urban	D	5,700	14,800	2.5	0	4.4	0	2.12	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
796	Florida Park Drive	Forest Hill Drive	Fleetwood Drive	0.64	2	Collector	4		Urban	D	6,600	14,800	2.5	0	3.4	0	1.43	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
801	Forest Grove Drive	Old Kings Road (E)	Palm Harbor Parkway	0.41	2	Collector	4		Urban	D	4,100	24,000	2.5	0	4.9	0	3.23	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
800	Forest Grove Drive	Old Kings Road (W)	Old Kings Road (E)	0.59	2	Collector	4		Urban	D	3,900	24,000	2.5	0	0	0	0	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
391	Fort Florida Rd.	Barwick Rd.	US 17/92	0.60	2	Collector	4	Minor Collector - Urban	Urban		1,670	10,220	2.5	0	0	0	0	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
389	Fort Florida Rd.	Highbanks Rd.	Ft. Florida Point Rd.	1.75	2	Collector	4	Minor Collector - Urban	Urban		1,450	13,640	2.5	0	0.8	0	1.52	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
390	Fort Florida Rd.	Ft. Florida Point Rd.	Barwick Rd.	2.25	2	Collector	4	Minor Collector - Urban	Urban		1,060	10,220	2.5	0	0.8	0	2.05	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
395	Fort Smith Blvd. (DEL)	Normandy Blvd.	India Blvd	0.55	2	Non-Regional	3	Major Collector - Urban	Urban		11,990	13,990	10	2.5	6.2	0	1.42	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	22.5
393	Fort Smith Blvd. (DEL)	Providence Blvd.	Newmark Dr.	0.50	2	Non-Regional	3	Major Collector - Urban	Urban		11,260	13,990	5	2.5	11.6	0	2.82	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	17.5
397	Fort Smith Blvd. (DEL)	Courtland Blvd.	Howland Blvd	0.75	2	Non-Regional	3	Major Collector - Urban	Urban		9,410	13,990	5	0	8.3	0	2.4	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	15.0
394	Fort Smith Blvd. (DEL)	Newmark Dr.	Normandy Blvd	0.85	2	Non-Regional	3	Major Collector - Urban	Urban		8,160	13,990	2.5	0	3.1	0	1.02	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	12.5
396	Fort Smith Blvd. (DEL)	India Blvd.	Courtland Blvd	2.25	2	Non-Regional	3	Major Collector - Urban	Urban		6,610	13,990	2.5	0	4.7	0	1.96	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	12.5
392	Fort Smith Blvd. (DEL)	Elkcam Blvd.	Providence Blvd	1.00	2	Non-Regional	3	Major Collector - Urban	Urban		3,140	10,660	2.5	0	2	0	1.75	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	7.5
398	Fort Smith Blvd. (DEL)	Howland Blvd.	SR 415	0.55	2	Non-Regional	3	Major Collector - Urban	Urban		3,030	10,660	2.5	0	2.5	0	2.33	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
401	French Ave.	Lawton Ave./Hamilton	US 17/92	1.00	2	Collector	4	Minor Collector - Urban	Urban		4,870	13,640	2.5	0	11.6	0	6.52	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
400	French Ave.	Blue Springs Park	Lawton Ave./Hamilton	1.25	2	Collector	4	Minor Collector - Urban	Urban		710	13,640	2.5	0	1.1	0	4.38	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
399	French Ave.	Beginning of road	Blue Springs Park	1.00	2	Collector	4	Minor Collector - Urban	Urban		200	13,640	2.5	0	2	0	25	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
802	Frontier Drive	Old Kings Road (E)	Palm Harbor Parkway	1.14	2	Collector	4		Urban	D	1,800	24,000	2.5	0	1.8	0	2.7	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
405	Garfield Rd.	Doyle Rd.	Enterprise-Osteen Rd	0.90	2	Collector	4	Minor Collector - Urban	Urban		1,900	13,640	2.5	0	0.2	0	0.32	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
407	Glencoe Rd.	SR 44	Paige Ave.	1.10	2	Collector	4	Minor Collector - Urban	Urban		4,280	13,640	2.5	0	3.5	0	2.21	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	10.0
406	Glencoe Rd.	Pioneer Tr.	SR 44	0.85	2	Collector	4	Minor Collector - Urban	Urban		1,500	13,640	2.5	0	0.2	0	0.43	0	0	0	0	0	0	0		0	2.5	0.0	0	2.5	5.0	7.5
408	Glencoe Rd.	Paige Ave.	Taylor Rd.	1.50	2	Collector	4	Minor Collector - Urban	Urban		1,740	13,640	2.5	0	1.2	0	1.88	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
410	Glenwood Rd.	SR 15A	US 17	1.25	2	Collector	4	Major Collector - Urban	Urban		2,400	13,640	2.5	0	4.8	0	5.45	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
409	Glenwood Rd.	Grand Ave.	SR 15A	1.60	2	Collector	4	Major Collector - Urban	Urban		4,360	13,640	2.5	0	2.1	0	1.34	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
415	Grand Av/CR 4053	Minnesota Ave.	SR 44	0.90	2	Collector	4	Major Collector - Urban	Urban		3,090	13,640	2.5	0	8	0	7.06	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
412	Grand Av/CR 4053	Lemon St.	Glenwood Rd.	1.30	2	Collector	4	Major Collector - Urban	Urban		4,010	14,740	2.5	0	1.8	0	1.26	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
413	Grand Av/CR 4053	Glenwood Rd.	Plymouth Ave.	2.10	2	Collector	4	Major Collector - Urban	Urban		2,680	12,300	2.5	0	0.5	0	0.49	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
411	Grand Av/CR 4053	Retta St.	Lemon St.	1.80	2	Collector	4	Major Collector - Urban	Urban		2,100	13,640	2.5	0	0.9	0	1.16	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
414	Grand Av/CR 4053	Plymouth Ave.	Minnesota Ave.	0.50	2	Collector	4	Major Collector - Urban	Urban		1,760	13,640	2.5	0	0	0	0	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
416	Grand Av/CR 4053	SR 44	Old New York Ave.	0.60	2	Collector	4	Major Collector - Urban	Urban		970	13,640	2.5	0	0.3	0	0.91	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
419	Graves Av/CR 4145	Veteran's Memorial Pkwy.	Kentucky Ave.	0.30	2	Collector	4	Minor Arterial - Urban	Urban		19,180	17,900	5	2.5	28	5	4	5	10	0	0	0	0	0		0	0.0	0.0	5	0	5.0	22.5
420	Graves Av/CR 4145	Kentucky Ave.	Howland Blvd.	0.90	2	Collector	4	Minor Arterial - Urban	Urban		15,310	17,900	10	2.5	19.6	5	3.51	5	10	0	0	0	0	0		0	0.0	7.5	0	0	7.5	30.0
418	Graves Av/CR 4145	Leavitt Ave.	Veteran's Memorial Pkwy	1.20	2	Collector	4	Major Collector - Urban	Urban		7,970	13,640	2.5	0	3	0	1.03	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
417	Graves Av/CR 4145	US 17/92	Leavitt Ave.	0.50	2	Collector	4	Major Collector - Urban	Urban		6,390	14,740	2.5	0	2.4	0	1.03	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
423	Halifax Dr. (OB)	Neptune Ave.	SR 40	0.70	2	Collector	4	Major Collector - Urban	Urban		5,790	13,640	2.5	0	14.6	5	6.89	5	10	0	0	0	1	5		0	2.5	0.0	0	0	2.5	20.0
422	Halifax Dr. (OB)	John Anderson Dr.	Neptune Ave.	1.35	2	Collector	4	Major Collector - Urban	Urban		3,560	13,640	2.5	0	5.5	0	4.2	5	5	0	0	0	1	5		0	0.0	0.0	0	0	0.0	12.5
630	Halifax/Riverside Dr. (PO)	Dunlawton Ave.	Commonwealth Ave	1.55	2	Collector	4	Minor Collector - Urban	Urban		1,990	13,640	2.5	0	2.8	0	3.93	5	5	0	5	5	0	0		0	2.5	0.0	0	0	2.5	15.0
424	Halleck St. (NSB)	Wayne Ave.	Enterprise Ave.	0.20	2	Collector	4	Major Collector - Urban	Urban		6,410	13,640	2.5	0	3	0	1.3	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
426	Hand Ave.	Clyde Morris Blvd.	Shangri La Dr.	0.75	2	Collector	4	Major Collector - Urban	Urban		15,370	13,640	5	2.5	8	0	1.43	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	12.5
427	Hand Ave.	Shangri La Dr.	Nova Rd.	0.25	4	Collector	4	Major Collector - Urban	Urban		15,820	37,970	2.5	2.5	4.8	0	0.83	0	0	0	0	0	1	5		0	0.0	0.0	5	0	5.0	15.0
425	Hand Ave.	Williamson Blvd.	Clyde Morris Blvd.	1.25	2	Collector	4	Major Collector - Urban	Urban		8,720	17,050	2.5	0	6.2	0	1.96	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	7.5
428	Hand Ave. (OB)	Nova Rd.	US 1	1.90	2	Collector	4	Major Collector - Urban	Urban		5,360	13,640	2.5	0	10.3	0	5.27	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
803	Hargrove Grade Road	US 1	RR Xing	1.00	2	Collector	4		Urban	D	3,400	24,000	2.5	0	1.2	0	0.97	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
429	Harley Strickland Blvd. (OC)	Enterprise Rd.	Veteran's Memorial Pkwy.	1.35	2	Collector	4	Major Collector - Urban	Urban		11,760	14,040	10	2.5	19.6	5	4.55	5	10	0	0	0	3	10		0	0.0	0.0	5	0	5.0	37.5
431	Hazen Rd.	Plymouth Ave.	SR 44	1.00	2	Collector	4	Minor Collector - Urban	Urban		1,680	13,640	2.5	0	1.2	0	1.94	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
430	Hazen Rd.	Mercers Fernery Rd.	Plymouth Ave.	1.50	2	Collector	4	Minor Collector - Urban	Urban		850	13,640	2.5	0	0.1	0	0.43	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
433	Highbanks Rd. (DB)	Westside Connector	US 17/92	1.00	2	Collector	4	Minor Collector - Urban	Urban		11,310	10,660	5	2.5	5	0	1.21	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
434	Highbanks Rd. (DB)	US 17/92	Enterprise Rd.	1.45	2	Collector	4	Minor Collector - Urban	Urban		8,310	12,740	5	0	2.9	0	0.95	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	12.5
432	Highbanks Rd. (DB)	Fort Florida Rd.	Westside Connector	1.75	2	Collector	4	Minor Collector - Urban	Urban		2,900	12,740	2.5	0	1.5	0	1.4	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
436	Highbridge Rd.	John Anderson Dr.	SR A1A	0.20	2	Collector	4	Major Collector - Urban	Urban		2,380	13,640	2.5	0	18	5	20	5	10	0	5	5	0	0		0	0.0	0.0	0	0	0.0	17.5
435	Highbridge Rd.	Walter Boardman Ln.	John Anderson Dr.	1.60	2	Collector	4	Major Collector - Rural	Rural		2,770	12,300	2.5	0	3.3	0	3.21	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
440	Hill Ave.	SR 44	Voorhis Ave.	0.25	2	Collector	4	Major Collector - Urban	Urban		3,220	13,640	2.5	0	10.4	0	8.67	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
441	Hill Ave.	Voorhis Ave.	Beresford Ave.	0.75	2	Collector	4	Major Collector - Urban	Urban		2,680	13,640	2.5	0	1.3	0	1.35	0	0	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	5.0
439	Hill Ave. (DL)	Minnesota Ave.	SR 44	0.50	2	Collector	4	Major Collector - Urban	Urban		3,800	13,640	2.5	0	10.8	0	7.71	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
438	Hill Ave. (DL)	Plymouth Ave.	Minnesota Ave.	0.50	2	Collector	4	Major Collector - Urban	Urban		5,850	13,640	2.5	0	6.4	0	3.02	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
437	Hill Ave./Jacobs Rd.	US 92	Plymouth Ave.	0.85	2	Collector	4	Major Collector - Urban	Urban		7,590	13,640	2.5	0	1.9	0	0.68	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
443	Hontoon Rd.	Old New York Ave.	Botts Landing Rd.	1.15	2	Collector	4	Minor Collector - Urban	Urban		3,450	13,640	2.5	0	1.6	0	1.25	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
444	Hontoon Rd.	Botts Landing Rd.	end of road	2.00	2	Collector	4	Minor Collector - Urban	Urban		1,090	13,640	2.5	0	0.7	0	1.75	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
445	Howland Blvd.	I-4/SR 472	Wolf Pack Run	0.40	4	Non-Regional	3	Minor Arterial - Urban	Urban		32,320	37,970	10	7.5	70	5	5.93	5	10	0	0	0	0	0		0	2.5	0.0	5	0	7.5	35.0
448	Howland Blvd.	Providence Blvd.	Elkcam Blvd.	2.10	2	Non-Regional	3	Minor Arterial - Urban	Urban		17,220	13,640	2.5	2.5	9	0	1.42	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	10.0
446	Howland Blvd.	Wolf Pack Run	Catalina Blvd.	1.15	4	Non-Regional	3	Minor Arterial - Urban	Urban		30,270	37,970	5	7.5	17.7	5	1.61	0	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	17.5
449	Howland Blvd.	Elkcam Blvd.	Lake Helen-Osteen Rd.	0.30	4	Non-Regional	3	Minor Arterial - Urban	Urban		15,940	37,970	2.5	2.5	54	5	9.31	5	10	0	0	0	3	10		0	0.0	0.0	0	0	0.0	25.0
447	Howland Blvd.	Catalina Blvd.	Providence Blvd.	0.35	4	Non-Regional	3	Minor Arterial - Urban	Urban		23,950	37,970	5	5	32	5	3.66	5	10	0	0	0	0	0		0	0.0	0.0	0	0	0.0	20.0
450	Howland Blvd.	Lake Helen-Osteen Rd.	Newmark Dr.	0.70	4	Non-Regional	3	Minor Arterial - Urban	Urban		21,360	37,970	2.5	5	9.4	0	1.21	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	17.5
453	Howland Blvd.	Ft Smith Blvd.	SR 415	0.65	4	Non-Regional	3	Minor Arterial - Urban	Urban		13,600	37,970	2.5	2.5	15.7	5	3.17	0	5	0	0	0	2	10		0	0.0	0.0	0	0	0.0	20.0
451	Howland Blvd.	Newmark Dr.	Courtland Blvd.	1.15	4	Non-Regional	3	Minor Arterial - Urban	Urban		17,440	37,970	2.5	2.5	6.1	0	0.96	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	15.0
452	Howland Blvd.	Courtland Blvd.	Ft Smith Blvd.	1.80	4	Non-Regional	3	Minor Arterial - Urban	Urban		12,000	37,970	2.5	2.5	9	0	2.06	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	15.0
458	India Blvd. (DEL)	Fort Smith Blvd.	Humphrey Blvd.	2.06	2	Collector	4	Minor Collector - Urban	Urban		4,120	10,660	2.5	0	2.8	0	1.87	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
461	Jimmy Ann Dr. (DAY)	LPGA Blvd.	Clyde Morris Blvd.	0.30	2	Collector	4	Minor Collector - Urban	Urban		6,980	12,740	2.5	0	25.3	5	10	5	10	0	0	0	1	5		0	2.5	0.0	5	0	7.5	25.0
462	Jimmy Ann Dr. (DAY)	Clyde Morris Blvd.	Mason Ave.	0.15	2	Collector	4	Minor Collector - Urban	Urban		3,890	12,740	2.5	0	13.3	0	9.09	5	5	0	0	0	1	5		0	2.5	0.0	0	0	2.5	15.0
464	John Anderson Dr.	Lynnhurst	Halifax Dr	0.85	2	Collector	4	Major Collector - Urban	Urban		5,790	13,640	2.5	0	2.1	0	1	0	0	0	5	5	1	5		0	0.0	0.0	0	0	0.0	12.5
463	John Anderson Dr.	Highbridge Rd.	Lynnhurst	7.40	2	Collector	4	Major Collector - Urban	Urban		4,190	13,640	2.5	0	1.2	0	0.81	0	0	0	5	5	1	5		0	0.0	0.0	0	0	0.0	12.5
467	John Anderson Hwy.	Walter Boardman Lane	Flagler Co.	1.00	2	Collector	4	Minor Collector - Rural	Rural		1,190	12,300	2.5	0	1.2	0	2.73	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
468	Josephine St./10th St.	Old Mission Rd.	Tatum Blvd.	0.30	2	Collector	4	Major Collector - Urban	Urban		6,650	13,640	2.5	0	11.3	0	4.72	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
469	Josephine St./10th St. (NSB)	Tatum Blvd.	US 1	1.80	2	Collector	4	Major Collector - Urban	Urban		6,990	14,040	2.5	0	10.1	0	3.96	5	5	0	0	0	1	5		0	0.0	0.0	0	0	0.0	12.5
471	Kennedy Pkwy (Old SR 3)	US 1	Park Entrance	4.00	2	Collector	4	Major Collector - Rural	Rural		660	6,300	2.5	0	0.3	0	1.25	0	0	0	5	5	1	5		0	0.0	0.0	0	0	0.0	12.5
472	Kicklighter Rd.	Macy Ave.	Lake Helen-Osteen/Prevatt	0.75	2	Collector	4	Minor Collector - Urban	Urban		2,020	13,640	2.5	0	0.3	0	0.36	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
478	Lake Helen-Osteen Rd.	Elkcam Blvd.	Howland Blvd.	0.40	2	Non-Regional	3	Minor Arterial - Urban	Urban		6,360	13,640	2.5	0	15.5	5	6.74	5	10	0	0	0	1	5		0	0.0	0.0	0	0	0.0	17.5
476	Lake Helen-Osteen Rd.	Catalina Blvd.	Haulover Blvd.	0.50	2	Non-Regional	3	Minor Arterial - Urban	Urban		11,000	13,640	10	2.5	2.8	0	0.7	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	12.5
475	Lake Helen-Osteen Rd.	Captain Dr.	Catalina Blvd.	0.40	2	Non-Regional	3	Minor Arterial - Urban	Urban		7,700	13,640	2.5	0	4	0	1.43	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
474	Lake Helen-Osteen Rd.	Kicklighter Rd.	Captain Dr.	1.40	2	Non-Regional	3	Minor Arterial - Urban	Urban		7,280	13,640	2.5	0	1.7	0	0.65	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
477	Lake Helen-Osteen Rd.	Haulover Blvd.	Elkcam Blvd.	1.75	2	Non-Regional	3	Minor Arterial - Urban	Urban		5,680	13,640	2.5	0	6.6	0	3.2	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
484	Lake Winona Rd.	Blackwelder Rd.	US 17	2.25	2	Collector	4	Minor Collector - Rural	Rural		1,030	6,300	2.5	0	0.6	0	1.67	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
483	Lake Winona Rd.	SR 40	Blackwelder Rd.	3.70	2	Collector	4	Minor Collector - Rural	Rural		200	6,300	2.5	0	0.2	0	2.14	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
807	Lakeview Boulevard	London Drive	Matanzas Woods Parkway	1.33	2	Collector	4		Urban	D	3,500	24,200	2.5	0	1.7	0	1.29	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
481	Lakeview Dr.	New York Ave.	Main St.	0.25	2	Collector	4	Minor Collector - Urban	Urban		1,150	13,640	2.5	0	1.6	0	4	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
482	Lakeview Dr.	Main St.	Ohio Ave.	0.50	2	Collector	4	Major Collector - Urban	Urban		3,280	13,640	2.5	0	1.2	0	1	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
918	Lambert Ave	Lambert Ave & SR 100	Lambert Ave & Flagler Co. Line	1.46	2	Collector	4		Urban	D	900	14,800	2.5	0	0.5	0	1.67	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
495	LPGA Blvd. (CO)	Derbyshire Rd.	SR5A/Nova Rd.	0.55	4	Non-Regional	3	Minor Arterial - Urban	Urban		16,300	30,420	2.5	2.5	41.1	5	6.89	5	10	10	0	10	0	0		0	2.5	7.5	0	0	10.0	35.0
494	LPGA Blvd. (DB)	Jimmy Ann Dr.	Derbyshire Rd.	0.25	2	Non-Regional	3	Minor Arterial - Urban	Urban		20,370	14,040	2.5	5	43.2	5	5.81	5	10	10	0	10	0	0		0	2.5	7.5	0	0	10.0	37.5
492	LPGA Blvd. (DB)	Williamson Blvd.	Clyde Morris Blvd.	0.50	4	Non-Regional	3	Minor Arterial - Urban	Urban		23,320	37,970	5	5	18	5	2.11	0	5	10	0	10	2	10		0	2.5	7.5	0	0	10.0	45.0
491	LPGA Blvd. (DB)	Tomoka Farms Rd	Williamson Blvd	0.65	4	Non-Regional	3	Minor Arterial - Urban	Urban		27,390	37,970	5	5	34.2	5	3.42	0	5	10	0	10	1	5		0	2.5	7.5	0	0	10.0	40.0
493	LPGA Blvd. (DB)	Clyde Morris Blvd.	Jimmy Ann Dr.	1.10	4	Non-Regional	3	Minor Arterial - Urban	Urban		18,490	37,970	2.5	2.5	6.7	0	1	0	0	10	0	10	2	10		0	2.5	7.5	0	0	10.0	35.0
490	LPGA Blvd. (DB)	Welshinger-Butler Circle	Tomoka Farms Rd.	2.60	2	Non-Regional	3	Minor Arterial - Urban	Urban		11,170	17,050	5	2.5	4.4	0	1.08	0	0	0	5	5	0	0		0	0.0	0.0	5	0	5.0	17.5
489	LPGA Blvd. (DB)	US 92	Welshinger-Butler Circle	2.75	2	Non-Regional	3	Minor Arterial - Urban	Urban		8,990	17,050	2.5	0	1.1	0	0.33	0	0	0	5	5	0	0		0	2.5	7.5	0	0	10.0	17.5
496	LPGA Blvd. (HH)	SR5A/Nova Rd.	US 1	1.10	2	Non-Regional	3	Minor Arterial - Urban	Urban		10,990	14,040	5	2.5	18.5	5	4.62	5	10	10	0	10	1	5		0	2.5	0.0	5	0	7.5	40.0
497	Macy Ave.	Ohio St.	Cassadaga Rd.	0.75	2	Collector	4	Major Collector - Urban	Urban		1,400	13,640	2.5	0	1.1	0	2.11	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
498	Madeline Ave. (PO)	Williamson Blvd.	Clyde Morris Blvd	1.30	2	Collector	4	Major Collector - Urban	Urban		11,549	14,040	10	2.5	2.8	0	0.66	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	12.5
499	Madeline Ave. (PO)	Clyde Morris Blvd.	SR5A/Nova Rd.	1.30	2	Collector	4	Major Collector - Urban	Urban		8,000	14,040	2.5	0	10	0	3.42	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
500	Madeline Ave. (PO)	SR5A/Nova Rd.	Sauls St.	1.00	2	Collector	4	Major Collector - Urban	Urban		4,860	14,040	2.5	0	2.6	0	1.46	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
503	Main St. (Enterprise)	DeBary Ave.	Lakeshore Dr.	0.20	2	Collector	4	Urban Local	Urban		2,540	13,640	2.5	0	2	0	2.22	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
504	Main St. (Harbor Oaks)	Riverside Dr.	US 1	0.20	2	Collector	4	Minor Collector - Urban	Urban		510	13,640	2.5	0	4	0	20	5	5	0	5	5	0	0		0	0.0	0.0	0	0	0.0	12.5
505	Main St. (Lake Helen)	I-4	Lakeview Dr.	0.95	2	Collector	4	Major Collector - Urban	Urban		7,500	13,640	2.5	0	4.4	0	1.62	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	10.0
813	Market Avenue	Belle Terre Parkway	Central Avenue	0.28	2	Collector	4		Urban	D	500	24,200	2.5	0	1.4	0	6.67	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
507	Marsh Rd.	Carter Rd.	US 92	2.05	2	Collector	4	Minor Collector - Urban	Urban		2,780	13,640	2.5	0	2.8	0	2.79	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
506	Marsh Rd.	Daugharty Rd.	Carter Rd.	3.00	2	Collector	4	Minor Collector - Rural	Rural		910	12,300	2.5	0	0.5	0	1.4	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
508	Mason Ave.	Williamson Blvd.	Fentress Blvd.	0.60	2	Non-Regional	3	Minor Arterial - Urban	Urban		10,250	17,900	2.5	2.5	5.3	0	1.43	0	0	0	5	5	1	5		0	2.5	0.0	5	0	7.5	22.5
509	Mason Ave.	Fentress Blvd.	Bill France Blvd.	0.50	2	Non-Regional	3	Minor Arterial - Urban	Urban		10,320	17,900	2.5	2.5	9.2	0	2.45	0	0	0	5	5	1	5		0	2.5	0.0	0	0	2.5	17.5
510	Mason Ave.	Bill France Blvd.	Jimmy Ann Dr.	0.30	4	Non-Regional	3	Minor Arterial - Urban	Urban		13,480	37,970	2.5	2.5	16	5	3.24	0	5	0	5	5	1	5		0	2.5	0.0	0	0	2.5	22.5
511	Mason Ave.	Jimmy Ann Dr.	SR 483/Clyde Morris Blvd	0.50	4	Non-Regional	3	Minor Arterial - Urban	Urban		13,030	37,970	2.5	2.5	2.8	0	0.59	0	0	0	5	5	1	5		0	2.5	0.0	5	0	7.5	22.5
817	Matanzas Woods Parkway	Bird of Paradise Drive	I-95 SB	0.10	2	Non-Regional	3		Urban	D	10,700	17,700	5	2.5	10	0	2.5	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	15.0
818	Matanzas Woods Parkway	I-95 SB	I-95 NB	0.29	2	Non-Regional	3		Urban	D	10,100	17,700	2.5	2.5	4.1	0	1.13	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	12.5
819	Matanzas Woods Parkway	I-95 NB	Old King Rd Extension	0.23	2	Non-Regional	3		Urban	D	9,300	17,700	2.5	0	0.9	0	0.26	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
816	Matanzas Woods Parkway	Belle Terre Parkway	Bird of Paradise Drive	0.80	2	Non-Regional	3		Urban	D	8,200	17,700	2.5	0	5	0	1.67	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
820	Matanzas Woods Parkway	Old Kings Rd Extension	Matanzas HS Entrance	0.52	2	Non-Regional	3		Urban	D	6,800	17,700	2.5	0	4.6	0	1.85	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
815	Matanzas Woods Parkway	US 1	Belle Terre Parkway	1.06	2	Non-Regional	3		Urban	D	4,000	17,700	2.5	0	1.1	0	0.78	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0

Road ID	Roadway	From	To	Length	# of Lanes	Roadway Classification	Road Class for Ranking	Functional Classification	Rural/Urban	Adopted LOS Standard	Existing Volumes	Roadway Capacity	V/C Scoring Final	Final Existing Scoring	Crashes/Year/Mile	Crashes/Year/Mile Scoring	Crashes/MVMT	Crashes/MVMT Scoring	Total Safety Scoring	Primary Scoring	Secondary Scoring	Total Evac Scoring	# of Transit Routes	Transit Scoring	Beach Connector?	Beach Scoring	CCTV Scoring	Existing Fiber Scoring	Touch Fiber Scoring	1/4 Fiber Scoring	Total ITS Scoring	Total Scoring
512	Maytown Rd.	New Smyrna Blvd.	Pell Rd.	5.60	2	Collector	4	Minor Collector - Rural	Rural		3,640	12,300	2.5	0	0.9	0	0.7	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
513	Maytown Rd.	Pell Rd.	Beacon Light Rd.	12.90	2	Collector	4	Minor Collector - Rural	Rural		840	6,300	2.5	0	0.9	0	2.93	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
514	Maytown Rd./Halifax Ave. (OH)	Beacon Light Rd.	US 1	1.10	2	Collector	4	Minor Collector - Rural	Rural		2,060	12,300	2.5	0	2	0	2.68	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
517	McGregor Rd.	Spring Garden Ave.	US17/92	1.40	2	Collector	4	Major Collector - Urban	Urban		4,110	13,640	2.5	0	5.9	0	3.9	5	5	0	0	0	0	0		0	2.5	0.0	5	0	7.5	15.0
516	McGregor Rd.	Westside Con./Fatio	Spring Garden Ave.	0.70	2	Collector	4	Minor Collector - Urban	Urban		2,010	13,640	2.5	0	0.3	0	0.38	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
520	Midway Ave.	Williamson Blvd.	US 92	2.00	4	Collector	4	Minor Collector - Urban	Urban		2,880	37,970	2.5	0	15.4	5	14.67	5	10	0	0	0	2	10		0	2.5	0.0	5	0	7.5	30.0
525	Minnesota Ave. (DeLand)	Blue Lake Ave.	Kepler Rd.	0.85	2	Collector	4	Major Collector - Urban	Urban		4,940	13,640	2.5	0	3.8	0	2.08	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
523	Minnesota Ave. (DeLand)	Amelia Ave.	Hill Ave	0.75	2	Collector	4	Major Collector - Urban	Urban		2,350	13,640	2.5	0	11.2	0	13.13	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
522	Minnesota Ave. (DeLand)	SR 15A	US 17/92	1.25	2	Collector	4	Minor Collector - Urban	Urban		1,610	13,640	2.5	0	7.4	0	12.43	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
521	Minnesota Ave. (DeLand)	Grand Ave.	SR 15A	1.35	2	Collector	4	Minor Collector - Urban	Urban		3,610	13,640	2.5	0	0.7	0	0.56	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
524	Minnesota Ave. (DeLand)	Hill Ave.	Blue Lake Ave.	0.50	2	Collector	4	Major Collector - Urban	Urban		2,310	13,640	2.5	0	0.8	0	0.95	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
527	Minnesota Ave. (Orange City)	US 17/92	Leavitt Ave.	0.50	2	Collector	4	Minor Collector - Urban	Urban		1,750	13,640	2.5	0	2.8	0	4.38	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
528	Minnesota Ave. (Orange City)	Leavitt Ave.	SR 472	0.50	2	Collector	4	Minor Collector - Urban	Urban		1,420	13,640	2.5	0	0.4	0	0.77	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
590	Mission Dr.	SR 44	Old Mission Rd.	0.75	4	Collector	4	Major Collector - Urban	Urban		13,230	37,970	2.5	2.5	8	0	1.66	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	12.5
531	New Hampshire Ave.	Clara Ave.	US 17/92	0.25	2	Collector	4	Minor Collector - Urban	Urban		3,250	13,640	2.5	0	32	5	26.67	5	10	0	0	0	1	5		0	0.0	0.0	0	2.5	2.5	20.0
530	New Hampshire Ave.	Adelle Ave	Clara Ave.	0.50	2	Collector	4	Minor Collector - Urban	Urban		3,260	13,640	2.5	0	2.8	0	2.33	0	0	0	0	0	1	5		0	0.0	0.0	0	2.5	2.5	10.0
529	New Hampshire Ave.	SR 15A	Adelle Ave	0.15	2	Collector	4	Minor Collector - Urban	Urban		3,040	13,640	2.5	0	5.3	0	5	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
538	New York Ave. (Lake Helen)	Summit Ave.	Lakeview Dr.	0.50	2	Collector	4	Minor Collector - Urban	Urban		1,020	13,640	2.5	0	1.6	0	4.44	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
537	New York Ave. (Orange City)	Carpenter Ave.	US 17/92	0.25	2	Collector	4	Minor Collector - Urban	Urban		6,820	13,640	2.5	0	31.2	5	12.58	5	10	0	0	0	0	0		0	0.0	0.0	5	0	5.0	17.5
536	New York Ave. (Orange City)	Sparkman Ave.	Carpenter Ave	0.30	2	Collector	4	Minor Collector - Urban	Urban		5,960	13,640	2.5	0	0.7	0	0.3	0	0	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	5.0
535	New York Ave. (Orange City)	Westside Pkwy/Hamilton Ave.	Sparkman Ave	0.50	2	Collector	4	Minor Collector - Urban	Urban		5,060	13,640	2.5	0	2	0	1.09	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
532	Newmark Dr. (DEL)	Ft Smith Blvd.	Humphrey Blvd.	1.60	2	Collector	4	Major Collector - Urban	Urban		6,900	10,660	5	0	3.9	0	1.54	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	15.0
533	Newmark Dr. (DEL)	Humphrey Blvd.	Howland Blvd	0.90	2	Collector	4	Major Collector - Urban	Urban		7,160	10,660	5	0	4	0	1.53	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	10.0
534	Newmark Dr. (DEL)	Howland Blvd.	Courtland Blvd.	0.75	2	Collector	4	Minor Collector - Urban	Urban		1,340	10,660	2.5	0	8.8	0	18.33	5	5	0	0	0	1	5		0	0.0	0.0	0	0	0.0	12.5
542	Normandy Blvd. (DEL)	Saxon Blvd.	Deltona Blvd	0.70	2	Non-Regional	3	Major Collector - Urban	Urban		10,630	10,660	10	2.5	16.6	5	4.26	5	10	0	0	0	2	10		0	2.5	0.0	0	0	2.5	35.0
543	Normandy Blvd. (DEL)	Deltona Blvd.	Tivoli Dr.	1.10	3	Non-Regional	3	Major Collector - Urban	Urban		10,100	10,660	10	2.5	8	0	2.17	0	0	0	0	0	3	10		0	0.0	0.0	0	0	0.0	22.5
544	Normandy Blvd. (DEL)	Tivoli Dr.	Providence Blvd	0.90	3	Non-Regional	3	Major Collector - Urban	Urban		7,100	10,660	5	0	4.4	0	1.71	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	15.0
546	Normandy Blvd. (DEL)	Saxon Blvd.	Ft Smith Blvd	0.75	2	Non-Regional	3	Major Collector - Urban	Urban		11,270	13,990	10	2.5	2.1	0	0.52	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	12.5
539	Normandy Blvd. (DEL)	Graves (old Howland)	Rhode Island Ave.	1.25	2	Non-Regional	3	Major Collector - Urban	Urban		8,140	12,740	5	0	1.1	0	0.38	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	10.0
541	Normandy Blvd. (DEL)	Elkcam Blvd.	Saxon Blvd	1.00	4	Non-Regional	3	Major Collector - Urban	Urban		10,850	29,160	2.5	2.5	9.4	0	2.37	0	0	0	0	0	1	5		0	2.5	0.0	0	0	2.5	12.5
545	Normandy Blvd. (DEL)	Providence Blvd.	Saxon Blvd	1.00	2	Non-Regional	3	Major Collector - Urban	Urban		7,310	13,990	2.5	0	5.6	0	2.11	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
540	Normandy Blvd. (DEL)	Rhode Island Ave.	Elkcam Blvd.	0.50	2	Non-Regional	3	Major Collector - Urban	Urban		7,520	29,160	2.5	0	12	0	4.35	5	5	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	10.0
547	Ohio Ave. (LH)	Macy Ave.	Lakeview Dr.	0.20	2	Collector	4	Major Collector - Urban	Urban		760	13,640	2.5	0	1	0	3.33	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
548	Old Dixie Hwy.	I-95	Old Kings Rd.	0.60	2	Non-Regional	3	Major Collector - Urban	Urban		9,200	13,640	5	0	7	0	2.08	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	12.5
549	Old Dixie Hwy.	Old Kings Rd.	Walter Boardman Ln.	0.55	2	Non-Regional	3	Major Collector - Urban	Urban		4,340	13,640	2.5	0	8.7	0	5.45	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
550	Old Dixie Hwy.	Walter Boardman Ln.	Pine Tree Dr..	5.10	2	Non-Regional	3	Major Collector - Urban	Urban		2,750	13,640	2.5	0	0.7	0	0.74	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
551	Old Dixie Hwy.	Pine Tree Dr.	Ingelsia	0.50	2	Non-Regional	3	Major Collector - Urban	Urban		2,390	13,640	2.5	0	1.6	0	1.82	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
903	Old Kings Rd S	Old Kings Rd & SR 100	Old Kings Rd & Volusia Co Line	4.22	2	Non-Regional	3		Rural	D	2,800	17,700	2.5	0	0.9	0	0.93	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
552	Old Kings Rd.	Flagler Co.	Old Dixie Hwy.	0.60	2	Non-Regional	3	Major Collector - Urban	Urban		3,680	13,640	2.5	0	0.7	0	0.5	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
827	Old Kings Road	Farragut Drive	Palm Coast Parkway	0.39	4	Non-Regional	3		Urban	D	18,700	39,800	2.5	2.5	31.8	5	4.66	5	10	0	0	0	0	0		0	2.5	7.5	0	0	10.0	25.0
828	Old Kings Road	Palm Coast Parkway	Utility Drive	0.63	2	Non-Regional	3		Urban	D	10,700	24,200	2.5	2.5	106.3	5	27.24	5	10	0	0	0	0	0		0	2.5	7.5	0	0	10.0	25.0
830	Old Kings Road	Oak Trails Boulevard	Hidden Lake Blvd	3.35	2	Non-Regional	3		Rural	D	8,400	24,200	2.5	10	1	0	0.31	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	20.0
831	Old Kings Road	Hidden Lake Blvd	Town Center Drive	0.20	2	Non-Regional	3		Rural	D	8,700	24,200	2.5	10	8	0	2.5	0	0	0	0	0	0	0		0	2.5	0.0	0	2.5	5.0	17.5
826	Old Kings Road	Fleetwood Drive	Farragut Drive	0.65	2	Non-Regional	3		Urban	D	13,700	24,200	2.5	2.5	6.8	0	1.35	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	10.0
833	Old Kings Road	SR 100	Palm Coast City Limit	0.30	2	Non-Regional	3		Rural	D	7,600	24,200	2.5	7.5	0	0	0	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	17.5
825	Old Kings Road	Frontier Drive	Fleetwood Drive	0.46	2	Non-Regional	3		Urban	D	11,600	24,200	2.5	2.5	1.3	0	0.31	0	0	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	7.5
829	Old Kings Road	Utility Drive	Oak Trails Boulevard	0.25	2	Non-Regional	3		Urban	D	9,000	24,200	2.5	0	10.4	0	3.17	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
824	Old Kings Road	Farmsworth Drive	Frontier Drive	0.39	2	Non-Regional	3		Urban	D	8,600	24,200	2.5	0	5.6	0	1.8	0	0	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	5.0
822	Old Kings Road	Princess Place Preserve Entrance	Forest Grove Drive	3.01	2	Non-Regional	3		Urban	D	1,300	24,200	2.5	0	1.7	0	3.52	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
823	Old Kings Road	Forest Grove Drive	Farmsworth Drive	1.55	2	Non-Regional	3		Urban	D	4,900	24,200	2.5	0	3.9	0	2.16	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
821	Old Kings Road	US 1	Princess Place Preserve Entrance	1.55	2	Non-Regional	3		Rural	D	1,400	24,200	2.5	0	1.5	0	3	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	10.0
832	Old Kings Road	Town Center Boulevard	SR 100	1.61	4	Non-Regional	3		Rural	D	8,900	65,600	2.5	0	0.6	0	0.19	0	0	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	5.0
592	Old Mission Rd.	Josephine St.	Park Ave	1.70	2	Collector	4	Major Collector - Urban	Urban		6,970	10,220	5	0	6.6	0	2.59	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	5.0
593	Old Mission Rd.	Park Ave.	SR 442	2.00	2	Collector	4	Major Collector - Urban	Urban		3,970	13,640	2.5	0	1.5	0	1.03	0	0	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	5.0
591	Old Mission Rd./Mission Rd.	Old Mission Rd.	Josephine St.	0.75	4	Collector	4	Major Collector - Urban	Urban		12,580	37,970	2.5	2.5	1.3	0	0.29	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	5.0
556	Old New York Ave.	Lakeview Dr.	Grand Ave.	0.50	2	Collector	4	Minor Collector - Urban	Urban		5,140	13,640	2.5	0	0.8	0	0.43	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
555	Old New York Ave.	Hontoon Rd.	Lakeview Dr.	0.40	2	Collector	4	Minor Collector - Urban	Urban		3,970	13,640	2.5	0	0.5	0	0.34	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
557	Old New York Ave.	Grand Ave.	SR 44	0.91	2	Collector	4	Minor Collector - Urban	Urban		3,160	13,640	2.5	0	1.1	0	0.96	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
565	Orange Camp Rd.	US 17/92	Princeton	0.75	2	Non-Regional	3	Minor Arterial - Urban	Urban		11,800	14,040	10	2.5	13.3	0	3.09	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	20.0
568	Orange Camp Rd.	W Volusia Bltwy. (Dr MLK Jr)	I-4	1.00	2	Non-Regional	3	Minor Arterial - Urban	Urban		12,050	17,050	5	2.5	7	0	1.59	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	15.0
567	Orange Camp Rd.	Blue Lake Ave.	W Volusia Bltwy. (Dr MLK Jr)	0.55	2	Non-Regional	3	Minor Arterial - Urban	Urban		12,110	17,050	5	2.5	6.5	0	1.48	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
566	Orange Camp Rd.	Princeton.	Blue Lake Ave.	0.90	2	Non-Regional	3	Minor Arterial - Urban	Urban		11,300	17,050	5	2.5	3.1	0	0.75	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
562	Orange/Silver Beach Ave.	Beach St.	City Island Pkwy.	0.20	4	Non-Regional	3	Minor Arterial - Urban	Urban		11,060	30,420	2.5	2.5	38	5	9.5	5	10	10	0	10	2	10		0	2.5	0.0	5	0	7.5	42.5
561	Orange/Silver Beach Ave.	US 1	Beach St.	0.20	4	Non-Regional	3	Minor Arterial - Urban	Urban		8,950	30,420	2.5	0	38	5	11.52	5	10	10	0	10	3	10		0	2.5	7.5	0	0	10.0	42.5
563	Orange/Silver Beach Ave.	City Island Pkwy.	Peninsula Dr.	0.60	2	Non-Regional	3	Minor Arterial - Urban	Urban		10,960	14,040	5	2.5	9.7	0	2.42	0	0	10	0	10	0	0		0	2.5	0.0	0	2.5	5.0	22.5
564	Orange/Silver Beach Ave.	Peninsula Dr.	SR A1A	0.30	2	Non-Regional	3	Minor Arterial - Urban	Urban		6,000	14,040	2.5	0	14.7	5	6.67	5	10	10	0	10	1	5		0	0.0	0.0	0	0	0.0	27.5
558	Orange/Silver Beach Ave.	Nova Rd.	Dr Martin Luther King Jr Blvd.	0.75	2	Non-Regional	3	Minor Arterial - Urban	Urban		7,480	14,740	2.5	0	34.7	5	12.75	5	10	0	0	0	1	5		0	0.0	7.5	0	0	7.5	25.0
559	Orange/Silver Beach Ave.	Martin Luther King Jr Blvd.	Marion St.	0.20	2	Non-Regional	3	Minor Arterial - Urban	Urban		6,240	14,740	2.5	0	22	5	9.57	5	10	0	0	0	1	5		0	0.0	7.5	0	0	7.5	25.0
560	Orange/Silver Beach Ave.	Marion St.	US 1	0.10	4	Non-Regional	3	Minor Arterial - Urban	Urban		6,200	30,420	2.5	0	186	5	84.55	5	10	0	0	0	1	5		0	0.0	7.5	0	0	7.5	25.0
839	Palm Coast Parkway	Cypress Point Parkway	I-95 South Bound Ramps	0.27	6	Non-Regional	3		Urban	D	47,900	59,900	5	10	14.8	5	0.85	0	5	10	0	10	0	0		0	2.5	7.5	0	0	10.0	40.0
840	Palm Coast Parkway	I-95 South Bound Ramps	I-95 North Bound Ramps	0.39	6	Non-Regional	3		Urban	D	45,400	59,900	5	10	50.8	5	3.07	0	5	10	0	10	0	0		0	2.5	7.5	0	0	10.0	40.0
841	Palm Coast Parkway	I-95 North Bound Ramps	Old Kings Road	0.24	6	Non-Regional	3		Urban	D	42,100	59,900	5	10	23.3	5	1.52	0	5	10	0	10	0	0		0	2.5	7.5	0	0	10.0	40.0
834	Palm Coast Parkway	US 1	Pine Lakes Parkway	0.53	4	Non-Regional	3		Urban	D	12,700	39,800	2.5	2.5	4.5	0	0.98	0	0	10	0	10	0	0		0	0.0	7.5	0	0	7.5	22.5
843	Palm Coast Parkway (Eastbound)	Florida Park Drive	Club House Drive	0.26	2	Non-Regional	3		Urban	D	12,500	39,800	2.5	2.5	15.4	5	3.39	0	5	10	0	10	0	0		0	2.5	0.0	5	0	7.5	27.5
842	Palm Coast Parkway (Eastbound)	Old Kings Road	Florida Park Drive	0.34	2	Non-Regional	3		Urban	D	12,900	39,800	2.5	2.5	8.2	0	1.75	0	0	10	0	10	0	0		0	2.5	7.5	0	0	10.0	25.0
835	Palm Coast Parkway (Eastbound)	Pine Lakes Parkway	Belle Terre Parkway	1.22	2	Non-Regional	3		Urban	D	10,600	39,800	2.5	2.5	0	0	0	0	0	10	0	10	0	0		0	0.0	7.5	0	0	7.5	22.5
844	Palm Coast Parkway (Eastbound)	Club House Drive	Colbert Lane	0.25	2	Non-Regional	3		Urban	D	9,900	39,800	2.5	0	1.6	0	0.44	0	0	10	0	10	0	0		0	2.5	0.0	5	0	7.5	20.0
836	Palm Coast Parkway (Eastbound)	Belle Terre Parkway	Cypress Point Parkway	0.66	3	Non-Regional	3		Urban	D	17,000	39,800	2.5	2.5	0	0	0	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	12.5
845	Palm Coast Parkway (Eastbound)	Colbert Lane	Palm Harbor Parkway	0.93	2	Non-Regional	3		Urban	D	7,300	39,800	2.5	0	1.7	0	0.65	0	0	10	0	10	0	0		0	0.0	0.0	5	0	5.0	17.5
850	Palm Coast Parkway (Hammock Dunes Parkway)	Palm Harbor Parkway	SR A1A	1.11	2	Non-Regional	3		Urban	D	12,500	17,700	5	2.5	0	0	0	0	0	10	0	10	0	0		0	0.0	0.0	5	0	5.0	22.5
837	Palm Coast Parkway (Westbound)	Cypress Point Parkway	Belle Terre Parkway	0.65	3	Non-Regional	3		Urban	D	18,500	39,800	2.5	2.5	54.2	5	8.04	5	10	10	0	10	0	0		0	2.5	7.5	0	0	10.0	35.0
849	Palm Coast Parkway (Westbound)	Florida Park Drive	Old Kings Road	0.33	2	Non-Regional	3		Urban	D	14,600	39,800	2.5	2.5	36.4	5	6.82	5	10	10	0	10	0	0		0	2.5	7.5	0	0	10.0	35.0
848	Palm Coast Parkway (Westbound)	Club House Drive	Florida Park Drive	0.28	2	Non-Regional	3		Urban	D	11,800	39,800	2.5	2.5	74.3	5	17.33	5	10	10	0	10	0	0		0	2.5	7.5	0	0	10.0	35.0
838	Palm Coast Parkway (Westbound)	Belle Terre Parkway	Pine Lakes Parkway	1.16	2	Non-Regional	3		Urban	D	10,100	39,800	2.5	2.5	34.1	5	9.25	5	10	10	0	10	0	0		0	0.0	7.5	0	0	7.5	32.5
847	Palm Coast Parkway (Westbound)	Colbert Lane	Club House Drive	0.32	2	Non-Regional	3		Urban	D	9,600	39,800	2.5	0	17.5	5	5	5	10	10	0	10	0	0		0	0.0	7.5	0	0	7.5	30.0
846	Palm Coast Parkway (Westbound)	Palm Harbor Parkway	Colbert Lane	0.65	2	Non-Regional	3		Urban	D	7,500	39,800	2.5	0	15.1	5	5.51	5	10	10	0	10	0	0		0	0.0	7.5	0	0	7.5	30.0
855	Palm Harbor Parkway	Club House Drive	Palm Coast Parkway	0.75	2	Collector	4		Urban	D	5,100	14,800	2.5	0	4.3	0	2.29	0	0	0	5	5	0	0		0	0.0	7.5	0	0	7.5	15.0
853	Palm Harbor Parkway	Fellowship Lane	Florida Park Drive	0.70	2	Collector	4		Urban	D	7,100	24,200	2.5	0	5.1	0	1.98	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
852	Palm Harbor Parkway	Cris Lane	Fellowship Lane	0.70	2	Collector	4		Urban	D	5,300	24,200	2.5	0	4.9	0	2.5	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
851	Palm Harbor Parkway	Matanzas HS Entrance	Cris Lane	0.60	2	Collector	4		Urban	D	5,200	24,200	2.5	0	0	0	0	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
854	Palm Harbor Parkway	Florida Park Drive	Club House Drive	1.78	2	Collector	4		Urban	D	4,700	24,200	2.5	0	3.5	0	2.03	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
571	Park Ave.	Air Park Rd.	US 1	1.40	2	Collector	4	Major Collector - Urban	Urban		7,460	14,740	2.5	0	6.3	0	2.3	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
570	Park Ave.	Old Mission Rd.	Air Park Rd.	0.90	2	Collector	4	Major Collector - Urban	Urban		4,420	13,640	2.5	0	0.2	0	0.14	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
573	Peninsula Dr. - South	Marcelle Ave.	Major St.	0.45	2	Collector	4	Minor Collector - Urban	Urban		5,370	13,640	2.5	0	7.1	0	3.64	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
572	Peninsula Dr. - South	Dunlawton Ave.	Marcelle Ave	0.15	2	Collector	4	Minor Collector - Urban	Urban		4,800	13,640	2.5	0	12	0	6.92	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
574	Peninsula Dr. - South (PI)	Major St.	Inlet Harbor Rd	0.55	2	Collector	4	Minor Collector - Urban	Urban		6,030	13,640	2.5	0	3.6	0	1.64	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
575	Peninsula Dr. - South (PI)	Inlet Harbor Rd	Beach Street	3.00	2	Collector	4	Minor Collector - Urban	Urban		1,320	13,640	2.5	0	0.3	0	0.56	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	7.5
859	Pine Lakes Parkway	White Mill Drive	Belle Terre Parkway (S)	1.81	2	Collector	4		Urban	D	8,300	17,700	2.5	0	11.7	0	3.87	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
857	Pine Lakes Parkway	Palm Coast Parkway	Commerce Boulevard	0.15	2	Collector	4		Urban	D	9,500	17,700	2.5	0	10.7	0	3.08	0	0	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	5.0
858	Pine Lakes Parkway	Commerce Boulevard	White Mill Drive	1.85	2	Collector	4		Urban	D	6,500	17,700	2.5	0	3.7	0	1.55	0	0	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	5.0
856	Pine Lakes Parkway	Belle Terre Parkway (N)	Palm Coast Parkway	1.21	2	Collector	4		Urban	D	4,300	17,700	2.5	0	0.7	0	0.42	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
581	Pioneer Tr.	SR 44	Tomoka Farms Rd.	4.00	2	Non-Regional	3	Major Collector - Rural	Rural		5,750	12,300	2.5	2.5	2.2	0	1.02	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	10.0
587	Pioneer Tr.	Enterprise Ave.	Jungle Rd	0.50	2	Non-Regional	3	Major Collector - Urban	Urban		7,520	13,640	2.5	0	5.6	0	2.03	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
583	Pioneer Tr.	Airport Rd.	Turnbull Bay Rd.	2.50	2	Non-Regional	3	Major Collector - Urban	Urban		3,960	13,640	2.5	0	2.1	0	1.44	0	0	0	5	5	0	0		0	2.5	0.0	5	0	7.5	15.0
586	Pioneer Tr.	Williams Rd.	Enterprise Ave	1.05	2	Non-Regional	3	Major Collector - Urban	Urban		7,040	13,640	2.5	0	3	0	1.19	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
588	Pioneer Tr.	Jungle Rd	Canal St.	0.25	2	Non-Regional	3	Major Collector - Urban	Urban		2,500	13,640	2.5	0	12	0	13.64	5	5	0	5	5	0	0		0	2.5	0.0	0	2.5	5.0	17.5
585	Pioneer Tr.	Sugar Mill Dr.	Williams Rd.	1.45	2	Non-Regional	3	Major Collector - Urban	Urban		6,880	13,640	2.5	0	3.6	0	1.43	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
582	Pioneer Tr.	Tomoka Farms Rd.	Airport Rd.	1.40	2	Non-Regional	3	Major Collector - Urban	Urban		4,660	13,640	2.5	0	2.4	0	1.43	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
584	Pioneer Tr.	Turnbull Bay Rd.	Sugar Mill Dr	1.75	2	Non-Regional	3	Major Collector - Urban	Urban		3,580	13,640	2.5	0	0.8	0	0.61	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
600	Plymouth Ave.	Clara Ave.	US 17/92	0.20	2	Collector	4	Major Collector - Urban	Urban		13,940	14,040	10	2.5	37	5	7.25	5	10	0	0	0	1	5		0	0.0	0.0	0	0	0.0	27.5
601	Plymouth Ave.	US 17/92	Amelia Ave	0.20	2	Collector	4	Major Collector - Urban	Urban		8,730	14,040	5	0	57	5	17.81	5	10	0	0	0	1	5		0	0.0	0.0	0	0	0.0	20.0
599	Plymouth Ave.	Stone St.	Clara Ave	0.50	2	Collector	4	Major Collector - Urban	Urban		10,500	13,640	5	2.5	6.4	0	1.67	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	12.5
598	Plymouth Ave.	SR 15A	Stone St.	0.50	2	Collector	4	Major Collector - Urban	Urban		9,620	13,640	5	0	7.6	0	2.16	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	10.0
602	Plymouth Ave.	Amelia Ave.	Garfield Ave.	0.20	2	Collector	4	Major Collector - Urban	Urban		6,730	13,640	2.5	0	14	0	5.6	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
603	Plymouth Ave.	Garfield Ave.	Blue Lake Rd./Jacobs Dairy Rd	0.75	2	Collector	4	Major Collector - Urban	Urban		6,080	13,640	2.5	0	11.2	0	5.06	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
597	Plymouth Ave.	Hazen Rd.	SR 15A	0.75	2	Collector	4	Major Collector - Urban	Urban		5,600	13,640	2.5	0	2.7	0	1.3	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
596	Plymouth Ave.	Grand Ave.	Hazen Rd.	1.00	2	Collector	4	Major Collector - Urban	Urban		1,290	13,640	2.5	0	3.4	0	7.08	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
605	Prevatt Ave.	SR 44	Lake Pearl Dr.	1.80	2	Non-Regional	3	Minor Arterial - Urban	Urban		5,680	17,050	2.5	0	1.7	0	0.8	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
606	Prevatt Ave.	Lake Pearl Dr.	Kicklighter Rd	1.50	2	Non-Regional	3	Minor Arterial - Urban	Urban		4,640	17,050	2.5	0	0.7	0	0.39	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
608	Providence Blvd.	Elkcam Blvd.	Ft Smith Blvd.	0.80	2	Non-Regional	3	Minor Arterial - Urban	Urban		14,750	13,640	5	2.5	16.5	5	3.07	0	5	0	0	0	4	10		0	0.0	0.0	0	0	0.0	22.5
612	Providence Blvd.	Normandy Blvd.	Anderson Dr.	0.80	2	Non-Regional	3	Minor Arterial - Urban	Urban		12,860	13,640	10	2.5	14.8	5	3.14	0	5	0	0	0	2	10		0	0.0	0.0	0	0	0.0	27.5
613	Providence Blvd.	Anderson Dr.	Doyle Rd.	0.55	2	Non-Regional	3	Minor Arterial - Urban	Urban		13,730	13,640	5	2.5	10.5	0	2.1	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	17.5
609	Providence Blvd.	Ft Smith Blvd.	Tivoli Dr.	0.05	4	Non-Regional	3	Minor Arterial - Urban	Urban		19,140	30,420	5	2.5	156	5	22.94	5	10	0	0	0	3	10		0	0.0	0.0	0	0	0.0	27.5
607	Providence Blvd.	Howland Blvd.	Elkcam Blvd.	1.70	2	Non-Regional	3	Minor Arterial - Urban	Urban		10,990	14,040	5	2.5	5.5	0	1.38	0	0	0	0	0	4	10		0	0.0	0.0	0	0	0.0	17.5
611	Providence Blvd.	Saxon Blvd.	Normandy Blvd	0.70	2	Non-Regional	3	Minor Arterial - Urban	Urban		8,510	13,640	5	0	11.4	0	3.67	5	5	0	0	0	2	10		0	0.0	0.0	0	0	0.0	20.0
610	Providence Blvd.	Tivoli Dr.	Saxon Blvd.	0.80	2	Non-Regional	3	Minor Arterial - Urban	Urban		8,740	14,740	2.5	0	6.8	0	2.11	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	12.5
860	Ravenwood Drive	White View Parkway	Rymfire Drive	0.56	2	Collector	4		Urban	D	5,200	24,200	2.5	0	3.2	0	1.7	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
618	Reed Canal Rd.	Sauls St.	US 1	0.90	2	Collector	4	Minor Collector - Urban	Urban		7,060	13,640	2.5	0	15.1	5	5.86	5	10	0	0	0	0	0		0	0.0	0.0	0	0	0.0	12.5
617	Reed Canal Rd.	SR5A/Nova Rd.	Sauls St.	0.65	2	Collector	4	Minor Collector - Urban	Urban		8,180	13,640	5	0	10.2	0	3.4	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	5.0
616	Reed Canal Rd.	Clyde Morris Blvd.	SR5A/Nova Rd.	0.80	2	Collector	4	Minor Collector - Urban	Urban		6,570	13,640	2.5	0	6.8	0	2.81	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
619	Reed Ellis Rd.	Enterprise-Osteen Rd.	SR 415	2.10	2	Collector	4	Minor Collector - Urban	Urban		2,120	13,640	2.5	0	3.6	0	4.69	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
620	Retta St.	Grand Ave.	US 17	0.15	2	Collector	4	Major Collector - Urban	Urban		1,020	13,640	2.5	0	6.7	0	16.67	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
621	Reynolds Rd.	US 17	SR 11	4.40	2	Collector	4	Minor Collector - Urban/Rural	Rural		1,100	6,300	2.5	0	1.4	0	3.52	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
624	Rhode Island Ave.	Carpenter Ave	US 17/92	0.25	2	Collector	4	Minor Collector - Urban	Urban		7,340	14,740	2.5	0	46.4	5	17.58	5	10	0	0	0	0	0		0	2.5	0.0	5	0	7.5	20.0
622	Rhode Island Ave.	Westside Connector	Sparkman Ave	0.45	2	Collector	4	Minor Collector - Urban	Urban		6,810	14,740	2.5	0	6.2	0	2.5	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
623	Rhode Island Ave.	Sparkman Ave	Carpenter Ave	0.25	2	Collector	4	Minor Collector - Urban	Urban		3,260	14,740	2.5	0	3.2	0	2.67	0	0	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	5.0
625	Rhode Island Ave. (OC)	US 17/92	Veteran's Memorial Pkwy.	2.80	2	Collector	4	Major Collector - Urban	Urban		8,270	13,640	5	0	2.3	0	0.76	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	12.5
629	Riverside Dr. (NSB)	SR 44 (N. Causeway)	SR A1A (S. Causeway)	0.20	2	Collector	4	Minor Collector - Urban	Urban		4,390	13,640	2.5	0	24	5	15	5	10	10	0	10	0	0		0	0.0	0.0	0	2.5	2.5	25.0
631	Riverside Dr. (PO)	Commonwealth Ave.	Main St	1.20	2	Collector	4	Minor Collector - Urban	Urban		600	13,640	2.5	0	1.2	0	5.38	5	5	0	5	5	0	0		0	0.0	0.0	0	0	0.0	12.5
906	Roberts Road	Roberts Rd & Colbert Lane	Roberts Rd & Volusia Co. Line	5.46	2	Collector	4		Rural	D	950	17,700	2.5	0	0.6	0	1.79	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
863	Royal Palms Parkway	Belle Terre Parkway	Town Center Boulevard	1.57	2	Collector	4		Urban	D	8,300	17,700	2.5	0	1.5	0	0.5	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	10.0
861	Royal Palms Parkway	US 1	Rymfire Drive	0.68	2	Collector	4		Urban	D	6,600	17,700	2.5	0	0.3	0	0.12	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
862	Royal Palms Parkway	Rymfire Drive	Belle Terre Parkway	2.05	2	Collector	4		Urban	D	5,900	17,700	2.5	0	0.3	0	0.14	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
865	Rymfire Drive	Ravenwood Drive	Belle Terre Parkway	1.34	2	Collector	4		Urban	D	5,700	24,200	2.5	0	9.9	0	4.75	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
864	Rymfire Drive	Royal Palms Parkway	Ravenwood Drive	1.71	2	Collector	4		Urban	D	4,000	24,200	2.5	0	4.2	0	2.88	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
632	Samsula Dr.	Pioneer Tr.	SR 44	2.60	2	Collector	4	Minor Collector - Rural	Rural		1,280	12,300	2.5	0	1.7	0	3.61	5	5	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	10.0
640	Saxon Blvd.	I-4	Finland Dr.	0.35	4	Non-Regional	3	Minor Arterial - Urban	Urban		39,790	37,970	5	7.5	72.6	5	5	5	10	0	0	0	2	10		0	2.5	7.5	0	0	10.0	42.5
639	Saxon Blvd.	FDOT Park & Ride	I-4	0.30	6	Non-Regional	3	Minor Arterial - Urban	Urban		39,570	37,970	5	7.5	20	5	1.38	0	5	0	0	0	2	10		0	2.5	0.0	5	0	7.5	35.0
641	Saxon Blvd.	Finland Dr.	Normandy Blvd.	0.35	4	Non-Regional	3	Minor Arterial - Urban	Urban		37,870	37,970	10	7.5	43.4	5	3.14	0	5	0	0	0	2	10		0	2.5	0.0	5	0	7.5	40.0
638	Saxon Blvd.	VMP	FDOT Park & Ride	0.30	6	Non-Regional	3	Minor Arterial - Urban	Urban		40,360	47,560	10	10	64.7	5	4.39	5	10	0	0	0	2	10		0	0.0	0.0	0	0	0.0	40.0
637	Saxon Blvd.	Enterprise Rd.	Veterans Memorial Pkwy.	0.60	6	Non-Regional	3	Minor Arterial - Urban	Urban		31,620	47,560	5	7.5	76	5	6.59	5	10	0	0	0	2	10		0	2.5	0.0	0	0	2.5	35.0
636	Saxon Blvd.	US 17/92	Enterprise Rd	0.65	4	Non-Regional	3	Minor Arterial - Urban	Urban		14,580	30,420	2.5	2.5	43.4	5	8.15	5	10	0	0	0	3	10		0	2.5	0.0	5	0	7.5	32.5
642	Saxon Blvd.	Normandy Blvd.	Tivoli Dr.	1.25	4	Non-Regional	3	Minor Arterial - Urban	Urban		26,030	37,970	5	5	22.1	5	2.32	0	5	0	0	0	2	10		0	2.5	0.0	0	0	2.5	27.5
643	Saxon Blvd.	Tivoli Dr.	Providence Blvd.	0.90	2	Non-Regional	3	Minor Arterial - Urban	Urban		10,910	13,640	5	2.5	8.4	0	2.12	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	17.5
644	Saxon Blvd.	Providence Blvd.	Normandy Blvd.	0.70	2	Non-Regional	3	Major Collector - Urban	Urban		7,610	13,640	2.5	0	0	0	0	0	0	0	0	0	2	10		0	2.5	0.0	0	0	2.5	15.0
645	Saxon Blvd.	Normandy Blvd.	Doyle Rd.	1.00	2	Non-Regional	3	Major Collector - Urban	Urban		5,230	13,640	2.5	0	5	0	2.63	0	0	0	0	0	1	5		0	2.5	0.0	0	0	2.5	10.0
646	Saxon Dr. (NSB)	3rd Ave/SR A1A	27th Ave.	1.75	2	Collector	4	Major Collector - Urban	Urban		6,300	13,640	2.5	0	2.1	0	0.9	0	0	0	5	5	0	0		0	0.0	0.0	5	0	5.0	12.5
647	Saxon Dr. (NSB)	27th Ave.	Hiles Blvd.	1.55	2	Collector	4	Major Collector - Urban	Urban		3,250	13,640	2.5	0	1.2	0	0.98	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
648	Saxon Dr. (NSB)	Hiles Blvd.	SR A1A	0.55	2	Collector	4	Major Collector - Urban	Urban		960	13,640	2.5	0	0.7	0	2	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
866	Seminole Woods Parkway	SR 100	Ulaturn Place	0.95	4	Non-Regional	3		Urban	D	10,100	65,600	2.5	2.5	0.6	0	0.17	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	10.0
869	Seminole Woods Parkway	Sesame Boulevard	US 1	1.37	2	Non-Regional	3		Urban	D	5,500	24,200	2.5	0	10.7	0	5.29	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5

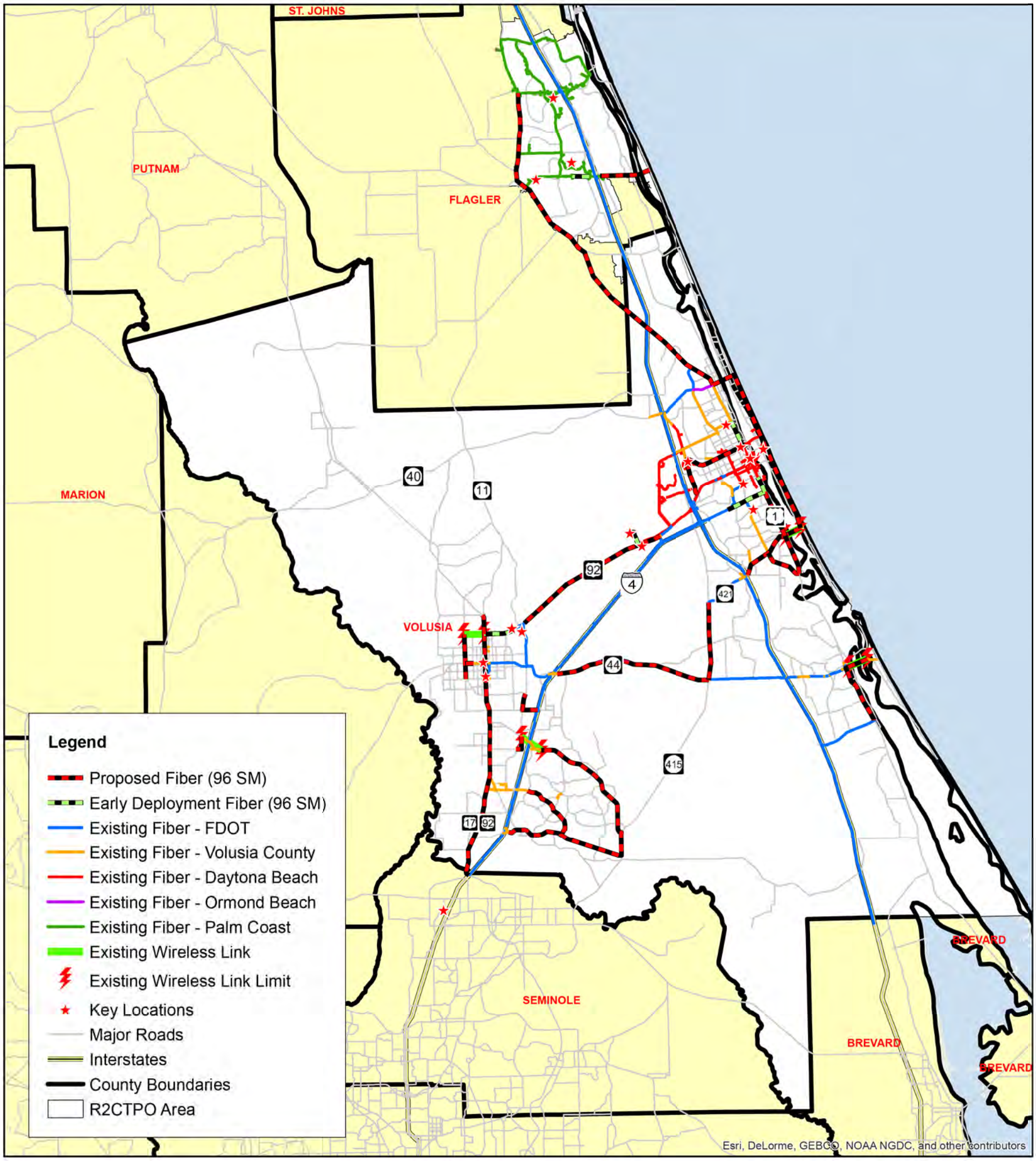
Road ID	Roadway	From	To	Length	# of Lanes	Roadway Classification	Road Class for Ranking	Functional Classification	Rural/Urban	Adopted LOS Standard	Existing Volumes	Roadway Capacity	V/C Scoring Final	Final Existing Scoring	Crashes/Year/Mile	Crashes/Year/Mile Scoring	Crashes/MVMT	Crashes/MVMT Scoring	Total Safety Scoring	Primary Scoring	Secondary Scoring	Total Evac Scoring	# of Transit Routes	Transit Scoring	Beach Connector?	Beach Scoring	CCTV Scoring	Existing Fiber Scoring	Touch Fiber Scoring	1/4 Fiber Scoring	Total ITS Scoring	Total Scoring
868	Seminole Woods Parkway	Citation Parkway	Sesame Boulevard	1.15	2	Non-Regional	3		Urban	D	5,200	24,200	2.5	0	2.1	0	1.1	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
867	Seminole Woods Parkway	Ulaturn Place	Citation Parkway	1.45	4	Non-Regional	3		Urban	D	8,500	65,600	2.5	0	3.6	0	1.16	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
870	Sesame Boulevard	Seminole Woods Parkway	terminus	2.92	2	Collector	4		Urban	D	1,300	24,200	2.5	0	1.1	0	2.32	0	0	0	0	0	0	0		0	2.5	0.0	0	2.5	5.0	7.5
649	Shell Rd. (DB)	Highbanks Rd.	Sanford Ave.	1.10	2	Collector	4	Minor Collector - Urban	Urban		2,570	10,660	2.5	0	3.5	0	3.65	5	5	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	10.0
650	Shell Rd. (DB)	Sanford Ave.	Benson Junction Rd.	0.70	2	Collector	4	Minor Collector - Urban	Urban		2,030	10,660	2.5	0	0.6	0	0.77	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
653	Sparkman Ave.	French Ave.	Blue Springs Ave.	0.65	2	Collector	4	Minor Collector - Urban	Urban		3,340	13,640	2.5	0	1.8	0	1.5	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
654	Sparkman Ave.	Blue Springs Ave.	Rhode Island Ave.	0.60	2	Collector	4	Minor Collector - Urban	Urban		2,420	13,640	2.5	0	2.7	0	3.08	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
652	Sparkman Ave.	New York Ave. W.	French Ave.	0.75	2	Collector	4	Minor Collector - Urban	Urban		2,160	13,640	2.5	0	1.1	0	1.33	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
656	Spring Garden Ave.	Beresford Rd. West	McGregor Rd.	0.90	2	Collector	4	Minor Collector - Urban	Urban		2,300	13,640	2.5	0	1.8	0	2.11	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
655	Spring Garden Ave.	Beresford Ave.	Beresford Rd. West	0.60	2	Collector	4	Minor Collector - Urban	Urban		2,080	13,640	2.5	0	2.3	0	3.04	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
657	Spring Garden Ranch Rd.	US 17	Aragon Ave	0.20	2	Collector	4	Major Collector - Urban	Urban		2,540	13,640	2.5	0	9	0	10	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
658	Spring Garden Ranch Rd.	Aragon Ave	Arrendondo Grant/East Ave	1.20	2	Collector	4	Major Collector - Urban/Rural	Urban		520	6,300	2.5	0	0.7	0	3.64	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
661	Spruce Creek Rd.	SR5A/Nova Rd.	Taylor Rd.	0.75	4	Collector	4	Major Collector - Urban	Urban		16,000	37,970	2.5	2.5	32.8	5	5.62	5	10	0	0	0	1	5		0	0.0	0.0	0	0	0.0	20.0
660	Spruce Creek Rd.	Commonwealth Blvd.	SR5A/Nova Rd.	0.50	2	Collector	4	Major Collector - Urban	Urban		9,280	13,640	5	0	8.4	0	2.47	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	5.0
659	Spruce Creek Rd. (PO)	Dunlawton Ave.	Commonwealth Blvd.	1.05	2	Collector	4	Major Collector - Urban	Urban		5,790	13,640	2.5	0	4.6	0	2.16	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
905	SR 100	SR100& Heritage Crossroads Hwy	SR 100 & Bunnell	5.53	2	SIS	1		Rural	C	8,100	16,800	2.5	10	3	0	1.01	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	22.5
921	SR 100	SR100 & Belle Terre Pkwy	SR 100 & Commerce Pkwy	0.73	4	SIS	1		Urban	C	15,100	37,900	2.5	2.5	4.1	0	0.74	0	0	10	0	10	0	0		0	0.0	7.5	0	0	7.5	22.5
910	SR 100	SR 100 & S Holland St	SR 100 & Flagler Co Line	0.85	2	Regional	2		Rural	D	3,200	24,200	2.5	0	1.9	0	1.63	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
177	SR 100 - Flagler County	John Anderson Hwy (CR 201)	Lambert Ave. (CR 201)	0.50	4	Regional	2	Principal Arterial - Other - Urban	Urban		18,600	39,800	2.5	2.5	14	0	2.06	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	25.0
178	SR 100 - Flagler County	Lambert Ave. (CR 201)	SR A1A	0.70	4	Regional	2	Principal Arterial - Other - Urban	Urban		14,000	39,800	2.5	2.5	12.9	0	2.51	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	25.0
127	SR 11	SR 40	CR 15A	9.19	2	Regional	2	Principal Arterial - Other - Rural	Rural		3,400	6,300	2.5	0	1.2	0	0.95	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
126	SR 11	CR 304 (in Flagler Co.)	SR 40	2.42	2	Regional	2	Principal Arterial - Other - Rural	Rural		2,800	6,300	2.5	0	3.4	0	3.31	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
128	SR 11	CR 15A	US 17	2.45	2	Regional	2	Principal Arterial - Other - Urban	Urban		7,700	24,200	2.5	0	4.9	0	1.74	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
132	SR 15A	Plymouth Ave.	SR 44/New York Ave.	1.01	4	SIS	1	Principal Arterial - Other - Urban	Urban		26,000	37,900	5	5	7.7	0	0.81	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	15.0
135	SR 15A	New Hampshire Ave.	US 17/92	1.17	4	SIS	1	Principal Arterial - Other - Urban	Urban		22,500	37,900	2.5	5	11.3	0	1.38	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
131	SR 15A	CR 92	Plymouth Ave.	0.83	4	SIS	1	Principal Arterial - Other - Urban	Urban		21,800	37,900	2.5	5	6.7	0	0.85	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	12.5
133	SR 15A	SR 44/New York Ave.	Beresford Ave.	1.00	4	SIS	1	Principal Arterial - Other - Urban	Urban		25,000	37,900	5	5	5.4	0	0.59	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	10.0
129	SR 15A	US 17	Glenwood Rd.	1.11	4	SIS	1	Principal Arterial - Other - Urban	Urban		10,900	37,900	2.5	2.5	47.2	5	11.86	5	10	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	17.5
134	SR 15A	Beresford Ave.	New Hampshire Ave.	0.59	4	SIS	1	Principal Arterial - Other - Urban	Urban		23,500	37,900	5	5	0	0	0	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	10.0
130	SR 15A	Glenwood Rd.	CR 92	1.20	4	SIS	1	Principal Arterial - Other - Urban	Urban		14,700	37,900	2.5	2.5	0.7	0	0.12	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	5.0
143	SR 40	Tymber Creek Rd.	I-95	0.79	4	SIS	1	Principal Arterial - Other - Urban	Urban		30,500	37,900	5	7.5	29.6	5	2.66	0	5	10	0	10	0	0		0	2.5	0.0	5	0	7.5	35.0
142	SR 40	Rima Ridge Rd	Tymber Creek Rd.	4.36	4	SIS	1	Principal Arterial - Other - Urban	Urban		30,500	37,900	5	7.5	3.2	0	0.29	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	22.5
137	SR 40	Lake County	Emporia Rd.	0.86	2	SIS	1	Principal Arterial - Other - Rural	Rural		8,700	16,400	2.5	10	6.3	0	1.97	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	17.5
138	SR 40	Emporia Rd.	US 17	5.58	2	SIS	1	Principal Arterial - Other - Rural	Rural		8,500	16,400	2.5	10	2.6	0	0.84	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	17.5
140	SR 40	SR 11	Pinto Lane	6.83	2	SIS	1	Principal Arterial - Other - Rural	Rural		6,900	16,400	2.5	5	1.7	0	0.69	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	12.5
139	SR 40	US 17	SR 11	6.69	4	SIS	1	Principal Arterial - Other - Rural	Rural		6,900	16,400	2.5	0	2.4	0	0.96	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
141	SR 40	Pinto Lane	Rima Ridge Rd (urban boundary)	1.25	4	SIS	1	Principal Arterial - Other - Urban/Rural	Urban		11,100	37,900	2.5	2.5	2.4	0	0.59	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	10.0
147	SR 40	US 1	Halifax Ave.	1.11	4	Regional	2	Principal Arterial - Other - Urban	Urban		34,500	32,400	5	7.5	57.1	5	4.54	5	10	10	0	10	4	10	Y	10	2.5	0.0	5	0	7.5	60.0
144	SR 40	I-95	Clyde Morris Blvd.	1.58	4	Regional	2	Principal Arterial - Other - Urban	Urban		35,500	39,800	10	7.5	53.5	5	4.13	5	10	10	0	10	3	10	Y	10	2.5	7.5	0	0	10.0	67.5
146	SR 40	SR5A/Nova Rd.	US 1	1.33	4	Regional	2	Principal Arterial - Other - Urban	Urban		31,000	39,800	5	7.5	55	5	4.87	5	10	10	0	10	5	10	Y	10	2.5	0.0	5	0	7.5	60.0
145	SR 40	Clyde Morris Blvd.	SR 5A/Nova Rd.	1.06	4	Regional	2	Principal Arterial - Other - Urban	Urban		32,000	39,800	5	7.5	39.2	5	3.36	0	5	10	0	10	3	10	Y	10	2.5	7.5	0	0	10.0	57.5
148	SR 40	Halifax Ave.	SR A1A	0.37	4	Regional	2	Principal Arterial - Other - Urban	Urban		20,200	32,400	5	5	39.5	5	5.37	5	10	10	0	10	3	10	Y	10	2.5	0.0	0	0	2.5	52.5
181	SR 400 - Beville Rd.	SR 483/Clyde Morris Blvd.	SR 5A/Nova Rd.	0.68	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		32,000	39,800	5	7.5	100.9	5	8.64	5	10	10	0	10	3	10		0	2.5	7.5	0	0	10.0	52.5
180	SR 400 - Beville Rd.	Williamson Blvd.	SR 483/Clyde Morris Blvd.	1.91	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		30,500	39,800	5	7.5	22.2	5	1.99	0	5	10	0	10	0	0		0	2.5	7.5	0	0	10.0	37.5
182	SR 400 - Beville Rd.	SR 5A/Nova Rd.	US 1	1.34	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		27,000	39,800	5	5	33.4	5	3.39	0	5	10	0	10	1	5		0	2.5	7.5	0	0	10.0	40.0
179	SR 400 - Beville Rd.	I-95	Williamson Blvd.	0.28	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		26,000	39,800	5	5	28.6	5	3.01	0	5	10	0	10	0	0		0	2.5	7.5	0	0	10.0	35.0
183	SR 415 - State Count	SR 44	Acorn Lake Rd	10.49	2	Regional	2	Minor Arterial - Rural	Rural		11,700	16,400	5	10	2.6	0	0.62	0	0	0	5	5	0	0		0	2.5	0.0	0	2.5	5.0	25.0
185	SR 415 - State Count	Howland Blvd.	Enterprise-Osteen Rd.	1.83	4	Regional	2	Minor Arterial - Urban	Urban		17,300	39,800	2.5	2.5	8.6	0	1.37	0	0	0	5	5	2	10		0	0.0	0.0	0	0	0.0	20.0
186	SR 415 - State Count	Enterprise-Osteen Rd.	Seminole Co.	4.39	4	Regional	2	Minor Arterial - Urban/Rural	Urban		18,300	24,200	5	2.5	5.6	0	0.84	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	12.5
184	SR 415 - State Count	Acorn Lake Rd	Howland Blvd.	0.88	4	Regional	2	Minor Arterial - Urban	Urban		8,600	39,800	2.5	0	2.7	0	0.87	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
188	SR 421 - Dunlawton Ave.	Williamson	Clyde Morris Blvd.	1.07	6	Non-Regional	3	Principal Arterial - Other - Urban	Urban		47,500	59,900	5	10	59.6	5	3.44	0	5	10	0	10	2	10	Y	10	2.5	0.0	5	0	7.5	57.5
189	SR 421 - Dunlawton Ave.	Clyde Morris Blvd.	SR 5A/Nova Rd.	1.31	6	Non-Regional	3	Principal Arterial - Other - Urban	Urban		41,500	59,900	5	10	59.8	5	3.95	5	10	10	0	10	5	10	Y	10	2.5	0.0	0	0	2.5	57.5
190	SR 421 - Dunlawton Ave.	SR5A/Nova Rd.	Spruce Creek Rd.	0.91	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		31,500	39,800	5	7.5	32.7	5	2.85	0	5	10	0	10	2	10	Y	10	2.5	0.0	0	0	2.5	50.0
191	SR 421 - Dunlawton Ave.	Spruce Creek Rd.	US 1	0.71	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		27,500	39,800	5	5	38.6	5	3.85	5	10	10	0	10	2	10	Y	10	2.5	0.0	0	0	2.5	52.5
192	SR 430 - Mason Ave.	SR 483/Clyde Morris Blvd.	SR 5A/Nova Rd.	0.99	4	Non-Regional	3	Minor Arterial - Urban	Urban		20,600	24,300	10	5	90.3	5	12.02	5	10	0	5	5	2	10	Y	10	2.5	7.5	0	0	10.0	60.0
193	SR 430 - Mason Ave.	SR 5A/Nova Rd.	US 1	1.08	4	Non-Regional	3	Minor Arterial - Urban	Urban		20,600	24,300	10	5	67.2	5	8.94	5	10	0	5	5	0	0	Y	10	0.0	0.0	5	0	5.0	45.0
194	SR 430 - Mason Ave.	US 1	Beach St.	0.30	4	Non-Regional	3	Minor Arterial - Urban	Urban		20,600	32,400	5	5	24	5	3.19	0	5	0	5	5	0	0	Y	10	2.5	7.5	0	0	10.0	40.0
195	SR 430 - Oakridge Blvd. - EB	Beach St.	Peninsula Dr	0.70	2	Non-Regional	3	Minor Arterial - Urban	Urban		7,200	23,880	2.5	0	17.1	5	6.52	5	10	10	0	10	0	0	Y	10	2.5	0.0	5	0	7.5	40.0
196	SR 430 - Oakridge Blvd. - EB	Peninsula Dr	SR A1A/Atlantic	0.28	2	Non-Regional	3	Minor Arterial - Urban	Urban		4,600	23,880	2.5	0	40.7	5	23.75	5	10	0	0	0	0	0	Y	10	2.5	7.5	0	0	10.0	32.5
198	SR 430 - Seabreeze Bridge - WB	Peninsula Dr	SR A1A/Atlantic	0.29	2	Non-Regional	3	Minor Arterial - Urban	Urban		5,800	19,440	2.5	0	177.2	5	82.9	5	10	10	0	10	0	0	Y	10	2.5	7.5	0	0	10.0	42.5
197	SR 430 - Seabreeze Bridge - WB	Beach St.	Peninsula Dr	1.01	2	Non-Regional	3	Minor Arterial - Urban	Urban		6,600	23,880	2.5	0	31.9	5	13.2	5	10	10	0	10	0	0	Y	10	2.5	7.5	0	0	10.0	42.5
168	SR 44	I-95	Mission Dr	2.83	4	Regional	2	Principal Arterial - Other - Urban	Urban		35,000	39,800	10	7.5	32.2	5	2.52	0	5	10	0	10	0	0	Y	10	2.5	7.5	0	0	10.0	52.5
160	SR 44	Kepler Rd.	Summit Ave.	1.18	2	Regional	2	Principal Arterial - Other - Urban	Urban		20,200	19,800	5	5	18.6	5	2.53	0	5	10	0	10	0	0		0	2.5	7.5	0	0	10.0	35.0
165	SR 44	SR 415/CR 415	Samsula Dr.	1.14	4	Regional	2	Principal Arterial - Other - Rural	Rural		20,500	25,900	5	5	8.9	0	1.19	0	0	10	0	10	0	0	Y	10	2.5	7.5	0	0	10.0	40.0
169	SR 44	Mission Dr.	Live Oak	1.35	4	Regional	2	Principal Arterial - Other - Urban	Urban		19,500	39,800	2.5	2.5	27.7	5	3.9	5	10	10	0	10	0	0	Y	10	2.5	7.5	0	0	10.0	45.0
159	SR 44	Blue Lake Ave.	Kepler Rd.	0.94	2	Regional	2	Principal Arterial - Other - Urban	Urban		15,700	20,800	5	2.5	22.3	5	3.9	5	10	10	0	10	0	0		0	2.5	7.5	0	0	10.0	37.5
162	SR 44	I-4	Prevatt Ave.	0.74	4	Regional	2	Principal Arterial - Other - Urban	Urban		21,500	39,800	2.5	5	21.6	5	2.76	0	5	10	0	10	0	0	Y	10	2.5	0.0	5	0	7.5	40.0
157	SR 44	Amelia Ave.	Hill Ave.	1.00	2	Regional	2	Principal Arterial - Other - Urban	Urban		13,100	18,939	5	2.5	22	5	4.6	5	10	10	0	10	0	0		0	0.0	7.5	0	0	7.5	35.0
166	SR 44	Samsula Dr.	Airport Rd	1.70	4	Regional	2	Principal Arterial - Other - Urban/Rural	Urban		20,000	25,900	5	0	2.8	0	0.39	0	0	10	0	10	0	0	Y	10	0.0	7.5	0	0	7.5	32.5
158	SR 44	Hill Ave.	Blue Lake Ave.	0.51	2	Regional	2	Principal Arterial - Other - Urban	Urban		12,600	19,800	5	2.5	21.6	5	4.7	5	10	10	0	10	0	0		0	0.0	7.5	0	0	7.5	35.0
156	SR 44	Clara Ave.	Amelia Ave.	0.50	2	Regional	2	Principal Arterial - Other - Urban	Urban		9,300	15,600	5	0	57.6	5	16.94	5	10	10	0	10	0	0		0	2.5	7.5	0	0	10.0	35.0
164	SR 44	Pioneer Tr.	SR 415/CR 415	3.56	4	Regional	2	Principal Arterial - Other - Rural	Rural		14,500	25,900	2.5	2.5	2.7	0	0.51	0	0	10	0	10	0	0	Y	10	2.5	0.0	5	0	7.5	32.5
163	SR 44	Prevatt Ave.	Pioneer Tr.	5.93	4	Regional	2	Principal Arterial - Other - Rural	Rural		19,500	25,900	5	2.5	3.7	0	0.52	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	27.5
167	SR 44	Airport Rd.	I-95	2.05	4	Regional	2	Principal Arterial - Other - Urban	Urban		20,000	39,800	2.5	0	10.6	0	1.46	0	0	10	0	10	0	0	Y	10	2.5	7.5	0	0	10.0	32.5
155	SR 44	Stone St.	Clara Ave.	0.51	2	Regional	2	Principal Arterial - Other - Urban	Urban		10,800	18,939	2.5	2.5	18.4	5	4.65	5	10	10	0	10	0	0		0	0.0	0.0	5	0	5.0	30.0
150	SR 44	Lake Co.	Shell Rd.	1.19	2	Regional	2	Principal Arterial - Other - Rural	Rural		12,900	16,400	5	10	4.2	0	0.89	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	25.0
154	SR 44	SR 15A/Spring Garden Ave.	Stone St.	0.50	2	Regional	2	Principal Arterial - Other - Urban	Urban		11,700	18,939	5	2.5	28.8	5	6.73	5	10	10	0	10	0	0		0	0.0	0.0	0	0	0.0	27.5
153	SR 44	Old New York/Hazen Rd.	SR 15A/Spring Garden Ave.	0.71	2	Regional	2	Principal Arterial - Other - Urban	Urban		12,800	24,200	2.5	2.5	22.5	5	4.82	5	10	10	0	10	0	0		0	0.0	0.0	0	0	0.0	25.0
161	SR 44	Summit Ave.	I-4	0.98	4	Regional	2	Principal Arterial - Other - Urban	Urban		18,100	39,800	2.5	2.5	11.2	0	1.7	0	0	10	0	10	0	0		0	2.5	7.5	0	0	10.0	25.0
151	SR 44	Shell Rd.	Grand Ave.	1.26	2	Regional	2	Principal Arterial - Other - Urban	Urban		12,900	24,200	2.5	2.5	4.3	0	0.91	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	15.0
152	SR 44	Grand Ave.	Old New York/Hazen Rd.	0.70	2	Regional	2	Principal Arterial - Other - Urban	Urban		10,800	24,200	2.5	2.5	8.9	0	2.25	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	15.0
174	SR 44 (Business) - Canal St.	Pioneer Tr.	US 1	0.76	2	Non-Regional	3	Minor Arterial - Urban	Urban		11,500	17,700	5	2.5	31.6	5	7.5	5	10	0	5	5	0	0		0	2.5	0.0	5	0	7.5	30.0
173	SR 44 (Business) - Canal St.	SR 44/Lytle St	Pioneer Trail	0.17	2	Non-Regional	3	Minor Arterial - Urban	Urban		9,500	17,700	2.5	0	43.5	5	12.76	5	10	0	5	5	0	0		0	2.5	7.5	0	0	10.0	27.5
175	SR 44 (Old) - N Causeway	Riverside Dr	Peninsula	0.14	2	Non-Regional	3	Minor Arterial - Urban	Urban		10,200	14,800	5	2.5	71.4	5	19.23	5	10	10	0	10	0	0		0	0.0	0.0	0	0	0.0	27.5
172	SR 44/SR A1A/3rd Ave/Atlantic	Saxon Dr.	6th Ave	0.50	4	Regional	2	Principal Arterial - Other - Urban	Urban		12,700	39,800	2.5	2.5	25.6	5	5.52	5	10	10	0	10	0	0	Y	10	0.0	7.5	0	0	7.5	42.5
171	SR 44/SR A1A/S Causeway	Peninsula Ave.	Saxon Dr.	0.35	4	Regional	2	Principal Arterial - Other - Urban	Urban		24,500	39,800	5	5	37.7	5	4.23	5	10	10	0	10	0	0	Y	10	0.0	7.5	0	0	7.5	47.5
170	SR 44/SR A1A/S Causeway	Live Oak	Peninsula Ave.	1.30	4	Regional	2	Principal Arterial - Other - Urban	Urban		30,000	39,800	5	0	4.2	0	0.38	0	0	10	0	10	0	0	Y	10	0.0	0.0	5	0	5.0	30.0
199	SR 441 - Peninsula Dr.	US 92/ISB	Silver Beach Ave.	0.65	2	Non-Regional	3	Minor Arterial - Urban	Urban		9,000	17,700	2.5	0	22.5	5	6.82	5	10	0	5	5	1	5		0	2.5	0.0	0	0	2.5	25.0
200	SR 441 - Peninsula Dr.	Silver Beach Ave.	Florida Shores	2.34	2	Non-Regional	3	Minor Arterial - Urban	Urban		9,000	17,700	2.5	0	5	0	1.51	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
201	SR 441 - Peninsula Dr.	Florida Shores	SR A1A/Dunlawton	2.42	2	Non-Regional	3	Minor Arterial - Urban	Urban		5,600	17,700	2.5	0	6.5	0	3.2	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
203	SR 442 - Indian River Blvd.	Air Park Rd.	US 1	1.69	4	Non-Regional	3	Minor Arterial - Urban	Urban		17,600	39,800	2.5	2.5	12.4	0	1.93	0	0	10	0	10	1	5		0	2.5	7.5	0	0	10.0	30.0
202	SR 442 - Indian River Blvd.	I-95	Air Park Rd.	2.09	4	Non-Regional	3	Minor Arterial - Urban	Urban		11,400	39,800	2.5	2.5	2.2	0	0.53	0	0	10	0	10	0	0		0	2.5	7.5	0	0	10.0	25.0
205	SR 472	CR 4101/MLK Blvd	I-4 (end of state road)	1.10	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		29,000	39,800	5	5	10.7	0	1.01	0	0	10	0	10	0	0		0	2.5	0.0	0	2.5	5.0	25.0
204	SR 472	US 17/92	CR 4101/MLK Blvd	2.31	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		24,000	65,600	2.5	5	8.1	0	0.92	0	0	10	0	10	0	0		0	0.0	0.0	5	0	5.0	22.5
207	SR 483 - Clyde Morris Blvd.	US 92/ISB	Aviation Ctr Pkwy/Bellevue	1.20	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		29,500	37,800	5	5	19.7	5	1.83	0	5	0	5	5	2	10		0	2.5	0.0	5	0	7.5	37.5
206	SR 483 - Clyde Morris Blvd.	SR 430 (Mason Ave.)	US 92/ISB	1.20	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		20,500	37,800	2.5	5	23	5	3.07	0	5	0	5	5	2	10		0	2.5	0.0	5	0	7.5	35.0
208	SR 483 - Clyde Morris Blvd.	Aviation Ctr Pkwy/Bellevue	SR 400/Beville Rd.	0.98	4	Non-Regional	3	Principal Arterial - Other - Urban	Urban		29,500	37,800	5	5	21.6	5	2.01	0	5	0	5	5	0	0		0	2.5	7.5	0	0	10.0	30.0
118	SR 5A - Nova Rd.	SR 430/Mason Ave.	US 92/ISB	1.22	6	Regional	2	Principal Arterial - Other - Urban	Urban		32,000	59,900	2.5	7.5	43	5	3.68	5	10	0	5	5	2	10		0	2.5	7.5	0	0	10.0	45.0
120	SR 5A - Nova Rd.	Bellevue Ave.	SR 400/Beville Rd.	1.00	6	Regional	2	Principal Arterial - Other - Urban	Urban		37,000	59,900	5	7.5	33.4	5	2.47	0	5	0	5	5	3	10		0	2.5	7.5	0	0	10.0	42.5
114	SR 5A - Nova Rd.	Wilmette Ave.	SR 40	0.51	6	Regional	2	Principal Arterial - Other - Urban	Urban		24,000	59,900	2.5	5	37.6	5	4.3	5	10	0	5	5	2	10		0	2.5	7.5	0	0	10.0	42.5
124	SR 5A - Nova Rd.	SR 421/Dunlawton Ave.	Spruce Creek Rd.	1.08	4	Regional	2	Principal Arterial - Other - Urban	Urban		26,000	39,800	5	5	37.2	5	3.93	5	10	0	5	5	4	10		0	2.5	0.0	0	0	2.5	37.5
116	SR 5A - Nova Rd.	Hand Ave.	LPGA Blvd.	2.06	6	Regional	2	Principal Arterial - Other - Urban	Urban		29,000	59,900	2.5	5	25.9	5	2.45	0	5	0	5	5	2	10		0	2.5	7.5	0	0	10.0	37.5
123	SR 5A - Nova Rd.	Madeline Ave	SR 421/Dunlawton Ave.	1.30	4	Regional	2	Principal Arterial - Other - Urban	Urban		26,500	39,800	5	5	40.6	5	4.2	5	10	0	5	5	1	5		0	2.5	0.0	0	0	2.5	32.5
119	SR 5A - Nova Rd.	US 92/ISB	Bellevue Ave.	1.07	6	Regional	2	Principal Arterial - Other - Urban	Urban		36,000	59,900	5	7.5	15.7	5	1.19	0	5	0	5	5	0	0		0	2.5	7.5	0	0	10.0	32.5
117	SR 5A - Nova Rd.	LPGA Blvd.	SR 430/Mason Blvd	1.47	6	Regional	2	Principal Arterial - Other - Urban	Urban		29,000	59,900	2.5	5	26.8	5	2.53	0	5	0	5	5	1	5		0	2.5	7.5	0	0	10.0	32.5
115	SR 5A - Nova Rd.	SR 40	Hand Ave.	1.15	6	Regional	2	Principal Arterial - Other - Urban	Urban		27,500	59,900	2.5	5	33.9	5	3.38	0	5	0	5	5	1	5		0	2.5	7.5	0	0	10.0	32.5
121	SR 5A - Nova Rd.	SR 400/Beville Rd.	Big Tree	0.70	6	Regional	2	Principal Arterial - Other - Urban	Urban		27,000	59,900	2.5	5	11.1	0	1.13	0	0	0	5	5	1	5		0	2.5	7.5	0	0	10.0	27.5
113	SR 5A - Nova Rd.	US 1	Wilmette Ave.	1.00	4	Regional	2	Principal Arterial - Other - Urban	Urban		14,000	39,800	2.5	2.5	18	5	3.52	5	10	0	5	5	0	0		0	2.5	7.5	0	0	10.0	30.0
122	SR 5A - Nova Rd.	Big Tree	Madeline Ave.	1.61	5	Regional	2	Principal Arterial - Other - Urban	Urban		27,000	49,850	2.5	5	10.4	0	1.06	0	0	0	5	5	1	5		0	0.0	0.0	5	0	5.0	22.5
125	SR 5A - Nova Rd.	Spruce Creek Rd.	US 1	1.44	4	Regional	2	Principal Arterial - Other - Urban	Urban		17,800	39,800	2.5	2.5	11.5	0	1.77	0	0	0	5	5	2	10		0	0.0	0.0	0	0	0.0	20.0
105	SR A1A - Atlantic Ave. North	Harvard Dr.	SR430/Seabreeze Blvd.)	2.53	4	Regional	2	Principal Arterial - Other - Urban	Urban		18,000	39,800	2.5	2.5	25.8	5	3.92	5	10	10	0	10	4	10	Y	10	2.5	7.5	0	0	10.0	55.0
107	SR A1A - Atlantic Ave. North	SR 430/Oakridge Blvd.	US 92/ISB	0.90	4	Regional	2	Principal Arterial - Other - Urban	Urban		15,800	39,800	2.5	2.5	50.2	5	8.69	5	10	10	0	10	4	10	Y	10	2.5	7.5	0	0	10.0	55.0
104	SR A1A - Atlantic Ave. North	SR 40	Harvard Dr.	1.70	4	Regional	2	Principal Arterial - Other - Urban	Urban		17,200	39,800	2.5	2.5	23.1	5	3.67	5	10	10	0	10	3	10	Y	10	2.5	0.0	5	0	7.5	52.5
106	SR A1A - Atlantic Ave. North	SR 430/Seabreeze Blvd.	SR430/Oakridge Blvd.	0.12	4	Regional	2	Principal Arterial - Other - Urban	Urban		20,000	39,800	2.5	0	45	5	6.14	5	10	10	0	10	3	10	Y	10	2.5	0.0	5	0	7.5	50.0
108	SR A1A - Atlantic Ave. South	US 92	Silver Beach Ave.	0.69	4	Regional	2	Principal Arterial - Other - Urban	Urban		14,200	39,800	2.5	2.5	19.4	5	3.74	5	10	10	0	10	2	10	Y	10	2.5	0.0	5	0	7.5	52.5
110	SR A1A - Atlantic Ave. South	Florida Shores	Van Ave.	1.29	4	Regional	2	Principal Arterial - Other - Urban	Urban		13,900	39,800	2.5	2.5	2.8	0	0.55	0	0	10	0	10	1	5	Y	10	0.0	0.0	0	0	0.0	30.0
111	SR A1A - Atlantic Ave. South	Van Ave.	SRA1A/Dunlawton Ave.	1.05	4	Regional	2	Principal Arterial - Other - Urban	Urban		13,600	39,800	2.5	2.5	3.4	0	0.69	0	0	10	0	10	1	5	Y	10	0.0	0.0	0	0	0.0	30.0
109	SR A1A - Atlantic Ave. South	Silver Beach Ave.	Florida Shores	2.34	4	Regional	2	Principal Arterial - Other - Urban	Urban		12,000	39,800	2.5	2.5	6.2	0	1.43	0	0	10	0	10	1	5	Y	10	0.0	0.0	0	0	0.0	30.0
112	SR A1A - Dunlawton Ave.	SR A1A/Atlantic Ave.	US 1	1.25	4	Regional	2	Principal Arterial - Other - Urban	Urban		30,500	39,800	5	7.5	6.7	0	0.6	0	0	10	0	10	1	5	Y	10	2.5	0.0	0	0	2.5	40.0
103	SR A1A - Ocean Shore Blvd.	Neptune Ave	SR 40 (Granada Blvd.)	0.70	2	Regional	2	Principal Arterial - Other - Urban	Urban		16,200	24,200	5	2.5	40	5	6.76	5	10	10	0	10	1	5	Y	10	2.5	0.0	0	0	2.5	45.0
102	SR A1A - Ocean Shore Blvd.	Ormond Mall	Neptune Ave	1.69	2	Regional	2	Principal Arterial - Other - Urban	Urban		15,800	24,200	5	2.5	13.7	0	2.38	0	0	10	0	10	1	5	Y	10	0.0	0.0	0	0	0.0	32.5
101	SR A1A - Ocean Shore Blvd.	High Bridge Rd	Ormond Mall	6.42	2	Regional	2	Principal Arterial - Other - Urban	Urban		15,500	24,200	5	2.5	7	0	1.24	0	0	10	0	10	1	5	Y	10	0.0	0.0	0	0	0.0	32.5
100	SR A1A - Ocean Shore Blvd.	Flagler Co Line	High Bridge Rd	1.26	2	Regional	2	Principal Arterial - Other - Urban	Urban		15,500	24,200	5	2.5	2.2	0	0.39	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	27.5
97	SR A1A - Ocean Shore Blvd.	N. 17th St.	SR 100	1.25	2	Regional	2	Principal Arterial - Other - Urban	Urban		6,700	17,700	2.5	0	11.7	0	4.77	5	5	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	27.5
98	SR A1A - Ocean Shore Blvd.	SR 100	S. 23rd St.	2.10	2	Regional	2	Principal Arterial - Other - Urban	Urban		8,700	17,700	2.5	0	7.9	0	2.49	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	22.5
99	SR A1A - Ocean Shore Blvd.	S. 23rd St.	Volusia Co. Line	2.00	2	Regional	2	Principal Arterial - Other - Urban	Urban		6,100	24,200	2.5	0	1.4	0	0.63	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	22.5
96	SR A1A - Ocean Shore Blvd.	Westmayer Pl.	N. 17th St.	2.25	2	Regional	2	Principal Arterial - Other - Urban	Urban		5,500	24,200	2.5	0	1.9	0	0.93	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	22.5
909	SR100	SR100 & Commerce Pkwy	SR100 & US1	1.30	2	SIS	1		Urban	C	12,700	7,300	2.5	2.5	18.6	5	4.02	5	10	10	0	10	0	0		0	0.0	7.5	0	0	7.5	32.5
907	SR100	SR100 & US1	SR100 & S Holland St	0.29	2	Regional	2		Urban	D	5,300	14,800	2.5	0	36.7	5	19.29	5	10	10	0	10	0	0		0	0.0	0.0	5	0	5.0	27.5
875	State Road 100	I-95	Memorial Medical Parkway	0.27	4	SIS	1		Urban	C	27,900	37,900	5	5	52.6	5	5.18	5	10	10	0	10	0	0		0	2.5	7.5	0	0	10.0	40.0
879	State Road 100	Landings Blvd.	Belle Terre Parkway	0.45	4	SIS	1		Urban	C	25,800	37,900	5	5	53.3	5	5.66	5	10	10	0	10	0	0		0	0.0	7.5	0	0	7.5	37.5
877	State Road 100	Seminole Woods Pkwy	Bulldog Drive	0.27	4	SIS	1		Urban	C	28,100	37,900	5	5	105.9	5	10.36	5	10	10	0	10	0	0		0	0.0	0.0	5	0	5.0	35.0
876	State Road 100	Memorial Medical Pkwy	Seminole Woods Parkway	0.35	4	SIS	1		Urban	C	28,200	37,900	5	5	9.1	0	0.89	0	0	10	0	10	0	0		0	0.0	7.5	0	0	7.5	27.5
878	State Road 100	Bulldog Drive	Landings Blvd.	0.78	4	SIS	1		Urban	C	26,900	37,900	5	5	12.3	0	1.25	0	0	10	0	10	0	0		0	0.0	7.5	0	0	7.5	27.5
880	State Road 100	Belle Terre Parkway	Palm Coast City Limits	0.45	4	SIS	1		Urban	C	17,200	37,900	2.5	2.5	62.7	5	10	5	10	10	0	10	0	0		0	0.0	7.5	0	0	7.5	32.5
874	State Road 100	Old Kings Road	I-95	0.49	4	Regional	2		Urban	D	31,100	39,800	5	7.5	35.9	5	3.17	0	5	10	0	10	0	0	Y	10	2.5	7.5	0	0	10.0	47.5
873	State Road 100	Tuscany Blvd.	Old Kings Road	1.07	4	Regional	2		Urban	D	22,500	39,800	2.5	5	6.2	0	0.75	0	0	10	0	10	0	0	Y	10	0.0	0.0	5	0	5.0	32.5
872	State Road 100	Colbert Lane	Tuscany Blvd.	0.46	4	Regional	2		Urban	D	22,600	39,800	2.5	5	3	0	0.37	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	27.5
871	State Road 100	John Anderson Drive	Colbert Lane	1.17	4	Regional	2		Urban	D	21,100	39,800	2.5	5	3.1	0	0.4	0	0	10	0	10	0	0	Y	10	0.0	0.0	0	0	0.0	27.5
663	Stone St.	CR 92	Plymouth Ave.	0.80	2	Collector	4	Major Collector - Urban	Urban		4,520	13,640	2.5	0	4	0	2.42	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
664	Sugar Mill Dr.	Pioneer Tr.	SR 44	1.30	2	Collector	4	Minor Collector - Urban	Urban		3,020	13,640	2.5	0	2.8	0	2.5	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
665	Summit Ave.	SR 44	Main St.	2.20	2	Collector	4	Minor Collector - Urban	Urban		4,130	13,640	2.5	0	0.5	0	0.36	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	10.0
671	Taylor Rd. (CO)	Williamson Blvd.	I-95 (at Dunlawton Ave.)	0.15	5	Non-Regional	3	Principal Arterial - Other -Urban	Urban		41,100	47,560	10	10	142.7	5	9.47	5	10	0	5	5	1	5		0	2.5	7.5	0	0	10.0	50.0
669	Taylor Rd. (CO)	Crane Lake Blvd.	Summertree Rd.	0.75	2	Non-Regional	3	Principal Arterial - Other -Urban	Urban		15,910	17,050	10	2.5	13.6	0	2.34	0	0	0	5	5	0	0		0	0.0	7.5	0	0	7.5	25.0
670	Taylor Rd. (CO)	Summertree Rd.	Williamson Blvd.	0.20	4	Non-Regional	3	Principal Arterial - Other -Urban	Urban		16,360	37,970	2.5	2.5	67	5	11.17	5	10	0	5	5	0	0		0	2.5	7.5	0	0	10.0	30.0
668	Taylor Rd. (CO)	Spruce Creek Blvd.	Crane Lake Blvd.	1.10	2	Non-Regional	3	Principal Arterial - Other -Urban	Urban		11,610	17,050	5	2.5	3.5	0	0.82	0	0	0	5	5	0	0		0	0.0	7.5	0	0	7.5	20.0
667	Taylor Rd. (CO)	Tomoka Farms Rd.	Spruce Creek Blvd.	0.70	2	Non-Regional	3	Principal Arterial - Other -Urban	Urban		9,200	17,050	2.5	0	4.6	0	1.36	0	0	0	5	5	0	0		0	2.5	7.5	0	0	10.0	17.5
675	Taylor Rd. (DL)	US 17/92	Stratford Dr.	0.80	2	Collector	4	Minor Arterial - Urban	Urban		6,410	13,640	2.5	0	2.3	0	0.96	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
677	Taylor Rd. (DL)	Blue Lake Ave.	Martin Luther King Bltwy.	0.80	2	Collector	4	Minor Arterial - Urban	Urban		5,600	13,640	2.5	0	4.5	0	2.2	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
676	Taylor Rd. (DL)	Stratford Dr.	Blue Lake Ave.	0.95	2	Collector	4	Minor Arterial - Urban	Urban		5,430	17,050	2.5	0	0.6	0	0.32	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
678	Taylor Rd. (NSB)	Glencoe Rd.	Mission Rd	0.75	2	Collector	4	Minor Collector - Urban	Urban		1,910	13,640	2.5	0	1.6	0	2.31	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
672	Taylor Rd. (PO)	Dunlawton Ave.	Clyde Morris Blvd.	0.55	2	Collector	4	Major Collector - Urban	Urban		13,110	13,640	10	2.5	23.3	5	4.85	5	10	0	0	0	1	5		0	2.5	0.0	5	0	7.5	35.0
673	Taylor Rd. (PO)	Clyde Morris Blvd.	Hensel Rd	0.50	4	Collector	4	Major Collector - Urban	Urban		19,650	37,970	2.5	2.5	30	5	4.19	5	10	0	0	0	1	5		0	0.0	0.0	0	0	0.0	20.0
674	Taylor Rd. (PO)	Hensel Rd.	Spruce Creek Rd.	1.00	4	Collector	4	Major Collector - Urban	Urban		15,810	37,970	2.5	2.5	7.6	0	1.31	0	0	0	0	0	1	5		0	0.0	0.0	0	0	0.0	10.0
680	Tivoli Dr. (DEL)	Saxon Blvd.	Providence Blvd	0.85	2	Collector	4	Major Collector - Urban	Urban		12,360	10,660	5	2.5	13.4	0	2.97	0	0	0	0	0	2	10		0	0.0	0.0	0	0	0.0	17.5
679	Tivoli Dr. (DEL)	Normandy Blvd.	Saxon Blvd.	0.60	2	Collector	4	Major Collector - Urban	Urban		4,620	11,880	2.5	0	11.3	0	6.67	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
687	Tomoka Farms Rd.	Pioneer Tr	SR 44	2.20	2	Non-Regional	3	Minor Arterial - Rural	Rural		6,520	12,300	2.5	5	5.3	0	2.21	0	0	0	5	5	0	0		0	2.5	0.0	0	2.5	5.0	17.5

Road ID	Roadway	From	To	Length	# of Lanes	Roadway Classification	Road Class for Ranking	Functional Classification	Rural/Urban	Adopted LOS Standard	Existing Volumes	Roadway Capacity	V/C Scoring Final	Final Existing Scoring	Crashes/Year/Mile	Crashes/Year/Mile Scoring	Crashes/MVMT	Crashes/MVMT Scoring	Total Safety Scoring	Primary Scoring	Secondary Scoring	Total Evac Scoring	# of Transit Routes	Transit Scoring	Beach Connector?	Beach Scoring	CCTV Scoring	Existing Fiber Scoring	Touch Fiber Scoring	1/4 Fiber Scoring	Total ITS Scoring	Total Scoring
686	Tomoka Farms Rd.	Taylor Rd.	Pioneer Tr	2.80	2	Non-Regional	3	Minor Arterial - Urban	Urban		12,360	24,975	2.5	2.5	3	0	0.66	0	0	0	5	5	0	0		0	2.5	0.0	0	2.5	5.0	15.0
682	Tomoka Farms Rd.	Dunn Ave.	US 92	1.90	2	Non-Regional	3	Major Collector - Urban	Urban		6,810	24,975	2.5	0	17.6	5	7.08	5	10	0	0	0	0	0		0	2.5	0.0	5	0	7.5	20.0
683	Tomoka Farms Rd.	US 92	Shunz Rd.	3.02	2	Non-Regional	3	Minor Arterial - Urban	Urban		7,360	24,975	2.5	0	3.4	0	1.26	0	0	0	5	5	0	0		0	2.5	0.0	5	0	7.5	15.0
685	Tomoka Farms Rd.	Townwest Blvd	Taylor Rd.	1.45	2	Non-Regional	3	Minor Arterial - Urban	Urban		7,760	24,975	2.5	0	4.7	0	1.66	0	0	0	5	5	0	0		0	2.5	0.0	0	2.5	5.0	12.5
681	Tomoka Farms Rd.	LPGA Blvd. (north end)	Dunn Ave.	1.90	2	Non-Regional	3	Major Collector - Urban	Urban		4,810	24,975	2.5	0	3.9	0	2.22	0	0	0	0	0	0	0		0	2.5	7.5	0	0	10.0	12.5
684	Tomoka Farms Rd.	Shunz Rd.	Townwest Blvd	1.50	2	Non-Regional	3	Minor Arterial - Urban	Urban		7,870	24,975	2.5	0	2.4	0	0.84	0	0	0	5	5	0	0		0	0.0	0.0	0	0	0.0	7.5
885	Town Center Blvd.	Royal Palm Parkway	Old Kings Road	0.25	2	Collector	4		Urban	D	9,500	24,200	2.5	0	34.4	5	10	5	10	0	0	0	0	0		0	0.0	0.0	5	0	5.0	17.5
883	Town Center Blvd.	Central Avenue	Lake Avenue	0.30	2	Collector	4		Urban	D	5,700	24,200	2.5	0	5.3	0	2.58	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
881	Town Center Blvd.	SR 100	Hospital Drive	0.29	4	Collector	4		Urban	D	5,600	65,600	2.5	0	8.3	0	4	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
884	Town Center Blvd.	Lake Avenue	Royal Palm Parkway	0.59	2	Collector	4		Urban	D	5,400	24,200	2.5	0	0.7	0	0.34	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
882	Town Center Blvd.	Hospital Drive	Central Avenue	0.39	4	Collector	4		Urban	D	5,800	65,600	2.5	0	3.6	0	1.71	0	0	0	0	0	0	0		0	0.0	7.5	0	0	7.5	10.0
688	Town West Blvd. (PO)	Tomoka Farms Rd.	Williamson Blvd.	1.59	2	Collector	4	Minor Collector - Urban	Urban		5,190	17,900	2.5	0	1.1	0	0.6	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
691	Turnbull Bay Rd.	Industrial Park Ave.	US 1	0.85	2	Collector	4	Minor Collector - Urban	Urban		4,300	13,640	2.5	0	7.3	0	4.63	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
690	Turnbull Bay Rd.	Williams Rd.	Industrial Park Ave.	1.20	2	Collector	4	Minor Collector - Urban	Urban		3,540	13,640	2.5	0	1.7	0	1.28	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
689	Turnbull Bay Rd.	Pioneer Tr.	Williams Rd.	2.90	2	Collector	4	Minor Collector - Urban/Rural	Urban		2,560	13,640	2.5	0	0.9	0	0.96	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
694	Tymber Creek Rd.	Tymber Run	SR 40	0.50	4	Collector	4	Major Collector - Urban	Urban		13,280	17,050	5	2.5	5.2	0	1.07	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
693	Tymber Creek Rd.	Airport Rd.	Tymber Run	0.90	2	Collector	4	Major Collector - Urban	Urban		9,900	17,050	2.5	0	4	0	1.1	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
916	US 1	US 1 & Heritage Crossroads Hwy	US 1 & SR 100	0.42	4	SIS	1		Urban	C	16,800	14,500	5	2.5	17.5	5	2.87	0	5	10	0	10	0	0		0	0.0	0.0	0	2.5	2.5	25.0
28	US 1	Fairview/Main St.	US 92/ISB	0.66	4	Regional	2	Principal Arterial - Other - Urban	Urban		31,500	32,400	10	7.5	63.9	5	5.57	5	10	10	0	10	8	10		0	2.5	7.5	0	0	10.0	57.5
29	US 1	US 92/ISB	Orange Ave.	0.30	4	Regional	2	Principal Arterial - Other - Urban	Urban		31,000	32,400	10	7.5	58	5	5.12	5	10	10	0	10	3	10		0	2.5	7.5	0	0	10.0	57.5
27	US 1	SR 430 (Mason Ave.)	Fairview/Main St.	0.54	4	Regional	2	Principal Arterial - Other - Urban	Urban		27,000	32,400	10	5	49.6	5	5.04	5	10	10	0	10	2	10		0	2.5	7.5	0	0	10.0	55.0
31	US 1	Bellevue Ave.	SR 400/Beville Rd.	1.05	4	Regional	2	Principal Arterial - Other - Urban	Urban		34,000	39,800	10	7.5	36.2	5	2.91	0	5	10	0	10	2	10		0	2.5	7.5	0	0	10.0	52.5
30	US 1	Orange Ave.	Bellevue Ave.	0.72	4	Regional	2	Principal Arterial - Other - Urban	Urban		28,500	39,800	5	5	18.1	5	1.74	0	5	10	0	10	3	10		0	2.5	7.5	0	0	10.0	45.0
32	US 1	SR 400/Beville Rd.	Bellewood Ave.	0.27	4	Regional	2	Principal Arterial - Other - Urban	Urban		26,500	39,800	5	5	17.8	5	1.83	0	5	10	0	10	2	10		0	2.5	0.0	5	0	7.5	42.5
26	US 1	LPGA Blvd.	SR 430 (Mason Ave.)	1.47	4	Regional	2	Principal Arterial - Other - Urban	Urban		24,500	32,400	5	5	30.6	5	3.42	0	5	10	0	10	1	5		0	0.0	7.5	0	0	7.5	37.5
41	US 1	Canal St. (Bus. SR 44)	10th Ave.	1.52	4	Regional	2	Principal Arterial - Other - Urban	Urban		24,000	32,400	5	5	18.6	5	2.12	0	5	10	0	10	1	5		0	2.5	0.0	5	0	7.5	37.5
35	US 1	Reed Canal Rd.	SR 421 (Dunlawton Ave.)	1.18	4	Regional	2	Principal Arterial - Other - Urban	Urban		28,500	39,800	5	5	28.3	5	2.72	0	5	10	0	10	2	10		0	2.5	0.0	0	0	2.5	37.5
43	US 1	Park Ave.	SR 442 (Indian River Blvd.)	1.49	4	Regional	2	Principal Arterial - Other - Urban	Urban		27,500	39,800	5	5	17.7	5	1.76	0	5	10	0	10	1	5		0	2.5	0.0	5	0	7.5	37.5
34	US 1	Big Tree Rd.	Reed Canal Rd.	1.17	4	Regional	2	Principal Arterial - Other - Urban	Urban		27,000	39,800	5	5	42.4	5	4.3	5	10	10	0	10	1	5		0	2.5	0.0	0	0	2.5	37.5
24	US 1	SR 40	Hand Ave.	0.84	4	Regional	2	Principal Arterial - Other - Urban	Urban		22,000	39,800	2.5	5	25.5	5	3.18	0	5	10	0	10	1	5		0	2.5	7.5	0	0	10.0	37.5
25	US 1	Hand Ave.	LPGA Blvd.	2.00	4	Regional	2	Principal Arterial - Other - Urban	Urban		24,500	39,800	5	5	20.4	5	2.28	0	5	10	0	10	1	5		0	0.0	7.5	0	0	7.5	37.5
40	US 1	Turnbull Bay Rd.	Canal St. (Bus. SR 44)	1.34	4	Regional	2	Principal Arterial - Other - Urban	Urban		26,500	39,800	5	5	32.4	5	3.35	0	5	10	0	10	1	5		0	2.5	0.0	0	2.5	5.0	35.0
23	US 1	Nova Rd.	SR 40	1.83	4	Regional	2	Principal Arterial - Other - Urban	Urban		19,300	39,800	2.5	2.5	21.4	5	3.04	0	5	10	0	10	2	10		0	2.5	0.0	5	0	7.5	37.5
22	US 1	Airport Rd.	Nova Rd.	1.13	4	Regional	2	Principal Arterial - Other - Urban	Urban		28,500	39,800	5	5	10.1	0	0.97	0	0	10	0	10	1	5		0	2.5	0.0	5	0	7.5	32.5
33	US 1	Bellewood Ave.	Big Tree Rd.	0.45	4	Regional	2	Principal Arterial - Other - Urban	Urban		30,000	39,800	5	0	34.2	5	3.13	0	5	10	0	10	1	5		0	2.5	0.0	0	0	2.5	27.5
21	US 1	I-95	Airport Rd.	2.81	4	Regional	2	Principal Arterial - Other - Urban	Urban		23,000	39,800	2.5	5	13.4	0	1.59	0	0	10	0	10	1	5		0	2.5	0.0	5	0	7.5	30.0
42	US 1	10th Ave.	Park Ave.	1.00	4	Regional	2	Principal Arterial - Other - Urban	Urban		26,000	39,800	5	5	15.4	5	1.62	0	5	10	0	10	1	5		0	0.0	0.0	0	0	0.0	30.0
44	US 1	SR 442 (Indian River Blvd.)	Volco Rd.	2.26	4	Regional	2	Principal Arterial - Other - Urban	Urban		21,500	39,800	2.5	5	11.8	0	1.5	0	0	10	0	10	1	5		0	2.5	0.0	5	0	7.5	30.0
36	US 1	SR 421 (Dunlawton Ave.)	Commonweath	1.37	4	Regional	2	Principal Arterial - Other - Urban	Urban		20,500	39,800	2.5	5	11.1	0	1.48	0	0	10	0	10	2	10		0	2.5	0.0	0	0	2.5	30.0
39	US 1	Art Center Ave.	Turnbull Bay Rd.	2.24	4	Regional	2	Principal Arterial - Other - Urban	Urban		26,500	39,800	5	5	10.2	0	1.05	0	0	10	0	10	1	5		0	0.0	0.0	0	0	0.0	25.0
37	US 1	Commonwealth	Nova Rd.	1.23	4	Regional	2	Principal Arterial - Other - Urban	Urban		15,400	39,800	2.5	2.5	15.8	5	2.8	0	5	10	0	10	2	10		0	0.0	0.0	0	0	0.0	30.0
20	US 1	Flagler Co.	I-95	1.53	4	Regional	2	Principal Arterial - Other - Urban	Urban		16,000	65,600	2.5	2.5	24.2	5	4.14	5	10	10	0	10	0	0		0	2.5	0.0	5	0	7.5	32.5
38	US 1	Nova Rd.	Art Center Ave.	3.19	4	Regional	2	Principal Arterial - Other - Urban	Urban		25,000	65,600	2.5	5	6.5	0	0.71	0	0	10	0	10	1	5		0	0.0	0.0	0	0	0.0	22.5
917	US 1	US 1 & SR 100	US 1 & S Chruch St	0.42	4	Regional	2		Urban	D	11,400	32,400	2.5	2.5	9.4	0	2.27	0	0	10	0	10	0	0		0	0.0	0.0	5	0	5.0	20.0
45	US 1	Volco Rd.	H.H. Birch Rd.	3.70	4	Regional	2	Principal Arterial - Other - Urban	Urban		13,300	39,800	2.5	2.5	2	0	0.41	0	0	10	0	10	1	5		0	0.0	0.0	0	0	0.0	20.0
46	US 1	H.H. Birch Rd.	Halifax Ave.	2.05	4	Regional	2	Principal Arterial - Other - Rural	Rural		13,300	40,700	2.5	2.5	1.4	0	0.28	0	0	10	0	10	1	5		0	0.0	0.0	0	0	0.0	20.0
912	US 1	US1 & Heritage Crossroads Hwy	US 1 & Bunnell	0.39	4	Regional	2		Urban	D	16,500	39,800	2.5	2.5	13.7	0	2.29	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	15.0
913	US 1	US1 & Bunell	US1 & Heritage Crossroads Hwy	0.52	4	Regional	2		Urban	D	16,500	39,800	2.5	2.5	6.5	0	1.08	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	15.0
919	US 1	US 1 & S Church St	US 1 & Flagler Co Line	0.68	4	Regional	2		Rural	D	10,800	39,800	2.5	2.5	10.9	0	2.78	0	0	10	0	10	0	0		0	0.0	0.0	0	2.5	2.5	17.5
49	US 1	Kennedy Pkwy.	Brevard Co.	3.97	4	Regional	2	Principal Arterial - Other - Rural	Rural		3,600	25,700	2.5	0	1.4	0	1.03	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	12.5
47	US 1	Halifax Ave.	Putnam Grove Rd.	0.57	4	Regional	2	Principal Arterial - Other - Rural	Rural		3,600	40,700	2.5	0	1.8	0	1.35	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	12.5
48	US 1	Putnam Grove Rd.	Kennedy Pkwy.	1.63	4	Regional	2	Principal Arterial - Other - Rural	Rural		3,600	40,700	2.5	0	0.9	0	0.65	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	12.5
55	US 17	SR 40	Lake Winona Rd.	4.93	2	SIS	1	Principal Arterial - Other - Rural	Rural		8,400	8,400	10	10	1.9	0	0.61	0	0	0	5	5	1	5		0	0.0	0.0	0	0	0.0	30.0
57	US 17	Spring Garden Ranch Rd.	Reynolds Rd	1.09	2	SIS	1	Principal Arterial - Other - Urban	Urban		11,400	17,000	5	2.5	4.6	0	1.1	0	0	0	5	5	1	5		0	0.0	0.0	0	0	0.0	17.5
52	US 17	Putnam County	CR 305/Lk George Rd	3.41	2	SIS	1	Principal Arterial - Other - Rural	Rural		5,200	8,400	5	2.5	1.6	0	0.83	0	0	0	5	5	1	5		0	0.0	0.0	0	0	0.0	17.5
56	US 17	Lake Winona Rd.	Spring Garden Ranch Rd.	0.56	2	SIS	1	Principal Arterial - Other - Urban	Urban		8,400	12,750	5	0	5	0	1.63	0	0	0	5	5	1	5		0	0.0	0.0	0	0	0.0	15.0
54	US 17	Washington Ave.	SR 40	5.02	2	SIS	1	Principal Arterial - Other - Rural	Rural		6,200	16,400	2.5	5	2.7	0	1.21	0	0	0	5	5	1	5		0	0.0	0.0	0	0	0.0	17.5
59	US 17	SR 15A/CR 15A	Glenwood Rd.	1.64	4	SIS	1	Principal Arterial - Other - Urban	Urban		14,800	39,800	2.5	2.5	10.4	0	1.92	0	0	0	5	5	1	5		0	0.0	0.0	0	0	0.0	15.0
58	US 17	Reynolds Rd	SR 15A/CR 15A	2.76	4	SIS	1	Principal Arterial - Other - Urban	Urban		17,200	51,800	2.5	2.5	9.3	0	1.49	0	0	0	5	5	1	5		0	0.0	0.0	0	0	0.0	15.0
53	US 17	CR 305/Lk George Rd	Washington Ave.	5.28	2	SIS	1	Principal Arterial - Other - Rural	Rural		5,000	16,400	2.5	0	1.2	0	0.64	0	0	0	5	5	1	5		0	0.0	0.0	0	0	0.0	12.5
61	US 17	Mercers Fernery Rd.	US 92	0.68	4	Regional	2	Principal Arterial - Other - Urban	Urban		33,500	42,190	5	7.5	47.9	5	3.92	5	10	0	5	5	3	10		0	0.0	0.0	0	0	0.0	37.5
60	US 17	Glenwood Rd.	Mercers Fernery Rd.	0.51	4	Regional	2	Principal Arterial - Other - Urban	Urban		24,500	39,800	5	5	15.3	5	1.71	0	5	0	5	5	1	5		0	0.0	0.0	0	0	0.0	25.0
71	US 17/92	Rhode Island Ave.	Enterprise Rd.	0.75	4	SIS	1	Principal Arterial - Other - Urban	Urban		31,500	39,800	5	7.5	48.3	5	4.2	5	10	10	0	10	2	10		0	2.5	7.5	0	0	10.0	52.5
70	US 17/92	Graves Ave.	Rhode Island Ave.	1.01	4	SIS	1	Principal Arterial - Other - Urban	Urban		31,000	39,800	5	7.5	45	5	3.98	5	10	10	0	10	2	10		0	2.5	7.5	0	0	10.0	52.5
66	US 17/92	Beresford Ave.	SR 15A (Taylor Rd.)	1.02	4	SIS	1	Principal Arterial - Other - Urban	Urban		33,500	42,190	5	7.5	47.1	5	3.85	5	10	10	0	10	2	10		0	0.0	7.5	0	0	7.5	50.0
67	US 17/92	SR 15A (Taylor Rd.)	SR 472	1.75	6	SIS	1	Principal Arterial - Other - Urban	Urban		47,000	59,900	5	10	34.6	5	2.02	0	5	10	0	10	2	10		0	2.5	7.5	0	0	10.0	50.0
69	US 17/92	New York Ave.	Graves Ave.	1.00	4	SIS	1	Principal Arterial - Other - Urban	Urban		29,500	39,800	5	5	18	5	1.67	0	5	10	0	10	2	10		0	0.0	7.5	0	0	7.5	42.5
73	US 17/92	Saxon Blvd.	DeBary Plantation Blvd	0.61	4	SIS	1	Principal Arterial - Other - Urban	Urban		30,500	37,900	5	7.5	5.9	0	0.53	0	0	10	0	10	3	10		0	0.0	7.5	0	0	7.5	40.0
77	US 17/92	Dirksen	Ft. Florida Rd.	0.72	4	SIS	1	Principal Arterial - Other - Urban	Urban		28,500	37,900	5	5	3.6	0	0.35	0	0	10	0	10	2	10		0	2.5	7.5	0	0	10.0	40.0
68	US 17/92	SR 472	New York Ave.	0.75	4	SIS	1	Principal Arterial - Other - Urban	Urban		29,000	39,800	5	5	12.5	0	1.18	0	0	10	0	10	2	10		0	0.0	7.5	0	0	7.5	37.5
74	US 17/92	DeBary Plantation Blvd	Highbanks Rd.	0.92	4	SIS	1	Principal Arterial - Other - Urban	Urban		25,500	37,900	5	5	3.3	0	0.35	0	0	10	0	10	3	10		0	0.0	7.5	0	0	7.5	37.5
76	US 17/92	Valencia Rd.	Dirksen Dr.	1.05	4	SIS	1	Principal Arterial - Other - Urban	Urban		22,000	37,900	2.5	5	2.7	0	0.33	0	0	10	0	10	2	10		0	2.5	7.5	0	0	10.0	37.5
75	US 17/92	Highbanks Rd.	Valencia Rd	0.74	4	SIS	1	Principal Arterial - Other - Urban	Urban		24,500	37,900	5	5	12.2	0	1.36	0	0	10	0	10	3	10		0	0.0	7.5	0	0	7.5	37.5
72	US 17/92	Enterprise Rd.	Saxon Blvd.	0.80	4	SIS	1	Principal Arterial - Other - Urban	Urban		21,000	39,800	2.5	5	13	0	1.69	0	0	10	0	10	1	5		0	2.5	7.5	0	0	10.0	32.5
78	US 17/92	Ft. Florida Rd.	Barwick Rd	0.76	4	SIS	1	Principal Arterial - Other - Urban	Urban		27,500	37,900	5	5	1.8	0	0.18	0	0	10	0	10	0	0		0	0.0	7.5	0	0	7.5	27.5
79	US 17/92	Barwick Rd.	Seminole Co.	0.52	4	SIS	1	Principal Arterial - Other - Urban	Urban		27,500	37,900	5	5	3.1	0	0.31	0	0	10	0	10	0	0		0	0.0	7.5	0	0	7.5	27.5
64	US 17/92	SR 44 (New York Ave.)	Euclid Ave.	0.49	2	Regional	2	Principal Arterial - Other - Urban	Urban		17,200	15,600	5	2.5	34.3	5	5.45	5	10	10	0	10	2	10		0	2.5	0.0	5	0	7.5	45.0
63	US 17/92	Plymouth Ave.	SR 44 (New York Ave.)	1.01	2	Regional	2	Principal Arterial - Other - Urban	Urban		18,200	19,150	10	2.5	32.1	5	4.84	5	10	10	0	10	2	10		0	2.5	0.0	5	0	7.5	50.0
65	US 17/92	Euclid Ave.	Beresford Ave.	0.49	2	Regional	2	Principal Arterial - Other - Urban	Urban		16,300	16,380	10	2.5	15.5	5	2.6	0	5	10	0	10	2	10		0	0.0	7.5	0	0	7.5	45.0
62	US 17/92	US 92	Plymouth Ave.	0.83	4	Regional	2	Principal Arterial - Other - Urban	Urban		23,000	42,190	2.5	5	36.6	5	4.37	5	10	10	0	10	2	10		0	0.0	0.0	0	0	0.0	37.5
90	US 92	SR 483/Clyde Morris Blvd.	SR 5A/Nova Rd.	0.93	6	Regional	2	Principal Arterial - Other - Urban	Urban		44,500	58,400	5	10	78.1	5	4.81	5	10	10	0	10	3	10	Y	10	2.5	7.5	0	0	10.0	65.0
91	US 92	SR 5A/Nova Rd.	Martin Luther King Blvd.	0.78	4	Regional	2	Principal Arterial - Other - Urban	Urban		28,000	37,900	5	5	100.5	5	9.82	5	10	10	0	10	3	10	Y	10	2.5	7.5	0	0	10.0	60.0
93	US 92	US 1	Beach St.	0.23	4	Regional	2	Principal Arterial - Other - Urban	Urban		23,500	32,400	5	5	111.3	5	12.93	5	10	10	0	10	5	10	Y	10	2.5	7.5	0	0	10.0	60.0
92	US 92	Martin Luther King Blvd.	US 1	0.38	4	Regional	2	Principal Arterial - Other - Urban	Urban		26,000	37,900	5	5	193.2	5	20.39	5	10	10	0	10	3	10	Y	10	2.5	7.5	0	0	10.0	60.0
88	US 92	Williamson Blvd.	Bill France Blvd.	1.13	8	Regional	2	Principal Arterial - Other - Urban	Urban		50,500	78,800	5	10	54.5	5	2.96	0	5	10	0	10	3	10	Y	10	2.5	7.5	0	0	10.0	60.0
87	US 92	I-95	Williamson Blvd.	0.71	8	Regional	2	Principal Arterial - Other - Urban	Urban		39,000	78,800	2.5	7.5	123.9	5	8.71	5	10	10	0	10	3	10	Y	10	2.5	7.5	0	0	10.0	60.0
89	US 92	Bill France Blvd.	SR 483/Clyde Morris Blvd.	0.86	8	Regional	2	Principal Arterial - Other - Urban	Urban		37,500	78,800	2.5	7.5	85.6	5	6.25	5	10	10	0	10	4	10	Y	10	2.5	7.5	0	0	10.0	60.0
86	US 92	LPGA Blvd.	I-95	2.03	4	Regional	2	Principal Arterial - Other - Urban	Urban		32,000	39,800	5	7.5	14.3	0	1.22	0	0	10	0	10	3	10	Y	10	2.5	7.5	0	0	10.0	52.5
85	US 92	I-4 EB Ramp	LPGA Blvd.	0.58	4	Regional	2	Principal Arterial - Other - Urban	Urban		18,600	39,800	2.5	2.5	21.7	5	3.2	0	5	10	0	10	2	10	Y	10	2.5	7.5	0	0	10.0	50.0
94	US 92	Beach St.	SR 441/Peninsula Dr.	0.88	4	Regional	2	Principal Arterial - Other - Urban	Urban		22,300	39,800	2.5	5	10.2	0	1.26	0	0	10	0	10	6	10	Y	10	2.5	0.0	5	0	7.5	45.0
95	US 92	SR 441/Peninsula Dr.	SR A1A/Atlantic	0.30	4	Regional	2	Principal Arterial - Other - Urban	Urban		11,700	32,400	2.5	2.5	42.7	5	10	5	10	10	0	10	3	10	Y	10	2.5	0.0	0	2.5	5.0	50.0
80	US 92	US 17	Jacobs Rd.	1.41	4	Regional	2	Principal Arterial - Other - Urban	Urban		28,000	42,190	5	5	12.3	0	1.21	0	0	10	0	10	3	10		0	0.0	0.0	5	0	5.0	35.0
81	US 92	Jacobs Rd.	Kepler Rd.	1.23	4	Regional	2	Principal Arterial - Other - Urban	Urban		26,000	42,190	5	5	12.4	0	1.3	0	0	10	0	10	1	5		0	2.5	7.5	0	0	10.0	35.0
84	US 92	Red John Dr.	I-4 EB Ramp	2.26	4	Regional	2	Principal Arterial - Other - Urban	Urban		18,600	39,800	2.5	2.5	8	0	1.17	0	0	10	0	10	2	10		0	2.5	7.5	0	0	10.0	35.0
83	US 92	Old Daytona Rd.	Red John Dr.	7.20	4	Regional	2	Principal Arterial - Other - Urban/Rural	Urban		16,400	25,900	5	2.5	2.3	0	0.39	0	0	10	0	10	1	5		0	0.0	0.0	5	0	5.0	27.5
82	US 92	Kepler Rd.	Old Daytona Rd.	1.32	4	Regional	2	Principal Arterial - Other - Urban	Urban		16,400	39,800	2.5	2.5	7.3	0	1.22	0	0	10	0	10	1	5		0	2.5	0.0	5	0	7.5	27.5
890	US1 (SR5)	Palm Coast Parkway	White View Parkway	2.11	4	Regional	2		Urban	D	15,500	39,800	2.5	2.5	5.1	0	0.9	0	0	10	0	10	0	0		0	0.0	0.0	5	0	5.0	20.0
892	US1 (SR5)	Royal Palms Parkway	Espanola Road	1.07	4	Regional	2		Urban	D	18,100	39,800	2.5	2.5	3.9	0	0.59	0	0	10	0	10	0	0		0	0.0	0.0	0	2.5	2.5	17.5
889	US1 (SR5)	Matanzas Woods Parkway	Palm Coast Parkway	3.65	4	Regional	2		Urban	D	10,200	39,800	2.5	2.5	4.5	0	1.22	0	0	10	0	10	0	0		0	0.0	7.5	0	0	7.5	22.5
891	US1 (SR5)	White View Parkway	Royal Palms Parkway	1.78	4	Regional	2		Urban	D	15,700	39,800	2.5	2.5	7.8	0	1.35	0	0	10	0	10	0	0		0	0.0	0.0	0	2.5	2.5	17.5
888	US1 (SR5)	Old Kings Road	Matanzas Woods Parkway	2.61	4	Regional	2		Urban	D	10,400	39,800	2.5	2.5	1.2	0	0.32	0	0	10	0	10	0	0		0	0.0	0.0	5	0	5.0	20.0
896	US1 (SR5)	Seminole Woods Parkway	Palm Coast City Limit	0.37	4	Regional	2		Urban	D	15,400	39,800	2.5	2.5	6.5	0	1.15	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	15.0
894	US1 (SR5)	Belle Terre Parkway	DuPont Road	0.90	4	Regional	2		Urban	D	13,500	39,800	2.5	2.5	11.8	0	2.39	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	15.0
895	US1 (SR5)	DuPont Road	Seminole Woods Parkway	1.04	4	Regional	2		Urban	D	13,300	39,800	2.5	2.5	2.9	0	0.6	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	15.0
887	US1 (SR5)	St. Johns County Line	Old Kings Road	0.76	4	Regional	2		Rural	D	11,800	39,800	2.5	2.5	5	0	1.16	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	15.0
893	US1 (SR5)	Palm Coast City Limit	Belle Terre Parkway	0.57	4	Regional	2		Urban	D	11,700	39,800	2.5	2.5	0.7	0	0.16	0	0	10	0	10	0	0		0	0.0	0.0	0	0	0.0	15.0
698	Volco Rd.	Beacon Light Rd.	35th St.	1.40	2	Collector	4	Minor Collector - Urban/Rural	Urban		560	13,640	2.5	0	1.3	0	6.43	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
699	Volco Rd.	35th St.	US 1	0.50	2	Collector	4	Minor Collector - Urban	Urban		1,790	13,640	2.5	0	1.2	0	1.88	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
700	Voorhis Ave.	US 17/92	Amelia Ave.	0.20	2	Collector	4	Major Collector - Urban	Urban		6,160	13,640	2.5	0	36	5	16.36	5	10	0	0	0	0	0		0	2.5	0.0	5	0	7.5	20.0
701	Voorhis Ave.	Amelia Ave.	Hill Ave.	1.00	2	Collector	4	Major Collector - Urban	Urban		3,260	13,640	2.5	0	7.2	0	6.1	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
703	Voorhis Ave.	Blue Lake Ave.	SR 44	0.50	2	Collector	4	Major Collector - Urban	Urban		3,580	13,640	2.5	0	1.2	0	0.91	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	10.0
702	Voorhis Ave.	Hill Ave.	Blue Lake Ave.	0.50	2	Collector	4	Major Collector - Urban	Urban		3,190	13,640	2.5	0	4.8	0	4.14	5	5	0	0	0	0	0		0	0.0	0.0	0	2.5	2.5	10.0
720	W. Volusia Bltwy (Dr MLK Jr)	Cassadaga Rd.	SR 472	0.20	2	Non-Regional	3	Minor Arterial - Urban	Urban		12,920	17,050	5	2.5	33	5	7.02	5	10	0	0	0	0	0		0	0.0	0.0	0	0	0.0	17.5
718	W. Volusia Bltwy (Dr MLK Jr)	Taylor Rd.	Orange Camp Rd.	1.00	2	Non-Regional	3	Minor Arterial - Urban	Urban		13,800	17,050	10	2.5	4.2	0	0.83	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	12.5
719	W. Volusia Bltwy (Dr MLK Jr)	Orange Camp Rd.	Cassadaga Rd.	1.40	2	Non-Regional	3	Minor Arterial - Urban	Urban		12,050	17,050	5	2.5	1.3	0	0.29	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
717	W. Volusia Bltwy (Dr MLK Jr)	Beresford Ave. Ext.	Taylor Rd.	1.10	2	Non-Regional	3	Minor Arterial - Urban	Urban		11,360	17,050	5	2.5	0.5	0	0.13	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
721	W. Volusia Bltwy (Kentucky Ave)	SR 472	Graves Ave	0.80	2	Non-Regional	3	Major Collector - Urban	Urban		10,670	17,050	5	2.5	19	5	4.87	5	10	0	0	0	0	0		0	0.0	0.0	5	0	5.0	22.5
715	W. Volusia Bltwy (Kepler Rd)	Minnesota Ave.	SR 44	0.75	2	Non-Regional	3	Minor Arterial - Urban	Urban		17,240	17,050	5	2.5	8.3	0	1.31	0	0	0	0	0	0	0		0	2.5	7.5	0	0	10.0	17.5
714	W. Volusia Bltwy (Kepler Rd)	US 92	Minnesota Ave.	1.85	2	Non-Regional	3	Minor Arterial - Urban	Urban		15,740	17,050	10	2.5	7.2	0	1.26	0	0	0	0	0	0	0		0	2.5	7.5	0	0	10.0	22.5
716	W. Volusia Bltwy (Kepler Rd)	SR 44	Beresford Ave. Ext.	0.75	2	Non-Regional	3	Minor Arterial - Urban	Urban		11,280	17,050	5	2.5	3.2	0	0.78	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	15.0
723	W. Volusia Bltwy (Veteran's Memorial Pkwy)	Rhode Island Ave.	Harley Strickland Blvd.	1.22	2	Non-Regional	3	Minor Arterial - Urban	Urban		20,170	17,050	5	5	5.4	0	0.73	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	10.0
724	W. Volusia Bltwy (Veteran's Memorial Pkwy)	Harley Strickland Blvd.	Saxon Blvd.	0.38	4	Non-Regional	3	Minor Arterial - Urban	Urban		13,150	37,970	2.5	2.5	77.9	5	16.26	5	10	0	0	0	3	10		0	0.0	0.0	0	0	0.0	25.0
722	W. Volusia Bltwy (Veteran's Memorial Pkwy)	Graves Ave.	Rhode Island Ave.	1.50	2	Non-Regional	3	Minor Arterial - Urban	Urban		16,430	17,900	10	2.5	3.2	0	0.53	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	12.5
589	Wallace Rd.	Canal St	SR 44	0.25	3	Collector	4	Major Collector - Urban	Urban		7,710	14,740	2.5	0	44	5	15.71	5	10	0	0	0	0	0		0	2.5	0.0	5	0	7.5	20.0
704	Walter Boardman Ln.	Old Dixie Hwy.	Highbridge Rd.	1.20	2	Collector	4	Major Collector - Rural	Rural		3,380	12,300	2.5	0	3.8	0	3.11	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
705	Wayne Ave. (NSB)	Halleck St.	US 1	1.00	2	Collector	4	Major Collector - Urban	Urban		7,290	13,640	2.5	0	14.8	5	5.56	5	10	0	0	0	0	0		0	0.0	0.0	0	0	0.0	12.5
712	Westside Parkway (Don Smith Blvd)	DeBary Plantation Blvd.	Highbanks Rd.	1.20	2	Collector	4	Minor Collector - Urban	Urban		1,960	13,640	2.5	0	0.3	0	0.47	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
707	Westside Parkway (Fatio Rd.)	Beresford Ave.	McGregor Rd.	2.00	2	Collector	4	Minor Collector - Urban	Urban		1,860	13,640	2.5	0	0.8	0	1.18	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
709	Westside Parkway (Hamilton Ave.)	Hamilton Ave. (north end)	French Ave.	1.20	2	Collector	4	Minor Collector - Urban	Urban		2,400	13,640	2.5	0	4	0	4.53	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
897	White Mill Drive	Pine Lakes Parkway	White View Parkway	0.39	2	Collector	4		Urban	D	4,100	24,200	2.5	0	0	0	0	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
899	White View Parkway	White Mill Drive	Belle Terre Parkway	1.53	2	Collector	4		Urban	D	7,600	17,700	2.5	0	4.4	0	1.6	0	0	0	0	0	0	0		0	0.0	0.0	5	0	5.0	7.5
900	White View Parkway	Belle Terre Parkway	Pritchard Drive	1.11	2	Collector	4		Urban	D	3,800	17,700	2.5	0	10.6	0	7.66	5	5	0	0	0	0	0		0	0.0	0.0	5	0	5.0	12.5
898	White View Parkway	US 1	White Mill Drive	0.88	4	Collector	4		Urban	D	6,500	39,800	2.5	0	6.8	0	2.88	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
727	Williamson Blvd.	SR 40	Hand Ave.	0.60	4	Regional	2	Principal Arterial - Other - Urban	Urban		21,850	37,970	2.5	5	57.3	5	7.2	5	10	0	5	5	3	10		0	2.5	0.0	5	0	7.5	40.0
728	Williamson Blvd.	Hand Ave.	LPGA Blvd.	2.05	2	Regional	2	Principal Arterial - Other - Urban	Urban		15,100	17,050	10	2.5	13.4	0	2.42	0	0	0	5	5	2	10		0	2.5	0.0	5	0	7.5	35.0
737	Williamson Blvd.	Willow Run Blvd.	Townwest Blvd	0.25	2	Regional	2	Principal Arterial - Other - Urban	Urban		18,260	17,050	5	2.5	23.2	5	3.49	0	5	0	0	0	0	0		0	2.5	0.0	5	0	7.5	20.0
735	Williamson Blvd.	SR400/Beville Rd.	Madeline Ave.	1.50	2	Regional	2	Principal Arterial - Other - Urban	Urban		17,440	17,050	5	2.5	2.5	0	0.4	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	15.0
734	Williamson Blvd.	Bellevue Ave. Ext.	SR400/Beville Rd.	1.00	4	Regional	2	Principal Arterial - Other - Urban	Urban		19,250	37,970	2.5	2.5	25.2	5	3.59	5	10	0	5	5	0	0		0	2.5	0.0	5	0	7.5	27.5
731	Williamson Blvd.	Dunn Ave.	US 92	2.35	4	Regional	2	Principal Arterial - Other - Urban	Urban		17,070	37,970	2.5	2.5	19.8	5	3.18	0	5	0	5	5	1	5		0	2.5	0.0	5	0	7.5	27.5
736	Williamson Blvd.	Madeline Ave.	Willow Run Blvd.	1.10	2	Regional	2	Principal Arterial - Other - Urban	Urban		17,520	17,050	5	2.5	7.1	0	1.11	0	0	0	0	0	0	0		0	2.5	0.0	0	2.5	5.0	12.5
738	Williamson Blvd.	Townwest Blvd	Taylor Rd.	2.75	4	Regional	2	Principal Arterial - Other - Urban	Urban		20,650	37,970	2.5	5	14.5	0	1.93	0	0	0	0	0	1	5		0	2.5	0.0	5	0	7.5	20.0
732	Williamson Blvd.	US 92	Midway Ave.	0.50	4	Regional	2	Principal Arterial - Other - Urban	Urban		10,060	37,970	2.5	2.5	17.2	5	4.67	5	10	0	5	5	0	0		0	2.5	0.0	5	0	7.5	27.5
729	Williamson Blvd.	LPGA Blvd.	Mason Ave.	0.35	4	Regional	2	Principal Arterial - Other - Urban	Urban		17,300	37,970	2.5	2.5	11.4	0	1.8	0	0	0	5	5	0	0		0	2.5	7.5	0	0	10.0	20.0
739	Williamson Blvd.	Taylor Rd.	Spruce Creek Bridge	0.80	4	Regional	2	Principal Arterial - Other - Urban	Urban		23,310	37,970	5	5	6.3	0	0.74	0	0	0	0	0	0	0		0	2.5	0.0	5	0	7.5	17.5
733	Williamson Blvd.	Midway Ave.	Bellevue Ave. Ext.	0.50	4	Regional	2	Principal Arterial - Other - Urban	Urban		13,520	37,970	2.5	2.5	6	0	1.22	0	0	0	5	5	1	5		0	2.5	0.0	5	0	7.5	22.5
730	Williamson Blvd.	Mason Ave.	Dunn Ave.	0.35	4	Regional	2	Principal Arterial - Other - Urban	Urban		14,040	37,970	2.5	2.5	14.3	0	2.78	0	0	0	5	5	0	0		0	2.5	0.0	5	0	7.5	17.5
740	Williamson Blvd.	Spruce Creek Bridge	Airport Rd	1.00	4	Regional	2	Principal Arterial - Other - Urban	Urban		19,250	37,970	2.5	2.5	11.8	0	1.68	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	5.0
741	Williamson Blvd.	Airport Rd	Pioneer Trail	3.00	4	Regional	2	Principal Arterial - Other - Urban	Urban		2,080	37,970	2.5	0	0	0	0	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	2.5
742	Willow Run Blvd. (PO)	Williamson Blvd.	Hidden Lake Dr.	0.50	2	Collector	4	Minor Collector - Urban	Urban		7,520	14,040	2.5	0	0.4	0	0.14	0	0	0	0	0	0	0		0	2.5	0.0	0	2.5	5.0	7.5
743	Willow Run Blvd. (PO)	Hidden Lake Dr.	Clyde Morris Blvd.	0.85	2	Collector	4	Minor Collector - Urban	Urban		10,190	30,420	2.5	2.5	4.2	0	1.14	0	0	0	0	0	0	0		0	0.0	0.0	0	0	0.0	5.0
744	Wilmette Ave. (OB)	SR 5A/Nova Rd	US 1	1.80	2	Collector	4	Minor Collector - Urban	Urban		9,620	14,040	5	0	4.7	0	1.33	0	0	0	0	0	2	10		0	0.0	0.0	5	0	5.0	20.0
745	Woodward Ave.	SR 44	Euclid Ave.	0.50	2	Collector	4	Minor Collector - Urban	Urban		780	13,640	2.5	0	2	0	7.14	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5
746	Woodward Ave.	Euclid Ave.	Beresford Ave.	0.50	2	Collector	4	Minor Collector - Urban	Urban		640	13,640	2.5	0	2.8	0	11.67	5	5	0	0	0	0	0		0	0.0	0.0	0	0	0.0	7.5

Appendix B – Overall Network Map

R2CTPO - TSM&O MASTER PLAN PHASE 2

PROPOSED PHYSICAL NETWORK ENHANCEMENTS
(OVERALL STUDY AREA)



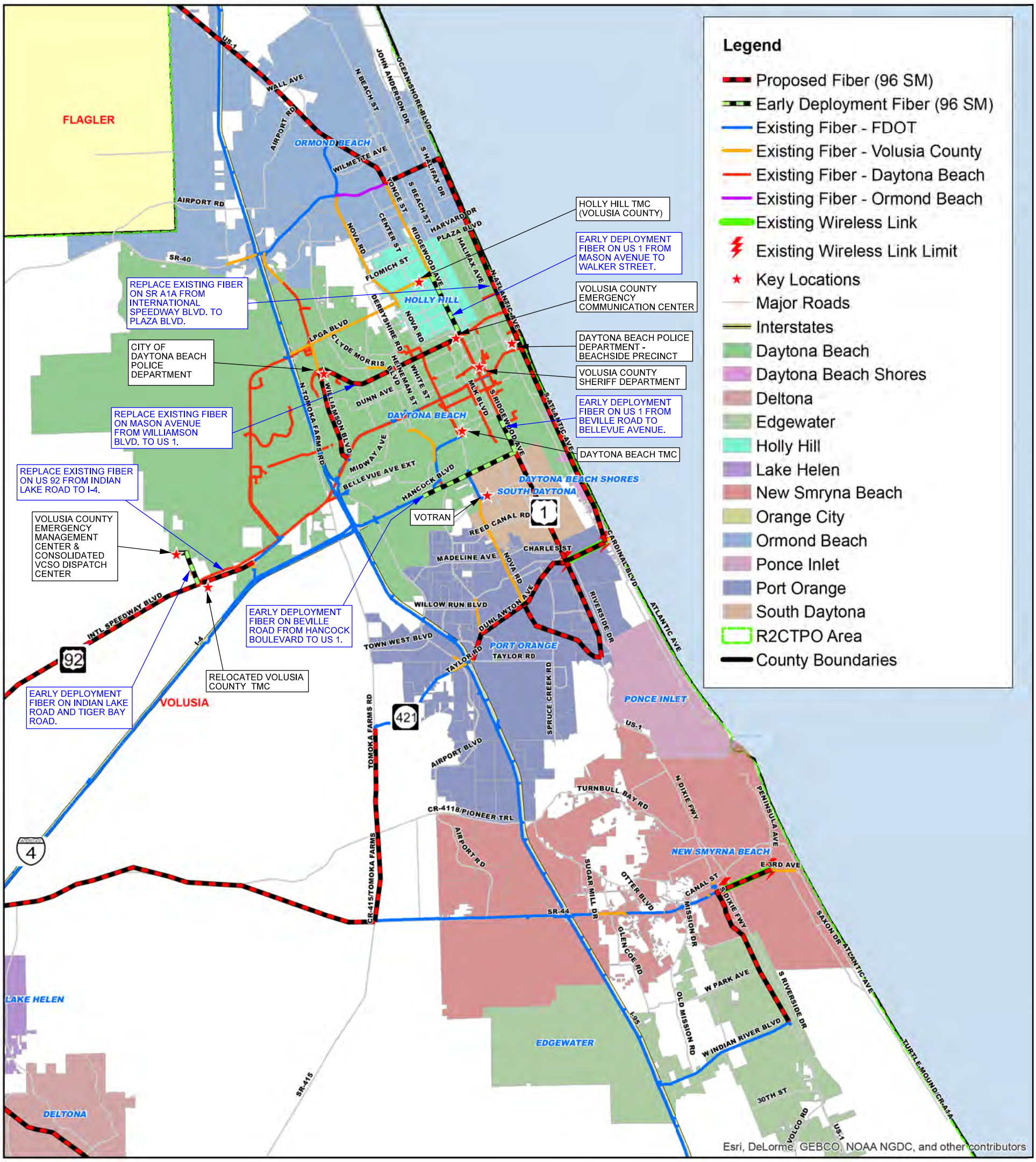
N

0 5 10 20 Miles

RIVER TO SEA TPO
Transportation Planning Organization
VISION - PLAN - IMPLEMENT

R2CTPO - TSM&O MASTER PLAN PHASE 2

PROPOSED PHYSICAL NETWORK ENHANCEMENTS (EAST VOLUSIA COUNTY)



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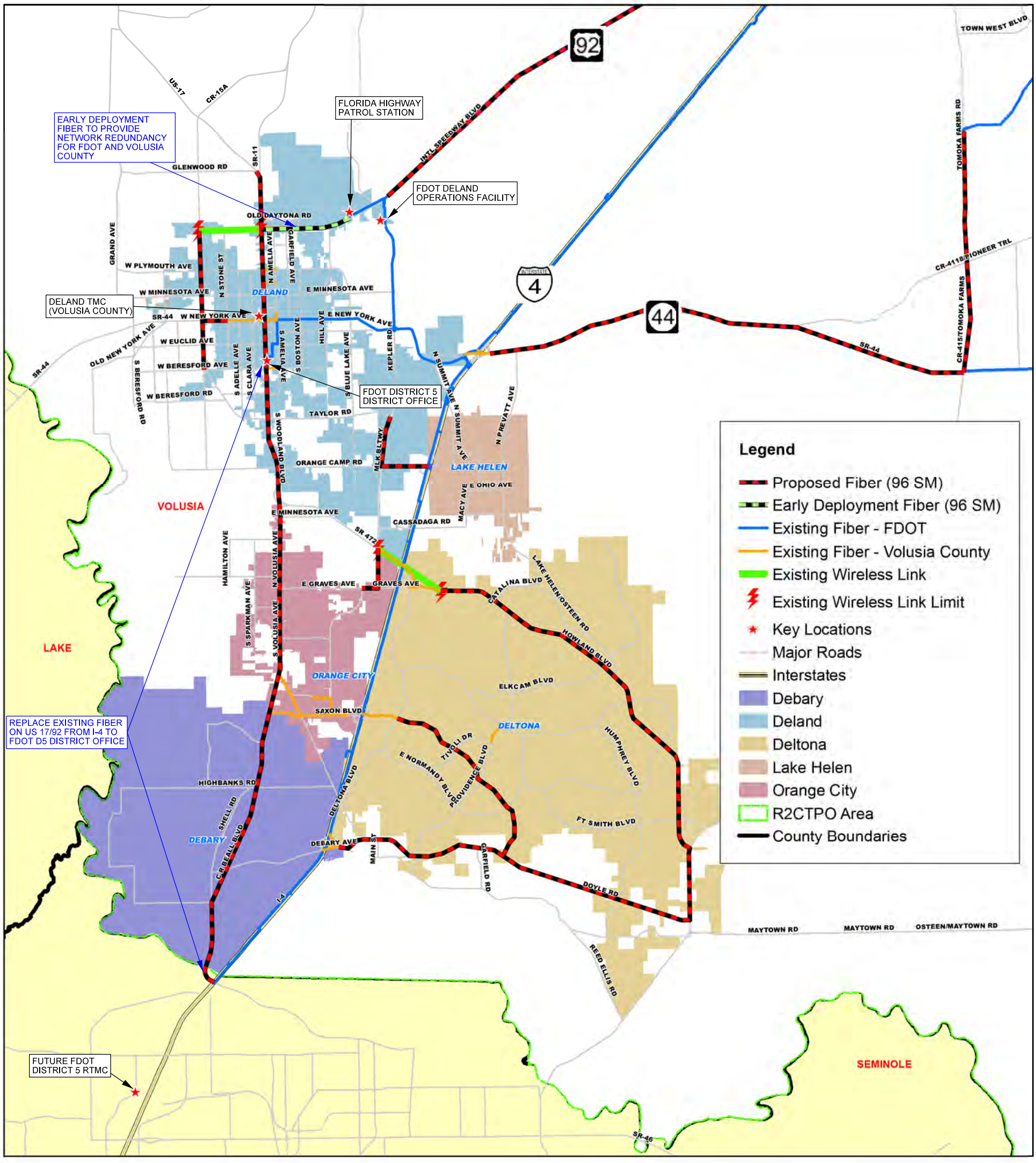
RIVER TO SEA TPO
Transportation Planning Organization
VISION - PLAN - IMPLEMENT

R2CTPO - TSM&O MASTER PLAN PHASE 2
PROPOSED PHYSICAL NETWORK ENHANCEMENTS
(WEST VOLUSIA COUNTY)



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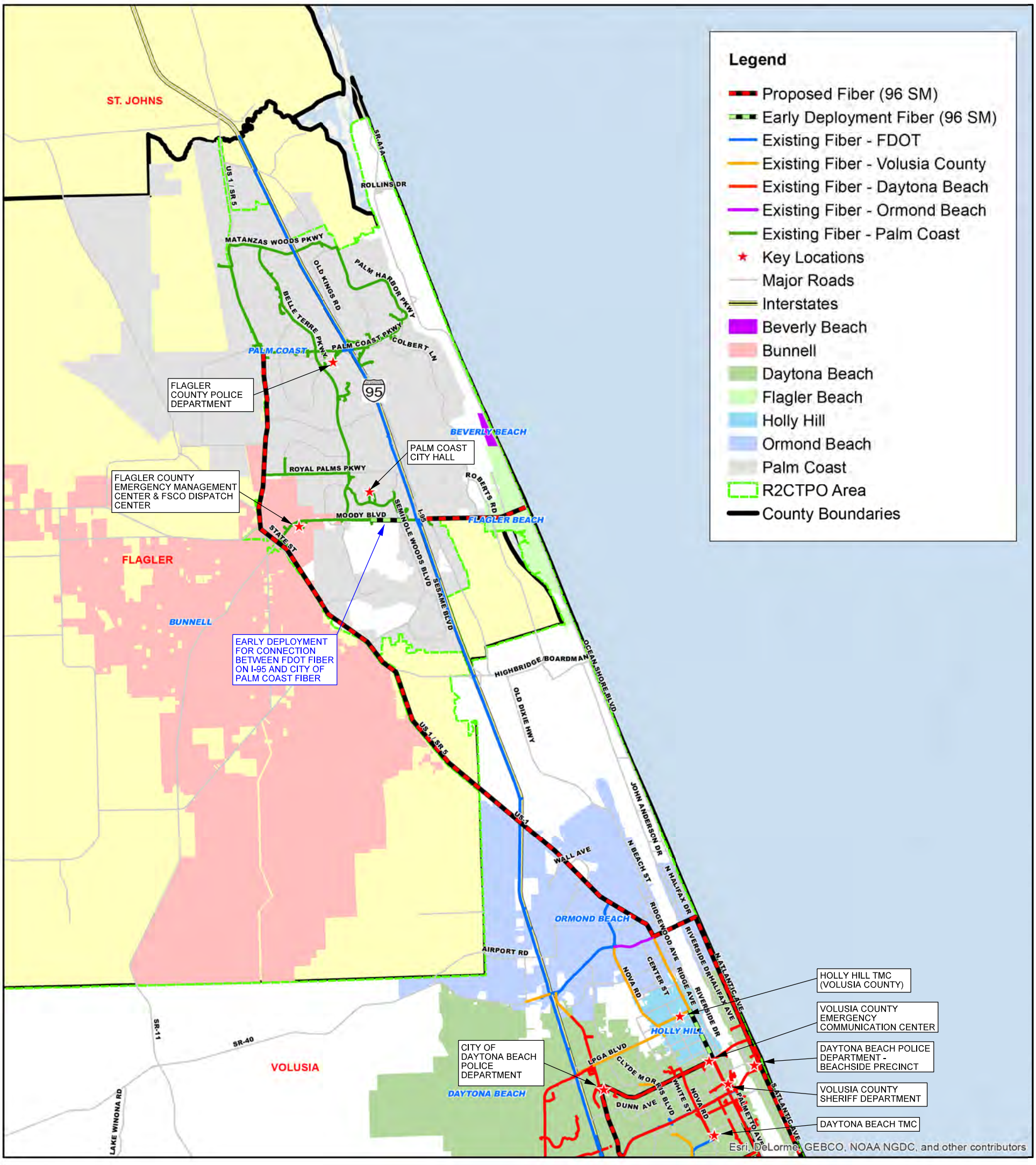
RIVER TO SEA TPO
Transportation Planning Organization
VISION - PLAN - IMPLEMENT

R2CTPO - TSM&O MASTER PLAN PHASE 2

PROPOSED PHYSICAL NETWORK ENHANCEMENTS (FLAGLER COUNTY)



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RIVER TO SEA TPO
Transportation Planning Organization
VISION - PLAN - IMPLEMENT

Appendix C – ATMS.Now Modules

ATMS.now Modules

Overview of ATMS.now

Trafficware's ATMS.now is an Advanced Traffic Management System that provides a global perspective of an agency's transportation network, allowing for integration with various technologies to optimize traffic flow and safety. The solution brings together traffic network data into a single repository for a completely integrated, 360-degree view of traffic operations in real time.

ATMS.now Modules

The ATMS.now platform provides maximum flexibility to meet an agency's specific needs. The standard ATMS.now system is a fully-featured management system, offering complete traffic and data management and real-time reporting. To provide maximum flexibility and scalability, Trafficware offers these additional modules to meet your specific requirements.

Premium Modules

- **CCTV.now:** Provides CCTV (Closed Circuit TV) surveillance footage from IP, IV&C, and Cameleon cameras, and integrates directly with the user interface.
- **CMS.now:** Allows users to remotely program changeable message signs (CMS).
- **Assets:** Tracks a variety of assets, such as controllers, hand-held devices, counters, etc. Each asset can be associated with trouble reports, service reports, and maintenance records.
- **Bing™ Maps:** Integrates with Microsoft Bing™ Mapping to provide high-resolution imagery.
- **WEB.now:** Allows an agency to port specific content that is retrieved from ATMS.now to the public internet to provide real-time traffic and congestion information to the public.
- **TSP.now:** Re-coordinates intersections after a public transportation vehicle passes through the corridor, helping to maintain normal traffic flow.
- **Disaster Recovery Module:** Provides a fully redundant, secondary server that will restore data and traffic operations in the event that the primary server fails.
- **Traffic Responsive:** Serves as a virtual master controller and responsive system management solution.
- **Wavetronix:** Integrates with Smart Sensor HD and 105 radar detectors to provide volume, occupancy, and speed values on the system map in real time.

Enterprise Modules

- **Emergency.now:** Displays vehicle positions on an interactive GIS map and modifies signals for the entire route, removing the "snowplow" effect during heavy congestion.
- **SynchroGreen:** Reduces delay and travel time by adjusting signal timing plans based on current traffic conditions.
- **Fleet.now:** Tracks the real-time location, speed, and direction of a fleet and displays the position of vehicles on an interactive GIS map.
- **Custom Module:** Optimize your ATMS.now platform with Trafficware's Integration Services Group, who will address your existing system's requirements and provide the right solution for your agency.

Appendix D – Centracs Modules

Centracs®

▷ ▷ The flexible and scalable Centracs 2.0 design also provides agencies with feature-rich options that best meet evolving transportation agency needs.

About Centracs

Transportation agencies, now more than ever, are looking for more efficient and cost effective solutions to manage traffic. Econolite offers Centracs 2.0 Advanced Transportation Management System (ATMS) as a valuable component of an effective ITS solution to easily address current and future traffic management challenges. Centracs 2.0 provides an integrated platform for traffic signal control, ITS field device monitoring and control, information management, graphical data display, advanced traffic algorithms, and much more. Centracs 2.0 is a flexible, user friendly and cost-effective system, enabling agencies to realize significant mobility benefits from its ATMS investment. The flexible and scalable Centracs 2.0 design also provides agencies with feature-rich options that best meet evolving transportation agency needs.

At A Glance

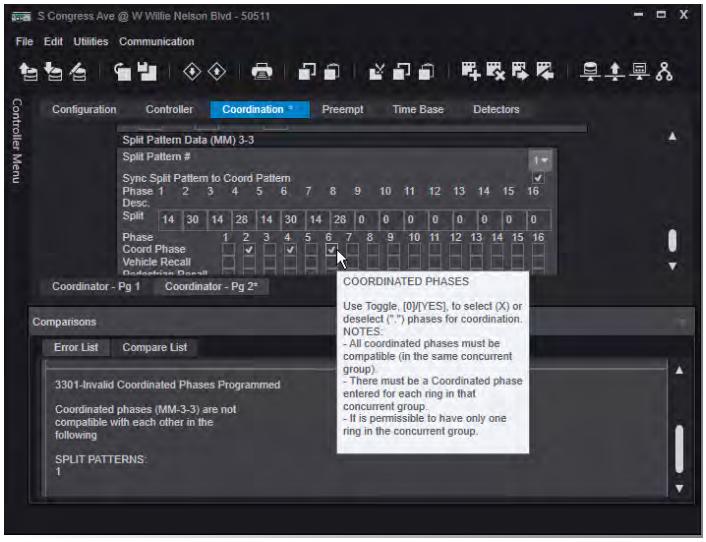
- ▷ NEW Database Editor
- ▷ Performance
  - Faster dialog loading times
  - Better processing and response times
  - Quicker report generation
- ▷ Support of newer technologies (Windows 10, touch features, and more)
- ▷ Improved User Interface

ECONOLITE®

Graphical User Interface and "Containers"

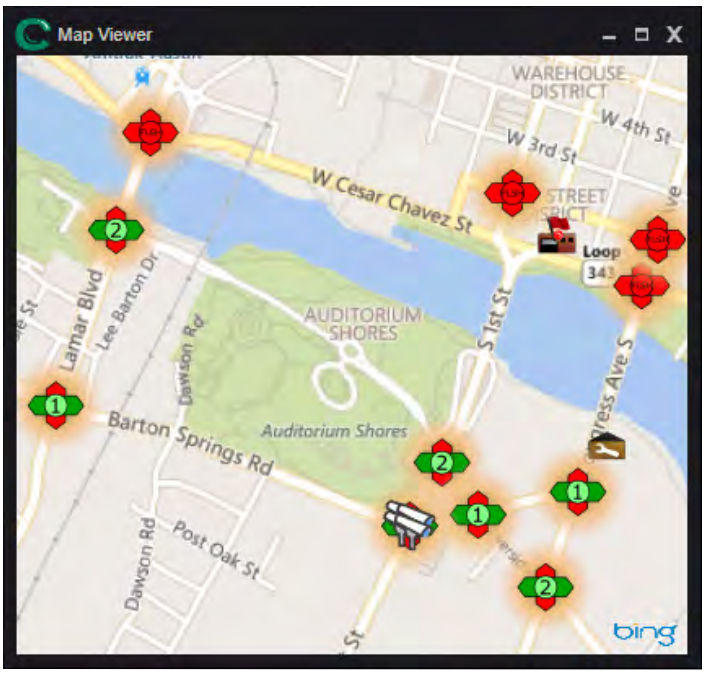
Modern Graphical User Interface (GUI) design is an integral part of Centracs 2.0. The intuitive GUI provides a short system learning curve, helping new users to immediately become productive while allowing experienced users to leverage the full power of Centracs 2.0's advanced features. Centracs 2.0 offers an extensive and flexible suite of tools, encouraging users to establish individual workflows and environments for increased efficiency.

User versatility is made possible by the Centracs 2.0 user interface, which utilizes powerful "Container" technology. Containers assist the user in managing the various maps, status, and control screens by enabling the user to drag-and-drop open windows into containers.



Interactive GIS Based Maps

The modern GIS map technology and rendering tools behind Centracs 2.0 map interfaces make the map a truly convenient tool for managing and monitoring field devices. Simple mouse gestures are used to pan and zoom, while the Centracs 2.0 Container technology allows users to customize, display and store multiple maps. Agencies can select from a variety of commercial or government GIS data sources including their own GIS databases. The local intersection map editor in Centracs 2.0 is easy to use allowing users to add fully functioning intersection displays in a matter of minutes.



Centracs 2.0 takes care of the positioning and sizing of contained windows, leaving the user free to focus on more important tasks. When a user exits Centracs 2.0, the entire layout is remembered and then restored on the next login. Additionally, all system configuration actions are performed through the GUI - no need to edit configuration text files or registry entries.

Scalable Architecture

Centracs 2.0 implements a distributed layer architecture providing scalability and expandability. The "Core" or application server manages the system scheduler, traffic control algorithms, field device time management, alert generation, and more. Communication or "Comm Servers" perform the communications to field devices. The entire system can reside on a single computer or it can be spread across multiple computers. This allows Centracs 2.0 to efficiently manage a small agency's needs on a single, inexpensive computer, or to scale up for a large agency needing to manage thousands of devices by distributing the processing across multiple computers.

Powerful Traffic Management Tools

The true value of a modern ATMS system depends on the tools provided to monitor and manage the system. Centracs 2.0 offers a wide range of reports and real-time monitors for nearly every aspect of the system. Real-time detector monitors, Time-Space and split monitors, coordination, Traffic Responsive, communication status, system performance monitors, alert monitors and detailed reports allow the various users of the system to track those aspects of the system that are most important. A real-time text-mode remote front panel for ASC/3 and Cobalt controllers allow Centracs 2.0 users to interface with controllers as if they were standing at the intersection. The signal database editor for Cobalt and ASC/3 controllers offers advanced features such as timing templates, spreadsheet style editing features and version management. Whether the user is a Traffic Engineer, a TMC manager, a System Administrator, or a signal shop manager, Centracs 2.0 provides the most effective tools for the job.

Communications and Device Support

Robust, dependable communication to field devices is key to a successful ATMS system and is a critical component of Centracs 2.0. Most communications media is supported, including fiber optics, twisted-pair, leased lines, and wireless. Protocol support includes: TCP/IP, UDP/IP, RS232 serial, ACT, PMPP, STMP, and SNMP. Traffic signal device support includes: Econolite's NTCIP-based Cobalt, ASC/2, ASC/2S, and ASC/3 (1000, 2100, or Rack Mount) NEMA TS1/TS2 controllers, 2070 (L or LN) controllers running ATC/2070, ASC/3 2070, or Oasis firmware, or controllers running EPAC version 4.01D,170-type controllers running certain versions of Wapiti W4IKS firmware, and NTCIP 1202 compliant controllers.

Centracs Maintenance Management System (MMS) (optional)

Centracs 2.0 MMS is a simple to use GIS-based asset management and maintenance system. It allows ITS and signal maintenance organizations to track assets in real-time through the products' entire life cycle. Offering both workstation and mobile device interfaces, it supports preventative maintenance planning and execution along with trouble ticket dispatch and work-order scheduling. Centracs 2.0 MMS is available as an optional module to Centracs 2.0, or as a stand-alone system.

Centracs DCMS (Data Collection Management System) (optional)

Centracs 2.0 DCMS turns new or existing detection systems into virtual count stations that gather and distribute traffic data without interruption, providing the accurate information needed for faster incident response, real-time changes to traffic signal timing,
or to anticipate special event traffic conditions.

Centracs Adaptive Module (optional)

Centracs 2.0 Adaptive is an arterial-based adaptive control module. Centracs 2.0 Adaptive uses the Centracs 2.0 native interface, simplifying the creation and management of adaptive intersection groups or sections. As a bonus, while the Centracs 2.0 Adaptive algorithms adjust splits and offsets, cycle length adjustments can be achieved by coupling our adaptive software with Centracs 2.0 Traffic Responsive techniques. Working directly with Econolite's ASC/3 controller software and avoiding adding undesirable hardware at the cabinet, Centracs 2.0 also allows the creation of multiple groups that can easily be managed using the Centracs 2.0 Time-of-Day scheduler. The power of Centracs 2.0 Adaptive provides a cost effective means of achieving real and measurable improvements in traffic flows without the cost of adding new servers, hardware, and by using existing controller coordination plans and existing communications channels.

Advanced Measures of Effectiveness (MOE) Module (optional)

The Centracs 2.0 MOE module was developed in conjunction with Purdue University. These reports use high density detector data collected 10 times per second from ASC/3 and Cobalt controllers to offer users a unique set of tools for understanding the factors influencing coordination and the effectiveness of timing at the intersection.

Dynamic Message Sign (DMS) Management (optional)

The Centracs 2.0 DMS module provides users the direct and instantaneous control to update and display valuable traveler information messages. By providing timely traffic condition or incident messages, Centracs 2.0 DMS can help provide congestion mitigation and increase roadway safety.

Server-to-Server Module (optional)

The Centracs 2.0 Server-to-Server module provides a unique interface allowing agencies to achieve unparalleled benefits through cooperative operations and system management. Adjoining Centracs 2.0 - managed cities can seamlessly share data and manage arterial traffic across agency boundaries providing true Center-to-Center communications. Centracs 2.0 Server-to-Server also allows agencies to participate in cross-jurisdictional management and monitoring of neighboring agency intersections.

CCTV (optional)

Close Circuit Television (CCTV) cameras have proven a valuable tool for many agencies. Econolite offers the Centracs Advanced CCTV module as an optional component of the Centracs ATMS. This module is an enterprise-class IP video surveillance solution that provides seamless management of digital video across IP networks.

Centracs Optional Modules

- Centracs MMS
- Centracs DCMS
- Centracs Travel Time
- Centracs Adaptive
- Centracs MOE
- Centracs DMS
- Centracs Server-to-Server
- Centracs CCTV

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Appendix E – Example Road Ranger Scope of Services

EXHIBIT A

SCOPE OF SERVICES

ROAD RANGER SERVICES FOR DISTRICT TWO

1. OBJECTIVE

The Florida Department of Transportation (Department) District Two Incident Management program, under the SunGuide Intelligent Transportation System (ITS) Program, desires to provide Road Rangers to support and promote the "Open Roads Policy" and provide highway assistance services to motorists stranded with disabled vehicles.

The Road Ranger highway assistance services shall include proactively assisting the Traffic Incident Management Program and Florida Department of Transportation's District Two Traffic Management Center to manage incidents in an effort to reduce traffic congestion and delay caused by vehicle crashes, disablements and non-hazardous material spills. This responsibility includes the ability to recognize hazardous spills and immediately report same to the FDOT Traffic Management enter (TMC). This Program is anticipated to lower the potential for secondary crashes by assisting with incidents and providing preliminary Maintenance of Traffic (MOT) for other responders to expedite recovery time.

This provider will represent the Department to the public and as such shall provide services in a professional and efficient manner with a quality of service and appearance that brings credit to the Department and the Vendor.

2. DEFINITION OF TERMS USED IN THE AGREEMENT

Department: Florida Department of Transportation (FDOT), Traffic Operations Office, Intelligent Transportation Systems (ITS) Office, Traffic Incident program, FDOT Maintenance Yards, or Transportation Management Center (TMC).

Traffic Management Center (TMC): a dispatch and communications facility housing both Department and SmartRoute Systems TMC Operators and Supervisors. Facility is used for dispatch, communications, traffic monitoring and management for traffic incidents on the freeways.

Service Patrol or Road Ranger Service: Road Ranger Patrols or Road Rangers that perform the services to motorists outlined in this Contract.

FHP: Florida Highway Patrol

Service Patrol Operator: A hired driver or employee of the Vendor duly licensed and trained by the Vendor as an operator of Vendor's vehicles.

Route: The specific section of roadway on which a Road Ranger is to patrol during his/her shift. Routes will vary dependent on the design of the program, and location and time of day.

Sponsorships: An agreement, whether formal or informal, to obtain goods or services or anything of value, including, but not limited to information, in exchange for any service rendered by the Road Ranger Service Patrol Vendor and/or a Road Ranger.

SLERS*:* Statewide Law Enforcement Radio System. A common communication system (radio) used for State Law Enforcement, authorized by Florida Legislature for the Department of Management Services.

MOT: Maintenance of Traffic

3. SERVICES TO BE PROVIDED BY VENDOR

The Vendor shall furnish all personnel, supervision, expertise, vehicles, equipment, materials, parts, licenses, supplies and incidentals necessary to provide a fully functioning Service Patrol operation.

The service patrols shall assist the Florida Highway Patrol, Jacksonville Sheriff's Office, Jacksonville Fire/Rescue, and the Department's Maintenance personnel (or representing Vendor) during incidents. All Service Patrol operators shall have a basic knowledge and recognition of hazardous materials whereby they will immediately report spills involving same to the TMC Operators.

The services to be provided by the Vendor shall include, but are not limited to, providing service patrols for Interstate 295, Interstate 95, Interstate 10, J. Turner Butler Boulevard, State Road 9A or other assigned routes as required. These service patrols shall also provide motorist assistance, perform minor repairs, move disabled vehicles from travel lanes, change flat tires, jump-start batteries and remove minor non-hazardous spills or debris from the highway.

The Vendor shall also be responsible for providing immediate first hand information on incidents involving but not limited to car crashes, fatalities and hazardous spills to agencies identified by the Department.

Hiring Preference: Vendor shall give preference in hiring employees for this contract to individuals who have served on active duty and were discharged under honorable conditions from the Armed Forces of the United States of America; and to individuals with a law enforcement/security background.

Drug-Free Workplace Compliance:

The Vendor must subscribe to and practice a drug-free work environment program in compliance with Florida Statute 287.087, and consistent with their signed drug-free workplace affidavit.

a) Service Patrol Operators shall be drug free in accordance with Section 112.0455, Florida Statutes, prior to beginning operations.

b) Service Patrol Operators shall undergo additional testing in concurrence with FDOT "Drug-Free Workplace and Testing Policy" (topic number 001-250-013) at a minimum of every six (6) months at the expense of the Vendor.

4. GENERAL CONTRACT REQUIREMENTS – PERFORMANCE CONTRACT

This is a performance based contract in which compliance is evaluated monthly by the Project Manager.

Instances where the Department finds the Service Patrol Vendor fails to comply with a specific provision(s) of their contract (i.e., not performing the responsibilities and services described herein) the Department shall reduce the monthly invoice (see Section 39, "Liquidated Damages"), or at the Department's discretion terminate the contract.

5. LANGUAGE / VERBAL COMMUNICATIONS

The Department conducts its official business in English. All communication between the Service Patrol Operators shall be conducted in English.

6. PROJECT AREA

The potential project area spans approximately two hundred (200) centerline miles (one way) in Jacksonville. During the life of the contract, the service area may expand for additional routes. The delivery of services shall be broken down into routes that enable each patrol to operate within their assigned area and reach incidents and/or stranded motorists with minimum delay.

7. VENDOR'S PROJECT MANAGER

The Vendor shall identify a Supervisor(s) for this project who shall be the point of contact for the Department. A Supervisor shall be available to the Department twenty four (24) hours a day, seven (7) days a week through a reliable, local area code (904) phone number.

This Supervisor shall have a response time of thirty (30) minutes after receiving a call from the Department.

If required, the Supervisor shall be at a requested location within one (1) hour after being contacted by the Department and/or the Department's Project Manager (or designee).

The Supervisor shall be based at a vendor offices and available (on-call) to assist individual operators as needed in the re-supply of expendable supplies or vehicle replacement and will be capable of replacing operator on designated route.

If during the term of this Contract, a new Supervisor is to be employed by the Vendor to meet the provisions of the contract, the new Supervisor shall be available to meet with the Department's Project Manager (or his/her designee). This time spent shall not be billable to the Department.

An interim Supervisor shall be assigned if the Vendor's Supervisor is away or the position is temporarily open.

The Vendor's Supervisor for this Contract shall meet the background and training requirements for Driver/Operator.

8. EMERGENCY & OTHER SERVICES

At times the Department may identify a need to utilize the Service Patrol Operators for purposes not specifically outlined in this scope. The Department reserves the right to assign the Service Patrol Operators to duties that are consistent with those outlined in this scope.

Emergency Services:

The Vendor shall make resources available for all activities described herein for providing services during a hurricane evacuation, major incidents, roadway construction, or FHP requests after receipt of approval from the Department's Project Manager or designee.

During hurricane evacuations, emergencies or occasionally during special events, the Vendor may be asked to expand the designated Road Ranger Patrol coverage area (by manning and deploying backup vehicles) to provide disabled vehicle assistance until such time as normal traffic operations have resumed. Payment shall be the same as that for regular working hours and the period for payment shall be calculated to the nearest one-half (1/2 hour).

Traffic Incident Management (TIM) Team:

The Vendor or designee shall attend and participate as an active team member at the bi-monthly First Coast Traffic Incident Management Team Meetings. Attendance at these meetings shall not be billable to the Department.

1. The Department's Traffic Incident Manager will provide the location and time of the meeting(s) to the Vendor at least two (2) weeks in advance.
2. Attendance at the meeting shall not result in fewer Road Rangers on patrol.

9. SERVICE PATROL HOURS OF OPERATIONS

Anticipated hours: Monday through Friday 6:30 AM to 6:30 PM. If a holiday falls within the scheduled work week, the Vendor shall provide coverage at the normal hourly rate. Any changes in the schedule will be addressed by the Project Manager on an "as needed" basis.

The Department reserves the right to adjust the shift times and the number of vehicles required per shift to meet the Department's needs.

Any additional hours worked due to clean up a traffic incident or as directed by FHP or the Department shall be turned in within 24 hours after the incident for approval from the Project Manager.

The Vendor is required to begin all shifts/assignments with the appropriate number and type of vehicles, at the times indicated in the contract.

If at any time a Service Patrol Vehicle and Operator are unavailable for routine beat patrol , the Vendor shall reduce the monthly invoice to reflect the time the service patrol was not available. The invoice reduction shall be in addition to any liquidated damages incurred by the Vendor.

10. SERVICE PATROL SHIFT CHANGES

The Vendor shall submit to the Department for approval prior to implementation, their plan for shift change times, duration of shifts and staffing requirements. Shift change hours shall coincide with low traffic volume hours.

Changes to the Vendor's plan during the contract period shall also be submitted for approval prior to their implementation.

Service Patrol Operators shall not leave their shifts until they receive authorization from the Department (TMC or Department's Project Manager).

Service Patrol Operators shall respond to all requests for service or assistance from the Department or a Law Enforcement Officer even if the request comes near the end of the Operator's shift. The services requested shall be accomplished prior to the Operator terminating their shift.

At shift changes, the Vendor shall be allowed a maximum of thirty (30) minutes from the time a unit leaves designated route until the time the unit must be back on route to change drivers, fuel, inspect vehicles and re-stock supplies.

Any time in excess of thirty (30) minutes shall be recorded by the Vendor and shall be at the expense of the Vendor.

A. Payment for extended services:

The Department shall pay the Vendor for the extended period, providing the services required an additional unit over and above the number normally on duty.

The rate of payment shall be the same as that for regular working hours and the period for payment shall be calculated to the nearest hour.

11. SHIFT CHECK-ON / OFF LOCATIONS AND RE-FUELING /RE-EQUIPPING LOCATIONS

Geographic Location of Facilities:

The locations where Service Patrol Operators refuel and / or replenish their supplies shall be within one (1) mile of patrol area.

Physical Facilities:

The facilities where Service Patrol Operators pick-up their trucks to begin or end their shifts shall be in locations that meet all local zoning requirements for the purpose.

12. SERVICE PATROL ROUTES

Service Patrol Vehicles shall operate within designated Service Patrol routes as designed by the Vendor and approved by the Department. Each route shall have specific turn-around locations and shall start and end at specific entrance/exit ramps.

13. ROUTE ADJUSTMENTS

At any time during the contract's term, the Department reserves the right to require adjustment, alteration or addition of route locations to better accommodate the demand for the service and the needs of the Department. This recommendation may also be provided by the Vendor.

a) Except during times of emergency, the Department will advise the Vendor of any required adjustment to a route within forty-eight (48) hours prior to the effective date of adjustment.

b) The Vendor will be given thirty (30) days notice when a new “permanent” service area is added to the contract that will increase the total number of hours of service.

c) The Vendor may agree to shorter notice at the time of the notification.

d) Service to the “new permanent” service area shall be at the same hourly rate as that for other service areas.

14. SERVICE PATROL VEHICLE ASSIGNMENTS

All Service Patrol Vehicles are restricted for Department official use only and are to be used to provide the services contained herein. Service Patrol Vehicles are not to be used for personal or other business-related work of the Vendor. Covering Department identification logos or markings shall be prohibited.

Specific Vehicle Assignments:

A “Tow Truck” shall be on-call primarily to areas (including any routes undergoing construction) where there is insufficient room on either side of the roadway for a disabled vehicle to be left standing without obstructing any part of a travel lane.

a) On-Call Tow Truck Coverage shall:

- Respond within 30 minutes after initial call
- Remove disabled vehicle(s) from travel lanes within 30 minutes
- Site cleanup and disposal of waste generated from incident.

Backup Vehicles:

Backup vehicle(s) shall be used when a regular, dedicated vehicle is taken out of service for any reason and shall be the same type, be equipped the same and perform all the functions of a regular vehicle.

Backup vehicle(s) shall be deployed and in service as a replacement within thirty (30) minutes of a regular vehicle breakdown.

If the replacement vehicle is not placed into service within thirty (30) minutes, the Vendor shall reduce the monthly invoice to reflect the time the service patrol was unavailable.

In the event of recurring unavailability of vehicles on patrol, the Department has the right to terminate the contract for non-compliance.

Re- supply Vehicles:

Supervisors on the road during the shifts shall carry in their vehicle extra expendable supplies to assist in the re-supply of other patrol vehicles.

15. SERVICE PATROL VEHICLE MINIMUMS & REPLACEMENT REQUIREMENTS

A minimum of nine (9) vehicles are required for the contract.

All vehicles in the Service Patrol Vehicle fleet shall meet the specific vehicle requirements and be capable of carrying the equipment specified in this contract. All vehicles must be licensed in the State of Florida. Proof of such licensing must be provided to the Department prior to a vehicle being used on this contract.

The Department may require an independent safety inspection of the vehicles by a technician of the Department's choosing and at the Vendor's expense.

a) Vendor shall assure vehicle availability during the entire service period.

b) Upon contract execution, all vehicles in the fleet shall not be greater than three (3) years old from their original manufactured date.

c) All used vehicles shall have verifiable maintenance records available for each vehicle that show the vehicle was consistently maintained according to manufacturer's service/interval recommendations.

- All body panels and parts on the used vehicles shall meet the same appearance standards as new vehicles.
- "Used" vehicles shall be replaced under the same guidelines as new vehicles.
- Consideration will be given to the replacement of chassis and/or body separately of each other for vehicles so designed. Should Vendor desire separate replacement, they shall request, in writing, and include the specific reasons for the request.

d) Fleet may include a maximum of one (1) "used" tow truck to meet the minimum required number of vehicles. Vendor's fleet may include any of their company owned FHP approved tow trucks. Flat type recovery vehicles are permitted if they are approved by FHP for services.

e) During the term of the Contract, gasoline powered vehicles will be maintained to OEM standards for operations on public highways. Any vehicle that fails to meet these criteria shall be removed from service regardless of years or mileage.

16. SERVICE PATROL VEHICLE LOGOS AND MARKINGS

Service Patrol Vehicles shall be painted white and shall only have the identification markings listed below. Markings shall be attached on the areas designated by the Department.

The Department will provide only the FDOT identification logos for each vehicle. All other markings shall be procured and installed by the Vendor. The Department shall approve the design of all identification markings prior to Vendor procuring and installing.

Required Identification Markings:

- Eleven (11.5) inch diameter F.D.O.T. logo (both sides).
- Eight and a half (8.5) inch by nine and a half (9.5) inch SunGuide logo (both sides).
- Two (2) inch black letters "A FREE SERVICE" logo below the F.D.O.T logo.
- Pickup trucks shall also have "A FREE SERVICE" logo on the rear bumper.

- All vehicles shall have a three-digit number placed on or near the driver's door and the rear bumper that shall identify each patrol vehicle. The numbers shall be sequential, all starting with "2_ _," such as 201, 202.
- "FHP" painted or affixed in two-inch (2") white letters on blue background.
- Traffic Incident Management logo on sides of vehicles and 2" wording "Traffic Incident Management to be placed on back bumper.

Required Conspicuity Markings:

- A single two (2) inch wide, red/white strip of reflective tape applied so as to cause the limits of the truck from any angle to be visible at night when illuminated by oncoming traffic.
- The tape should be applied at a minimum height of four (4) feet, but may vary according to truck or body configuration.
- On the rear of the vehicle the tape shall be applied to the upper portion of the bumper.
- Gaps in the tape where members protrude or the configuration does not lend itself to tape application shall be considered normal.

All markings and decals shall be maintained in a clean, bright and readable condition throughout the term of this contract.

Should a Service Patrol Vehicle become permanently inoperable for any reason or should the Service Patrol contract be terminated for any reason, the Service Patrol Vehicles shall have all logos referencing this contract permanently removed before being junked, sold, or placed in private service.

The Department may require the addition/deletion of markings at any time during the contract.

Vendor may apply Department approved Service Patrol Sponsorship markings and/or decals to Service Patrol Vehicles, provided that:

- Sponsor markings/decals do not cover any FDOT required logos.

- Sponsor markings/decals meet all FDOT Sponsorship requirements as specified in the Vendor Sponsorship agreement and approved by the Department. Appendix "A" contains additional guidelines for Service Patrol Sponsorship logos.

17. <u>TOW TRUCK VEHICLE SPECIFICATIONS</u>

- Minimum Gross Vehicle Weight Rating (GVWR) chassis of twelve thousand (12,000) pounds.
- Dual wheel chassis and four (4) ton recovery equipment rating.
- Wheel-lift towing equipment, with a minimum lift rating of three thousand (3,000) pounds.
- All tow equipment shall include proper safety straps.
- Boom with a minimum static rating of five thousand (5,000) pounds.
- Winch Cable - eight thousand (8,000) pound rating on the first layer of cable.
- Winch Cable - one hundred feet (100') of three eight inch (3/8") diameter, with a working limit of three thousand five hundred (3,500) pounds.
- Towing slings rated at three thousand (3,000) pounds minimum.
- Tow chains of five-sixteenths inch (5/16") allow or OEM specs, J.T. hook assembly.
- A rubber face push bumper.
- Spot light capable of directing a beam centered in any direction of a 360 degree horizontal arc around the vehicle.

- Power outlets ("booster outlets" or “hot boxes”), front and rear-mounted, with outlets compatible to twelve (12)-volt booster cables.
- Heavy duty, sixty (60) + amps charged battery.
- Suitable cab lighting.
- A trailer hitch capable of handling a 1.875 inch ball and/or two (2) inch ball.
- Motorcycle transporting capability.
- Rear work lights.
- Safety chain D-ring or eyelet mounted on rear of vehicle body.
- A roof-mounted amber warning / strobe light bar with front to rear directional flashing and capability, equipped with removal lenses and on/off switch in cab that meet or exceed the specifications described in Appendix “B”.

Alternative Flat Bed Truck Option:

As an alternative to the tow truck specifications referenced above, the vendor may provide a flat bed tow truck with capabilities equal to or greater than the specifications referenced. The intention of this alternative is to allow the vendor the option of relocation high-end vehicles (i.e., Mercedes Benz or BMW) that cannot be moved by the standard tow truck unit addressed above.

Portable Dynamic Message Signs (DMS):

- Vendor shall equip all of the ~~tow~~ trucks with Portable Dynamic Message Signs (DMS) that meet or exceed the specifications described in Appendix “A.”

- Any and all equipment shall be securely attached and, when appropriate, in reach of the driver without distraction to driving safely.

18. <u>PICKUP TRUCK VEHICLE SPECIFICATIONS</u>

- Minimum of a Full size, half (1/2) ton, 4-door, long bed pickup, capable of carrying the equipment specified in this contract.
- Each vehicle must have seat belts for passengers on both the front and on rear cab benches.
- Two (2) towing straps rated at 3,000 pounds minimum.
- Rubber face push bumper.
- Spot light.
- Power outlets (“booster outlets or “hot boxes”), front and rear-mounted, with outlets compatible to twelve (12) volt booster cables.
- Two (2) heavy duty, 750 CCA (Cold Cranking AMP) (Minimum) Batteries.
- Suitable cab lighting that allows Service Patrol Operator to complete paperwork, etc.
- Equipped with Portable Dynamic Message Signs (DMS) that meet or exceed the specifications described in Appendix “A.”
- Equipped with a roof-mounted amber warning/strobe light bar with front to rear directional flashing capability, equipped with removable lenses and an on/off switch in cab that meet or exceed the specifications described in Appendix “B“.
- All equipment shall be securely attached and, when appropriate, in reach of the driver without distraction to driving safely.

19. <u>AUTOMATIC VEHICLE LOCATION (GPS) SYSTEM</u>

a) Vendor shall ensure there is an operational GPS monitoring system (radio system component) in each vehicle and shall be responsible for protecting any installed system components in the vehicles.

Internet access to the GPS information will be provided by the Vendor to the Department's Project Manager.

b) The GPS System shall be monitored by the Vendor and the Department's Traffic Incident Manager/Road Ranger Project Manager and Traffic Management Center.

c) Throughout the term of the contract, the Vendor shall be responsible for all costs associated with the monthly service and maintenance of the Radio / GPS system including the units in use by the Department for communication with the Vendor and the base station(s).

20. COMMUNICATIONS EQUIPMENT REQUIREMENTS

Radio Communications Requirement:

The Department must be able to communicate with the Service Patrol Vehicles utilizing a two-way radio system for the purpose of monitoring of the Road Ranger Patrols and ensuring they are aware of and deployed to incidents.

Unless otherwise specified in the Contract, all communications equipment shall be supplied and maintained by the Vendor.

a) The Department will approve the equipment to ensure it interfaces with the Department Communications systems and meets the Department's requirements.

b) The Department can, at will, replace communications radios with upgraded units to better serve the needs of the Department.

c) The Vendor shall be responsible/ensure that all communications equipment shall be standardized and compatible for all stakeholders identified in the performance of this contract.

Cellular Telephones with Two-way Radio Capability

The Department will provide procedures for radio communications and may change/alter the procedures at any time during the term of the contract.

The Vendor shall be responsible for all the fixed and recurring costs and licenses associated with the cellular radio/telephones throughout the term of this Contract.

- Vendor shall provide each Service Patrol Vehicle, including backup and supervisor vehicles, with licensed cellular, two-way radio telephone or wireless telephone.
- Vendor shall also provide a hand-held two-way radio to the Traffic Management Center (TMC), the Road Ranger Project Manager, and FHP.
- Vendor must immediately notify the Department to report any loss of signal or cellular phone problems of more than fifteen (15) minutes duration.
- Inoperable or faulty cellular phones shall be replaced within thirty (30) minures of detection of the fault.

SLERS: STATE LAW ENFORCEMENT RADIO SYSTEM:

a) The Department may provide radio communications equipment, at the Department's expense, at any time during the life of this contract.

b) The Department may require, at the Department's expense, training and certification of operators for State Law Enforcement Radio System (SLERS).

c) The Department reserves the right to implement FDLE communications criteria to qualify Road Ranger Service Patrol operators for SLERS.

Electronic Mail (e-mail):

Vendor shall maintain a reliable e-mail service capable of receiving attachments at their headquarters and at each facility where Road Rangers pick-up / drop-off vehicles to begin / end their shifts.

Public Address System:

Each Service Patrol Vehicle shall be equipped with an external speaker, public address system with "air horn" feature in a one hundred (100) watts minimum system.

- The public address system shall be connected to the radio system in such a way that radio transmissions can be broadcast over the speaker.

Laptop Computers/PDAs:

Laptop computers or PDA's for each Service Patrol Vehicle may be required for this contract. The Department's Project Manager will determine the need for this technology and will provide a Letter of Authorization to the Vendor for purchase and installation of the equipment once a decision has been made.

When implemented, the Contractor is responsible for ensuring that there is an operational, DEPARTMENT approved laptop computer in each Service Patrol Vehicle for each shift.

The Vendor shall provide installation of the laptop computer in each Service Patrol vehicle required by this Contract.

When there are other reasons to reinstall or remove laptop computers from Service Patrol Vehicles (i.e. vehicle damage, crash, repair or replacement of vehicle, etc.) the CONTRACTOR shall be responsible for the charges.

The CONTRACTOR shall only use DEPARTMENT authorized technicians to install, remove, ore repair the laptop computer.

The **CONTRACTOR** shall be responsible for the cost of replacing any damaged or stolen Handheld PCs or other devices provided by the **DEPARTMENT**.

Introductory training on laptop computer (hardware and software) operations will be provided by the **DEPARTMENT** as part of the orientation for new hires, but the **CONTRACTOR** shall be responsible for continued training on laptop computers as deemed necessary by the **DEPARTMENT**.

21. SERVICE PATROL VEHICLE ACCESSORIES / PARTS / TOOL BOX REQUIREMENTS

a) Each Service Patrol Vehicle shall, at a minimum, have a toolbox containing tools as listed below. Tools and equipment shall meet the quality requirements of the Department Project Manager.

- Screwdrivers – one (1) each: ¾ Standard 1/8; 3/16); 1/4; 5/16) ¾ Phillips head #1 and #2
- Star Driver (one set)
- Needle nose pliers (one pair).
- Adjustable rib joint pliers, two-inch minimum capacity (one pair).
- Adjustable wrenches – one (1) each: ¾
  Eight (8”) inch ¾
  Twelve (12”) inch.
- Five (5) pound hammer (one (1) each).
- Rubber mallet (one (1) each).
- Electrical tape (twenty (20) yards).
- Duct tape (twenty (20) yards).
- Tire pressure gauge (one (1) each).
- Mechanic’s wire (twenty five (25) foot roll).
- Bolt cutters – 24” or larger (one (1) pair).
- Wire cutting pliers (one (1) pair).
- Complete set of open end and box wrenches (both metric and standard).
- Two, (4”) X (6”) X (12”) wood blocks.
- Four (4) safety chains, minimum five feet in length.
- Fifty (50) foot, ½ inch rope with attachable body harness.

b) Each Service Patrol Vehicle shall, at a minimum, carry the following accessories and parts:

- Diesel fuel (minimum five (5) gallons) in a clearly labeled approved can or tank.
- Ninety- three (93) octane unleaded gasoline (minimum five (5) gallons} in a clearly labeled approved can or tank.
- 3 quarts, SAE 30 oil.
- First aid kit (First Responder Kit, fully stocked) (one (1) each).
- Fire extinguishers – two (2) each ten (10) pound Dry Chemical ABC, meeting all safety requirements. If seal is broken, unit shall be tested, resealed and certified.
- Pry bar, minimum thirty-six (36”) inches in length (one (1) each).
- Radiator water (ten (10) gallons) in clearly labeled container.
- Twenty-four (24”) inch wide street broom (one (1) each).
- Shovels, Square-end (one (1) each), Round-end (one (1) each).
- Highway wet flares, thirty (30) minute burn (forty-eight (48) each). “Turboflares” are acceptable in lieu of Highway Wet Flares.
- Cones, DOT approved, thirty-six (36”) inch reflectorized -fifteen (15) each. Vendor shall replace cones semi-annually (or earlier if damaged or visually faded/discolored).
- Long Frame Aluminum Jack, 2 ½ ton, one (1) each, or steel jack, three (3) ton, one (1) each.
- Air compressor, one (1) each, with at least 12 CFM capability, capable of inflating tires of vehicles and operating impact wrench.
- Air operated impact wrench with sockets to fit all vehicles (metric and standard), one each.
- Lug wrenches (metric and standard) to fit all vehicles, one each.
- Large 2 or 5-cell battery flashlight and spare batteries (one (1) set).
- Booster cables, three (3) gauge copper wire with heavy-duty clamps and one end adapted to vehicle’s power outlets, minimum twenty five (25) feet in length (one (1) set).
- Funnel, multi-purpose, flexible spout (two (2) each).
- One trash can - five (5) gallon.

- Ten (10) gallons of absorbent material for liquid spills equivalent to or exceeding the brand name “Speedy Dry.”
- Drinking water, individually sealed bottles, minimum sixteen (16) ounce, chilled (twelve (12) each).
- One roll paper towels.
- Water cooler for potable water.
- Additional Safety Equipment, as warranted.

c) Vendor is encouraged to install / provide any equipment that will aid and add to the safe operation by the Service Patrol Operators. Such equipment shall be installed, if possible, in both the tow truck and pickups.

22. MAINTENANCE OF SERVICE PATROL VEHICLES

The Vendor shall perform all necessary Service Patrol Vehicle maintenance outside of the service periods specified herein.

a) Vehicle exteriors and interiors shall be kept neat, clean and polished, and shall be maintained in conformance with the requirements of the Motor Vehicle Code, applicable Florida Statutes, Rules of the Department of Highway Safety and Motor Vehicles and Duval County.

23. SERVICE PATROL VEHICLE INSPECTIONS

Prior to the beginning of each shift, the Vendor shall inspect each patrol vehicle and its associated equipment, accessories and parts to ensure they meet all specifications and requirements contained herein.

a) Should the AVL/GPS system be inoperable, the vehicle shall not be placed into service until the system is functioning.

24. SERVICE PATROL OPERATOR REQUIREMENTS

Service Patrol Operators shall be competent in the tasks of operating the Service Patrol vehicle and providing safe and proper discharge of the service responsibilities outlined herein.

Rejection of Driver/Operator, Supervisors or Managers: The Department reserves the right to reject, without reason or explanation given, any Vehicle/Driver/Operators, Supervisors and Managers prior to their being assigned duties related to this Contract.

Removal of Driver/Operators: The Department reserves the right, without the right, without reason or explanation given, to require the Vendor to relieve an employee from duty assignments, and/or bar an employee from further service under this Contract at any time.

Operator Resumes:

The Vendor shall maintain and provide, upon request of the Department, resumes of the Management, Supervisors, Service Patrol Operators and potential Service Patrol Operators.

The resumes shall contain verifications that the Service Patrol Operator or potential Service Patrol Operator complies with the following requirements:

a) Speak and understand English fluently.

b) Demonstrated ability to exercise sound judgment.

c) Documented mechanical background to perform the required vehicle repairs.

d) Have a current Class “E” or higher (Tow operator) Driver’s license in accordance with the Florida Motor Vehicle Code. The Vendor is responsible for ensuring the Service Patrol Operators maintain current and valid licensing requirements throughout the term of the contract.

e) Minimum age of eighteen (18) years old.

f) Verification of “Safe Driving Record.”

g) References which have been verified by Vendor Supervisory personnel or a service paid for the purpose.

h) The results of driving record and criminal background checks.

Driving Record and Criminal Background Checks:

The Vendor will conduct and provide the Department with copies of driving records and criminal background checks for all employees of the contract at contract begin date and as new employees are hired. Copies shall also be provided when requested by the Department throughout the term of the contract.

The Department’s Project Manager may have the Vendor conduct additional checks on approved drivers at any time during the term of the contract. The Vendor shall pay for all costs associated with this task.

a) The Vendor shall furnish to the Department the name, date of birth, social security number and address of all applicants for employment on this contract.

b) Criminal record checks shall go back to the employee’s date of birth.

c) The Department’s Project Manager may have one or more of the following conduct driving and criminal background checks on the applicant(s): Florida Department of Law Enforcement, the FHP, the Department or other authority approved by the Department at the expense of Vendor.

d) Drivers/Operators shall have a safe driving record, in accordance with FDOT “Driver’s Records Requirements” procedure (topic number 250-000-010), prior to beginning operations.

e) The Vendor shall provide the Department with updated Service Patrol Operator driver’s license checks every six (6) months.

OPERATOR SECURITY CLEARANCE FOR USE OF SLERS

All Road Ranger Operators shall have JTF Security Clearance checks processed yearly by the Florida Highway Patrol and the FDOT Program Manager. If this yearly check results any of the JTF Security Clearance Denial Reasons, the **Department** reserves the right to remove the Road Ranger Operator from the Road Ranger Program immediately. If further investigation has determined a mistake in the JFT Security Clearance check, the Road Ranger Operator shall be eligible to re-apply to the Road Ranger Program.

Potential Security Clearance Denial Reasons may include:

- The applicant has been convicted of a felony offense.
- The applicant is currently on probation for any offense or has charges pending (felony or misdemeanor).
- The applicant has been convicted of a misdemeanor offense involving any type of theft, violence or drug offenses within the past three (3) years.
- The applicant's driver license is currently suspended or revoked for any reason.
- The applicant has been convicted of a crime involving domestic violence or currently has a restraining order involving domestic violence or threats.
- The applicant has been arrested for any charge involving resisting arrest, battery or assault on a law enforcement officer.
- The applicant is wanted for any criminal offense.
- The applicant is illegally residing in or is not approved to work in the United States.
- The identification of adverse Homeland Security intelligence information for the applicant.
- At the discretion of the Security Manager based on any other adverse information regarding the applicant.

If a Road Ranger operator's security clearance is denied based on any of the above denial reasons, they may be disqualified as an applicant for the Road Ranger Program.

25. <u>DRIVER / OPERATOR CONDUCT AND GROOMING</u>

a) The Drivers/Operators shall be professional and courteous at all times, shall exercise good sound judgment in carrying out their duties and shall conduct themselves in such a manner that will reflect favorably upon the Department.

b) Drivers/Operators shall wear clean uniforms at the start of each shift. All uniforms items shall be maintained in good repair and appearance. Uniforms shall consist of:

- Uniform style shirts with collars as approved by the Department. Undershirts, if worn, shall not have printing or pictures which show through the outer shirt.

- Each uniform shirt shall have a "SunGuide" emblem and a DOT RR emblem (specific dimensions, locations for and types of emblems, colors, etc., will be provided to the Vendor by the Department). No other emblems, patches, Vendor's names, or logos will be permitted, unless authorized by the Department.

- Shirts shall have a FDOT RR Patch on the left shoulder and a D2 SunGuide patch on the right shoulder.

- Shirts must be tucked into trousers at all times.

- Dark Blue / Navy uniform work trousers (no jeans or cutoffs), belted (black).

- If a cap is worn, it must match the uniform pants and be without adornment, lettering or patches unless specifically approved by the Department. The FDOT approved reflective safety cap is acceptable.

- Black steel-toed shoes with laces.

- If jacket is worn, it must match the trousers and be without ornamentation.

c) Service Patrol Operators shall be well groomed, clean, with neatly trimmed hair, and have no offensive body odor or visible offensive tattoos. Beards and mustaches shall be clean and neatly trimmed.

d) Service Patrol Operators shall display clearly visible picture identification over their left breast.

Alcohol/Drugs:

a) Service Patrol Operators shall not have the smell of alcohol, be intoxicated or under the influence of alcohol or any controlled substance or medical prescription or any other drug that causes impairment anytime while working or reporting for duty under this contract.

b) The Vendor shall never allow a Service Patrol Operator to work under this contract if they feel he/she is impaired in any way.

c) No smoking will be allowed in Service Patrol vehicles.

d) If the Vendor determines that a Service Patrol Operator reported for work or was working while in violation of any part of this section, they shall immediately and permanently remove the Service Patrol Operator from eligibility to work under this contract.

26. TRAINING AND CERTIFICATION REQUIREMENTS FOR SERVICE PATROL OPERATORS

All Service Patrol Operators shall obtain the following training and certifications within sixty (60) calendar days from the date of contract award. The cost for training and licensing operators is the responsibility of the Vendor.

Certification and Training in CPR.

Certification and training in Basic First Aid.

Basic Maintenance of Traffic (MOT) Training:

Service Patrol Operators are required to have training on Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) involving setting up maintenance of traffic (MOT). This “Utility” Level shall be obtained from a firm or individual certified to teach the “Utility Level” MOT Training Course.

- a new employee is not able to immediately attend MOT training, then the Vendor shall show them a training video in conjunction with hands-on training to ensure that the new employees understand the basic safety principals of MOT.

- This process shall only be used to temporarily satisfy this requirement for new employees until the operator can attend the required training.

b) The actual required certification/training shall be completed within the first 60 days of employment.

c) Service Patrols Operators are required to attend a refresher MOT course annually.

d) The Vendor shall ensure that all Service Patrol Operator Certifications remain valid for the duration of the contract. Under no circumstances shall a Service Patrol Operator be allowed to operate under this Contract if their various mandatory certifications / training have expired.

e) If the Vendor chooses to do their own training, the trainer(s) must be fully certified and licensed (if required) to conduct the training.

f) The Vendor shall maintain a current listing, by Service Patrol Operator names, documenting the types of training received, date training was received, the date training / certification expires, location of training and instructor's name.

- The list shall be provided to the Department or designee each quarter of the calendar year, beginning with the effective date of this Contract.

g) Special Training - The Department may identify "Special Training" at a time after the start date of this contract. If the Department requires the Road Rangers to attend "Special Training"/meetings that are not specified in this contract, then the Department will pay all charges through a Letter of Authorization.

27. <u>MINIMUM PAY RATE FOR SERVICE PATROL OPERATORS</u>

a) The Vendor shall be required to compensate all Service Patrol Operators working under this contract a minimum wage of ten dollars ($10.00) per hour. Any increases to the wage rate shall be solely at the discretion and expense of the Vendor. Contract wage rates shall not increase to offset any wage rate increases.

- Proof of compliance shall be made available for review by the Department.

b) The Vendor shall be required to initiate a Service Patrol Operator hiring and retention program that will be reviewed by Department's Project Manager on a quarterly basis.

28. <u>SERVICE PATROL OPERATOR DUTIES AND RESPONSIBILITIES</u>

The Service Patrol Operator shall perform the following duties and responsibilities in an efficient and professional manner.

a) Patrolling - Continuously patrol the designated areas in continuous loops seeking disabled vehicles, stranded motorists, debris in the roadway, spilled loads, vehicle crashes, obstructions to traffic and other potential hazards.

b) Service Patrol Operators shall not use road shoulders during normal patrolling. Using due care and at a reasonable a prudent speed, Service Patrol Vehicles may use the road shoulder when responding to a specific emergency request, if it allows them to reach the destination faster.

c) Any path or maneuver contrary to law or this contract must be cleared by law enforcement and Service Patrol Operators shall comply with lawful orders of Law Enforcement.

d) If necessary, when responding to crashes or other incidents, the Service Patrol Operator shall communicate to the Law Enforcement officer at the scene the need to gain access to the scene.

e) All inquiries into controversies shall be handled by the Department's Contract Manager.

f) Service Patrol Operators shall use their horn and/or air horn when necessary to alert drivers.

Clearing and Clean Up:

a) Clear lanes of all disabled vehicles encountered in the Road Rangers' Service Patrol Sector.

b) Remove small non-hazardous debris from the roadway and paved shoulder area and place in areas for

collections by the Vendor's pickup truck.

c) Notify the Department of any debris or obstructions on the roadway or paved shoulder area too large for the Service Patrol Operator to remove or move with assistance from another Service Patrol Operator.

Notifications:

Notify the Department TMC or Project Manager for the following:

a) Accidents, emergencies, law enforcement situations, or responding to directives given by external agencies outside the scope of the contracted services.

b) Verified fires that will impact traffic and lane blockage. Also notify the local fire department.

c) Large spilled loads or large debris, or in other situations as appropriate.

d) Notify the Department Maintenance Yard for spilled loads or large debris or incidents requiring advanced maintenance of traffic (MOT) or roadway repairs.

e) All major incidents or accidents resulting in road or lane closures of more than one (1) hour.

f) Any road damage or other damage needing repair.

Advice to Motorists:

Motorists shall be initially advised, prior to providing services, of the following:

a) That moving, fueling, servicing their vehicle or calling a towing service is being provided FREE of charge as a courtesy by Florida Department of Transportation.

b) Once the vehicle is cleared from the travel lanes, Service Patrol Operators may only attempt minor repairs not to exceed approximately fifteen (15) minutes.

c) Should repairs not prove possible within the fifteen- minute time frame criteria due to their complexity, the motorist shall be allowed a minimum of three (3) telephone calls using the Service Patrol Vehicle's cellular telephone to make arrangements for further service, towing, or transportation.

d) All costs for further service, towing or transportation must be paid by the motorist. This DOES NOT include services provided by the on-call tow truck.

e) The Service Patrol Operator shall never comment on the quality or lack of quality of any repairs or work done by dealerships or garages. 27

f) In no event shall the Vendor or Service Patrol Operators provide or recommend any towing, repair service or facility.

Assistance to Motorists:

The Service Patrol Operators shall provide prompt, courteous and skillful assistance to motorists as follows:

a) Move the disabled vehicle from traffic lanes, either pushing or towing.

b) Change flat tires.

c) Provide jump-starts.

d) Provide up to one (1) gallon of eighty-nine (89) octane unleaded fuel to motorist enabling them to reach the closest fueling location.

e) Provide up to one (1) quart of SAE thirty (30) grade motor oil.

f) Provide water for radiators and / or chilled bottled water for drinking.

g) Assist motorist with mechanical failures and perform minor repairs where feasible (maximum fifteen (15) minutes).

h) Never leave a motorist stranded with a disabled vehicle in a potentially unsafe or dangerous location on the roadway. Make a concerted effort to remain with motorists in dangerous environs until help arrives or they can be relocated to a safe area.

i) The Vendor or Service Patrol Operators shall not charge any fees, accept ANY gratuities, recommend secondary towing service, or recommend repair/body shops. Violation of this requirement shall constitute grounds for immediate removal of employee and possible cancellation of this contract.

Disabled Vehicles:

a) The Service Patrol Operator shall offer its services to all stranded motorists. Disabled vehicles shall be removed from the travel lanes to the road shoulder, with the least practical delay.

b) Should a motorist refuse to allow a disabled vehicle to be cleared from the travel lanes, the Service Patrol Operator shall contact the FHP and the TMC for assistance, and shall remain on the scene until FHP or Law Enforcement personnel arrives.

- The Service Patrol Operator shall provide the motorist with a copy of the Florida Statue 316.061 card informing them that they may be cited for a non-moving violation, punishable as provided in chapter 318.

c) The Service Patrol Operator shall not attempt to move such disabled vehicles where injuries or fatalities are involved until directed to do so by authorized Law Enforcement personnel.

d) All disabled vehicles that are relocated shall be parked with the wheels turned away from the roadway and the parking brake set if possible.

Abandoned Vehicles:

a) When an abandoned vehicle is observed, the Service Patrol Operator shall contact the FHP/TMC to report the vehicle's location, make, color, and body type, license plate number and whether or not it is impeding traffic. The Operator shall tag the vehicle with a comment card depicting the time/date the vehicle was discovered.

b) If the abandoned vehicle is impeding traffic or is considered to be a potential safety hazard, the Service Patrol Operator shall call the FHP via the TMC to report the vehicle location and request to move the abandoned vehicle.

Crashes:

a) The Service Patrol Operator shall call the FHP or local Law Enforcement, Fire and ambulance assistance as necessary at crash scenes and shall remain at the scene until the appropriate assistance arrives.

b) The Service Patrol Operator shall follow all directions of Law Enforcement personnel.

c) The Service Patrol Operator is not to question or complain to Law Enforcement personnel directly, but shall inform the Department's Contract Manager of any incident where there is a difference of opinion, procedure or conflict with policies.

d) The Service Patrol Operator shall protect crash scenes by setting highway flares, cones, flagging, and/or flashing amber/white lights, arrow boards, and assisting in traffic control.

Assistance to Law Enforcement Personnel:

a) The Service Patrol Operator shall promote good will and cooperation while rendering assistance and shall follow the instruction of and obey the orders of Law Enforcement Personnel.

b) Any reasonable request by Law Enforcement Officials to provide assistance outside of the designated patrol highways shall be honored. The Operator must notify the TMC if additional vehicles/hours beyond the normal route were required.

Moving Disabled Vehicles from Traffic Lanes:

Service Patrol Operators shall utilize all safety precautions, procedures and appropriate methods when moving (pushing or towing) disabled vehicles from traffic lanes.

a) Vehicles disabled due to crashes without injuries or fatalities shall not be moved without permission of the driver, except when directed by employees or agents of the Department, Law Enforcement Officials or the Expressway Authority (Florida Statue 316.061).

b) Drivers of vehicles involved in crashes without injuries or fatalities who refuse to allow their vehicle to be moved, shall be provided a copy of the Florida Statute that states, "The vehicle shall be moved out of the travel lane if the vehicle can be moved."

c) If the crash involves an injury or fatality, the vehicles shall not be moved until directed by Law Enforcement Officials.

d) Disabled vehicles on roadways or bridges without shoulders or sufficiently wide emergency lanes shall be pushed or towed to a safer location off the next exit ramp or an alternate location off the bridge or main traffic lanes/ramp within approximately 0.80 km (1/2 mile) of the exit.

Transporting People:

a) If vehicle assistance or towing services cannot be obtained for a motorist(s), the Service Patrol Operator shall contact the TMC and Vendor's Main Office or Supervisor to request authorization to transport the person(s) to the nearest exit ramp or facility with available communications.

b) Immediately prior to the beginning and at the completion of the transport, the Operator shall contact the TMC with the location and mileage.

Animals :

After clearing the travel lane, the Service Patrol Operator shall call the Department to report the location, type, and condition of injured or dead animals. Should a Service Patrol Operator find a live animal in an unoccupied vehicle, they shall notify the TMC to request assistance from FHP.

29. <u>SAFETY RULES AND GENERAL REGULATIONS</u>

Service Patrol Operators shall exercise safety and caution at all times and shall obey the following safety rules and general regulations:

a) Inspect and document assigned Service Patrol Vehicles at the beginning of each shift, and take action as necessary to ensure that they are in compliance with all specifications and requirements of this contract.

b) Keep all communications radios, monitors and cellular phones "on"' and the volume up".

c) Remain on their assigned Patrol Route and depart from the Patrol Route only as described in this contract.

d) Obey all traffic laws.

e) Wear seat belt / safety belt / shoulder harness at all times when operating the vehicle.

f) Smoking is not allowed in the Service Patrol Vehicle.

g) Stop on Interstate/ramps/shoulders only to service an incident. Record details of an incident off the Interstate travel lane.

h) Never push a vehicle in a direction that obscures visibility. Such vehicles shall be towed.

i) Contact the Florida Highway Patrol, the Department of 511 when appropriate.

J) Do not carry firearms or other weapons either on their persons or in the Service Patrol Vehicle.

k) Use flashing light bars in conformance with the Florida Motor Vehicle Code and only in the following circumstances:

- When merging, exiting from traffic lanes or slowing to make a stop at an incident site.
- To warn traffic when performing services specified herein.

The use of red or blue flashing or revolving lights or police sirens is prohibited under this contract and is grounds for immediate termination.

l) Vendor-provided Class Three, orange safety vests, with or without sleeves, are to be worn at all times while assisting motorists or conducting any business on any roadway or shoulder.

- Vests shall be approved by the DOT, and shall meet and be labeled as meeting ANSI/ISEA 107-2004 Standard. Vests shall be replaced immediately if damaged or visually faded/discolored.

m) The Vendor shall provide the Service Patrol Operator appropriate rain gear with "ROAD RANGER," in large block letters, in a contrasting color, imprinted on the back of the rain coat / jacket.

- Rain gear shall meet and be labeled as meeting Class Two, ANSI/ISEA 107-2004 Standard. Only this type of rain gear shall be worn when operating under this contract.

30. AUTHORIZED LEAVE FROM SERVICE PATROL ROUTE

Service Patrol Vehicles shall not leave their designated Service Patrol Sector without authorization from the Vendor or the Department.

31. AUTHORIZED SERVICE PATROL VEHICLE STOPS

Service Patrol Operators shall not stop continuous patrolling of their designated Patrol Routes without authorization of the Department. Authorized stops shall include, but are not limited to:

a) Assisting stranded motorist(s) with minor repairs.

b) Removing disabled vehicles from travel lanes.

c) Removing small spills (non-hazardous) and debris from the travel lanes.

d) Assisting Law Enforcement Officials with crash site traffic management.

e) The initial check of "abandoned" vehicles to confirm that the vehicle is without occupants or animals that

may be sick, injured or deceased.

f) Restroom breaks for fifteen (15) minutes or meal for thirty (30) minutes.

- Only one restroom break may be taken per four-hour work period. Breaks shall not be taken between 7:00 A.M. - 9:00 A.M. and 4:00 P.M. - 6:00 P.M. on any working day and only one per four (4) hour work period.
- Rest and meal periods shall be postponed or interrupted by the Department if the services of the Service Patrol Operator are needed.

g) Completing Road Rangers Service Patrol Log for five (5) minutes.

h) Re-fuelling Service Patrol Vehicle.

i) Assisting the Department or its Vendors with Incident Management.

32. FLORIDA HIGHWAY PATROL TOWING SERVICE ROTATION SYSTEM

If a motorist does not request a specified towing service, repair facility, or individuals to assist them, the Service Patrol Vehicle Operator shall contact FHP directly, via the TMC or Department to request that towing service be provided through the FHP towing service rotation list.

a) Apparent deviations from this requirement will be investigated by the Department.

b) Assertions that the owner "requested" a wrecker owned by the Vendor could be construed to fall into the category of "towing" by the Road Ranger, especially if "charges" were or could have been collected by the driver/operator.

33. COMMENT CARDS (RESPONSE FORM) OTHER PRINTED MATERIAL

The Vendor shall be responsible for all costs associated with the printing and distribution of a postage-paid Comment Card bearing a designated return address. Cards will have a "bubble" section to be completed by the Service Patrol Operator.

a) Using a format approved by the Department, the Vendor shall have prepared one thousand (1,000) Comment Response Cards prior to beginning Road Rangers Service Patrol activities.

b) The response cards shall be obtained from PRIDE by the Department. The Vendor shall be responsible for payment to PRIDE directly.

c) The Service Patrol Operator shall provide a postage-paid Comment Card to every individual receiving assistance (one person per vehicle).

d) Thereafter, the Vendor shall print, furnish and provide first class postage for a minimum of nineteen thousand (19,000) Comment Cards annually.

e) The Vendor shall notify the Department when they have distributed fifteen thousand (15,000) Comment Cards.

f) The Vendor shall be responsible for ensuring that each active Service Patrol Vehicle is supplied with an adequate number of blank cards at all times.

g) The Department may require the Vendor to distribute other printed material to motorists, such as maps or safety information.

34. <u>SERVICE PATROL DRIVER / OPERATOR LOGS</u>

a) Service Patrol Operators shall maintain "Road Rangers Service Patrol Operations Logs" which shall be completed and submitted daily at the end of the Operator's shift to the Vendor's Lead Supervisor.

b) Road Rangers Service Patrol Logs shall reflect the data shown in Appendix "C" of this Contract.

c) The Department reserves the right to change the data required or the method of collection and reporting at any time.

35. <u>DISPOSAL OF DEBRIS</u>

a) The Vendor shall dispose of debris and materials gathered during patrolling rounds and generated during incidents in a safe and appropriate manner and in accordance with local ordinances and regulations.

- No debris shall be left on bridges or median shoulders by barrier walls.
- Appropriate containers shall be used for collected materials

b) The Vendor shall not be required to handle hazardous material, but shall be responsible to report hazardous material as defined in the DEP spill agreement or to assure the proper agency is made aware.

36. <u>DAMAGE TO MOTORIST PROPERTY</u>

a) The Vendor shall bear the cost of repair for any damage caused by <u>negligence</u> of the operator to the Department's or a motorist's property while performing service under the Contract.

b) The Vendor shall notify the Department, in writing, of any and all "claims" of injury or damage by the Vendor within twenty-four (24) hours of the claim being made.

37. <u>INSURANCE</u>

In addition to the general liability insurance required as referenced in Section 4 of the Standard Written Agreement, the Vendor shall maintain the following insurance policies throughout the term of the contract according to the minimum limits set forth below. Each policy shall be in the name of the Vendor and shall include coverage for towing and storage. All insurance policies shall be with insurers qualified and licensed to do business in the State of Florida.

a) Vendor shall have and keep in force during the period of this Agreement an Automobile Liability Insurance which provides coverage in the amount of at least Five Hundred Thousand Dollars ($500,000.00) combined single limit per occurrence for bodily injury and property damage arising or occurring in connection with the use of an automobile by the Vendor or any Person on behalf of the Vendor in connection with Services provided pursuant to this Agreement..

b) The Vendor must carry and keep in force during the period of this Agreement a Garage Keepers legal liability insurance policy or policies with a company or companies authorized to do business in the state of Florida, covering customer vehicles in the Vendor's Care Custody and Control in an amount of at least sixty thousand dollars ($60,000.00) per loss, covering perils of fire and explosion; theft of a vehicle, its parts or contents; riot and civil commotion; vandalism; malicious mischief; and damage to a vehicle in tow.

c) All insurance policies shall be with insurers qualified and licensed to do business in the State of Florida. Such policies shall provide that the insurance is not cancelable except upon thirty (30) days prior written notice to the Department. Ten (10) days notice of cancellation for nonpayment of premium.

d) The Department shall be exempt from and in no way liable for any sums of money, which may represent a deductible in any insurance policy. The payment of such deductible shall be the sole responsibility of the Vendor and/or subcontractor providing such insurance.

e) The following minimum levels of combined bodily injury liability insurance and property damage liability insurance acquired by section 627.7415, Florida Statutes, in addition to any other insurance coverage as required by the contract:

- Fifty-thousand dollars ($50,000.00) per occurrence for a wrecker with a gross vehicle weight of less than thirty-five thousand (35,000.00) pounds.

- The insurance coverage required shall include those classifications listed in standard liability manuals, which most nearly reflect the operations of wrecker operators.

- The wrecker operator shall furnish certificates of insurance to the Contract Administrator prior to the execution of the contract, and after those thirty (30) days prior to the expiration dates of the policies. The certificates shall clearly indicate that the wrecker operator has obtained insurance of the type, amounts and classifications required for compliance with this section and that no material change or cancellation of the insurance shall be effective without thirty (30) days prior written to the FDOT Contract Administrator.

38. <u>SPONSORSHIPS</u>

The Vendor shall not enter into any sponsorship agreements, formal or informal, relating directly or indirectly to the Road Ranger Service Patrol Contract, without the specific, expressed, formal, written approval of the Department.

39. <u>FUEL PRICE ADJUSTMENT</u>

The Department recognizes the volatility of fuel prices and the difficulty inherent in attempts to predict fuel costs and recognizes it is in the best interests of the Department and the Vendor to establish an initial base fuel price and, if necessary, make periodic adjustments during the term of the Contract. The Department is, therefore, establishing a "Fuel Cost Adjustment" in this Contract that will have the following effects:

a) When fuel prices increase, within the formula's parameters, then the Vendor will be reimbursed for the increased costs.

b) When fuel prices decrease, within the formula's parameters, the reimbursement to the Vendor will be lowered accordingly.

Base Fuel Prices:

Base fuel price will be calculated using a cost average of the dates from 1/1/06 to 11/30/06 as provided in the http://tonto.eia.doe.gov/oog/info/gdu/gasdiesel.asp website.

a) The base fuel price for this Contract shall be the current market prices plus 10%.

b) The base usage per vehicle / per hour for this contract is:

- Gasoline – 3.0 gallons per hour.
- Diesel Fuel – 2.0 gallons per hour.

The base per vehicle / per hour usage may be recalculated by the Department, at any time; however the decision to do so is solely the Department's. Calculations will be made using mileage and idle rates approved by the Department.

Annual Fuel Cost Review:

The Department will review fuel prices annually to determine if there is a significant change (+/- 20%) in the base price of fuels. The calculation will be done separately for Gasoline and Diesel Fuel

Method of Computation:

The Department price adjustments due to fuel cost increases or decreases shall utilize the Federal Government's Official US Energy Information Administration website (www.eia.doe.gov).

On the web page, "Gasoline and Diesel Fuel Update for the Lower Atlantic States in the categories of "Regular Gasoline-Conventional Area" and "Retail on-highway diesel-Conventional Area." http://tonto.eia.doe.gov/oog/info/gdu/gasdiesel.asp.

a) The average price will be compared to the average price from the previous contract year.

b) If the average price has not increased or decreased by more than 20%, there will be no change in the reimbursement rate.

c) If the change is greater than 20% (+/-), then the Department will adjust the reimbursement rate to the closest full percent (%).

d) The actual adjustment will be calculated by subtracting the base rate from the adjusted rate, and multiplying the result by the gallons of consumption per hour / per vehicle and multiplying that result by the total vehicle hours for the month (invoice period).

Example:

- $2.90 per gallon (new average) – 2.20 per gallon (gasoline base cost) = .70 per gallon difference
- .70 /$2.20 = 31.82% which is >20% so it qualifies for adjustment
- .70 (adjustment amount) * 3.0 (gallons per hour/per vehicle-gasoline) = 2.1 adjustment per hour

Sample invoice for a total of 4464 hours (six vehicles 24/7 for 31 days) * 2.1 (adjustment per hour) =

$9,374.40 fuel adjustment for the month.

Should the new adjusted amount be lower than the previous year, the total amount will be deducted from the monthly invoice.

40. LIQUIDATED DAMAGES

The Vendor's performance and compliance with the Scope of Services shall be evaluated periodically by the Department. If the Vendor does not meet or exceed the performance standards established herein, the Department shall reserve the right to assess the Vendor "Liquidated Damages" that shall be deducted from the monthly Vendor invoice. Vendor shall be notified, in writing, of the date and nature of the infraction prior to invoice reduction.

The infractions that shall activate the invoice payment reductions for liquidated shall include, but are not limited to:

a) Tampering, removing, disengaging or disabling AVL (GPS) components - $500.00 per occurrence per day.
b) Tampering, removing, disengaging or disabling SLERS components - $1000.00 per occurrence.
c) Tampering, removing, disengaging or disabling Laptop (PC) components - $500.00 per occurrence.
d) Improper communications on SLERS - $500.00 per occurrence
b) Unauthorized Sponsorship- $500.00 per day until the sponsorship is terminated.
c) Not disposing of debris in legal manner - $100.00 per occurrence.
d) Improperly licensed driver - $100.00 per occurrence.
e) Not providing proof from a licensed medical practitioner that all Operators are drug free in accordance - $100.00 per occurrence/per operator.
f) Safety violation by Operator/Driver (examples: not wearing/using safety equipment, careless operation of the vehicle, etc.) - $100.00 per occurrence.
g) Loss of Identification Card - $50.00 per occurrence.
h) Service Patrol Vehicle Operators not patrolling their beat in a continuous loop - $100.00 per occurrence/per day.
i) Service Patrol Vehicles not equipped with vehicle logos - $100.00 per occurrence/per day
j) No cellular telephone or inoperative cellular phone - $100.00 per occurrence/ per day.
k) Unauthorized leave of Service Patrol Vehicle form Service Patrol beat - $100.00 per occurrence /per day.
L) Sleeping on Duty - $100.00 per occurrence
m) Not deploying the backup vehicle within thirty (30) minutes from the breakdown of the regular vehicle - $100.00 per occurrence and in combination with number 14.5.3.1, $50.00 per hour until vehicle is made available,
n) Failure to comply with training requirements as specified in this contract - $50.00 per day/per employee for each day out of compliance.
o) If at any time a Service Patrol Vehicle and Operator are unavailable for routine beat patrol- $50.00 per hour, for each hour service is not provided.
p) Failure to change shifts within the allotted thirty (30) minutes - $50.00 per occurrence/per unit.
q) Failure to have specified equipment or other specified items on truck (per truck, per incident) - $50.00 per occurrence/per day.
r) Not maintaining the interiors and exteriors of Service Patrol Vehicles neat and clean, as described in this Contact - $50.00 per occurrence/per day.
s) Not submitting documentation of monthly Service Patrol Vehicle Inspections - $50.00 per occurrence.
t) Incomplete Service Patrol Operations Logs - $50.00 per occurrence/per day
u) Improper uniforms - $50.00 per occurrence / per day.

The list above is not inclusive of all chargeable liquidated damages. For any liquidated damages not listed above, the Department shall assess liquidated damages between the amounts of $50.00 and $500.00 depending on the severity of the infraction.

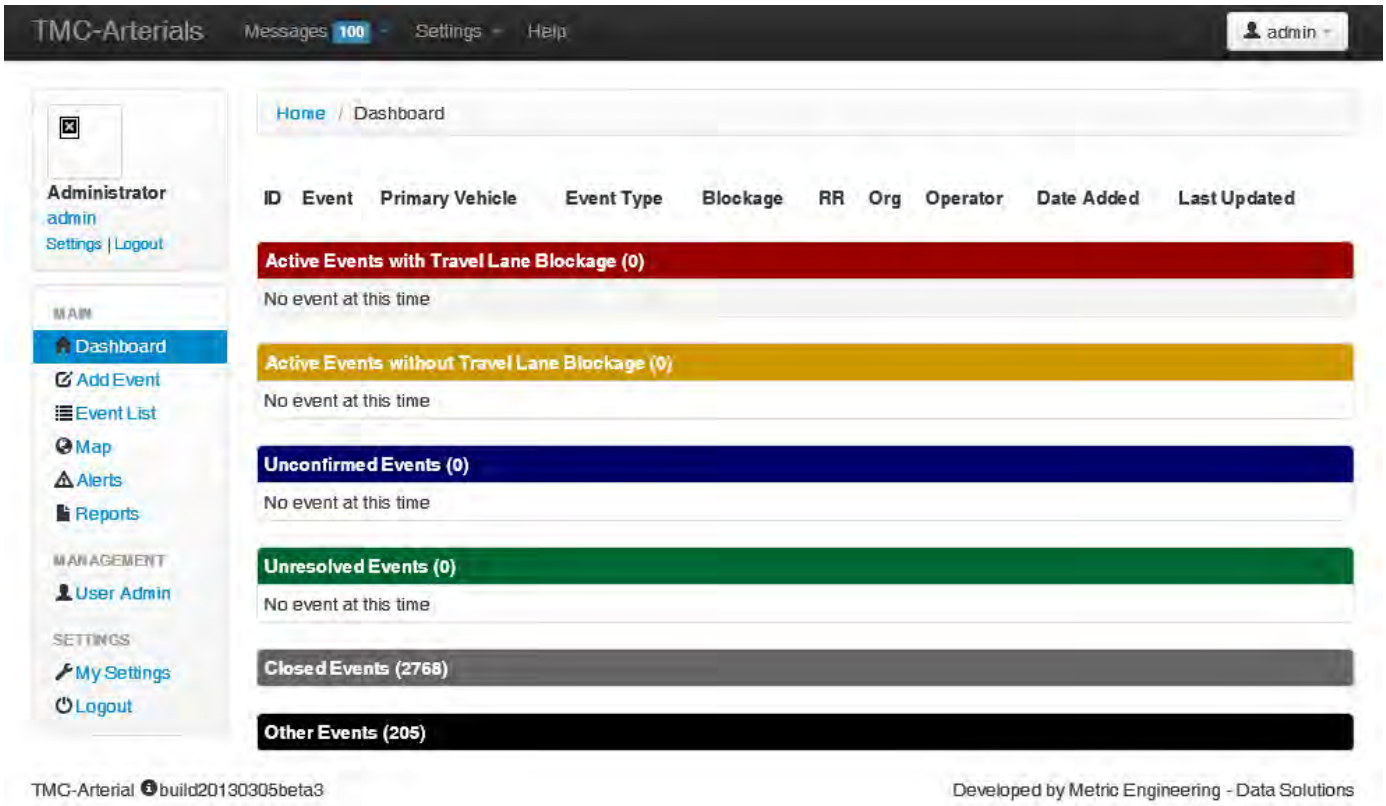
The reduction in payment as described herein on some infractions shall continue to be applied daily until the Vendor complies with the terms and conditions of the contract. It shall be the Vendor's responsibility to notify the Department when in compliance.

Application of liquidated damages shall not waive the Department's right to terminate the Agreement in the interest of the Department.

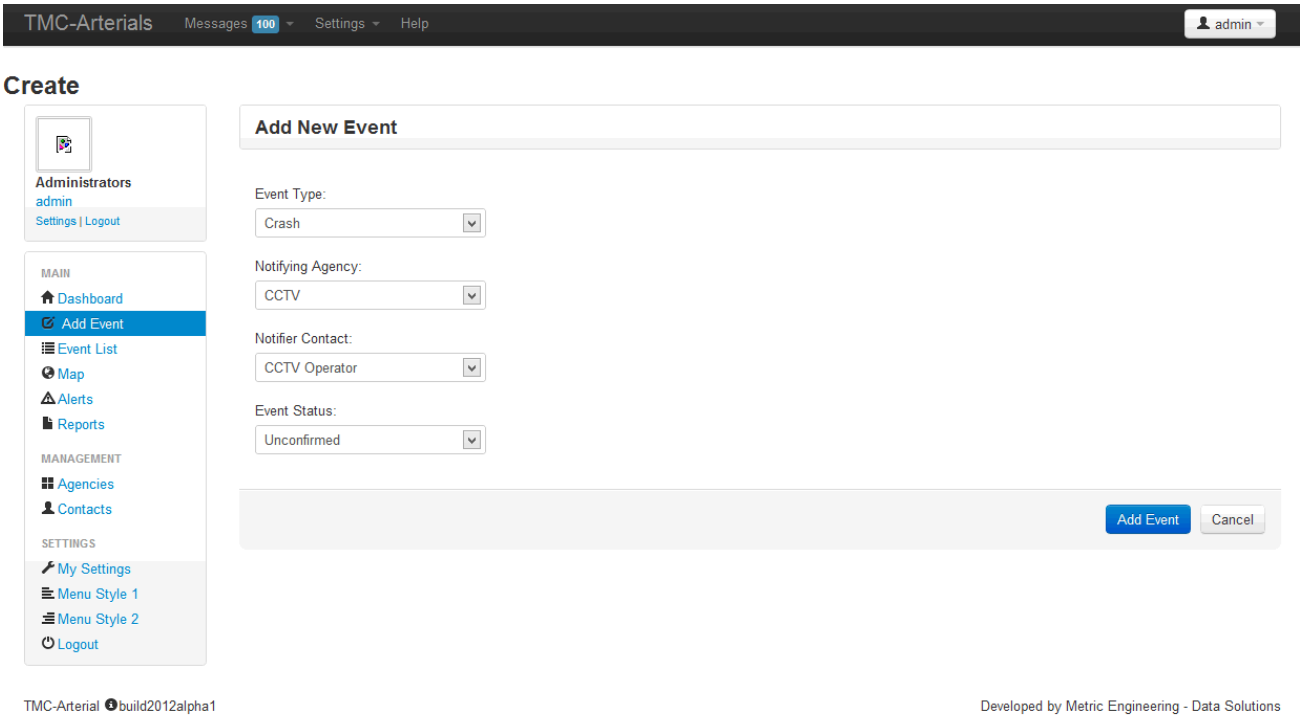
Appendix F – 511 Screenshots

Palm Beach County 511 Screenshots Example

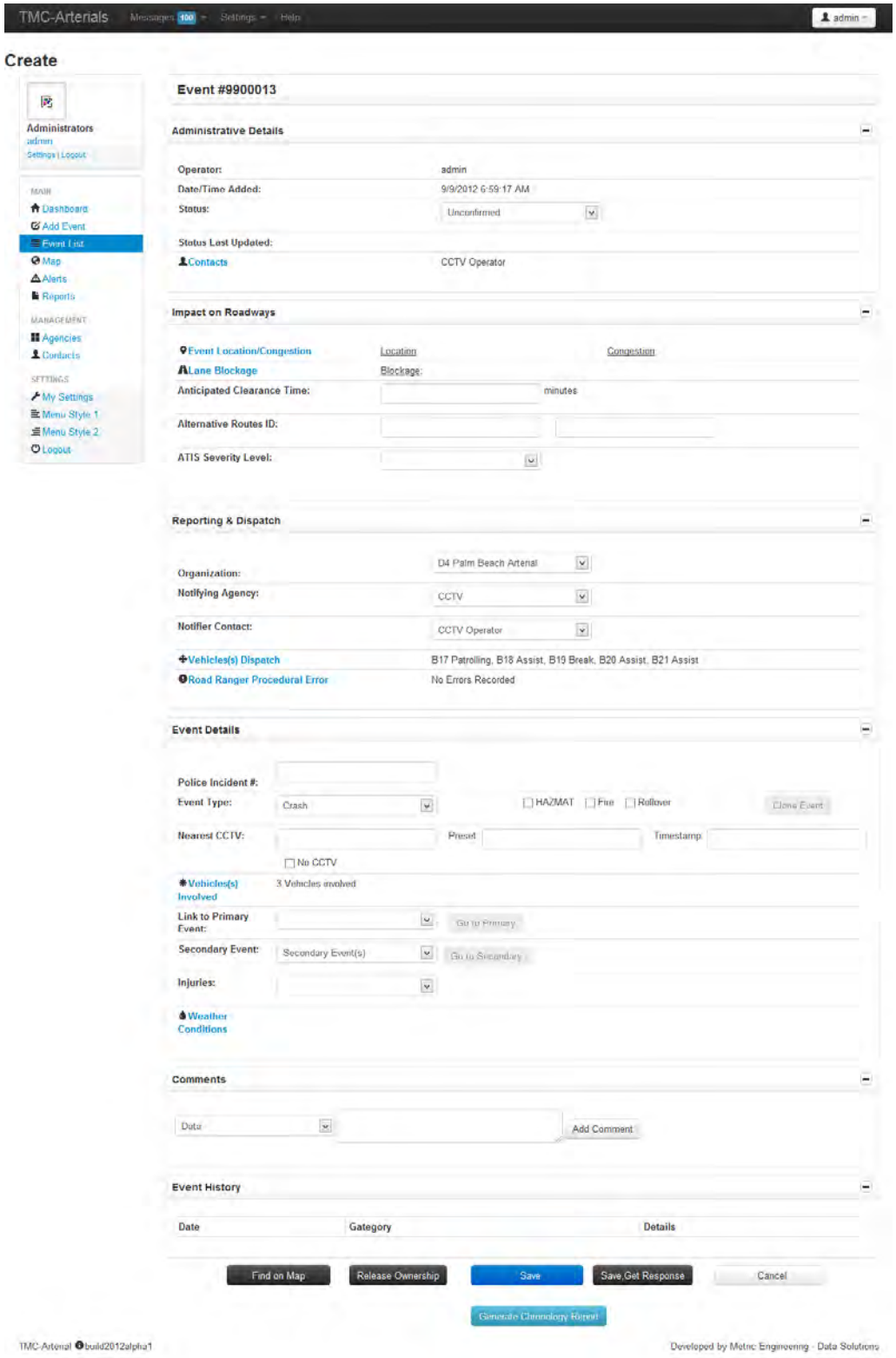
Dashboard



Data Entry Screens (Initialize New Event)



Data Entry Screens (Event Details)



Report

Periodically Incident Duration

Performance Measures Report

Includes All Responders

PBC

Reporting from Nov 1, 2014 to Nov 30, 2014

Created on: 12/4/2014 2:55:03PM

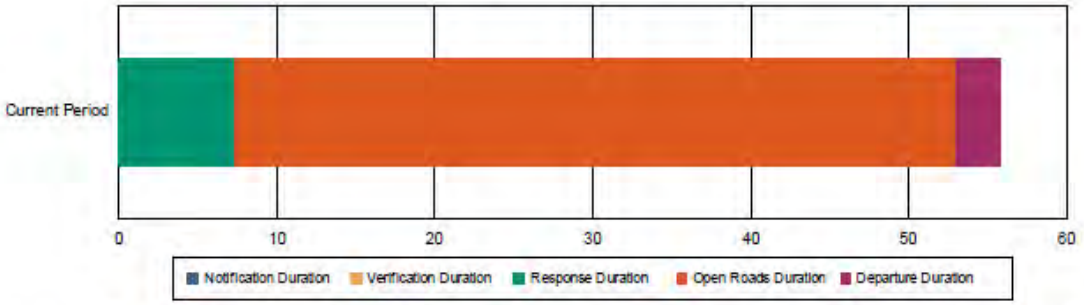
Report Template version 2.2m

Performance Measures Summary

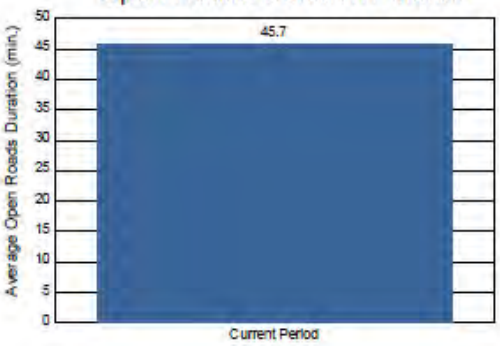
	Current Period
Events included in Performance Measures	5
A. Notification Duration (min.)*	0.0
B. Verification Duration (min.)	0.0
C. Response Duration (min.)	7.3
D. Open Roads Duration (min.)	45.7
E. Departure Duration (min.)	2.9
Roadway Clearance Duration (min.)	53.0
Incident Clearance Duration (min.)	55.9

*FHP Data is not available for Notification Duration

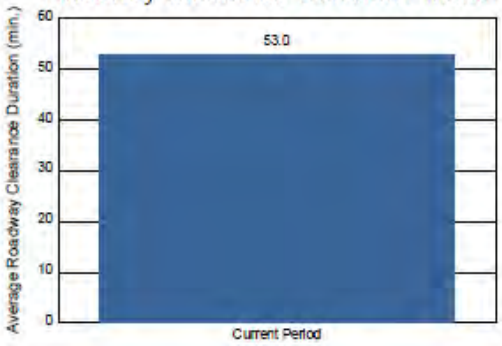
Incident Duration Summary



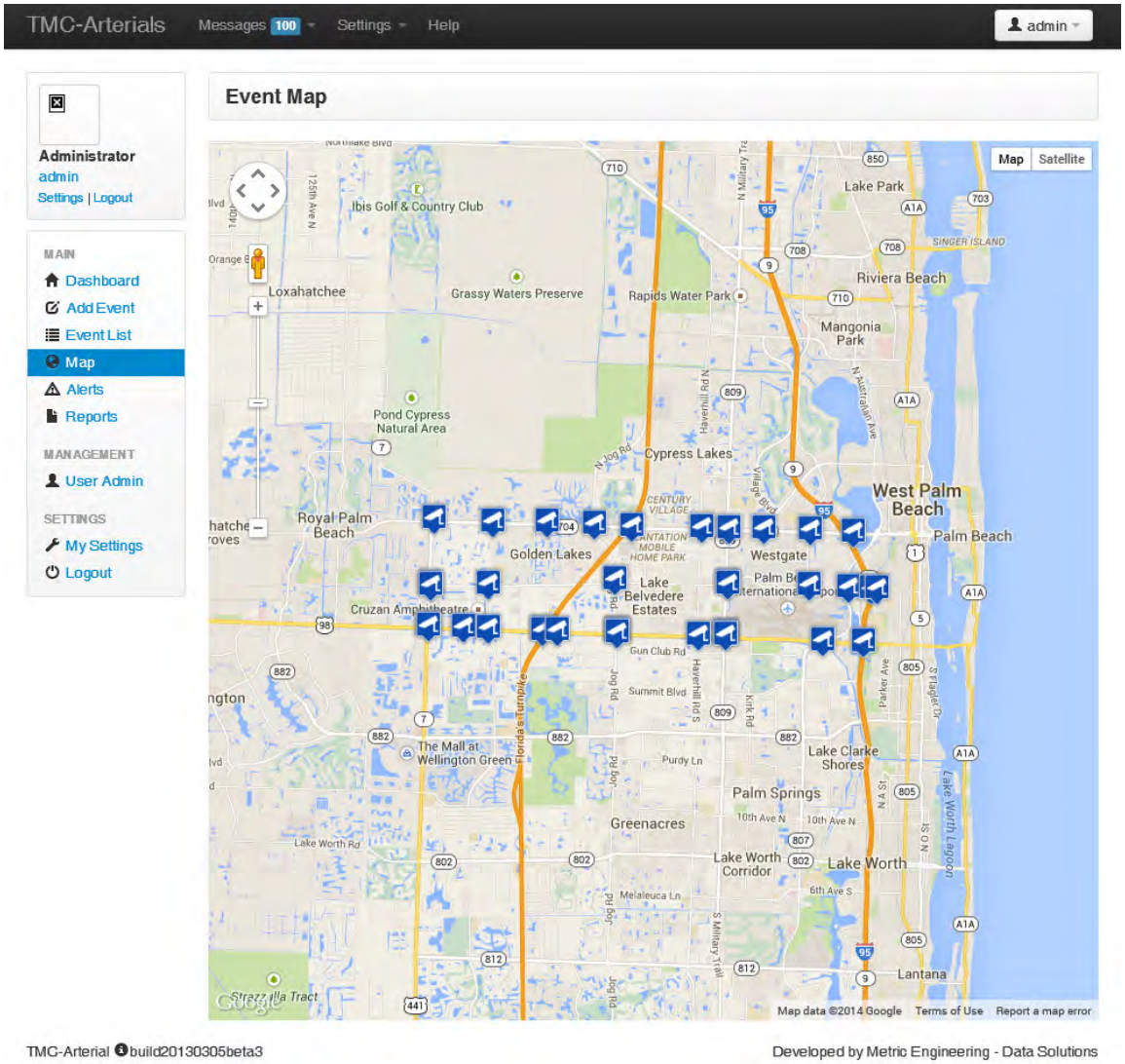
Open Roads Duration / Month



Roadway Clearance Duration / Month



Event Map



TMC-Arterial build20130305beta3

Developed by Metric Engineering - Data Solutions

Appendix G – Deployment Cost Estimates

RIVER TO SEA TSM&O IMPROVEMENTS EARLY DEPLOYMENT ENGINEER'S ESTIMATE
New fiber, Equipment upgrades for Volusia, Daytona, and Palm Coast TMCs

PAY ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST
	Fiber				
630-2-11	CONDUIT, F&I, OPEN TRENCH	LF	28,237	$ 6.25	$ 176,478.75
630-2-12	CONDUIT, F&I, DIRECTIONAL BORE	LF	18,824	$ 20.20	$ 380,252.88
633-1-123	FO CABLE,F&I,UNDERGROUND,49-96 FIBERS	LF	48,861	$ 2.24	$ 109,448.64
633-2-31	FO CONN.,INSTALL,SPLICE	EA	852	$ 38.75	$ 33,015.00
633-3-11	FO CONN. HARDWARE,F&I,SPLICE ENCLOSURE	EA	7	$ 607.70	$ 4,253.90
633-3-12	FO CONN. HARDWARE,F&I,SPLICE TRAY	EA	16	$ 34.74	$ 555.84
635-2-12	PULL & SPLICE BOX, F&I, 24" X 36" COVER SIZE	EA	32	$ 1,337.82	$ 42,810.24
635-2-13	PULL & SPLICE BOX, F&I, 36" ROUND COVER	EA	7	$ 3,204.29	$ 22,430.03
	TMCs (3 total)				
	FLAT SCREEN MONITORS FOR VIDEO WALL (TMC)	EA	18	$ 9,390.48	$ 169,028.64
	WALL MOUNTS FOR MONITORS	EA	18	$ 5,233.32	$ 94,199.76
	ACTIVU SYSTEM, INCLUDING SOFTWARE AND SERVERS(TMC)	EA	3	$ 7,800.00	$ 23,400.00
	HP PROLIANT DL380 G9 2U RACK SERVER	EA	3	$ 47,389.32	$ 142,167.96
	NETWORK SECURITY AND MANAGEMENT	LS	3	$ 150,000.00	$ 450,000.00
	WORKSTATION, TOWERS	EA	12	$ 1,780.68	$ 21,368.16
	WORKSTATION, MONITORS	EA	72	$ 356.40	$ 25,660.80
	WORKSTATION, MONITOR MOUNTS	EA	72	$ 1,621.32	$ 116,735.04
	WORKSTATION, DESKS (BY OTHERS)	EA	12	$ -	$ -
	WORKSTATION, GRAPHICS CARD	EA	12	$ 394.68	$ 4,736.16
	WORKSTATION, MST HUB	EA	12	$ 92.40	$ 1,108.80
				UNIT COST SUBTOTAL	**$ 1,817,650.60**
				MOBILIZATION 5%	$ 90,882.53
				MANITENANCE OF TRAFFIC 5%	$ 90,882.53
				COMPLETION OF DESIGN 10%	$ 181,765.06
				DESIGN BUILD RISK ADDITIVES 0%	$ -
				CONTINGENCY 10%	$ 181,765.06
				CONSTRUCTION TOTAL	**$ 2,362,945.78**

MAINTENANCE

	DESCRIPTION	NOTES	UNIT	QUANTITY	UNIT COST	COST
	TSM&O DEVICES MAINTENANCE	PER YEAR	EA	1	$ 33,573	$ 33,573
	TMC EQUIPMENT	PER YEAR	EA	1	$ 104,841	$ 104,841
	SIGNAL MAINTENANCE	PER YEAR	EA	0	$ 4,391	$ -
	SIGNAL RETIMING (EVERY 3 YEARS)	PER YEAR	EA	0	$ 3,000	$ -
					TOTAL COST	$ 138,413

OPERATIONS

	DESCRIPTION	NOTES	UNIT	QUANTITY	UNIT COST	COST
	DATA MANAGEMENT	PER CENTER MILE * YEARS	EA	8.913068	$ 200	$ 1,783
	SUNGUIDE MAINTENANCE	1 PER TMC	EA	1	$ 50,000	$ 50,000
UTILITY	STAFF	1 PER R2CTPO	EA	1	$ 24,960	$ 24,960
	CCTV	PER YEAR	EA	0	$ 200	$ -
	BLUETOOTH	PER YEAR	EA	0	$ 120	$ -
	WIRELESS EQUIPMENT	PER YEAR	EA	0	$ 225	$ -
					TOTAL COST	$ 76,743

TOTAL O&M COST P	$ 215,155.85

LIFE CYCLE REPLACEMENT (TO BE DONE AT END OF YEAR 10)

PAY ITEM	DESCRIPTION	NOTES	UNIT	QUANTITY	UNIT COST	COST
660-6-121	VEHICLE DETECTION SYSTEM-AVI, BLUETOOTH, F&I, CABINET EQUIPMENT		EA	0	$ 7,500	$ -
660-6-122	VEHICLE DETECTION SYSTEM-AVI, BLUETOOTH, F&I, ABOVE GROUND EQUIPMENT		EA	0	$ 9,500	$ -
682-1-113	CCTV CAMERA, F&I, DOME PTZ PRESSURIZED, IP HD		EA	0	$ 9,500	$ -
684-1-1	MANAGED FIELD ETHERNET SWITCH, F&I		EA	0	$ 2,500	$ -
684-6-11	WIRELESS COMMUNICATION DEVICE, F&I, ETHERNET ACCESS POINT		EA	0	$ 11,000	$ -
					TOTAL COST	$ -
					MOBILIZATION 5%	$ -
					MANITENANCE OF TRAFFIC 5%	$ -
					COMPLETION OF DESIGN 10%	$ -
					DESIGN BUILD RISK ADDITIVES 0%	$ -
					CONTINGENCY 10%	$ -
					GRAND TOTAL	$ -

RIVER TO SEA TSM&O IMPROVEMENTS DEPLOYMENT 1 ENGINEER'S ESTIMATE
156 Signals

PAY ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST
460-98-2	PIPE HANGERS, STAINLESS STEEL	EA	3,076	$ 44.00	$ 135,326.40
630-2-11	CONDUIT, F&I, OPEN TRENCH	LF	93,505	$ 6.25	$ 584,407.50
630-2-12	CONDUIT, F&I, DIRECTIONAL BORE	LF	59,437	$ 20.20	$ 1,200,623.36
630-2-14	CONDUIT, F&I, ABOVE GROUND	LF	1,475	$ 20.36	$ 30,031.00
630-2-15	CONDUIT, F&I, BRIDGE MOUNT	LF	30,756	$ 23.74	$ 730,147.44
633-1-122	FO CABLE,F&I,UNDERGROUND,13-48 FIBERS	LF	6,900	$ 4.37	$ 30,153.00
633-1-123	FO CABLE,F&I,UNDERGROUND,49-96 FIBERS	LF	178,170	$ 2.24	$ 399,100.80
633-2-31	FO CONN.,INSTALL,SPLICE	EA	1,368	$ 38.75	$ 53,010.00
633-3-11	FO CONN. HARDWARE,F&I,SPLICE ENCLOSURE	EA	40	$ 607.70	$ 24,308.00
633-3-12	FO CONN. HARDWARE,F&I,SPLICE TRAY	EA	114	$ 34.74	$ 3,960.36
633-3-13	FO CONN. HARDWARE,F&I,PRETERMINATED CONNECTOR ASSEMBLY	EA	864	$ 57.19	$ 49,412.16
633-3-16	FO CONN. HARDWARE,F&I,FIELD TERMINATED PATCH PANEL	EA	28	$ 1,753.80	$ 49,106.40
633-3-17	FO CONN. HARDWARE,F&I,CONNECTOR PANEL	EA	72	$ 143.46	$ 10,329.12
633-8-1	MULTI-CONDUCTOR COMMUNICATION CABLE, F&I	LF	8,625	$ 3.96	$ 34,155.00
635-2-11	PULL & SPLICE BOX, F&I, 13" X 24" COVER SIZE	EA	118	$ 580.02	$ 68,442.36
635-2-12	PULL & SPLICE BOX, F&I, 24" X 36" COVER SIZE	EA	104	$ 1,337.82	$ 139,133.28
635-2-13	PULL & SPLICE BOX, F&I, 36" ROUND COVER	EA	82	$ 2,408.84	$ 197,524.88
635-3-11	JUNCTION BOX, F&I, AERIAL	EA	16	$ 270.79	$ 4,332.64
639-1-122	ELECTRICAL POWER SERVICE, F&I, UNDERGROUND, METER FURNISHED BY POWER COMPANY	AS	34	$ 2,605.93	$ 88,601.62
639-2-1	ELECTRICAL SERVICE WIRE, F&I	LF	3,044	$ 5.90	$ 17,959.60
639-3-11	ELECTRICAL SERVICE DISCONNECT, F&I, POLE MOUNT	EA	34	$ 834.35	$ 28,367.90
641-2-12	PRESTRESSED CONCRETE POLE, F&I, TYPE P-11 SERVICE POLE	EA	35	$ 1,373.58	$ 48,075.30
660-6-121	VEHICLE DETECTION SYSTEM-AVI, BLUETOOTH, F&I, CABINET EQUIPMENT	EA	33	$ 1,800.30	$ 59,409.90
660-6-122	VEHICLE DETECTION SYSTEM-AVI, BLUETOOTH, F&I, ABOVE GROUND EQUIPMENT	EA	33	$ 6,344.26	$ 209,360.58
676-2-144	ITS CABINET, F&I, GRND W/ SUNSHIELD, OTHER	EA	1	$ 11,000.00	$ 11,000.00
676-3-10	SMALL EQUIPMENT CABINET, F&I,	EA	115	$ 1,331.78	$ 153,154.70
682-1-113	CCTV CAMERA, F&I, DOME PTZ PRESSURIZED, IP HD	EA	82	$ 6,012.97	$ 493,063.54
684-1-1	MANAGED FIELD ETHERNET SWITCH, F&I	EA	27	$ 2,258.37	$ 60,975.99
	AC FOR MHUB	EA	1	$ 2,500.00	$ 2,500.00
	RPM	EA	27	$ 300.00	$ 8,100.00
				UNIT COST SUBTOTAL	**$ 4,788,746.43**
				MOBILIZATION 10%	$ 478,874.64
				MANITENANCE OF TRAFFIC 10%	$ 478,874.64
				COMPLETION OF DESIGN 10%	$ 478,874.64
				DESIGN BUILD RISK ADDITIVES 0%	$ -
				CONTINGENCY 20%	$ 957,749.29
				CONSTRUCTION TOTAL	**$ 7,183,119.65**

MAINTENANCE

	DESCRIPTION	NOTES	UNIT	QUANTITY	UNIT COST	COST
	TSM&O DEVICES MAINTENANCE	PER YEAR	EA	1	$ 158,077	$ 158,077
	TMC EQUIPMENT	PER YEAR	EA	0	$ 83,245	$ -
	SIGNAL MAINTENANCE	PER YEAR	EA	155	$ 4,391	$ 680,605
	IGNAL RETIMING (EVERY 3 YEARS	PER YEAR	EA	51.66666667	$ 3,000	$ 155,000
					TOTAL COST	$ 993,682.05

OPERATIONS

	DESCRIPTION	NOTES	UNIT	QUANTITY	UNIT COST	COST
	DATA MANAGEMENT	PER CENTER MILE * YEARS	EA	28.14242424	$ 200	$ 5,628
	SUNGUIDE MAINTENANCE	1 PER TMC	EA	0	$ 50,000	$ -
UTILITY	STAFF	1 PER TMC	EA	0	$ -	$ -
	CCTV	PER YEAR	EA	82	$ 200	$ 16,400
	BLUETOOTH	PER YEAR	EA	33	$ 120	$ 3,960
	WIRELESS EQUIPMENT	PER YEAR	EA	0	$ 225	$ -
					TOTAL COST	$ 25,988

TOTAL O&M CO	$ 1,019,670.53

LIFE CYCLE REPLACEMENT (TO BE DONE AT END OF YEAR 10)

PAY ITEM	DESCRIPTION	NOTES	UNIT	QUANTITY	UNIT COST	COST
660-6-121	VEHICLE DETECTION SYSTEM-AVI, BLUETOOTH, F&I, CABINET EQUIPMENT		EA	33	$ 7,500	$ 247,500
660-6-122	VEHICLE DETECTION SYSTEM-AVI, BLUETOOTH, F&I, ABOVE GROUND EQUIPMENT		EA	33	$ 9,500	$ 313,500
682-1-113	CCTV CAMERA, F&I, DOME PTZ PRESSURIZED, IP HD		EA	82	$ 9,500	$ 779,000
684-1-1	MANAGED FIELD ETHERNET SWITCH, F&I		EA	27	$ 2,500	$ 67,500
684-6-11	WIRELESS COMMUNICATION DEVICE, F&I, ETHERNET ACCESS POINT		EA	0	$ 11,000	$ -
					TOTAL COST	$ 1,407,500
					MOBILIZATION 10%	$ 140,750
					MANITENANCE OF TRAFFIC 10%	$ 140,750
					COMPLETION OF DESIGN 10%	$ 140,750
					DESIGN BUILD RISK ADDITIVES 0%	$ -
					CONTINGENCY 20%	$ 281,500
					GRAND TOTAL	$ 2,111,250

RIVER TO SEA TSM&O IMPROVEMENTS DEPLOYMENT 2 ENGINEER'S ESTIMATE
101 Signals

PAY ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST
460-98-2	PIPE HANGERS, STAINLESS STEEL	EA	0	$ 44.00	$ -
630-2-11	CONDUIT, F&I, OPEN TRENCH	LF	203,014	$ 6.25	$ 1,268,838.75
630-2-12	CONDUIT, F&I, DIRECTIONAL BORE	LF	132,143	$ 20.20	$ 2,669,284.56
630-2-14	CONDUIT, F&I, ABOVE GROUND	LF	1,675	$ 20.36	$ 34,103.00
630-2-15	CONDUIT, F&I, BRIDGE MOUNT	LF	0	$ 23.74	$ -
633-1-122	FO CABLE,F&I,UNDERGROUND,13-48 FIBERS	LF	12,000	$ 4.37	$ 52,440.00
633-1-123	FO CABLE,F&I,UNDERGROUND,49-96 FIBERS	LF	361,107	$ 2.24	$ 808,879.68
633-2-31	FO CONN.,INSTALL,SPLICE	EA	1,980	$ 38.75	$ 76,725.00
633-3-11	FO CONN. HARDWARE,F&I,SPLICE ENCLOSURE	EA	77	$ 607.70	$ 46,792.90
633-3-12	FO CONN. HARDWARE,F&I,SPLICE TRAY	EA	165	$ 34.74	$ 5,732.10
633-3-13	FO CONN. HARDWARE,F&I,PRETERMINATED CONNECTOR ASSEMBLY	EA	1,272	$ 57.19	$ 72,745.68
633-3-16	FO CONN. HARDWARE,F&I,FIELD TERMINATED PATCH PANEL	EA	45	$ 1,753.80	$ 78,921.00
633-3-17	FO CONN. HARDWARE,F&I,CONNECTOR PANEL	EA	106	$ 143.46	$ 15,206.76
633-8-1	MULTI-CONDUCTOR COMMUNICATION CABLE, F&I	LF	8,625	$ 3.96	$ 34,155.00
635-2-11	PULL & SPLICE BOX, F&I, 13" X 24" COVER SIZE	EA	118	$ 580.02	$ 68,442.36
635-2-12	PULL & SPLICE BOX, F&I, 24" X 36" COVER SIZE	EA	231	$ 1,337.82	$ 309,036.42
635-2-13	PULL & SPLICE BOX, F&I, 36" ROUND COVER	EA	91	$ 2,408.84	$ 219,204.44
635-3-11	JUNCTION BOX, F&I, AERIAL	EA	16	$ 270.79	$ 4,332.64
639-1-122	ELECTRICAL POWER SERVICE, F&I, UNDERGROUND, METER FURNISHED BY POWER COMPANY	AS	25	$ 2,605.93	$ 65,148.25
639-2-1	ELECTRICAL SERVICE WIRE, F&I	LF	1,497	$ 5.90	$ 8,832.30
639-3-11	ELECTRICAL SERVICE DISCONNECT, F&I, POLE MOUNT	EA	25	$ 834.35	$ 20,858.75
641-2-12	PRESTRESSED CONCRETE POLE, F&I, TYPE P-11 SERVICE POLE	EA	26	$ 1,373.58	$ 35,713.08
660-6-121	VEHICLE DETECTION SYSTEM-AVI, BLUETOOTH, F&I, CABINET EQUIPMENT	EA	24	$ 1,800.30	$ 43,207.20
660-6-122	VEHICLE DETECTION SYSTEM-AVI, BLUETOOTH, F&I, ABOVE GROUND EQUIPMENT	EA	24	$ 6,344.26	$ 152,262.24
676-2-144	ITS CABINET, F&I, GRND W/ SUNSHIELD, OTHER	EA	1	$ 11,000.00	$ 11,000.00
676-3-10	SMALL EQUIPMENT CABINET, F&I,	EA	115	$ 1,331.78	$ 153,154.70
682-1-113	CCTV CAMERA, F&I, DOME PTZ PRESSURIZED, IP HD	EA	91	$ 6,012.97	$ 547,180.27
684-1-1	MANAGED FIELD ETHERNET SWITCH, F&I	EA	44	$ 2,258.37	$ 99,368.28
	AC FOR MHUB	EA	1	$ 2,500.00	$ 2,500.00
	RPM	EA	44	$ 300.00	$ 13,200.00
				UNIT COST SUBTOTAL	**$ 6,917,265.36**
				MOBILIZATION 10%	$ 691,726.54
				MANITENANCE OF TRAFFIC 10%	$ 691,726.54
				COMPLETION OF DESIGN 10%	$ 691,726.54
				DESIGN BUILD RISK ADDITIVES 0%	$ -
				CONTINGENCY 20%	$ 1,383,453.07
				CONSTRUCTION TOTAL	**$ 10,375,898.04**

MAINTENANCE

	DESCRIPTION	NOTES	UNIT	QUANTITY	UNIT COST	COST
	TSM&O DEVICES MAINTENANCE	PER YEAR	EA	1	$ 277,052	$ 277,052
	TMC EQUIPMENT	PER YEAR	EA	0	$ 83,245	$ -
	SIGNAL MAINTENANCE	PER YEAR	EA	101	$ 4,391	$ 443,491
	SIGNAL RETIMING (EVERY 3 YEARS)	PER YEAR	EA	33.66666667	$ 3,000	$ 101,000
					TOTAL COST	$ 821,542.65

OPERATIONS

	DESCRIPTION	NOTES	UNIT	QUANTITY	UNIT COST	COST
	DATA MANAGEMENT	PER CENTER MILE * YEARS	EA	62.56761364	$ 200	$ 12,514
	SUNGUIDE MAINTENANCE	1 PER TMC	EA	0	$ 50,000	$ -
UTILITY	STAFF	1 PER TMC	EA	0	$ -	$ -
	CCTV	PER YEAR	EA	91	$ 200	$ 18,200
	BLUETOOTH	PER YEAR	EA	24	$ 120	$ 2,880
	WIRELESS EQUIPMENT	PER YEAR	EA	0	$ 225	$ -
					TOTAL COST	$ 33,594

TOTAL O&M COST	$ 855,136.17

LIFE CYCLE REPLACEMENT (TO BE DONE AT END OF YEAR 10)

PAY ITEM	DESCRIPTION	NOTES	UNIT	QUANTITY	UNIT COST	COST
660-6-121	VEHICLE DETECTION SYSTEM-AVI, BLUETOOTH, F&I, CABINET EQUIPMENT		EA	24	$ 7,500	$ 180,000
660-6-122	VEHICLE DETECTION SYSTEM-AVI, BLUETOOTH, F&I, ABOVE GROUND EQUIPMENT		EA	24	$ 9,500	$ 228,000
682-1-113	CCTV CAMERA, F&I, DOME PTZ PRESSURIZED, IP HD		EA	91	$ 9,500	$ 864,500
684-1-1	MANAGED FIELD ETHERNET SWITCH, F&I		EA	44	$ 2,500	$ 110,000
684-6-11	WIRELESS COMMUNICATION DEVICE, F&I, ETHERNET ACCESS POINT		EA	0	$ 11,000	$ -
					TOTAL COST	$ 1,382,500
					MOBILIZATION 10%	$ 138,250
					MANITENANCE OF TRAFFIC 10%	$ 138,250
					COMPLETION OF DESIGN 10%	$ 138,250
					DESIGN BUILD RISK ADDITIVES 0%	$ -
					CONTINGENCY 20%	$ 276,500
					GRAND TOTAL	$ 2,073,750

RIVER TO SEA TSM&O IMPROVEMENTS DEPLOYMENT 3 ENGINEER'S ESTIMATE
60 Signals

PAY ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	COST
460-98-2	PIPE HANGERS, STAINLESS STEEL	EA	626	$ 44.00	$ 27,535.20
630-2-11	CONDUIT, F&I, OPEN TRENCH	LF	85,903	$ 6.25	$ 536,895.00
630-2-12	CONDUIT, F&I, DIRECTIONAL BORE	LF	56,069	$ 20.20	$ 1,132,589.76
630-2-14	CONDUIT, F&I, ABOVE GROUND	LF	625	$ 20.36	$ 12,725.00
630-2-15	CONDUIT, F&I, BRIDGE MOUNT	LF	6,258	$ 23.74	$ 148,564.92
633-1-122	FO CABLE,F&I,UNDERGROUND,13-48 FIBERS	LF	2,100	$ 4.37	$ 9,177.00
633-1-123	FO CABLE,F&I,UNDERGROUND,49-96 FIBERS	LF	151,051	$ 2.24	$ 338,354.24
633-2-31	FO CONN.,INSTALL,SPLICE	EA	792	$ 38.75	$ 30,690.00
633-3-11	FO CONN. HARDWARE,F&I,SPLICE ENCLOSURE	EA	15	$ 607.70	$ 9,115.50
633-3-12	FO CONN. HARDWARE,F&I,SPLICE TRAY	EA	66	$ 34.74	$ 2,292.84
633-3-13	FO CONN. HARDWARE,F&I,PRETERMINATED CONNECTOR ASSEMBLY	EA	480	$ 57.19	$ 27,451.20
633-3-16	FO CONN. HARDWARE,F&I,FIELD TERMINATED PATCH PANEL	EA	12	$ 1,753.80	$ 21,045.60
633-3-17	FO CONN. HARDWARE,F&I,CONNECTOR PANEL	EA	40	$ 143.46	$ 5,738.40
633-8-1	MULTI-CONDUCTOR COMMUNICATION CABLE, F&I	LF	3,450	$ 3.96	$ 13,662.00
635-2-11	PULL & SPLICE BOX, F&I, 13" X 24" COVER SIZE	EA	49	$ 580.02	$ 28,420.98
635-2-12	PULL & SPLICE BOX, F&I, 24" X 36" COVER SIZE	EA	85	$ 1,337.82	$ 113,714.70
635-2-13	PULL & SPLICE BOX, F&I, 36" ROUND COVER	EA	31	$ 2,408.84	$ 74,674.04
635-3-11	JUNCTION BOX, F&I, AERIAL	EA	1	$ 270.79	$ 270.79
639-1-122	ELECTRICAL POWER SERVICE, F&I, UNDERGROUND, METER FURNISHED BY POWER COMPANY	AS	16	$ 2,605.93	$ 41,694.88
639-2-1	ELECTRICAL SERVICE WIRE, F&I	LF	1,623	$ 5.90	$ 9,575.70
639-3-11	ELECTRICAL SERVICE DISCONNECT, F&I, POLE MOUNT	EA	16	$ 834.35	$ 13,349.60
641-2-12	PRESTRESSED CONCRETE POLE, F&I, TYPE P-11 SERVICE POLE	EA	17	$ 1,373.58	$ 23,350.86
660-6-121	VEHICLE DETECTION SYSTEM-AVI, BLUETOOTH, F&I, CABINET EQUIPMENT	EA	15	$ 1,800.30	$ 27,004.50
660-6-122	VEHICLE DETECTION SYSTEM-AVI, BLUETOOTH, F&I, ABOVE GROUND EQUIPMENT	EA	15	$ 6,344.26	$ 95,163.90
676-2-144	ITS CABINET, F&I, GRND W/ SUNSHIELD, OTHER	EA	1	$ 11,000.00	$ 11,000.00
676-3-10	SMALL EQUIPMENT CABINET, F&I,	EA	46	$ 1,331.78	$ 61,261.88
682-1-113	CCTV CAMERA, F&I, DOME PTZ PRESSURIZED, IP HD	EA	31	$ 6,012.97	$ 186,402.07
684-1-1	MANAGED FIELD ETHERNET SWITCH, F&I	EA	11	$ 2,258.37	$ 24,842.07
	AC FOR MHUB	EA	1	$ 2,500.00	$ 2,500.00
	RPM	EA	11	$ 300.00	$ 3,300.00
				UNIT COST SUBTOTAL	**$ 3,004,827.43**
				MOBILIZATION 10%	$ 300,482.74
				MANITENANCE OF TRAFFIC 10%	$ 300,482.74
				COMPLETION OF DESIGN 10%	$ 300,482.74
				DESIGN BUILD RISK ADDITIVES 0%	$ -
				CONTINGENCY 20%	$ 600,965.49
				CONSTRUCTION TOTAL	**$ 4,507,241.15**

MAINTENANCE

	DESCRIPTION	NOTES	UNIT	QUANTITY	UNIT COST	COST
	TSM&O DEVICES MAINTENANCE	PER YEAR	EA	1	$ 130,505	$ 130,505
	TMC EQUIPMENT	PER YEAR	EA	0	$ 83,245	$ -
	SIGNAL MAINTENANCE	PER YEAR	EA	60	$ 4,391	$ 263,460
	SIGNAL RETIMING (EVERY 3 YEARS)	PER YEAR	EA	20	$ 3,000	$ 60,000
					TOTAL COST	$ 453,965.10

OPERATIONS

	DESCRIPTION	NOTES	UNIT	QUANTITY	UNIT COST	COST
	DATA MANAGEMENT	PER CENTER MILE * YEARS	EA	26.54772727	$ 200	$ 5,310
	SUNGUIDE MAINTENANCE	1 PER TMC	EA	0	$ 50,000	$ -
UTILITY	STAFF	1 PER TMC	EA	0	$ -	$ -
	CCTV	PER YEAR	EA	31	$ 200	$ 6,200
	BLUETOOTH	PER YEAR	EA	15	$ 120	$ 1,800
	WIRELESS EQUIPMENT	PER YEAR	EA	0	$ 225	$ -
					TOTAL COST	$ 13,310

TOTAL O&M COST	$ 467,274.65

LIFE CYCLE REPLACEMENT (TO BE DONE AT END OF YEAR 10)

PAY ITEM	DESCRIPTION	NOTES	UNIT	QUANTITY	UNIT COST	COST
660-6-121	VEHICLE DETECTION SYSTEM-AVI, BLUETOOTH, F&I, CABINET EQUIPMENT		EA	15	$ 7,500	$ 112,500
660-6-122	VEHICLE DETECTION SYSTEM-AVI, BLUETOOTH, F&I, ABOVE GROUND EQUIPMENT		EA	15	$ 9,500	$ 142,500
682-1-113	CCTV CAMERA, F&I, DOME PTZ PRESSURIZED, IP HD		EA	31	$ 9,500	$ 294,500
684-1-1	MANAGED FIELD ETHERNET SWITCH, F&I		EA	11	$ 2,500	$ 27,500
684-6-11	WIRELESS COMMUNICATION DEVICE, F&I, ETHERNET ACCESS POINT		EA	0	$ 11,000	$ -
					TOTAL COST	$ 577,000
					MOBILIZATION 10%	$ 57,700
					MANITENANCE OF TRAFFIC 10%	$ 57,700
					COMPLETION OF DESIGN 10%	$ 57,700
					DESIGN BUILD RISK ADDITIVES 0%	$ -
					CONTINGENCY 20%	$ 115,400
					GRAND TOTAL	$ 865,500

Appendix H – Road Rangers Cost Methodology

The following equation is being utilized to determine the cost of Proposed Road Rangers. Note that the equations utilize D-2 was used as baseline.

1) D-2 Summary:
   Services Offered – the D-2 Road Rangers offering assistance with low fluids/gas, replacing a tire, etc.
   D-2 pays $82,000/month for the following:
   - 8 Road Rangers patrolling 8 paths (Attached) - range between 12-18~ miles per ranger
   - Monday-Friday
   - 6AM-6PM
2) Next, we broke down the "hourly charge for the full service" with 8 road rangers:

$$\frac{Cost\ of\ 8\ RR\ in\ D2}{hr} = \frac{\$82{,}000}{month} * \frac{day}{12\ hrs} * \frac{year}{365\ days} * \frac{12\ months}{year} = \frac{\$224.66}{hr}$$

3) Decided area of Patrol needed for R2CTPO Area

On I-95, we would be recommending:

- 2 Road Rangers patrolling I-95
  - 6:00 AM to 12:00 AM Monday through Thursday, and 6:00 AM to 3:30 AM Friday through Sunday

On the arterials, we would be proposing as an option:

- 4 Road Rangers patrolling 4 different arterial paths
  - Potential paths include US 17/92, US 92, US 1, SR 40, SR A1A, SR 100, and LPGA Boulevard
  - 6:00 AM-10:00 PM, 7 days a week, 365 days a year

This would be three quarters of the number of Road Rangers as compared to D-2, but increased hours and days active.

5) Calculated price for R2CTPO – using the following formulas:

$$\frac{Cost\ per\ RR}{hr} = \left(\frac{1}{8}\right)\left(\frac{\$224.66}{hr}\right) = \frac{\$28.08}{hr}$$

$$\frac{Cost\ of\ 2\ RR\ on\ I-95\ in\ Volusia\ and\ Flagler}{week} = \frac{\$56.16}{hour}\left(\frac{136.5\ hrs}{week}\right) = \frac{\$7{,}665.84}{week}$$

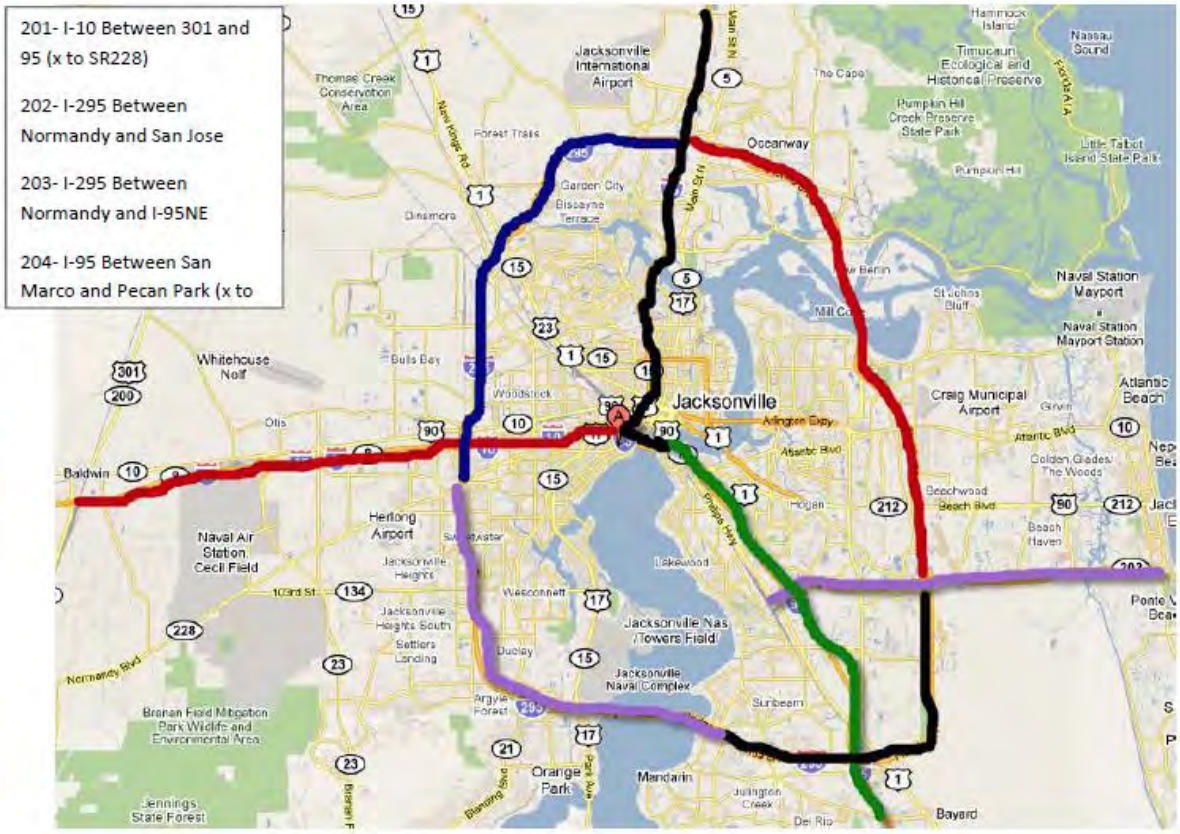
$$\frac{Cost\ of\ 2\ RR\ on\ I-95\ in\ Volusia\ and\ Flagler}{year} = \frac{\$7{,}665.84}{week}\left(\frac{52\ weeks}{year}\right) = \frac{\$398{,}623.68}{year}$$

$$\frac{Cost\ of\ 4\ RR\ on\ Arterials\ in\ Volusia\ and\ Flagler}{week} = \frac{\$112.32}{hour}\left(\frac{112\ hrs}{week}\right) = \frac{\$12{,}579.84}{week}$$

$$\frac{Cost\ of\ 4\ RR\ on\ Arterials\ in\ Volusia\ and\ Flagler}{year} = \frac{\$12{,}579.84}{week}\left(\frac{52\ weeks}{year}\right) = \frac{\$654{,}151.68}{year}$$

For more D-2 information, please see:

http://www.jax511.com/D2TIMwp/?page_id=119



D-2 Road Rangers coverage Area

Appendix I – Opportunity Cost Formulas

SOURCE: Statewide Active Arterial Management Needs Plan, 2013

Note: Formulas were updated as needed.

Monetary Losses

The parameters utilized for the monetary costs are the following:

Parameter	Value	Source
Travel Time Delay Cost	$16.79 per hour of travel per person	2012 Urban Mobility Report by Texas Transportation Institute
Auto Occupancy	1.25 persons per vehicle	2012 Urban Mobility Report by Texas Transportation Institute
Average cost per gallon for regular gasoline	$2.567	U.S Energy Information Administration

Parameters of Study Simulation

To estimate the cost, the following formulas were utilized per time period:

(Eq. 9-1) Cost from fuel consumption = Fuel consumption increase x Average cost per gallon of regular gasoline

(Eq. 9-2) Cost from total travel time increase = Total travel time increase x Auto occupancy x Cost of travel person

The following equation is being utilized to determine the detector failure opportunity cost:

(Eq. 9-3) Detector Failure Opportunity Cost = $0.0059344 x AADT x 364 Days x No. of Signals

Annual Highway Congestion Costs

The methodology for determining the overall annual cost of congestion per year is shown below. This analysis was completed by the Texas Transportation Institute utilizing the following formulas (For more information go to: http://mobility.tamu.edu/ums/report/):

(Eq. 9-4) Delay per Auto Commuter = (Peak Period Delay/ Auto Commuters) + (Remaining Delay/ Population)

(Eq. 9-5) Annual Fuel Wasted in Congestion = Annual Fuel Consumed in Congestion - Annual Fuel That Would be Consumed in Free-Flow Conditions

(Eq. 9-6)	Annual Psgr-Veh Delay Cost	=	Delay per Auto Commuter (Eq. 9-4)	x	Value of Person Time ($/hour)	x	Vehicle Occupancy (person/ vehicle)	x	Annual Conversion Factor
(Eq. 9-7)	Annual Psgr Fuel Cost	=	Annual Fuel Wasted in Congestion (Eq. 9-5)	x	Percent of Passenger Vehicles	x	Gasoline Cost	x	Annual Conversion Factor
(Eq. 9-8)	Annual Commercial-Veh. Delay Cost	=	Delay per Auto Commuter (Eq. 9-4)	x	Value of Comm. Vehicle Time ($/hr)	x	Annual Conversion Factor		
(Eq. 9-9)	Annual Commercial Veh. Fuel Cost	=	Annual Fuel Wasted in Congestion (Eq. 9-5)	x	Percent of Comm. Vehicles	x	Diesel Cost	x	Annual Conversion Factor
(Eq. 9-10)	Annual Cost Due to Congestion	=	Annual Passenger-Vehicle Delay Cost (Eq. 9-6)	+	Annual Passenger Fuel Cost (Eq. 9-7)	+	Annual Comm. Veh. Delay Cost (Eq. 9-8)	+	Annual Comm. Veh. Fuel Cost (Eq. 9-9)

Next determine the number of miles that a vehicle will travel within that hour. For the overall state road system, the statewide average speed in Florida is 41.5 mph.[1] Once the average speed on the Statewide System has been determined, it is necessary to equate the mileage traveled for each arterial segment to the congestion cost in one hour. This is achieved utilizing the following formula:

(Eq. 9-11)	Annual Congestion Cost Per Mile	=	Congestion Cost Per Vehicle Per Hour	/	41.5 Miles Per Hour

Finally, it is necessary to obtain the annual congestion cost the following formulas were used:

(Eq. 9-12)	Annual Congestion Cost Per Segment (Enhanced Maintenance Loc.)	=	Annual Congestion Cost Per Mile (Eq. 9-11)	x	Average AADT Per District	x	Average Miles Per Section Per District		
(Eq. 9-13)	Annual Congestion Cost (Full AAM Loc.)	=	Annual Congestion Cost Per Mile (Eq. 9-11)	x	AADT Per Arterial Section	x	Miles Per Arterial Section		

[1] "2011 Source Book," FDOT, 2011. http://www.dot.state.fl.us/planning/statistics/sourcebook/.

Signal Retiming Opportunity Costs

The following formulas are used to obtain the signal retiming opportunity cost:

(Eq. 9-15)	Annual Congestion Opportunity Cost of Signal Retiming (Full AAM)	=	Opportunity Cost (Congestion Cost)	x	8%	x	% of Signals Coordinated

Arterial Management Opportunity Costs

The following formulas apply:

(Eq. 9-16)	Congestion Cost Per Segment Per Hour	=	Annual Congestion Cost (Full AAM Loc.) (Eq. 9-13)	/	365 days	/	24 hrs

(Eq. 9-17)	Opportunity Cost of Arterial Management	=	No. of Crashes	x	1.67 hrs	x	20%	x	Congestion Cost Per Segment Per Hour (Eq. 9-16)

Adaptive Technology Opportunity Costs

Therefore, to quantify this benefit, the following formula applies:

(Eq. 9-18)	Opportunity Cost of Adaptive Technology	=	Annual Congestion Opportunity Cost (Eq. 9-13)	x	3%	x	% of Adaptive Intersections (69.42%)

Crash Reduction Opportunity Costs

Per FHWA, studies have indicated that crashes can be reduced up to 15% through improved signal timings.[2] However, since the retiming of traffic signals will only provide a reduction of certain types of crashes (i.e. rear-end), only 50% of the crashes were assumed to apply. In addition, per the 2013 FDOT Plans Preparation Manual, Volume 1, the total average cost per crash on the state road system is $141,085.

Therefore, to quantify this benefit, the following formula applies:

(Eq. 9-19)	Opportunity Cost of Crash Reduction	=	No. of Crashes/2	x	$141,085	x	15%	x	50%

[2] "Adaptive Signal Control," FHWA, 5/15/2012. http://www.fhwa.dot.gov/everydaycounts/technology/adsc/description.cfm.

Appendix J – Opportunity Cost Breakdown

AAM Opportunity Cost Analysis - R2CTPO's Regionally Significant Facilities

	Road Name	FROM	TO	Total Mileage	# Signals	# Crash in 2014	AADT	Detector Maintenance Opportunity Cost	Average Annual Congestion Cost Per Hour	Annual Congestion Cost Per Mile	Annual Congestion Cost Per Segment	Travel Time Delay Reduction % (Signal Retiming)	Annual Congestion Opportunity Cost (Signal Retiming)	Congestion Cost Per Segment Per Hour	Opportunity Cost (Arterial Management)	Travel Time Delay Reduction % (Adaptive)	Annual Congestion Opportunity Cost (Adaptive)	Annual Congestion Opportunity Cost (Crash Reduction)
Deployment 1 - East Volusia	US 1	Washington Street	SR 442	4.410	6	83	25,833	$334,818.85	$350.00	$8.43	$960,387.75	8%	$76,831.02	$109.63	$1,519.63	3%	$28,811.63	$878,254.13
	SR44	US 1	S Atlantic Avenue	2.000	4	18.6	27,250	$235,453.25	$350.00	$8.43	$459,435.00	8%	$36,754.80	$52.45	$162.91	3%	$13,783.05	$196,813.58
	SR 421/SR A1A	Taylor Road	SR A1A	5.250	12	207.8	45,980	$1,191,868.69	$350.00	$8.43	$2,034,959.85	8%	$162,796.79	$232.30	$8,061.46	3%	$61,048.80	$2,198,809.73
	SR A1A	SR 421/SR A1A	SR 40	10.620	15	190.2	15,588	$505,063.43	$350.00	$8.43	$1,395,495.88	8%	$111,639.67	$159.30	$5,060.01	3%	$41,864.88	$2,012,577.53
	SR 40	S Tymber Creek Road	SR A1A	5.870	17	286.2	32,700	$1,200,811.60	$350.00	$8.43	$1,618,130.07	8%	$129,450.41	$184.72	$17,657.35	3%	$48,543.90	$3,028,389.53
	Clyde Morris Boulevard	Bill France Bouelevard	Mason Avenue	0.600	3	3.2	14,960	$96,946.26	$350.00	$8.43	$75,667.68	8%	$6,053.41	$8.64	$9.23	3%	$2,270.03	$33,860.40
	US 92	Indian Lake Road	SR A1A	10.670	27	554.6	29,350	$1,711,788.36	$350.00	$8.43	$2,639,976.74	8%	$211,198.14	$301.37	$55,824.18	3%	$79,199.30	$5,868,430.58
	S Clyde Morris Bouelevard	SR 421	Herbert Street	0.850	2	31.6	22,480	$97,119.07	$350.00	$8.43	$161,080.44	8%	$12,886.44	$18.39	$194.08	3%	$4,832.41	$334,371.45
	SR 5A	SR 40	US 1	15.610	28	405.8	27,138	$1,641,426.55	$350.00	$8.43	$3,571,212.57	8%	$285,697.01	$407.67	$55,254.81	3%	$107,136.38	$4,293,921.98
	US 1	SR 40	SR 421	10.650	29	347.8	27,917	$1,748,798.45	$350.00	$8.43	$2,506,344.38	8%	$200,507.55	$286.11	$33,236.30	3%	$75,190.33	$3,680,202.23
	Mason Avenue	Williamson Boulevard	US 1	3.970	12	176	14,713	$381,391.07	$351.00	$8.46	$494,164.96	8%	$39,533.20	$56.41	$3,316.10	3%	$14,824.95	$1,862,322.00
	Williamson Boulevard	Mason Avenue	US 92	2.700	1	51.6	15,555	$33,600.69	$352.00	$8.48	$356,147.28	8%	$28,491.78	$40.66	$700.68	3%	$10,684.42	$545,998.95
	Beville Road	Yorktowne Drive	US 1	2.020	2	113.4	29,500	$127,447.17	$353.00	$8.51	$507,110.90	8%	$40,568.87	$57.89	$2,192.59	3%	$15,213.33	$1,199,927.93
Deployment 2 -West Volusia	US 17/92	Seminole County Line	US 92	15.220	26	339.2	26,806	$1,505,503.10	$350.00	$8.43	$3,439,318.01	8%	$275,145.44	$392.62	$44,480.59	3%	$103,179.54	$3,589,202.40
	Debary Avenue	I-4 WB Ramps	SR 415	8.650	8	68	18,007	$311,172.72	$350.00	$8.43	$1,313,037.13	8%	$105,042.97	$149.89	$3,404.30	3%	$39,391.11	$719,533.50
	Saxon Boulevard	US 17/92	Park and Ride	1.550	5	93.2	28,853	$311,633.54	$350.00	$8.43	$377,012.08	8%	$30,160.97	$43.04	$1,339.72	3%	$11,310.36	$986,184.15
	Saxon Boulevard	I-4	Doyle Road	4.550	6	80.8	21,257	$275,501.91	$351.00	$8.46	$818,232.87	8%	$65,458.63	$93.41	$2,520.76	3%	$24,546.99	$854,975.10
	Veterans Memorial Parkway	Saxon Boulevard	Harley Strickland Boulevard	0.380	1	29.6	13,150	$28,405.60	$350.00	$8.43	$42,124.71	8%	$3,369.98	$4.81	$47.54	3%	$1,263.74	$313,208.70
	Harley Strickland Boulevard	Enterprise Road	Veterans Memorial Parkway	1.350	2	26.4	11,760	$50,806.06	$350.00	$8.43	$133,834.68	8%	$10,706.77	$15.28	$134.71	3%	$4,015.04	$279,348.30
	SR 472/Howland Boulevard	Dr. Martin Luther King Jr. Beltway	SR 421	9.700	18	146.4	21,310	$828,579.44	$350.00	$8.43	$1,742,540.01	8%	$139,403.20	$198.92	$9,726.72	3%	$52,276.20	$1,549,113.30
	Graves Avenue	Normandy Boulevard	Howland Boulevard	0.200	1	3.52	14,000	$30,241.70	$350.00	$8.43	$23,604.00	8%	$1,888.32	$2.69	$3.17	3%	$708.12	$37,246.44
	Graves Avenue	Veteran's Memorial Parkway	Kentucky Avenue	0.300	1	8.4	19,180	$41,431.13	$351.00	$8.46	$48,678.84	8%	$3,894.31	$5.56	$15.59	3%	$1,460.37	$88,883.55
	Kentucky Avenue	SR 472	Graves Avenue	0.800	1	15.2	10,670	$23,048.50	$352.00	$8.48	$72,385.28	8%	$5,790.82	$8.26	$41.95	3%	$2,171.56	$160,836.90
	Dr. Martin Luther King Jr. Beltway	Taylor Road	Orange Camp Road	1.000	1	4.2	13,800	$29,809.68	$353.00	$8.51	$117,438.00	8%	$9,395.04	$13.41	$18.81	3%	$3,523.14	$44,441.78
	Orrange Camp Road	Dr. Martin Luther King Jr. Beltway	I-4	1.000	1	7	12,050	$26,029.47	$354.00	$8.53	$102,786.50	8%	$8,222.92	$11.73	$27.43	3%	$3,083.60	$74,069.63
	SR 44	I-4	CR 415	10.230	4	47.4	18,500	$159,849.00	$350.00	$8.43	$1,595,419.65	8%	$127,633.57	$182.13	$2,883.34	3%	$47,862.59	$501,557.18
	CR 415/Tomoka Farms Road	SR 44	SR 421	5.000	2	20	9,440	$40,783.10	$350.00	$8.43	$397,896.00	8%	$31,831.68	$45.42	$303.42	3%	$11,936.88	$211,627.50
	CR 415/Tomoka Farms Road	Doyle Road	Howland Boulevard	1.500	2	13	17,300	$74,740.21	$351.00	$8.46	$219,537.00	8%	$17,562.96	$25.06	$108.82	3%	$6,586.11	$137,557.88
	SR 44	US 17/92	Amelia Avenue	0.300	1	15	9,300	$20,089.13	$350.00	$8.43	$23,519.70	8%	$1,881.58	$2.68	$13.45	3%	$705.59	$158,720.63
	Amelia Avenue	SR 44	Rich Avenue	0.100	1	15	10,000	$21,601.22	$350.00	$8.43	$8,430.00	8%	$674.40	$0.96	$4.82	3%	$252.90	$158,720.63
	Plymouth Avenue	US 17/92	Amelia Avenue	0.200	1	11.4	8,730	$18,857.86	$350.00	$8.43	$14,718.78	8%	$1,177.50	$1.68	$6.40	3%	$441.56	$120,627.68
	US 92	US 17	Indian Lake Road	11.150	6	58.8	37,520	$486,286.57	$350.00	$8.43	$3,526,673.64	8%	$282,133.89	$402.59	$7,906.51	3%	$105,800.21	$622,184.85
	US 17	Glenwood Road	Mercers Fernery Road	1.190	1	40.4	29,000	$62,643.53	$351.00	$8.46	$291,954.60	8%	$23,356.37	$33.33	$449.72	3%	$8,758.64	$427,487.55
	Spring Garden Avenue	CR 92	Beresford Avenue	2.840	6	18.8	24,267	$314,513.70	$352.00	$8.48	$584,418.99	8%	$46,753.52	$66.71	$418.91	3%	$17,532.57	$198,929.85
Deployment 3 - Flagler	US 1	SR 40	Flagler County Line	7.300	6	125.2	21,700	$281,247.83	$350.00	$8.43	$1,335,396.30	8%	$106,831.70	$152.44	$6,374.66	3%	$40,061.89	$1,324,788.15
	US 1/SR 5	Palm Coast City Limits	Palm Coast Parkway	10.420	3	57.6	13,614	$88,225.54	$350.00	$8.43	$1,195,887.03	8%	$95,670.96	$136.52	$2,626.36	3%	$35,876.61	$609,487.20
	SR 100	Belle Terre Boulevard	SR A1A	6.510	11	124.8	24,255	$576,320.44	$350.00	$8.43	$1,331,072.48	8%	$106,485.80	$151.95	$6,333.72	3%	$39,932.17	$1,320,555.60
	Belle Terre Boulevard	SR 100	Matanzas Woods Parkway	9.580	17	154.4	21,408	$786,134.72	$350.00	$8.43	$1,728,872.39	8%	$138,309.79	$197.36	$10,177.77	3%	$51,866.17	$1,633,764.30
	Palm Coast Parkway	Pine Lake Parkway	Palm Harbor Parkway	4.560	14	38.2	22,844	$690,854.89	$350.00	$8.43	$878,158.72	8%	$70,252.70	$100.25	$1,279.02	3%	$26,344.76	$404,208.53
	Cypress Point Parkway	Palm Coast Parkway	Cypress Edge Drive	0.310	2	51.8	24,000	$103,685.84	$350.00	$8.43	$62,719.20	8%	$5,017.54	$7.16	$123.87	3%	$1,881.58	$548,115.23
	Old Kings Road	Palm Coast Parkway	Kings Way	0.100	1	5	18,700	$40,394.27	$350.00	$8.43	$15,764.10	8%	$1,261.13	$1.80	$3.01	3%	$472.92	$52,906.88
	Total			115.990	307		Subtotal	$16,534,924.14			$38,221,544.16		$3,057,723.53		$283,964.41		$1,146,646.32	$43,262,163.32
						Average AADT	23622									% Adaptive Intersections =	5.00%	
							TOTALS	$16,534,924					$3,057,723.53		$283,964.41		$57,332.32	$43,262,163.32

TOTAL	$63,196,107.71
10 YEAR COST **	$691,979,747.74

** Cost includes 2% inflation per year

Appendix K – Concept of Operations

Concept of Operations for: ***River to Sea TSM&O Master Plan Phase 2***

Version: *1.0*

Approval date: *insert approval date*

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	Jonathan Katz, E.I.	March 12, 2018
	Jonathan Katz, E.I.	April 18, 2018
Approved By:		

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List of Acronyms and Abbreviations

APL ..... Approved Products List
BOS ..... Blank Out Sign
ATMS ..... Advanced Traffic Management System
CCTV ..... Closed Circuit Television
CFR ..... Code of Federal Regulations
DMS ..... Dynamic Message Sign
ConOps ..... Concept of Operations
EOC ..... Emergency Operations Center
FDOT ..... Florida Department of Transportation
FOC ..... Fiber Optic Cable
ITS ..... Intelligent Transportation System
MOT ..... Maintenance of Traffic
MVDS ..... Microwave Vehicle Detectors
O&M ..... Operations and Maintenance
PTZ ..... Pan Tilt Zoom
R2CTPO ..... River to Sea Transportation Planning Organization
RTMC ..... Regional Traffic Management Center
SOP ..... Standard Operating Procedure
TERL ..... Traffic Engineering Research Lab
TMC ..... Traffic Management Center
TSM&O ..... Transportation Systems Management and Operations

1. Overview

1.1 Identification

This Concept of Operations (ConOps) document will serve as an operational guide for the Transportation Systems Management and Operations (TSM&O) network of the agencies within the jurisdiction of the River to Sea Transportation Planning Organization (R2CTPO).

1.2 Document Overview

This ConOps will serve as a **high-level** description of the existing TSM&O infrastructure deployed in the region, as well as all proposed TSM&O upgrades to the transportation network environment. In addition, the stakeholder environment will be detailed, including what agencies will have access to the TSM&O devices and how all stakeholders will interact with the system and with each other. The goal of the R2CTPO TSM&O Master Plan Phase 2 is to identify areas that would benefit from TSM&O infrastructure expansion, recommend TSM&O deployments, and emphasize the importance of Operations and Maintenance (O&M) protocols. Below is an outline of the different portions of the ConOps document:

Section 1 – Overview
Section 2 – Referenced Documentation
Section 3 – Current System Situation
Section 4 – Justification and Nature of Changes
Section 5 – Concepts for the Proposed System
Section 6 – Operational Scenarios
Section 7 – Summary of Impacts
Section 8 – Analysis of the Proposed System
Section 9 – Glossary

The development of this Concept of Operations and other project management materials for the R2CTPO TSM&O Master Plan Phase 2 were developed in accordance with guidelines and information presented at the Florida Department of Transportation's (FDOT) Systems Engineering website, which can be found at the following link:

http://www.dot.state.fl.us/trafficoperations/ITS/Projects_Deploy/SEMP.shtm

The development of this Concept of Operations document was prepared as required by Title 23 Code of Federal Regulations (CFR) 940 and State guidelines and systems engineering processes as defined in the following documents:

- Deliverable 1-10: Technical Memorandum, Florida's Statewide Systems Engineering Management Plan, Version 2, March 7, 2005. http://www.floridaits.com/01ITSGC/doc-SEMP/050315_D1-10_V2.pdf
- Technical Memorandum: Writing a Project Systems Engineering Management Plan (Version 4, September 29, 2006). http://www.floridaits.com/01ITSGC/doc-SEMP/060929-PSEMP-V4.pdf

1.3 System Overview

The transportation operation agencies located within the R2CTPO's jurisdiction, including FDOT District 5, the R2CTPO, Volusia County Traffic Engineering, the City of Daytona Beach Traffic Engineering, and the City of Palm Coast Traffic engineering, currently have a mature TSM&O network deployed in the region. The overall transportation network is made up of the previously described entities as well as non-traffic specific stakeholders (municipalities, police departments, schools, public safety, etc.). The goal of this master plan is to further bolster the existing infrastructure and fill in any gaps identified. This will be accomplished through the design and installation of the proposed infrastructure and any necessary subsystems (power service, security protocols, etc.). Currently, FDOT District 5 has built out TSM&O infrastructure on the freeways (Fiber Optic Cable (FOC), Dynamic Message Signs (DMS), Microwave Vehicle Detectors (MVDS) and Closed-Circuit Television (CCTV) Cameras) and has some infrastructure located on throughout the arterial system. Volusia County Traffic Engineering, the City of Daytona Beach Traffic Engineering and the City of Palm Coast Traffic Engineering all have similar infrastructure on the majority of the main arterials within their jurisdictions. However, some gaps have been identified as a part of master planning efforts. All three agencies also have active Traffic Management Centers (TMCs) that monitor traffic conditions on the road. Upgrades to the City of Daytona Beach TMC and the City of Palm Coast TMC have been recommended as a part of the master plan, and a relocation and upgrade of the Volusia County TMC is detailed within the master plan as well. In addition, the following infrastructure upgrades are recommended as part of the master plan: filling in of FOC gaps, additional CCTV cameras, BlueTooth travel time detectors, and all operating supporting subsystems (i.e. central control software, local software/hardware items such as servers, computers, and switches). **Figure 1** on the following page shows all existing and planned TSM&O infrastructure recommended to be installed within the R2CTPO.

An extensive TSM&O network will allow controlling agencies/stakeholders to better manage the operations on the arterials. Through stakeholder coordination, a lack of funding for O&M (staffing in particular) has been identified as major point of concern for maintaing agencies. In order to promote data sharing and to preserve resources, a recommendation of the master plan is to connect all TMCs in the region. Additionally, it has been recommended that, if they are not already, the traffic operations agencies connect to the FDOT District 5 RTMC to utilize both the software that would become available (i.e. SunGuide, asset management software, etc.) and the operations personnel located at the FDOT District 5 Regional Traffic Management Center (RTMC). In addition, data will be collected and stored, and video/images collected by the network will be available for sharing, benefiting operators and motorists alike. An overview of the operations of the system is as follows (more thorough discussion of operational scenarios will be discussed later in this document): operators will be made aware of congestion, verify the cause, determine an appropriate response (adjust signal timings, dispatching of emergency responders, etc.), and alert motorists of congestion and the causes so they may make informed decisions. The goal of these actions is to decrease the negative effects of traffic incidents and recurring congestion, decrease response times, decrease secondary incidents, and create more reliability in the transportation system as a whole.

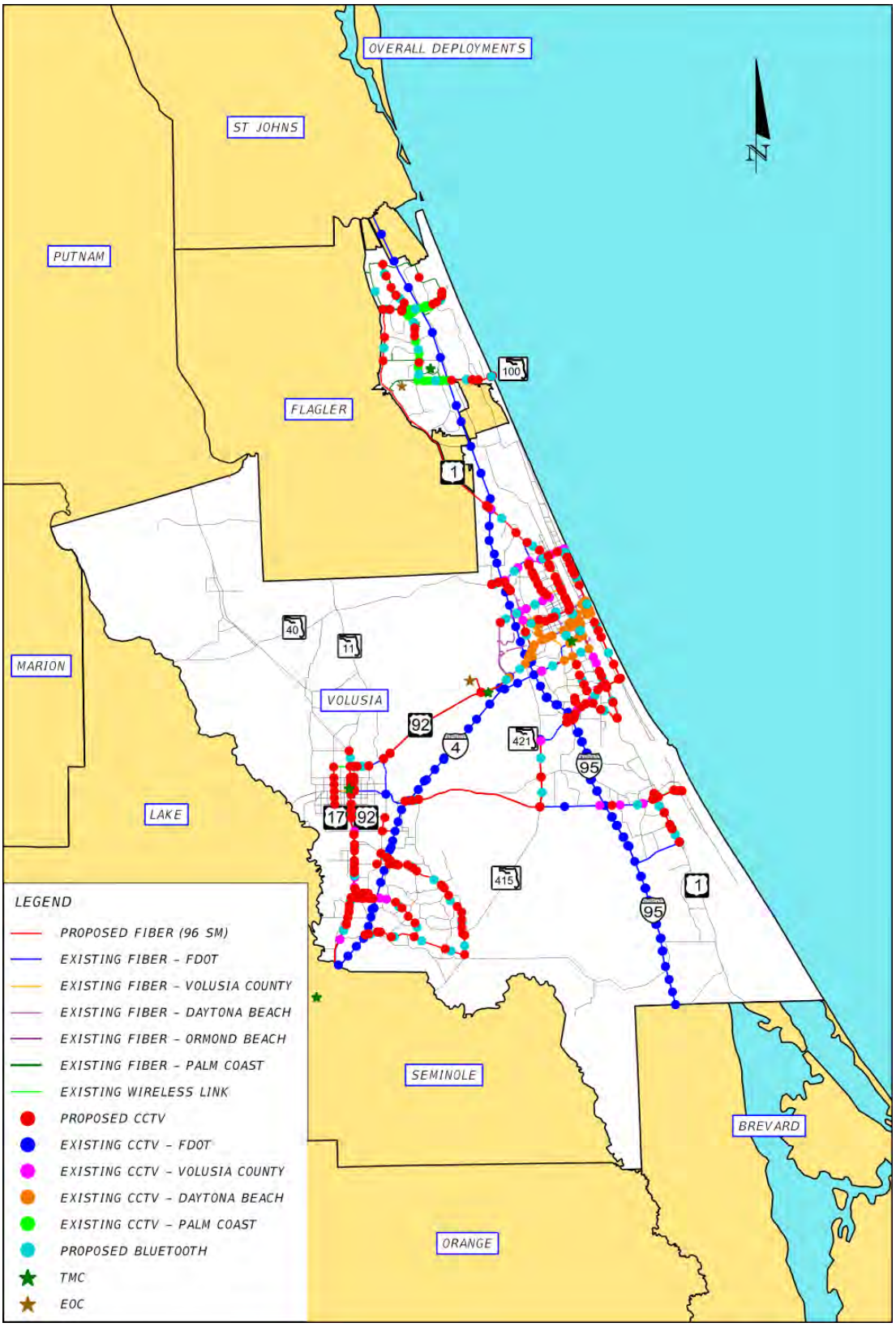

Figure 1 – Overall Existing and Proposed TSM&O Infrastructure

Below is an overview of the different agencies that will operate the system and their roles and responsibilities:

- **Project Sponsors** – refers to agencies that participate in the creation of goals, objectives, and requirements of the system, and are involved in funding the improvements. The project sponsors for this project include:
    - FDOT District Five
    - River to Sea TPO
    - Volusia County Traffic Operations
    - The City of Daytona Beach Traffic Engineering
    - The City of Palm Coast Traffic Engineering
    - Flagler County Engineering

- **User Agencies** – Agencies that will control and/or use data video images provided by the System to improve the performance of the transportation network. The user agencies for this project include:
    - FDOT District Five
    - River to Sea TPO
    - Volusia County Traffic Operations
    - The City of Daytona Beach Traffic Engineering
    - The City of Palm Coast Traffic Engineering
    - Flagler County Engineering
    - Volusia County Emergency Operations Center (EOC)
    - Flagler County EOC
    - Volusia County and Local Emergency Responders
    - Flagler County and Local Emergency Responders

- **Maintenance and Support Agencies –** Agencies that have a responsibility to maintain field devices and infrastructure. The maintenance and support agencies for this project include:
    - FDOT District Five
    - Volusia County Traffic Operations
    - The City of Daytona Beach Traffic Engineering
    - The City of Palm Coast Traffic Engineering
    - Flagler County Engineering

- **Operating Centers** – Agencies that will utilize software and hardware of the system to control TSM&O devices implemented by Master Plan. The operating centers (summarized in **Figure 2**) for this project include:
    - FDOT District Five (view only if agencies do not connect to the RTMC)
    - Volusia County Traffic Operations
    - The City of Daytona Beach Traffic Engineering
    - The City of Palm Coast Traffic Engineering

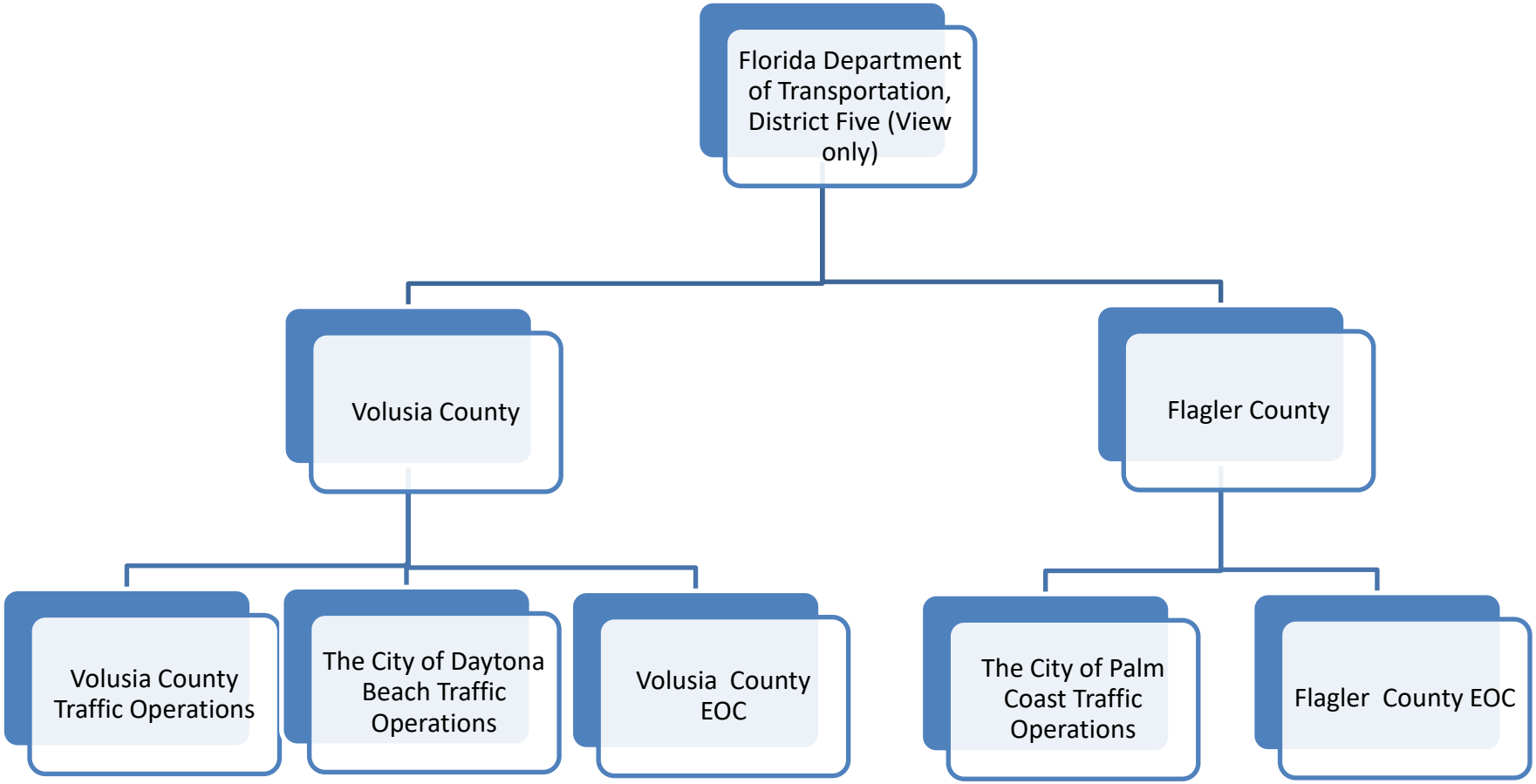

Figure 2 - R2CTPO Operating Centers

1.3.1 Agency Contact Information

- FDOT District Five
  719 S. Woodland Blvd.
  DeLand, FL 32720-6800
  Phone: 1-800-780-7102

- River to Sea TPO
  2570 West International
  Speedway Boulevard, Suite 100
  Daytona Beach, FL 32114-8145
  Phone: 386-226-0422

- Volusia County Traffic Operations
  123 W Indiana Ave
  DeLand, FL 32720
  Phone: 386-736-5968

- The City of Daytona Beach Traffic Operations
  950 Bellevue Ave
  Daytona Beach, FL 32114
  Phone: (386) 671-8659

- The City of Palm Coast Traffic Operations
  160 Lake Ave
  Palm Coast, FL 32164
  Phone: 386-986-4758

- Flagler County Engineering
  1769 E Moody Blvd # 2
  Bunnell, FL 32110
  Phone: 386-313-4045

- Volusia County EOC
  3825 Tiger Bay Rd #102
  Daytona Beach, FL 32124
  Phone: 386-258-4088

- Flagler County EOC
  1769 E Moody Blvd # 3
  Bunnell, FL 32110
  Phone: 386-313-4200

2. Referenced Documentation

Document	Date Adopted	Contact
River to Sea TPO 2040 Long Range Transportation Plan	1/27/16	River to Sea TPO 2570 West International Speedway Boulevard, Suite 100 Daytona Beach, FL 32114-8145 Phone: 386-226-0422
River to Sea TPO Transportation Improvement Program	6/28/17	River to Sea TPO 2570 West International Speedway Boulevard, Suite 100 Daytona Beach, FL 32114-8145 Phone: 386-226-0422
River to Sea TPO Unified Planning Work Program	4/27/16	River to Sea TPO 2570 West International Speedway Boulevard, Suite 100 Daytona Beach, FL 32114-8145 Phone: 386-226-0422
River to Sea TPO TSM&O Master Plan Phase 2	TBD	River to Sea TPO 2570 West International Speedway Boulevard, Suite 100 Daytona Beach, FL 32114-8145 Phone: 386-226-0422

Table 1: Referenced Documentation

3. Current System Situation

3.1 Background, Objectives, and Scope

Between FDOT District 5, Volusia County Traffic Engineering, the City of Daytona Beach Traffic Engineering, and the City of Palm Coast Traffic Engineering, the R2CTPO region has a mature and extensive TSM&O network in place. The operation of these devices is split in the following fashion: FDOT District 5 has jurisdiction of the freeways and limited infrastructure on some arterials, the City of Daytona Beach Traffic Engineering has jurisdiction over signals and infrastructure within the city limits of Daytona Beach, the City of Palm Coast Traffic Engineering has jurisdiction over all signals and infrastructure within the city limits of Palm Coast (with potential plans to take over additional signals elsewhere in Flagler County), and Volusia County Traffic Engineering has jurisdiction over any signals within Volusia County outside of the city limits of Daytona Beach (The maintenance in other City limits is contracted to Volusia County). Volusia County Traffic Engineering utilizes the Centracs Advanced Traffic Management System (ATMS) software to operate the signals under their control, while both the City of Daytona Beach Traffic Engineering and the City of Palm Coast Traffic Engineering use the ATMS.now software to operate their respective signals. The Master Plan has identified major arterials that would benefit from improved TSM&O infrastructure.

3.2 Operational Constraints

Currently, TSM&O infrastructure is well built out throughout the region. However, gaps in the communications network have been identified that make it difficult to operate their entire respective transportation systems and for operations agencies to connect to one another for data sharing purposes. In addition, a lack of funding for O&M purposes has been identified during stakeholder coordination as an obstacle in the way of operating the transportation network in the most efficient way possible. A goal of this phase of the master plan is to fill in the communication gaps and emphasize the importance of fully funded O&M with the aim of securing additional O&M funding for all operating agencies.

3.3 User Profiles

The R2CTPO TSM&O system will feature the following six user profiles (note that all operating agencies previously identified will utilize these profiles):

- ITS Operators/Supervisors
    - Has access to and controls Intelligent Transportation Systems (ITS) devices on arterials
        - Utilizes Pan Tilt Zoom (PTZ) capabilities of CCTVs to monitor coverage areas
        - Monitors traffic signal control system
        - Gathers and reports data generated by the travel time system
    - Informs emergency personnel of incidents and coordinates with emergency response personnel throughout the process of clearing any incidents that may occur

    - Monitors performance of system and informs traffic operations personnel of any faulty equipment so that they may dispatch maintenance personnel to any devices not functioning properly
- ITS/Traffic Operations Device Maintenance Personnel
    - Maintain all ITS/signal equipment in the field
    - Ensure minimal equipment downtime
    - Perform routine maintenance
    - Can be in-house or available via maintenance contract
- ITS/Traffic Operations Network Support Personnel
    - Monitor health and performance of network
    - Perform routine maintenance
    - Implement any required updates
    - Monitor FOC for any physical damage
- Traffic Operation Engineers and Personnel
    - Analyze data generated by ITS devices
    - Make changes and improvements to signal timings and respond in real time to improve performance of the system
    - Make recommendations for future equipment upgrades
- Emergency Response Personnel
    - Work with ITS Operator and respond to incidents detected by ITS equipment
    - View video feeds of traffic conditions
    - Use travel time information to determine best route to incidents
- Motorists
    - Receive travel time and incident information reported by ITS Operators
        - Options for traveler information dissemination currently under consideration are Florida 511and 3rd parties such as Google/Waze
    - Make informed decisions on travel routes to ensure best travel times

3.4 Support Environment

All signals and TSM&O equipment are currently operated and maintained in the fashion described in **Section 3.1**. Any new infrastructure proposed by the master plan will be operated and maintained in the same fashion.

4. Justification and Nature of the Changes

4.1 Justification for Changes

The areas within the R2CTPO's jurisdiction are in the unique position of having an increasing population, seasonal population changes ("snowbirds"), large scale events at the Daytona International Speedway, beach traffic and being in a high-risk area for hurricanes that sometimes necessitate large scale evacuations. These factors lead to both recurring congestion and instances of greatly increased congestion due to events/evacuations as most of this traffic is generated by personal vehicles during commuting. The region is in a good position to manage the congestion brought about by these factors with widespread TSM&O infrastructure already in place and being operated by the four main traffic operations agencies. For the system to work to its fullest potential, key gaps in communications, dedicated O&M funding, and increased coordination between the agencies is recommended.

4.2 Description of the Desired Changes

The following changes have been identified and proposed as a part of the master plan effort to bolster the operations capabilities of the traffic network:

- FOC in several key spots to fill in gaps in communications and connect operating agencies
  - Single mode fiber (standardized to 96 count) with sufficient fiber count to accommodate any future transportation needs or support new technologies (i.e. preemption, connected vehicles)
  - Identified gaps include: US 17-92, US 92, SR 44, SR A1A, and SR 100
- Additional CCTV cameras at most signals in deployment areas
  - Provide Operators with the ability to monitor large areas of the transportation network
- Travel Time System
  - BlueTooth system that will provide information regarding travel times through typically congested corridors
- TMC Upgrades
  - Upgrade equipment and network capabilities at the Daytona Beach TMC
  - Upgrade equipment and network capabilities at the Palm Coast TMC
  - Upgrade and relocation of the Volusia County TMC to shared public works facility

4.3 Change Priorities

The highest priority changes are those that have been identified in the master plan as a part of an early deployment project. These include the filling in of smaller fiber gaps on SR 100 in Palm Coast and US 92 in DeLand, upgrades to the TMCs in the previously described fashion, and recommendations for additional O&M resources. These minimal upgrades should have an immediate effect on the communications and operations capabilities for all of the operating agencies. All other infrastructure improvements (additional FOC, CCTV cameras, BlueTooth detectors) have been recommended as part of larger scale deployments that will occur as funding is generated.

4.4 Changes Considered but Not Included

In addition to the previously described updates and deployments, a recommendation of the master plan is to build upon the recently completed design of the Daytona Area Event Management into a potential Daytona Area Event Management Phase 2 (which has been submitted by Volusia County for funding). Phase 1 includes the introduction of major TSM&O infrastructure that will allow roadway operators to direct traffic in real time. The system includes Blank Out Signs (BOS) that will be able to rotate between fixed diagrammatic signs that direct traffic to proper areas, including parking lots, handicap accessible areas, and proper egress routes; as well as detours for incidents during normal operations. It is recommended that the viability of expanding this project to areas that were left out of Phase 1 due to budgetary concerns be explored. This is not included as a separate deployment, however.

4.5 Assumptions and Constraints

All new improvements and equipment were chosen to be compatible with all existing ITS infrastructure to avoid the cost of implementing new equipment in all locations. All equipment will be from the FDOT Statewide Approved Products List (APL), as possible. All devices found on the APL have been tested and verified by the FDOT Traffic Engineering Research Lab (TERL) as meeting FDOT standards.

It was also assumed that all necessary funding for both design/construction and O&M for the system will be available. This will allow for the system to operate as designed and minimize the need for unnecessary and costly upgrades to the system in the future.

5. Concepts for the Proposed System

5.1 Background, Objectives, and Scope

Regarding infrastructure, the goal of this master plan is to replace/supplement the already robust TSM&O infrastructure utilized by the traffic operating agencies in the region. Gaps in fiber on major arterials such as US 17-92, US 92, SR A1A, and SR 100 will be filled and additional CCTV cameras for surveillance purposes will be added. In addition, BlueTooth travel time detectors will be installed to provide travel time data to TMC operators in real time.

At minimum, these devices will be controlled and maintained by the user agency that has jurisdiction over the region in which they are installed. It is recommended that increased coordination between the Volusia County TMC, Daytona Beach TMC, and Palm Coast TMC be put into practice. Should it be agreeable among all parties, an agreement (Memorandum of Understanding (MOU), Joint Participation Agreement (JPA), etc.) is recommended to be established that would allow one operator from any of the TMCs to monitor all signals in the region, if necessary. This will promote data sharing and aid in the preservation of staffing resources. For similar information sharing and resource sharing purposes, it is further recommended that each agency connect to the FDOT District 5 ITS network to gain access to FDOT software (i.e. SunGuide, iVEDDS, etc.) and the FDOT District 5 RTMC operations staff.

5.2 Operational Policies and Constraints

All signals within the R2CTPO are operated and maintained in the fashion described in **Section 3.1**. All field devices that are recommended to be installed as a part of the master plan will be controlled and maintained in the same fashion. For the purposes of resource sharing, a recommendation of the master plan is to connect the three TMCs in the region so that one TMC will be able to monitor and report on all signals in the region. It is recommended that the TMC be staffed at a minimum as follows:

- 1 operator during peak weekday morning traffic hours and 1 operator during peak weekday evening traffic hours
    - 7:00 AM – 11:00 AM
    - 3:00 PM – 7:00 PM
    - Part-time hourly employees
- Additional staffing as needed for weekends and events
- Each operating agency will decide who will supervise their respective TMCs

5.3 Description of the Proposed System

The already extensive TSM&O network deployed in the region will be supplemented with the following elements:

- Additional FOC
  - Gaps in fiber communication and redundant fiber routes identified as a part of Task 3 of the master plan will be filled in and added respectively
  - All additional fiber will be 96 count single mode

- CCTV cameras
  - Provide visual surveillance at major intersections
  - Can be controlled by operators using PTZ capabilities
  - Used to verify incident occurrence, location, and determine severity
  - Used to verify proper traffic signal timing performance
  - Can be viewed by all authorized agencies (i.e. Daytona International Speedway, Volusia County Fire Rescue, etc.), but controlled only by Volusia County, Daytona Beach, or Palm Coast ITS operators and traffic operations personnel

- Travel time system
  - BlueTooth detectors
  - Vehicles with BlueTooth enabled devices (discoverable MAC addresses) passing by a detector will be assigned an ID based on a portion of the MAC address and their progress through the roadways will be tracked. Please note that this information is encrypted and not stored.
  - Travel time data will be accessible to ITS operators and traffic operations personnel
  - Operators will use the travel time data to monitor the performance of the system and disseminate the travel time data to motorists

5.4 Modes of Operation

As stated previously, at least one TMC in the region should be staffed on weekdays from 7:00 AM to 11:00 AM and 3:00 PM to 7:00 PM. In addition, other agencies have been identified as good candidates for having access to the TSM&O network in a limited capacity. All agencies who will have access to the TSM&O network in some fashion and what their access rights will be can be seen in **Table 2**. It should be noted that the control capabilities of the FDOT D5 RTMC may expand should the controlling agencies decide to allow the RTMC to operate their signals in some fashion (i.e. During off-peak hours).

Agency	Signals	CCTVs	Travel Time System
Volusia County Traffic Operations	• Observe • Control	• Observe • Control	• Observe • Disseminate information
Daytona Beach Traffic Operations	• Observe • Control	• Observe • Control	• Observe • Disseminate information
Palm Coast Traffic Operations	• Observe • Control	• Observe • Control	• Observe • Disseminate information
FDOT District 5 RTMC	• None	• Observe	• Observe
Daytona International Speedway (During Events)	• None	• Observe	• Observe
Votran	• None	• Observe	• Observe
Volusia County EOC	• Observe	• Observe	• Observe
Flagler County EOC	• Observe	• Observe	• Observe
Volusia County Fire Rescue	• None	• Observe	• Observe
Flagler County Fire Rescue	• None	• Observe	• Observe

Table 2: Agency TSM&O Access Permissions

5.5 User Involvement and Interaction

The arterial TSM&O network of the region is currently operated by three primary entities: Volusia County Traffic Engineering, the City of Daytona Beach Traffic Engineering, and the City of Palm Coast Traffic Engineering. Any additional infrastructure or devices that will be brought online as a part of the master plan will be under the control of the agency that has jurisdiction over it. Should it be agreeable among the three agencies, connections between the TMCs of each agency will be created so that the signals and devices of all agencies will be able to be monitored by the other TMCs for the purposes of resource (particularly staffing) sharing. Additionally, should the FDOT D5 RTMC be granted operations access to signals during times agreed to by the operating agencies, it will have the capacity to monitor signals and field devices, and implement timing changes **that have been approved by the primary operating agencies**. Any data generated by the TSM&O devices will be available to the operating agencies, the R2CTPO, and FDOT to monitor the performance of the system, determine successes/deficiencies, and identify where further improvements are needed.

5.6 Support Environment

All TSM&O infrastructure that has been recommended as part of the master plan will be operated and maintained by the operating agency with jurisdiction over it (see **Section 3.1**). Should any additional TSM&O deployments beyond the scope of the master plan be developed, all infrastructure as part of those deployments will be operated and maintained in the same fashion.

5.7 Future Agency Connectivity

In order to facilitate efficient operation of all aspects of the R2CTPO transportation network, several agencies will have access to (in some limited fashion) the ITS field devices and information generated by the field devices. Recommended levels of access for select users were detailed in **Section 5.4** of this document. The following agencies are recommended to have access to the system now and potentially in the future:

- Volusia County Traffic Operations
- Daytona Beach Traffic Operations
- Palm Coast Traffic Operations
- Flagler County Engineering
- R2CTPO
- FDOT District 5 RTMC
- Daytona International Speedway
- Volusia County EOC
- Flagler County EOC
- Volusia County Fire Rescue
- Flagler County Fire Rescue
- Votran

6. Operational Scenarios

The list below details certain operational scenarios that may be encountered during daily operations of the regional transportation system and how they should be dealt with using the proposed TSM&O infrastructure:

- **Normal Operations:** The roadway network is operating efficiently and congestion is either minimal or non-existent. Operators constantly observe the roadway network using CCTVs and verify that the roadway network is performing up to minimum standards (compared to baseline target numbers put in place by operating agencies) through information provided by the travel time system. Traffic operations personnel will monitor the system as well and verify that current signal timings are adequate. Should any incidents be detected during this timeframe, emergency response personnel will be dispatched to clear the incident in as efficient manner as possible. These incidents include anything that would obstruct the normal flow of traffic such as minor traffic incidents and disabled vehicles.
- **Peak Traffic Times:** Morning and evening rush hours bring increased traffic volumes and congestion is increased as a result. Operators will be alerted to increasing travel times from the travel time system and operators will verify the increased congestion using the CCTVs. Traffic operations personnel will implement alternative signal timings if deemed appropriate. Similar to normal operations, should any incidents be detected during this timeframe, emergency response personnel will be dispatched to clear the incident in as efficient manner as possible. These incidents include anything that would obstruct the normal flow of traffic such as minor traffic incidents and disabled vehicles.
- **Incident Operations:** Major delays can be created by increased congestion that results from incidents that impede normal traffic flow. This increased congestion can occur for a multitude of reasons including decreased roadway capacity and other motorists slowing down to observe the accident scene ("rubbernecking"). As in peak traffic times, operators will be alerted to increasing travel times from the travel time system and operators will verify the increased congestion using the CCTVs. Should the operating agencies deem it appropriate, alternative signal timings will be implemented on roadway sections seeing the most congestion. These changes in signal timing can increase throughput of the impacted roadway, thereby decreasing congestion, travel time delay, and the likelihood of secondary incidents. Operators will also use the CCTVs to assess the severity of the incident and dispatch appropriate emergency response personnel (flat bed trucks, HAZMAT, coroner) that will clear the incident scene as quickly as possible to ensure that the roadway can return to normal operations. Once congestion has returned to normal, the signals will be changed back to their normal signal timing plans. Finally, operators will send out alerts to motorists that will detail the nature of the incident and expected changes in travel time.
- **Event Operations:** The region often hosts large-scale events at the Daytona International Speedway that could lead to travel lanes being affected. In addition, beach traffic can result in additional operational needs. Traffic operations personnel will work with operators and emergency response personnel ahead of time to plan alternate routes and alternative signal timings that will accommodate the changes in traffic conditions. Traffic operations personnel will also be on scene during the event to monitor the traffic before and after the event to monitor the roadway network using the CCTVs and information generated by the travel time system. Should it be possible, it is recommended that a representative from a

third party routing software (such as Waze) be present during the event to further increase the real-time travel information dissemination capabilities of the traffic operations agencies during these events.

- **Evacuation Operations:** Due to the region being coastal, the region is susceptible to hurricanes and, as such, is likely to be put under mandatory evacuation orders. Should an evacuation order be issued, all operating agencies should be fully operational to monitor the roadways to monitor the progress of the evacuation in real time. If deemed appropriate, it is recommended that a workstation be installed in the major EOCs in the region to allow for streamlined evacuations procedures. Operators will monitor the roadways using the CCTVs and route evacuating vehicles to less congested roadways to clear the roadways as soon as possible. Should any incidents that could impede the flow of traffic be detected, emergency responding personnel will be dispatched to clear the incident as quickly as possible. Should arterials be used as major evacuation routes, signal timings that optimize the flow of traffic out of the region will be implemented.
- **Maintenance Operations:**
    - Equipment malfunction: Operators should poll all devices at the start of their respective shifts using their agencies ATMS software of choice to ensure that all devices are operating in a way that ensure optimal connectivity and performance. Should the poll return a result that indicates certain devices are not working properly, maintenance personnel (either in-house or maintenance contract personnel) should be dispatched to each non-functioning device and repair the device(s). The maintenance personnel will then contact the operators when repairs are finished and the operators will verify that the repairs have returned the devices to full functionality. In addition, network support personnel will verify that all FOC is fully functioning and that no damage to the FOC is present. This will ensure that the full communications capacity of the region is fully functional.
    - Preventative maintenance: Maintenance personnel will follow Standard Operating Procedures (SOP) put in place by the operating agencies. If SOPs for preventative maintenance are not already in place, it is recommended that they be created. At minimum, all devices/equipment should be checked at regular intervals to ensure that the transportation system will be able to operate at full capacity and to determine when devices are nearing the end of their life cycle and will need to be replaced.

7. Summary of Impacts

During construction of this new TSM&O system, there is the potential for impacts on traffic flow in areas where new communications infrastructure is being installed due to the potential need for lane closures. To ensure that lane closures will only be put in place as necessary and produce as little congestion as possible, proper Maintenance of Traffic (MOT) standards and practices should be implemented and followed. These include but are not limited to advance driver warnings and law enforcement presence. An additional reason for impact on traffic flow would be the need for time for all previously mentioned user profiles to familiarize themselves with all new equipment and O&M protocols. Once all personnel have been properly acclimated to and trained in the use of the new network and equipment, decreases in efficiency will cease to be an issue. These small increases in congestion should be viewed as a long-term investment, however, as these minor inconveniences will lead to pronounced benefits for all transportation network users in the region. These benefits will all be in line with the goals identified both in Phase 1 of the TSM&O Master Plan and in Task 2 of the Phase 2 of the TSM&O Master Plan.

The installation of new surveillance and travel time system equipment should have a minimal impact on the performance of the mature TSM&O network already in place. This is due to the TSM&O experience already collected by the operating agencies of the region, and due to the fact that any new devices will be from the FDOT APL, if possible, meaning that all devices will already be consistent with the field devices deployed already in the region and compatible with any existing infrastructure and operating systems.

8. Analysis of the Proposed System

With mature infrastructure in place and a wealth of knowledge and experience of the operating agencies located within the R2CTPO region, the region is well poised to take the next step in actively managing the transportation network. The improvements recommended as a part of the Master Plan will put the region in a position to not only better manage the transportation network as it is, but also allow the region to be well equipped to deploy new technologies as well. Connections between operating agencies, especially the three main TMCs described earlier in this document, will allow for more active resource sharing (crucial due to funding challenges experienced by all agencies) and data sharing/analysis that will allow the operating agencies to assess how well the network is performing and identify any additional deficiencies as they become apparent.

Building on the goals and objectives identified as a part of Phase 1 of the R2CTPO TSM&O Master Plan effort, Phase 2 has identified the needs of the region through existing conditions analysis and one-on-one meetings with stakeholders, identified potential solutions including infrastructure deployments and organizational needs, and identified O&M needs that will be imperative to the success of the transportation network. This ConOps has detailed the operational needs that will contribute to the success. The improvements will allow operators to expand their surveillance and communications capabilities to new areas that were not previously part of the TSM&O network, operate key corridors in a more efficient manner, and disseminate traffic information in real-time, leading to a more informed and prepared motoring public.

9. Glossary

Concept of Operations: A document that details the characteristics of a proposed transportation system from a stakeholder's perspective. It includes the following sections: Overview, Referenced Documentation, Current System Situation, Justification and Nature of Changes, Concepts for the Proposed System, Operational Scenarios, Summary of Impacts, Analysis of the Proposed System, and a Glossary.

Intelligent Transportation System: Electronics, communications, and/or information processing used individually or in combination to improve the efficiency or safety of a transportation system.

Stakeholders: Any entities/agencies that have a vested interest in the optimal performance of the system that is the subject of the ConOps. These can include government agencies, private organizations, and the public.

Transportation Systems Management and Operations: The effective implementation and management of ITS devices that contribute to the safer and more efficient operation of the roadway network.

Transportation Management Center: The office that controls all ITS devices, coordinates with all responding agencies to manage incidents, and disseminates travel information to the public.

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