Brevard County
Advanced Traffic Management System (ATMS)

Project Systems Engineering Management Plan (PSEMP)

DRAFT

October 9, 2012
Version 2.4

Prepared for:
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1-800-780-7102

Document Control Panel	
File Name:	Brevard County SEMP
Version No.:	Version 2.0
Created By:	Carlo Adair, Atkins
Date of Submission:	TBD
Comments Received:	Brevard County / Doug Mihalich / 2010.09.03
	FDOT D5 / Demetrius Lewis / 2010.09.03
	City of Melbourne / Jenni Lamb, PE / 2010.11.16
	Brevard County / Gilberto Ramirez, PE / 2010.11.17

Revision History Control Panel		
CREATED BY:	Carlo Adair	August 22, 2010
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	Gilberto Ramirez, PE	November 17, 2010
	Gilberto Ramirez, PE	August 28, 2012
MODIFIED BY:	Carlo Adair	November 23, 2010
	Vanessa Perez de Morales	December 7, 2010
	Vanessa Perez de Morales	February 1, 2010
	Carlo Adair	March 24, 2011
	Krista Small	July 3, 2012
	Krista Small	October 1, 2012

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Acronyms and Abbreviations

ADA	Americans with Disabilities Act
ATMS	Advanced Traffic Management System
CCTV	Closed Circuit Television
CEI	Construction, Engineering and Inspection
CFR	Code of Federal Regulations
ConOps	Concept of Operations
EIA	Electronic Industries Alliance
EOC	Emergency Operations Center
FDOT	Florida Department of Transportation
FHP	Florida Highway Patrol
FHWA	Federal Highway Administration
ITS	Intelligent Transportation System
MOE	Measures of Effectiveness
MOP	Measures of Performance
MTR	Minimum Technical Requirements
MUTCD	Manual on Uniform Traffic Control Devices
NITSA	National ITS Architecture
O&M	Operations and Maintenance
PERT	Project Evaluation and Review Technique
PM	Project Manager
PSEMP	Project Systems Engineering Plan
PSTMC	Public Safety and Traffic Management Center
QA	Quality Assurance
QC	Quality Control
QM	Quantitative Measures
QMP	Quality Management Plan
RITSA	Regional ITS Architecture
RTVM	Requirements Traceability Verification Matrix
SEMP	Systems Engineering Management Plan
SEP	Systems Engineering Processes
SIC	SunGuide® ITS Checklist
SITSA	Statewide ITS Architecture
TMC	Traffic Management Center
TPM	Technical Performance Measure
TRIP	Transportation Regional Incentive Program

1. Document Overview

This document is the Project Systems Engineering Management Plan (PSEMP) for the Brevard County ATMS Project. A PSEMP is a plan that helps manage and control a project using the System Engineering Plans (SEPs) process

The document is organized as follows:

Section 2 – Need for a PSEMP
Section 3 – Applicable Documents
Section 4 – Applicable Systems Engineering Processes
Section 5 – Project Management and Control

The development and management of the Brevard County ATMS SEMP is based on a number of guidelines and builds upon planning, reports, and documentation developed prior to the development of this PSEMP, including:

- State and Federal Guidelines
- Project Planning Reports
- FDOT ITS Strategic Plan
- Brevard County ITS Strategic Plan

The development of this PSEMP and other project management materials for the Brevard County ATMS project were developed in reference to guidelines and information presented at the Florida Department of Transportation's (FDOT) SEMP 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 PSEMP was prepared in reference to State guidelines and systems engineering processes as defined in

- Deliverable 1-10: Technical Memorandum, Florida's Statewide Systems Engineering Management Plan, Version 2, March 7, 2005.
- Technical Memorandum: Writing a Project Systems Engineering Management Plan (Version 4, September 29, 2006).

1.1 Framework:

As previously noted, the PSEMP represents the plan for project execution and management that was based on the Systems Engineering model and associated processes. The regulations that frame the development and implementation of a PSEMP are born from Federal Regulations related to ITS projects, more specifically, 23 CFR 940.

1.2 23 CFR 940:

On April 8, 2001, the Federal Highway Administration (FHWA) issued Rule 940 entitled Intelligent Transportation System Architecture and Standards. The intent of the Rule is to require procedures for implementing sections of the Transportation Equity Act for the 21st Century (TEA-21) requiring ITS projects to conform to the National ITS Architecture (NITSA) and standards.

As a requirement of 23 CFR 940, any project receiving federal-aid that moves into design is required to follow a systems engineering analysis (including development of a PSEMP) that is commensurate with the project scope.

2. Need for a Project Systems Engineering Management Plan

The FHWA requires[1] states that desire federal assistance for ITS deployment projects to use a SEP to qualify for financial assistance. The PSEMP documents tasks to be performed for the coordination and control of all ITS device deployments.

Florida's Statewide SEMP is used as a reference guide in the creation of this PSEMP.

2.1 Project Identification:

- Project Name: Brevard County ATMS
- Financial Project Identification(s) (ID):
  - 428957-1-52-01
  - 428919-1-52-01
  - 428920-1-52-01
- Federal Aid Project Number: ARRA 641-B

2.2 Project Description:

The Brevard County ATMS project is a collaborative effort between FDOT District 5 and Brevard County. This project consists of the design and construction of ITS infrastructure and ITS sub-system components along the following corridors in Brevard County, Florida:

- SR 500 (US 192) from the I-95 Southbound Ramps to Dairy Road
- SR 518 (Eau Galle Blvd/Montreal Ave) from CR 509 (Wickham Road) to Pineapple Ave.
- SR 520 (King Street) from Clearlake Road to Banana River Drive
- SR 5 (US 1) from Peachtree Street to Eyster Blvd.
- SR 5 (US 1) from Lake Washington to Babcock Street
- SR 50 (Cheney Hwy) from I95 to SR 405
- SR 405 (Columbia Blvd) from SR 50 (Cheney Hwy) to SR 5 (US1)
- Palm Bay Road from Minton Road to Robert J. Conlan Blvd.
- Minton Road from I95 overpass to Emerson Drive NW
- CR 509 (Wickham Road) from SR 5054 (Sarno Road) to SR 500 (US 192)

ITS sub-systems for the project are defined as: a fiber optic network system (FON), a vehicle detection system (VDS), a closed circuit television (CCTV) camera system, a travel-time data collection system, and an adaptive signal control system for the traffic corridors. These systems are inclusive of central control software, local software, and hardware (such as but not limited to servers, computers and switches). Central command operations are housed and performed at the joint Brevard County Traffic Management Centers (TMCs) located at:

Brevard County Public Works Engineering Office
2725 Judge Fran Jamieson Way, A211
Viera, Florida 32940-6605

Brevard County Traffic Operations
580 Manor Drive
Merritt Island, Florida 32952

Brevard County Emergency Operations Center
1746 Cedar Street
Rockledge, Florida 32955

The ITS network was extended sufficiently close to the municipal facilities of the Cities of Titusville, Melbourne, and Palm Bay, and terminals have been installed allowing the Cities to have monitoring capabilities over the entirety of the ATMS components.

2.3 Funding:

Beginning in May of 2010, FDOT District 5 in conjunction with Brevard County, entered into an agreement to use unencumbered American Recovery and Reinvestment Act (ARRA) funding as a monetary source to deploy ITS upgrades to the US 192 corridor from I-95 to Dayton Drive. FDOT District 5 began development of a Request for Proposal (RFP) for a design/build solicitation for the project under a maximum bid price solicitation format in the amount of $276,924.00. During development, the project was rolled into a larger effort due to further coordination between FDOT District 5 and Brevard County as a result of additional funding availability. Inclusive of the roll-up of projects was another ARRA funded project, the SR 518 corridor from Wickham Road to SR 5 (US 1) in Brevard County.

In August of 2010 Brevard County's Transportation Planning Organization (TPO) reported additional funding availability to FDOT District 5 in the amount of $4,681,405.00. This funding became available through the TPO's "SU-ON" and "SU-OFF" funding sources. Additionally, funding from FDOT District 5's ARRA unencumbered sources increased to a total amount of $874,558.00. In November, extra funding was provided to the project by additional contributions from the County's MPO. The greater amount of funding has resulted in the project's final form described in this PSEMP.

In October of 2010 Brevard County's Project estimates were re-calculated. Estimates depict that the Project was over budget by $1.4 million and could not be constructed as scoped at the time of the revised estimate. The Brevard County TPO added an additional $1,474,165.96 to the project budget of which $814,167 was added to the "SU-ON" funding and $660,000 added to the "SU-OFF" funding. The final funding total reached $7,555,519.00 as the final funding source for the project.

2.4 Purpose and Scope:

Florida's Statewide Systems Engineering Management Plan (SEMP) provided an extensive description and definition for control and management of the planning, design, construction, integration, and operations of Intelligent Transportation Systems (ITS). This document served as the PSEMP for the Brevard County ATMS of the Florida Department of Transportation (FDOT) District 5. It provided planning guidance for the technical management, procurement, installation, and acceptance of the Brevard County ATMS project which included design and construction of traffic management facilities within the County of Brevard. The project included the design, construction, integration, and operations of the following primary system components:

- Traffic signal controllers/cabinet upgrades;
- Closed circuit television (CCTV) cameras;
- Adaptive signal control;
- System detector stations; and
- Fiber optic communications network

The following documentation provided a detailed plan for managing the project within a Systems Engineering framework. The project incorporated systems engineering principles and protocols for the life-cycle of the system as guided by Title 23, Code of Federal Regulations, Part 940 – Intelligent Transportation System Architecture and Standards (23 CFR 940).

Further details of the project can be obtained by reviewing other documents, such as the project Concept of Operations (ConOps), Quality Assurance (QA) Plan, Operating and Maintenance (O&M) plan, etc (refer to section 3 for a detailed list of applicable documents).

2.5 Technical Project Summary Schedule:

Following is the overview of the project's current schedule:

- Advertisement……09/13/2010
- Letting / Notice to Proceed (NTP) ……07/11/2011
- Construction Completion…….. 01/04/2013
- Unit Testing……05/28/2012 - 12/03/2012
- Subsystem Testing……...12/03/2012 - 02/03/2013
- Substantial Completion……...12/03/2012
- Burn-In……01/19/2013 - 03/20/2013

Project is behind schedule. The Project Summary schedule has been updated to reflect the delayed completion date. The original construction schedule was for 366 days. The current construction schedule has been modified to 640 days.

2.6 Relationship to Other Plans:

The following section was intended to identify related state, district, and local agency documentation of plans for ITS within the region of the Brevard County ATMS project; FDOT District 5, Brevard County, and various cities throughout Brevard County.

2.6.1 Relationship to Florida's Ten-Year ITS Cost Feasible Plan

The FDOT Ten-Year ITS Cost Feasible Plan (CFP) is a 10-year program and resource plan that identifies ITS projects in the overall context of Florida's ITS Corridor Implementation Plans (FY 09/10 - FINAL published March 2010)[2]. It represents a commitment of state and district managed funds over a 10-year period to provide ITS funds in a coordinated statewide program to develop ITS infrastructure on Florida's major intrastate highways. It is limited access facility specific as published to date. The Brevard County ATMS project is an arterial facility deployment and therefore is not included in the Ten-Year ITS Cost Feasible Plan.

2.6.2 Relationship to Florida's Statewide ITS Architecture (SITSA)

In February of 2006, FDOT District 5, in conjunction with the state and all other Districts throughout Florida, developed the Statewide Intelligent Transportation System Architecture (SITSA) update project[3]. This effort was made to update the previous 2001 Florida SITSA plan to accommodate the changes and future plans of Florida ITS improvements and to ensure all requirements with the National Intelligent Transportation System Architecture plan (NITSA), as required by FHWA, were met. As part of the update, various District 5 specific market packages were identified. Of them, specific ATMS market packages were identified that relate to the goals of the Brevard County ATMS project. Specifically, they were:

- ATMS01 – Network Surveillance
- ATMS06 – Traffic Information Dissemination

2.6.3 Relationship to Other "On-project" Plans

2.6.3.1 FDOT ITS Strategic Plan:

The FDOT ITS strategic plan is a statewide ITS plan that outlines various elements of ITS and that addresses four primary goals:

- Safe transportation for residents, visitors, and commerce;
- Protection of the public's investment in transportation;
- A statewide, interconnected transportation system that enhances Florida's economic competitiveness; and
- Travel choices to ensure mobility, sustain the quality of the environment, preserve community values, and reduce energy consumption.

This document was used by Brevard County as the foundational resource in the development of Brevard County's ITS strategic plan.

2.6.3.2 Brevard County ITS Strategic Plan

Brevard County developed the Brevard County ITS strategic plan following the format and intent of the FDOT ITS strategic plan. It mimics the format and intent of the FDOT ITS strategic plan with the intent to document the County's overall plan to implement ITS throughout the County. The document also contains the County's business plan to deploy and operate the County-wide ITS. This document is continually reviewed and revised to account for changes in overall County goals and was referenced in the development of this project. The Brevard County ITS strategic plan is the main resource for the selection of corridors of the project. The County-wide ITS strategic map depicting the overall goals of the County is provided for reference in section 4.1 below.

2.6.3.3 Traffic Signal Maintenance and Compensation Agreements

The "Traffic Signal Maintenance and Compensation Agreements" established between FDOT District 5 and other agencies is the governing document outlining the roles and responsibilities of each entity as it pertains to signalized intersections. This agreement includes all definitions of responsibilities as they pertain to all, "…traffic signals, traffic signal systems (central computer, cameras, message signs, and communications interconnect), school zone traffic control devices, intersection flashing beacons, illuminated street name signs, and the payment of electricity and electrical charges incurred in connection with operation of such traffic signals and signal systems…" Due to the evolving nature of ITS and the interchangeability of ATMS's and signal operation, responsible roles for the maintenance of this project are loosely defined. As a result, the definitions of the "Off System Maintenance Agreement" (see section 2.6.3.4) were

developed to further clarify the line of system definitions and responsible roles of each agency.

2.6.3.4 Off System Maintenance Agreement

The "Off System Maintenance Agreement" between FDOT District 5 and Brevard County is the governing maintenance agreement document between the two agencies for non-state roads identified as part of the project. These corridors are specifically identified as Wickham Road, Minton Road, and Palm Bay Road. This agreement establishes various responsibilities and conditions required of and by these agencies per, during, and post construction of the project.

2.6.3.5 Other Documents

The development of the Brevard County ATMS project and PSEMP also required the development of the project's Concept of Operations, Requirements Verification Traceability Matrix (quality assurance/testing), and operations and maintenance (O&M) plans. These documents are designed to complement the contents of this PSEMP and detail the finite elements required of each document. The Concept of Operations Document has been complete. The Requirements Verification Traceability Matrix (testing) and O&M plans are under development and will be utilized towards the end of the project and after operations have been in place.

3. Applicable Documents

The following documents, of the exact issue shown, form a part of this document to the extent specified herein. In the event of a conflict between the contents of the documents referenced herein and the contents of this document, this document shall be considered the superseding document. Additionally, noted documents will be developed in support of, or in conjunction with, the preparation and definitions of this PSEMP.

DOCUMENT	DATE	CONTACT
Statewide Intelligent Transportation System Architecture (SITSA) update project	February 20, 2006; Version 2	Florida Department of Transportation Intelligent Transportation Systems Office 605 Suwannee Street, M.S. 90 Tallahassee, Florida 32399-0450 (850)-410-5600
Brevard County ITS Strategic Plan	July 28, 2008 Version 4	Brevard County Public Works Engineering 2725 Judge Fran Jamieson Way Building A211 Viera, Florida 32940-6605 (321)-633-2077
Brevard County Traffic Signal Maintenance and Compensation Agreement	August 27, 2002	Florida Department of Transportation 719 S. Woodland Blvd. Deland, FL 32720 1-800-780-7102
City of Melbourne, City of Palm Bay, and City of Titusville Traffic Signal Maintenance and Compensation Agreement	September 13, 2002	Florida Department of Transportation 719 S. Woodland Blvd. Deland, FL 32720 1-800-780-7102
Off System Maintenance	September	Florida Department of Transportation

Agreement	2010	719 S. Woodland Blvd. Deland, FL 32720 1-800-780-7102
Brevard County ATMS Preliminary Systems Engineering Management Plan	July 25, 2011	Brevard County Public Works Engineering 2725 Judge Fran Jamieson Way Building A211 Viera, Florida 32940-6605 (321)-633-2077
Brevard County ATMS Operations and Maintenance	April 14, 2011	Brevard County Public Works Engineering 2725 Judge Fran Jamieson Way Building A211 Viera, Florida 32940-6605 (321)-633-2077
City of Melbourne, City of Palm Bay, and City of Titusville Interlocal Agreement for ITS Maintenance	June, 2012	Brevard County Public Works Engineering 2725 Judge Fran Jamieson Way Building A211 Viera, Florida 32940-6605 (321)-633-2077
Brevard County Fiber Sharing Agreement	July, 2012	Brevard County Public Works Engineering 2725 Judge Fran Jamieson Way Building A211 Viera, Florida 32940-6605 (321)-633-2077

3.1 Local Agreements

In addition to the applicable documents identified above, local agreements in place that may have some bearing on the project are defined below:

3.1.1 Fiber sharing agreement with FDOT District 5

Brevard County has developed a fiber sharing agreement defining roles and responsibilities between FDOT District 5 and Brevard County for sharing, accessing, and utilizing fiber owned by each agency as well as the process and requirements for installing fiber on each agency's right of way.

3.1.2 Inter-local agreement between Brevard County and Cities within the County

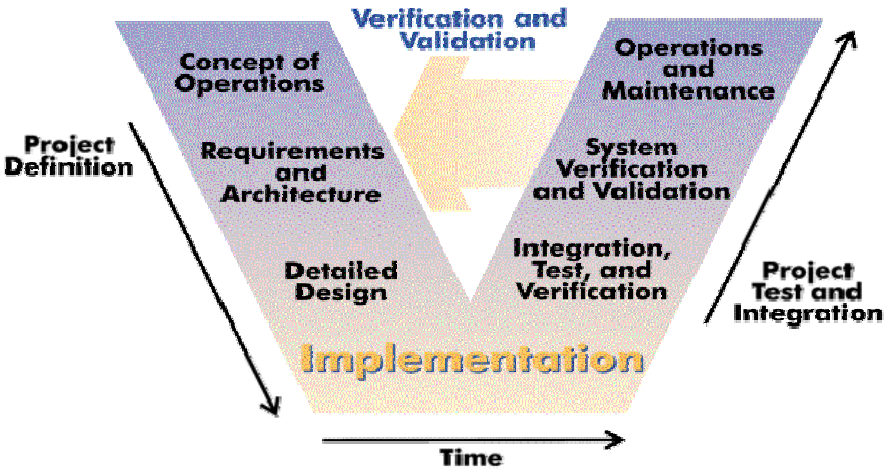
Brevard County has developed the ITS inter-local agreement document between the various cities within the county in conjunction with the development of this project's RFP. The intent of this document is to define all roles and responsibilities of each agency (city or county) as they pertain to this project's and future ITS related county-city cross-jurisdictional boundary efforts. This document defines ITS related elements as opposed to signal operational elements with the intent to clearly define the boundaries of the two systems. Federally funded technical support and equipment will be provided to the regional ITS network outside of the standard signal operations and maintenance agreements mentioned in previous sections (refer to section 2.6.3). This support will focus solely on the continued operations and maintenance of the Brevard County ITS fiber optic network. The ITS inter-local agreement developed by Brevard County in conjunction with all cities within the County establishes the newest rules to be adhered to by each agency. Inter-local agreements between Brevard County and the City of Titusville, the City of Palm Bay, and the City of Melbourne have been executed.

4. Systems Engineering Processes

The Systems Engineering Process (SEP) defines a formal framework for "systematically" executing a project, in its entirety, from project inception to project completion, for the entire life-cycle of the project. The IEEE 1220-1998 standard is the basis for the FDOT SEMP. The standard specifies the requirements for the SEP and its application throughout a projects life-cycle as well as addresses the issues associated with defining and establishing supportive life-cycle processes early and continuously throughout the project.

The life-cycle of a project and the overlay of systems engineering processes can be graphically defined in what is known as the "V" diagram. The following graphic provides depiction of the "V" diagram for the system engineering model.

Systems Engineering "V" Diagram



Key processes that were used for the Brevard County ATMS project include:

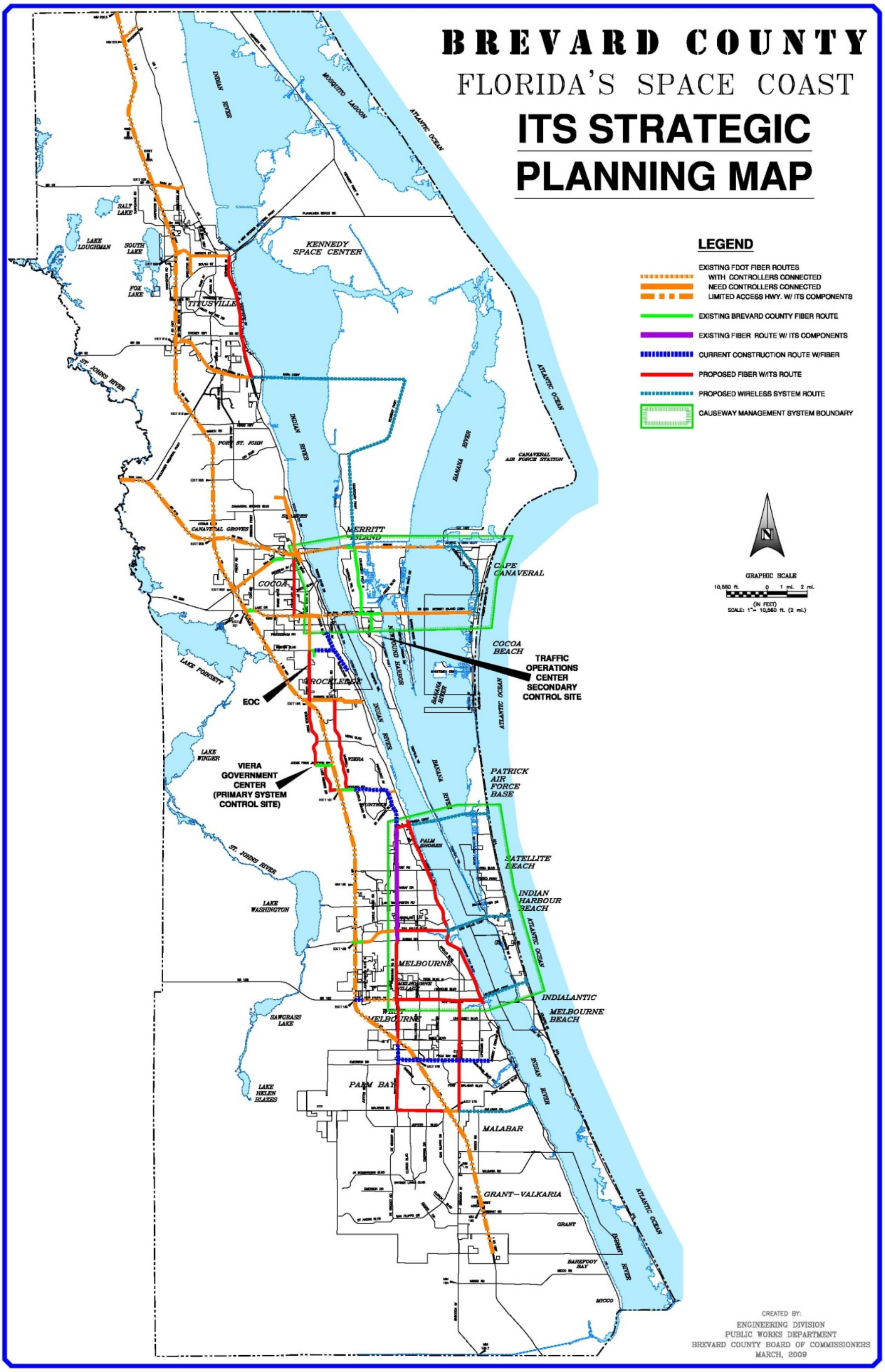
- Preparation of the SunGuide® ITS Checklist (SIC) Form
- Creation of high-level requirements
- Creation of detailed requirements
- Trade-off studies, gap analyses, or technology assessments
- Technical reviews
- Risk identification, assessment, and mitigation
- Creation of the Requirements Traceability Verification Matrix (RTVM)
- Creation of performance measure metrics
- System test, integration, and acceptance planning

4.1 Project Intelligent Transportation System Architecture (PITSA)

The Brevard County ATMS Architecture is a component of the SITSA. The following diagram depicts a high-level view of the overall processes associated with the development of the Brevard County ITS Architecture.

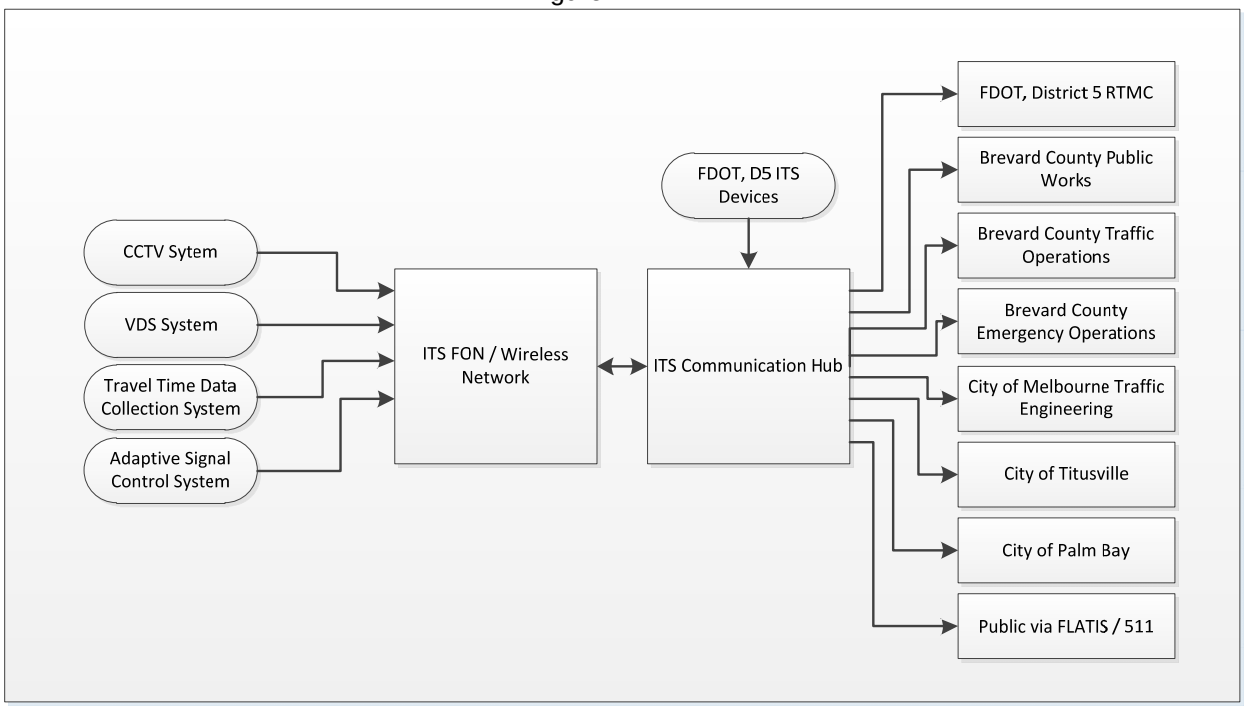
The high level PITSA presented herein (see Figure 1 below) is a copy of the high-level Brevard County ITS Strategic Plan map identifying key corridors and communication paths on the physical level. It is presented here for reference to the overall ITS strategy in place for Brevard County's county-wide system and as a resource in illustrating the corridors chosen for this project.

Figure 1


BREVARD COUNTY
FLORIDA'S SPACE COAST
ITS STRATEGIC PLANNING MAP
LEGEND
EXISTING FDOT FIBER ROUTES
WITH CONTROLLERS CONNECTED
NEED CONTROLLERS CONNECTED
LIMITED ACCESS HWY. W/ ITS COMPONENTS
EXISTING BREVARD COUNTY FIBER ROUTE
EXISTING FIBER ROUTE W/ ITS COMPONENTS
CURRENT CONSTRUCTION ROUTE W/FIBER
PROPOSED FIBER W/ITS ROUTE
PROPOSED WIRELESS SYSTEM ROUTE
CAUSEWAY MANAGEMENT SYSTEM BOUNDARY
GRAPHIC SCALE
10,560 ft. 0 1 mi. 2 mi.
(IN FEET)
SCALE: 1" = 10,560 ft. (2 mi.)
TRAFFIC OPERATIONS CENTER SECONDARY CONTROL SITE
EOC
VIERA GOVERNMENT CENTER (PRIMARY SYSTEM CONTROL SITE)
KENNEDY SPACE CENTER
TITUSVILLE
COCOA
ROCKLEDGE
MERRITT ISLAND
CAPE CANAVERAL
COCOA BEACH
PATRICK AIR FORCE BASE
SATELLITE BEACH
INDIAN HARBOUR BEACH
INDIALANTIC
MELBOURNE BEACH
MELBOURNE
WEST MELBOURNE
PALM BAY
MALABAR
GRANT—VALKARIA
GRANT
BAREFOOT BAY
MICCO
CANAVERAL GROVES
PORT ST. JOHN
CANAVERAL AIR FORCE STATION
SALT LAKE
LAKE LOUGHMAN
SOUTH LAKE
FOX LAKE
LAKE POINSETT
LAKE WINDER
LAKE WASHINGTON
SAWGRASS LAKE
LAKE HELEN BLAZES
ST. JOHNS RIVER
INDIAN RIVER
BANANA RIVER
MOSQUITO LAGOON
ATLANTIC OCEAN
NEWFOUND HARBOR
DOMINY RIVER
CREATED BY:
ENGINEERING DIVISION
PUBLIC WORKS DEPARTMENT
BREVARD COUNTY BOARD OF COMMISSIONERS
MARCH, 2009

A further defined logical architecture representing the physical architecture of the project is shown in Figure 2.

Figure 2



4.1.1 Market Packages

The market packages identified for the Brevard County ATMS project architecture are defined by the logical and physical framework for the region. The ITS market packages include:

Market Packages	
APTS7	Multi-modal Coordination
Advanced Traffic Management Systems	
ATMS01	Network Surveillance
ATMS03	Surface Street Control
ATMS07	Regional Traffic Management
ATMS08	Incident Management
ATMS09	Traffic Forecast and Demand Management
ATMS19	Speed Monitoring
Commercial Vehicle Operations	
CVO10	HAZMAT Management
Emergency Management	
EM3	Mayday Support
Archived Data Management	
AD1	ITS Data Mart
Maintenance and Construction Operations	
MC01	Maintenance and Construction Vehicle Tracking
MC07	Roadway Maintenance and Construction
MC08	Work Zone Management
MC09	Work Zone Safety Monitoring
MC10	Maintenance and Construction Activity Coordination
Evacuation Coordination	
EC01	Evacuation Coordination

4.2 High-level Functional Requirements

The primary goal of the Brevard County ATMS project was to successfully deploy traffic control and traffic management technologies in conjunction with required sub-systems necessary to enable improved traffic flow and congestion mitigation, as well as provide system monitoring within the Brevard County region. The specific objectives identified as essential to the successful planning, design, and deployment of the Brevard County ATMS project include:

- Improved safety
- Improved air quality mitigation
- Improved congestion mitigation
- Improved emergency response
- Improved regional growth adaptability
- Improved evacuations
- Improved system communications
- Improved cross-jurisdictional traffic flow
- Integration of transportation systems
- Improved regional security
- Improved transportation agency operations
- Reduced Operations and Maintenance (O&M) costs

Project Stakeholder coordination efforts were required to further define the high-level functional requirements. The ConOps has been developed based on these coordination efforts and further documents the functional requirements. The ConOps has lead to the development of the detailed requirements as the project progressed. The project's ConOps has been developed in a method per Appendix R of the Florida's Statewide SEMP.

To view the aforementioned Concept of Operations (ConOps) please visit the following website (enter url here; once document is developed).

4.2.1 Stakeholder Meeting 1:

Stakeholder Meeting 1 was held on January 26th, 2011 specifically for this project. The discrepancy between the need to have already completed this effort prior to this project's solicitation and the current state of the project results in awkward narrative to describe the necessary content.

The focus of the first meeting was to provide project scope and clarification to the group as it related to the current state of the project RFP solicitation. The goal of the meeting was to provide a high level view of the project's various sub-systems, use thereof, and planned functionality of the overall system. A presentation and subsequent open-floor discussion was held to further clarify project intent. An attendee questionnaire was provided for feedback to the District and County for evaluation.

The discussion of preemption was a primary focus of those attending. It was explained that the preemption sub-system was not included in the scope of this project effort but was clearly noted as a desire of the majority of those attending.

4.3 Detailed Requirements

Preliminary Minimum Technical Requirements (MTRs) have been developed based on FDOT District 5 and County-wide functional requirements and have been published with the preliminary version of the project request for proposal (RFP). These requirements may require further development as the project progresses, thus generating a potential for amendments and/or addendums to the project. This potential is not expected to impact the project in any significant fashion. The Requirements Traceability Verification Matrix list the requirements of this project in detail and can be used as a checklist during overall project testing.

4.4 Trade-off Studies, Gap Analyses, or Technology Assessments

Value engineering assessments and "trade-off" studies are used to implement a systematic process to evaluate and analyze the feasibility of tangible alternative approaches to the same design criteria. The evaluation of the requirements provides a basis for defining the objectives of the trade-off study. The required technology for the project will be defined by the MTRs that were developed as mentioned previously.

Brevard County has previously performed various testing and evaluation efforts that have lead to a series of technology choices already deployed throughout the County. Experience with existing technologies deployed throughout the County has resulted in system-wide deployments of those devices that met the County expectations. The resulting system relied on various specific devices in order to maintain interoperability and consistency. The existing system and underlying management system (both hardware and software) limit the ability to integrate alternative technology choices due to interoperability constraints. These constraints limit the trade-off studies needed and none are anticipated at this time.

Gap analyses of the existing and anticipated hardware and software against stakeholder functional requirements have been performed. Functional requirements and comparisons have been identified that will require gap analyses. Such analyses will be performed and documented at the time of installation and product testing. The VDS used for this project are both integral to intersection detection and signal operation and will further enhance the capabilities of data reporting by the County after deployment. The origin-destination and travel time data provided by the VDS technology used in this project required an analysis.

Similar to the trade-off and gap analysis sections above, technology assessments were performed on an as needed basis. As Brevard County's technology requirements were met, assessments of current technologies were required to enhance the system and guarantee reliability. Appropriate assessments were performed on an as needed basis and referenced in this section accordingly; this section will be updated as required during project progression and document development until the system has successfully completed the burn-in period.

4.4.1 Technology assessment of Bluetooth reader technology:

A technology assessment of Bluetooth reader technology was performed to evaluate the potential use of the sub-system for detection and re-identification use. The technology is used to develop travel time information for links along a roadway network. A test bed of this system was deployed to ascertain the viability of the sub-system for deployment County-wide. The test bed was deployed along a stretch of SR 520 in Merritt Island with acceptable results. Cost comparisons to alternative technologies were evaluated and final decision to use this technology was made.

4.5 Technical Reviews

Technical reviews were required to properly accomplish work items that were completed for the Brevard County ATMS project. Brevard County or their representative followed the FDOT design review process for this project. FDOT District 5 and Brevard County, in collaboration with all local agencies involved with this project, participated in the review process. Reviews that were conducted as part of this project included but are not limited to:

- Project Kick-off
- ConOps Review
- System Requirements Review
- Preliminary Design Review
- Hardware Design Review
- Software Design Review
- Requirement Traceability and Verification Matrix
- Final Design Review – conducted to provide the final review of the system design
- Test Readiness Review – conducted prior to formal acceptance testing of the system
- Hot Wash-Up Review – conducted immediately after formal acceptance testing to obtain consensus on testing results and resolve major discrepancies
- Operational Readiness Review – conducted prior to full-scale deployment and operation to address all elements that need to be completed

4.6 Risk Identification, Assessment, and Mitigation

Risk assessment and control procedures have been established for the Project. These procedures provided a method for determining the inherent risk in the project and for the

evaluation of the effectiveness of risk reduction efforts. The procedures also prepared and implemented plans for mitigating risk.

4.6.1 Risk Identification

Risk items are identified and documented based on an analysis of the functional requirements as they apply to the project's contractual and technical requirements. All project sources are continually reviewed for timely risk identification. The Brevard County Project Manager (PM) validates the identifies risks and makes them part of risk reporting by assigning responsibility to each risk item.

4.6.2 Risk Assessment

Basic project risk assessment consists of identifying individual risks, categorizing the risk, determining the level of risk, and recommending an approach to risk solution.

Low Risk - defines an area in which technical and project metrics are within plan or tolerances.
Medium Risk - defines an area in which one or more major technical or performance metrics are out of tolerance, but are within the maximum established limits for low-impact recovery techniques.
High Risk - defines an area with potential serious failures in accomplishment which requires major milestone re-planning or intensive reallocations of personnel and resources.

The level ranking of identified risks determines the priority and urgency of attention given. Risk items are assigned to key individuals who are responsible for developing and executing individual risk management plans and reporting the status. The mitigation status for identified medium and high risks is reported at status meetings until each risk is resolved.

4.6.3 Mitigation Plans

Effective mitigation plans will be developed by the FDOT District 5 PM or their representative, with the assistance of other key individuals. These individuals initiate mitigation actions, continually monitor the mitigation progress, and perform follow-up activities, as required. Mitigation action plans, procedures, schedules, and responsibility definitions are maintained by the FDOT District 5 PM or their representative.

Mitigation action plans are required for all medium-risk and high-risk items. These plans assign specific actions to specific individuals to achieve detailed and correct analyses of each addressed risk and execute corrective actions. The FDOT District 5 PM or their representative formulates and issues these directive plans and intensely monitors progress against these directives.

4.7 Requirements Traceability Verification Matrix (RTVM)

A Requirements Traceability Verification Matrix (RTVM) was developed upon execution of the design package. Each of the technical requirements are monitored during all phases of the project as well as utilized for specific test points during the testing and acceptance phases of the project.

The Requirements Traceability Verification Matrix was created for use during the testing and acceptance stages. Each requirement has been assigned a unique identifying number and included form of verification (inspection, demonstration, documentation, etc). The RTVM also includes a field for confirming compliance through testing or for noting issues or other notes related to final acceptance of each requirement.

The RTVM developed for this project is attached to this document as Appendix A.

4.8 Creation of Performance Measure Metrics

During the final planning stages, FDOT District 5 or their representative will define system effectiveness measures that reflect overall stakeholder expectations and the resultant system level of operations and satisfaction. As stated in the FHWA Freeway Management and Operations Handbook:

> *"Performance measurement is a process of assessing progress toward achieving predetermined goals, including information on the efficiency with which resources are transformed into goods and services (outputs), the quality of those outputs (how well they are delivered to clients and the extent to which clients are satisfied) and outcomes (the results of the program activity compared to its intended purposes), and the effectiveness of government operations on terms of their specific contributions to program objectives. Performance measures provide the basis for identifying the location and severity of problems (such as congestion and high accident rates), and for evaluating the effectiveness of the implemented freeway management strategies."*

There are two primary evaluation categories utilized to identify how well a system meets the predefined requirements:

- Measures of Effectiveness (MOEs)
- Measures of Performance (MOPs)

4.8.1 Measures of Effectiveness

Customers or stakeholders will utilize Measures of Effectiveness (MOEs) to measure satisfaction with products produced as a result of the project or system implemented. Measures of Performance (MOPs) are the engineering performance measures that provide the design requirements needed to satisfy the MOEs. There may be several Technical Performance Measures (TPMs) for each of the MOEs. As the functional system requirements are defined and low-level requirements are allocated to the sub-systems, components and the individual elements of the system, FDOT District 5 or their representative will select or specify the requirements that are testable. Testable requirements are MOPs that can be traced to stakeholder requirements and their MOEs.

4.8.2 Measures of Performance

FDOT District 5 or their representative will define system effectiveness measures that reflect overall stakeholder expectations and satisfactions related to the overall system. These measures will be related to project stakeholder goals and objectives for the project. Performance measures will be identified for the following categories:

- Safety measures
- Protection of public investment measures
- Interconnected transportation measures
- Travel choice measures

MOPs are the product design assessments which estimate, through engineering analyses and tests, the values of essential performance parameters of the design elements. They forecast the values to be achieved through the planned technical project effort; measure differences between the achieved values and those allocated to the product element by the Systems Engineering Process; and determine the impact of those differences on system effectiveness. As a result of the Engineering Process Analysis, the following Quantitative Measurement (QM) areas have been defined for the project:

- Schedule performance – data relating to the completion of major milestones and individual work products.
- Funding and staffing – data relating to the balance between the work being performed and the personnel resources assigned to the project.
- Product Quality – data relating to the ability of the delivered product to support the user's needs without failure.

Each stakeholder identifies the controlled course of action required to meet each MOP. Any MOP with medium or high risk is tracked as a risk item, and includes a Risk Management Plan. Continual monitoring tracks progress on these control plans. The MOP values are reported in the project metrics report maintained by the Construction Engineering, and Inspection (CEI).

4.9 System Testing, Integration, and Acceptance Planning

The selected Design/Build Team is required to demonstrate to FDOT District 5 or their representative through testing plans and criteria how each of the selected products, sub-systems and overall ATMS meet the functional requirements as defined for the project. The following documents are inputs to the test planning process:

1. Contract Requirements (Scope of Services (SOS), Technical Special Provisions (TSP), etc.)
2. Requirement Traceability and Verification Matrix
3. Project Schedule
4. A test plan outline

Testing shall include, but is not limited, to each of the main components of the ATMS (central hardware and software, local controller hardware and software, network hubs, field cabinets, CCTV cameras, and system sensors). FDOT District 5 or their representative will be responsible for developing final test plans for all testing and subsystem testing required to formally accept the project. Testing of the equipment and system shall include the following hierarchical testing scheme:

- Factory Acceptance Test
- Standalone Test
- Subsystem Test
- System Operational Test
- Burn-In Period

Testing shall provide verification and documentation that all requirements as defined in this document, contract documents, and the requirements defined in the test plan are met by the furnished subsystem components.

4.9.1 Test Approach

The test plans and test procedures together shall provide a two-step description of each test. The test plans shall provide a high-level functional summary of the methods used for verifying each feature of the hardware, software, and firmware being tested. The test procedures shall detail the step-by-step activities associated with each test. The following information shall be included in the test plan:

- An implementation plan and detailed schedule (PERT and GANTT Microsoft Word format);
- Record-keeping procedures and forms;
- Procedures for monitoring, correcting, and retesting variances;
- Procedures for stopping and restarting the testing due to failures;
- Procedures for controlling and documenting all changes made after the start of testing;
- A list of individual tests to be performed, the purpose of each test segment, and the appropriate functional design specification reference describing the feature being tested;
- Test Evaluation/Traceability Matrix;
- Identification of special hardware or software tools or test equipment to be used during the test; and
- Copies of any certified test data to be used in lieu of testing.

4.9.2 Test Schedules

The Design/Build Team will submit the test plans, testing procedures and forms to FDOT District 5 for review at least forty-five (45) calendar days prior to performing the associated tests. FDOT District 5 will review submitted test procedures and forms and shall provide comments or approval to the Design/Build Team within twenty (20) calendar days after receiving the testing documentation.

4.9.3 Test Tools

The Design/Build Team will furnish and maintain all required test equipment necessary to conduct the testing. The test equipment (both hardware and software) will be made ready for FDOT District 5 use at the time it is needed. The Design/Build Team will, if requested by FDOT District 5, postpone any test for up to seven (7) days. Such postponements shall not be grounds for extensions of contract time.

4.9.4 Test Facility

The Design/Build Team shall notify FDOT District 5 of the time, date and place of each test at least fourteen (14) calendar days prior to the date the test is planned. All central system testing will be conducted at designated locations identified by FDOT District 5 and/or Brevard County.

4.9.5 Subsystem Tests

The subsystem tests shall be performed based on the construction project milestones. These tests shall verify all of the requirements defined in the equipment functional requirements, for each subsystem being tested, have been met. These tests shall be performed utilizing the project field equipment and new communications system. The test shall demonstrate full control of the field device(s) from the central management facility with the communications channels as well as the functionalities of local/remote trouble shooting/diagnostics specified in the equipment functional requirements.

During the test, the Design/Build Team will provide qualified personnel to support the diagnosing and repair of system equipment during the operational test as required. The personnel will be available for this support within twenty-four (24) hours of notification of the need for their services.

The Design/Build Team will prepare test plans for the individual Subsystem Tests required for this project. The test plans shall be prepared based on the testing requirements identified in the individual subsystem sections of the final MTRs document. In cases where the test requirements are not identified or described in detail, the Design/Build Team shall prepare detailed plans for approval by the FDOT District 5 prior to testing. The test plan shall include, as a minimum, the following information:

- Date, time, location and estimated duration of test
- Name of designated witnesses
- Description of subsystem to be tested - showing a test of every function of the equipment or system to be tested
- Test equipment list
- Test objectives
- Expected results – A description of the expected operation outputs and test results including a Test Evaluation/Traceability Matrix
- Test sequence details – A step-by-step outline of the test sequence to be followed
- Test result forms – Data forms to be used to record all data and quantitative results obtained during the test
- Connection diagrams wherever applicable
- Software - A copy of all diagnostic software shall be supplied by the Design/Build Team to the County with full documentation

4.9.6 System Acceptance Testing

The Design/Build Team will perform a comprehensive system acceptance test at the central management facility. The Design/Build Team will be responsible for ensuring all ATMS components are operational within the management facility and in strict conformance with the requirements developed for the project.

The Design/Build Team will develop test plans for the integration of the signal controllers, CCTV cameras, system detectors, and communications network with the existing central system.

4.9.7 Final Acceptance Testing

Final Acceptance of the work associated with this project shall be made after satisfactory completion of all tests including the System Operational Test and final inspection of the entire system. The final inspection of the entire system shall be performed by representative(s) of FDOT District 5 and Brevard County in the presence of a representative of the Design/Build Team. All “as-built” documents shall be submitted to the County before the time of Final Acceptance. Notification of final acceptance shall be in writing from FDOT District 5. Following final acceptance, the Design/Build Team shall include a 90-day burn-in period. The burn-in shall be per the requirements outlined in the RFP developed for the project.

5. Project Management and Control

5.1 Organization Structure

5.1.1 Design/Build Team

The Design/Build Team is responsible for the design, installation and testing of all elements of the project. The Design/Build Team will demonstrate good project management practices while working on this project. This shall include:

- Communication with Brevard County, FDOT District 5, and others as necessary;
- Management of time and resources;
- Documentation of design and construction activities, and
- Set up and maintain throughout the design of the project a contract file in accordance with FDOT District 5 procedures.

5.1.2 FDOT District 5

FDOT District 5 provided contract administration, management services, and technical reviews, as necessary, for all work associated with the development and preparation of the contract documents, shop drawings, and construction of the project. FDOT District 5 will provide job specific information and/or functions as outlined in this document.

5.2 Managing the Schedule

The project schedule was developed with coordination between the FDOT District 5 PM or their representative and the Design/Build Team. An initial schedule was developed by FDOT District 5 that has been fine-tuned since the Design/Build Team was selected.

5.2.1 Scheduling Application

A project management software package was utilized by the Design/Build Team and the CEI. The software application was required to support project scheduling, resource allocation in the project planning phase, and schedule and cost tracking during the implementation phase of a project. This software implemented the critical path method for schedule planning and analysis.

5.3 Procurement Management

All procurement adhered to the standards and specifications set forth by the State of Florida, the FDOT and FDOT District 5 Traffic Operations and District 5 Construction office. All procurement also adhered to specific project requirements defined in the RFP.

5.4 Risk Management

Risk identification and assessment materials previously developed under earlier project tasking formed the foundation for project-related design and construction risk management.

FDOT District 5 or their representative built upon the planning risk assessments and developed enhanced risk identification, assessment and mitigation strategies. A new, updated, enhanced risk matrix was developed as a result of new analysis and assessments conducted as part of the

design phase of the project. The risk matrix identified all potential risk line items and assigned means and methods of risk avoidance and mitigation where applicable.

Coordination with ongoing projects that potentially conflict with the project were:

- I-95 Six-laning 18 miles from north of Palm Bay Road to SR 519, with a new interchange at an extension of the Pineda Causeway (FM No. 4055068)
- I-95 Six-laning 4.1 miles from Malabar Road to Palm Bay Road (FM No. 4055063)
- US 1 Six-laning 2.6 miles from Park Avenue to Pine Street (FM No. 237592 & 2375762)
- Wickham Road reconstruction and widening from Nasa Boulevard to SR 500 (US 192)
- SR 500 (US 192) 4.2 miles from I-95 SB Ramps to Dairy Road lighting/left turn lane addition and lane rehabilitation (FM No. 416965-1 & 418328-1 & 405506-8-52-01)
- SR 500 (US 192) 1 mile resurfacing from Dairy Road to Babcock Street (FM No. 418328-2)
- SR 520 5.65 miles from Clearlake Road and South Banana River Drive landscape, intersection improvement, and traffic signal improvement (FM No. 427400-1 & 427418-1 & 427654-1 & 414977-1)
- US 1 (SR 5) widening and resurfacing from Peachtree Street to Eyster Boulevard (FM No. 237576-2-52-01 & 237592-1 & 237592-3)
- SR 50 (Cheney Hwy) resurfacing from I-95 to SR 405 (FM No. 424890-1)
- SR 405 resurfacing from SR 50 (Cheney Hwy) to US 1 (SR 5) (FM No. 423350-1-52-01 & 418647-1)
- SR 518 TMS and sidewalk repair from CR 509 (Wickham Road) to SR 5054 (FM No. 428925-1)
- US 1 resurfacing from Aurora Road to SR 500 (US 192)
- CR 507 (Babcock Street) widening near the intersection of SR 500 (US 192)

The Design/Build Team is responsible for coordinating all project activities that interface or physically integrate with the aforementioned projects, and/or other projects in the region to avoid possible conflicts.

5.5 Sub-Design/Build Team Management

The Design/Build Team is responsible for all aspects, output and project interfaces executed by any and/or all of the sub-Design/Build Teams for this project. The Design/Build team managed their sub-design/build members in similar fashion to that expected by the project.

5.6 Engineering Specialty Integration

The design, development, and production of a system required integration across all engineering and programmatic disciplines. This section addresses the integration of specialty engineering disciplines with other disciplines. Attainable supportability characteristics are defined throughout the design process using design trade-off efforts involving all product design and support disciplines.

To achieve the necessary balance of specialty engineering factors within the systems engineering process, System Engineering must define trade-off and decision criteria that adequately address support requirements. Specialty engineers draw upon an extensive background of data extracted from past and current projects to develop standards, guidelines, and checklists to support and evaluate the development of the system. These specialists work to define and document requirements and work with the functional engineering groups to ensure the necessary supportability features are incorporated into the design.

Specialty engineers generally are brought into the design process at a very early stage, but may be employed as-needed to resolve issues. These requirements are then placed into the specifications. These requirements are both quantitative and qualitative. Specialty engineers also review and analyze the evolving design and ensure the incorporation of necessary features such as redundancy, accessibility, etc.

Specialty engineers form a part of the design team. As the system design progresses from requirements interpretation to detailed specifications, the involvement and participation of the engineering specialty areas increases. Specialty engineers verify compliance with all specialty area requirements and review data produced throughout the design process. Deficiencies are documented in action items and followed up to assure resolution. The applicable specialty engineers review all change packages.

5.6.1 Integrated Logistics Support and Maintenance Engineering

This engineering specialty is responsible for determining the total support required for a system to ensure operational readiness and sustainability throughout its life cycle. This specialty provides the following project input:

- Defines support requirements (i.e., the mean time to repair (MTTR))
- Supports considerations that influence requirements and design
- Provides the necessary support package
- Provides operational support at minimum cost

The Brevard County ATMS Master Plan and Conceptual Design and the Brevard County ATMS and TMC Concept of Operations address these criteria with the assistance of the FDOT, jurisdictions within the County of Brevard, and County staff.

5.6.2 Test Engineering

The test engineering specialty provides a systematic approach to verify that all functional requirements have been complied with. The test engineering specialty establishes a philosophy and strategy for qualifying the system, and includes the identification of any special tests and special test equipment that are needed.

5.7 Monthly Project Status Reviews

FDOT District 5 or their representative will conduct periodic meetings as required for the resolution of design and/or construction issues. These meetings may include:

- Action item reviews and resolution
- County or City technical issue resolution
- Permit agency coordination
- Local government agency coordination
- Scoping meetings
- Risk items
- Critical path item status review
- Pre-construction meeting

5.8 Configuration Management

Configuration Management established methodologies and procedures for controlling system change. The approach assisted in planning and implementing changes that were best for the system as a whole, as well as best for the system at a micro level. The objective of Configuration

Control Management is to maintain consistency and traceability of the design requirements, physical configuration, and change made to documentation. Electronic Industries Alliance (EIA) Standard 649 states:

> *"Configuration Management, applied over the life cycle of a system, provides visibility and control of its performance, functional and physical attributes. Configuration Management verifies that a system performs as intended, and is identified and documented in sufficient detail to support its projected life cycle…The Configuration Management process facilitates orderly management of system information and system changes for such beneficial purposes as to revise capability; improve performance, reliability, or maintainability; extend life; reduce cost; reduce risk and liability; or correct defects. The relatively minimal cost of implementing Configuration Management is returned many fold in cost avoidance. The lack of Configuration Management, or its ineffectual implementation, can be very expensive and sometimes can have such catastrophic consequences as failure of equipment or loss of life."*

5.8.1 Change Management

A critical component of the overarching Configuration Management approach includes "Change Management". Change Management represents the process of assessing impacts of potential changes to a system. Change Management provides a mechanism for evaluating the comprehensive affects of potential changes to a design or system. The process provides control for changes and minimizes negative impacts to a system as a result of changes. Procedures to be enacted as part of ATMS Project include:

- Immediate identification of all changes
- Documentation of potential change (notes and database)
- Stakeholder review (as required)
- Technical review (as required)
- Impact assessment
- Schedule assessment
- Change review and approval/denial
- Identification of procedures, documentation, and instructions required for incorporating the approved change in the product, as well as its related product configuration information.
- Document changes, including decisions, stakeholder input and technical evaluations

Procedures documented by the FDOT District Construction Office represent the guiding principles and procedures for change management during the life-cycle of the Brevard County ATMS Project.

5.9 Quality Management

The ATMS project adhered to several Quality Management standards, including those set forth by FDOT District 5 and Brevard County. The overarching Quality Management program will be subdivided into two primary stages:

1. Design
2. Construction

5.9.1 Design

The Design/Build Team was responsible for the professional quality, technical accuracy, and coordination of all surveys, design, drawings, specifications, geotechnical, and other services furnished under this project.

The Design/Build Team provided a Design Quality Management Plan (QMP), which describes the Quality Control (QC) procedures to be utilized to verify and review all design drawings, specifications, and other documentation prepared as part of the project. In addition, the QMP will establish a Quality Assurance (QA) program to confirm that the QC procedures were followed.

FDOT District 5 or their representative will oversee the quality management during the design and construction phases of the project.

5.9.2 Construction

FDOT District 5 or their representative will provide final quality management for ultimate delivery of the system. The Construction QC Plan which describes the QC procedures to verify, check, and maintain control of key construction processes and materials.

5.10 Systems Acceptance

Upon completion of the testing, the CEI PM or the County PM or their representative will make a final inspection of the entire system. When all construction, plans, device requirements and the Verification Plan are found complete, the FDOT District 5 PM or their representative may declare this project complete and provide final acceptance in writing as of the date of final inspection.

If during the final inspection, the CEI PM, FDOT District 5 PM or their representative deems any work unsatisfactory or not conforming to the Plans, the Device Requirements, and the Verification Plan, they will notify the Design/Build Team in writing of any deficiencies. The Design/Build Team will correct these conditions within five working days, unless additional time is granted in writing by the CEI PM, or the County PM or their representative. Upon completion of the Design/Build Team's corrections, the CEI PM, or the FDOT District 5 PM or their representative will conduct another final inspection. When the final inspection is approved by the CEI PM, or the FDOT District 5 PM or their representative, the PM will send written notice to the Design/Build Team of the final acceptance of the project.

5.11 Operations and Maintenance, Upgrade and Retirement

An operations and maintenance evaluation of the existing and future system will be assessed once the project reaches near design completion. This sub-section will document the number of devices deployed, expected, and overall operations and maintenance efforts required to sustain the system. The evaluation of the design elements will include the review of system lifetime, overall and device specific, and determine the anticipated retirement/replacement timeframe.

All associated costs for the system will also be reported with the evaluation. These costs will be identified on a per device basis and rolled up into the overall planning budget amount required by the County to maintain the system and all associated costs of other agencies, where applicable; as it is determined through the various agency contracts and inter-local agreements developed as the project develops.

5.12 Lessons Learned

Lessons learned will be documented both during project execution and after final acceptance of the project. The lessons learned will be a critical component to both the improvement of future

ATMS projects within Brevard County, as well as important in defining critical project phasing events and resolution to design and construction issues related to the project. A “lessons learned” depository will be created at the on-set of the design phase and maintained throughout the life-cycle of the project. Updates to the PSEMP will be reflected at the various stages of submittal that will document the lessons learned. Please see Appendix A for Issue Logs and how they were resolved as part of this project.

Appendix A

US 192
Corridor 1
Last Update: 8/4/2012

Reported Date	Issue	Responsible Party	Issue Resolution	Completion Date
7/11/2011	NOTICE TO PROCEED	COUNTY/FDOT		
9/13/2011	Correct size pelco astro brackets needed to attach CCTV Cameras (120" stainless steel)	MILLER ELECTRIC	Correct astro brackets procured and brought to job site	9/26/2011
9/20/2011	CCTV placement issues at Evans/Hollywood and Dairy Road. Field meeting with county to discuss alternate placement location	EOR/FDOT	EOR and contractor advised to move CCTV to new location	9/26/2011
10/4/2011	strainpole mounting hardware needs to be submitted prior to any CCTV cameras being attached to strain poles	MILLER ELECTRIC	Submitted with cutsheets Bosch Aluminum hardware and RedHead 304 SS anchor bolts	10/10/2011
10/17/2011	It is determined the Contractor has no advanced MOT certified staff on-site. No Lane Closures without Cert Advanced MOT Supervisor	MILLER	Resolved, Devon Johnson Provided Advanced Cert	11/10/2011
10/17/2011	Dairy Road and Wickham/Minton CCTV cable needs to be blown from CCTV assembly to Cabinet	MILLER	Dairy Road Resolved	11/22/2011
10/19/2011	Minton/Wickham needs conduit route proofed to get cable back from SW quad to SE quad cabinet **NEEDS BORE**	MILLER	completed	5/2/2012
11/16/2011	Evans/Hollwood tree trimming for south view needed	MILLER		
11/22/2011	ROW issue at hub foundation placement, survey needed prior to filling forms	MILLER	ROW verified by EOR from Brevard Co Tax Assessors cadd files	12/5/2011
1/6/2012	7 DAY NOTICE FOR LANE CLOSURE NEEDED. Night work needed to hang FO cable	MILLER	Contractor advised to give proper notice at Jan 10 Progress Meeting	1/10/2012
1/18/2012	Clinching hardware needed from poles 500-52 to poles 500-57 in order to keep FOC on front side of FPL poles	MILLER		
1/25/2012	still need; hardware, cable adjustments, ID tags, splice and drops	MILLER/ACS	drops started installation 2/20/2012	
1/25/2012	coherent updated splicing diagrams needed for hub at Minton/Wickham	EOR/MILLER	100% splicing diagrams submitted and acceptable	2/15/2012
2/14/2012	Loop L-5 EB inside left and loop L-4 SB inside through need to be replaced due to damage from core drilling.	MILLER/PRECISON	Loop repaired and megged insulation/resistance test completed. Test results need to be submitted to CEI	*2/22/2012
2/15/2012	Pucks mushrooming out of cored hole, moisture in crushed stone seems to be the issue. Pucks need to be popped up and properly reinstalled.	MILLER/PRECISON	All pucks popped up and replaced except Hollywood Blvd.	5/6/2012
2/15/2012	Repeaters attached below 18 feet and not per 100% plans at several locations. Address Issue with EOR	MILLER/EOR	Addressed issue w/ EOR Contractor to move to planned attachment height. **OPEN ISSUE TILL VERIFIED**	
3/7/2012	At Dayton Ave. Steel 1.5" riser pipe ran adjacent to Ped push button. Possible ADA violation. Move pipe to back of pole	MILLER	Checked ADA requirements, no issue	3/16/2012
4/20/2012	Field hub installed, no generator panel per 785-4 Spec	MILLER	Contractor agreed to install/waiting on submittal	
4/20/2012	Field hub needs heat exchange to protect layer 3 switch	MILLER	Contractor agreed to install/waiting on submittal	
4/22/2012	WIC enclosures not properly secured to interior of controller cabinets/need space/need to consult County	MILLER	Smaller WIC submitted and approved, contractor to install with County consultation if needed	
4/23/2012	At Minton/Wickham; inductive loop L-8 northbound through damaged by contractor while repacing Snsys sensors. Contractor needs to repair ASAP.	MILLER	Loop repaired and megged insulation/resistance test completed. Test results need to be submitted to CEI	*** 5/3/2012**
5/10/2012	Sensys and Blue Toad need TVSS prior to termination point in controller cabinet/Plan sheet IT-177 calls this out	MILLER	Contractor agreed to install/waiting on submittal	
5/10/2012	intermediate pull boxes for fiber optic cable transfer need conduits cut down in pull boxes to 6" or greater to comply with min bend radius	MILLER		
6/15/2012	County Requests Miller Electric to coordinate with Devin and re-install the 3 pucks on northbound Hollywood Blvd at the stop bar	MILLER	Should be ready for re-install August 16, 2012	
6/15/2012	cat5e cable slack installed for Sensys Access Points must be re-installed or properly run inside cantilever arms and holes sealed with grommets.	PRECISION		
6/25/2012	Switch out hub power main disconnect breakersfrom 30 amps to 40 amps per FDOT TERL inspection matrix and spec A639	MILLER	50 amp breaker meets minimum specs and NEC	7/13/2012
7/23/2012	It is determined that the contractor is not responsible for the US 192 network west of Minton/Wickham Road per Addendum 6 of the RFP	MILLER		
7/23/2012	It is determined the indide NB puck at Dayton road is bad and needs to be replaced	MILLER/TEMPLE		
7/23/2012	Validation testing needs to occur. CEI needs prior notice of intent and will verify.	MILLER/EOR		

SR 518 Eau Galle
Corridor 2
Last Update: 8/4/2012

Reported Date	Issue	Responsible Party	Issue Resolution	Completion Date
7/11/2011	NOTICE TO PROCEED	COUNTY/FDOT		
9/13/2011	Correct size pelco astro brackets needed to attach CCTV Cameras (120" stainless steel)	MILLER ELECTRIC	Miller came to Job site with correct astro brackets	9/26/2011
9/26/2011	Spoke to Miller about RJ-45 connectors. Connectors not crimped properly. Need to redo crimping to aviod signal loss	MILLER ELECTRIC	Spoke with Jeff Hand of Miller, he assured CEI that all new crimping would be correct and **all the others will be corrected**	11/15/2011
9/26/2011	Montreal and Pineapple the Bosch video card was defective.	MILLER ELECTRIC	Miller Electric replaced card and was advised by CEI to additional cards on hand in case another issue arose.	9/26/2011
9/26/2011	SR 518 at Croton, oversite by CEI revealed issue with condensation inside CCTV dome	MILLER ELECTRIC	Miller electric cleaned dome. This location along with others will be monitored for additional condensation. If problem persists, dome with be evaulated for seal leakage	9/26/2011
9/26/2011	SR 518 at Croton, auto iris control was unresponsive from the interface.	MILLER ELECTRIC	Corrected	11/15/2011
10/4/2011	strainpole mounting hardware needs to be submitted prior to any CCTV cameras being attached to strain poles	MILLER ELECTRIC	Submitted with cutsheets Bosch Aluminum hardware and RedHead 304 SS anchor bolts	10/10/2011
10/17/2011	It is determined the Contractor has no advanced MOT certified staff on-site. No Lane Closures without Cert Advanced MOT Supervisor	MILLER	Resolved, Devon Johnson Provided Advanced Cert	11/10/2011
11/15/2011	CCTV at Pineapple (WB) needs to be adjusted to see cabinet	MILLER		
11/15/2011	Contractor Closed sidewalk with no signs as required	MILLER	**Written Deficiency issued**	11/18/2011
11/14/2011	US 1, limited east view due to 2-way split. May need additional CCTV camera	EOR/COUNTY	designer decined improvement	3/25/2012
12/5/2011	Hub area at US 1 and the Starbucks landscaping is deplorable. Clean up needs to occur (Private Property) Need to Move sprinkler head. Area need st. Augustine Grass	MILLER	Sprinkler moved	4/2/2012
2/10/2012	ITS pull box just west of RR track on north side of road needs to submitted for 24" depth instead of standard 36" depth due to untility conflicts	MILLER	Submiited, approved, installed, resolved	3/10/2012
2/28/2012	At Pineapple Blue toad riser needs expandable foam since no weatherhaed was used.	MILLER	weatherhead installed, issue resolved	3/2/2012
3/13/2012	Concrete sidewalk slab needs to be replaced at Montreal and Highland. Temporary asphalt has been installed.	MILLER		
3/26/2012	Hub area at US 1 and the Starbucks Erosion Control needs to be redone with Silt Fence	MILLER	completed	4/2/2012
4/4/2012	ROW ISSUE; As discussed in the field yesterday, the owner (Jim Stivers 321-403-1947) of the properties located at the SW (Starbucks) & SE (Walgreens) corner of SR 518 and US1 issued complaint to our inspector that the fiber optic cable splice vault and cabinet (hub) pad installed at the SW corner are located on his property (SW Corner) and need to be relocated. In addition, the property owner indicated the conduit stubbed out of the ground located on the SE corner is located on his property.	MILLER/EOR	New Plan submitted, all infrastructure needs to be removed	*5/13/2012 * abandoned conduit needs to be filled with flowable fill per FDOT Specifications
4/20/2012	Field hub installed, no generator panel per 785-4 Spec	MILLER	Contractor agreed to install/waiting on submittal	
4/20/2012	Heat exchange will be needed to protect layer 3 router in field hub	MILLER	Contractor agreed to install/waiting on submittal	
4/26/2012	Directional bore under railroad overshot by 130 feet to get 25' beneath tracks to avoid utility. Alternate route or different pole will be needed to transition from UG to OH.	MILLER	Contractor Resoved by back trenching to original ground to aerial transition point	5/1/2012
4/30/2012	At RR, World War II memorial was knocked down and broken. Contractor needs to replace with 4" X 4" pressure treated support made as good or better than the one destroyed.	MILLER	Resolved	5/8/2012
5/10/2012	Sensys and Blue Toad need TVSS prior to termination point in controller cabinet/Plan sheet IT-177 calls this out	MILLER	Contractor agreed to install/waiting on submittal	
5/10/2012	intermediate pull boxes for fiber optic cable transfer need conduits cut down in pull boxes to 6" or greater to comply with min bend radius	MILLER		
6/15/2012	Eau Gallie and Highland, Montreal Pineapple controllers having start-up issues after power outage. MMU reports come out blank. Need resolution	MILLER/NAZTEC	Dan Sailes of Naztec along with Scott Arnold's Technical Staff resolve issue.	7/10/2012
6/15/2012	All Shareholders need to act prior to M&R. in ground sensors need to be removed, properly inventoried and stored, then replaced in exact locations once M&R is completed	MILLER/MELBOURNE/COUNTY	Scheduled to start after Labor Day. Department to ntry and postphone start of M&R until 60 day burn can start.	
6/15/2012	cat5e cable slack installed for Sensys Access Points must be re-installed or properly run inside cantilever arms and holes sealed with grommets.	PRECISION		
6/25/2012	Switch out hub power main disconnect breakersfrom 30 amps to 40 amps per FDOT TERL inspection matrix and spec A639 (at US 1)	MILLER	Repalced and installed	7/25/2012
6/26/2012	MMU/Controller communication issue (Montreal/Eau Gallie region) needs to be resolved so MMU can properly reset controller to cycle after 7 seconds and give an acceptable error report	MILLER	Meet in field with Dan Sailes of Naztec. Dan to forward corrective measure/resolution	7/10/2012
7/24/2012	Pole 518-57 just west of Commodore having attachment issues due to existing utilities not transferred by permited Make Ready	MILLER /ACS	Miller attaches to pole using accepted permit/plan. If event occurs in future, Miller to unlatch line from "J" hook to allow utility Level 3 to move their line.	8/3/2012
8/1/2012	At the Pineapple/Highland area, Miller decides to use existing pull boxes as Splice boxes against design standards. Department does not accept this method of installation and requires splice boxes for splice enclosures and slack fiber optic cable	MILLER?ACS		
8/3/2012	Directional bores need to occur at SR 518 in order to terminate FOC into local hub	MILLER/ACS/ACCI		

SR 520
Corridor 3
Last Update: 8/4/2012

Reported Date	Issue	Responsible Party	Issue Resolution	Completion Date
7/11/2011	NOTICE TO PROCEED	COUNTY/FDOT		
9/13/2011	Correct size pelco astro brackets needed to attach CCTV Cameras (120" stainless steel)	MILLER ELECTRIC	Contractor procured correct size pelcp astro brackets	9/26/2011
9/20/2011	CCTV placement issues at Sykes Pkwy and Fiske Blvd. Field meeting with county to discuss alternate placement location	EOR/FDOT	EOR and contractor advised to move CCTV to new location	9/26/2011
9/29/2011	Work Trucks did not have enough room to mount CCTV at US 1, Lane closure needed, Advised to install at night. OTHER LOCATIONS ALONG SR 520 will also need to occur at night	MILLER ELECTRIC	Resolved	11/15-11/17/2011
10/4/2011	strainpole mounting hardware needs to be submitted prior to any CCTV cameras being attached to strain poles	MILLER ELECTRIC	Submitted with cutsheets Bosch Aluminum hardware and RedHead 304 SS anchor bolts	10/10/2011
10/17/2011	It is determined the Contractor has no advanced MOT certified staff on-site. No Lane Closures without Cert Advanced MOT Supervisor	MILLER	Resolved, Devon Johnson Provided Advanced Cert	11/10/2011
10/18/2011	Per Testing, Clearlake and Fiske will need grounding assembies installed.	MILLER	Issue relsoved	10/28/2011
11/10/2011	Follow up with Brevard County Public Works to test irrigation system around the trenching area on the Merritt Island Causeway Bridge. Contractor must restore area to its original condition.	MILLER/BREVARD COUNTY	Irrigation is irrelavent; City of Cocoa disbanded system	12/1/2011
11/15/2011	Tree trimming needs to occur at Brevard to see cabinet	MILLER		
11/15/2011	Adjustment of CCTV needs to occur at Newfound Harbor to see cabinet	MILLER		
11/16/2011	Willard and Forrest CCTV will need a cantilever arm. No south view is possible due to billboard.	MILLER	Sensys Site Installation test sucessful	8/1/2012
11/15/2011	CCTV at Courtnay needs to be adjusted to view south and cabinet	MILLER		
11/20/2011	Weekly Storm Water Form needs to be submitted for erosion control on Merritt Island causeway	MILLER	SUBMITTED 11/21/2011, ONGOING	8/3/2012
11/26/2011	At US 1 CCTV shown on SW quad at cabinet. CCTV installed on NW Quad per spreadsheet	MILLER/EOR	EOR was informed via email and 100% paln review	2/20/2012
11/29/2011	Conduit and electrical conductors cut on west side of Merritt Island Causeway Bridge.	MILLER	MILLER repaired conduit/NEEDS TO REPAIR CONDUCTORS	5/15/2012
12/7/2011	Hub at SR 520 and US 1 needs sod placed to restore landscaping per City of Cocoa	MILLER	Sod Placed	12/19/2011
12/15/2011	FDOT ruling states only HDPE SDR 11 conduit permitted for use, not SDR 13.5. 240 feet of SDR 13.5 were installed at the east side of the Merritt Island Causeway	MILLER	FDOT TERL allows use of HDPE SDR 13.5 for open trench only	12/20/2011
1/6/2012	2 CCTVS along with their poles and power supply need to be constructed on the east and west sides of the Merritt Island Causeway	MILLER	Safety Contractors to install/need to be added to approved vendors in Site Manager	5/18/2012
1/6/2012	Sod needs to be placed at several aeras in and around the Merritt Island Causeway./Humphrey Bridge area	MILLER	Completed and being maintained	6/22/2012
1/21/2012	Trench along Causway west of Bal Harbour needs to be completed	MILLER	Directional Bore will be used in leiu of underground trench	1/30/2012
3/22/2012	Damaged conduit for ITS pull box at King and Brevard needs to be repaired	MILLER	Conduit repaired	4/1/2012
3/22/2012	Puck damaged just west of Sykes creek due to milling (inside through lane)	MILLER	Puck replaced no cost to FDOT	4/30/2012
4/4/2012	The damaged/missing "One Way" signs on west shoulder of Delannoy Av at King St was reinstalled by Precision Loops 6' above the ground. Per Standard Index 17302 the panel should be mounted 7' above. Also, the sign was not reinstalled on the original post, which was an approx. 3" diameter aluminum post, not a channel post. Please reinstall the sign meeting Standard Index 17302 and 11860.	MILLER/PRECISION		
4/9/2012	Plan revision will be needed from just west of Tropical Trail to Banana River Road due to Plan defiencies that do not show a existing buildable condition.	MILLER/FR ALEMAN	Contractor working with revison on 4/26/2012. FDOT or CEI were not given copies…contacted Contractor.	
4/20/2012	Field hub installed, no generator panel per 785-4 Spec	MILLER	Contractor agreed to install/waiting on submittal	
4/20/2012	Field hub needs heat exchange to protect layer 3 switch	MILLER	Contractor agreed to install/waiting on submittal	
4/20/2012	Pull box just west of Sykes on northside of road next to Long Horn steak house has damaged conduit that was excavated and reburied. Once existing fiber comm cable is pulled and new FOC installed, conduit needs to be excavated and properly repaired	MILLER		
5/10/2012	Sensys and Blue Toad need TVSS prior to termination point in controller cabinet/Plan sheet IT-177 calls this out	MILLER	Contractor agreed to install/waiting on submittal	
5/10/2012	intermediate pull boxes for fiber optic cable transfer need conduits cut down in pull boxes to 6" or greater to comply with min bend radius	MILLER		
5/12/2012	ITS Pull Box on the north side Merritt Island Cswy west of Newfound Harbor Dr at Sta 971+25 (IT-73) has a crack on the side from top to bottom	MILLER	Issue resolved	6/1/2012
5/18/2012	Removed guardrail for CCTV pole installation on Merritt Island causeway needs Miscellaous asphalt (2" thick mat) installed at all guardrail areas affected by construction. Area needs to be graded and dressed up (both east and west sides)	MILLER	Issue resolved	5/22/2012
6/7/2012	Newfound Harbor erosion issues adjacent to cabinet 6" deep by 12" wide rut due to run off and untreated soil erosion. Needs to be filled in and sodded.	MILLER	Area dressed up appropriately	6/12/2012
6/18/2012	Issue with insufficient drop cable lenths between King and Riveredge and King at Delonney. Plan shows directional bore from bank, NE quad to new splice box NW quad that does not exist.	MILLER/ACS	New drop cable installed at contractors cost	7/1/2012
6/20/2012	Tropical Trail will need additional Sensys pucks (6) and repaeters (2) due to the existing microwave detection not working with traffic adaptive software.	MILLER	repeaters installed/need pucks installed resolved. 7/23/2012	7/23/2012
6/15/2012	cat5e cable slack installed for Sensys Access Points must be re-installed or properly run inside cantilever arms and holes sealed with grommets.	PRECISION		

6/25/2012	Switch out hub power main disconnect breakersfrom 30 amps to 40 amps per FDOT TERL inspection matrix and spec A639 (at US 1 and both power CCTV power service drops on east and west side of Merritt Island Causeway)	MILLER	40 amp breakers placed per FDOT Spec A639	7/13/2012
6/25/2012	Issue with econolite viseo detection and Sensys CC cards needs to resolved at several locations from Tropical trail east.	MILLER		
8/1/2012	ACS needs to run a 72 ct FOC between both splice vaults at US and properly splice to enable ATMS requirements and future communication expansion. PROVIDE CEI splicing diagram prior to work occuring	MILLER/ACS		
8/2/2012	Clearlake Mast Arm signal rebuild and M&R - Tropical Trail/Courtneay Mast Arm rebuild coordination. Postphone 140 days to enable wrap up of bridge and FON integration and begin 60 day test	MILLER/ACS		

US 1 Rockledge
Corridor 4
Last Update: 8/4/2012

Reported Date	Issue	Responsible Party	Issue Resolution	Completion Date
7/11/2011	NOTICE TO PROCEED	COUNTY/FDOT		
9/13/2011	Correct size pelco astro brackets needed to attach CCTV Cameras (120" stainless steel)	MILLER ELECTRIC	Contractor procured correct size pelcp astro brackets	9/26/2011
10/4/2011	strainpole mounting hardware needs to be submitted prior to any CCTV cameras being attached to strain poles	MILLER ELECTRIC	Submitted with cutsheets Bosch Aluminum hardware and RedHead 304 SS anchor bolts	10/10/2011
10/17/2011	It is determined the Contractor has no advanced MOT certified staff on-site. No Lane Closures without Cert Advanced MOT Supervisor	MILLER	Resolved, Devon Johnson Provided Advanced Cert	11/10/2011
6/4/2012	Econolite video detection BIU card acting up/issue not caused by Miller Electric	MILLER	Miller Electric resoved by resetting dip switch	6/5/2012
6/15/2012	Peachtree, SR 520 Sensys Installation Test fail, need redo	MILLER		
6/18/2012	CEI noted a plan descpepancy with the drop cables NB/SB US 1 and EB/WB SR 520 termination verses plan sheet and splicing diagram	MILLER	72 count SM FOC to be ran between both splice vaults and terminated per the County's advisement. Contrator to provide splicing schematic to CEI PRIOR to work performed	
6/15/2012	cat5e cable slack installed for Sensys Access Points must be re-installed or properly run inside cantilever arms and holes sealed with grommets.	PRECISION		
6/25/2012	Switch out hub power main disconnect breakersfrom 30 amps to 40 amps per FDOT TERL inspection matrix and spec A639 (at SR 520)	MILLER	40 amp breaker installed per FDOT A630 Spec	6/11/2012
6/25/2012	Barton has a Econolight/CC card compatibility issue. needs troubleshooting	MILLER		
7/25/2012	Comm issues at Peachtree (bad CC card) and US 1	MILLER/TEMPLE/SENSYS		

US 1 Eau Gallie
Corridor 5
Last Update: 8/4/2012

Reported Date	Issue	Responsible Party	Issue Resolution	Completion Date
7/11/2011	NOTICE TO PROCEED	COUNTY/FDOT		
9/13/2011	Correct size pelco astro brackets needed to attach CCTV Cameras (120" stainless steel)	MILLER ELECTRIC	Contractor procured correct size pelcp astro brackets	9/26/2011
10/4/2011	strainpole mounting hardware needs to be submitted prior to any CCTV cameras being attached to strain poles	MILLER ELECTRIC	Submitted with cutsheets Bosch Aluminum hardware and RedHead 304 SS anchor bolts	10/10/2011
10/17/2011	It is determined the Contractor has no advanced MOT certified staff on-site. No Lane Closures without Cert Advanced MOT Supervisor	MILLER	Resolved, Devon Johnson Provided Advanced Cert	11/10/2011
10/18/2011	Per testing, Sarno will need a new grounding system installed	MILLER	Issue resolved, 4 ground rods added	10/29/2011
12/15/2011	Plan IT-89 for Babcock is inconsistant with the splicing diagrams. Conractor needs to provide a solution for the fiber drop to the cabinet	MILLER	Splicing diagram resubmitted with 100% plans is acceptable	2/15/2012
12/15/2011	Due to constructibility review, directional bore totals will overrun by about 200 feet between Washington Street and Aurora.	MILLER	Bores overrun and documented	2/3/2012
12/15/2011	CCTV at Aurora still needs to be installed; Bore needed from SE to SW quadrant	MILLER	Bore Completed 1/31/2012, **CCTV PTZ standalone test needed**	
1/6/2012	EOR needs to submit a revision and Miller needs to as-built new conduit path from Masterson Rd north to Lake Washingtopn Road.	MILLER	New path was approved by EOR via email/no revision was submitted/ contractor needs to asbuilt	1/10/2012
1/13/2012	Erosion Issue in utility strip north of Masterson Road/ Soil reduction and sod is needed	MILLER	2 Trucks of dirt removed, issue resolved except for sod replacement	1/25/2012
1/20/2012	Sod still needed in utility strip to restore area prior to construction.	MILLER	Gutter Buddies removed from area between Lake Washington Rd and Masterson Road.	4/25/2012
1/27/2012	Erosion issue from Cliff Creek Rd north to Lake Washington; either silt fence asap or sod restoration needed. Swale area prior to DBI faces possible realignment of run off.	MILLER	Resolved	5/9/2012
1/30/2012	Un authorized plan change approved by EOR regarding direction boring pattern at US 1 and SR 518. CEI accepts but warns thaT ALL MAJOR PLAN CHANGES NEED TO BE FIRST SUBMITTED FOR REVIEW AND APPROVAL BY FDOT.	MILLER/EOR	New path completed	2/2/2012
1/30/2012	Dirt piles along US 1 at several locations need to be picked up and hauled off by COB Friday February 3, 2012	MILLER /ACCI	Dirt hauled off and area cleaned up, erosion control still needed	2/3/2012
1/31/2012	Directional Bore at SR 518 from SE quadrant to SW quadrant **tone wire broke while pulling conduit through**. Need continuous tone wire per the Specs 630/783/785	MILLER /ACCI	The white spare conduit will be used for continuity and will be spiced to the existing run at the nearest pullbox	2/6/2012
2/11/2012	3m enclosure at SR 518 power pedestal contains a 20 amp and 50 amp breaker. Enclosure rated a max of 70 amps. Proposed switch out 20 amp for 30 amp. That will exceed the enclosures rating of 70 amps	MILLER	Contractor to switch out breakers to conform with NEMA rating...NEED to follow up through completion - power service moved	6/8/2012
3/15/2012	6" HDPE Schedule 9 or 11 conduit must be submitted for approval to run underground under the RR tracks at the RR crossing	MILLER	Submitted and approved	4/3/2012
3/18/2012	Existing controllers coordinating City of Melbourne cabinets until network up and firmware updated . Also City numbers updated	MILLER	Controllers and installed on US 1 and Eau Gallie east, Commodore and Wickham on SR 518 still need to be installed	
5/10/2012	Sensys and Blue Toad need TVSS prior to termination point in controller cabinet/Plan sheet IT-177 calls this out	MILLER	Contractor agreed to install/waiting on submittal	
5/10/2012	intermediate pull boxes for fiber optic cable transfer need conduits cut down in pull boxes to 6" or greater to comply with min bend radius	MILLER		
5/22/2012	US 1 at Sarno Access Point Cat 5e cable was tie wrapped. Needs to be lashed	MILLER		
5/29/2012	ACS crissrosses cable which causes OH issue with lashing	ACS	ACS resolves by unlashing 2200 feet of oh and relashing in order to properly attach OH FOC	4/4/2012
6/6/2012	ACS needs to install Down Guys as needed	ACS		
6/13/2012	Aurora; Damaged 12 ct SM drop cable needs to be switched out. Signal pull box adjacent to cabinet needs 2" conduit cut down to min 6" in order to meet bend radius	ACS	Completed	7/1/2012
6/18/2012	Plan descrepancy at US 1 and S Magnolia Rd. ACS cannot attach to pole 19 as shown in the plans due to primary riser. Contractor needs to bore between poles 18 and 19A for fiber optic cable run.	MILLER/ACS	Bypass pole 19; Directional bore from pole 18 to pole 19A	7/13/2012
6/15/2012	cat5e cable slack installed for Sensys Access Points must be re-installed or properly run inside cantilever arms and holes sealed with grommets.	PRECISION		
6/25/2012	Switch out hub power main disconnect breakersfrom 30 amps to 40 amps per FDOT TERL inspection matrix and spec A639 (at SR 518)	MILLER	40 amp breaker installed to staisfy FDOT Spec A639	7/25/2012
6/25/2012	Bores need to occur at S. Magnolia and SR 518 in order to complete the communications (FON) run from Babcock north and tie-in at SE 518	MILLER/ACS		
7/25/2012	FPL pole just north of Sarno needs the existing communication lines dropped to keep our ATMS FOC at the top utility 40" beneath the neutral. This pole was permitted.	MILLER/EOR/ACS		
8/3/2012	Aurora Road; Scott Arnold sends email notifing all parties the pushbutton project has been completed and the 2 eastbound pucks are ready to be reinstalled	MILLER/TEMPLE		
8/3/2012	Scott Arnold informs team that the future M & R signal sub will pemove and re-install the ground sensors. Coordination needs to occur or possibly stall the M & R till FON is installed and 60 burn -in can start	MILLER/ACS/TEMPLE/ACCI		

SR 50
Corridor 6
Last Update: 8/4/2012

Reported Date	Issue	Responsible Party	Issue Resolution	Completion Date
7/11/2011	NOTICE TO PROCEED	COUNTY/FDOT		
9/13/2011	Correct size pelco astro brackets needed to attach CCTV Cameras (120" stainless steel)	MILLER ELECTRIC	Contractor procured correct size pelco astro brackets	9/26/2011
10/4/2011	strainpole mounting hardware needs to be submitted prior to any CCTV cameras being attached to strain poles	MILLER ELECTRIC	Submitted with cutsheets Bosch Aluminum hardware and RedHead 304 SS anchor bolts	10/10/2011
10/4/2011	I-95 SB Off-Ramp Working with no plans. Spreadsheet calls for CCTV mounted on SE quadrant strainpole. No pullboxes on SE Quad. Cabinet and clear line of sight on NW pole.	MILLER ELECTRIC	Plans Provided, will need to occur at night	10/18/2011
10/17/2011	It is determined the Contractor has no advanced MOT certified staff on-site. No Lane Closures without Cert Advanced MOT Supervisor	MILLER	Resolved, Devon Johnson Provided Advanced Cert	11/10/2011
10/20/2011	Per testing, several locations will need new grounding systems installed.	MILLER	Grounding of Strainpoles completed as discussed	4/5/2012
11/2/2011	Contractor left deep ruts with work vehicles with FDOT ROW. This area needs to be graded or raked	MILLER	Area adjusted itself	2/24/2012
11/17/2011	Contractor interfered with Hubbard Construction MOT. FHP recommended they discontinue work Overhead at SB I-95 off ramp incomplete	MILLER	**Written Warning Issued**	11/20/2011
11/21/2011	SR 50 and I-95, Sta. 1501+70 (IT-97) power issue, tap into 600V and provide transformer and disconnect prior to hub. ALSO SR 528 HUB NEEDS A 480 STEP DOWN TRANSFORMER	MILLER	100% plans account for this	2/24/2012
12/5/2011	Hub area at I-95 needs seed and hay or sod installed to prevent erosion of soils around hub and generator pads	MILLER	Time/natural erosion healed and weeds have sprouted	6/16/2012
1/6/2012	CCTV at SB I-95 off ramp needs to be installed	MILLER	installed. needs to be tested...does not PTZ	4/5/2012
3/12/2012	SR 405 hub at SR 50 jumpered to bring up I-95 after SR 405 trunkline fiber optic cable is cut.	ACS	Hub is "unjumpered" once temporary splicing of corridor is completed	3/15/2012
4/20/2012	Field hub installed, no generator panel per 785-4 Spec	MILLER	Contractor agreed to install/waiting on submittal	
4/20/2012	Field hub needs heat exchange to protect layer 3 switch	MILLER	Contractor agreed to install/waiting on submittal	
5/10/2012	Sensys and Blue Toad need TVSS prior to termination point in controller cabinet/Plan sheet IT-177 calls this out	MILLER	Contractor agreed to install/waiting on submittal	
5/10/2012	intermediate pull boxes for fiber optic cable transfer need conduits cut down in pull boxes to 6" or greater to comply with min bend radius	MILLER		
5/12/2012	Nylon protectors need to be installed on aerial fiber run west of Barna to protect FOC from chaffing on trees.	MILER/ACS	Still not addressed as of August 3, 2012	
6/20/2012	Shareholder need to prepare to remove and reinstall pucks at I-95 overpass and SR 50 at Columbia Ave (SR 405)	MILLER/COUNTY	Coordination to occur between P&S Paving and Miller Electric	
6/15/2012	cat5e cable slack installed for Sensys Access Points must be re-installed or properly run inside cantilever arms and holes sealed with grommets.	PRECISION		
6/25/2012	Switch out hub power main disconnect breakersfrom 30 amps to 40 amps per FDOT TERL inspection matrix and spec A639 (at I-95 and SR 528 master hub at I-95)	MILLER	40 amp breaker installed per FDOT Spec A639	7/11/2012
6/25/2012	I-95 SB off ramp overlap needs to be tweeked for efficiency	MILLER	Joe Arena from City of Titusville asssists Jeff Hand of Miller and Signal is deemed efficient , 8 overlaps and 2 time of day plans verified	7/11/2012
8/3/2012	Link between local hub and master hub needs to be spliced to the north/south I-95 white network buffer	MILLER/ACS		

SR 405
Corridor 7
Last Update: 8/4/2012

Reported Date	Issue	Responsible Party	Issue Resolution	Completion Date
7/11/2011	NOTICE TO PROCEED	COUNTY/FDOT		
9/13/2011	Correct size pelco astro brackets needed to attach CCTV Cameras (120" stainless steel)	MILLER ELECTRIC	Contractor procured correct size pelco astro brackets	9/26/2011
10/4/2011	strainpole mounting hardware needs to be submitted prior to any CCTV cameras being attached to strain poles	MILLER ELECTRIC	Submitted with cutsheets Bosch Aluminum hardware and RedHead 304 SS anchor bolts	10/10/2011
10/17/2011	It is determined the Contractor has no advanced MOT certified staff on-site. No Lane Closures without Cert Advanced MOT Supervisor	MILLER	Resolved, Devon Johnson Provided Advanced Cert	11/10/2011
10/20/2011	Per Testing, several CCTV locations will need need grounding system	MILLER	Strain pole intersections grounded as recommended	4/5/2012
11/3/2011	Weatherhead needs to installed on steel riser by cabinet corner at SR 407	MILLER	Resolved	12/21/2011
11/15/2011	Tree Trimming needs to occur at Target entrance cabinet in order for CCTV to view	MILLER		
11/20/2011	MOP will need to be submitted and APPROVED prior to taking down network	MILLER/ACS	2/21/2012 MOP submitted 10 days needed waiting for FDOT to approve. Approved; 9 day total allowance for outage starting AM on Monday, March 12, 2012	3/30/2012
1/4/2012	Columbia at US 1 Bluetoad- card or no card?	EOR/MILLER	Resolved	1/8/2012
1/22/2012	Repeater on guide sign just west of Sisson road was installed with cardbaord stabization. This is unacceptable and needs to be properly re-attached	MILLER/PRECISION	Re-installed 3/25/2012 but not installed properly inspection May 14, properly installed	5/14/2012
3/22/2012	Steel riser on hub at US 1 needs to be properly attached at 5' center to center.	MILLER	properly attached and reinforced	5/2/2012
3/22/2012	Liquid Tite flexible steel conduit used at hub on US 1 needs to be properly submitted.	MILLER	Submitted and approved	4/3/2012
4/2/2012	All but 2 FPL poles the new FOC is attached incorrectly. Field meeting with ACS Foreman and problem is acknowledged. J hooks skipped, nylon tree protectors installed incorrectly. Entire run needs to be re-connected proprrly to poles.	MILLER/PCS	need additional nylon tree protectors	
4/19/2012	Splicing issue at Dash 336 hub at US 1. existing network blue buffer cannot be spliced as shown due to existing Dash III orange network buffer.	MILLER/EOR/ACS	blue and white buffer terminated as shown in plans	4/27/2012
4/22/2012	Riser utilization choices at 405/407 in Titusville, do not attach FOC 20 feet verticle with tie wraps to outside of riser. Alternate construction method needed	MILLER/ACS	riser attached on 5/2/2012 - still not trenched to signal box	5/8/2012
5/10/2012	Sensys and Blue Toad need TVSS prior to termination point in controller cabinet/Plan sheet IT-177 calls this out	MILLER	Contractor agreed to install/waiting on submittal	
5/10/2012	intermediate pull boxes for fiber optic cable transfer need conduits cut down in pull boxes to 6" or greater to comply with min bend radius	MILLER		
6/22/2012	Cabinet Switchout 405 at Windover (Walmart) loops were originally piggybacked. City of Titusville notified. Loops were attached properly - signal in recall; other issues. Plexiglass cover for cabinet power panel needs to be installed (it is in maintenace drawer in cabinet) stand out bolts are needed from Naztec. L-2 loops were not labled, need fargo locks at disconnect (tie wrapped temporaily)	MILLER	Joe Arena assumes resposibility for existing condition Problem resolved	7/11/2012
6/22/2012	Cabinet at SR 405 an SR 50 needs caulk at base in front. Contractor ran out of caulk.	MILLER	Resolved	6/30/2012
6/22/2012	Repeater just west of Walmart (Windover) on the shoulder is attached to a guide sign with a 20 foot steel rod, The rod is loose and the assembly is leaning about 20 degrees toward the road. This needs to be addressed ASAP	MILLER	Replaced by Miller Electric	7/11/2012
6/15/2012	cat5e cable slack installed for Sensys Access Points must be re-installed or properly run inside cantilever arms and holes sealed with grommets.	PRECISION		
8/3/2012	Several locations have either bad CC cards or bad magnetometers that need replacing. Only 2 locations on SR 405 pass Sensys Site Installtion testing	MILLER/TEMPLE/SENSYS		

Palm Bay Road
Corridor 8
Last Update: 8/4/2012

Reported Date	Issue	Responsible Party	Issue Resolution	Completion Date
7/11/2011	NOTICE TO PROCEED	COUNTY/FDOT		
9/13/2011	Correct size pelco astro brackets needed to attach CCTV Cameras (120" stainless steel)	MILLER ELECTRIC	Contractor procured correct size pelco astro brackets	9/26/2011
9/13/2011	IT-27; Plans incorrectly show mast arm at southwest quadrant when the intersection is an "X" span with 4 strainpoles. Contractor was not prepared to attach to strainpole. Contractor needs to attach RGS riser with weatherhead, and find way back to cabinet not exeeding 300 feet allowable for Cat 5e cable. Contractor recommended to have air compressor, generator, jet line/fish tape and any other tools/material needed to complete task. Contractor skipped this intersection and moved east.	EOR/MILLER ELECTRIC	Presented comment on ERC, The EOR shall address with next plan submittal	9/22/2011
9/13/2011	Blue Toad cut sheet dipicts blue tooth antenna inside a Nema box. Test module at Minton and Heild did not have a Nema box	MILLER ELECTRIC	Nema Box should only be needed at solar powered sites	9/14/2011
9/18/2011	Contractor needs to re-crimp RJ-45 connectors on ends of Cat 5e cables. Terminations are unacceptable.	MILLER ELECTRIC	repaired	11/15/2011
10/4/2011	strainpole mounting hardware needs to be submitted prior to any CCTV cameras being attached to strain poles	MILLER ELECTRIC	Submitted with cutsheets Bosch Aluminum hardware and RedHead 304 SS anchor bolts	10/10/2011
10/17/2011	It is determined the Contractor has no advanced MOT certified staff on-site. No Lane Closures without Cert Advanced MOT Supervisor	MILLER	Resolved, Devon Johnson Provided Advanced Cert	11/10/2011
1/21/2012	updated splicing diagram need to integrate new FOC with existing Dash III trunk at Palm Bay Road/Minton OH splice enclo sure	EOR/MILLER	resolved with updated splicing diagrams	2/15/2012
2/22/2012	BlueToad at Babcock needs cable feed to cabinet	MILLER	Issue resolved	2/29/2012
5/10/2012	Sensys and Blue Toad need TVSS prior to termination point in controller cabinet/Plan sheet IT-177 calls this out	MILLER	Contractor agreed to install/waiting on submittal	
5/10/2012	intermediate pull boxes for fiber optic cable transfer need conduits cut down in pull boxes to 6" or greater to comply with min bend radius	MILLER		
5/27/2012	During Sensys Installed site Test, 3 east bound pucks at I-95 northbound did not respond to Traffic Dot 2 software. Troubleshoot and re-test	MILLER	Standalone **PASS** 6/28/2012	6/28/2012
6/12/2012	Issues with Econlite detection, Sensys and controller. Troubleshooting needed	MILLER/PRECISION	Installing 32 channel HD card racks would fix the problem, however the contractor want to try other options first; Shieled Cat 5 e installed as well as re-crimping connectors RJ-45 **ISSUE STILL REMAINS AT RJ CONLIN**.	
6/15/2012	cat5e cable slack installed for Sensys Access Points must be re-installed or properly run inside cantilever arms and holes sealed with grommets.	PRECISION		
6/15/2012	Econolite BIU and Sensys CC cards needs to mesh without issue. Troubleshooting needed at 5 locations	MILLER	It seems the issue has been resolved with the exception of RJ Conlin	
7/12/2012	Community Asphalt mills I-95 overpass. Nathan Burda of Miller stockpiles 2 Sensys Magnetometers	MILLER		
8/3/2012	County needs to replace an Econolite video detector camera at Dairy Road.	COUNTY		
8/3/2012	Validation testing needs to occur. Design/Build firm MUST give 10 days notice prior to testing so a Department Representative shall be present to verify (per RFP)	MILLER		

Minton Road
Corridor 9
Last Update: 8/5/2012

Reported Date	Issue	Responsible Party	Issue Resolution	Completion Date
7/11/2011	NOTICE TO PROCEED	COUNTY/FDOT		
9/13/2011	Correct size pelco astro brackets needed to attach CCTV Cameras (120" stainless steel)	MILLER ELECTRIC	Contractor procured correct size pelcp astro brackets	9/26/2011
9/30/2011	Testing of Blue Toad back to Traffic Cast under review	MILLER/COUNTY ELECTRIC	Miller to Provide back up data to County and FDOT	10/10/2011
10/4/2011	strainpole mounting hardware needs to be submitted prior to any CCTV cameras being attached to strain poles	MILLER ELECTRIC	Submitted with cutsheets Bosch Aluminum hardware and RedHead 304 SS anchor bolts	10/10/2011
10/5/2011	At Emerson, existing SW joint use strain pole has transmission/distribution lines. An alternate pole may be necessary to attach CCTV Camera to. REI may be needed.	MILLER/EOR	EOR Determines NE pole shall be used for CCTV attachment	10/17/2011
10/17/2011	Emerson NE pole has bee hive stuck in top of pole. Pest control needs to come out and remove the Hive	COUNTY/MILLER	Resolved	11/2/2011
10/17/2011	It is determined the Contractor has no advanced MOT certified staff on-site. No Lane Closures without Cert Advanced MOT Supervisor	MILLER	Resolved, Devon Johnson Provided Advanced Cert	11/10/2011
11/29/2011	Contractor needs to coordinate with on-going public works program project at Minton Road flyover at I-95 prior to infringment of their MOT to install a steel communication riser	MILLER	Completed	12/18/2011
12/7/2011	Latest plans and splicing diagram is needed for the Fiber Optic Cable Sub, ACS. Plan issues due to communication between County. EOR and Contractor. CEI needs to know of all plan changes prior to contractor beginning work	MILLER	EOR verifies that plans the CEI has are buildable and coorespond with the FP&L attachment permit	12/12/2011
12/8/2011	Determined Miller Electric did not install an approved HDPE conduit. Conduit needs to removed just north of Norfolk ant at base of slope at I-95 overpass	MILLER	FDOT and CEI rules that HDPE 13.5 SDR cannot be used on this project. Minimum to be used is HDPE 11	12/15/2011
12/15/2011	Need resoilution on already installed HDPE SDR 13.5 installed conduit. Will resolve at next Progress Meeting	MILLER	FDOT TERL allowing use of HDPE SDR 13.5 for open trench placement only	12/20/2011
1/4/2012	Contractor needs to locate BlueToad card that was in the test cabinet at Minton and Heild	MILLER	Blue Toad Card Located	1/8/2012
1/6/2012	CCTV at Minton/Wickhan US 192 needs to be installed	MILLER	Installed 5/5/2012 Still need to stand alone test	
1/20/2012	Poles 25 and 28 need make ready done/other make ready's need neutral raised	EOR/FPL	**Grounded per FPL recommendation**	2/28/2012
1/21/2012	Competent splicing diagrams needed	EOR/MILLER	Resolved	2/15/2012
1/31/2012	12 ct Drop issues involving pull box at Emerson (bending radius) and WIC enclosure (modified bulkheads needed) at Hield	EOR/MILLER	At Heild, existing drop may be used in place of proposed or use existing bulkhead, waiting on EOR	4/26/2012
1/31/2012	All FOC needs "FDOT FIBER OPTIC CABLE" imprinted or ID tags attached as needed to satisfy SPEC	MILLER/ACS	Tags Procured/ need to be installed	
2/15/2012	Repeaters attached below 18 feet and not per 100% plans at several locations. Address Issue with EOR	MILLER/EOR	Addressed with EOR/ System must operate...OPEN ISSUE TILL ACCEPTANCE	
2/17/2012	6 pucks mushrooming out of cored hole, moisture in crushed stone seems to be the issue. Pucks need to be popped up and properly reinstalled.	MILLER/PRECISION	Pucks popped up and replaced, issue resolved	4/24/2012
2/23/2012	68 additional butt splices performed at Heild due to ACS cutting the 72 ct trunkline contrary to the plans expressing through	ACS/MILLER/FDOT	FDOT ALLOWS VARIANCE - TESTING MUST MEET MINIMUM LOSS BUDGET...OPEN ISSUE TILL OTDR TRACE REVIEW and/or ACCEPTANCE	
2/23/2012	At Heild, a splice vault or overhead s oversize splicing enclosure will now be needed since 68 additional splices were done	ACS/MILLER/FDOT	Investigating whether existing ITS oversize ground pull box can be used,need approval from FDOT and COUNTY/Accepted	5/15/2012
3/18/2012	Network communication issue with TMC	MILLER	New Switches configured and installed, Issue resolved	3/20/2012
5/10/2012	Sensys and Blue Toad need TVSS prior to termination point in controller cabinet/Plan sheet IT-177 calls this out	MILLER	Contractor agreed to install/waiting on submittal	
5/10/2012	intermediate pull boxes for fiber optic cable transfer need conduits cut down in pull boxes to 6" or greater to comply with min bend radius	MILLER		
6/15/2012	Minton and Heild need 6 additional stopbar Sensys pucks installed due to plan issue not accounted for. Kitting needs to occur	MILLER	Contractor needs to replace all 27 sensors (RMA Number Assigned: RMA-001594 (27 Sensors Brevard Co.)	
6/15/2012	cat5e cable slack installed for Sensys Access Points must be re-installed or properly run inside cantilever arms and holes sealed with grommets.	PRECISION		
6/25/2012	Switch out hub power main disconnect breakersfrom 30 amps to 40 amps per FDOT TERL inspection matrix and spec A639 (at US 192)	MILLER	40 amp breaker installed per FDOT Spec A639	6/1/2012
8/5/2012	Once Minton and Hield is online, new validation counts need to be implemented CEI needs advance notice and shall verify a 24 hour installtion	MILLER/EOR		

Wickham Rd.
Corridor 10
Last Update: 8/4/2012

Reported Date	Issue	Responsible Party	Issue Resolution	Completion Date
7/11/2011	NOTICE TO PROCEED	COUNTY/FDOT		
9/13/2011	Correct size pelco astro brackets needed to attach CCTV Cameras (120" stainless steel)	MILLER ELECTRIC	Contractor procured correct size pelcp astro brackets	9/26/2011
9/20/2011	Issue with placing CCTV on wooden pole on NW corner. Power lines and upcoming widening project to convert to mast arm. Field report turned into FDOT for further advisement	EOR/FDOT	EOR and contractor advised to move CCTV to new location	9/26/2011
10/4/2011	strainpole mounting hardware needs to be submitted prior to any CCTV cameras being attached to strain poles	MILLER ELECTRIC	Submitted with cutsheets Bosch Aluminum hardware and RedHead 304 SS anchor bolts	10/10/2011
10/10/2011	CCTV attchment issue at Wright Ave. Contractor experanced arc/electrical shock while attching to strainpole on SW quadrant/ May need to move to NE Quadrant	MILLER ELECTRIC/EOR	EOR Directs Miller to miove to NE quadrant	10/17/2011
10/17/2011	It is determined the Contractor has no advanced MOT certified staff on-site. No Lane Closures without Cert Advanced MOT Supervisor	MILLER	Resolved, Devon Johnson Provided Advanced Cert	11/10/2011
11/15/2011	Contractor shows up for night MOT unprepared. Does unauthorized lane closure prior to allowed time, has inadequate signs and cones	MILLER	**Miller is given WRITTEN WARNING. Further non-compliance will result in fines and deficency**	**11/16/2011 and on going**
1/6/2012	PLANS NEED TO BE SUBMITTED	MILLER	NEW SCOPE OF SERVICES TO BE IMPLEMENTED	4/2/2012
4/19/2012	Field constructibility review with FPL. Need to receive approval to attach approximately 5200 feet of aerial FOC to existing FPL poles from Old Nasa Rd to south of Sheridan	MILLER/ALPINE/FPL	Approval granted by FPL. Alpine Engineering to submit pole attchment permit criteria	6/28/2012
4/20/2012	Waiting for revised cost estimate along with fair and realistic design fee	MILLER/EOR	Estimate submitted 5/23/2012	7/11/2012
5/16/2012	3 Sensys aerial location can use a 20' frangible base with a 4'precast foundation. NO EOR approval needed since design is a FDOT Standard. Miller to investigate use	MILLER	Miller Electric to revise cost of corridor to reflect frangible bases 6/15/2012 and re-submit estimate	6/28/2012
8/1/2012	Miller proposes 168 days to complete Wickham which extends the contract to May 16, 2013	MILLER		