Surface Transportation Security and Reliability Information System Model Deployment

Cooperative Agreement Number
DTFH61-03-H-00105

iFlorida

Final Work Plan

Submitted by:
Florida Department of Transportation
District 5
719 South Woodland Boulevard
DeLand, FL 32720

Prepared for:
United States Department of Transportation
Federal Highway Administration
Office of Acquisition Management, Room 4410
400 Seventh Street, SW
Washington, DC 20590

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
FHWA-OP-03-120		

4. Title and Subtitle	5. Report Date
iFlorida Project Work Plan	06/13/2003
	6. Performing Organization Code: HRDO

7. Author(s)	8. Performing Organization Report No.
Anne Brewer - Florida Department of Transportation Rick Schuman, Joe Schuerger – PBS&J	

9. Performing Organization Name and Address	10. Work Unit No. (TRAIS)
Florida Department of Transportation – District 5 719 South Woodland Boulevard DeLand, FL 32720	11. Contract or Grant No.: DTFH61-03-H-00105

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
Federal Highway Administration 400 Seventh Street, S.W. Washington D.C. 20590	Final Work Plan
	14. Sponsoring Agency Code: HOIT

15. Supplementary Notes
Agreement Officer's Technical Representative (AOTR) - Toni Wilbur

16. Abstract

FDOT began design of a Surface Transportation Security and Reliability Information System Model Deployment in May 2003. This model deployment focuses on enhancing the security and reliability of the surface transportation system through the widespread availability of real-time information. The model deployment will examine how security and reliability can be improved under several situations or scenarios.

The Final Work Plan was developed to guide the overall sequence of activities and management approach for the model deployment. It identifies all of the organizations involved in the model deployment as well as contractual and other working arrangements in them. It addresses systems engineering and software acquisition practices to be followed and includes a project schedule of all model deployment tasks.

17. Key Words	18. Distribution Statement
IFlorida, ITS, Florida, Model Deployment, Weather, Security, ATIS, Broadband Wireless, Evacuation, Infostructure	No restrictions. This document is available to the public from: The National Technical Information Service, Springfield, VA 22161

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
N/A	N/A	90	N/A

Document Control Panel	
File Name:	iFlorida Draft Work Plan
Created By:	Joe Schuerger, John Pope, Marty Sas
Date Created:	May 15, 2003
Version No.:	1.0
Reviewed By:	Susan Kuca
Reviewed By:	Rick Schuman
Approved By:	Anne Brewer
Modified By:	Joe Schuerger
Date Modified:	June 9, 2003

Table of Contents

List of Figures

List of Tables

Appendices

1.0 Introduction

In March 2003, the Florida Department of Transportation (FDOT) was selected to participate in a highly innovative model deployment with the Federal Highway Administration (FHWA). The formal name of the program is the Surface Transportation Security and Reliability Information System Model Deployment (DTFH61-02-X-0089). However, as its goal is to provide an information infrastructure, it is more commonly referred to as the "Infostructure" MDI. The objective of the model deployment – called iFlorida – is to demonstrate the wide variety of operational functions that are enabled or enhanced by a surface transportation security and reliability information system. The model deployment will:

- Expand and integrate existing data collection and monitoring systems;
- Collect and share data;
- Use the data operationally to improve transportation system security, safety, reliability and performance; and
- Where appropriate, distribute the data to the traveling public.

The model deployment will demonstrate today's best practices and innovative approaches for the collection, processing, use, dissemination, sharing, and archiving of transportation information. As part of this model deployment, existing surveillance and monitoring systems will be augmented to fill gaps, and overall coverage will be enhanced with new sensor types, increased data rates, or increased coverage density. Existing institutional arrangements will be expanded to facilitate the enhancement of operational functionality and integration.

1.1 Program Objectives

The objectives of the iFlorida program (Program) are captured in the four "i"s of information, integration, intelligence, and innovation. The Program is designed to deliver information required by operating agencies to manage the transportation network more securely, reliably and efficiently and deliver the decision quality information that travelers need to make best use of transportation facilities.

The Program will accomplish this through the seamless integration of information and telecommunication systems, incorporation of the highest levels of intelligence and the adoption of appropriate innovation. To be specific, the Program will:

- Expand the existing data collection, transportation management and information delivery infrastructure;
- Integrate data collection, monitoring and management systems both in normal operation and during times of crisis;
- Collect and share data;

- Use data operationally to improve transportation system management;
- Distribute decision-quality data to the traveling public;
- Establish a model for others and share the lessons and experiences learned along the way;
- Define performance measures, collect performance data and evaluate results;
- Illustrate how transportation, hurricane evacuation, weather information and security management can be integrated from both technical and organizational perspectives.

The iFlorida Team will achieve these objectives through the application of resources, experience and expertise within the framework of our proposed approach.

The model deployment solicitation specifies nine component areas. iFlorida addresses each:

1. *Metropolitan Area Data and Information Systems* – Projects focused on the Orlando area;
2. *Statewide Reporting Systems* – Data collection and fusion projects for statewide data and information;
3. *Security of Critical Infrastructure* – Projects focused on Central Florida and Jacksonville;
4. *Non-Metropolitan Evacuation* – Projects focused on the SR 528 evacuation corridor between Brevard County and the Orlando area;
5. *Weather Response* – Project focused on Central Florida;
6. *Multi-Modal Traveler Information* – Projects focused on the Orlando area and statewide;
7. *Data Availability* – Data from all but the security projects will be made available to public agencies and private firms;
8. *Locally-Defined Components* – Project focused on developing recommended practices associated with the evacuation of attractions and special event venues; and
9. *Cooperation With National Evaluation* – Cooperation will be provided to national evaluators examining the benefits and costs associated with iFlorida.

To meet the model deployment's objectives, the iFlorida proposal identified 24 specific projects. To better manage, procure and control the projects, iFlorida has bundled these 24 projects into eight integrated projects. The mapping of the 24 projects originally proposed to the eight bundled projects is shown in Table 5.3-1. These eight groups of bundled projects are described in detail in Section 5 and build upon Florida's

institutional, operational and technical foundations, and leverage the collective experience, commitment and resources of the participating organizations.

1.2 Work Plan

The purpose of the iFlorida Program Work Plan is to describe the overall sequence of activities and management approach to be pursued as part of model deployment. The Work Plan will also describe how the eight Bundled Projects will be carried out and the goals of the program accomplished. This includes describing roles and responsibilities, schedules and milestones, program activities and reporting mechanisms involved in the execution of the Bundled Projects.

2.0 Program Management

The multi-faceted nature of this model deployment necessitates strong program management. iFlorida embraces these challenges through an integrated public/private management team that captures the leadership and management skills of both FDOT and PBS&J.

FDOT District Five (D5) will take the management lead for iFlorida, on behalf of FDOT. D5 is ideally positioned for this role as the lead transportation agency in the Central Florida region.

PBS&J will assist FDOT D5 in managing iFlorida. PBS&J's presence throughout the state, experience in ITS and program management, and strong relationships with many of the involved public agencies – currently serving as the ITS general consultant to the Statewide ITS Office, the general engineering consultant to OOCEA, the ITS general consultant to LYNX, and participant in the ITS general consultant contract for Florida's Turnpike Enterprise – provide the additional staff necessary to deliver this project.

iFlorida's program management approach is to apply a proven structured methodology that identifies and manages risks, and when appropriate select technologies having a history of successful deployment. This approach will identify potential risks at the onset of the program, develop risk management and mitigation strategies, encourage discussion of issues on a non-attribution basis (in closed sessions if appropriate, to protect proprietary information), and adopt a decision-making process that takes timely corrective actions. Essential to iFlorida's success are the following program management challenges:

Managing Multiple Partners – This model deployment is substantially different from traditional engineering projects, or even conventional ITS deployments, because of the multiple, integrated operational components, and numerous public and private partners. This challenge will require the implementation of programmatic oversight that facilitates coordination across geographical, organizational, and functional areas.

The program management approach will leverage existing operational partnerships that already focus on coordinated operations and regional collaboration, ensuring that our private partners have a seat at the table. An example of what can be accomplished using this approach can be seen from the success of the iFlorida Program and National Evaluation Kick Off partnership meetings held in May 2003. The goal of this approach is to achieve three things:

1. All partners will be treated as equals, with each having the same opportunity to participate in the overall direction of iFlorida, without creating new layers of statewide, regional, or local management.
2. The team will use established operational partnerships. As a result, iFlorida will immediately overcome the difficulties faced by some previous initiatives that have been developed outside the mainstream of transportation planning.

Furthermore, this arrangement ensures that when the model deployment is concluded, the legacy of iFlorida will be immediately mainstreamed into operational practices.

3. The combined FDOT/PBS&J program management team will focus their energy and capabilities on maximizing the probability of a successful outcome for the model deployment, without being distracted by the need to support ineffective and unnecessary steering and technical committees.
4. The program management team has identified a strong, dedicated steering group and project managers with decision-making authority.

Understanding Partner Rewards and Risks – In the past, there has been a natural tendency to look upon such grants as opportunities to fund existing deployment programs. This has particularly been the case when some operational tests have experienced delays and staffing turnover to such an extent that the original purpose of the grant has faded into institutional history, or the relevance and value of the expected lessons learned have diminished through the passage of time. We recognize that the primary purpose of the model deployment is to provide lessons for a national audience. We also recognize that each of our public and private partners have their own objectives for participating in iFlorida, and that these objectives have to be harmonized with those of the FHWA.

The approach to managing rewards and risks will be to reinforce the philosophy already used to build the iFlorida team. The goal is to create an environment in which the success of each partner, public or private, is inextricably linked to the overall success of iFlorida. For public partners, including FDOT, this means treating the entities involved as partners (not contractors) to facilitate the deployment and operation of technologies and systems. For private partners, this means implementing innovative technologies and solutions as originally conceived. For all partners, this means following through on match commitments, understanding other partners' roles, and supporting the national evaluation.

Meeting a Constrained Deadline – Our 48-month period of performance to complete the model deployment is sufficient. However, the last 24 months of this period is devoted to operations and evaluation, constraining the time at the front end of the period of performance for planning, design, and deployment. The initial 8-month period of planning and design is aggressive, clearly indicating that product development is not included within the model deployment. Our technical approach to phases 1 and 2 is discussed in Section 4 of this document. Our program management approach for project delivery according to this aggressive schedule is comprised of four elements:

1. The organizational partnerships are already established; no need to form new committee structures.
2. FDOT and PBS&J have identified the key staff in the proposal's organizational chart to direct and manage iFlorida, manage operational components, liaise with federal and state governments, and manage partners. These key staff have been involved with preparation of the proposal and this Work Plan, are fully

knowledgeable of the concepts embodied in iFlorida, and are currently working on the program.

3. The identification of early start and deployment of projects where appropriate and when possible.
4. FDOT and PBS&J have pre-existing working arrangements with many of the major public sector agencies, and have developed close working arrangements with many of the private sector agencies. Much of the groundwork associated with beginning the model deployment is already in place. Planning and design activities began May 1, 2003.

A Sense of Urgency – FHWA's request for applications seeks responses to a wide range of operational scenarios for data collection, processing, and use. A common theme that runs through iFlorida is the emphasis on surface transportation security and reliability. The security-related lessons learned from this model deployment are desired with some urgency. In part, this is because of the continued heightened sense of alert, but also because it represents a significant departure from the traditional missions of most transportation agencies.

There is also the possible need for data and information collected, processed, and used by this model deployment to be subject to security restrictions. The program management approach concerning this sense of urgency will be to place a high priority on the security operational components, and to work closely with FHWA and the national evaluation team to extract interim lessons learned during the period of performance.

Educating a National Audience – The evaluation component of field operational tests and model deployments is perhaps the most important element of FHWA objectives. iFlorida will work closely with FHWA and specifically address the following:

- Innovative approaches and technologies for providing security monitoring and management of critical infrastructure, particularly bridges, and key intermodal transit facilities.
- Collection and operational use of traffic and weather data to support emergency evacuation.
- The data needed to support security management, emergency evacuation, congestion management, safety management, weather response, and traveler information. This includes determining the appropriate spacing, coverage, frequency, and mix of innovative and traditional data sources.
- Innovative approaches and technologies for monitoring and collecting traffic, transit, weather, and transportation security information.
- The level of surveillance or monitoring needed to support improved transportation security and reliability as a function of traffic volumes and geographic area.
- New institutional arrangements needed for the integration and sharing of data.
- The costs and operational impacts of deploying an infostructure.

We recognize that this is a model deployment and appreciate the importance of the lessons to be learned in the coming years for FHWA, a national audience, and the local Florida audience. We will ensure that the national evaluation receives the full cooperation of the iFlorida partners, and we commit to maintaining operations throughout the deployment and operations phase.

Day-to-day Management – There will be a myriad of parallel activities to be managed on a day-to-day basis throughout the period of performance. While the emphasis will change as the program moves through planning, design, deployment, and operations, the role played by the program manager will be pivotal to maximizing the probability of a successful outcome. The following are key staff to be involved in the day-to-day management of the iFlorida program:

Anne Brewer, P.E. of FDOT District 5 is the Program Manager, having day-to-day responsibility for managing iFlorida. Ms. Brewer's primary responsibilities as program manager will be to:

- Ensure iFlorida proceeds on schedule and meets or exceeds technical expectations;
- Apply financial control;
- Adopt incremental program monitoring to ensure only minor course corrections are required, and manage problem identification and problem rectification through changes in procedures, resource reallocation, or other actions;
- Oversee key staff from FDOT and PBS&J to manage the individual operational components of iFlorida;
- Coordinate the activities of all partners; and
- Provide regular reports to FHWA on the progress of iFlorida.

Rick Schuman from PBS&J is the Business and Operations Manager, having day-to-day responsibility for ensuring individual operational components of iFlorida remains focused on project goals.

Dr. Joe Schuerger from PBS&J is the Technical and Integration Manager, having day-to-day responsibility for ensuring that the technical components are deployed and integrated in a manner that satisfies both the technical and operational goals of the iFlorida program.

2.1 Organization

Upon program award, the iFlorida organization chart was revised to reflect the implementation organization necessary to support the management of this program. Figure 2.1-1 depicts the iFlorida organization and the following sections provide additional detail on the Core Management Team, Strategy Team, and Project Management Team identified on the organization chart. Table 2.1-1 identifies the composition of these key management teams.

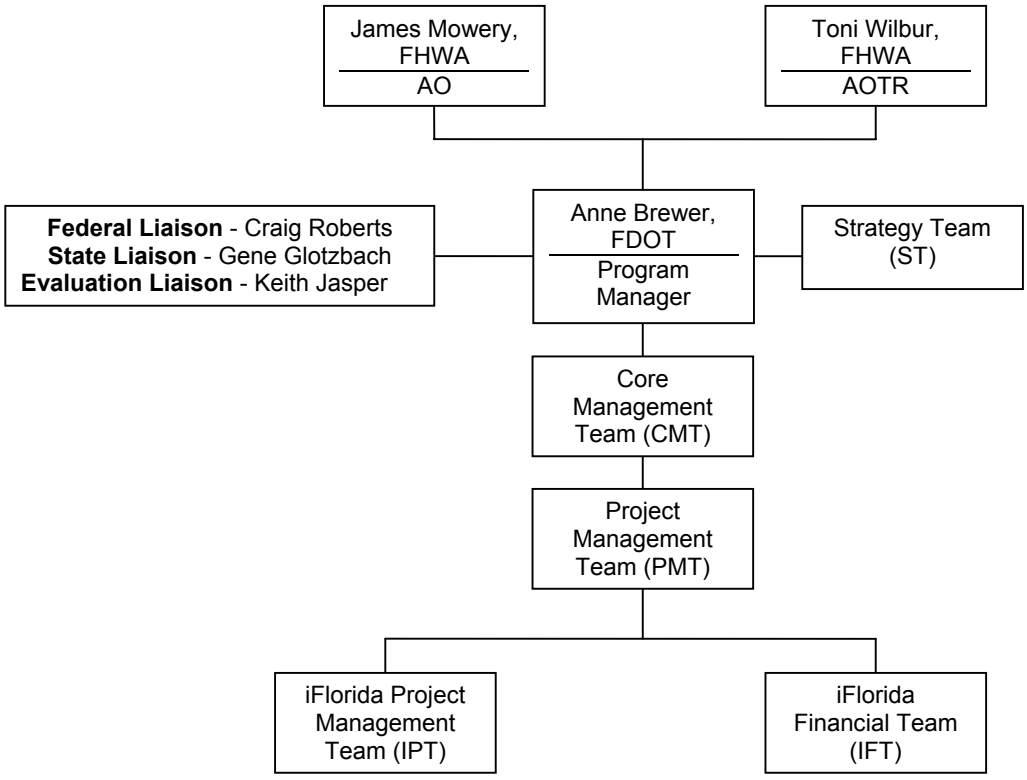


Figure 2.1-1: iFlorida Organization Chart

Table 2.1-1: iFlorida Management Team Composition

	Strategy Team	Core Management Team	Project Management Team
FDOT			
Gene Glotzbach	●		
George Gilhooley	●		
Fred Ferrell	●		●
Anne Brewer	●	●	●
Steve Kegel		●	
Larry Rivera	●		●
Nick Adams			●
Clipper Tefft			●
Jerry Woods	●		●
Harsad Desai			●
Rich Jardim			●
PBS&J			
Rick Schuman	●	●	
Joe Schuerger	●	●	●
Rich Mino	●	●	
Brian Vitetta			●
Armand Ciccarelli			●
Marty Sas			●
Bob McQueen			●
Pete Costello			●
Keith Jasper			●

2.2 Strategy Team

The Strategy Team will provide overall program guidance for iFlorida. This includes ensuring that program objectives (i.e., cost, schedule, and scope) are met. This team will be responsible for ensuring that iFlorida Program and Project risks have been identified, tracked and managed. The Strategy Team will receive monthly reports from iFlorida project managers, and, in turn, provide advice and direction on a monthly, or as needed basis.

2.3 Core Management Team

The Core Management Team will manage iFlorida's day-to-day program activities, and provide ongoing monitoring and control of program budget, schedule, and scope.

As the program will have a high visibility both locally and nationally, a sub-set of this team will be responsible for managing iFlorida public and media relations. Anne Brewer and Rick Schuman, with assistance from FDOT D5's Public Information Officer, will manage this critical function. The intent is to ensure external communications are managed and controlled.

2.4 Project Management Team

The members of the Project Management Team are responsible for managing the scope, schedule, and budget of individual iFlorida projects. Section 5 describes the rationale for this reorganization and identifies the re-grouping of the original twenty-four (24) projects into eight (8) groups of bundled projects. Table 2.4-1 identifies the iFlorida Project Management Team, including both the FDOT and PBS&J staff necessary to manage these bundled projects.

Each iFlorida project has been assigned appropriate management staff that has the necessary skills and experience required to successfully manage their project(s). To be clear, these project managers stand "side-by-side" and share their appointed project management responsibilities.

Table 2.4-1: iFlorida Project Management Team

Bundled Project	FDOT PM(s)	PBS&J PM(s)
Central Florida Field Components		
Design/ Build Scope	Anne Brewer/Jerry Woods/Rich Jardim	Brian Vitetta and Armand Ciccarelli
Contract w/ 3-M	Anne Brewer	Brian Vitetta and Armand Ciccarelli
City of Orlando	Fred Ferrell	Brian Vitetta and Armand Ciccarelli
Weather		
UNF	Nick Adams	Marty Sas
Meteorlogix	Anne Brewer	Marty Sas
Probe Vehicle Test Bed	Anne Brewer	Bob McQueen
Security Command and Control		
Boeing Autometric	Anne Brewer/Larry Rivera	Joe Schuerger
Cameras	Larry Rivera/Clipper Tefft	Joe Schuerger
Data Fusion, ATIS, Sharing & Archiving		
Statewide and Orlando Conditions System	Anne Brewer/Larry Rivera/Gene Glotzbach	Joe Schuerger
Statewide TTMS Upgrade	Anne Brewer	Armand Ciccarelli
Data Warehouse Expansion	Anne Brewer/Clipper Tefft	Pete Costello
Statewide and Orlando 511 Operations	Anne Brewer/Rich Jardim	Pete Costello
Broadband Wireless	Anne Brewer/Clipper Tefft	Joe Schuerger
Studies		
Metroplan Data Mining	Anne Brewer	Armand Ciccarelli
Network Reliability / Traffic Modeling	Anne Brewer / Rich Jardim	Armand Ciccarelli and Mohamed Hadi
Speedway Evac Plan/RTMC Vulnerability	Clipper Tefft / Rich Jardim	Keith Jasper
Evaluation Support	Anne Brewer	Keith Jasper

2.5 Project Team

The iFlorida Project Team is composed of representatives from all public and private partners involved in iFlorida. These include:

Public Agencies

- Brevard County
- City of Daytona Beach
- City of Orlando
- FHP, Troops D and G
- Florida Division of Emergency Management
- Greater Orlando Airport Authority
- LYNX
- METROPLAN
- OOCEA
- Orange County
- Seminole County
- Volusia County

Private Organizations

- 3M
- Boeing Autometric
- Cambridge Systematics, Inc.
- International Speedway Corporation
- Meteorlogix
- PBS&J
- University of Central Florida's Advanced Transportation Systems Simulation
- University of North Florida

Together, their role is to facilitate full program team communications. To this end, iFlorida Project Team partners have agreed to host full program team meetings on a rotating basis.

2.6 Financial Team

The iFlorida Financial Team is composed of representatives from all public and private partners involved in funds transfers or expenditures as part of iFlorida. Together, they are responsible for facilitating full program team communications regarding financial issues.

iFlorida Financial Team

Partner	Contact
3M	Nate Batson 3808 N. Sullivan Road, Bldg. 10 Spokane, WA 99216-1670 (800) 727-9111
Boeing/Autometric, Inc.	Lisa McPhaul 7700 Boston Boulevard Springfield, VA 22153 (703) 270-6682
Meteorlogix	Mr. John Leiferman 11400 Rupp Drive Burnsville, MN 55337 (952) 882-4553
UCF	Andrea Adkins 12443 Research Parkway, Suite 207 Orlando, FL 32826-3252 (407) 823-0138
UNF	Dawn Boatman 4567 St. John Bluff Road, South Jacksonville, FL 32224-2645 (904) 620-2455

3.0 Communications

The purpose of this section is to describe the iFlorida approach to the implementation of project communications practices. Communications tools and procedures are identified to assist the program team to coordinate, collaborate, report, schedule, and deliver information and documents in an efficient, timely and well-managed manner.

3.1 Program Web Site

The iFlorida web site address is www.iFlorida.net. The purpose of the web site is to provide ready access to iFlorida related program, project and evaluation related contacts, documentation and schedules. Figure 3.1-1 depicts the current home page for the web site.

Figure 3.1-1: iFlorida.net Home Page

PBS&J has the responsibility of constructing and maintaining this web site. The web site is currently under construction and will have an initial operational capability on June 15, 2003. As the program evolves, new documents and information will be added monthly and made available to users. The web site will include a collaboration application (i.e., PBS&J's Team Access), as well as having both a public and private access capability.

The collaboration application is a framework that provides all of the necessary communications functions necessary for iFlorida. These include:

- Electronic Mail
- Calendar

- File Sharing
- Message Boards

Over the 4-year life of the program, the intent will be to fully utilize both the public and private access capabilities.

Public Access – The following are examples of the types of information that will be made available via public access to the web site:

- Program and Project Information
- Public Relations and Media-related Information
- Project Description Information
- Project Related Procurement Information and Schedule
- iFlorida Library (i.e., Program, Project and Evaluation Documents)

Private Access – This side of the web site will require a UserID and password to gain access. The initial list of those users to have access include the Strategy Team, Core Management Team, Project Team and others, as deemed necessary by the Core Management Team. The following are examples of the types of information that will be made available via private access to the web site:

- Contact Information
- E-mail
- Calendar
    - Program and Project
    - Meetings and Events
- Working Documents Organized by Project
- Security-related Documents, if approved by FDOT and appropriate agencies
- Other Sensitive Program and Project Related Documentation

3.2 Internal and External Communications

The Program Coordinator for iFlorida is Richard Mino of PBS&J. He is available at 407.647.7275 x.396 or richardmino@pbsj.com. He will be the single focal point for all iFlorida related internal and external (including media and public relations releases) program communications. As the Program Coordinator, he will be responsible to coordinate:

- Logging all in/out bound formal correspondence and documentation
- Being present at all Management Team meetings to document the results and incorporate actions into the Action Item Data Base
- Tracking of all action items
- Handling requests for both internal and external information
- Creating and maintaining team distribution lists/contact list (Appendix B provides a current view of the iFlorida contact list
- Maintaining the program web site (www.iflorida.net)
- Maintaining the integrated project schedule, budget and overall program calendar

- Configuration management of all program records, files, and other related documents
- Traceability matrix of requirements from proposal through subsequent iFlorida system documents

3.3 Reporting

Strategy Team – Receives monthly reports from iFlorida project managers, and, in turn, provides advice and direction on a monthly, or as needed basis. The Strategy Team will be the focal point for risk identification, tracking, and approval for further action.

Core Management Team – Provides quarterly progress and financial reports to the FHWA. These quarterly reports will be based on weekly status reports and monthly financial reports received from individual project teams.

Project Management Team – Submits both weekly status reports and monthly financial reports to the Core Management Team. This team is also responsible for identifying project-related risks as their projects evolve. Project-related risks and risk mitigation strategies will be forward to the Strategy Team for identification, tracking, and approval for further action.

3.4 Meetings

The primary objective of iFlorida management meetings is to discuss, identify, resolve and track key programmatic and project-related issues and concerns. To accomplish this, the following practice will be adhered to:

Typically, at least 1 business day prior to a formal meeting, an agenda will be prepared and distributed. Meeting minutes will be taken and Action Items will be identified and placed into the Action Item Data Base (AIDB) (to be made available via the web site) typically within 3 business days following the meeting. All subsequent AIDB activities will be controlled and managed by the Program Coordinator. In general, team meetings will focus on the expedient resolution of all OPEN action items.

iFlorida management teams have the following schedule of meetings:

- *Strategy Team* – Quarterly for Risk Management issues, other meetings scheduled as necessary
- *Core Management Team* – Weekly conference calls
- *Core Management Team and FHWA* – Conference call every two weeks
- *Project Management Team* – During Phase 1 of iFlorida, the Project Management Team will hold twice monthly conference calls/meetings. Subsequently, the Project Management Team will meet on a monthly basis
- *Project Team* – Meetings are tied to major Phase 1 deliverables. These include the Operational Concept and Requirements Document

- *Financial Team* – Meetings/teleconferences will be conducted as necessary to communicate iFlorida financial processes and procedures

3.5 Program Schedule

The iFlorida Program is a 4-year project, 2-year design and implementation, and 2-year operational evaluation. The iFlorida program schedule is divided into three phases:

1. Planning and Design (Phase 1) – May 1, 2003 to December 31, 2003
2. Deployment and Operations (Phase 2A) – January 1, 2004 to April 30, 2005
3. Operations and Maintenance (Phase 2B) – May 1, 2005 to April 30, 2007

Figure 3.5-1 identifies the DRAFT iFlorida Integrated Program Schedule. Dates have been adjusted to fall on workdays. The draft program schedule is completed and will be maintained in MS Project 2000 format. Individual projects are currently shown as durations. The intent is to provide the additional task-related and schedule detail as each project is further defined. This additional definition will occur as each project's Scope of Work is defined and refined for issuance as a Request for Proposal, Invitation to Negotiate, etc. Each project's final set of tasks and schedule will become an integral part of the final contract negotiations and subsequent contract award. Each project's detailed schedule will be added to and integrated with other projects to form the Integrated Program Schedule. The integrated schedule will be maintained by the iFlorida Team over the life of the project.

The deployment strategy was developed within the framework of the project's critical factors, and a harmonized bundling of projects deployment strategy was subsequently developed to ensure that contingencies are planned for. The approach to the development of the deployment strategy was to develop a candidate solution based on our knowledge and experience, optimized for the critical factors, then reevaluate the packaging of each project to take account of evolutionary deployment and technical logic requirements.

As previously described, the bundling of the software-related projects into the Data Fusion, ATIS, Sharing & Archiving projects, is essential to the iFlorida management approach. This approach enables a rigorous set of standards, procedures, and configuration management techniques to be applied to ensure software development remains on schedule.

Additionally, there are numerous processes and procedures specified in the Systems Engineering Management Plan that will enable rapid problem identification and correction. The FDOT Systems Engineering Management Plan (SEMP) has been re-scheduled from an April 2003 to a December 2003 delivery to the FDOT ITS Program Office. To be clear, the lack of an FDOT approved SEMP will have a minimal effect on the program. If problems do occur, experienced managers will apply best engineering judgment to resolve the problem.

iFlorida Master Schedule

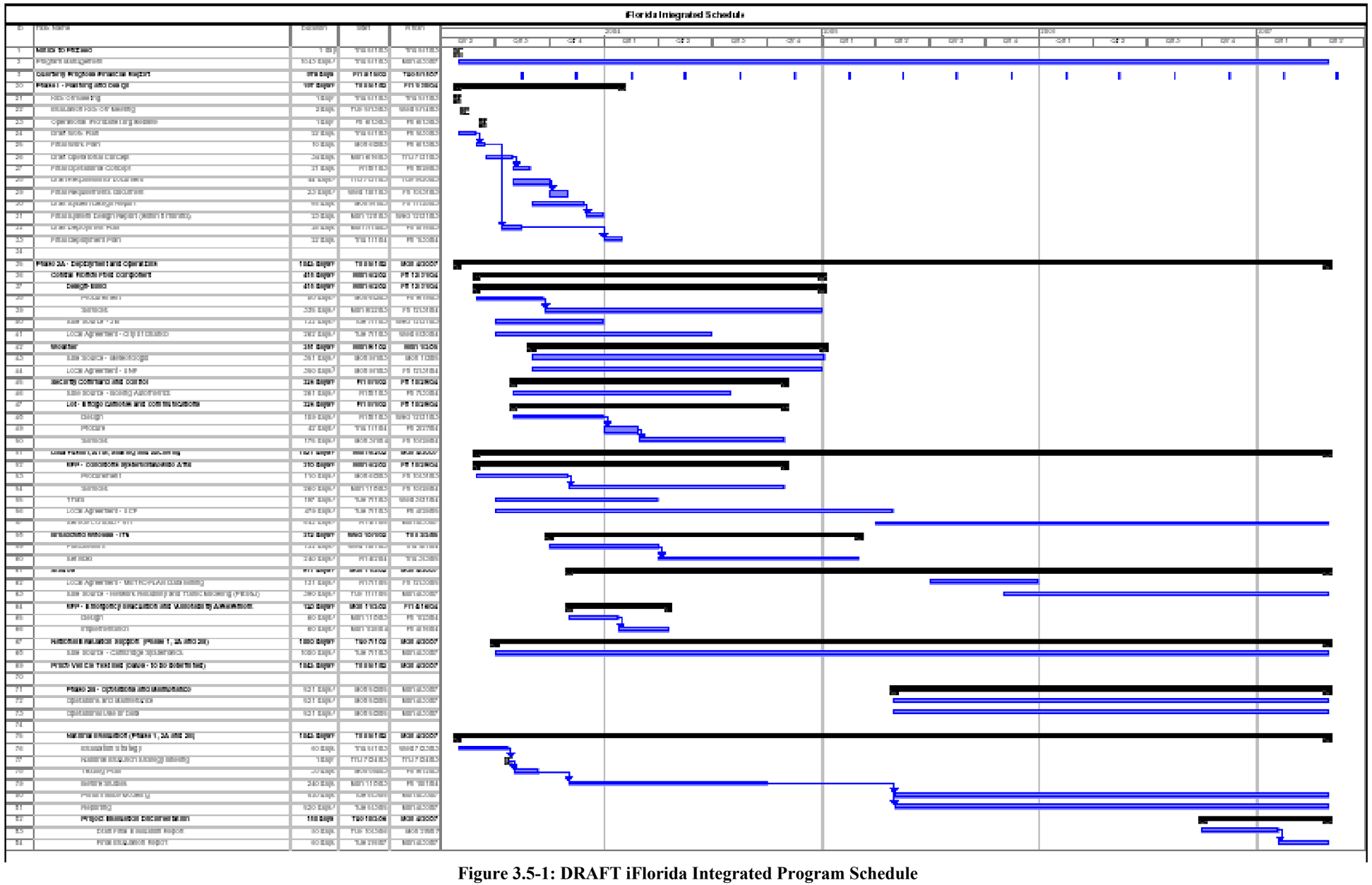


Figure 3.5-1: DRAFT iFlorida Integrated Program Schedule

3.6 Deliverables

3.6.1 Contract Deliverables

Table 3.6-1 summarizes the deliverables and associated due dates from the Cooperative Agreement. These dates have been adjusted for dates falling on weekends and are reflected in the iFlorida Integrated Schedule.

Table 3.6-1: Cooperative Agreement Contract Deliverables

Contract Deliverable	Date
Draft Work Plan	May 30, 2003
Establish a fully functional iFloridanet.org project web site	June 13, 2003
Final Work Plan	June 13, 2003
Deliver Table Top and Floor Mounted Exhibit Displays	June 30, 2003
Draft Operational Concept	July 31, 2003
Draft Deployment Plan	August 15, 2003
Final Operation Concept	August 29, 2003
Draft System Requirements Document	September 30, 2003
Final System Requirements Document	October 31, 2003
Draft System Design	November 28, 2003
Final System Design	December 31, 2004
Final Deployment Plan	January 31, 2004

3.6.1.1 Contract Deliverables Topical Outlines and Associated Systems Engineering Processes

The following topical outlines were briefed during the iFlorida Program Kick-off meeting and are provided as a baseline. Following the outline are the relevant systems engineering processes that will be performed during the analysis and development of the engineering document.

Work Plan

- Overall Sequence of Activities
- Management Approach
- Roles and Responsibilities
- Reporting and Communication Mechanisms
- Schedules and Milestones
- Program Activities

Determine Method of Procurement – The unique nature of this program requires that deployments will be executed through a combination of public/private partnerships and use of existing contractual relationships of consultants and contractors.

This task is essentially complete and additional details regarding the initial procurement plan is presented in section 5 and addresses the proposed method of procurement. However, during system design and development of the final deployment plan in Phase I, the methods of procurement may be re-addressed to ensure that the FDOT and FHWA acquire the equipment and services required to support this application in the best terms and conditions possible.

Operational Concept

- Define System Users
- Define Data Available
- Define How Users Will Interact
- Initial Requirements Collected
- Coordinate With Other Agencies Affected By The System
- Develop View of the System in Operation

Concept of Operations and Business Plan – This application provides an initial concept of operations developed consistent with the IEEE Std. 1362 -1998 and an initial deployment or business plan. The concept of operations will reflect the result of the requirements collection and initial validation of requirements with the stakeholders. During Phase I of the iFlorida program, these initial concepts will be refined.

Information Sharing – An integral part of the iFlorida program is the strategy for sharing information between stakeholders. An integration strategy is provided in the application that will be enhanced and refined during Phase I of the project.

Concept Designs and Master Plans – This application includes an initial deployment plan for the iFlorida program. The implementation strategy will be refined during Phase I of the iFlorida program.

Operations – FDOT D5 will be the lead agency for the operations of the projects proposed in the iFlorida program. However, many aspects of the deployment plan require a cooperative approach to the management and operations of the transportation system to enhance security and reliability. These relationships will be outlined in greater detail in the concept of operations.

Management – FDOT D5 will be the lead agency for the management and maintenance of the projects proposed in the iFlorida program. However, many aspects of the deployment plan require a cooperative approach to the management and operations of the transportation system to enhance security and reliability. These relationships will be outlined in greater detail in the Concept of Operations.

The final Concept of Operations will provide an unambiguous view of the iFlorida sub-systems and how they relate to one another and provide information and data to form the iFlorida system.

Requirements Document

- Define Functional Requirements
- Detail Functional Requirements
- Identify, Define and Manage Interfaces
- Validate Requirements With Stakeholders
- Define Testing Methodology

Requirements Analysis – This application includes an initial requirements analysis that will be refined during Phase I of the iFlorida program. Based on a review and refinements to the project requirements, a baseline set of requirements will be established.

Requirements Database – A requirements database will be developed and maintained to ensure that all requirements are identified and tracked. The database was developed in FileMaker Pro Version 5.5 and has been utilized on numerous PBS&J programs. This process will begin by capturing those requirements identified in the Proposal. As the requirements analysis process continues in Phase 1, the refinements, modifications, additions, and deletions will be traceable to their Proposal basis. This approach will ensure that all requirements are traceable in a hierarchical functional requirement, and are complete, consistent, and correct via a requirements management process. The requirement management process, as documented by the requirements database, will provide disposition records of all requirements to identify those requirements approved, disapproved, or remaining open. New requirements will be examined for impacts to cost, schedule, and functionality. The Core Management Team will make the decisions regarding approval or disapproval of new requirements.

System Design Document

- Design Considerations and Tradeoffs
- System Architecture
- Software Architecture
- Sub Systems
- System Interfaces
- Detailed Design
- Database and Data Management
- User Interface Design
- Requirements Traceability Matrix

Information Sharing – An integral part of the iFlorida program is the strategy for sharing information between stakeholders. An integration strategy is provided in the application that will be enhanced and refined during Phase I of the project.

Project Architecture and System Requirements – FDOT maintains a Statewide ITS Architecture and Standards Application Plan. This ITS architecture includes a regional architecture for FDOT D5 and corridor architectures for I-4, I-95, and Florida's Turnpike. These architectures will be used as a basis for defining functional requirements based on user service requirements and process specifications. A configuration management approach to maintaining the architecture will be used to refine and enhance the architecture based on the refinements to the proposed concept of operations and deployment plan that will be performed in Phase I.

Identifying Applicable ITS Standards – The Statewide ITS Architecture and Standards Application Plan maintained by FDOT contains the relevant standards for all elements and data flows associated with the ITS components in the ITS architecture. This document will be placed onto the web site in the near future. The Standards Application Plan will be enhanced and maintained through the course of the iFlorida program, and national standards that are made available through the Standards Development Organization will be addressed where appropriate. Every effort will be made to implement designs that are compliant with existing, mature, ITS Standards and that are within the financial scope of the iFlorida program. Beta versions of ITS Standards will not be tested or implemented, unless there are clear and compelling reasons for doing so.

Applying ITS Standards and Specifications – As part of the system design required in the iFlorida program, Design Criteria Packages will be developed from the initial scopes of work, performance criteria, and functional requirements for each project element in the application. These packages will be enhanced and refined to be sufficient to support design/criteria packages for procurement as defined in Section 287 of the Florida Statutes.

These Design Criteria Packages will contain sufficient locations, designs, standards, and specifications to procure projects using the design-build procurement technique. If a traditional design and bid technique is preferred, FDOT will complete design prior to procurement. However, with the time allowed for system design, procurement, installation, and testing, a design-build procurement method is preferred for projects related to field devices and software development at this time.

Verification of Design and Design Acceptance – Through the development of the systems design, verification of the scope of work and functional requirements with the stakeholder requirements documented in the needs, issues, problems, and objectives and ITS architecture will be verified. A value engineering analysis will be performed to determine if the design under or over specifies the project to meet the stakeholder requirements. Design review will be performed to ensure that all applicable ITS and other standards and specifications are met through the project. Design acceptance will be

provided by FDOT and FHWA prior to installation and testing. Where exceptions or variations of existing design standards are needed, standard FDOT procedures will be used.

Statewide Performance Criteria, ITS Standards and Specifications – Through the iFlorida program, FDOT will leverage the lessons learned through this project to refine our statewide performance criteria and ITS standards and specifications, as appropriate. The ITS Office will be responsible for implementing these "lessons learned."

Statewide Testing Requirements – Through the iFlorida program, FDOT will leverage the "lessons learned" to refine statewide testing requirements for field elements and software integration. The ITS Office will be responsible for implementation.

Deployment Plan

- General Approach
- Organizational Structure
- Project Implementation
- Acceptance Testing
- Evaluation Process
- Recommended Phase Deployment Timeline

Implementation Strategy – This application includes an initial deployment plan for the iFlorida program. The implementation strategy will be refined during Phase I of the iFlorida program.

3.6.2 Suggested Deliverable Review Schedule

Table 3.6.2-1 is provided as an initial recommendation for the review of iFlorida contract deliverables by FHWA. The intent is to focus FHWA review time on the three most critical documents – Operational Concept, Requirements and System Design Documents.

3.6.3 Administrative Deliverables

The following reports will be delivered to the Agreement Officer's Technical Representative (AOTR) on the 15th day of the month following the quarter being reported. These quarterly due dates are August 15, November 15, February 15, and May 15 respectively.

Quarterly Progress Reports – To include a summary of all work accomplished during the quarter being reported, as well as work in progress, including any problems encountered during the quarter being reported. Also included will be a summary of work planned for the upcoming quarter and costs incurred for the quarter being reported, including, when appropriate, analysis and explanation of cost overruns.

Table 3.6.2-1: Suggested Review Schedule for iFlorida Contract Deliverables

Deliverable	Due Date	FHWA Suggested Review Cycle
Draft Work Plan	30-May-03	1 week
Final Work Plan	13-Jun-03	3 days
Draft Operational Concept	31-Jul-03	2 weeks
Final Operational Concept	29-Aug-03	1 week
Draft Requirements Document	30-Sep-03	2 weeks
Final Requirements Document	31-Oct-03	1 week
Draft System Design Document	30-Nov-03	2 weeks
Final System Design Document	31-Dec-03	1 week
Draft Deployment Plan	15-Aug-03	1 week
Final Deployment Plan	31-Jan-04	3 days

Financial Status Report – To include a Standard Form 269 or 269A in accordance with OMB Circular A-110, Subpart C Section 52. This report will also include a breakdown by cost accounting elements of funds spent during the quarter as well as funds spent to date.

Report of Federal Cash Transactions – To include a Standard Form 272 and, when necessary, its continuation sheet, Standard Form 272A, in accordance with OMB Circular A-110, Subpart C, Section 52.

4.0 Technical/ Project Management

The technical/project management approach for iFlorida will reflect the systems engineering requirements of the FHWA Rule 940; tailors professionally accepted system engineering approaches and standards of the Department of Defense, Institute of Electrical and Electronics Engineering (IEEE), and the International Council on Systems Engineering (INCOSE); and is consistent with professional, engineering, and procurement requirements of the Florida Statutes.

This approach is based on the recommended practices of INCOSE as documented in the Electronic Industries Alliance Standard EIA 731, Systems Engineering Compatibility Model (SECM). The SECM is considered the international standard for systems engineering process appraisal and definition. The systems engineering approach is organized into two major areas: program management and technical/project management. Use of this documented approach promotes cost-efficient and effective model deployments that will be fully integrated, seamless, and fully documented. These two areas are further detailed:

This approach will support the deployment of ITS through the strategic, long-range planning of ITS, process definition, configuration management, and information management. The activities associated with this program area for the iFlorida program are intended to promote:

- Increased efficiency and cost-effectiveness through the establishment of best management practices;
- Coordinated deployments, development, and maintenance of the statewide ITS architecture;
- Adoption of statewide ITS standards;
- Development and maintenance of the Systems Engineering Management Plan (SEMP);
- Support of information sharing and development and adoption of statewide policies and procedures;
- Performance of risk analyses and provision of technical assistance and support on projects; and
- Quality assurance for all processes used in deployment.

The approach also provides the management functions necessary to support the technical development of the ITS model deployment projects in Florida. The activities associated with this program area are intended to ensure that individual ITS projects are deployed in a cost-effective and efficient manner. This program area addresses the requirements of the FHWA's Rule 940 for systems engineering and fully satisfies the IEEE Standard 1220-1998, Standard for Application and Management of the Systems Engineering Process. The approach used in the Technical Management program area places the

traditional emphasis on the systems engineering process for project development and includes:

- Requirements analysis and definition
- Design
- Validation
- Construction Engineering and Inspection (CEI) and maintenance

The following section identifies and details specific technical/project management related tasks to be accomplished during the iFlorida project.

4.1 Software Acquisition Practices

A large component of the iFlorida program requires new and expanded software to be developed. iFlorida will adhere to the following general software acquisition principles:

- Program software will be selected based on its merits, not simply the model of its development. All software products offer varying benefits and costs. State DOTs should procure the software that best meets their needs based on functionality, performance, security, value, and cost of ownership.

- iFlorida will avoid any categorical preferences for open source software, commercial software, free software, or other software development models.

- Program software will promote neutral standards. Voluntary, industry-led standards will be the most effective way to develop neutral and market-based standards. When these standards are open and available to all through licensing, they help developers to create products that can interoperate with each other. For the iFlorida program to be successful, it will be necessary to develop, document, implement, and enforce an appropriate acquisition strategy. This process will be identified and include considerations of the following essential factors:
    - The objectives of the acquisition
    - Project constraints, such as funding and schedules
    - Available and projected assets and technologies
    - Acquisition methods
    - Potential contract types and terms
    - End user considerations
    - Consistency with the system acquisition strategy
    - Risk identification
    - Life cycle support installation approach

4.2 Software Acquisition

The iFlorida Program will, in general, follow the best practices and practical advice on how to acquire software components of Intelligent Transportation Systems presented in Volume II of *The Road to Successful ITS Software Acquisition* (USDOT/FHWA) documents.

Table 4.3-1 identifies the iFlorida software-related projects that will require software to be newly developed, existing software to be expanded, and software to be purchased as Commercial-off-the-Shelf (COTS) software and customized. Significant new software development efforts will be required for the Conditions System/Statewide ATIS project and its associated new modules (i.e., functionalities) – Variable Speed Limit Algorithms and Automated Messages on VMS.

Table 4.3-1: iFlorida Software Acquisition Requirements

Bundled Project	Software Required		
	Newly Developed	Expanded	COTS
Central Florida Field Components			
Design/ Build Scope			
Contract w/ 3-M			
City of Orlando			
Weather			
UNF			
Meteorlogix			
Probe Vehicle Test Bed			
Security Command and Control			
Boeing Autometric			●
Cameras			
Data Fusion, ATIS, Sharing & Archiving			
Statewide and Orlando Conditions System	●		
Variable Speed Limit Algorithms	●		
Automated Messages on VMS	●		
Statewide TTMS Upgrade		●	
Data Warehouse Expansion		●	
Statewide and Orlando 511 Operations		●	
Broadband Wireless			
Studies			
Metroplan Data Mining			
Network Reliability / Traffic Modeling			
Speedway Evac Plan / RTMC Vulnerability			
Evaluation Support			

The acquisition of software for the iFlorida program will utilize the best practices checklist presented in Table 4.3-2 as a guide for the acquisition of all software for iFlorida**.** *The Checklist for Best Practice Activities for Software Acquisition* is from the Software Acquisition Capability Maturity Model (SA-CMM) [Ferguson, 1996].

Table 4.3-2: Checklist for Best Practice Activities for Software Acquisition

☑	Use existing products to the maximum extent practicable.
☑	Document the software acquisition plan that addresses the entire project through operations and maintenance.
☑	Build a team and collaborate with them to acquire the system.
☑	Maintain on-going, open communications with the contractor and other members of your team
☑	Prepare independent cost and schedule estimates.
☑	Document requirements and have them serve as the basis of other activities (test cases, budget and schedule, design, etc.)
☑	Trade off requirements to decrease cost and schedule. Keep all three in synch.
☑	Develop formal source selection criteria, which, for a software development process, include assessment of the bidders' software engineering process.
☑	Identify problems, record, and track their status
☑	Track expenditures and progress
☑	Manage risks: identify and resolve them. Conduct risk management in conjunction with your contractor and other team members as an integral part of the acquisition process
☑	Include system acceptance criteria in the contract.
☑	Develop an acceptance test plan and carry out acceptance testing in accordance with it. (Note: This plan may be developed by the contractor subject to your review and approval.)
☑	Have explicit contract language documenting licensing and ownership rights.
☑	Develop training materials and carry out a training program for use and operation of the system.
☑	Develop a support strategy for the system.
☑	Ensure software meets Federal requirements for architecture and standards consistency.

4.3 Risk Management

Starting with the Operational Concept and through the development of the final deployment plan for the project, FDOT will evaluate the risk associated with each proposed project deployment with the FHWA and assess the potential for success, particularly with the private partners. FDOT will seek to minimize the risk associated with any procurement method or project scope of work and functional requirements. Where risk is of a concern, FDOT will work with the FHWA to develop a risk management approach for each individual project.

4.4 Configuration and Change Order Management

During the course of the iFlorida program, requests for change orders are likely, due to uncertainty in project requirements and specifications, or for unanticipated conditions. FDOT will make every effort to minimize the potential for change orders through early standards and specifications work that will support enhanced communications between the contractor/partner. Early project scoping and requirements meetings will be held to address potential conflicts or concerns of the contractor/partner in the project. When change orders are justified, they will be reviewed for technical, cost, and schedule implications. Specific written justification will be provided to the Core Management Team and FHWA. A joint Core Management Team and FHWA will provide a final review and approval.

Once the baseline design has been established and approved by FDOT and FHWA, requests for change orders or changes to the baseline design will be evaluated by a formal Configuration Control Board and controlled by FDOT. Changes to the baseline design approved by the Configuration Control Board will be documented as a change order to the design and/or requirements. Changes to documents and drawings will be documented to ensure appropriate internal control has been observed. Additionally, all hardware and commercial-off-the-shelf (COTS) software will be kept under configuration control. Configuration control for the iFlorida program will consist of an Excel spreadsheet program.

All interfaces will be managed by an FDOT Interface Control Working Group and documented via an Interface Control Document.

Modified and newly developed software written for this project will come under strict FDOT software configuration management (CM) control. Software contractors for the iFlorida program will be required to provide a Software CM plan with their initial proposal and implement their plan for the life of the project. Software CM, at a minimum, will encompass the following tasks:

- Identify the software components that will be placed under configuration control.
- Identify the components via a numbering or some other scheme.
- Maintain a current status of all parts (revision number, etc.) that are in a baseline (i.e., configuration control).

- Maintain a backup copy of the baseline. At any point in time, it shall be possible to go back and faithfully reproduce a previous baseline on the system (i.e., configuration control).
- For modified and newly developed software FDOT will chair and manage a configuration control board (CCB). The CCB will evaluate changes as necessary, and provide a formal approval before allowing a vendor to make changes to the baseline (i.e., change control).
- Review and ensure that requirements, design, code, test cases, etc. all track with one another (i.e., configuration audit).

4.5 System Acceptance Testing

Every project in the iFlorida program will require the development and documentation of a testing plan and successful execution of that plan based on criteria established in the testing plan. The incremental build approach is preferred for larger or more complex system elements as opposed to a single final acceptance test. FDOT will oversee the execution of the hardware and software test plans for any new or incremental improvements. The following procedures will apply:

- For each subsystem a limited factory acceptance test (FAT) will be conducted with a minimum set of hardware integrated with the software under test to demonstrate baseline software configuration and operability. FAT hardware will be provided by FDOT. For example, FDOT will provide Boeing Autometrics the CCTV camera to be used on bridges, so that the camera image and pan-tilt-zoom (PTZ) controls can be integrated into the Boeing software application.
- Following each test, the contractor will develop an action report. If the FAT were to fail, an action report will be developed by the contractor to define the steps needed to achieve satisfactory completion of the FAT. Once the FAT is completed the contractor will provide a report to define the steps needed to achieve final acceptance for the project.

Once the software has been completed, project installed, and the testing plan is completed for any incremental builds, FDOT or its agents will administer the final acceptance testing. The final acceptance test will include a burn-in period of thirty days. Satisfactory completion of the burn-in period is defined to be 30 days without any failures.

Upon mutual agreement between FDOT and the Contractor that the 30 day period has been successfully completed, the Systems Acceptance Test will begin and continue for 60 days. Specific criteria for the acceptance of the deliverables will be documented in the testing plan. If the final acceptance test were to fail, an action report will be developed by the contractor/partner to define the steps needed to achieve final acceptance for the project. Following completion of the final acceptance test, FHWA and FDOT will issue a project acceptance letter to the contractor/ partner.

4.6 ITS Regional Architecture

FDOT has developed and maintains the ITS Corridor Master Plans and ITS Master Plans. These are available for review on the ITS Florida Web site. The site includes completed FIHS corridor architectures for I-4, I-95, I-75, I-10, and Florida's Turnpike, as well as the logical and physical architecture components of the Florida Statewide Architecture. The statewide architecture harmonizes the five corridors into a single architecture. This architecture was completed in September 2000 and updated to reflect the Statewide Architecture 2002. The I-4 corridor architecture includes both the logical and physical architecture components. The iFlorida program has utilized these architectures as the validated foundation for defining functional requirements based on user service requirements and process specifications. These architectures already provide a comprehensive, robust capability that ensures that all aspects of the iFlorida program are addressed.

Should a change be required to the statewide or the I-4 corridor architectures, a configuration management approach to maintaining these architectures has already been established. This approach to change will be used to refine and enhance the architecture, as necessary, based on the refinements to the proposed concept of operations and deployment plan that will be performed in Phase I. The following are additional ITS specific tasks to be performed:

ITS Plan Coordination – The iFlorida program will have a significant, positive impact on the state's Ten-Year ITS Cost Feasibility Plan and its supporting documents, such as the Statewide Concept of Operations for Florida Intrastate Highway System Limited-Access Facilities. The FDOT ITS Office will track and monitor the progress of the iFlorida program and continue to coordinate statewide ITS deployments.

Maintain Statewide ITS Architecture – During the system design and specification for the iFlorida program, harmonization of the FDOT D5 regional and statewide ITS architecture may be needed. The FDOT ITS Office will take the lead in the configuration management of the architecture and ensure enhancements and modifications are reflected on a statewide basis as appropriate.

4.7 Program Quality Control

The iFlorida Team is committed to and responsible for providing the professional quality, technical accuracy, and coordination of all designs, specifications, drawings, studies, and other services to be furnished under the iFlorida Contract. Quality Control of projects is based on the premise that at least two responsible and qualified individuals agree on the correctness of each work product before it is released. To accomplish this, the iFlorida Program Quality Control Plan (located in Appendix A) describes the procedures that will be used to verify, independently check, and review all design drawings, specifications, technical memorandums, and other documentation prepared as a part of the iFlorida Contract. It also describes how the checking and review processes are to be documented to verify that the required procedures were followed.

5.0 Project Activities

The proposal response focused on nine major component areas, with 24 separate projects. As the program has evolved from the conceptualization stage (i.e., proposal) to an implementation stage, the team has re-examined its original plan to deploy projects. The result of the analyses is a bundling of projects to support our initial system architecture (see Figure 5.0-1) and implementation approach.

This section provides detailed information regarding projects, their bundling and associated costs. The bundling as presented in this Work Plan remains consistent with the bundling presented at both the Program and Evaluation Kick-off meetings. The motivation for the bundling remains as follows:

- Provide logical grouping of projects
- Leverage iFlorida staff skills
- Produce economies of scale
- Manage procurement process
- Minimize program risk

5.1 Project Grouping

There are 24 specific projects encompassed within the iFlorida proposal. To better manage, procure and control the projects, the 24 projects have been bundled into the following eight groups:

1. Central Florida Field Components
2. Weather
3. Probe Vehicle Test Bed
4. Security Command and Control
5. Data Fusion, ATIS, Sharing, & Archiving
6. Broadband Wireless
7. Studies
8. Evaluation Support

iFlorida Initial System Architecture

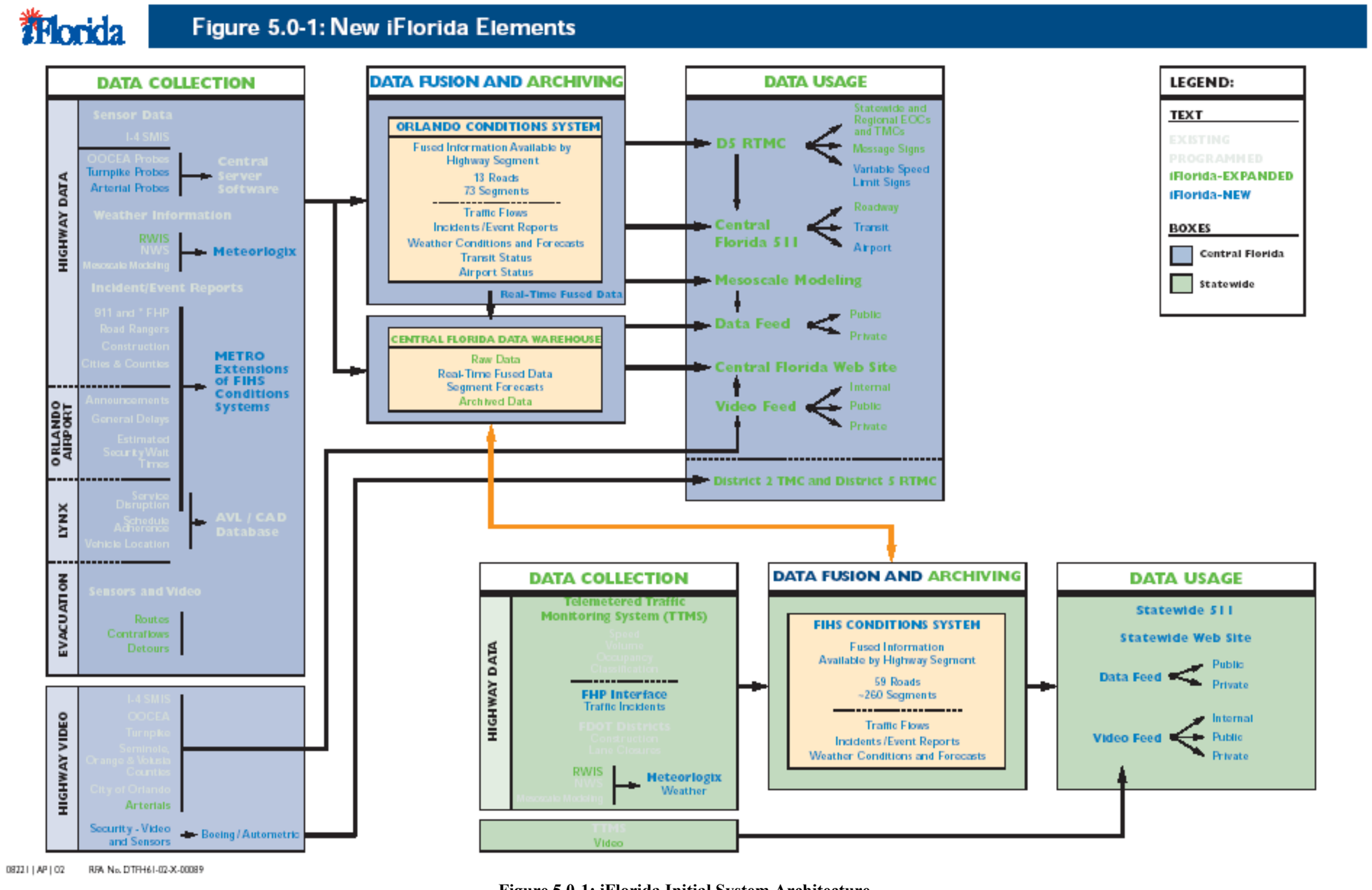


Figure 5.0-1: iFlorida Initial System Architecture

5.2 *Procurement Overview*

Figure 5.2-1 is from the iFlorida proposal and summarizes the proposed program resources. A key outcome of the project grouping analysis was to make additional determinations as to how each of these bundled projects would be procured. Additional cost and procurement related detail is presented in Table 5.2-1. This table identifies the major contributors by category and provides procurement type, costs, and scheduling by fiscal year.

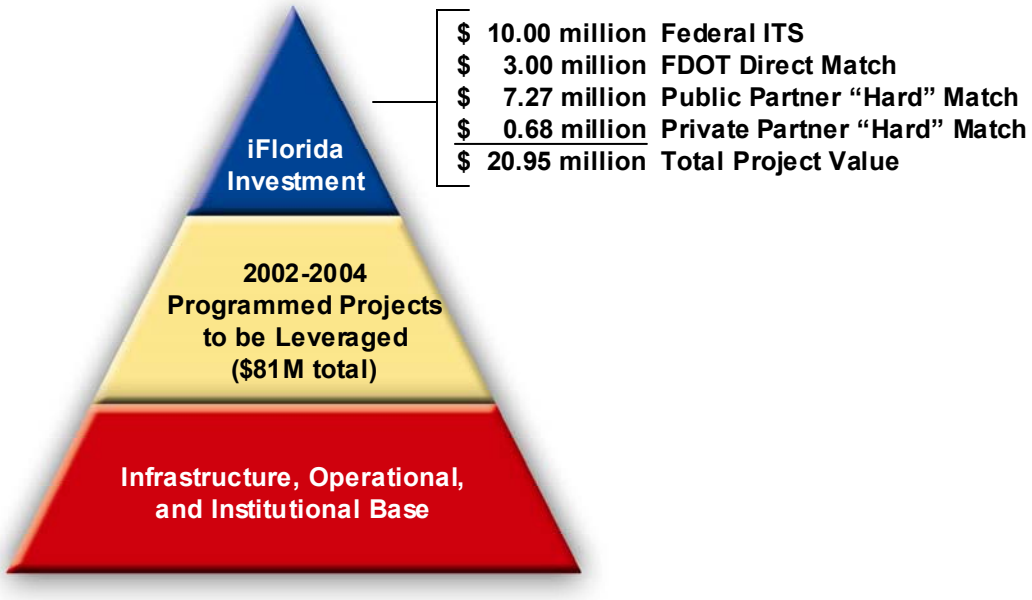


Figure 5.2-1: Proposed Program Resources

An overview of the procurements to be utilized for iFlorida include the following methods:

- *Request for Proposal* – a competitive bidding process.
- *Design/Build Operate and Maintain (DBOM)* – a contract for all-inclusive services through April 30, 2007.
- *Sole Source* – iFlorida is permitted to enter into this type of contractual arrangement, per the Cooperative Agreement.
- *Local Area Participation (LAP)* – an interagency fund transfer.
- *Inter-local Agreement* – purpose is to create a partnership for an interagency fund transfer. Similar to, but statutorily different from a LAP.
- *Let* – a contract to be issued and monitored by FDOT District 5 staff.
- *Invitation to Negotiate* – a Letter of Interest will be circulated; FDOT will identify the Long List and pare it down to a Short List (e.g., 3 proposers), each of the proposers will be issued an RFP.

5.3 Project Descriptions

This section details each group with a Summary Description, Projects Included, and Procurement Approach. The projects included in each group are further detailed, citing the Project Managers, the Project Partners, and Project Description. Each project is associated with a reference letter and number from the proposal. Table 5.3-1 uses these references to show how projects are bundled. Within the table, the original project number in parenthesis (M.2) (e.g., Arterial CCTVs (M.2)) enables the reader to track the project from the original proposal to the newly bundled project group. Known schedule related dates are provided.

The iFlorida team will share the scopes and procurement documents with the evaluation team in order to comprehend and assess the impacts upon the National Evaluation component

Table 5.2-1: Current Program Resources and Sources

Bundled Project	Procurement Method	Anticipated Fiscal Year of Project Funding	Contract Value			
			Federal ITS	FDOT Direct Match	"Hard Match"	Project Subtotal
Central Florida Field Components						
Design/ Build Scope	Request for Proposal	03/04	$2,782,000	$1,996,000	$1,400,000	$6,178,000
Contract w/ 3-M	Sole Source	03/04	$261,000		$86,000	$347,000
City of Orlando	Inter-local Agreement	03/04	$431,000		729,000	$1,160,000
					Group Total:	**$7,685,000**
Weather						
UNF	Inter-local Agreement	03/04	$638,000			$638,000
Meteorlogix	Sole Source	03/04	$500,000		$339,000	$839,000
					Group Total:	**$1,477,000**
Probe Vehicle Test Bed	To Be Determined	03/04	$200,000			**$200,000**
Security Command and Control						
Boeing Autometric	Sole Source	03/04	$511,000		$96,000	$607,000
Cameras	Let	03/04		$400,000		$400,000
					Group Total:	**$1,007,000**
Data Fusion, ATIS, Sharing & Archiving						
Statewide and Orlando Conditions System	Request for Proposal	03/04	$1,205,000	$350,000		$1,555,000
Statewide TTMS Upgrade	Funds Transfer	03/04	$575,000		$239,000	$814,000
Data Warehouse Expansion	Inter-local Agreement	03/04	$1,286,000			$1,286,000
Statewide and Orlando 511 Operations	Request for Proposal	04/05		$2,729,000		$2,729,000
					Group Total:	**$6,384,000**
Broadband Wireless	Invitation To Negotiate	04/05	$639,000			**$639,000**
Studies						
Metroplan Data Mining	Local Area Participation	05/06	$100,000			$100,000
Network Reliability / Traffic Modeling	Sole Source	05/06	$300,000			$300,000
Speedway Evac Plan / RTMC Vulnerability	Request for Proposal	04/05	$300,000			$300,000
					Group Total:	**$700,000**
Evaluation Support	Sole Source	03/04	$272,000		$44,000	**$316,000**
Project Management	GEC Contract	03/04		$2,000,000		
		TOTALS	**$10,000,000**	**$7,475,000**	**$2,933,000**	**$20,408,000**

Table 5-3.1: Revised iFlorida Project Bundling

Bundled Projects	Projects in Proposal																														
	M.1a – Turnpike Travel Time Data Collection	*M.1b – Arterial Travel Time Data Collection*	M.1.c - Expanded Arterial Data Collection - Deleted; Added Probe Vehicle Test Bed	M.2 – Arterial CCTVs	M.3 –Telecommunications Network Enhancements	M.4 – Metropolitan Extension of FIHS Conditions System	M.5 – Orlando Conditions System	M.6 – Central Florida Data Warehouse and Internet Expansion	M.7 – Variable Speed Limit Trial	M.8 – Roadway Diversion Information	M.9 – Orlando Regional Transportation Network Reliability	M.10.a – Broadband Wireless Internet	M.10.b - Data Usage Promotion	M.10.c - METROPLAN data Mining	SW.1 – FHP Conditions System Interface	SW.2 – Weather Forecasting by Road Segment	SW.3 – Statewide Flows and Images Using TTMS	SW.4 – FIHS Conditions System	E.1 – SR 528 Corridor Monitoring System	E.2 – Brevard County Agency Integration	W.1 – Central Florida RWIS	A.1 – Central Florida 511 System Expansion	A.2 – Statewide ATIS	S.1 – Security Command and Control	S.2 – Traffic Modeling	S.3 – LYNX Streaming Video Proof of Concept	S.4 – District 5 RTMC Vulnerability Assessment	L.1 – Recommended Practices for Emergency Evacuation of Attractions and Special Events Venues	Evaluation Support
Central Florida Field Components	●	●		●	●															●	●										
Weather																●						●									
Probe Vehicle Test Bed			●																												
Security Command and Control																								●							
Data Fusion, ATIS, Sharing & Archiving						●	●	●	●	●			●		●		●	●					●	●							
Broadband Wireless												●														●					
Studies											●			●											●			●	●		
Evaluation Support																															●

5.3.1 Central Florida Field Components

Summary Description: Field device installation, including communications, CCTV, and detection equipment.

Procurements (3)

Procurement 1 – Field Elements Deployment and Operations

Planned Procurement Approach: Design/Build Operate and Maintain

Estimated Contract Budget: $6.2M

Milestones: Project Duration June 03 – December 04
RFP: June 2003
Award: August 21, 2003
Notice to Proceed: September 10, 2003

Project Managers

FDOT: Anne Brewer, Jerry Woods, and Rich Jardim
PBS&J: Brian Vitetta and Armand Ciccarelli

Key Partners: FDOT D5 (lead), counties, City of Orlando, Brevard EOC and OOCEA

Scope

This procurement method will encompass designing and building of this project. The following describes how this project will be deployed and operated:

The first portion of this project will deploy transponder readers at key locations on Turnpike-operated facilities, including the Turnpike mainline, the western end of SR 528 ("Beeline") and the northern and southern ends of SR 417. Figure 5.3.1-1 depicts the area encompassed by this project. With the exception of the low volume initial leg of the Western Beltway (SR429), this project will provide 55 miles of new coverage and complete the limited-access roadway flow-monitoring network in the region. It is anticipated that 12 reader sites will be necessary – six on the Turnpike, two on SR 528, and four on SR 417 – enabling the monitoring of 11 additional road segments. Communications to these readers will occur through existing fiber communications, dedicated dial-up, or wireless means.

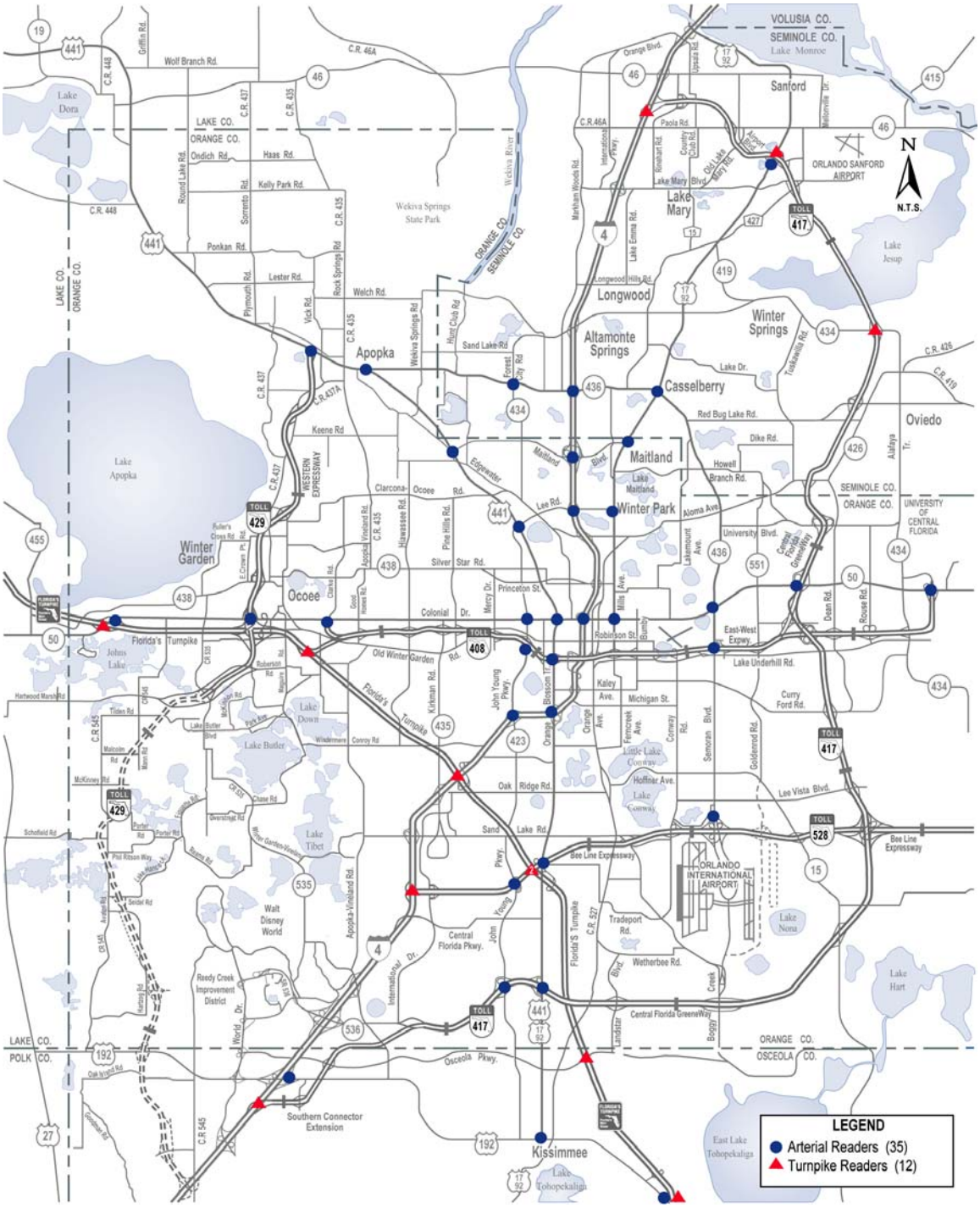


Figure 5.3.1-1: Travel Time Data Collection Expansion

The next portion of this project will extend travel time data collection to the key arterials in the area and provide 128 miles of new coverage. The region's seven highest priority principal arterials will be equipped with 35 reader sites, creating 35 distinct road segments (refer to Figure 5.3.1-2). The roadside systems will be connected to Central System Software via fiber and dedicated dial-up connections.

This project will improve regional operations, facilitate better arterial incident/event responding, and increase video coverage available to travelers. 13 CCTVs will be co-located with 13 of the 35 arterial travel time reader stations that listed above and that are deployed at key intersections where fiber already exists or will exist will be relocated. Figure 5.3.1-3 depicts the area encompassed by this project. Adding these will nearly double the arterial CCTVs in the region.

With less than one block between the LYNX South Street Facility and SR 408, a fiber connection between LYNX's Command Center and the fiber backbone will enable high-speed exchange of data and video between LYNX and other Consortium members, including FHP at the RTMC. This will aid both in day-to-day operations to support dispatching by giving LYNX access to the regional video and traffic conditions information, as well as by giving policy and public safety officials access to LYNX-generated video and information, including monitoring of the LYNX Central Station. Finally, this project will also add about 38 miles of aerial fiber along arterials including SR 50, SR 423, and SR 436

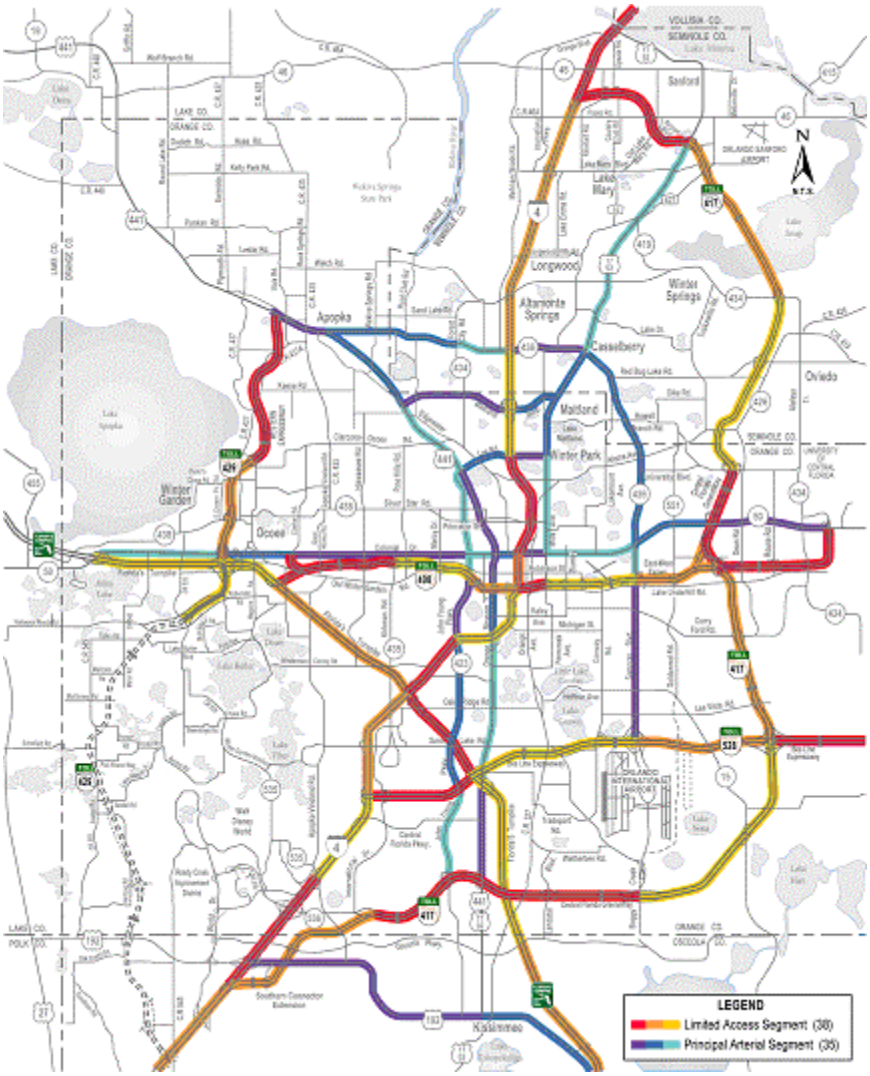


Figure 5.3.1-2: iFlorida Metropolitan Roadway Segments

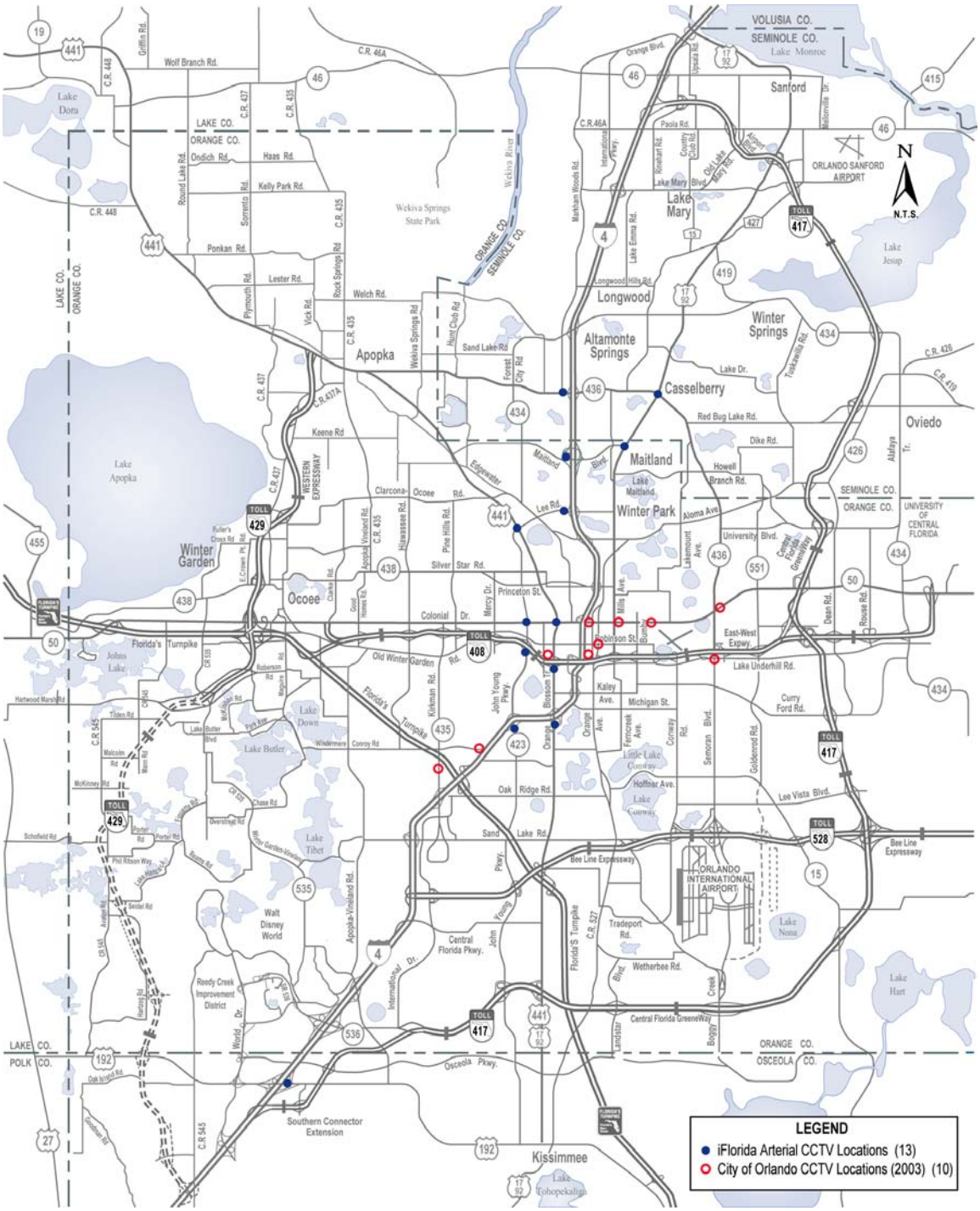


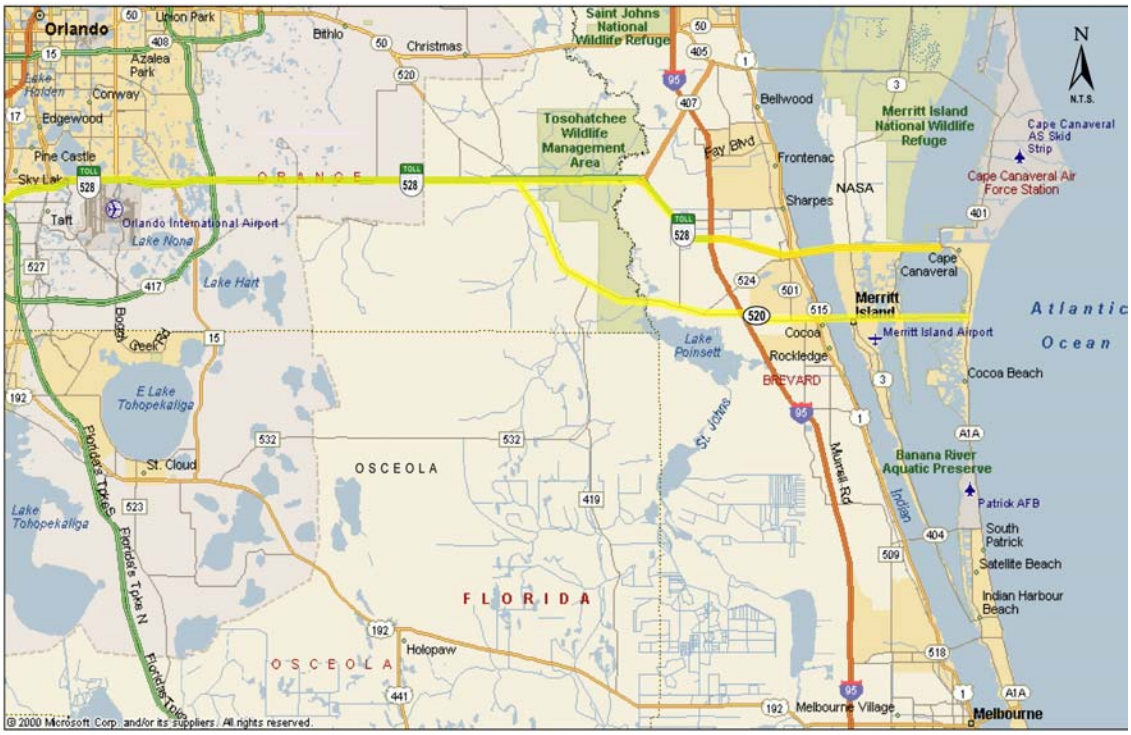
Figure 5.3.1-3: Arterial CCTV Locations

This project will also build upon the I-95/SR 528 Hurricane Evacuation System (HES) to obtain full traffic sensor data coverage and additional strategic CCTV coverage on SR 528 and SR 520. Three specific forms of data collection will be implemented.

Detector stations along SR 528 and at key locations on SR 520. Project partner 3M (i.e., Procurement 2) is supplying 22 Canoga Non-Invasive Microloop Detector stations. Eighteen will be located at a one-mile spacing on SR 528, providing speed and volume data that can also be converted to segment travel times. 3M have recommended the one-mile sensor spacing. Figure 5.3.1-4 depicts the area encompassed by this project. The remainder will be positioned at key locations along SR 520 for volume information that will be of value to real time evacuation planning models. Figure 5.3.1-5 depicts the components included in this project. License plate readers will be placed at three key intersections on SR 520 to generate arterial segment travel times.

Two CCTVs will be added to provide additional monitoring capabilities. Fiber will be extended roughly two miles further east on SR 528 to the western edge of the causeway, with the detector stations utilizing the fiber network. On the causeway and over to SR A1A, wireless communications will be used from the terminus of the fiber.

Figure 5.3.1–4: SR 528 Evacuation Corridor



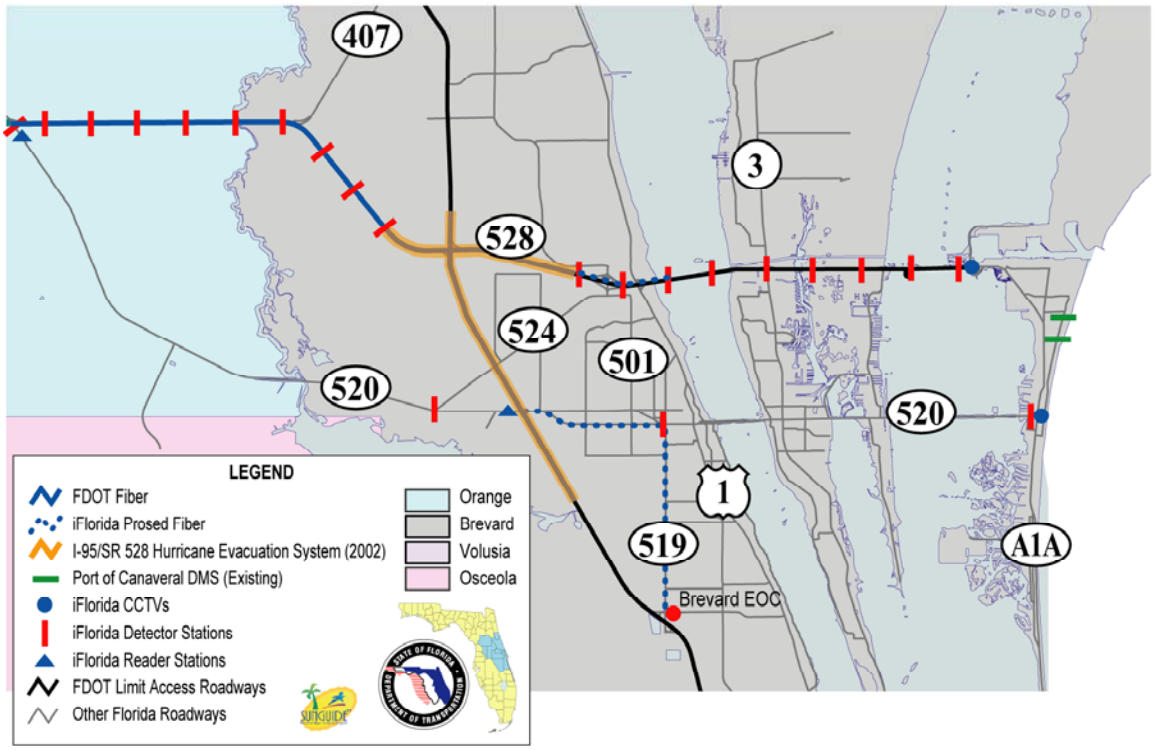


Figure 5.3.1-5: iFlorida Evacuation Components

The focus of the last portion of this project is to facilitate the sharing of data and video with the Brevard County EOC and the TMC via integration into the fiber backbone. Physical connection to the backbone will occur via a six-mile connection from existing fiber on I-95. In addition, a workstation will be installed in the EOC to connect the EOC and the RTMC in Orlando, allowing for the real time sharing of transportation data and high quality video.

Procurement 2 – 3M Equipment

Planned Procurement Approach: Sole Source

Estimated Contract Budget: $347K

Milestones: July 03 – December 03

Project Managers

FDOT: Anne Brewer
PBS&J: Brian Vitetta and Armand Ciccarelli

Key Partners: 3M

Scope – Within this procurement 22 variable speed signs and 22 detection stations will be purchased by FDOT from 3M and supplied to the

contractor for installation. Installation of equipment will be completed in Procurement 1.

Procurement 3 – Local Agreement

Planned Procurement Approach: Local Assistance Program (LAP)

Estimated Contract Budget: $1.16M

Milestones: July 03 – June 04

Project Managers

FDOT: Fred Ferrell
PBS&J: Brian Vitetta and Armand Ciccarelli

Key Partners: City of Orlando

Scope
This project will relocate the City of Orlando's traffic management to the city's Integrated Operations Center, enabling city police, fire, and emergency operations department's real time access to the region's information base.

5.3.2 Weather

Summary Description: To implement permanent high-end weather station installations to support predictive model development and travel-related information on key corridors for evacuation and intercity travel; and to implement an ad-hoc wireless networked system of devices that can be deployed to temporary sites to support travel advisories when needed.

Procurements (2)
Procurement 1 – University of North Florida

Planned Procurement Approach: Inter-local Agreement

Estimated Contract Budget: $638K

Milestones: September 03 – December 04

Project Managers

FDOT: Nick Adams
PBS&J: Marty Sas

Key Partners: FDOT D5 (lead), FDOT ITS Office, UNF, and FSU.

Scope

The goal of this portion of the project is to augment existing and planned RWIS capabilities by expanding the current capabilities in the Central Florida region. Ten additional Tower-based permanent weather stations, 4 bridge-based Wind Monitor Stations and 1 Between-Tower and Ad-hoc network prototype demonstration unit will provide additional resolution of weather data for the Central Florida Region. Figure 5.3.2-1 depicts the area encompassed by this project. This will provide real time, critical weather and roadway travel conditions information to travelers, law enforcement, traffic and emergency management centers in order to ensure safe transportation in both normal and evacuation conditions for residents, visitors, and commerce. The project will facilitate decision-making both through the dissemination of real time road weather conditions collected at specific locations and by the incorporation of this specific location data into forecast models produced by both the National Weather Service and private sector forecasters.

The project will provide several methods of access to current, forecasted, and historical road weather information, allowing travelers to get current and forecasted road weather via expansion of the 511 Travel Information System, iFlorida Web site, and the state's "MyFlorida.Com" Web site, as well as providing real time traveler information via highway advisory radio, dynamic message signs, and variable speed limit signs.

This project will significantly increase the number of Central Florida weather station sites available to both the National Weather Service and private sector weather forecasters. The spatial precision and accuracy of forecasts and advisories of several weather phenomena will be greatly improved with deployment of this project. Through an existing cooperative effort between the National Weather Service, the FDOT ITS Office, University of North Florida, and other cooperators, Central Florida weather stations will become a significant addition to the statewide weather MESONET that is currently being developed.

Procurement 2 – Meteorlogix

Planned Procurement Approach: Sole Source

Estimated Contract Budget: $839K

Milestones: September 03 – January 05

Project Managers

FDOT: Anne Brewer
PBS&J: Marty Sas

Key Partners: FDOT ITS Office, Meteorlogix, and FDOT

Scope

Numerous sources of weather information, current and forecasted, are available and will be increased through iFlorida. This project includes hardware and software applications. This portion of the Weather project takes all those sources as input and develops very specific current conditions and forecasts for each FIHS segment defined in the FIHS Conditions System. The resulting output of this project is time-sliced forecasts for each segment that will be provided each hour. (While the exact slices will be determined during design, we are projecting forecasting slices of, 15 minutes, 30 minutes, and on the hour for the following eight hours.) The data will be formatted for inclusion as attributes for each FIHS road segment. This format could be a candidate for future standardization.

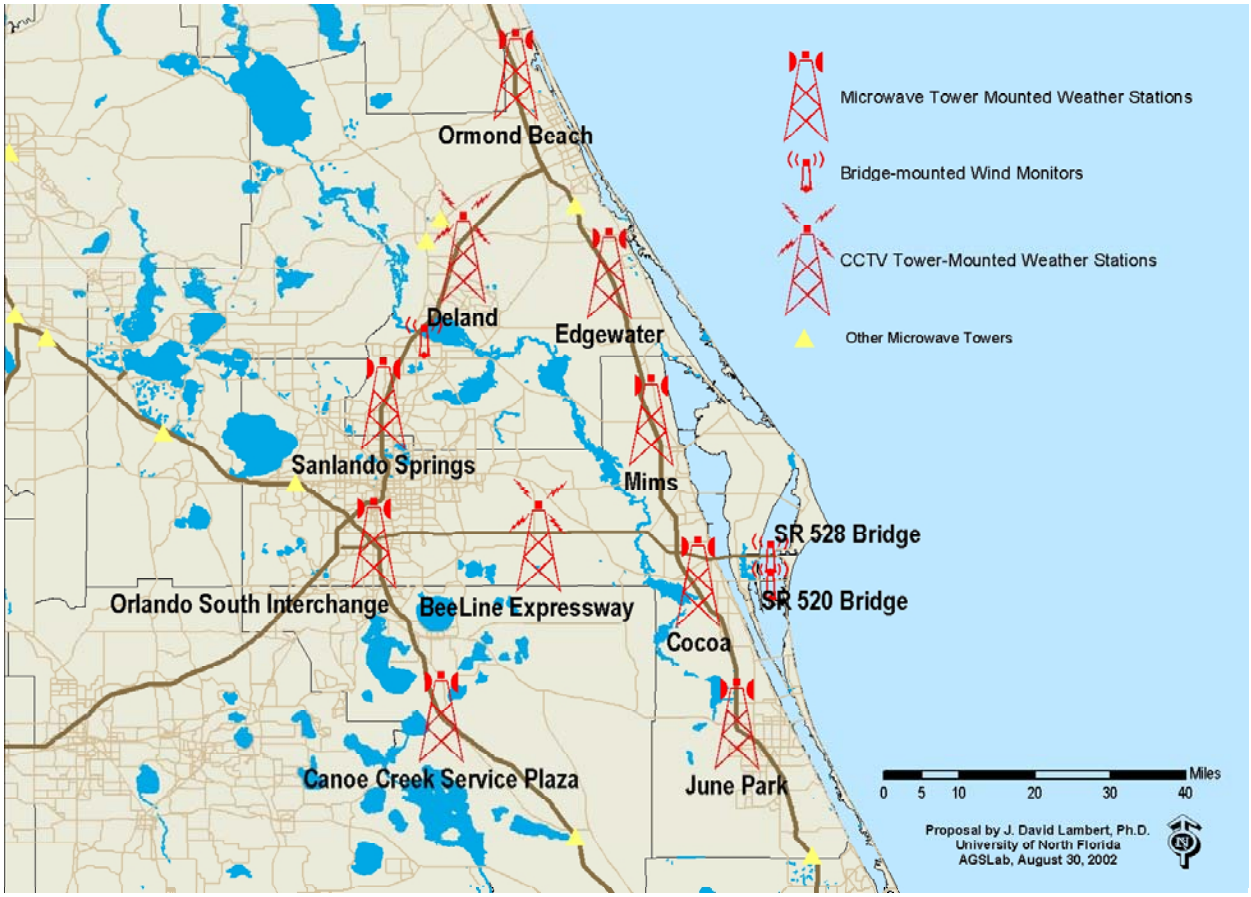


Figure 5.3.2-1: Proposed Locations of RWIS Facilities

5.3.3 Probe Vehicle Test Bed

Summary Description: This Project was added at the request of FHWA. The Project will serve as a test bed for the application of innovative private sector probe vehicle technologies. Expanded Arterial Data Collection has been replaced with Probe Vehicle Test Bed project and funding reassigned.

Procurement

Planned Procurement Approach: TBD

Estimated Contract Budget: $200K

Milestones: To be determined

Project Managers

FDOT: Anne Brewer
PBS&J: Bob McQueen

Key Partners: FDOT D5 (lead), and others TBD.

Scope
This project is on hold until we have further direction from FHWA.

5.3.4 Security Command and Control

Summary Description: Deployment of security application on Fuller Warren and Bennett Causeway bridges. Connect to FHP (Troop G), D5 RTMC, and Brevard County EOC.

Procurements (2)
Procurement 1 – Boeing Autometric

Planned Procurement Approach: Sole Source

Estimated Contract Budget: $607K

Milestones: August 03 – July 04

Project Managers

FDOT: Anne Brewer and Larry Rivera
PBS&J: Joe Schuerger

Key Partners: FDOT D5 (lead); FHP, Troop Jacksonville; RTMC-D5 staff; FDOT D5, and Brevard County Emergency Operations Center.

Scope

Security Monitoring for Critical Bridge Infrastructure – It should be clearly noted that in the proposal the two bridges identified were the I-295 Buckman Bridge (Jacksonville) and the S.R. 528 Bennett Causeway Bridge in Brevard County. Since the contract was awarded, FDOT has made a conscious decision to delete the Buckman Bridge and add the Fuller Warren Bridge in Jacksonville. This decision was based on the current availability of communications infrastructure. All associated costs for the Buckman Bridge have been internally re-allocated to the Fuller Warren Bridge. All cost and operationally related components for this project remain the same. This project will contain two elements :

Security Monitoring Command and Control Software – This element will provide a monitoring capability for sensors and video at two high priority bridges as defined by FDLE. The Fuller Warren Bridge on I-95 serves as a bypass route for Jacksonville, the largest city in the nation in square miles. The S.R. 528 Bennett Causeway Bridge serves the NASA - Kennedy Space Center area and is a primary evacuation route between the Brevard Space Coast and Orlando. A single security application will be networked and deployed in each of locations listed below:

- FHP, Troop G, Jacksonville
- FDOT D5, RTMC - D5 staff is collocated with FHP Troop D
- Brevard County Emergency Operations Center

Each of these facilities provides 24/7 operations and monitoring capability. During a security event, alarms and alerts from the Fuller Warren Bridge will be sent simultaneously to the following offices: Jacksonville FHP, Troop G; FDOT D2 TMC; and FDOT D5 RTMC in Orlando. Alarms and alerts from the Bennett Causeway Bridge will be sent simultaneously to the following offices: FDOT D5, Brevard County Traffic Operations Center (TOC); Brevard County Emergency Operations Center (EOC); and FDOT D5, RTMC. Alarms and alerts will trigger an automatic, real time digital recording for post event analysis.

Boeing/Autometric will provide automated security monitoring and control with their visual security operations console (VSOC) application. This application provides the visual alarm annunciation, security surveillance, and video assessment and alarm management necessary to support the two bridges used for this model deployment.

The application has the capability to present a photo-realistic model of the bridges, as well as their security cameras and alarm sensors. This virtual reality environment provides FDOT staff excellent situational awareness and command and control. VSOC visually fuses sensor alarms with video surveillance to decrease response times and improve the quality of alarms assessment. This project will provide automatic camera call-up for alarm detection and interactive camera call-up for the verification of a security event.

Procurement 2 – Cameras

Planned Procurement Approach: Let

Estimated Contract Budget: $400K

Milestones: Design: August-December 03
Award: February 04
Services: March 04 – October 04

Project Managers

FDOT: Larry Rivera and Clipper Tefft
PBS&J: Joe Schuerger

Key Partners: FDOT

Scope
FDOT will let a contract for bridge cameras and communications.

5.3.5 Data Fusion, ATIS, Sharing & Archiving

Summary Description: All iFlorida efforts relating to integrating, archiving and sharing with the public. This included

Procurements (4)
Procurement 1 – Statewide and Orlando Conditions System

Planned Procurement Approach: RFP

Estimated Contract Budget: $1.55M

Milestones: June 03 – October 04

Project Managers

FDOT: Anne Brewer, Larry Rivera, and Gene Glotzbach
PBS&J: Joe Schuerger

Key Partners: FDOT D5 (lead), Turnpike Enterprise, OOCEA, LYNX, Greater Orlando Aviation Authority, counties, the City of Orlando, and FDOT ITS Office and districts.

Scope
This project will establish an enhanced version of the statewide incident/event reporting systems in place today in many other parts of the country. The system, which will likely be an adaptation of an Internet-based system currently operational in the U.S., will incorporate automated data from sources including the Florida Highway Patrol's Computer Aided Dispatch (CAD) system, TTMS, and segment weather conditions and forecasts provided by Meteorlogix. The system will provide direct operator interface to enable appropriate personnel from FDOT, its partner agencies, and approved private contractors/consultants to enter reports directly into the Conditions System. Operator inputs will be TMDD-compliant. The output from the Conditions System will be in XML format, based on SAE's emerging J2354 standard and provide for each defined road segment, TTMS speed and volume data (if relevant), descriptions of all incidents/events, and the current and forecasted weather.

This system will also drive an integrated statewide Internet site, such that all available information regarding conditions on the Florida Intrastate Highway System is easily retrievable from a single site.

Within the system, a more granular level of monitoring will be established for the Orlando area, including the covered arterials, transit, and aviation elements. Automated interfaces will be established with the I-4

Surveillance and Motorist Information System (SMIS) and the Orlando Orange County Expressway Authority's Data Server (where all reader-based data in the region is being processed). For the all limited-access roadways and covered arterials, the appropriate organizations or contracted operators will insert information, geo-located and linked to its corresponding segment(s), regarding any event that impacts the expected flow of traffic, such as construction, maintenance, incidents, weather events, and special events. The interface to the FHP dispatch system will be applied here as well to automatically inject incident data into the system. LYNX and/or RTMC personnel will enter transit events regarding service disruptions, changes, and additions. GOAA and/or RTMC personnel will enter information regarding landside transportation (such as parking), generalized airport delays, and estimated wait times at security screening.

A two-way feed will be established with the Data Warehouse. The Conditions System will provide statewide and Orlando area segment reports as well as raw Meteorlogix, FHP CAD and operator-entered incident and event data to the Data Warehouse. The Data Warehouse will provide its segment forecasts with the Conditions System.

In addition, several modest software applications will be developed to support several planned data uses. These applications include:

- Converting I-4 Surveillance and Motorist Information System (SMIS) detector data into travel times over defined road segments
- Developing recommended speed limit values for each of the signs in the I-4 Variable Speed Limit Trial (utilizing both real-time and segment forecast information)
- Calculating and developing recommended roadway diversion messages, including travel times for the SR 417 and SR 423 diversion routes around I-4 (utilizing both real-time and segment forecast information)

This project provides the hardware/software platform for operations. The operators that will use this system will be procured in procurement 4 of this project bundle.

Procurement 2 – Statewide TTMS Upgrade

Planned Procurement Approach: Transfer to FDOT D5

Estimated Contract Budget: $814K

Milestones: July 03 – March 04

Project Managers

FDOT: Anne Brewer
PBS&J: Armand Ciccarelli

Key Partners: FDOT D5 (lead) and FDOT Transportation Statistics Office (lead).

Scope
The portion of the project will provide dedicated communications to all 54 TTMS sites and adds CCTVs at 48 of these sites. Figure 5.3.5-2 depicts the area encompassed by this project. Real time traffic information (volume and speed) will be available at key locations throughout the state, and video images will be provided in near real time to support traffic management and travel choice.

Where possible, real time polling capabilities will be provided using the microwave backbone (26 sites) or existing ITS fiber optic communications (11 sites) to implement the real time polling and video capabilities. Where communications are limited to leased-line access (17 sites), the video will be limited to dial-up access, with real time polling and video activated at these sites only during emergency/ evacuation applications.

Figure 5.3.5-2: Telemetered Traffic Monitoring Sites for EOC Real-Time Polling

Procurement 3 – Central Florida Data Warehouse

Planned Procurement Approach: Inter-local Agreement with the University of Central Florida

Estimated Contract Budget: $1.3M

Milestones: July 03 – April 05

Project Managers

FDOT: Anne Brewer and Clipper Tefft
PBS&J: Pete Costello

Key Partners: UCF (lead), FDOT, Turnpike, OOCEA, City of Orlando, LYNX, and Orange County.

Scope
This project will expand the existing Central Florida Data Warehouse in several areas. In addition to data supplied from the I-4 SMIS data and the OOCEA data server (the feed between the Data Server and the Data Warehouse will be completed in an ongoing project), new data sources will be accommodated, including:

- Meteorlogix weather data
- FHP CAD Data
- Operator-entered incident and event reports
- Statewide and Orlando area segment reports from the Conditions System
- LYNX static and CAD/AVL data, such as routes, stops, schedules, fares, schedule adherence and automatic passenger count data

The Data Warehouse's Orlando area web site (to be activated in late 2003 with the URL www.iflorida.gov) will be expanded to include all monitored facilities and available information.

The Data Warehouse's segment forecasting capabilities will be expanded to cover all defined Orlando roadway segments and to factor in information beyond flow data, such as weather and incidents.

The Data Warehouse will be the location from which all third party access to iFlorida data will be available. This information will be available via a published data feed and accessible to all licensed users.

Standard interfaces will be utilized to the maximum extent possible, both in terms of data input and data retrieval.

Procurement 4 – Statewide and Orlando 511 Operations

Planned Procurement Approach: Function to be part of D5 RTMC Operations Contract being re-advertised in early 2004

Estimated Contract Budget: $2.73M

Milestones: April 05 – April 07

Project Managers

FDOT: Anne Brewer and Rich Jardim
PBS&J: Pete Costello

Key Partners: FDOT D5 (lead), Turnpike Enterprise, OOCEA, LYNX, Greater Orlando Aviation Authority, counties, the City of Orlando, and, FDOT ITS Office and districts.

Scope
This project, will serve many operational purposes:

Operators will be supplied in this project to utilize, populate and ensure timely, accurate and reliable information is available on the Conditions System.

The statewide and Orlando area 511 systems will be designed, implemented, operated and maintained through this project, incorporating and formatting the segment reports available from the conditions system as the foundation for content in the service. A mix of recorded voices and text-to-speech will be utilized in the service.

Operators will serve as the primary interface with the message signs and variable speed limit signs used in the roadway diversion and variable speed limit trials, respectively. While the conditions systems contractor will develop applications to recommend what information to provide on these signs, it will be up to the operators to review and implement these recommendations as appropriate.

A major part of this project is to ensure quality control and proper operator training and procedures are in place to optimally operate the tools iFlorida provides.

5.3.6 Broadband Wireless

Summary Description: High speed internet on limited access highways. Integrate streaming bus video into broadband wireless internet.

Note: Depending on how the Probe Vehicle Test Bed is scoped, the Broadband Wireless project may be combined with the Probe Vehicle Test Bed project.

Procurement

Planned Procurement Approach: Invitation to Negotiate (ITN)

Estimated Contract Budget: $639K

Milestones: August 03 – December 04

Project Managers

FDOT: Anne Brewer and Clipper Tefft
PBS&J: Joe Schuerger

Key Partners: FDOT D5 (lead), Turnpike, OOCEA, FHP, and LYNX.

Scope
This project will implement some form of Dedicated Short-Range Communications (DSRC), IEEE 802.11 type, broadband Internet access on most or all of the limited-access highway system in the Orlando region. Our research and consultation with multiple technology providers has convinced us that the time is right to establish a high-speed (500kb/sec or more) wireless network, and that it can be done cost-effectively, particularly with our extensive regional fiber network. As described below, there is a great deal of interest in this concept to develop new uses of data that are possible only with high-speed wireless access.

Public-sector oriented applications will focus on giving public safety and incident management personnel – starting with FHP troopers, who will all have computers in their vehicles– access to the Internet and RTMC sources, including video feeds, via low-cost wireless modems. An exciting element of the project is the opening up of the network to private firms, on a nonexclusive basis at no cost to the project, who wish to try or deploy applications to take advantage of broadband access.

Several significant companies have expressed desire to participate in testing applications ranging from in-vehicle location-based services and real time traffic information to infrastructure devices. These companies have included:

- Microsoft
- Delphi Automotive
- BellSouth
- Kivera
- MetroOne
- MapInfo
- Renaissance Technologies
- Telcontar

This project will utilize broadband wireless Internet to provide a high-speed network. Twelve buses will be deployed with security cameras. Upon activation for security-related reasons by the vehicle driver or the command center, these buses will provide a "live feed" from the bus to LYNX's command center. The high density I-4 bus route from downtown Orlando to the Walt Disney attractions area has been selected for this security project. This project will demonstrate the compatibility of the technology to provide a high-speed backbone for security-related video.

5.3.7 Studies

Summary Description: How to use region-wide multi-modal data in the planning process. Apply Florida Reliability Method throughout region using automated data and bridge traffic simulation modeling. Develop emergency evacuation plan with Daytona Speedway; perform physical and cyber vulnerability assessment at RTMC.

Procurements (3)

Procurement 1 – METROPLAN Data Mining

Planned Procurement Approach: Local Agreement

Estimated Contract Budget: $100K

Milestones: July 05 – December 05

Project Managers

FDOT: Anne Brewer
PBS&J: Armand Ciccarelli

Key Partners: METROPLAN Orlando

Scope
This project will enable the region's metropolitan planning organization, METROPLAN, to identify, experiment and evaluate how comprehensive multi-modal data – available through the data warehouse – can be used to improve regional planning and decision-making.

Procurement 2 – Network Reliability / Traffic Modeling

Planned Procurement Approach: Sole Source to PBS&J

Estimated Contract Budget: $300K

Milestones: November 05 – April 07

Project Managers

FDOT: Anne Brewer and Rich Jardim
PBS&J: Armand Ciccarelli and Mohammed Hadi

Key Partners: FDOT Transportation Statistics Office, and METROPLAN Orlando.

Scope
One portion of the project will use automated travel time data generated by the project to facilitate region-wide application of the Florida Reliability Method, the state's approach of determining roadway facility reliability. The current tools used to measure reliability will be expanded in scale to accommodate a year's worth of automated data, from the first year of project operation, to obtain reliability measures over all covered segments, both limited-access and arterials.

Another portion of the project will conduct traffic simulation and modeling and dynamic traffic assignment modeling to test the effectiveness of alternative routes and transportation management strategies in the event of a disabled or destroyed bridge.

Procurement 3 – Speedway Evacuation Plan / RTMC Vulnerability

Planned Procurement Approach: RFP

Estimated Contract Budget: $300K

Milestones: Design: August – December 03
Award: February 04
Services: March – October 04

Project Managers

FDOT: Clipper Tefft and Rich Jardim
PBS&J: Keith Jasper

Key Partners: FDOT D5 (lead), FDLE, Volusia County, City of Daytona Beach, and Daytona International Speedway.

Scope
The FDOT has five operational and six planned RTMCs. The RTMCs have multiple functions, all of which involve voice, data, and video, as well as a communications infrastructure, computer equipment, multiple databases, and various applications. The primary functions of FDOT RTMCs are:

- Surveillance and monitoring
- Traffic management
- Incident and event response
- Coordination of FHP and other jurisdictions
- Provision of travel information
- Turnpike Operations, including financial systems

The existing FDLE vulnerability assessment process and apply it to the FDOT D5 RTMC to ensure adequate application of security safeguards to

the building and to ITS communications, applications, and systems within the facility. This project will combine an RTMC facility assessment with an assessment of RTMC information security. The information security will include communications, network, computer, application, and data security. The project will provide security guidelines for the FDOT D5 RTMC. This process may then be replicated by FDOT to ensure all existing and planned RTMCs meet or exceed the guidelines developed. Guidelines could be disseminated nationally to provide a basis for state and district-level DOT usage.

In this project, the Daytona International Speedway has committed to work with FDOT D5 and the transportation agencies of Volusia County to focus on coordinating transportation activities necessary to support an emergency evacuation, both in terms of getting spectators out and public safety and law enforcement personnel in.

Known as the "World Center of Racing," the Daytona Beach area is engulfed by 450,000 to 500,000 visitors for Speedweeks, two weeks of racing in February that culminates in the Daytona 500. In addition, the Pepsi 400 hosted on July 4 weekend attracts over 200,000 visitors. Many of the visitors during these events stay in the speedway's infield in motor homes, trailers, and tents. The Speedway recently updated its emergency evacuation plan. The plan is focused internally on getting spectators off property and is not focused on the effects such an evacuation would have on loading the transportation network. More importantly, the plan offers little to no reflection upon how operations and ITS-supported traffic control strategies could positively assist in such an evacuation.

The existing and programmed ITS infrastructure near the Speedway offers an "ITS-rich" environment that can be used to support such evacuations, with the key transportation agencies of FDOT D5, Volusia County, and the City of Daytona Beach all being members of the Central Florida Regional Transportation Operations Consortium. The first portion of the proposed project would develop and evaluate responses to a variety of evacuation scenarios (e.g., a panic mass evacuation with spectators in panic, a precautionary evacuation with no obvious public reason, an evacuation when one or more exits cannot be used).

Simulation modeling and visualization will be conducted to support the development of coordinated evacuation plans and corresponding ITS and transportation operations strategies. The potential role of transit providers or other means of mass transportation to support evacuation will also be investigated.

The second portion of the proposed project will review the results of this study with other major venue operators in the region. From this review, we

intend to identify common elements regarding planning evacuations from these major event venues and the role operations and ITS can play in support of evacuations and differentiate them from those elements that may be unique to the Daytona area. From this, the net result will be recommended practices that transportation agencies nationwide could use to develop better relationships with venue operators and to develop better overall plans in the unfortunate event that an emergency evacuation is necessary. While not called for specifically in the RFA, this project is an extremely cost-effective enhancement to our application and will significantly improve the performance of Central Florida's transportation system during security-related crises.

5.3.8 Evaluation Support

Summary Description: Conduct evaluation opportunity screening, develop evaluation strategy and evaluate baseline conditions, and conduct post-deployment evaluation.

Procurement

Planned Procurement Approach: Sole Source

Estimated Contract Budget: $316K

Milestones: July 03 – April 07

Project Managers

FDOT: Anne Brewer
PBS&J: Keith Jasper

Key Partners: Cambridge Systematics.

Scope
To assist and support national evaluation efforts and to conduct specific local evaluation activities as needed and desired by FDOT.

Phase 1 – Evaluation Opportunity Screening

Evaluation efforts will be initiated during the early stages of the project to begin identifying opportunities for evaluation and to assess the availability of data. Discussions between project partners and evaluators will be conducted to identify the goals of the partners in deploying the systems and to communicate the benefits of the evaluation to the partners. During this phase, particular opportunities for evaluation will be identified and investigated. Consistent with the Management Plan, this will include an identification of all participants in the deployment, along with their respective roles and responsibilities, and an assessment of the available data sources that may be used in evaluating the particular deployment. During this phase, the national evaluators may wish to work alongside the FDOT evaluation team, or may choose to allow the FDOT evaluation team to perform the initial screening of opportunities and review the assessment when complete. The FDOT evaluation team will be prepared to provide the national evaluators with information regarding:

- Project descriptions.
- Proposed deployment timelines.
- Roles and responsibilities of project partners.
- Identified deployment goals of the project partners.

- Potential data sources (including the data formats).
- Initial assessment of the opportunities for evaluation.

Phase 2 – Develop Strategy and Evaluate Baseline Conditions

During this phase, FDOT and national evaluators will coordinate to develop and implement a comprehensive evaluation strategy. This strategy must be structured to meet the needs of the national evaluators, as well as provide supplementary data feedback of specific interest to the project partners regarding the deployment and to Florida, in general, with respect to state transportation goals and objectives.

The first step in formulating this strategy will consist of the development of a detailed Evaluation Plan, including specific performance measures and targets to address project deployment, state, and national evaluation needs.

6.0 National Evaluation Focus on iFlorida Projects

Table 6.0-1 lists iFlorida projects and provides an initial suggested allocation of National Evaluation resources to support a comprehensive National Evaluation strategy across each of the 3 phases of the Program. The purpose of the table is to identify those elements of the bundled projects that have the highest probability of providing Infostructure growth and provide new, or significantly increase, the operational performance of end users. The greatest evaluation opportunities to track growth and performance are identified as being "High".

The early identification and categorization of these potential evaluation opportunities provides the National Evaluation team a project related evaluation baseline. It is recommended that the National Evaluation team review this initial suggested allocation of resources and provide feedback to the iFlorida team.

Table 6.0-1: iFlorida and the National Evaluation Focus on Projects

Bundled Project	Allocation of National Evaluation Resources - Potential Payoff		
	High	Medium	Low
Central Florida Field Components			
Design/ Build Scope		●	
Contract w/ 3-M			●
City of Orlando			●
Weather			
UNF	●		
Meteorlogix	●		
Probe Vehicle Test Bed	●		
Security Command and Control			
Boeing Autometric	●		
Cameras			●
Data Fusion, ATIS, Sharing & Archiving			
Statewide and Orlando Conditions Systems	●		
Statewide TTMS Upgrade		●	
Data Warehouse Expansion		●	
Statewide and Orlando 511 Operations	●		
Broadband Wireless		●	
Studies			
Metroplan Data Mining		●	
Network Reliability / Traffic Modeling		●	
Speedway Evac Plan / RTMC Vulnerability	●		
Evaluation Support	●		

APPENDIX A - iFlorida Quality Control Plan

Document Control Panel	
File Name:	W:\ITS Program\ITS GC\TWO1\Quality Control Plan\020913 PCP.doc
Created By:	Terrel Shaw
Date:	September 13, 2002
Version No.:	4.0
Reviewed By:	Paul Watson, Bob McQueen
Modified By:	Joe Schuerger
Date Modified:	May 25, 2003
New Version No.	1

iFlorida Program Quality Control Plan

Quality Control Plan:

Each deliverable shall include a quality control tracking log as outlined below. This page shall be a numbered page that will be located immediately following the cover page for any reports or studies. Construction documents or other plans shall include the quality control tracking log as part of the computation book that will be maintained for any design-related effort.

Document Control Panel	
File Name:	
Created By:	
Date Created:	
Version No.:	
Reviewed By:	
Reviewed By:	
Approved By:	
Modified By:	
Date Modified:	

1. Overview

The iFlorida Team is committed to providing quality professional services to FHWA.

A quality work product is one that meets contract requirements and is prepared in accordance with accepted standards of professional practice. Quality work products are more likely to be achieved with quality management practices.

This manual documents the iFlorida Program Quality Control Plan for the iFlorida program. Included are the following essential components:

- A ***Program Work Plan*** is written as the first activity on any project. Among the required elements of the Work Plan is a ***Quality Control Plan.***

- Each ***Project Manager*** is responsible for quality control on his or her project. There is a unique project manager for each project in the iFlorida program. Program. This person is responsible for ensuring that the principles of this Quality Control Plan are executed commensurate with the complexity and effort required for each task. It is not anticipated that formal quality control reviews will be required for every possible deliverable; however, at a minimum, a peer review of all reports, studies, and computations should be performed. Design projects or configuration management efforts will require more formal quality control plans and documentation as outlined in this plan

- The ***Program Manager (Anne Brewer, P.E., FDOT)*** is responsible for the application of this process within the program and for overall quality assurance of all deliverables and quality audits on any project during production. The Program Manager is responsible for the review of any products for dissemination to FHWA.

2. Definitions

Biddability Review – A review prior to bidding of construction contract documents that seeks to identify omissions, conflicts, ambiguities, inaccuracies, and deficiencies in and among the construction documents; biddability reviews are made in addition to quality control reviews.

Constructibility Review – A supplemental and specialized review of construction plans and specifications that seeks to identify construction requirements that are impractical, unnecessarily costly, or impossible to build; constructibility reviews are made in addition to quality control reviews.

Coordination Review – A review of combined work elements to identify and resolve any conflicts that may exist among the elements.

Deliverable – A document that is a product of our professional service and that is to be furnished to our client in the contract for those services.

Field Review – A visit to the site to verify compatibility with the conditions under which the designed facilities will be constructed.

Kick-Off Meeting – A meeting held before work begins on a project in which the Project Control Plan is discussed by the project manager, the lead technical professionals, the quality control reviewers, and others as appropriate.

Lead Technical Professional – An engineer, architect, planner, scientist, surveyor, or other qualified professional with primary technical responsibility for the production of a task or work element on a project.

Originator – The author of a document or drawing.

Peer Review – A second quality control review performed on selected projects, or portions of a project, by an independent team of qualified reviewers; this review is performed in addition to the regular quality control process conducted under the direction of the project manager. Normally, members of the peer review team are not assigned to the same organizational unit or location that managed and produced the project. The peer review is a comprehensive examination of the technical aspects of the project design. Peer reviews are made in addition to quality control reviews.

Program Manager – Responsible for the application of the Quality Control process within the program and for communicating and developing compliance with this process.

Program Work Plan – A document that outlines the progress of the assignment from project start through production, quality control, coordination, delivery of the product, and archiving of the project records.

Project Manager – The project team leader responsible for the overall management, production coordination, and quality control on a task assignment.

Project Team – Technical and support staff and subconsultants responsible for performing a project assignment for a client under the direction of a project manager.

Q-Audit Team – A designated group of professionals, appointed by iFlorida management, who is responsible for monitoring the process. The team members perform training, audits, and other activities to facilitate compliance with the Quality Control Plan.

Quality Control Review – A process for reviewing and correcting work products before they are released for use by the client or otherwise released as a final work product of iFlorida.

Quality Control Reviewer – A designated project team member responsible for performing quality control reviews associated with a task in accordance with the Quality Control Plan for the project; the quality control reviewer has the technical knowledge and qualifications necessary to serve as the lead technical professional for the work products being reviewed.

Quality Assurance – Procedures to determine that quality control is being or has been performed effectively and appropriately.

Quality Control – Prescribed procedures by which work products are reviewed and brought into compliance to conform to professional standards, contractual obligations, and client commitments.

Quality Control Plan – A document that details the activities, staff, and schedule for quality control on the project.

Subconsultant – A firm or individual working under contract to FDOT to provide responsible technical services on a project under FDOT's direction.

3. Elements of the Quality Plan for any Task Assignment

A Quality Control Plan is prepared for each iFlorida project. The typical Quality Control Plan accomplishes the following:

- Identifies the level of detail to be applied on each review;
- Includes quality requirements for subconsultants, if they are utilized on the project;
- Identifies which milestones will require quality control reviews;
- Identifies the quality control reviewers responsible for each task element and the project manager responsible for quality assurance verification;
- References this manual and describes any specialized quality control review or quality assurance procedures to be followed;
- Identifies what, if any, supplemental reviews (i.e., biddability, constructibility, peer) are to be performed; and
- Includes a quality control review log to be utilized by the project manager for tracking and documenting the quality control process. The log identifies the documents to be reviewed and the schedule for those reviews.

The Quality Control Plan will be prepared as a stand-alone document by the project manager for each assignment using the checklist provided in this Quality Control Plan. A project manager will be identified by iFlorida for each task assignment. This project manager is responsible for ensuring that all work prepared by iFlorida, or any subconsultant, employs a comparable quality control system. If not, the subconsultants will revise or develop their procedures to be equivalent. Subconsultants are to be compelled to follow the approved procedures, document their quality control activities, and make their documentation available to iFlorida's project manager for quality assurance verification.

4. Review Procedures

4.1 Overview

A wide range of engineering, planning, architectural, scientific, and related technical services that entail the production of a multitude of different types of work products will be provided on this contract. Work products to be quality control reviewed fall under the following categories:

- Studies and reports;
- Calculations (hand and computer);
- Shop drawings;
- Technical specifications and design criteria;
- Quantity and cost estimates;
- Configuration management; and
- Products provided in Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Microsoft Access, graphics, maps, and any other information requested.

The project's Quality Control Plan should specify the work products requiring quality control reviews, the responsible quality control reviewers, and the schedule for performing the quality control reviews. Generally, quality control reviews should be performed on each work product before it is used for further design development and before a required phase submittal to the client.

The quality control reviewer needs to know the technical basis on which the work has been produced and the project's objectives, constraints, and requirements. The project manager is to furnish the quality control reviewer with a complete package of background information with the work product.

4.2 Quality Control Review Package

This quality control review package will typically include the following:

- The work product to be reviewed;

- The project scope;
- Client directives;
- Design criteria, assumptions, technical standards, codes, and regulations;
- Exceptions or variances to design criteria, with the client's concurrence, if appropriate;
- Applicable data;
- Computations;
- Alternatives analyses and selected alternative justification; and
- Previous review comments.

4.3 Quality Control Review Process

The following five-steps constitute iFlorida's standard process for QC review of work products:

1. The originator prepares the document under the supervision of the lead technical professional. The lead technical professional delivers the document and supporting documentation to the quality control reviewer.

2. The quality control reviewer marks in yellow those items he has checked and agrees with and identifies in red those items that may require correction. Marks or comments by the quality control reviewer should be clearly distinguished from those of the originator. The quality control reviewer returns the document to the lead technical professional for review and concurrence.

3. The lead technical professional indicates concurrence by red check mark on any changes recommended by the quality control reviewer. If they cannot initially agree, they resolve the differences with a third qualified technical resource, usually the program manager. Quality control comments determined to be inappropriate or not applicable are crossed out and initialed by the lead technical professional and the quality control reviewer.

4. The agreed-upon changes are made to the document, reviewed by the lead technical professional, and a clean (revised) document is sent back to the quality control reviewer by the lead technical professional along with the revised (marked up) review document for verification of changes.

5. The quality control reviewer verifies by a re-review and indicates by a green check mark that the appropriate changes were made to the document. Incorrect or omitted changes are circled or otherwise clearly marked in green.

4.4 Review of Studies and Reports

In lieu of the hand marking of materials, electronic delivery of review and comments can be provided using Adobe Acrobat or Microsoft Word tracking programs for editing,

commenting, and tracking changes. When these functions are used, a set of the comments should be saved by the quality control reviewer and transmitted to the lead technical professional or project manager. This step is similar to Step 2 above. The lead technical professional will then review the comments and choose to accept them or resolve any differences with the Program Manager. These steps parallel Steps 3 and 4 above. The revised document should then be reviewed by the quality control reviewer as noted in Step 5 above.

4. 5 Review of Calculations

Calculations should be quality control reviewed before proceeding to subsequent steps or stages of a project that depend on them. Progressive review of calculations in this manner should help avoid unnecessary and costly "redo's" to interim and final work products that depend on successive calculations.

4.5.1 Review of Computer Calculations (Commercial Software)

Manual calculations are to be clearly and legibly written on standard computation sheets. All heading information is to be filled out on the computation sheets. A complete set of computation sheets for calculations typically includes:

- A title sheet;
- An index arranged by group or component (i.e., slab, diaphragms, geometric data, vertical data);
- Criteria and references;
- The calculations themselves, checked and with all sheets properly numbered and initialed;
- An appendix containing the following pertinent information –
    - Reference calculations by others;
    - FDOT standard calculations;
    - Reference information such as catalog cuts, tables from the American Association of State Highway and Transportation Officials (AASHTO), American Society for Testing and Materials (ASTM) standards, etc.; and
    - Books and pamphlets referenced by title, author, and page number.

4.5.2 Review of Computer Calculations (Commercial Software)

In general, only FDOT-accepted software is to be used in technical work and only under the direction of personnel that are skilled in its use. FDOT standard software will be used

for work prepared in this program (i.e., Microsoft Word, Microsoft Excel, Microsoft PowerPoint, Microsoft Visio, and Microsoft Access.).

The quality control reviewer must be knowledgeable about the software's capabilities and limitations as well as the technical subject to which the software is applied. The quality control reviewer confirms the following:

- The software is FDOT-accepted or the necessary verification process has been followed, including documentation;
- The software was properly applied;
- The input data was accurate and in the format required by the program; and
- The output meets the test of reasonableness, based on a sufficient number of spot checks.

4.5.3 Review of Computer Calculations (Spreadsheets and Other User-Developed Models)

For spreadsheets, database management programs, and other applications software in which the user provides the computational logic, quality control review closely follows the requirements for hand calculations.

The quality control reviewer must be knowledgeable in the application software as well as the technical subject on which it is used. The quality control review under Step 2 of the Quality Control Review Process encompasses at least the following, with appropriate documentation of concurrence:

- Examination of the formulas and computational logic;
- Spot checks of the calculations;
- Verification of the input; and
- Verification of the results.

4.6 Review of Shop Drawings

Shop drawings are received from, and returned to, only the general contractor on the work (or to the client, if required by our client contract). A shop drawing log is maintained for all construction projects. Shop drawings are reviewed against the following:

- Calculations;
- Plans and specifications; and
- Any addenda or change orders.

The individual who is the most familiar with the design should review shop drawings. The initial reviewer marks those items he has checked and agrees with and identifies those items that may require correction. He initials and dates the review print. The

marked-up prints are reviewed by the lead technical professional or other designated quality control reviewer who, once satisfied, directs that the remaining copies of the shop drawing be stamped and appropriate comments be added in red.

Shop drawings are initialed and dated, before return to the contractor, by a professional who is licensed to practice in the state in which the work is to be performed, usually the lead technical professional on that aspect of the design.

4.7 Technical Specifications and Design Criteria Packages

The same guidelines presented herein for engineering computation and design documents, including the requirement that each individual sheet be checked, initialed, and dated, apply to the development of technical specifications and design criteria packages.

4.8 Quantity and Cost Estimates

The same guidelines presented herein for technical computations apply to quantity take-offs, estimates of probable construction (or project) costs and calculations, including the requirement that each individual sheet be checked, initialed, and dated. Assumptions, data sources, and other pertinent estimating criteria should also be recorded. Standard calculation paper should be used and the calculations must be neat.

It is the project manager's responsibility to see that quantity take-offs and estimates reflect the current status of the project, including recent revisions. Estimates of probable construction (or project) costs should be reviewed, initialed, and dated (as are drawings and specifications) by the project manager prior to providing this information to the client or others outside the firm.

4.9 Invitations to Negotiate (ITN), Scopes of Work, Functional Requirements, and Other Advertisement-Related Documents

The same guidelines presented herein for engineering computation and design documents, including the requirement that each individual sheet be checked, initialed, and dated, apply to the development of technical specifications and design criteria packages.

4.10 Configuration Management

Projects that require configuration management should follow professionally accepted techniques such as the Systems Engineering Compatibility Model published by the Electronic Industry Association (EIA Std. 731/732) or the equivalent.

4.11 Documentation

A quality control file is established at the outset of each project and is maintained with the project files. Quality control and quality assurance documents consists of the following two elements:

1. A quality control file that is maintained in the contract filing system; and

2. A quality control documentation package that is maintained by the project manager.

During the project, the following information is compiled by the project and incorporated into the quality control file:

- A current Quality Control Plan and any previous Quality Control Plans;
- A copy of all subconsultant Quality Control Plans and approvals;
- A copy of the Quality Control Plan approval from the client (if required);
- A quality control review log;
- Quality assurance review comments and responses (if not contained on reviewed documents);
- Peer review comments and responses (if not contained on reviewed documents);
- Copies of all quality control correspondence; and
- A quality control and quality assurance evaluation form.

During the production and quality control review activities on a project, the lead technical professionals compile and retain (file) relevant technical information pertaining to their work for which they are responsible. When the five-step quality control review process has been completed for a work element, the lead technical professional compiles documents utilized and/or generated by the process from the quality control reviewer(s) and others involved in the process and forwards a quality control documentation "package" to the project manager. This package should include the following:

- The working documents that were subjected to quality control reviews, bearing the original quality control markings and comments and the completed quality control tracking stamp.
- A print or copy of the latest (updated) version of the document after the quality control process with all agreed-upon changes and revisions from the quality control review process incorporated.

- Copies of internal communications relating to the quality control review process and other pertinent information relied upon by the quality control reviewer, the lead technical professionals, and others in making and resolving quality control review comments and changes to the originally produced documents.

The project manager compiles all of the quality control documentation packages for the project (identified in the quality control review log), evaluates them for completeness, follows up with the responsible lead technical professionals to correct any noted deficiencies, and incorporates this information into the quality control file. Additional quality control documentation arising from the project manager's coordination review and other supplemental reviews (e.g., constructibility, biddability, peer) is to be added by the project manager to this file to create a complete record of quality control and quality assurance activities on the project.

These quality control files and documentation packages are to be retained permanently.

4.12 Documentation Control

The establishment of a thorough document control procedure is essential to any project manager in order to retrieve prior records of correspondence in a timely manner and to provide a quick response to clients. The discussion here is intended to be general and should be applied as appropriate for any project.

The following documents, including all original correspondence, correspondence logs, forms, and design notes, must be placed in the iFlorida central files. In addition, the central files shall contain all permit applications, sketches, reports, copies of applications, sketches, copies of application fee receipts, and other information submitted for regulatory or city/county code enforcement review. Plans and/or specifications and any other bulky information shall be placed in a manila envelope labeled to properly identify its contents and inserted immediately behind the job file. If FDOT is involved in the construction phase, then all correspondence with client and contractor should be retained, as well as all contractor approvals, pay requests, change orders, and certifications. Project files shall indicate the project name, project number, and type of material included.

Production personnel are allowed to maintain their own design notebooks for reference; however, all information contained therein shall be copies. Under no circumstances shall production personnel maintain their own original job files at their desks.

4.12.1 Project Calculations

Calculation sheets are important records of job activity. They are a major part of the project work effort and may be referenced by persons unfamiliar with the project years

after they are completed. These documents are to be neat, presentable, well organized, and easily retrievable.

Calculation sheets are to be bound with the job number and title conspicuously posted on the outside of the volume. Three-ring binders are effective for this purpose while the work is being performed, but a more permanent binding should be used when the job is complete. An index and/or tabs should be used to facilitate retrieval of computation subsets.

All calculations are to be made on standard calculation paper, with the heading completed for each individual sheet. Since the computational procedures are as important as the result, always record calculations neatly. Neatness facilitates checking, reduces errors, and allows effective review of computational processes after the job is complete.

4.12.2 Calculation Check Sets

Calculation check sets shall be handled the same as calculations.

4.12.3 Checklists

Checklists shall be maintained by the project professional in the service work area during the production of the project. Upon project completion, the checklist shall be bound into the project quality control file.

4.12.4 Check Prints

Development check prints may be discarded after their quality control review; however, each check print set for a submittal shall be retained forever.

4.12.5 Submittal Prints (Interim Submittal)

Record reproducibles (mylars) or prints for all phase submittals shall be kept in the drawing files. These may be purged from the project files and archived.

4.12.6 Submittal Prints with Review Comments

All submittal check prints with review comments shall be kept in the drawing files. These sets shall be kept separate from the record sets.

4.12.7 Submittal Prints (Final Submittal Issued for Bidding and Construction)

Final prints and a reproducible set shall be stored in the drawing files.

4.12.8 Computer Program Verification

Computer program verification documents shall be filed and retained.

4.12.9 Shop Drawing Submittal

Shop drawing submittal returned to the construction engineering inspection or contractor shall be stored either in the drawing file or the project file as appropriate for size. The shop drawing log should be part of this file.

4.12.10 Correspondence

The importance of recording dates and distribution of correspondence often cannot be predicted at the time material is sent or received. Therefore, it is imperative that office procedures related to correspondence be applied in a consistent, systematic manner. It is the routine nature of these procedures that gives them credence in the event questions arise at a later date. All outgoing correspondence must be identified regarding the job and phase to which it applies.

Copies of correspondence shall always be maintained in the central file. Additional copies of correspondence frequently referred to may be retained by the project manager or others, but personal files must never supersede the central filing system.

4.12.11 Telephone Calls

A brief record should be made of each telephone call pertaining to a job. This should be accomplished routinely since a seemingly insignificant call may become very important at a later date. Procedures vary from office to office regarding the filing of telephone memoranda. In any case, a record of obviously important calls should be filed in the general correspondence file. If it is recognized that the call might result in potential time or fee change decisions, a confirming letter or memorandum to the caller is in order.

4.12.12 Program Work Plan

The Program Work Plan and associated documents shall be retained and archived.

4.12.13 Design Notes

Project design notes shall be recorded, using computation paper, to maintain an accurate record of the assumptions made for the basis of design, formulas applied and their sources, computations, and a summary of findings. The design notes should be clear and concise so that any technical personnel can review and understand the notes fully without prior knowledge of the project. Design notes shall be bound, stapled, or otherwise attached in a set with all pages consecutively numbered. The cover sheet shall indicate the correct number of pages in the set of design notes.

The design notes should clearly indicate:

- The purpose and intent of the computation or design;

- A clear statement of the trial-by-trial or step-by-step analysis of the problem or computation, including bad assumptions or misdirection. Bad assumptions, misdirection, and the resulting computations are important records so that the different approaches form the complete design approach and eliminate subsequent repetition of a computation based on poor assumptions;

- A check of the computations by a different mathematical approach or reference to similar results from computations on the other projects;

- A statement of the factor of safety used in the design, understanding that the more unknowns or assumptions made to perform the computation, the greater the factor of safety should be; and

- A statement of the findings and conclusions.

4.12.14 Quantity and Cost Estimates

a) Preparation and Checking

The same guidelines presented herein for technical computations apply to quantity take-offs, estimates of probable construction (or project) costs and calculations, including the requirement that each individual sheet be checked, initialed, and dated. Assumptions, data sources, and other pertinent estimating criteria should also be recorded. Standard calculation paper should be used and the calculations must be neat.

It is the project manager's responsibility to see that quantity take-offs and estimates reflect the current status of the project, including recent revisions. Estimates of probable construction (or project) costs should be reviewed, initialed, and dated (as are drawings and specifications) by the project manager prior to providing this information to the client or others outside the firm.

b) Transmittal Procedures

Due to the sensitive nature of estimates of probable construction (or project) costs, they are to be transmitted only at the program manager's direction. The basis and purpose of the estimate is to be indicated in the transmittal letter to reduce the possibility of misunderstanding by the client.

As with other calculations, quantity estimates and probable estimates of construction costs should be supported by documenting assumptions and sources of quantity or unit price data.

c) Precautions

All probable estimates of construction costs are important, from the preliminary estimate that a client may believe represents the maximum cost of the projects to the final estimate that may be a basis for rejection of bids. Observance of the following precautions should minimize misunderstandings:

- **Inform the Client –** At the time the first estimate is submitted, be sure the client understands that it is no guarantee that the project can be built for that amount. Many clients understand this, but misunderstandings may arise with the client who has work constructed infrequently.

- **Keep a Record –** The project manager must keep a careful record of estimates furnished to the client. As the work progresses, changes to the estimate should be documented promptly.

- **Keep the Client Informed –** Notify the client of cost changes promptly and give reasons for the changes.

4.12.15 Project Drawings

All project drawings should be kept in a file and controlled by the project manager or his designate. Final check prints and record drawings should also be kept in the same file.

If revisions occur to contract drawings once they've been completed, the following procedure should be followed:

1. Make reproducible mylar sepia of drawing prior to making revision;

2. Write "VOID" across mylar sepia using indelible ink;

3. Make revisions to drawing completing the revision block and identifying the revision on the drawing;

4. Make distribution prints of revised original; and

5. Return revised original voided sepia to flat file.

4.12.16 Official Project File

The official project files for any project executed in this program are maintained in the FDOT Office. ***All project documentation shall be copied to the file and assigned an identifier in the electronic filing system established for this program.*** For these projects, the task project manager is required to provide copies of the complete project file upon completion of the project. In the interim, all major correspondence and deliverables should be copied to the iFlorida Program Coordinator (Richard Mino) for identification and filing.

APPENDIX B - List of Contacts

Company	Last Name	First Name	Address	City	State	Zip Code	Phone
3M	Griffith	Terry	217 Evans Drive	Jacksonville Beach	FL	32250	(904) 246-9638
Boeing-Autometric, Inc.	Fortunato	Tom	7700 Boston Boulevard	Springfield	VA	22153	(703) 923-4354
Boeing-Autometric, Inc.	Frampton	Hal	7700 Boston Boulevard	Springfield	VA	22153	
Boeing-Autometric, Inc.	McPhaul	Lisa	7700 Boston Boulevard	Springfield	VA	22153	(703) 270-6682
Boeing-Autometric, Inc.	Rummage	Kenneth	7700 Boston Boulevard	Springfield	VA	22153	(703) 923-4523
Boeing-Autometrics, Inc.	Casullo	Robert	7700 Boston Boulevard	Springfield	VA	22153	(703) 270-6720
Boeing-Autometrics, Inc.	Cressy	Chris					
Brevard County	Thompson	Dick					
Brevard County Emergency Operations	Lay	Bob	1746 Cedar Street	Rockledge	FL	32955	(321) 637-6670
Brevard County Traffic Engineering	Clymer	Lee	2725 Judge Fran Jamieson Way, Building A	Viera	FL	32940-6605	(321) 455-1440
Brevard County Traffic Engineering	Denninghoff	John	2725 Judge Fran Jamieson Way, Building A	Viera	FL	32940	(321) 633-2077
Brevard County Traffic Engineering	Kamm	Bob	2725 Judge Fran Jamieson Way, Building A	Viera	FL	32940-6605	(321) 633-2077
Brevard County Traffic Engineering	Mihalich	Doug	2725 Judge Fran Jamieson Way, Building A	Viera	FL	32940-6605	(321) 455-1440
Brevard County Traffic Engineering	Pelham	Greg					
Cambridge Systematics Inc.	Tobin	Candace	150 Cambridge Park Drive, Suite 4000	Cambridge	MA	02140	(617) 354-0167
Cambridge Systematics Inc.	Vandervalk	Anita	1820 East Park Avenue, Suite 203	Tallahassee	FL	32301	(850) 219-6388
City of Daytona Beach Traffic Engineering	Boggs	Bob	P.O. Box 2451	Daytona Beach	FL	32115-2451	(386) 671-8650
City of Kissimmee	Cogh	Larry					
City of Orlando	Campbell	Harry	P.O. Box 4990	Orlando	FL	32802-4990	
City of Orlando	Kibler	Chris					
Daytona International Speedway	Campbell-Baker	Lorie	1801 W. International Speedway Boulevard	Daytona Beach	FL	32114	(386) 947-6416
Daytona International Speedway	Powers	John					
FDOT - Central Office	Desai	Harshad	605 Suwannee Street, MS 27	Tallahassee	FL	32399-0450	(850) 414-4315
FDOT - District 2	Vega	Peter	2250 Irene Street	Jacksonville	FL	32204	(904) 360-5463
FDOT - District 2	Warden	Randy	2250 Irene Street	Jacksonville	FL	32204	(904) 360-5454
FDOT - District 5	Brewer	Anne					(386) 943-5319
FDOT - District 5	Ferrell	Fred					
FDOT - District 5	Gilhooley	George					
FDOT - District 5	Heller	Jennifer					(386) 943-5322

FDOT - District 5	Jardim	Richard	State of Florida Department of Transportation 133 South Semoran Boulevard	Orlando	FL	32807	(407) 736-1901
FDOT - District 5	Kegel	Steven					
FDOT - District 5	Rivera	Larry					
FDOT - District 5	Tefft	Clipper	State of Florida Department of Transportation 719 S. Woodland Blvd., MS 3-562	DeLand	FL	32720	(386) 943-5331
FDOT - District 5	Woods	Jerry					
FDOT - District 5 ITS Office	Glotzbach	Gene					
FDOT Central Office	Golden	James	605 Suwannee Street, MS 27	Tallahassee	FL	32399-0450	(850) 414-4736
FDOT Central Office	Hoang	Lap					
FDOT Central Office	Hsia	Liang	605 Suwannee Street, MS 90	Tallahassee	FL	32399-0450	(850) 410-5615
Company	Last Name	First Name	Address	City	State	Zip Code	Phone
FHP	Carrick	Grady	7322 Normandy Boulevard	Jacksonville	FL	32205	
FHP	Grady	Carrick					
FHP	James	Lee					
FHP	Lee	Jim	133 S. Semoran Boulevard	Orlando	FL		(407) 737-2300
FHP	Williams	Steve					
FHWA	Lokesh	Hebbani		Tallahassee	FL		
FHWA	Mowery	James	Office of Acquisition Management (HAAM30-D) Federal Highway Administration Room 4410 400 7th St, S.W.	Washington	DC	20590	(202) 366-4244
FHWA	Munoz	Norbert					
FHWA	Pol	James					
FHWA	Rupert	Bob					
FHWA	Wilbur	Toni	FHWAHRDO-1Turner Fairbank Highway Research Center6300 Georgetown Pike	McLean	VA	22101	(202) 493-3269
GOAA	Friel	Brad	1 Airport Boulevard	Orlando	FL	32827-4399	(407) 825-3139

LYNX	Jamison	Doug	445 W. Amelia St., Suite 800	Orlando	FL	32801-1128	(407) 841-2279
LYNX	Johnson	Edward	445 W. Amelia Street, Suite 800	Orlando	FL	32801-1128	(407) 841-2279
LYNX	Schneeman	Bill	445 W. Amelia St., Suite 800	Orlando	FL	32801-1128	(407) 841-2279
Meteorlogix	Goertz	Steve	11400 Rupp Drive	Minneapolis	MN	55337	(952) 882-4569
Meteorlogix	Masse	Mike					
Meteorlogix	Moormeier	Reed					
Metroplan Orlando	Barley	Harry	315 E. Robinson Street, Suite 355	Orlando	FL	32801	(407) 481-5672
MetroPlan Orlando	Hill	Eric	315 E. Robinson Street, Suite 355	Orlando	FL	32801	(407) 481-5672
Mitretek	Gonzalez	Paul					
Mitretek	Salwin	Art					
OOCEA	Griffin	LA	525 S. Magnolia Avenue	Orlando	FL	32801	(407) 316-3800
Orange County Traffic Engineering	El-Assar	Hazem	4200 S. John Young Parkway	Orlando	FL	32839	(407) 836-7866
Orange County Traffic Engineering	Rozier	Ruby	4200 S. John Young Parkway	Orlando	FL	32839	(407) 836-7866
PBS&J	Watson	Paul		Tallahassee	Florida		
PBS&J - Orlando	Schuerger	Joe					(407) 647-7275
Science Applications International Corporation - FHWA	Carter	Mark	400 7th Street, SW Room 3416	Washington	DC	20590	(202) 366-2196
Seminole County	Muniz	Dave					
Seminole County	Wetzel	Charlie					(407) 665-5686
Seminole County Traffic Engineering	Oteyza	Noel					(407) 665-5640
TPKE	Birenbaum	Ingrid					
Turnpike Traffic Operations	Whiticker	Ranzy	P.O. Box 613069	Ocoee	FL	34761	(407) 532-3999
UCF	Al-Deek	Haithem	Turnpike Mile Post 263, Building 5317 P.O. Box 162450	Orlando	FL	32816-2450	(407) 823-2988
University of Central Florida	Atkins	Andrea	12443 Research Parkway, Suite 207	Orlando	FL	32826-3252	(407) 823-0138
University of Central Florida	Kerr	Patrick					
University of Central Florida	Radwan	Essam	P.O. Box 162450	Orlando	FL	32816-2450	(407) 823-2841
University of Central Florida	Selter	Jack					
University of North Florida	Lambert	David	4567 St. Johns Bluff Road	South Jacksonville	FL	32224-2645	(904) 620-3881
Volusia County Traffic Engineering	Cheney	Jon	123 West India Avenue	DeLand	FL	32720-4262	(386) 736-5968