SunGuide^{SM}:

Implementation Plan – District 4

SunGuide-IP-D4-1.1.1

Prepared for:

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List of Acronyms

CCTV ....Closed Circuit Television
ConOps ....Concept of Operations
CSE ....Computer Sizing Estimates
DMS..........................Dynamic Message Sign
EH ....Executive Handler
FDOT ....Florida Department of Transportation
GUI ....Graphical User Interface
IIS..............................Internet Information Server
IM..............................Incident Management
IP...............................Internet Protocol
ITS.............................Intelligent Transportation Systems
IV&V ....Independent Verification and Validation
NTCIP.......................National Transportation Communications for ITS Protocol
SATP.........................Software Acceptance Test Plan
SDD...........................Software Design Document
SICP ....Software Integration Case Procedures
SIP.............................Software Integration Plan
SRS ....Software Requirements Specification
STP............................Software Test Procedures
SUM..........................Software User's Manual
SwRI ....Southwest Research Institute
TCP ....Transmission Control Protocol
TMC...........................Transportation Management Center
TSS............................Transportation Sensor Subsytem
VDD...........................Version Description Document
VS ....Video Switching
VW............................Video Wall

REVISION HISTORY

Revision	Date	Changes
1.0.0	January 7, 2005	Initial Release.
1.1.0	May 26, 2005	Updated for Release 1.1
1.1.1	June 2, 2005	Updated: • To include Incident Management Subsystem estimates • The integration case tests to be run as part of the Software Test Procedures • Schedule based on post Factory Acceptance Testing discussions.

1. Scope

1.1 Document Identification

This document serves as the Implementation Plan (IP) for the SunGuide^{SM} software specific to District 4.

1.2 Project Overview

The Florida Department of Transportation (FDOT) is conducting a program that is developing SunGuide^{SM} software. The SunGuide^{SM} software is a set of Intelligent Transportation System (ITS) software that allows the control of roadway devices as well as information exchange across a variety of transportation agencies. The goal of the SunGuide^{SM} software is to have a common software base that can be deployed throughout the state of Florida. The SunGuide^{SM} software development effort is based on ITS software available from both the states of Texas and Maryland; significant customization of the software is being performed as well as the development of new software modules. The following figure provides a graphical view of the software to be developed:
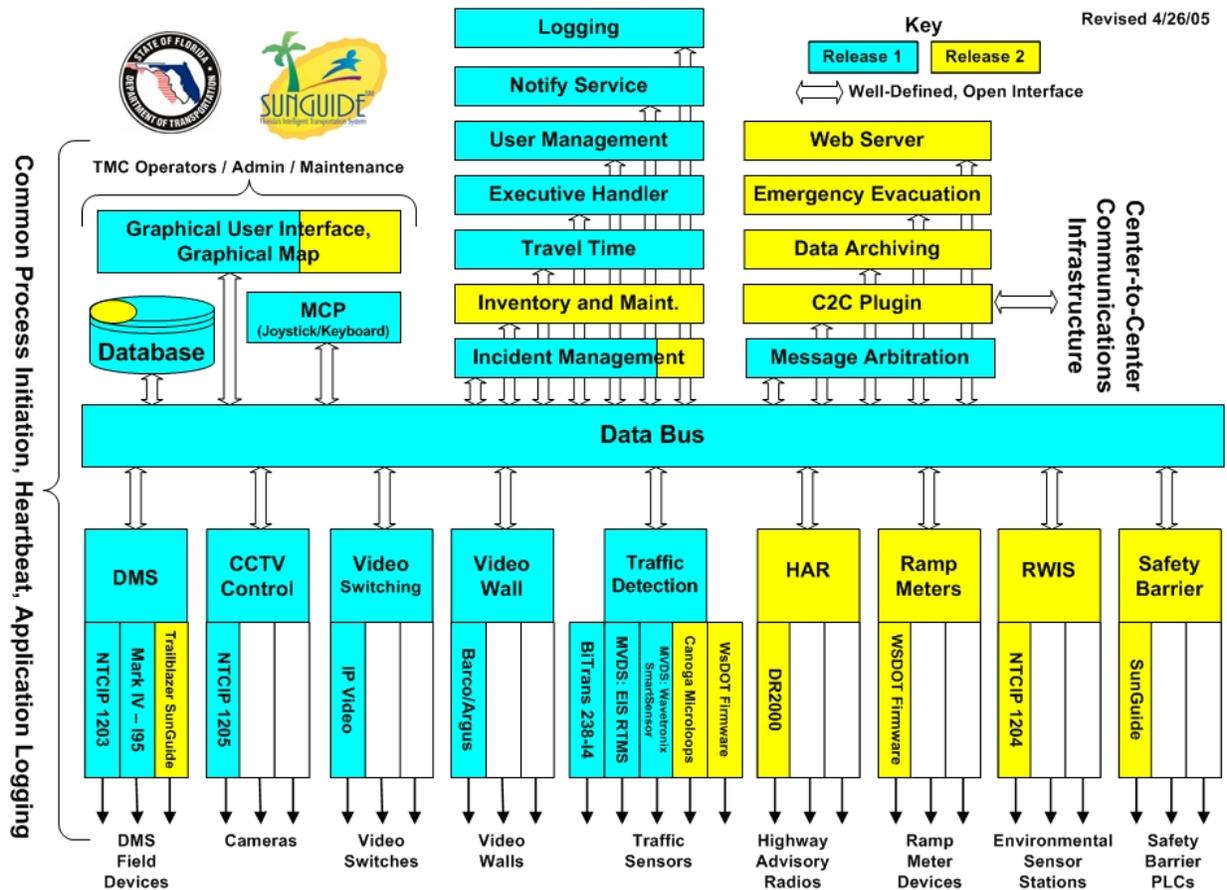

Figure 1.1 - High-Level Architectural Concept

The SunGuide^{SM} development effort spans approximately two years. After the development, the software will be deployed to a number of Districts and Expressway Authorities throughout Florida and support activities will be performed.

1.3 Related Documents

The following documents were used to develop this document:

- SwRI Qualification Response: *Response to the Invitation to Negotiate (ITN): Statewide Transportation Management Center Software Library System, Negotiation Number: ITN-DOT-02/03-9025-RR,* SwRI Proposal No. 10-35924, dated: November 18, 2002.

- SwRI Technical Proposal: *Technical Proposal for Invitation to Negotiate (ITN): Statewide Transportation Management Center Software Library System, Negotiation Number: ITN-DOT-02/03-9025-RR,* SwRI Proposal No. 10-35924, dated: January 31, 2003.

- SwRI Cost Proposal: *Cost Proposal for Invitation to Negotiate (ITN): Statewide Transportation Management Center Software Library System, Negotiation Number: ITN-DOT-02/03-9025-RR,* SwRI Proposal No. 10-35924, dated: January 31, 2003.

- SwRI BAFO letter: *Southwest Research Institute® Proposal No. 10-35924, "Invitation to Negotiate (ITN): Statewide Transportation Management Center Software Library System", Reference: Negotiation Number: ITN-DOT-02/03-9025-RR*, dated: May 5, 2003.

- FDOT procurement document: *Invitation To Negotiate (ITN), Negotiation Number: ITN-DOT-02/03-9025-RR, Statewide Transportation Management Center Software Library System*, dated: October 21, 2002.

- FDOT Scope of Services: *Statewide Transportation Management Center Software Library System: Scope of Services,* September 22, 2003.

- FDOT Requirements Document: *Statewide Transportation Management Center Software Library System: Requirements Specification,* June 3, 2003.

- Southwest Research Institute, *TMC Software Study*, November 15, 2001.

- Southwest Research Institute, *Introduction to an Operational Concept For the Florida Statewide Library*, FDOT – OCD – 1.0, March 31, 2002.

- World Wide Web Consortium (W3) website: http://www.w3.org.

- SunGuide^SM Project website: http://sunguide.datasys.swri.edu.

1.4 Contacts

The following are contact persons for the SunGuide^SM software project:

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The following are contacts that will be used by the SunGuide^{SM} software project team to assure consistency with other FDOT projects and FDOT procedures:

- Jim Mosser, PB Farradyne, FDOT C2C Project, mosser@pbworld.com, 754-224-6966
- David Lambert, University of North Florida, RWIS, jlambert@unf.edu, 904-620-3881
- Bob Colins, PBS&J, Emergency Evacuation, bobcolins@pbsj.com, 850-575-1800
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- Leslie Jacobson, PB Farradyne, Ramp Metering, jacobsonl@pbworld.com, 206-382-5290

2. Deployment Details

The following documents should be available to FDOT staff as they prepare for a SunGuide^{SM} deployment (the most recent versions are available on the project web site):

- Computer Sizing Estimates (CSE)
- Concept of Operations (ConOps)
- Software Requirements Specification (SRS)
- Software Design Document (SDD)
- Version Description Document (VDD)
- Software User's Manual (SUM)
- Software Integration Plan (SIP)
- Software Acceptance Test Plan (SATP)
- Software Integration Case Procedures (SICP)
- Software Test Plan (STP)

2.1 Subsystems To Be Installed

The following SunGuide^{SM} subsystems will be installed for the initial deployment at District 4:

- Administrative Editor
- Executive Handler
- Status Logger
- Data Bus
- GUI / Map (GUI)
- Closed Circuit Television (CCTV)
- Dynamic Message Sign (DMS)
- Video Switching (VS)
- Video Wall (VW)
- Transportation Sensor Subsystem (TSS)
- Incident Management (IM)

As additional hardware is installed at District 4, additional subsystems will be added to the base deployment.

2.2 FDOT: Before Software Installation

The following sections describe the activities that FDOT staff needs to perform prior to the SunGuide^{SM} software deployment.

2.2.1 Servers

The following table is extracted from the SunGuide^{SM} *Computer Sizing Estimates* document and is used to quantify the number of SunGuide^{SM} application servers required based on the subsystems to be installed.

SunGuide^{SM} Subsystem	Number of Servers Required	District 4 Deployment
Status Logger	0.1	0.1
Data Bus		
Base system up to 500 ITS devices	0.5	0.5
Over 500 devices	0.5	0
User Interface		
For every 10 users simultaneously logged in	0.5	0.5
DMS (includes MAS)		
Base subsystem	0.5	0.5
For every 100 TCP/IP connected signs	0.5	0.5
For every 50 dialup signs (assumes 5 modems)	0.5	0
CCTV Control (includes MCP)		
Base subsystem	0.25	0.25
For every 10 users simultaneously controlling cameras	0.25	0.25
Video Switching		
Base subsystem	0.50	0.5
For every 10 users simultaneously switching video	0.1	0.1
Video Wall		
Base subsystem	0.25	0.25
For each Barco/Argus Controller	0.1	0.1
TSS		
Base subsystem	0.25	0.25
For every 300 detectors	0.5	0.5
Incident Management		
Base subsystem for up to 20 concurrent incidents	0.25	0.25
For each 20 concurrent incidents over the base amount	0.25	0
Ramp Metering		
Base subsystem	0.50	0
For every 20 ramps	0.25	0
RWIS		
Base subsystem	0.25	0
For every 50 TCP/IP connected sensors	0.25	0
HAR		
Base subsystem	0.25	0
For every 50 HARs	0.1	0
Archive		
Base subsystem	0.5	0
Web Servers (should be protected with a firewall)		
General Web server	1.0	0
Center-to-Center interface server	0.5	0
Emergency Evacuation	0.5	0
Maintenance Management Systems	0.5	0

SunGuide^{SM} Subsystem	Number of Servers Required	District 4 Deployment
Total SunGuide^{SM} Application Servers Needed		**4.55**

The above analysis suggests that 4.55 servers would be needed to support the SunGuide^{SM} installation as has been discussed with FDOT. The sizing estimates in the *Computer Sizing Estimates* were based on best engineering judgment since SunGuide^{SM} has not yet been deployed. The numbers in the document will need to be refined after the first installation. SwRI believes that given the small number of devices and small number of subsystems being initially deployed in District 4 that a four application servers will suffice (this is in addition to the database server that will be required).

The following software needs to be installed on the servers before the software installation team arrives on-site:

- Microsoft Standard Server 2003 (no service packs) with all current updates from Microsoft

The software installation team assumes that FDOT will have licenses and installation media available for the following products:

- Microsoft Standard Server 2003
- Oracle 10g, version 10.1.0.2.0

The SunGuide^{SM} software will be installed and configured on the following machines (the recommendations are based on the current number of devices and the number of devices expected in the future):

- Application Server #1:
  - Status Logger
  - Data Bus
  - CCTV
  - MCP
- Application Server #2:
  - User Interface (IIS Web Server)
  - Incident Management
- Application Server #3
  - DMS
- Application Server #4:
  - Video Wall
  - Video Switching
  - TSS

Note that the deployment team may choose to "split device drivers and subsystem" across different servers based on the expected availability of field devices when the software is initially configured.

2.2.2 Workstations

The following software must be installed on each workstation that will access the SunGuide^{SM} software:

- Microsoft Windows XP, Service Pack 2
- Microsoft Internet Explorer 6.01 or greater
- Adobe SVG Viewer 3.0 (can be downloaded at no charge from the Adobe website)

2.2.3 Device Protocol Compliance

For the devices being deployed, FDOT needs to verify that the protocol used by the devices to be controlled by the SunGuide^{SM} software is compliant to the following protocols:

Subsystem	Protocol Reference
DMS	NTCIP 1203, FDOT MIB (Sep 2001)
DMS	Mark IV - I95: Document Number A316111-102 REV. A8 (June 26, 2001)
CCTV Control	NTCIP 1205 v01.08 Amendment 1 v01.08 (August 2004)
Video Switching	MPEG-2 devices: IP Video (VBrick 4200/5200, Teleste IDP301/IDE301, Coretec VCX2400D/VCX2400E, iMpath i1000)
Video Wall	Barco/Argus Apollo, version 1.6a of the remote API
Traffic Detection	EIS RTMS, Issue 2 (April 2003)
Traffic Detection	Wavetronix RTMS: SS105 SmartSensor Data Protocol V2.02

2.2.4 Network Infrastructure

The following sections described the network infrastructure that must be in place prior to installation of the SunGuide^{SM} software.

2.2.4.1 Hardware

Due to the client/server nature of the SunGuide^{SM} software, TCP/IP is used to exchange data between application servers. Due to the web based implementation of the SunGuide^{SM} user interface, each SunGuide^{SM} workstation requires TCP/IP access to the SunGuide^{SM} application servers. FDOT needs to verify that TCP/IP connectivity exists between all SunGuide^{SM} application severs and SunGuide^{SM} workstations.

Early in the development of requirements for SunGuide^{SM}, FDOT made the decision that the devices should be connected via TCP/IP to the SunGuide^{SM} application servers. There are a number of techniques to connect traditional serial ITS devices so that they can be accessed via TCP/IP, these techniques include the use of a terminal server (a box that has a TCP/IP connection and has multiple serial ports) or a port server (a box that has a TCP/IP connection and a single serial port). The only exception to the use of TCP/IP access is that DMS devices can be accessed via a modem or directly through a serial port if the connection is made through a Windows "COM" port on the SunGuide^{SM} application server running the DMS device driver.

It is FDOT's responsibility to provide all necessary network hardware and cables to provide the required connectivity.

2.2.4.2 Software

As the SunGuide^{SM} software is configured, it will need access to various network servers that may be installed as part of the SunGuide^{SM} installation or may be available as part of the greater FDOT network. The following network services need to be available and the details (e.g. host names, addresses) need to be available during the SunGuide^{SM} software configuration:

- SMTP Mail Server: The SunGuide^{SM} notify manager needs to be able to send emails on major system events so SMTP mail server access is required.
- DNS Server (optional): The SunGuide^{SM} applications utilize TCP/IP to exchange data and the applications can use either IP addresses or host names in their configuration files. Note that the use of DNS is preferred because using explicit IP addresses is less flexible than using hostnames.
- Time Server (optional): It is recommended that all SunGuide^{SM} computers be synchronized to a common time source as it is desirable during diagnostics to have the same time on all SunGuide^{SM} systems.

2.2.5 Device Worksheets

The following sections describe the information that must be collected about each device that is to be utilized by the SunGuide^{SM} software.

2.2.5.1 CCTV Worksheet

The following data needs to be collected for each CCTV to be configured:

Camera Name	Unique name of camera
Center Id	Unique name of center where camera resides
Protocol	Specifies the protocol (values: SNMP, SNMP(PMPP)) for camera
Poll Process	Name of driver for camera
Manufacturer	Manufacturer of camera
Location Description	Description of where camera resides
Roadway	Roadway of where camera resides
Direction	Direction of roadway where camera is installed
Latitude	Latitude of where camera resides
Longitude	Longitude of where camera resides
Op Status	Operational status (values: Active, Error, Failed, OutOfService) of camera
Address Type1	Address type (values: pmppAddress, commAddress) for camera, if pmppAddress then camera uses SNMP (PMPP); if commAddress then camera uses SNMP
Address Type2	Specific address type (values: portServerAddress) of Address Type 1
Address	Device address of camera
Port Server IP	IP address for the port server where camera resides
Port Server Port Number	Port number for the port server where camera resides
Community Name	Community name for camera
Attach to Video Device	If selected, additional IP video parameters must be supplied.

The following data need to be provided for IP video:

Video Device IP Address	IP address for encoder
Blackout	Determines if camera restricted
Video Device Type	Type (IP video device) of video device for encoder
IP Streaming Driver ID	Unique IP video switch driver name
Card Number	Card number for VBrick encoder
Manufacturer	Manufacturer (values: Coretec, iMpath, Teleste, VBrick) of encoder
Model	Model of encoder
Streaming Type	Streaming type (values: elementary, transport, program) for encoder
Secondary Interface	Secondary interface for VBrick encoder which enables users to maximize number of inputs for encoder
Snapshot Requested	Determines if snapshots are generated for encoder

2.2.5.2 DMS Worksheet

The following data needs to be collected for each DMS to be configured:

Sign Name	Unique name of DMS
Center Id	Unique name of center where DMS resides
Protocol	Specifies the protocol (values: SNMP, SNMP(PMPP), MarkIV, SunGuide (for Trailblazers)) for DMS
Connection Type	Specifies how the DMS is connected to the network (values: Direct, Modem, Long Distance Modem)
Poll Process	Name of driver for DMS
Packet Timeout	Amount of time the driver will wait on a response from a DMS before timing out (recommended time is 5 seconds)
Packet Retry Limit	How many times a packet is attempted before it errors out, most signs the recommended number is 2, for signs prone to errors, this can be increased
Command Retry Limit	How many times a command is attempted before it errors out, a command consists of multiple packets. Recommended number is 1
Op Status	Operational status (values: Active, OutOfService) of DMS
Type	Values: Fiber Optic, LED, Flip-Disk, Shutter
Manufacturer	Values: FDS, IDI, MarkIV, Telespot, Skyline
Number of Lines	Number of displayable lines
Beacons	Whether the sign has beacons, if so, specify the beacon address
Day Brightness Level	The numeric value for brightness setting in the daytime
Night Brightness Level	The numeric value for brightness setting in the nighttime
Location Description	A text field describing the location of the DMS
Roadway	Roadway on which this DMS resides
Direction	The direction of the roadway on which this DMS resides
Latitude	Latitude of where this DMS resides
Longitude	Longitude of where this DMS resides
Number of Columns	Number of characters that can be displayed using a normal font
Beacon Address	The address on which the sign receives activate/deactivate beacon requests
Address Type 1	Address type (values: PMPP, SunGuide, MarkIV) for dms, if PMPP then DMS protocol should be SNMP (PMPP); if SunGuide or MarkIV, then DMS uses same protocol name

Address Type 2	Specific address type (values: Direct, PortServer, Dialup) of Address Type 1
Address	Device address of DMS
Community Name	Community name for DMS

The following data need to be provided for DMSs connected via a TCP/IP connection:

IP Address	IP address for the port server where DMS resides
Port Number	Port number for the port server where DMS resides

The following data need to be provided for DMSs directly via a serial port:

Communications port	Communications port to which the DMS is connected
Baud Rate	This should match the baud rate of the DMS
Data Bits	This should match the data bits the DMS is expecting
Stop Bits	This should match the stop bits the DMS is expecting
Parity	This should match the parity the DMS is expecting

The following data need to be provided for DMSs connected via a modem:

Phone Number	Phone number for the DMS, should include any prefix needed for dialing
Baud Rate	This should match the baud rate of the DMS

2.2.5.3 American Dynamics Keyboard Worksheet

The following data needs to be collected for each American Dynamics keyboard to be configured:

Identifier	Unique name of the keyboard
User ID	Unique user name to be associated with the keyboard
Password	Password that is encrypted using MD5 hashing
Keyboard Type	Either "AD2088" or "ADCC300" depending on the model to be supported
IP Address	IP address of the keyboard
Port Number	Port number of the keyboard (this is related to the IP address)

2.2.5.4 Barco Video Wall Worksheet

The following data needs to be collected for each CCTV to be configured:

URL for WSDL	The URL where the Apollo API was installed (e.g. http://newton/ApolloAPI if the machine that host the Apollo software is name "Newton")

2.2.5.5 TSS Worksheet

The following data need to be provided for each Highway (Route) to be in the deployment:

Roadway Description	Textual description of the roadway (route)
Short Name	Short text name that will be seen by the operators
Directions	The directions that the roadway runs (can be multiple directions)
Cross Streets (multiple entries)	Textual descriptions of cross streets (that intersect the roadway); typically a roadway will have multiple cross streets

The following data needs to be collected for each TSS detector to be configured:

Detector Name	Unique name of detector
Center Id	Unique name of center where detector resides
Driver Name	Name of driver for the detector (e.g BiTrans, RTMS)
Poll Cycle	Time in seconds between device polls
Type	Type of detector (e.g. Loop or Radar)
Protocol	Specifies the protocol (values: EIS, Wavetronix, BiTrans)
Op Status	Operational status (values: Available or Offline)
Location Description	Description of where detector resides
Roadway	Roadway of where detector resides
Direction	Direction of roadway where detector is installed
Latitude	Latitude of where detector resides
Longitude	Longitude of where detector resides
Address	Device address of detector
Port Server IP	IP address for the port server where detector resides
Port Server Port Number	Port number for the port server where detector resides

The following data needs to be collected for each lane that is to be configured:

TSS Link	The name of the links that will be defined in the system; links will have an association to detectors.
TSS Lanes	For each link, the name of each lane associated with the link; for each lane the zone number and description needs to be identified (e.g. which detection zone is associated with a lane)

The following data needs to be collected for each link that will have an alarm threshold to be configured:

TSS Link	The name of the links that will be defined in the system.
Threshold Value(s)	What the speed and occupancy values should be for each threshold (this includes a start and end time) value to be defined.

2.3 SwRI: Software Installation

The following sections describe the activities that SwRI staff will perform to install the SunGuide^{SM} software. SwRI will need administrative level access to any computer on which SunGuide^{SM} software or Oracle is to be installed. FDOT staff should be available to monitor and observe the software installation process.

2.3.1 Server Preparation

The following software needs to be installed on the servers before the software installation team arrives on-site:

- Database server:
    - o Oracle 10g server, version 10.1.0.2.0
- Application servers:
    - o Oracle 10g Client, version 10.1.0.2.0
    - o IIS (Microsoft installation disk)
    - o ASP.NET (this installed as part of Microsoft IIS)
- Barco Video Wall Driver
    - o Apollo API (version 1.6a)

2.3.2 Workstation Preparation

The following software needs to be installed on the workstations before the software installation team arrives on-site:

- Adobe SVG Viewer (must be acquired from Adobe.com)
- Roadgeek font (this is provided on the SunGuide^{SM} install CD)

2.3.3 Software Installation

In order to install the SunGuide^{SM} application software, the following steps will be performed by the software installation team:

- In a common directory with a share point accessible to the SunGuide^{SM} application servers the following files will be installed:
    - o Install master configuration file which is named config.xml and edit the contents to match the FDOT network configuration
    - o Install XML schemas used by the SunGuide^{SM} applications
- Execute the database creation scripts to prepare the database for installation of the SunGuide^{SM} applications
- Using the installation instructions in the SunGuide^{SM} *Version Description Document* (VDD) install the SunGuide^{SM} applications

Two SunGuide^{SM} system administration applications do not execute in a browser environment. These applications should be installed on workstations that may be used to diagnose the health and status of the system; details of the application are contained in the SUM. SwRI will install the following applications on workstations as directed by FDOT:

- Executive Handler viewer: provides an overview of currently operating SunGuide^{SM} applications
- Status Logger viewer: provides the ability to review the SunGuide^{SM} application log files

2.3.4 Software Configuration

After the SunGuide^{SM} software is installed, various configuration activities need to occur; the software installation team will perform the following configurations:

- Install and configure Status Logger on a single SunGuide^{SM} application server (the SunGuide^{SM} applications will log to this one instance of Status Logger)
- Install and configure Executive Handler server on all SunGuide^{SM} application servers
- Modify the Internet Information Server (IIS) to restrict access to the SunGuide^{SM} Admin utility to users specified by FDOT

The SunGuide^{SM} Graphical User Interface (GUI) is designed to load GUI components for the SunGuide^{SM} applications. The loading (and overall performance) of the GUI can be improved if the GUI components associated with subsystems not installed is removed. The software installation team will remove the GUI components for the subsystems that were not installed.

2.4 FDOT: Post Software Installation

The following sections describe the activities that FDOT staff need to perform after the SunGuide^{SM} software deployment. SwRI staff will be available to assist and work with FDOT staff to accomplish these activities.

2.4.1 Populate Tables

The following tables need to be populated using the SunGuide^{SM} Administration tool (the DMS and CCTV data will be needed during this process):

- User Management:
  - Users
  - Groups
  - Workstations
- DMS:
  - Device Tables
  - Approved Words
- CCTV:
  - Device Tables
- TSS:
  - Device Tables
  - Detector Maps
- Video Switching:
  - Device Tables
- Video Wall:
  - Device Tables
- Incident Management:
  - Contacts
- Miscellaneous
  - Centers

The SunGuide^{SM} *Software User's Manual* (SUM) should be consulted on use of these editors.

2.4.2 Create Map Links

Each implementation of SunGuide^{SM} must have a Map Link layer created; this layer is used by the operator map to display instrumented sections of roadway as well as highway shields. This layer is displayed in conjunction with the GDT shape file data to provide a complete looking map on the operator workstation. The SUM has a section titled "Map Administration with Link Editor" that explains the use of this software; since the initial District 4 deployment contains no traffic detection devices the Map Link Editor should be used to create the shields that should be displayed.

2.5 FDOT/SwRI: Testing

The following sections describe the testing that will be performed once the software is installed. The FDOT staff that will be testing the software should review the SunGuide^{SM} testing documentation.

2.5.1 Test Cases To Be Run

The SunGuide^{SM} *Software Test Procedures* (STP) document contains a set of step-by-step test procedures that are used to test the SunGuide^{SM} software. The STP contains tests for the SunGuide^{SM} subsystems. Note that the STP will be a tailored version of the SICP that were used during the software factory acceptance testing process. Since a limited number of subsystems will be deployed in District 4, only the following tests will be executed during the SunGuide^{SM} deployment:

- IC-1: Core Processes
    - User Administration (AS-1)
    - Display Software Version / System Health (SL-5)
    - Starting and Stopping SunGuide^{SM} Services (EH-1)
    - SunGuide^{SM} Auto Restart (EH-3)

- IC-2: Dynamic Message Sign
    - Map Access to DMS (DMS-1)
    - Send DMS Message (DMS-2)
    - Support Message Libraries (DMS-4)
    - High Level DMS Status Support (DMS-5)
    - DMS Sequences. (DMS-8)
    - Message Priority Queue (DMS-10)
    - Alphabetized Message Library Management (DMS-11)
    - Multi Page Message Timing (DMS-13)

- IC-3: Video
    - Map Access to Cameras (CCTV-1)
    - Barco Wall and IP Video Switching Support (CCTV-2)
    - CCTV GUI High Level Status (CCTV-3)
    - NTCIP Driver Support (CCTV-4)
    - CCTV Auto Lock Request (CCTV-8)
    - AD M300 MCP (CCTV-9)
    - Device Failure and Device Status Reporting (CCTV-10)

- IC-4: Transportation Sensor Subsystem comprised of the following test cases:

o   TSS Data Updates (TSS-2)
o   TSS Generated Alarms (TSS-4)

- IC-5: Incident Management
  o   Event Creation (IM-1)
  o   Event Management (IM-2)
  o   Response Plan Implementation (IM-5)
  o   Response Plan Generation (IM-7)
  o   Decreasing IM Message Priority with Distance (IM-10)
  o   Incident Closure and Response Plan Cancellation (IM-11)

2.5.2 Test Process

During the testing process FDOT will be the lead tester and SwRI will be an observer. During testing, the following schedule will be followed:

- Short meeting to discuss which tests will be performed
- Testing performed
- Short meeting at the end of the day to discuss the testing results

2.5.3 FDOT IV&V Procedures

The FDOT plans to have a set of IV&V (Independent Verification and Validation) procedures that will be executed as part of the installation. The purpose of the IV&V procedures is to provide verification of the System Requirements. This test will be run by FDOT personnel (or their designees) and witnessed by SwRI. It is anticipated that this testing will occur during the second week of the installation process.

2.5.4 Issue Resolution and Retesting

If during the testing process issues are identified, the installation team will attempt to resolve them while on-site and if they are resolved the tests associated with the issue will be re-run at the discretion of FDOT.

2.6 Deployment Schedule

The following schedule is proposed for the deployment. The installation team will need access to hardware devices throughout the implementation process. Note that if activities complete early then if FDOT and SwRI agree the timing for the following events may be modified to shorten the overall deployment schedule.

ID	Task Name	Week 1							Week 2							Week 3							Week 4						
		S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
1	**FDOT Complete Predeployment Acitivities (lead: FDOT)**																												
2	**Installation Acitivities**																												
3	Conectivity Verification (lead: SwRI)																												
4	Server Preparation (lead: SwRI)																												
5	Configure Oracle Cluster (D4 and SwRI)																												
6	Software Installation (lead: SwRI) - use 10g																												
7	Software Configuration (lead: SwRI)																												
8	Database Population (lead: FDOT)																												
9	Link Editor (lead: FDOT)																												
10	Issue Resolution (lead: SwRI)																												
11	Change Database to Oracle Cluster as Appropriate																												
12	D4 "Exercising" System																												
13	Operator Training																												
14	D4 Exercising System																												
15	**Testing**																												
16	Begin testing / issue resolution (lead: SwRI)																												
17	Execute Software Test Procedures (lead: SwRI)																												
18	Central Office "Test" IV&V Procedures at SwRI																												
19	Execute FDOT IV&V Procedures (lead: FDOT)																												

3. Notes

None.