

## Technical Memorandum

## SunGuide<sup>®</sup> Software System



## Concept of Operations for Virtual Video Wall with Integration into the Operator Map

**Version 2.0**

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### **Prepared for:**

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## List of Acronyms and Abbreviations

CCTV .....	Closed-Circuit Television
FDOT .....	Florida Department of Transportation
GUI .....	Graphical User Interface
ITS.....	Intelligent Transportation Systems
PTZ .....	Pan/Tilt/Zoom
VVW .....	Virtual Video Wall

# 1 Scope

## 1.1 Document Identification

The Florida Department of Transportation (FDOT) has developed a concept of operations and the high-level requirements document for a virtual video wall (VWV) with integration into the SunGuide® software operator map. This document will be provided for stakeholder review and consensus. Additionally, this document clearly defines this enhancement to support the requirements for development and a cost estimate to design and build the enhancement.

## 1.2 Project Overview

The Florida Department of Transportation (FDOT) SunGuide Support, Maintenance, and Development Contract, contract number BDQ69, addresses the necessity of supporting, maintaining, and performing enhancement development to the SunGuide software. The SunGuide software was developed by the FDOT in a contract from October 2003 through June 2010. The SunGuide software is a set of intelligent transportation systems (ITS) software that allows the control of roadway devices as well as information exchange across a variety of transportation agencies; it is deployed throughout the state of Florida. The SunGuide software is based on ITS software available from the state of Texas with significant customization and development of new software modules to meet FDOT's needs. Figure 1 provides a graphical view of the SunGuide software.

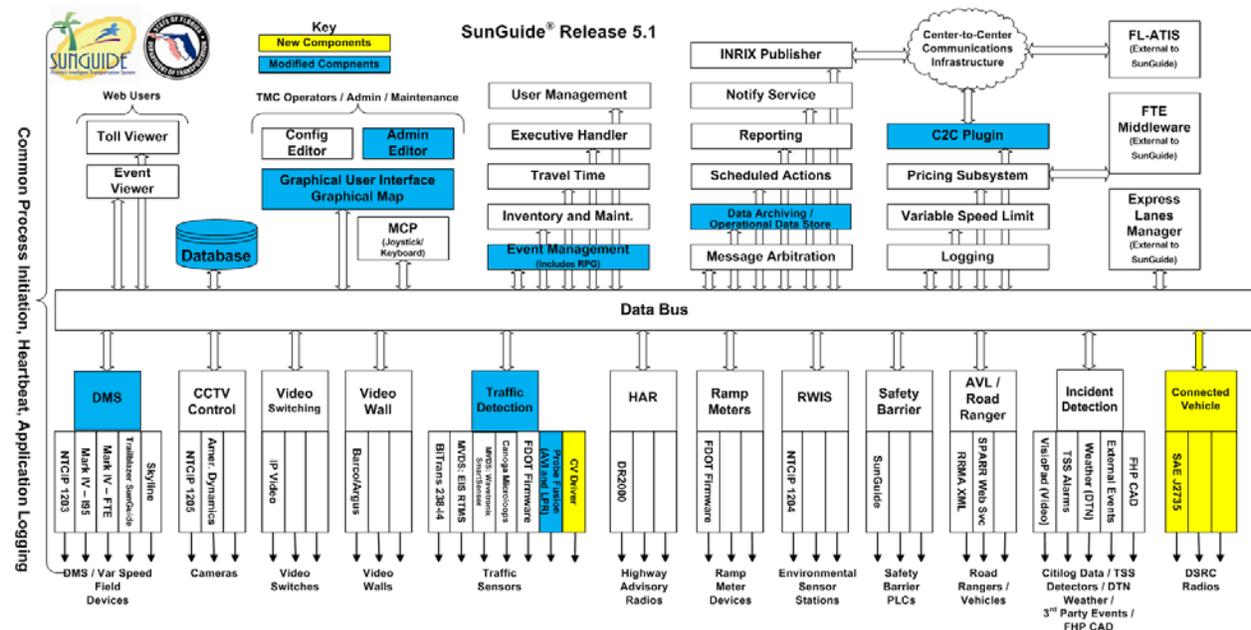


Figure 1: High-Level Architectural Concept

The SunGuide software development effort began in October 2003; several major releases have been developed and this document addresses an incremental update of the most recent release. After development, the software will be deployed to a number of regional and local transportation management centers throughout Florida and support activities will be performed.

### **1.3 Related Documents**

The following documents form a part of this concept of operations to the extent specified herein. In the event of a conflict between the documents referenced herein and the contents of this document, this document shall be considered the superseding requirement.

- FDOT Scope of Services: *BDQ69, Standard Written Agreement for SunGuide Software Support, Maintenance, and Development, Exhibit A: Scope of Services*. July 1, 2010.
- Letter of Authorization 003: Letter to SwRI for BDQ69, August 19, 2010.
- SunGuide project web site: <http://sunguidesoftware.com>.

### **1.4 Contacts**

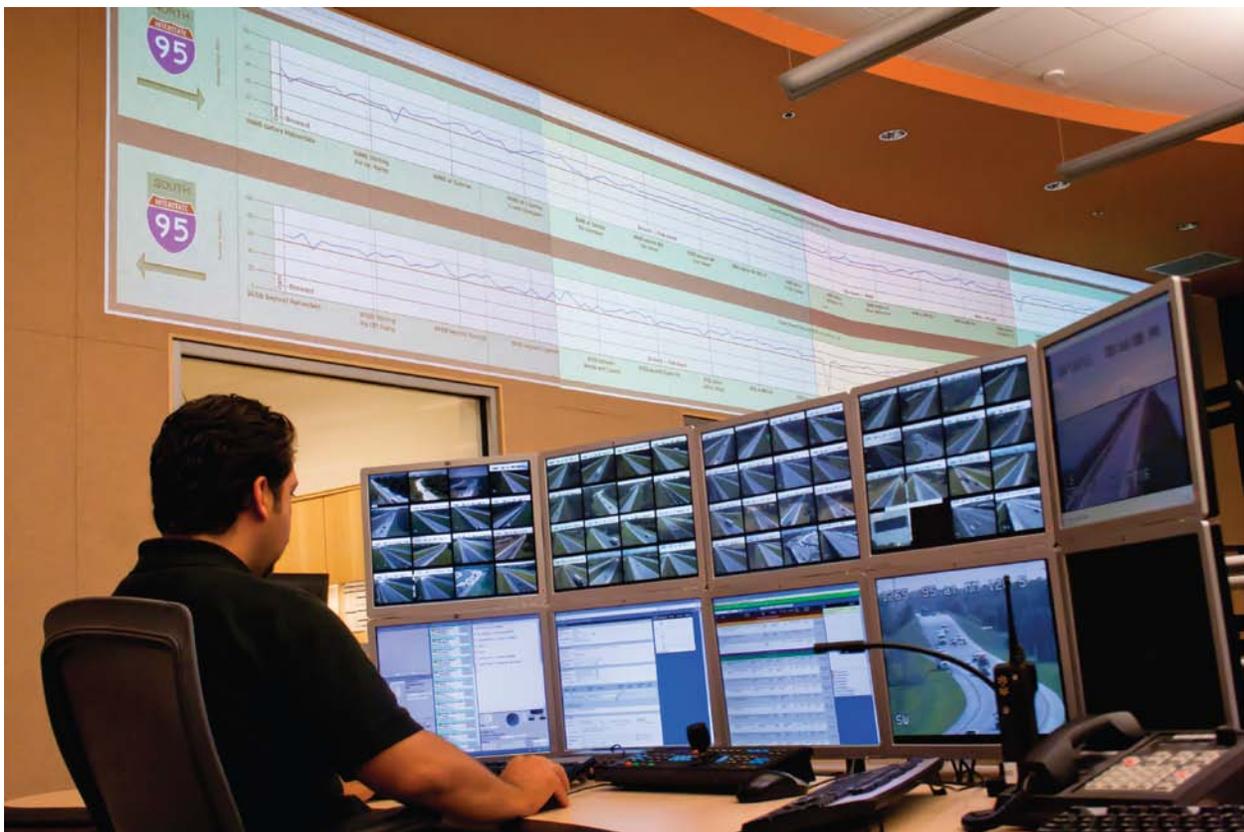
The following is a list of contacts for the SunGuide software project:

- Elizabeth Birriel, ITS Section, Traffic Engineering and Operations Office, [elizabeth.birriel@dot.state.fl.us](mailto:elizabeth.birriel@dot.state.fl.us), 850-410-5606
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## 2 Existing Operation

The SunGuide software system currently uses shared displays to show video. The closed-circuit television (CCTV) camera, video switching, and video wall subsystems work together, allowing operators to control CCTV cameras and switch and view video on the video wall with built-in and integrated video decoders, or on monitors connected to external video decoding appliances. This configuration is missing the video viewing capability to allow the video to be shown right on the operator's desktop workstation from a fully integrated SunGuide software user-interface.

Currently, an off-the-shelf software decoder could be installed on the workstation as shown in Figure 1. However, without this proposed integration into the operator map, a separate list of camera names and multicast addresses must be maintained in a separate software application database, in a look-up table, or memorized. Additionally, the decoder must be launched and controlled independently from the SunGuide software. Integration of this component into the SunGuide software graphical user interface (GUI) will reduce the configuration, maintenance, and run-time operational effort required for this capability.



**Figure 2: Off-the-shelf Software Video Decoder**

## 3 Virtual Video Wall Operations

### 3.1 Operator Map Integration

The desired usage of the operator map enhancement would be for the operator, while using the operator map or the CCTV status dialog, to be able to easily launch a VVW on their desktop monitors. This VVW would allow the operator to use the mouse to drag and drop the camera icons from the operator map and the camera list in the CCTV dialog to the VVW for display in individual, dynamic viewers – each containing a single video stream. The enhancement would also allow the camera icons and camera list items to be double-clicked as an alternative to the drag and drop operation.

### 3.2 Virtual Video Wall Operation

The VVW window will automatically position and resize the viewer close to where it was dropped and will automatically position and resize all viewers within the VVW window to accommodate the number of viewers in that window. The VVW will accommodate new viewers from double-clicked video streams by moving and resizing the other viewers in a similar fashion as if the new video source was dragged and dropped near the bottom right of the VVW with available space. The user can drag viewers around to further customize the viewer positions and resize them by dragging the viewer corner. The viewer's aspect ratio will be preserved during resizing.

The current display configuration of the viewer's set of displayed video streams along with their size and position can be saved as a user-specific preference within the SunGuide software database; it can be recalled by the user as a faster alternative to setting up a VVW window one video at a time. Each individual viewer window can be saved and recalled with a label. SunGuide software shall have a list of VVW preset windows to launch from the appropriate context menu and possibly other locations in the operator map GUI.

The VVW will initially open in a new, resizable window that, when maximized, will enter into a full screen mode without the window border, menus, or window frame buttons. The Esc key on the keyboard will exit the full screen mode if the VVW is in focus.

Each VVW window will accommodate 64 viewers before being considered full. If additional video is launched or dragged onto a full VVW window, another VVW window will be opened to accommodate the additional viewers if another non-full VVW window is not available. If all viewers are removed from a VVW window, the window will close itself. Viewers can be dragged from one VVW window to another.

### 3.3 Video Viewer with Embedded Camera Controls

The name of the camera or video stream, and the location description from within SunGuide software, would appear in bold text near the bottom or top of the viewer.

If the encoder is attached to a camera within SunGuide software, the viewer will be overlaid with thick, arrow-head shaped, translucent controls on the edges of the viewer allowing the user to pan, tilt, and zoom (PTZ) the camera. There will be a range of speeds that the camera is commanded to move based on where the control is clicked. When the user clicks near the far edge of this control near the outside of the viewer, the camera will be commanded to move fast in that direction as opposed to when the user clicks near the edge of the control towards the center of the viewer where the camera moves slower. It will also provide eight numbered translucent buttons inside the viewer to move the camera to previously saved preset, PTZ locations. There will also be a translucent button near one of the corners of the viewer to launch the SunGuide software CCTV control/status dialog.

A translucent close button appearing as an 'X' will appear near the upper right hand corner of the viewer to close it for removal from the VVW window. A translucent square will appear to the left of the close button to full-screen the viewer within the VVW window. When a viewer is in full screen mode, the translucent square will convert into a translucent restore icon (square on top of and offset from another square – consistent with the Microsoft® Windows environment). When the restore button is pressed, the VVW window will return to the layout that appeared prior to the viewer occupying the full screen. When the close button is pressed, the viewer will be removed from the layout, the auto arranging and sizing of the rest of the video wall will accommodate the vacancy, and the video stream will no longer be subscribed to.

### **3.4 Maximum Video Streams**

SunGuide software will allow for a system-wide configurable maximum number of simultaneous open video viewers per operator.

SunGuide software will display the most recent snapshot of the CCTV camera when the operator hovers over a CCTV icon.

### **3.5 Video Tours**

All mention of video streams and cameras can be applied to tours as well. SunGuide software has a list of tours from which the user can drag and drop or double-click onto the VVW in the same fashion as an individual video source. Also, a viewer from a VVW window can be dragged and dropped onto another viewer in any VVW window creating a temporary tour from that user action. Additional viewers and camera icons can be dragged onto that viewer to be added to the tour. This tour will be saved along with the layout of the VVW window in the user preferences when the user saves the layout.