

**SunGuide™:**

**System Administration  
Application Interface  
Control Document**

**SunGuide-SAA-ICD-6.2**



Prepared for:

Florida Department of Transportation  
Traffic Engineering and Operations Office  
605 Suwannee Street, M.S. 90  
Tallahassee, Florida 32399-0450  
(850) 410-5600

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Reviewed By:	Steve Dellenback, SwRI	SWD	4/26/07
	Steve Dellenback, SwRI	SWD	12/19/07
Modified By:	John Boguslawski, IBI Group	JJB	4/25/07
	John Boguslawski, IBI Group	JJB	12/17/07
	Adam Hoffman, SwRI	AGH	3/23/16
Completed By:			

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## **List of Acronyms**

ATMS	Advanced Traffic Management System
DOT	Department of Transportation
SAA	System Administration Application
FDOT	Florida Department of Transportation
ITS	Intelligent Transportation Systems
ITN	Invitation to Negotiate
SwRI	Southwest Research Institute
TMC	Traffic Management Center
XML	Extensible Markup Language

## **REVISION HISTORY**

<b>Revision</b>	<b>Date</b>	<b>Changes</b>
3.0.0	April 25, 2007	Initial Release
3.0.1	December 19, 2007	Added “how to use this document” section
6.2	March 23, 2016	Updated for Release 6.2

# 1. Scope

## 1.1 Document Identification

This Interface Control Document (ICD) describes the interface between individual SunGuide™ clients and the System Administration Application (SAA) subsystem and between the SAA subsystem and other subsystems. The general base architecture of the XML communications including connection information, byte order and base transaction classes is delineated in this document. This ICD defines Extensible Markup Language (XML) schemas upon which XML requests shall be based in communicating amongst the various processes. Refer to the SunGuide-General-ICD document for details regarding data transfer.

## 1.2 Project Overview

The Florida Department of Transportation (FDOT) is conducting a program that is developing SunGuide software. The SunGuide 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 software is to have a common software base that can be deployed throughout the state of Florida. The SunGuide software development effort is based on ITS software available from the state of Texas; 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:

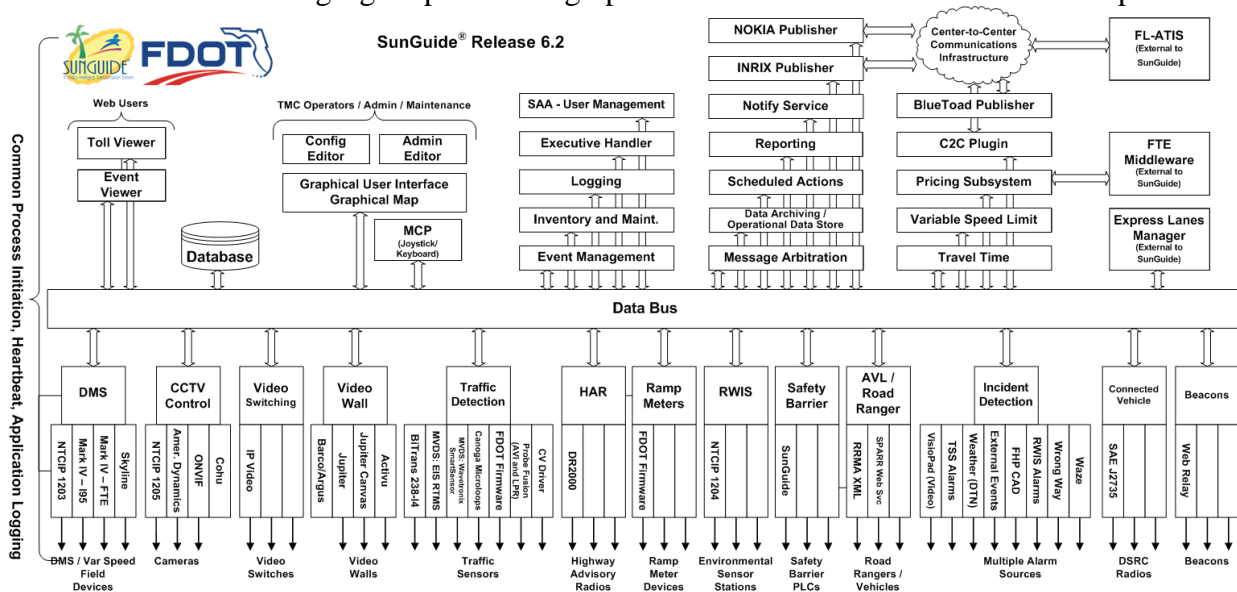
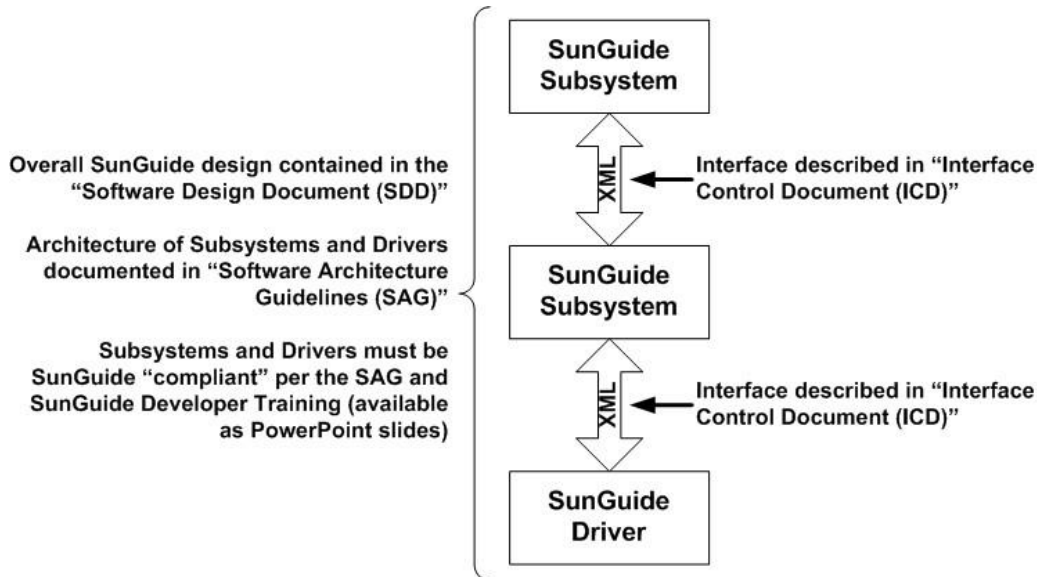


Figure 1-1 - High-Level Architectural Concept

### **1.3 How to Use This Document**

The ICDs describe the specific interface between two SunGuide subsystems or between a SunGuide subsystem and a SunGuide driver. The relationship of appropriate documents is shown in the Figure 1-2.



**Figure 1-2 - SunGuide Developer Documentation**

This document describes an *internal* SunGuide interface. The interface described is between two SunGuide compliant processes. The reader should review the following document to gain an understanding of how SunGuide compliant application is created (this will vary if the application is a driver or subsystem):

#### *SunGuide Software Architecture Guidelines (SAG)*

The SAG describes what needs to be included in a SunGuide application to assure that it will work cooperatively in the SunGuide environment. Once the SAG is reviewed, the following document should be reviewed:

#### *SunGuide Software Design Document (SDD)*

The SDD will provide an understanding of how individual components of SunGuide were designed. Finally, the ICD, along with the associated schema should be reviewed to determine what data needs to be exchanged on the interface being defined in this document.

Additionally, a SunGuide “Developer Training” class is available that provides the students with an introduction into developing SunGuide processes. The SunGuide source code repository has a generic subsystem and a generic driver available that can be used as the basis for developing a new application.

### **1.4 Related Documents**

The following documents were used to develop this document:



- FDOT Scope of Services: *BDQ69, Standard Written Agreement for SunGuide Software Support, Maintenance, and Development, Exhibit A: Scope of Services*. July 1, 2010.
- Notice to Proceed: Letter to Southwest Research Institute® (SwRI®) for BDQ69, July 1, 2010.
- SunGuide Project website: <http://sunguidesoftware.com>.

## **1.5 Contacts**

The following are contact persons for the SunGuide software project:

- Fred Heery, ITS Section, Traffic Engineering and Operations Office Central Office, [fred.heery@dot.state.fl.us](mailto:fred.heery@dot.state.fl.us), 850-410-5606
- Derek Vollmer, ITS Section, Traffic Engineering and Operations Office Central Office, [Derek.Vollmer@dot.state.fl.us](mailto:Derek.Vollmer@dot.state.fl.us), 850-410-5615
- Clay Packard, Atkins Project Manager, [clay.packard@dot.state.fl.us](mailto:clay.packard@dot.state.fl.us), 850-410-5623
- David Chang, Atkins Project Advisor, [david.chang@dot.state.fl.us](mailto:david.chang@dot.state.fl.us), 850-410-5622
- Tucker Brown, SwRI Project Manager, [tbrown@swri.com](mailto:tbrown@swri.com), 210-522-3035
- Roger Strain, SwRI Software Project Manager, [rstrain@swri.org](mailto:rstrain@swri.org), 210-522-6295

## **2. Data**

The following sections detail the XML transactions that can be exchanged between client and server applications.

### **2.1 Schema**

The schemas for these transactions may be located in the Schemas directory. The objects directory contains common data schemas that are used by the various request, messages, and responses. Schemas are organized in the following tree structure:

- Messages
  - displayLocationUpdateMsg.xsd
  - equipmentOrderUpdatedMsg.xsd
  - operationUpdateMsg.xsd
  - operatorActionCanceledMsg.xsd
  - operatorActionReqMsg.xsd
  - passwordChangeRequiredMsg.xsd
  - roadwayIntersectionUpdatedMsg.xsd
  - roadwayUpdatedMsg.xsd
  - systemSettingsUpdatedMsg.xsd
  - updateUserTypesMsg.xsd
  - userDataUpdatedMsg.xsd
  - userGroupUpdatedMsg.xsd
  - usersConnectedMsg.xsd
  - userUpdatedMsg.xsd
- Objects
  - equipmentDisplayLocation.xsd
  - equipmentPermission.xsd
  - equipmentRoadwayDirectionOrder.xsd
  - group.xsd
  - metaData.xsd
  - modifyCommand.xsd
  - possibleRespAction.xsd
  - roadway.xsd
  - roadwayData.xsd
  - roadwayIntersectionData.xsd
  - userData.xsd
  - userLoginData.xsd
  - userName.xsd
- Requests
  - addManufacturerReq.xsd
  - addRoadwayReq.xsd
  - addSystemSettingsReq.xsd
  - addUserGroupReq.xsd
  - addUserReq.xsd
  - authenticateUserReq.xsd
  - changeOperatingModeReq.xsd

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- changeUserPasswordReq.xsd
- deleteManufacturerReq.xsd
- deleteRoadwayReq.xsd
- deleteSystemSettingsReq.xsd
- deleteUserGroupReq.xsd
- deleteUserReq.xsd
- getGroupDataReq.xsd
- getGroupUsersReq.xsd
- getSubsystemPermissionsReq.xsd
- getUserDataReq.xsd
- getUsersWithDevicePermissionReq.xsd
- grantDeviceToUsersReq.xsd
- modifyDisplayLocationReq.xsd
- modifyEquipmentOrderReq.xsd
- modifyRoadwayReq.xsd
- modifySubsystemDataReq.xsd
- modifySystemSettingsReq.xsd
- modifyUserGroupReq.xsd
- operatorActionReq.xsd
- operatorActionResolvedReq.xsd
- resetUserPasswordReq.xsd
- retrieveDataReq.xsd
- setRoadwayIntersectionReq.xsd
- setUserDataReq.xsd
- subscribeReq.xsd
- updateUserTypesReq.xsd
- Response
  - addManufacturerResp.xsd
  - addRoadwayResp.xsd
  - addSystemSettingsResp.xsd
  - addUserGroupResp.xsd
  - addUserResp.xsd
  - authenticateUserResp.xsd
  - changeOperatingModeResp.xsd
  - changeUserPasswordResp.xsd
  - deleteManufacturerResp.xsd
  - deleteRoadwayResp.xsd
  - deleteSystemSettingsResp.xsd
  - deleteUserGroupResp.xsd
  - deleteUserResp.xsd
  - getGroupDataResp.xsd
  - getGroupUsersResp.xsd
  - getSubsystemPermissionsResp.xsd
  - getUserDataResp.xsd
  - getUsersWithDevicePermissionResp.xsd
  - grantDeviceToUsersResp.xsd
  - modifyDisplayLocationResp.xsd
  - modifyEquipmentOrderResp.xsd

## *SAA Interface Control Document*

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- modifyRoadwayResp.xsd
- modifySubsystemDataResp.xsd
- modifySystemSettingsResp.xsd
- modifyUserGroupResp.xsd
- operatorActionResolvedResp.xsd
- operatorActionResp.xsd
- resetUserPasswordResp.xsd
- retrieveDataResp.xsd
- setRoadwayIntersectionResp.xsd
- setUserDataResp.xsd
- subscribeResp.xsd
- updateUserTypesResp.xsd

### **2.2 Subsystem communication**

The following table shows the various subscriptions a client may request.

Subscription	Description	Updates Received
userData		
groupData		
processSubscription		
operationData		
displayLocationData		
roadwayData		
roadwayIntersectionData		
systemSettings		
manufacturerData		

## 2.3 Subsystem Schemas

FC (From Client), TC (To Client), TD (To Driver), FD (From Driver)

Usage Description	Requests	FC	TD	Responses	FD	TC	Messages	TD	FD	TC
Used to add a manufacturer to the system	addManufacturerReq.xsd	X		addManufacturerResp.xsd		X				
Used to add roadway information to the system	addRoadwayReq.xsd	X		addRoadwayResp.xsd		X				
Used to add new system setting values	addSystemSettingsReq.xsd	X		addSystemSettingsResp.xsd		X				
Used to add a group to the system	addUserGroupReq.xsd	X		addUserGroupResp.xsd		X				
Used to add a user to the system	addUserReq.xsd	X		addUserResp.xsd		X				
Checks the user password and returns the requested data for the user	authenticateUserReq.xsd	X		authenticateUserResp.xsd		X				
Used to change the method of storing and using user data at runtime	changeOperatingModeReq.xsd	X		changeOperatingModeResp.xsd		X				
Used to change a user's password.	changeUserPasswordReq.xsd	X		changeUserPasswordResp.xsd		X				
Used to delete a manufacturer	deleteManufacturerReq.xsd	X		deleteManufacturerResp.xsd		X				

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Usage Description	Requests	FC	TD	Responses	FD	TC	Messages	TD	FD	TC
Used to delete a roadway information from the system.	deleteRoadwayReq.xsd	X		deleteRoadwayResp.xsd		X				
Used to delete system setting values	deleteSystemSettingsReq.xsd	X		deleteSystemSettingsResp.xsd		X				
Used to delete a group from the system	deleteUserGroupReq.xsd	X		deleteUserGroupResp.xsd		X				
Used to delete a user from the system	deleteUserReq.xsd	X		deleteUserResp.xsd		X				
Used to notify subscribed clients of updates to the display location of items in the system.							displayLocationUpdateMsg.xsd			X
Used to notify subscribed clients of updates to the equipment order on a given roadway in a single direction.							equipmentOrderUpdatedMsg.xsd			X
Used to retrieve a group's data	getGroupDataReq.xsd	X		getGroupDataResp.xsd		X				
Used to retrieve a list of users belonging to a group	getGroupUsersReq.xsd	X		getGroupUsersResp.xsd		X				
Used to retrieve the permissions which are available for a subsystem	getSubsystemPermissionsReq.xsd	X		getSubsystemPermissionsResp.xsd		X				

*SAA Interface Control Document*

Usage Description	Requests	FC	TD	Responses	FD	TC	Messages	TD	FD	TC
Used to retrieve a user's data	getUserDataReq.xsd	X		getUserDataResp.xsd		X				
Used to retrieve a list of users with permission to a given device	getUsersWithDevicePermissionReq.xsd	X		getUsersWithDevicePermissionResp.xsd		X				
Used to retrieve a list of users with permission to a given device	grantDeviceToUsersReq.xsd	X		grantDeviceToUsersResp.xsd		X				
Used to modify the display location of equipment for a given roadway in a single direction in the system	modifyDisplayLocationReq.xsd	X		modifyDisplayLocationResp.xsd		X				
Used to modify the order of equipment for a given roadway in a single direction in the system	modifyEquipmentOrderReq.xsd	X		modifyEquipmentOrderResp.xsd		X				
Used to request modify a roadway information in the system	modifyRoadwayReq.xsd	X		modifyRoadwayResp.xsd		X				
Used to modify elements in the subsystem data for one or more users	modifySubsystemDataReq.xsd	X		modifySubsystemDataResp.xsd		X				
Used to change the system setting values	modifySystemSettingsReq.xsd	X		modifySystemSettingsResp.xsd		X				
Used to modify a user group	modifyUserGroupReq.xsd	X		modifyUserGroupResp.xsd		X				

*SAA Interface Control Document*

Usage Description	Requests	FC	TD	Responses	FD	TC	Messages	TD	FD	TC
Used to notify subscribed clients of changes in the operation mode data.							operationUpdateMsg.xsd			X
Message sent to the target operator when the request has timed out							operatorActionCanceledMsg.xsd			X
Used to request that another operator perform a given action	operatorActionReq.xsd	X		operatorActionResp.xsd		X				
Message sent to the operator specified by the operatorActionReq							operatorActionReqMsg.xsd			X
Message back from an operator in response to an action request by another operator	operatorActionResolvedReq.xsd	X		operatorActionResolvedResp.xsd		X				
Message sent to a user to notify that the logged in user needs to change their password							passwordChangeRequiredMsg.xsd			X
Used to change a user's password	resetUserPasswordReq.xsd	X		resetUserPasswordResp.xsd		X				
Used to retrieve data from system	retrieveDataReq.xsd	X		retrieveDataResp.xsd		X				



*SAA Interface Control Document*

Usage Description	Requests	FC	TD	Responses	FD	TC	Messages	TD	FD	TC
Used to notify subscribed clients of updates to roadway's intersection data							roadwayIntersectionUpdatedMsg.xsd			X
Used to notify subscribed clients of updates to roadway data							roadwayUpdatedMsg.xsd			X
Used to set a roadway's intersection information in the system	setRoadwayIntersectionReq.xsd	X		setRoadwayIntersectionResp.xsd		X				
Used to change the fields for the user which are outside of the subsystem data	setUserDataReq.xsd	X		setUserDataResp.xsd		X				
Used to subscribe to changes in the system.	subscribeReq.xsd	X		subscribeResp.xsd		X				
Used to notify subscribed clients of updates to system settings							systemSettingsUpdatedMsg.xsd			X
Used to notify subscribed clients that a user type has been updated							updateUserTypesMsg.xsd			X

*SAA Interface Control Document*

Usage Description	Requests	FC	TD	Responses	FD	TC	Messages	TD	FD	TC
Used to change user types. Currently only the isPasswordChanged Required can be updated	updateUserTypesReq.xsd	X		updateUserTypesResp.xsd		X				
Used to notify subscribed clients of updates to a user							userDataUpdatedMsg.xsd			X
Used to notify subscribed clients of updates to user groups							userGroupUpdatedMsg.xsd			X
Used to notify subscribed clients of logged into each of the subsystems and applications							usersConnectedMsg.xsd			X
Used to notify subscribed clients of updates to a user							userUpdatedMsg.xsd			X

### **3. Notes**

Information about XML and schemas can be found at the World Wide Web Consortium (W3) website at <http://www.w3.org>.