Change Management Board Meeting

Bridgeline # 850-410-0960

Welcome and Introductions

Steve Corbin, CMB Chairman

CMB Agenda

Time	Item	Lead	Supporting Materials
8:00 – 8:05	Welcome and Introductions	Corbin	
8:05 – 8:20	Previous Meeting Recap and Action Item Review	Corbin	August 29, 2006 Meeting Minutes
8:20 – 8:30	SunGuide^{SM} Software COTS Licensing Budget	Tillander	PowerPoint Presentation
8:30 – 9:05	Central Data Warehouse Research Project / Global Device Numbering Scheme Update	Courage	PowerPoint Presentation
9:05 – 9:15	Ramp Metering Firmware Update	Dellenback	PowerPoint Presentation
9:15 – 9:30	Break		

Change Management Board

Time	Item		Lead	Supporting Materials
9:30 – 9:50	SunGuideSM Software Release 2.2 Update	Event Manager and Performance Measures Subsystems	Corbin	Release 2.2 Documents – SICP, IV&V, VDD, SUM
		GUI Performance Enhancement	Dellenback	PowerPoint Presentation
9:50 – 10:05	DMS Spell Check Enhancement		Vega	PowerPoint Presentation
10:05 – 10:25	Preset Scheduling Enhancement *[Vote]*		Bonds	Requirements, Ballot
10:25 – 10:50	SunGuide^{SM} Software Release 3 – AVL Subsystem *[Vote]*		Bonds	Requirements, Ballot
10:50 – 11:00	Closing and Action Item Review		Corbin	

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Previous Meeting Recap and Action Item Review

Action items from last CMB

1. David Chang will review the Central Data Warehouse (CDW) Road Ranger XML schema versus the Road Ranger procedure and SunGuide requirements to ensure consistence among all three.
2. Trey Tillander and SwRI will review the CDW global device number proposal and provide a report to the CMB.
3. Liang Hsia will distribute the Invitation to Bid (ITB) package to the CMB.
4. John Bonds will update the preset scheduling requirements for the CMB to review and approve.
5. Trey Tillander and SwRI will coordinate with Paul Clark to analyze costs and benefits for geo-fencing.
6. Walt Townsend will update the AVL requirements based on discussion.
7. John Bonds will provide the final AVL requirements specification for review and approval by the CMB.
8. Steve Corbin will schedule the next CMB teleconference in November.

SunGuide℠ Software COTS Licensing Budget

SunGuide℠ Software COTS Annual Cost:

- Oracle 10g : $ 10,000 ($5,000 per processor license)
- TeleAtlas Dynamap v.8.0: $4,000

CDW - Proposed Global Device Number

- FIPS State # (2 Char)
- *Agency Code (2 Char) **
- Station Code (6 Char)
  - *1 for District, 2 for Road Facility, 3 for Station **
- Travel direction (1 Char)
- Lane Number (2 Char)
- Equipment code (1 Char)
- Lane Type Monitored (1 Char)

** Added after discussion at 8/29/06 CMB Meeting*

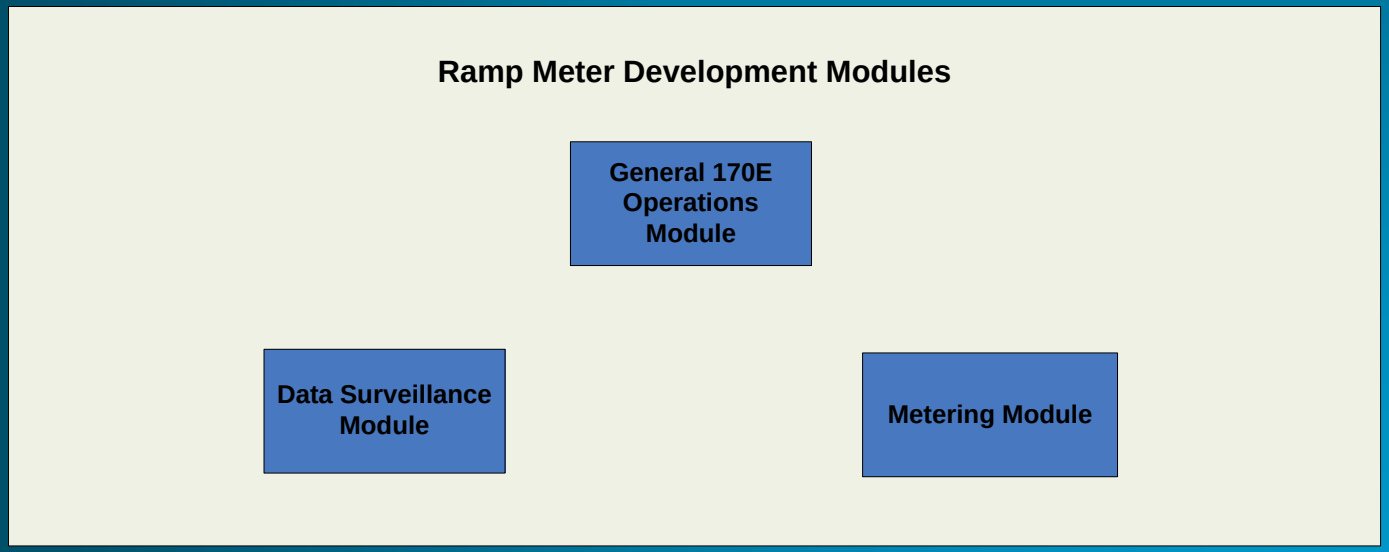
Change Management Board

Ramp Metering Firmware Update

SwRI

RM Development Process

- **Development Segmentation:**
  - 3 operational modules
  - Continuous integration testing between Data/Metering modules
  - Full integration testing once all modules developed



Firmware Development Status

- General 170E operations Module
  - Completed startup code to initialize CPU and board
  - Completed basic functionality to communicate to front panel, including LEDs, call lights and keypad
  - Completed interrupt service routine to read the 8 detector upstream/downstream states at 120 Hz sample period
  - Completed real time interrupt routines to allow scheduling of functions for execution periodically or as a one-shot
  - Completing code to set and read time on DS1744 real time clock module

- Data Surveillance Module
  - Basic volume and occupancy calculations are complete
  - Basic speed and length calculations are complete

Firmware Development Status:
Continued

- Metering module
  - Designed memory structures to represent lane data
  - Implemented calculation of the following rates:
    - Time of Day Metering Rate
    - Traffic Metering Rate
    - Bottleneck Metering Rate
    - Intermediate Metering Rate
  - Developing the various adjustments (Queue Adjusted Metering Rate, Volume Adjustment, Advanced Queue Override, etc).

Firmware Development Status:
Continued

- Integration and testing:
  - Modules are being integrated
  - Testing is being performed

- Schedule
  - Integration Testing: to continue through December 1, 2006
  - Parallel Testing (running against WSDOT firmware): through November 30, 2006
  - IV&V: Planned for December 1 to December 8
  - Delivery to FDOT: December 15, 2006

- Concerns:
  - Code size (physical limit in EPROM)

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Break

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SunGuide^{SM} Software Release 2.2 Update - Event Manager and Performance Measures Subsystems

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- D4's slides

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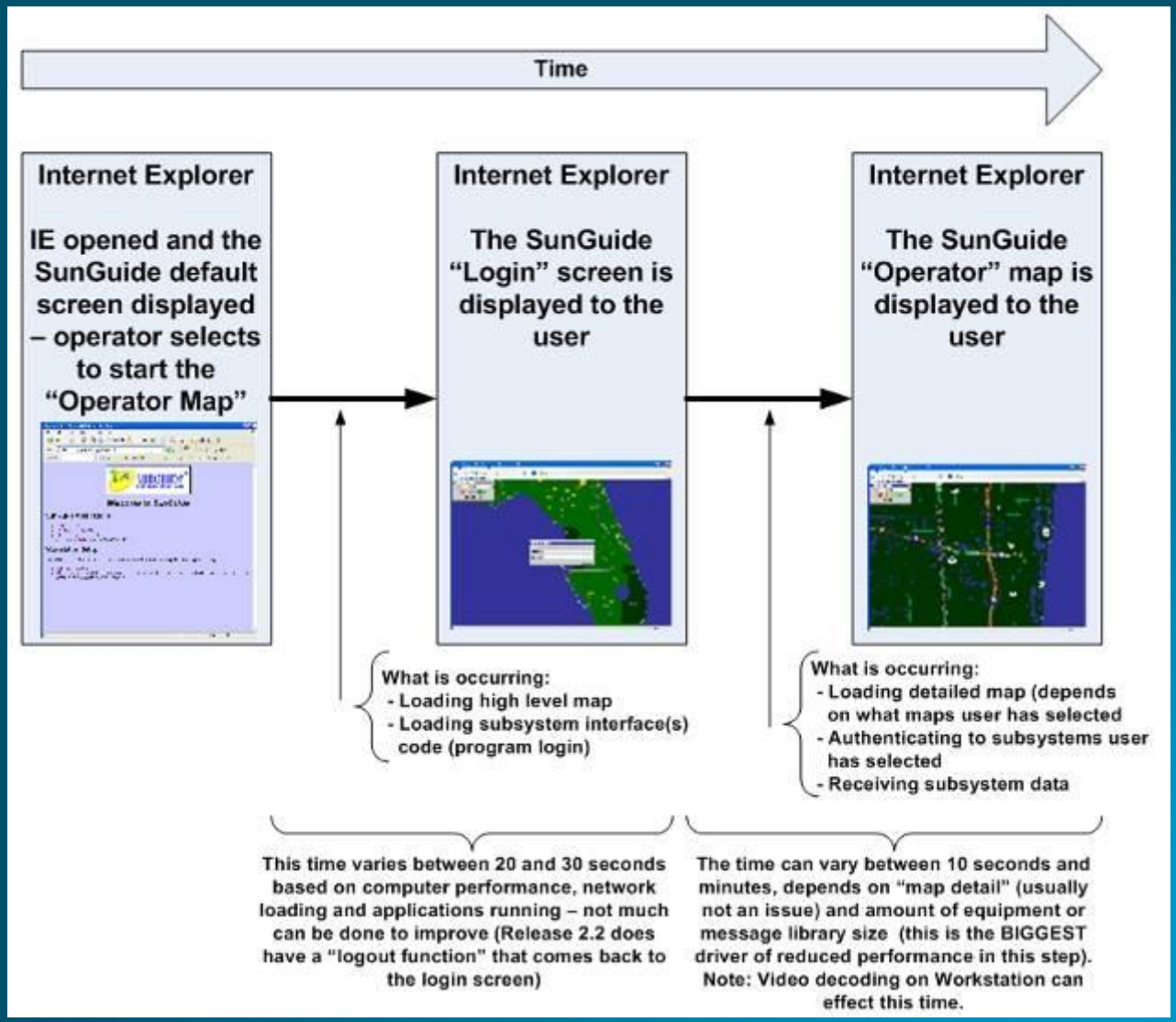
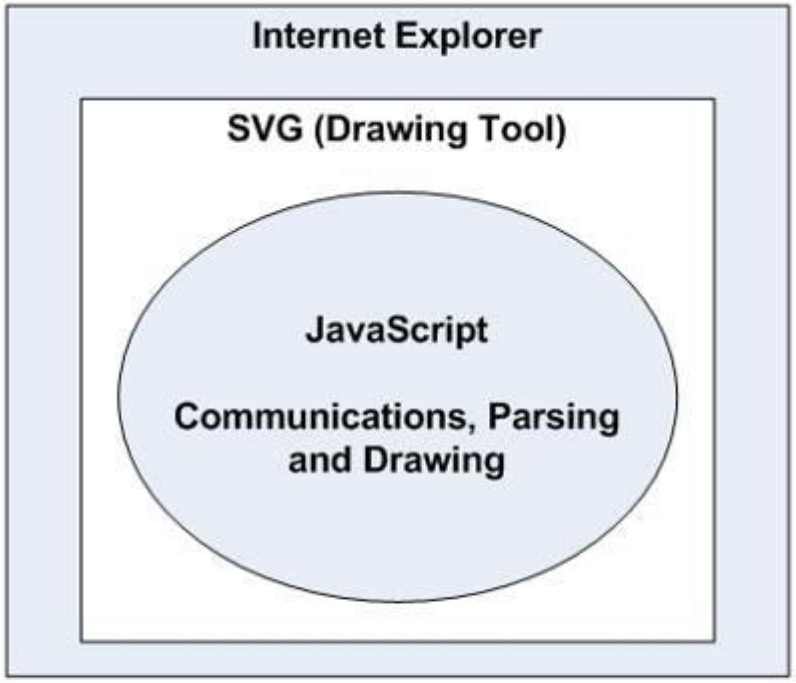
SunGuide^{SM} Software Release 2.2 Update
GUI Performance Enhancement

SwRI

Logging Into SunGuide℠

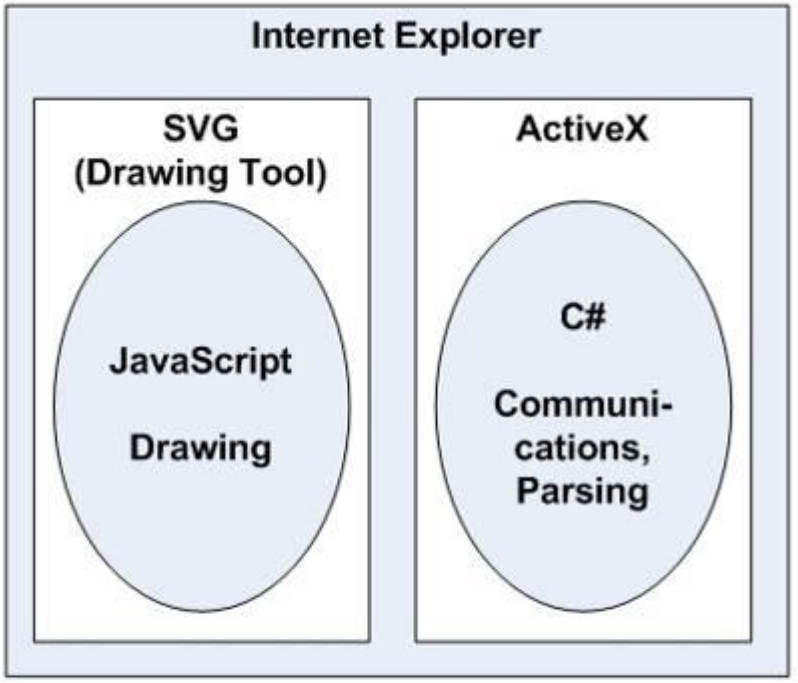


IE – The "Root" of the Problem



SunGuide exchanges MANY XML messages to exchange data – this is most significant processing component in the GUI. The map is not the processing "hog" - the processing "hog" is the parsing of XML messages.

The current implementation is single threaded using an "interpreted" language (JavaScript)



By utilizing ActiveX, a C# application (which would reuse a significant amount of code from existing systems) could be implemented to allow a multi-threaded environment that would significantly enhance the XML parsing.

C# is a byte coded language that is significantly more efficient than JavaScript. Note that ActiveX would need to be enabled to use this approach.

Background and Recommendation

- SwRI internal development effort (not at FDOT's expense):
  - Undertook an Internal Research and Development project to evaluate the performance of ITS applications:
    - Where do they "break" (with respect to performance
    - How to they scale (say 5,000 detectors)
  - A prototype was developed:
    - Set up in our lab a "stripped down" SunGuide (only has DMS)
    - Processed 3,000 DMS library messages (40 libraries, 75 messages each):
      - SunGuide R2.1.2 provided a "login time" of 93 seconds.
      - Alternative approach of using ActiveX the login time drops to 2.25 seconds (actual parse time within the GUI was < 1 sec)
- Recommendation:
  - Change the entire GUI to use ActiveX controls to process the XML
  - Cost: $81K (the work SwRI performed on internal money will be given to FDOT)
  - Note: would be funded from surplus available from previous tasks, no additional budget required.

DMS Spell Check Enhancement

- **Issue: Sep 13, 2006 from D2; When sending a message with unapproved words, a pop up dialog will allow the operator to edit the words to fit within the normal operating parameters. MAS will then NOT reflect this (corrected) state.**
- **Response: Sep 14, 21006 from SwRI: The desire to have MAS updated if a message is changed due to a spelling error can be implemented.**
- **CMB to decide if SunGuide should be modified to have MAS reflect the correct message after a spell check change.**

SunGuide SM Software Release 3.x Added Video Control Subsystem Requirements

Final Vote

Preset Scheduling Enhancement

Reason for added requirements:

- District 2 Comments, Jason Summerfield e-mail 9/20/2006

Added/Modified Video Control Requirements

Req ID	Requirement	CMB Vote
TV007C	The CCTV Preset Scheduler function shall be such that if a camera is locked by an operator while a schedule is active or in progress, the schedule will resume with the action scheduled following release of the lock.	
TV007C1	The scheduler shall continue to generate CCTV commands in accordance with the schedule even if the camera is locked.	
TV007C2	CCTV Schedule commands shall be issued to the designated CCTV(s) only if the CCTV is not locked.	
TV007C3	The operator shall be able to suspend and resume the schedule through the use of the CCTV GUI.	
TV007C4	An operator-suspended schedule will, after a user defined time period, notify an operator that it is still suspended, allowing them the option to continue suspending, or to resume schedule.	
TV007C5	The schedule shall be suspended if the camera is locked and shall resume from where it was suspended when the CCTV is unlocked.	

SunGuide℠ Software Release 3.x AVL Subsystem Requirements

Final Vote

AVL Requirements Source

Requirements Specification for Autonomous Vehicle Location Tracking, Final Version 1 dated September 7, 2006

AVL Requirements

Req ID	Requirement	CMB Vote
AV001	The AVL subsystem shall acquire vehicle information containing position coordinates in XML format originated external to SunGuide.	
AV002	The AVL subsystem shall display vehicle position using icons on the SunGuide Map.	
AV003	AVL subsystem shall display vehicle status that is provided by the AVL data feed.	
AV004	The AVL subsystem shall store vehicle position data by vehicle so that the vehicle's track can be replayed on the SunGuide map.	
AV005	The AVL subsystem shall support the generation of a report about vehicle position time line with vehicle status information that was associated with the date-time of the position report.	
AV006	The AVL subsystem shall update the vehicle position each time a new position is reported for the vehicle.	
AV007	The operator shall be able to turn off the display of vehicle position information on the SunGuide map.	
AV008	Admin Editor functions shall be provided to allow administrators to add and remove vehicles from the AVL tracking system.	
AV009	The AVL subsystem shall update the vehicle status each time a new status is reported for the vehicle.	
AV010	If a driver is stopped for a configurable length of time without accounting for the stop the system shall notify the operator.	
AV011	The AVL subsystem shall provide the capability to manage road ranger assets according to geographic areas that define their patrol areas called geo-fences.	

AVL Requirements Continued

Requirements imposed on EM/PM by AVL

Req ID	Requirement	CMB Vote
EM010	An operator shall be able to invoke the EM/PM GUI, with location information pre-filled by right-clicking on an AVL icon and choosing “create new incident at vehicle location”	
EM018G	A Vehicle List window shall be provided that displays a tabular listing of all the AVL-enabled vehicles.	
EM018G1	A "Find on map" option shall be provided from the list, which will 'zoom' the SunGuide map to the current position of the vehicle icon.	
EM018G2	The tabular list shall include the following information for each vehicle: vehicle ID, status, location, speed, driver, beat, stopped time, incident ID (if available).	

AVL Requirements Continued

AVL Data Acquisition Requirements

Req ID	Requirement	CMB Vote
AV001L	The AVL data acquisition component shall be able to acquire a data file in XML format either from a URL or in a shared directory or by FTP pull.	
AV001L1	The AVL subsystem shall interface with the road ranger tablet application developed by District 4, and use the reported status as an input in decision points where required.	
AV001L2	The AVL system shall be compatible with the PC tablet devices used by the District 4 road ranger tablet application.	
AV002L	If multiple files are acquired containing more than one position for a vehicle, the acquisition component shall order the position reports by vehicle chronologically so the most currently reported position is last in the list.	
AV003L	If necessary, the acquisition component shall format the received data in accordance with the AVL Data Interface Specification.	

AVL Requirements Continued

AVL Data Acquisition Requirements (continued)

Req ID	Requirement	CMB Vote
AV004L	As a minimum, the XML data file shall contain the following information: vehicle ID; latitude in decimal degrees; longitude in decimal degrees; vehicle heading; vehicle speed in mph; type of event vehicle is responding to; event data (classification) location the vehicle is traveling to; area of responsibility for the vehicle (zone ID or area ID); date-time stamp.	
AV004L1	Geo-coordinates are expected to be reported to 3 decimal places at a minimum, if they bare not the acquisition component shall locate the closest road to the reported position and fill in the coordinates accordingly.	
AV004L2	Position reports that are corrected by SunGuide shall be flagged in the data log and indicated to the operator.	
AV005L	The icon status and position shall be updated upon receipt of new data.	
AV006L	The source location of the AVL data source shall be configurable using the SunGuide Administration function.	
AV007L	An operator shall be able to right-click on a vehicle to dispatch it to a new or existing event.	
AV007L1	In the case of new events, the operator will be prompted to enter the required information for the new event.	

AVL Requirements Continued

Icon Management Requirements

Req ID	Requirement	CMB Vote
AV002V	The icon symbol for each vehicle shall be able to be selected by an operator with administration rights on SunGuide and with appropriate permission for the subsystem.	
AV002V1	The icon used on the SunGuide map shall be an SVG icon.	
AV003V	The icon assigned by the administrator shall be used to represent vehicles for which position reports are received.	
AV004V	If position reports are received for different service vehicles such as DOT maintenance vehicles, road ranger service vehicle, fire vehicles, FHP vehicles, etc., the operator with appropriate privileges shall be able to assign an icon to represent the type of vehicle for the type of position reports received.	
AV005V	Vehicle icon color shall be configurable.	
AV006V	When an operator hovers the mouse cursor over an AVL icon on the SunGuide map, SunGuide shall display a “tool tip” like status box that shows the vehicle summary data.	
AV006V1	The summary data shall consist of truck number, beat, driver, radio/telephone number, truck position (roadway, direction, reference location, proximity to reference location), speed and status (availability) .	
AV007V	Vehicle status shall be provided to the extent provided by the received vehicle data file.	
AV007V1	Vehicle Status shall include at a minimum: vehicle ID, heading, speed, destination, event type, location in lat/long coordinates, and the last date-timestamp that position data was received.	
AV007V2	When there is no data in the position or status report for a particular field, a blank for the missing field will be displayed.	

AVL Requirements Continued

Icon Management Requirements (continued)

Req ID	Requirement	CMB Vote
AV008V	The SunGuide display of vehicles shall be refreshed whenever a new position report is available for display.	
AV008V1	If a position report is not displayed on the SunGuide map before a new position is received, the newer position will be displayed but the older one will be maintained in the track history and available for replay.	
AV008V2	A “find on map” option shall be provided in the Vehicle List window that will re-center the SunGuide map to the position of the selected vehicle.	
AV009V	Each vehicle shall be represented on the map with an icon, with the icon placed at the last reported geo-coordinate location.	
AV010V	The relevant AVL Icon shall appear different in shape and color, depending on the availability status reported by data feed from the vehicle.	
AV010V1	SunGuide shall support at a minimum the following four vehicle status values: patrolling, dispatched, assisting, and out-of-service.	
AV010V2	SunGuide shall allow at least four values to be defined for "Availability Status".	

AVL Requirements Continued

Icon Management Requirements Concluded

Req ID	Requirement	CMB Vote
AV011V	An operator shall be able to bring up a detailed vehicle status window by right-clicking on an AVL icon and selecting “show detailed status”.	
AV011V1	The “Detailed Vehicle Status” window shall be a floating window similar to other SunGuide Status windows.	
AV011V2	The Detailed Vehicle Status window shall display the following information about the most recently selected AVL vehicle icon: Vehicle ID, speed, heading, location, status, stopped time, operator, beat, nearest reference location (milepost), distance to nearest reference location, and, if available, the following information about the incident the vehicle is responding to: Incident ID, incident severity, incident type, incident description	
AV011V3	The operator can display information about a different vehicle in the Detailed Vehicle Status window by clicking on any other visible AVL icon.	

AVL Requirements Continued

Geo-Fences Requirements

Req ID	Requirement	CMB Vote
AV001V	SunGuide AVL subsystem shall support management of road ranger contract responsibilities through geo-fences using the SunGuide map and vehicle position reports.	
AV001V1	If a vehicle leaves the Geo-fenced area without justification, the system shall alert the operator with a popup notification and an audible alarm.	
AV012V	A "more noticeable" icon (e.g. flashing, larger, exclamation) shall be used when a vehicle stops or leaves the geo-fenced area without justification (non-patrolling status entered into the road ranger tablet).	
AV012V1	If a vehicle is assigned to a beat which has beat-specific geo-fences defined, then the AVL system shall use only the geo-fences for the specified beat to assess whether or not a given vehicle has left its beat zone.	
AV013V	The AVL system shall provide a graphical user interface to define the geo-fences, both system wide geo-fences and beat specific geo-fences.	

AVL Requirements Continued

Vehicle Tracking Requirements

Req ID	Requirement	CMB Vote
AV001T	The operator shall be able to view the vehicle status via the SunGuide GUI Map.	
AV009T	Chronological position data shall be maintained for each vehicle reporting position for a configurable number of days subject to data storage capacity on the hard disk(s).	
AV009T1	After a configurable number of days, the oldest vehicle position data will be deleted as new position reports are received.	
AV009T2	All vehicle location status data received from the AVL subsystem shall be logged to the database for reporting purposes.	
AV009T3	The following related data from the EM/PM subsystem shall be logged, if available: Beat, Driver, reference location, proximity to reference location, status, responding incident ID	

AVL Requirements Continued

Vehicle Tracking Requirements continued

Req ID	Requirement	CMB Vote
AV002T	The operator shall be able to turn on a “breadcrumb trail” display on the main SunGuide map which displays a configurable number of past positions of the vehicle.	
AV002T1	It shall be possible to enable and disable the trail feature on a per-vehicle basis.	
AV002T2	If the operator leaves "display track" on for a particular vehicle, the number of symbols representing the track shall follow the vehicle's position on the map with the oldest track symbol being erased as the next to current one is displayed.	
AV002T3	If a vehicle speed is "stopped" or "0", no more than one track icon shall be displayed.	
AV002T4	If vehicle is stopped, displayed status data shall include the amount of time that the truck has been stopped.	
AV002T5	If vehicle is moving, displayed status data shall include the amount of time that the truck has been moving..	

AVL Requirements Continued

Vehicle Tracking Requirements continued

Req ID	Requirement	CMB Vote
AV003T	The operator with appropriate permissions shall be able to right click on the SunGuide map in an area without any symbols and get a menu of "AVL Replay" options to generate a historical track of a selected vehicle.	
AV003T1	The operator may designate a vehicle ID, a span of time in date and time, and a replay rate when replaying vehicle track information.	
AV003T2	The operator may select to replay the vehicle's position in real time or faster than real time at a rate specified by the operator.	
AV003T3	The operator shall have the ability to delete from the display all of the historical tracks for a particular vehicle.	
AV003T4	The operator shall have the ability to globally delete all vehicles displaying a historical track.	
AV004T	The operator shall be able to designate a vehicle or a group of vehicles and enter a date-time and time span that position reports are generated for.	
AV004T1	SunGuide shall provide the option for the operator to sort report data by vehicle or by area of operation or by event type or event data codes or by date and time period.	
AV004T2	SunGuide shall make available the report data selected by the operator so that a reporting function external to SunGuide can generate the desired reports and print them.	

AVL Requirements Continued

Vehicle Tracking Requirements concluded

Req ID	Requirement	CMB Vote
AV005T	Position reports shall be displayed on the SunGuide workstation when requested by the operator.	
AV005T1	The operator shall have the option to save the report format thereby preserving the order in which the data is grouped to use as a template for future reports.	
AV005T2	The operator shall have the option to save or delete a report.	
AV006T	The reporting function shall retrieve AVL data based on a date/time range and a particular vehicle.	
AV006T1	At a minimum the identification criteria shall be able to be identified as: truck number, beat, driver, radio/telephone number, truck position (roadway, direction, reference location, proximity to reference location), speed and status (availability).	
AV007T	If a non-active status (gas, meal, inspection, etc.) is received in the AVL feed, the AVL icon shall remain normal.	
AV008T	The AVL subsystem shall store vehicle location and speed history in the SunGuide Oracle database.	

END AVL Ballot

Change Management Board

Closing and Action Item Review

Steve Corbin, CMB Chairman