Software Test Report Iteration 4 for R-ICMS:
Regional Integrated Corridor Management System

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List of Acronyms and Abbreviations

AAM	Active Arterial Management
AM	Ante Meridiem
API	Application Program Interface
AST	Agency for State Technology
ATMS	Advanced Traffic Management System
AVL	Automatic Vehicle Location
AWS	Amazon Web Services
CCTV	Closed Circuit Television
CLI	Command Line Interface
COTS	Commercial Off the Shelf
CSV	Comma Separated Variable
DFE	Data Fusion Environment
DMS	Dynamic Message Signs
DOT	Department of Transportation
DSS	Decision Support System
ERD	Entity Relationship Diagram
ETL	Extract, Transform, Load
FCS	Florida Cybersecurity Standards
FDOT	Florida Department of Transportation
FTP/SFTP	File Transport Protocol / Secure File Transport Protocol
GIS	Geographic Information System
GTFS	General Transit Feed Specification
GTFS-RT	General Transit Feed Specification – Real Time
HCS7	Highway Capacity Software
HDFS	Hadoop Distributed File System
HTTPS	Hyper Text Transfer Protocol Secure
HWU	Hot Wash Up
IC	Integration Case
ICD	Interface Control Document
ID	Identifier
IEN	Information Exchange Network
IMC	Intersection Movement Counts
IT	Information Technology
ITS	Intelligent Transportation System
ITSIQA	Intelligent Transportation System Input Quality Assurance
JSON	JavaScript Object Notation
JWT	JSON Web Tokens
LDAP	Lightweight Directory Access Protocol
ME	Modeling Engine
MOE	Measure of Effectiveness
MS SQL	Microsoft SQL

MVC	Model View Controller
OAS	OpenAPI Specification
PD	Preliminary Design
PDF	Portable Document Format
PDR	Preliminary Design Review
PM	Post Meridiem
RCI	Roadway Characteristics Inventory
RDBMS	Relational DataBase Management System
REST	Representational State Transfer
R-ICMS	Regional Integrated Corridor Management System
RP	Response Plan
RPE	Response Plan Element
SDD	System Design Document
SHS	State Highway System
SLES	SUSE Linux Enterprise Server
SOT	Signal Optimization Tool
SQL	Structured Query Language
SSL	Secure Sockets Layer
SwRI	Southwest Research Institute
TBD	To Be Determined
TC	Test Case
TGDC	Time Grouped Demand Cluster
TLS	Transport Layer Security
TRR	Test Readiness Review
TSMO	Transportation Systems Management and Operations
UI	User Interface
UML	Unified Modeling Language
URL	Uniform Resource Locator
VHB	Vanasse Hangen Brustlin
VM	Virtual Machine
VPN	Virtual Private Network
XML	Extensible Markup Language

1   Introduction

This document provides a record of the testing of Iteration 3 of the Regional Integrated Corridor Management System (R-ICMS).

1.1   *Purpose*

The first sections of this document describe the software and resource management used to conduct the test. The last sections of this document specify the requirements verified by this test.

1.2   *Overview*

The R-ICMS is intended to be an initial implementation of a multi-modal regional transportation management system. The R-ICMS will integrate freeway, arterial, transit, and rail transportation management for the I4 corridor, including management of transportation system components owned and operated by the state, as well as the county, city, and regional transportation agencies.

The R-ICMS will consist of, but not be limited to; commercial off-the-shelf (COTS) modeling software (provided by the DEPARTMENT), a custom-built Decision Support System (DSS), a custom-built Information Exchange Network (IEN) subsystem that includes dashboards and other user interfaces to the system, and a Data Fusion Environment (DFE) to host data sources for both the R-ICMS and other external users and applications.

This project is funded and managed by District 5 of the Florida Department of Transportation (FDOT). It is intended for the use of District personnel, as well as personnel from the cities, counties, and transportation agencies located within the District. The initial deployment of the R-ICMS will be to the Transportation Management Center being built in District 5 by the FDOT.
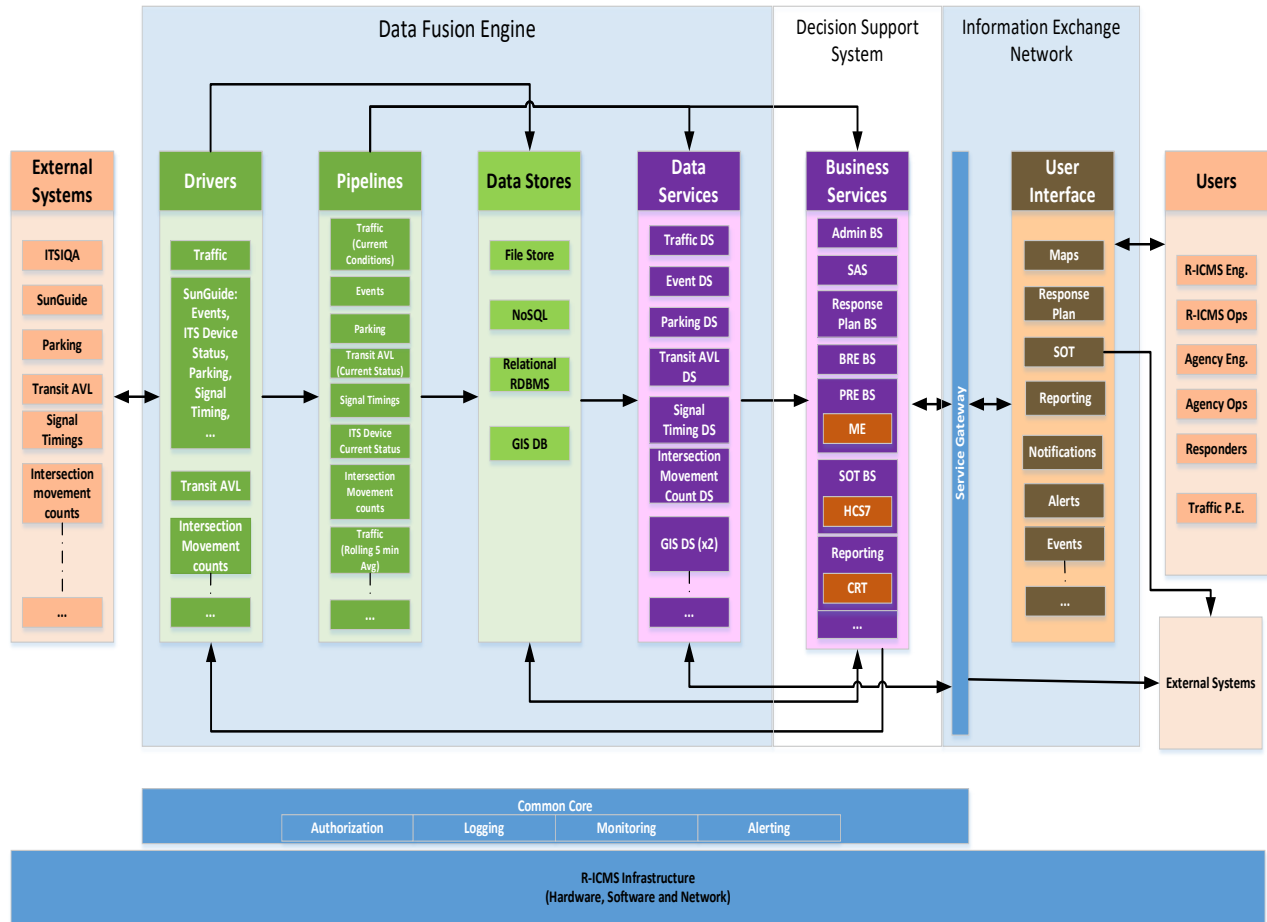
Figure 1 - High Level Architecture

1.2.1 Release Scope

Iteration 4 of 4 focused on finalizing all data sources.the initial R-ICMS event management user interface, implementation of DSS rules for evaluating SunGuide events, and integration with the external traffic simulation tools for both DSS and SOT. Additionally, new and updated data pipelines were developed, and the SOT user interface was expanded. This test plan will include testing of the following.

Table 1 - Iteration 4 Data Sources

Data Source	Functionality Tested
SunGuide TMDD	Ingestion / Storage / Retrieval
SunGuide Ramp Meter	Ingestion / Storage / Retrieval
SunGuide Connected Vehicle (RSE)	Ingestion / Storage / Retrieval
SunGuide Truck Parking	Ingestion / Storage / Retrieval
SIIA	Ingestion / Storage / Retrieval
Response Plans	Storage

2   Integration and Testing

Provides the details of the planned integration and acceptance testing.

2.1   Test Participants

Table 2 - Test Participants shows the personnel designated to participate in the testing process.

Table 2 - Test Participants

Participant	Contact Info	Environment Prep	Test Readiness Role	Test Execution Role (Location)	Test Report
Clay Weston SwRI	cweston@swri.edu (210) 867-7353	Oversight	Conductor	Conductor (SwRI)	Developer
Angela Bos SwRI	abos@swri.edu (210) 522-5969	Swarm AD Databases Deployment Tester	Conductor	Attendee (SwRI)	Developer
Adam Dylla SwRI	adylla@swri.edu (210) 522-5341	Tester	Conductor	Attendee (SwRI)	Developer
Sam Burnett SwRI	sburnett@swri.edu (210) 522-3586	Tester	Conductor	Attendee (SwRI)	Developer
Patrick Martinez SwRI	sburnett@swri.edu (210) 522-2910	Tester	Conductor	Attendee (SwRI)	Developer
Natalie Coggeshell SwRI (EPIC)	natalie@epicgroupllc.com (407) 381-3742		Conductor	Conductor (EPIC)	Developer
Gary Miller SwRI (EPIC)	gary@epicgroupllc.com (407)545-1973	Oversight	Attendee	Attendee (EPIC)	Oversight
Suresh Sanka SwRI (EPIC)	suresh@epicgroupllc.com (407) 381-3742	System Setup	Conductor	Conductor (EPIC)	Developer
Sindhura Pandrangi SwRI (EPIC)	sindhura@epicgroupllc.com 407-381-3742	GIS Setup	Attendee	Attendee (EPIC)	Attendee
Jared Allen SwRI (EPIC)	jared@epicgroupllc.com 407-381-3742	GIS	Conductor	Conductor (EPIC)	Developer
Sudhir Labh SwRI (EPIC)	sudhir@epicgroupllc.com 407-381-3742	DFE	Conductor	Attendee (EPIC)	Developer
Dinesh Vardhan SwRI (EPIC)	dinesh@epicgroupllc.com 407-381-3742	System Setup (Sub Service / APIs)	Conductor	Attendee (EPIC)	Developer
Clay Packard FDOT (VHB)	cpackard@vhb.com (407) 901-2804	SunGuide Prep	Witness	Witness (FDOT)	Reviewer
Claudia Paskauskas FDOT (Innovo Partners)	cpaskauskas@innovopartners.com 407.432-4866		Witness	Witness (FDOT)	Reviewer
Tim Klawa FDOT (Kapsch)	Timothy.Klawa@kapsch.net (540) 680-4890		Witness	Witness (FDOT)	Reviewer

Participant	Contact Info	Environment Prep	Test Readiness Role	Test Execution Role (Location)	Test Report
Kevin Miller FDOT (Kapsch)	Kevin.Miller@kapsch.net		Witness	Witness (FDOT)	Reviewer
Tushar Patel FDOT	Tushar.Patel@dot.state.fl.us 386-943-5315		Witness	Approver (FDOT)	Approver
Jeremy Dilmore FDOT	Jeremy.Dilmore@dot.state.fl.us (386) 943-5360		Witness	Witness (FDOT)	Reviewer
Jay Williams FDOT	Jay.Williams@dot.state.fl.us 386-943-5329		Witness	Witness (FDOT)	
Manny Rodriquez FDOT	Manny.Rodriquez@dot.state.fl.us O: 321-257-7208 C: 352-359-2135			(FDOT)	
Steve Johnson FDOT	Steve.Johnson@dot.state.fl.us O: 321-257-7245 C: 386-279-5469			ITS Support (FDOT)	
Aurelio Giovinazzo FDOT	Aurelio.Giovinazzo@dot.state.fl.us O: 321-257-7268			ITS IT Support (FDOT)	
Abram Little FDOT	Abram.Little@dot.state.fl.us O: 321-257-7266			ITS IT Support (FDOT)	
Jake Rutherford Metric	Jake.Rutherford@metriceng.com O: 407-644-1898 C: 407-795-0820			ITS Network (Metric)	
Christy Flickinger AECOM	Christy.Flickinger@dot.state.fl.us O: 386-943-5386			GIS Program Manager (AECOM)	

2.2 Test Environment

Testers will be remotely located and use personal District 5 VPN accounts and remote-desktop access to login to a system where remote screen-sharing will be used to demonstrate the test procedures.

A screen share and teleconference will be set up such that all parties will be able to view the test steps being run and the expected results. The test conductor (Clay Weston) will read the steps aloud while the appropriate personnel at SwRI, EPIC, and Aimsun will perform the steps. All steps and expected results will be visible to participants at FDOT through the screen share and any steps can be run again or any extra steps needed can be performed to ensure FDOT that the appropriate level of testing is being performed.

Figure 2 - Physical Diagram shows the physical configuration for this test. Some servers may run as Virtual Machines (VMs) and some services may be combined to run on a single server. The primary installation for the purposes of this test will be installed on servers located at FDOT RTMC.

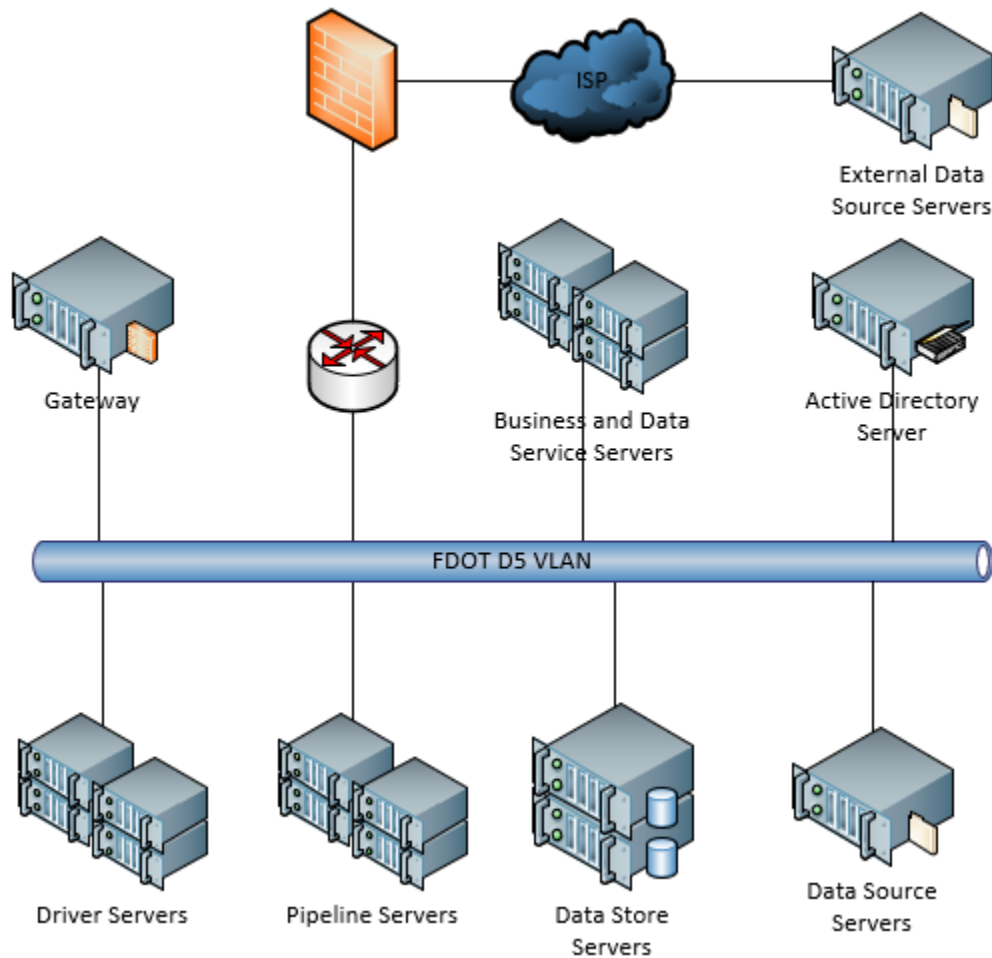**Figure 2 - Physical Diagram**

2.3   Test Dependencies

Table 3 - Test Dependencies lists the resources needed to complete this test as well as the owner agency responsible for providing the associated resource. Additional description follows below

Table 3 - Test Dependencies

Resource	Owner
Iteration 4 R-ICMS Software	SwRI, EPIC
Windows/Linux Servers	FDOT, SwRI, EPIC

Resource	Owner
Deployment Folder Setup	SwRI, EPIC
Data Stores (SQL, MongoDB, HDFS)	SwRI, EPIC
ESRI ArcGIS Environment	Jared Allen Christy Flickinger FDOT, SwRI, EPIC
ESRI Workstation	SwRI, EPIC, FDOT
HCS7 Streets Software	Angela Bos SwRI
SunGuide 7.2 Test System	Aurelio Gionavazzo FDOT
SunGuide Simulators	Clay Packard FDOT
Aimsun Live and Next server	Matt Juckes FDOT
Test User List	Aurelio Gionavazzo FDOT

2.3.1 Iteration 4 R-ICMS Software

This consists of all relevant R-ICMS software for this test event. At end of testing a final version of the source code will be provided.

2.3.2 Windows/Linux Servers

The following table lists the servers that will be used as part of this installation and test.

Table 4 - Iteration 4 Test Servers

Role	Name	IP	OS
cloudera edge 0	ITSSD5ICMSCDHE0	10.32.92.100	linux
cloudera master 0	ITSSD5ICMSCDHM0	10.32.92.120	linux
cloudera master 1	ITSSD5ICMSCDHM1	10.32.92.121	linux
cloudera worker 0	ITSSD5ICMSCDHW0	10.32.92.140	linux
cloudera worker 1	ITSSD5ICMSCDHW1	10.32.92.141	linux
cloudera worker 2	ITSSD5ICMSCDHW2	10.32.92.142	linux
cloudera worker 3	ITSSD5ICMSCDHW3	10.32.92.143	linux
cloudera kafka 0	ITSSD5ICMSCDHK0	10.32.92.110	linux

Role	Name	IP	OS
cloudera kafka 1	ITSSD5ICMSCDHK1	10.32.92.111	linux
cloudera utility 0	ITSSD5ICMSCDMU0	10.32.92.130	linux
elastic 0	ITSSD5ICMSES0	10.32.92.80	linux
elastic 1	ITSSD5ICMSES1	10.32.92.81	linux
elastic 2	ITSSD5ICMSES2	10.32.92.82	linux
kubernetes linux worker 0	ITSSD5ICMSKLW0	10.32.92.60	linux
kubernetes linux worker 1	ITSSD5ICMSKLW1	10.32.92.61	linux
kubernetes linux worker 2	ITSSD5ICMSKLW2	10.32.92.62	linux
kubernetes linux worker 3	ITSSD5ICMSKLW3	10.32.92.63	linux
kubernetes linux worker 4	ITSSD5ICMSKLW4	10.32.92.64	linux
kubernetes linux worker 5	ITSSD5ICMSKLW5	10.32.92.65	linux
kubernetes master 0 docker registry (image-repo.ricms)	ITSSD5ICMSKM0	10.32.92.50	linux
kubernetes master 1 docker swarm manager	ITSSD5ICMSKM1	10.32.92.51	linux
kubernetes master 2	ITSSD5ICMSKM2	10.32.92.52	linux
kubernetes windows worker 0 swarm worker build/deploy host	ITSSD5ICMSKWW0	10.32.92.70	windows
kubernetes windows worker 0 swarm worker	ITSSD5ICMSKWW1	10.32.92.71	windows
kubernetes windows worker 2 authentication authorization Windows API Caller	ITSSD5ICMSKWW2	10.32.92.72	windows
mongodb node 0	ITSSD5ICMSMDB0	10.32.92.90	linux
mongodb node 1	ITSSD5ICMSMDB1	10.32.92.91	linux
mongodb node 2	ITSSD5ICMSMDB2	10.32.92.92	linux
proxy for k8s	ITSSD5ICMSKP0	10.32.92.40	linux
sql server	ITSSD5ICMSSQL1	10.32.92.30	windows
D5 Aimsun		10.32.1.30:8075	linux

Role	Name	IP	OS
D5 GIS			
ESRI VM (for ATP)	ITSTD5ARCPRO01	10.32.90.157	windows

2.3.3 Deployment Folder Setup

The following table lists the deployment folder setup used for this installation and test

Table 5 - Iteration 4 Deployment Folder Setup

Host Name	IP	OS	Folder	Role / Purpose
ITSSD5ICMSKM0	10.32.92.50	Linux	/etc/kubernetes/ admin.conf	Kubernetes cluster config (for kubectl)
ITSSD5ICMSKWW0	10.32.92.70	Windows	C:\Deploy	Kubernetes configs for FDOT and deployment script
ITSSD5ICMSKWW2	10.32.92.72	Windows	C:\Deploy\Docker\ auth-docker-swarm	docker-compose.fdot. yml for authentication and authorization services
ITSSD5ICMSKWW2	10.32.92.72	Windows	C:\Deploy\ WindowsApiCaller	Windows service for AD login (configured with FDOT API key)
ITSSD5ICMSKWW2	10.32.92.72	Windows	C:\Program Files\filebeat	filebeat executable and configuration

Host Name	IP	OS	Folder	Role / Purpose
ITSSD5ICMSSQL1	10.32.92.30	Windows	C:\DataStores	Database create and seed scripts
ITSSD5ICMSKP0	10.32.92.40	Linux	/etc/haproxy/haproxy.cfg	Kubernetes master proxy configuration

2.3.4 Data Stores (SQL, MongoDB, HDFS)

The relevant data stores have been set up pursuant to the Iteration 4 System Design Document. Instructions for data store installation can be found in the Iteration 4 Version Description Document.

2.3.5 ESRI ArcGIS environment

The full ESRI ArcGIS environment setup can be found in the System Design Document - Table 3 - Third Party Components, Esri ArcGIS Enterprise Advanced Component

2.3.6 ESRI Workstation

For the purposes of this test event, the FDOT ESRI workstation will be utilized. It is not necessary that it be this specific computer, rather, it was a resource on the network that all groups have access to.

2.3.7 HCS7 Streets Software

The HCS7 Streets software will be installed and maintained by SwRI and used to run HCS7 optimizations.

2.3.8 SunGuide 7.2 Test System

For this iteration, all SunGuide testing will be done utilizing the SunGuide 7.2 Test System which was setup and installed by FDOT.

2.3.9 SunGuide 7.2 Truck Parking Simulator

For this iteration the system will need to be running the truck parking simulator to send status messages which can be consumed and shown on the RICMS user interface.

2.3.10 Aimsun Live and Next Server

The system will test using the installed Aimsun Live and Next servers. Live will return response plan results and Next will provide SOT simulation results.
The Aimsun systems should implement the following interface defined in the R-ICMS source code repository

- Api\SimulationInterface.yaml

On the R-ICMS side, these interfaces must be implemented:

- Api\ResponsePlanSimulationCallback.yaml
- Api\SotSimulationCallback.yaml

2.3.11 Test User List

For the purpose of this test event the following users have been entered into Active Directory with the following groups.

User	Member of Group
SwriAdmin	gg_RICMS_operator,
EpicAdmin	gg_RICMS_operator,gg_RICMS_admin
SwriUser1	gg_RICMS_operator,gg_RICMS_corr-mngr,gg_RICMS_event-admin
SwriUser2	gg_RICMS_operator,gg_RICMS_event-oper,gg_RICMS_corr-apprv,gg_RICMS_signal-oper,gg_RICMS_signal-apprv
SwriUser3	gg_RICMS_operator,gg_RICMS_event-oper,gg_RICMS_corr-apprv,gg_RICMS_signal-oper,gg_RICMS_signal-apprv
EpicUser1	gg_RICMS_operator,gg_RICMS_corr-mngr,gg_RICMS_event-admin
EpicUser2	gg_RICMS_operator,gg_RICMS_event-oper,gg_RICMS_corr-apprv,gg_RICMS_signal-oper,gg_RICMS_signal-apprv
EpicUser3	gg_RICMS_operator,gg_RICMS_event-oper,gg_RICMS_corr-apprv,gg_RICMS_signal-oper,gg_RICMS_signal-apprv

3   Test Results

The following sections detail the steps performed to complete testing for Iteration 3.

3.1 Test Readiness Review

The Test Readiness Review (TRR) was held immediately prior to the Test Execution. The slides presented as part of the TRR are shown in Exhibit A - RICMS Iteration 4 TRR.pptx.

3.2 Test Execution

The test team conducted the testing as described in the Software Test Procedures.
- Exhibit A - R-ICMS-TPD-4.0.pdf is a pdf of the Software Test Procedures with notations indicating deviations from the test procedures if any as well as indication of Pass / Fail for each of the test steps.
- All Test Artifacts can be found on the FDOT Sharepoint site under the Iteration 4 – System Test Report folder.

Table 6 - Test Case Pass/Fail

Test Case ID	Test Case Name	Test Case Description	Pass / Fail / Corrective Action
RICMS-IEN-1	Demonstrate the RICMS allows users to view the current status of the transportation network.	The objective of this test is to demonstrate the RICMS provides current status of the transportation network to authorized users.	Pass
RICMS-IEN-2	Demonstrate the RICMS allows users to view current weather data on the map.	The objective of this test is to demonstrate the RICMS provides current weather data to authorized users on the map display.	Pass (Steps 8 – 9 passed on Corrective Action)
RICMS-IEN-3	Demonstrate the RICMS allows users to manage event list data.	The objective of this test is to demonstrate the RICMS provides users with the ability to sort, filter and export event list data.	Pass
RICMS-IEN-4	Demonstrate the RICMS supports a data analytics toolset for querying data	The objective of this test is to demonstrate the RICMS provides users with dashboard, queries, and 6 identified reports.	Pass
RICMS-IEN-5	Demonstrate the RICMS supports reporting and analytic functions.	The objective of this test is to demonstrate the RICMS provides users with dashboard, queries, and 6 identified reports.	Pass
RICMS-IEN-6	Demonstrate the RICMS supports lane	The objective of this test is to demonstrate the RICMS provides users with the ability to create, and	Pass

Test Case ID	Test Case Name	Test Case Description	Pass / Fail / Corrective Action
	blockage diagrams for RICMS events.	edit lane blockage diagrams for RICMS events.	
RICMS-IEN-7	Demonstrate the RICMS supports CCTV video capabilities for available devices.	The objective of this test is to demonstrate the RICMS provides users with the ability to locate and view CCTV video from available devices for all RICMS and SunGuide events.	Pass
RICMS-IEN-8	Demonstrate the RICMS supports Travel Advisory Messages (TAM) from the map display.	The objective of this test is to demonstrate the RICMS provides users with the ability to locate and view TAM characteristics from the map display.	Pass
RICMS-IEN-9	Demonstrate the RICMS supports event ownership and related event association.	The objective of this test is to demonstrate the RICMS provides the ability to transfer ownership of an event to an authorized user and create a relationship of an RICMS event to a SunGuide event.	Pass
RICMS-DFE-1	Demonstrate data can be ingested / stored by the RICMS.	The objective of this test is to demonstrate the RICMS can ingest and store data from data sources.	Pass
RICMS-DFE-2	Demonstrate the RICMS can transform and store data source data.	The objective of this test is to demonstrate RICMS can load and store transformed data from the data sources into JSON format.	Pass
RICMS-DFE-3	Demonstrate that transformed data can be filtered and accessed by data consumers through a representational state transfer (REST API) web services interface	The objective of this test is to demonstrate the RICMS provides the ability for internal and external consumers to request and receive data using filtered parameters on an individual basis.	Pass
RICMS-DFE-4	Demonstrate that transformed data can be accessed by data consumers through a subscription service	The objective of this test is to demonstrate the RICMS provides the ability for internal and external consumers to request and receive data using	Pass

Test Case ID	Test Case Name	Test Case Description	Pass / Fail / Corrective Action
		filtered parameters on a subscription basis.	
RICMS-DFE-5	Demonstrate the RICMS supports data source activity logging and statistics for maintenance support.	The objective of this test is to demonstrate the RICMS provide access to data source logs and history by support personnel.	Pass
RICMS-DFE-6	Demonstrate the RICMS supports data availability status information.	The objective of this test is to demonstrate the RICMS collection and logging of availability and errors in the data stores.	Pass
RICMS-DFE-7	Demonstrate the RICMS supports data capacity expansion.	The objective of this test is to demonstrate the RICMS can support additional data capacity storage as needed.	Pass
RICMS-MON-1	Fatal Error Monitoring	The objective of this test is to demonstrate the RICMS can monitor and alert when a severe error event occurs.	Pass
RICMS-MON-2	Invalid Data Monitoring	The objective of this test is to demonstrate the RICMS can monitor and alert when invalid data is retrieved by drivers.	Pass
RICMS-MON-3	Data Store Monitoring	The objective of this test is to demonstrate the RICMS can monitor and alert when a data store is unavailable.	Pass
RICMS-MON-4	CPU Monitoring	The objective of this test is to demonstrate the RICMS can monitor and alert when a RICMS related server exceeds its designated CPU utilization.	Pass
RICMS-MON-5	RAM Monitoring	The objective of this test is to demonstrate the RICMS can monitor and alert when a	Pass

Test Case ID	Test Case Name	Test Case Description	Pass / Fail / Corrective Action
		RICMS related server exceeds its designated RAM utilization.	
RICMS-MON-6	Disk Space Monitoring	The objective of this test is to demonstrate the RICMS can monitor and alert when a RICMS related server exceeds its designated Disk Space utilization.	Pass
RICMS-DSS-1	Initial (Pre-simulation) Event Evaluation	The system will perform initial event evaluation for response plan consideration using the selection settings, including filtering of response plans based on device status.	Pass (Unable to test steps 12 – 16)
RICMS-DSS-2	Simulation Engine Interaction	The system will send the applicable response plan data obtained from the GIS server to the Simulation Engine and await the score data callbacks from the Simulation Engine.	Pass
RICMS-DSS-3	Suggestion of Response Plans to ICM Managers	Upon receiving the scores from the Simulation Engine, the system will notify ICM managers of the plans and allow for selection of a plan, including selection of the 'do-nothing' plan.	Pass (Benefit Thresholds Passed During Corrective Action)
RICMS-DSS-4	Device Approval	Upon receiving the selected Response Plan from the ICM manager, the system will notify Device Owners as needed to allow approval of the device(s) to be included in the plan and automatically approve or reject devices for the selected plan based on the configured auto-approval profiles of the devices and device groups.	Pass

Test Case ID	Test Case Name	Test Case Description	Pass / Fail / Corrective Action
RICMS-DSS-5	Plan Approval and Activation	Upon receiving device manager approvals needed for the plan, the system will allow the ICM manager(s) to approve the plan for activation. When activated, performance timestamps will be calculated and saved for later reporting.	Pass
RICMS-DSS-6	Plan Override	Instead of waiting on approval of devices, the ICM manager(s) are able to select a plan to activate.	Pass
RICMS-DSS-7	Limiting frequency of signal timing changes	After activating a response plan, a new event evaluation will not recommend a plan that has signals in common with the active response plan if the plan has been activated within the last 15 minutes	Initial Failure (Passed on Correction Action)
RICMS-DSS-8	Re-evaluation of Active Plan	Enacted plans are re-evaluated on a configurable interval and a return-to-normal plan is considered by the system.	Pass (Design updated upon request and shown during Corrective Action)
RICMS-SOT-0	Signal corridor measures of effectiveness	The system will demonstrate the detailed results of full signal corridor optimization and simulation that generated before ATP.	Pass
RICMS-SOT-1	Multiple intersection signal corridor optimization	The system will demonstrate a multiple signal corridor configuration, optimization, review, modification, re-evaluation, and deployment. The system will demonstrate map integration, exports of timing reports and data, and imports of signed reports.	Pass (Step 27 initially failed but passed on Corrective Action) Step 50 unable to be tested.

Test Case ID	Test Case Name	Test Case Description	Pass / Fail / Corrective Action
RICMS-SOT-2	Single intersection signal corridor optimization	The system will demonstrate a single signal corridor configuration with automatic day-plan generation, optimization, and review.	Pass
RICMS-SOT-3	Recurring signal corridor optimization	The system will demonstrate a recurring signal corridor configuration, optimization, review, and deployment with conflicts that must be resolved.	Pass
RICMS-SOT-4	Signal corridor map integration	The system will demonstrate integration of GIS map views for SOT corridors and signals.	Pass
RICMS-SOT-5	Signal corridor restrictions per day of week and time of day	The system will demonstrate signal corridor configurations with respect to the following restrictions set in the SIIA system: 1) Can't Lag Left 2) Can't Run Concurrent Lefts 3) Exclusive phases for pedestrians Split phase side street	Pass

3.3   Hot Wash Up

The Hot Wash Up (HWU) meeting was held following Test Execution. The HWU included:
- Test Case Status
- Demonstrated R-ICMS capabilities
- Deviations
- Known Software Issues
- Test Procedure Updates

The HWU can be found on the FDOT Sharepoint site under the Iteration 4 – Hot Wash Up folder

3.4   Corrective Action

The following Test Cases were affected during initial testing but all passed after Corrective Action.

Test Case ID	Test Case Name	Test Case Description	Corrective Action
RICMS-IEN-2	Demonstrate the RICMS allows users to view current weather data on the map.	The objective of this test is to demonstrate the RICMS provides current weather data to authorized users on the map display.	Pass Proxied weather service to allow for a more stable connection
RICMS-DSS-1	Initial (Pre-simulation) Event Evaluation	The system will perform initial event evaluation for response plan consideration using the selection settings, including filtering of response plans based on device status.	Pass Steps 12 -16 were unable to be tested due to Aimsun not containing ITSIQA links past the response plan coverage area.
RICMS-DSS-3	Suggestion of Response Plans to ICM Managers	Upon receiving the scores from the Simulation Engine, the system will notify ICM managers of the plans and allow for selection of a plan, including selection of the 'do-nothing' plan.	Pass Fixed benefit threshold logic to ensure that only scores above configured threshold are show in the UI. Retained ability to store all results.
RICMS-DSS-7	Limiting frequency of signal timing changes	After activating a response plan, a new event evaluation will not recommend a plan that has signals in common with the active response plan if the plan has been activated within the last 15 minutes	Pass Fixed logic to disallow new response plans to include signals that have been active for a different event within the last 15 minutes
RICMS-DSS-8	Re-evaluation of Active Plan	Enacted plans are re-evaluated on a configurable interval and a return-to-normal plan is considered by the system.	Pass Added logic to always display active response plan. Added logic to track device updates and update activation status.

Test Case ID	Test Case Name	Test Case Description	Corrective Action
RICMS-SOT-1	Multiple intersection signal corridor optimization	The system will demonstrate a multiple signal corridor configuration, optimization, review, modification, re-evaluation, and deployment. The system will demonstrate map integration, exports of timing reports and data, and imports of signed reports.	Pass Fixed date error (Step 27) Step 50 unable to be tested but will be resolved before production.

Attachment A
R-ICMS-TPD-4.0.pdf