VOLVO

Document Number	Issue Number	Date	Page
6980-02941-01-08	1.0	11-Oct-2010	1 (12)
Author Company	Author Department, Name		Author Phone
Volvo Technology	Mike Siebert, 6980		+1 (336) 393-3171
Customer Company	Customer Name		Customer Phone
New York State DOT	Rick McDonough		+1 (518) 457-5871
Customer Contract Number	Customer Contract Start/Finish Dates		
C030588	21-Jan-2009 to 31-Dec-2010		

Acceptance Test Plan

C030588 CVII Tasks 3 and 4

Tasks 3 and 4 build on the base CVII infrastructure developed in Task 2 providing a driver credentials verification application and a wireless roadside vehicle safety inspection application.

Responsible	Tom Richter
Established Date	30-Sep-2010
Archived until	11-Oct-2020
Classification	OPEN

Contents

1 General Information

This document describes the acceptance test plan for Tasks 3 and 4 of the NYSDOT CVII Project.

1.1 Document Contacts

Company	Name	Phone	Email
VTEC	Mike Siebert	+1 (336) 393-3171	mike.siebert@volvo.com
VTEC	Tom Richter	+1 (336) 393-2371	tom.richter@volvo.com

1.2 Revision History

Issue	Date	Author	Changes
1.0	11 Oct 2010	Mike Siebert	Initial

1.3 Reference Documents

[1] Contract #C030588 – PIN: CC95.07.121
Commercial Vehicle Infrastructure Integration
New York State – Department of Transportation

[2] 6980-02821-01-02 C030588 CVII Program Plan
Volvo Technology – Tom Richter
Issue 3.1 – 06 Nov 2009

[3] 6980-02941-01-05 C030588 CVII Task 3 Concept of Operations
Volvo Technology – Mike Siebert
Issue 1.1 – 11 June 2010

[4] 6980-02941-01-10 C030588 CVII Task 4 Concept of Operations
Volvo Technology – Mike Siebert
Issue 1.1 – 11 June 2010

1.4 Abbreviations

CVII	Commercial Vehicle to Infrastructure Integration
DOT	Department of Transportation
DMCU	5.9 GHz DSRC Mobile Communications Unit
DSRC	Dedicated Short-Range Communications
GBS	Government Back-Office System
IP	Internet Protocol
KTC	Kapsch TrafficCom Inc.
N/A	Not Applicable
NYS	New York State
NYSDOT	New York State Department of Transportation
PIN	Personal Identification Number
RSE	Roadside Equipment
TGW	Telematics GateWay
VII	Vehicle to Infrastructure Integration
VTEC	Volvo Technology
WRI	Wireless Roadside Inspection

1.5 Acceptance Criteria Identification

All acceptance criteria defined in this specification shall utilize the following notation:

Criteria TASK3&4-nnn/i.i: <Criteria Title>
<Criteria Specification>

Where:

‘nnn’	Serial number: 000-999
‘i.i’	Issue of test plan in which the criteria was added or modified

2 Acceptance Test Procedure

The acceptance test for Tasks 3 and 4 shall be accomplished by running the commercial test vehicle through the procedures defined in this document which will verify that the requirements for Driver Credentials Verification [3] and Wireless Vehicle Safety Inspection [4] have been met. There will be no connectivity to NYS systems available for the acceptance test, so all of these functions shall be simulated.

The purpose of this acceptance test shall be to demonstrate the basic operation of the system from the vehicle to the roadside and to provide data for FMCSA WRI Team evaluation. Detailed analysis of the collected data will occur during Task 6 – NYS Back Office Integration.

Driver Credential Verification

The vehicle shall be parked and within the range of an RSE in order to verify the Driver Credential application. The operational scenario verified via this test plan represents a simple, perfect-path case.

Wireless Vehicle Safety Inspection

The wireless vehicle safety inspection service can support a number of system level operational scenarios. For the purposes of this test procedure, a general operational scenario shall be used which exercises all four of the defined use cases:

1. Broadcast Inspection Request
2. Send Inspection Message
3. Request Inspection Advisory
4. Display Inspection Advisory

The first three use cases require that the test route shall be within the range of an RSE. Since the Display Inspection Advisory use case does not require RSE coverage, the test route for this use case shall not be within the range of an RSE to demonstrate that RSE coverage is not required.

2.1 Test Procedure Log

During the execution of the test procedure, a Test Procedure Log shall be maintained as defined in the remainder of this paragraph.

2.1.1 Pre-Test Data

Prior to running the test route, the following information shall be collected:

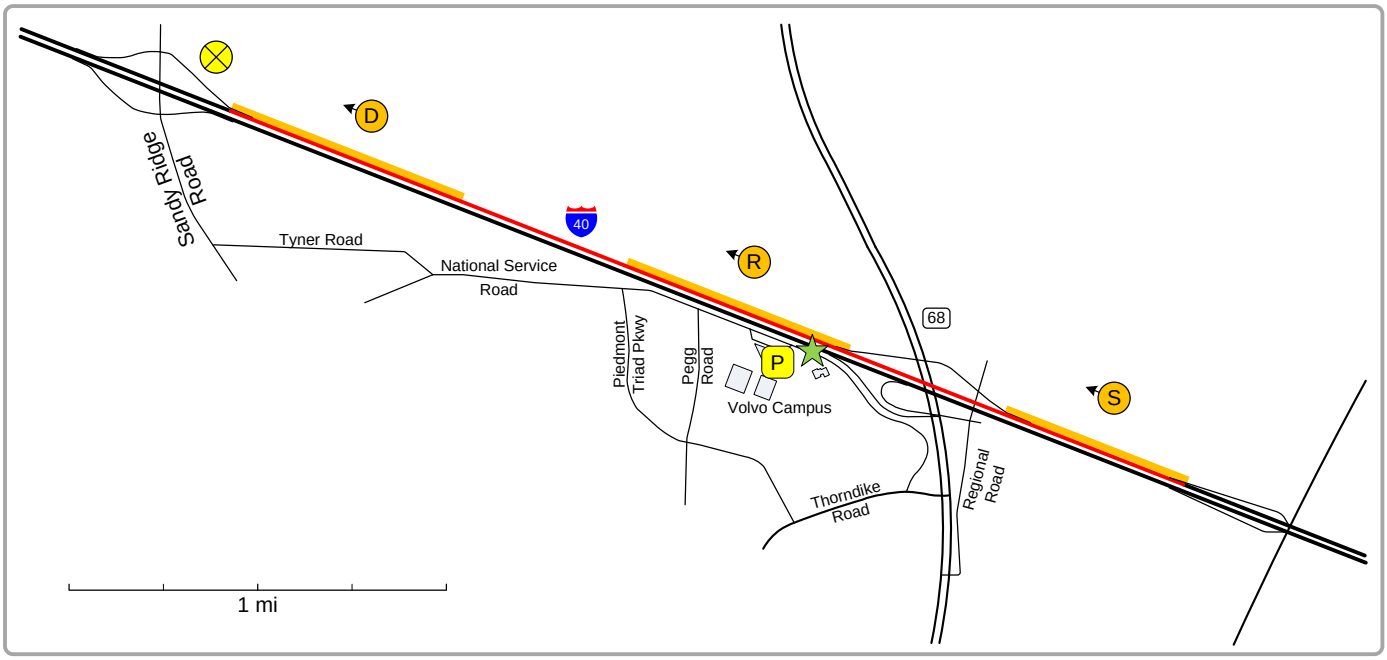
- Test hardware configuration:
  - System diagram showing:
    - Equipment
    - Connectivity (including IP addresses, etc.)
  - For each equipment item:
    - Manufacturer
    - Model
    - Serial Number
- Service configuration for:
  - Driver Credentials Verification
  - Wireless Roadside Inspection

2.1.2 Test Execution Data

During the execution of the test, the information defined in the test procedures below (i.e. "Log …") shall be collected.

2.2 Acceptance Test Location

The acceptance test location for Tasks 3 and 4 shall be in the vicinity of the Volvo campus in Greensboro, NC, as shown on the map below:



The following notation is used on the map:

- RSE Location

  ★

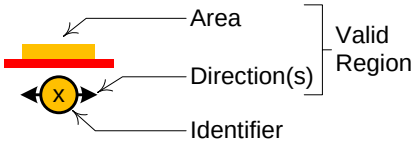
- Driver Credential Verification Location (Parking Lot)

  P

- Wireless Inspection Test Route

  ▬

- Wireless Inspection Geo-Zone Locations



- "Inspection Station" Location

2.3 Driver Credentials Verification Test

The driver credentials verification test shall be conducted with the vehicle parked in front of the Volvo Campus in the parking lot marked with P on the map above.

2.3.1 Invalid Driver Credentials Test

The credentials contained on the simulated driver's license used for this test shall be considered invalid by the GBS Simulator.

Procedure:

- Log:
  - Driver credentials content contained on the simulated drivers license
  - Starting time of the test
- Following the on-screen prompts, the driver attempts to start the vehicle using an invalid PIN code
- Log the system response
- Following the on-screen prompts, the driver attempts to start the vehicle using the correct PIN code
- Log the system response

2.3.2 Valid Driver Credentials Test

The credentials contained on the simulated driver's license used for this test shall be considered valid by the GBS Simulator.

Procedure:

- Log:
  - Driver credentials content contained on the simulated drivers license

  - Starting time of the test

- Following the on-screen prompts, the driver attempts to start the vehicle using the correct PIN code
- Log the system response

2.4 Wireless Roadside Inspection Test

The wireless roadside inspection test shall be conducted through two passes of the test route shown on the map above.

The GBS Simulator shall be programmed to:

- Use the following geo-zones defined on the map above:
  - Send Inspection Message Ⓢ
  - Request Inspection Advisory Ⓡ
  - Display Inspection Advisory Ⓓ
- Broadcast the inspection request message to the RSE

2.4.1 Invalid Vehicle Data Pass

Following safety constraints, the following vehicle status shall be forced to be invalid for this pass:

- Lights
- Seat belt
- Tire pressure

The inspection advisory provided by the GBS Simulator for this pass shall be:

Inspection Required
Enter Station
At Exit 208
Ahead

Procedure:

- Log:
  - Vehicle status items forced to be invalid including the method used to invalidate the items
  - Starting time of the pass
- Driver proceeds through the test route

- Log the following for the displayed inspection advisory
  - Display start time and location
  - Inspection advisory content
  - Display end time and location

2.4.2 Valid Vehicle Data Pass

To the greatest extent possible, all vehicle status shall be valid for this pass.

The inspection advisory provided by the GBS Simulator for this pass shall be:

Inspection Passed
Bypass Station
At Exit 208

Procedure:

- Log the starting time of the pass
- Driver proceeds through the test route
- Log the following for the displayed inspection advisory
  - Display start time and location
  - Inspection advisory content
  - Display end time and location

3 Acceptance Criteria

3.1 Driver Credentials Validation Service

Each of the following criteria shall be evaluated by analyzing the data collected in the Test Procedure Log and the RSE, DMCU, and TGW transaction information.

Criteria TASK3&4-001/1.0: Driver Credential Verification Service Configuration
The logged RSE driver credential verification service configuration shall be verified for consistency with the test hardware configuration.

Criteria TASK3&4-002/1.0: Driver Credential
The driver credentials shall be verified to be stored on a Smart Card which requires a valid PIN code for access.

Criteria TASK3&4-003/1.0: Invalid Driver Credentials Status Response
An invalid driver credentials status response from the GBS Simulation shall be verified to not release the vehicle immobilization function preventing the vehicle from starting.

Criteria TASK3&4-004/1.0: Valid Driver Credentials Status Response
A valid driver credentials status response from the GBS Simulation shall be verified to release the vehicle immobilization function allowing the vehicle to start.

3.2 Wireless Roadside Inspection Service

Each of the following criteria shall be evaluated by analyzing the data collected in the Test Procedure Log and the RSE, DMCU, and TGW transaction information.

Criteria TASK3&4-005/1.0: WRI Service Configuration
The logged RSE WRI service configuration shall be verified for consistency with the test hardware configuration.

Criteria TASK3&4-006/1.0: Send Inspection Message Geo-Zone
The inspection message position shall be analyzed to ensure that it is consistent with the Send Inspection Message Geo-Zone.

Criteria TASK3&4-007/1.0: Request Inspection Advisory Geo-Zone
Using the logged pass time and speed, the request for inspection advisory time shall be analyzed to ensure that it is consistent with the Request Inspection Advisory Geo-Zone.

Criteria TASK3&4-008/1.0: Display Inspection Advisory Geo-Zone
The logged inspection advisory display start and stop locations shall be analyzed to ensure that it is consistent with the Display Inspection Advisory Geo-Zone.

Criteria TASK3&4-009/1.0: Inspection Advisory Content
The logged inspection advisory content from each pass shall be analyzed to ensure that it is consistent and accurate.

Table of Tests