About This Document

This document provides guidelines for acceptance testing of a Wrong-Way Vehicle Detection System (WWVDS). These guidelines are intended for reference purposes only and do not replace or supersede any applicable Department of Transportation (DOT) regulations, standards, or directives. The operation and performance of the WWVDS must always comply with all relevant DOT requirements.

Prerequisites

Before proceeding with the following guidelines, make sure to have the necessary resources and tools:

- Installed and configured WWVDS and highlighted signs
- Cabinet key (if applicable)
- Computer with a network interface card and an Internet browser running Windows 10 or later
- Maintenance of Traffic (MOT)
- Police officer(s) (if required)
- Department of Transportation (DOT) representative(s)

Notify the Department of Transportation

If the WWVDS is connected to the DOT network, notify the DOT operator that you will be testing the WWVDS and to expect alerts with images. If applicable, suggest placing the system in “maintenance mode” during testing.

Notify the DOT operator when testing procedures have been completed.

WWVDS Testing Procedures

Complete testing and document results according to applicable DOT-approved testing procedures and standards. These may include, for example, tests for:

- Field Acceptance Test (FAT) demonstrates functionality of the WWVDS

  FAT validates the functionality of WWVDS and ancillary components, including the required accuracy.
  See the FAT Procedure and Checklist below.

- Sub-System Acceptance Test (S-SAT) demonstrates connectivity to a DOT hub

  S-SAT validates that WWVDS is available and operating from the nearest DOT master hub via an Ethernet connection to the WWVDS network switch.
  See the S-SAT Procedure and Checklist below.

- System Acceptance Test (SAT) confirms full functionality of the ITS

  SAT validates the functionality of the ITS deployment in Advanced Traffic Management System (ATMS) software.
  See the SAT Procedure and Checklist below.

Product Information

Note that you can save the system report as a PDF from the “About” page of the WWVDS web interface, which contains most of the product information mentioned in this section.

Site ID	
Local Hub	
Station	
Product Manufacturer’s Name	**GovComm**
Product Model	
Product Serial Number	
Product Firmware Version Number	
Main Unit IP Address	
Main Unit Gateway	
Main Unit Subnet Mask	
Detection Camera IP Address	
Confirmation Camera IP Address (if applicable)	

FAT Procedure and Checklist

Test #	Procedure	Expected Result	Pass	Fail
1	Conduct a True Positive Test as described below and calculate the True Positive Rate (TPR)	TPR = 100%	☐	☐
2	Conduct a False Positive Test as described below and calculate the False Positive Rate (FPR)	FPR ≤ 1%	☐	☐

True Positive Test

Conduct this test on a closed lane using test vehicles provided by the Contractor.

Test each lane and paved shoulder 8 feet wide or wider by driving two types of test vehicles traveling at two speed ranges the wrong direction.

For purposes of this test, the small vehicle must be an FHWA Class Group 2 vehicle (passenger car) and the large vehicle must be an FHWA Class Group 3 vehicle (pickup track or van).

Each lane shall be subject to all of the following test runs, with each paved shoulder 8 feet wide or wider subject only to the test runs described in #1 and #2:

- Five (5) runs of a small vehicle traveling 15 miles per hour
- Five (5) runs of a large vehicle traveling 15 miles per hour
- Five (5) runs of a small vehicle traveling 35 miles per hour or greater
- Five (5) runs of a large vehicle traveling 35 miles per hour or greater

Complete the table in the “True Positive Test Data” section below, placing a check mark for each lane (L) each time the WWVDS software (SW) displays an alert and the highlighted sign is activated.

True Positive Rate Calculation

Based on the collected data, calculate the true positive rate (TPR) using the formula:

TPR = TP / N × 100%

where **TP** = cumulative for all test runs, the total number of times the WWVDS software correctly detected a vehicle traveling in the wrong direction and activated the highlighted signs, and **N** = total number of test runs.

TP _____ **/ N** _____ **× 100% = TPR** _____ **%**

To pass the test, the TPR must be 100%.

True Positive Test Data

Test Run	Vehicle Size	Speed, mph	L1 SW	L1 Sign	L2 SW	L2 Sign	L3 SW	L3 Sign	L4 SW	L4 Sign	L5 SW	L5 Sign	L6 SW	L6 Sign	L7 SW	L7 Sign
1	Small	15	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
2	Small	15	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
3	Small	15	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
4	Small	15	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
5	Small	15	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
6	Small	≥ 35	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
7	Small	≥ 35	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
8	Small	≥ 35	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
9	Small	≥ 35	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
10	Small	≥ 35	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
11	Large	15	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
12	Large	15	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
13	Large	15	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
14	Large	15	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
15	Large	15	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
16	Large	≥ 35	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
17	Large	≥ 35	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
18	Large	≥ 35	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
19	Large	≥ 35	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
20	Large	≥ 35	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

False Positive Test

Conduct this test on open lanes. Conduct one 15-minute observation during the day and one 15-minute observation at night if there are 150 or more vehicles during each observation period. If the count is less than 150, continue observing until 150 vehicles are counted, or observe for a maximum of one hour.

False Positive Rate Calculation

Calculate the false positive rate (FPR) using the formula:

FPR = FP / N × 100%

where **FP** = total number of times the WWVDS was activated for a vehicle traveling in the correct direction and **N** = total number of vehicles traveling in the correct direction.

FP _____ **/ N** _____ **× 100% = FPR** _____ **%**

To pass the test, the FPR must be less than 1%.

Field Acceptance Test Witness Signature

Date	
Daytime FAT start time	
Daytime FAT end time	
Nighttime FAT start time	
Nighttime FAT end time	
Test anomalies and comments (if applicable)	
Completed By Technician	
Technician Signature	
DOT Rep. Name	
DOT Rep. Signature	

S-SAT Procedure and Checklist

Test #	Procedure	Expected Result	Pass	Fail
1	From a computer on the DOT network, open the WWVDS web interface at **http://<WWVDS_IP_address>:<port>** (the default WWVDS port is **8000**)	The WWVDS login page should open	☐	☐
2	Log in and check the functionality of the WWVDS web interface	Once logged in, the user should be able to see the WWVDS home page, configure system settings, and monitor video stream(s)	☐	☐

Sub-System Acceptance Test Witness Signature

Date	
S-SAT start time	
S-SAT end time	
Test anomalies and comments (if applicable)	
Completed By Technician	
Technician Signature	
DOT Rep. Name	
DOT Rep. Signature	

SAT Procedure and Checklist

Test #	Procedure	Expected Result	Pass	Fail
1	Trigger wrong direction alert by using the WWVDS web interface function or driving in the wrong direction in the detection area	ATMS software receives an alert when the wrong-way vehicle is detected	☐	☐
2	Trigger wrong direction alert by using the WWVDS web interface function or driving in the wrong direction in the detection area	ATMS software receives and displays a sequence of images for up to 10 seconds that covers a configurable time before and after the wrong-way vehicle detection	☐	☐

System Acceptance Test Witness Signature

Date	
SAT start time	
SAT end time	
Test anomalies and comments (if applicable)	
Completed By Technician	
Technician Signature	
DOT Rep. Name	
DOT Rep. Signature	