Video Detection System (VDS) – Site Test

This test will confirm that the VDS equipment at the site is fully operational, per manufacturer's specifications, prior to network connectivity.

VDS: General Information

Project Number:	_____	Project Name:	_____
Project Stationing:	_____	Date of Test:	_____
Device Name:	_____	Manufacturer:	_____
Serial #:	_____	Model #:	_____
Username (If Required):	_____	Password (If Required):	_____
Communication Method:	_____	IP Address:	_____
Subnet Mask:	_____	Inspector:	_____

VDS: General Requirements

Requirement	Pass	Fail	Notes
Verify location of VDS installation is as per the plans. VDS offset from edge of travel lane: _____ Latitude:_____ Longitude:_____	☐	☐	
Verify height of pole and mounting height of VDS	☐	☐	
Verify that NHDOT-approved VDS hardware is installed.	☐	☐	

VDS: AC Power – Device Specific

Requirement	Pass	Fail	Notes
Verify voltage in VDS load center is within +/- 5% of 120 VAC or 240 VAC.	☐	☐	
Verify that the manufacturer's recommended power/communication cable is being used and is of adequate length.	☐	☐	

VDS: Calibration

Requirement	Pass	Fail	Notes
Follow the directions on the accompanying Test sheets			
Complete VDS Operations Test for Volume.	☐	☐	
Complete VDS Operations Test for Speed (if applicable).	☐	☐	
Complete VDS Operations Test for Classification.	☐	☐	

VDS: Record Settings / Configuration

Requirement	Included	Notes
VDS ID	☐	
VDS Serial Number	☐	
VDS IP Address	☐	
Zone Configuration	☐	
Polling Cycle / Frequency (1 minute)	☐	
Fine Tune / Sensitivity Readings	☐	
Save to File	☐	

Overall VDS Site Test: ☐ Pass ☐ Fail

Inspector Name: _____ Organization: _____ Signature: _____

Witness Name: _____ Organization: _____ Signature: _____

Date: _____

12/20/2022

Video Detection System (VDS) – Communications & Systems Test

This test will confirm that the installed equipment is fully operational utilizing New Hampshire's Traffic Data Management System (TDMS) at the NHDOT BOT.

VDS: General Information

Project Number:		Project Name:	
Project Stationing:		Date of Test:	
Device Name:		Manufacturer:	
Serial #:		Model #:	
Username (If Required):		Password (If Required):	
Communication Method:		IP Address:	
Subnet Mask:		Inspector:	

VDS: Prerequisites*

Requirement	Pass	Fail	Notes
Contractor has coordinated with the BOT, and has established connectivity to the VDS unit from the BOT.	☐	☐	
Contractor has verified all device components are configured with supplied IP's, VLANs, configurations, and interface login credentials, and has properly labeled all ports in device web interfaces.	☐	☐	
Contractor must be ready, with all necessary parties and preparation, to start the testing at the designated start time.	☐	☐	

*-Failure to meet any of the prerequisite requirements shall be grounds for immediate testing termination

VDS: Communications			
Requirement	**Pass**	**Fail**	**Notes**
If wireless communications is utilized, document the signal strength. _____dB	☐	☐	
Verify communications to the VDS (Ping).	☐	☐	
Verify device status appears on New Hampshire's TDMS.	☐	☐	
Generate a manual communications failure at the VDS cabinet, and verify TDMS, and manufacturer software display the error. Verify the VDS responds after communications have been restored.	☐	☐	
Verify TDMS regains communication to the VDS after power has been disconnected in the field for 2 minutes then restored.	☐	☐	

VDS: Central Control			
Requirement	**Pass**	**Fail**	**Notes**
Perform a full diagnostic scan in TDMS and manufacturer software and confirm no errors shown.	☐	☐	
Disconnect power to the device and verify a power supply error is displayed TDMS, and/or manufacturer software. Verify the error no longer exists after power is restored.	☐	☐	
Verify that correct volume data is being communicated to the BOT from the VDS. Data must be identical to those collected in the field by the device.	☐	☐	
Verify that correct occupancies are being communicated to the and BOT from the VDS. Data must be identical to those collected in the field by the device.	☐	☐	
Verify that correct vehicle class are being communicated to the BOT from the VDS. Data must be identical to those collected in the field by the device.	☐	☐	
Log into all site device component web interfaces. Verify no errors reported in the software or in web interfaces. Verify web interfaces display all information needed for remote monitoring of device status. Verify all ports are properly addressed and labeled in interfaces.	☐	☐	

Overall VDS Systems Test: ☐ Pass ☐ Fail

Inspector Name: _____ Organization: _____ Signature: _____

Witness Name: _____ Organization: _____ Signature: _____

Date: _____

12/20/2022

VDS Operations Test – Volume

Site: _____

Date: _____ Time: _____

Objective

To verify and demonstrate the functionality and accuracy of volume for the detector locations.

Prerequisites

Detector and cabinet installation must be complete. Lane must be open to traffic. BOT inspector must be present during testing.

Test Equipment

A stopwatch and traffic count board.

Success Criteria

Volume obtained from each detector for each lane of traffic will be within +/- 10 percent of each sample size. Sample size will be ten minutes, or 50 vehicles, whichever comes first. Traffic will be running at typical free-flowing speed and condition.

Test Instructions

1. Record the observed actual hand count volume and detector counts for ten minutes, or 50 vehicles, whichever comes first.
2. Record the lane number according to the proximity of the device. Closest lane to the device is lane #1.
3. Record the volume of vehicles detected by the video detection system over the test period.
4. Subtract hand count volume from detector count volume and then divide by the hand count volume. Multiply by 100 to get the percent accuracy.
5. Indicate pass if result is +/- 10 percent.
6. Adjust sensitivity and repeat if percent accuracy is out of range.

VDS: Volume Test Results								
Lane #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Test Duration (min:sec)								
Observed Hand Count Volume								
Detector Count Volume (from Laptop)								
% Accuracy = (100 x (detector count – hand count)/(hand count))								
Pass or Fail (Pass if accuracy is < +/- 10%*								
Sensitivity Setting								

*-Or per the manufacturers specifications.

Overall VDS Volume Test: ☐ Pass ☐ Fail

Inspector Name: _____ Organization: _____ Signature: _____

Witness Name: _____ Organization: _____ Signature: _____

Date: _____

12/20/2022

VDS Operations Test – Speed

Site: _____

Date: _____ Time: _____

Objective
To verify and demonstrate the functionality and accuracy of speed for detector locations.

Prerequisites
Detector and cabinet installation must be complete. Lane must be open to traffic. BOT Inspector must be present during testing.

Test Equipment
A calibrated radar gun, a stopwatch, 2-way radios, and a laptop.

Procedure
1. Ensure that Detector unit is functioning, and that rolling average speed is being recorded.
2. Set the interval on the detector unit to 3 minutes.
3. Record the individual speeds of 16 consecutive vehicles using radar gun. If measuring consecutive vehicles is not possible, measure speeds for as many vehicles in the lane as possible, for 16 vehicles or 3 minute time period, whichever comes first.
4. Simultaneously to recording the 16th vehicle, or completing the 3 minute time period, immediately record the current Detector Mean Speed as indicated at that moment by the Detector unit.
5. Compute the mean (Average) speed of the 16 vehicles, based on radar gun readings.
6. Compute the Modified Radar Gun Mean Speed (= radar gun mean speed / cosine theta), if needed, if radar gun is not shooting head-on at vehicles.
7. Compare the Modified Radar Gun Mean Speed to the Detector Mean Speed. Pass if difference < 5 mph. If test does not pass, adjust the sensitivity of the sensor and retest.
8. Repeat for each lane.

Overall VDS Speed Test: ☐ Pass ☐ Fail

Inspector Name: _____ Organization: _____ Signature: _____

Witness Name: _____ Organization: _____ Signature: _____ Date: ____

VDS: Speed Test Results								
Lane #	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Vehicle 1 Radar Speed (mph)								
Vehicle 2 Radar Speed (mph)								
Vehicle 3 Radar Speed (mph)								
Vehicle 4 Radar Speed (mph)								
Vehicle 5 Radar Speed (mph)								
Vehicle 6 Radar Speed (mph)								
Vehicle 7 Radar Speed (mph)								
Vehicle 8 Radar Speed (mph)								
Vehicle 9 Radar Speed (mph)								
Vehicle 10 Radar Speed (mph)								
Vehicle 11 Radar Speed (mph)								
Vehicle 12 Radar Speed (mph)								
Vehicle 13 Radar Speed (mph)								
Vehicle 14 Radar Speed (mph)								
Vehicle 15 Radar Speed (mph)								
Vehicle 16 Radar Speed (mph)								
Radar Gun Mean Speed (mph)								
Cosine Theta								
Modified Radar Gun Mean Speed (mph)								
Detector Mean Speed (mph)								
% Accuracy = (100 * Radar Mean Speed – Detector Mean Speed) / Radar Mean Speed								
Pass or Fail (Pass if % Accuracy < +/- 10%)								
Detection Setting								

VDS Operations Test – Classification

Site: _____

Date: _____ Time: _____

Objective
Verify and demonstrate the functionality and accuracy of vehicle classification for the detector locations.

Prerequisites
Detector and cabinet installation must be complete. Lane must be open to traffic. BOT Inspector must be present during testing.

Test Equipment
A stopwatch, a traffic count board, and a laptop.

Success Criteria
Classifications obtained from each detector for each lane of traffic will be within +/- 10 percent of each sample size. Sample size will be at least three minutes, and include at least 5 vehicles in each classification type (see table below). Traffic will be running at typical free-flowing speed and condition.

Test Instructions
1. Record the observed actual hand count classifications and detector counts for at least three (3) minutes, capturing at least 5 vehicles of each classification type.
2. Record the classification of vehicles detected by the sensor over the test period.
3. Subtract hand count classification counts from detector count volume and then divide by the hand count classification count. Multiply by 100 to get the percent accuracy.
4. Indicate pass if result is +/- 10%.
5. Adjust sensitivity and repeat if % accuracy is out of range.

Classification Measurements	
# of Axles	**Vehicle Length (Approximate)**
2	**20 Feet**
3	**30 – 40 Feet**
> 3	**> 50 Ft**

Use the chart above to determine the number of axles by vehicle length. Use the chart on the next page to complete the test for each travel lane.

VDS: Classification Test Results									
Lane #		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Time (min:sec)									
Observed Classification Counts	2 Axle								
	3 Axle								
	> 3 Axle								
Classification (From Laptop)	2 Axle								
	3 Axle								
	> 3 Axle								
% Accuracy = (laptop - observed) / (observed)	2 Axle								
	3 Axle								
	> 3 Axle								
Pass/Fail	Pass if all < +/- 10%								
Sensitivity Setting									

Overall VDS Classification Test: ☐ Pass ☐ Fail

Inspector Name: _____ Organization: _____ Signature: _____

Witness Name: _____ Organization: _____ Signature: _____

Date: _____