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|  | FDOT Traffic Engineering Research Laboratory (TERL)  Video Vehicle Detection System (VVDS) Compliance Matrix | By signing this form, the applicant declares that he/she has read and understands the provisions of Sections 660 and 995 of the FDOT *Standard Specifications for Road and Bridge Construction* and all implemented modifications. The requirements listed on this matrix are derived from Sections 660 and 995, and are the basis for determining a product’s compliance and its acceptability for use on Florida’s roads. |

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| --- | --- | --- | --- |
| Date: | Click here to enter a date. | Applicant’s  Name (print): |  |
| Manufacturer: |  |  |  |
| Item, Model No.: |  | Signature: |  |

| **ID No** | **Section** | **Requirement** | **Item Comply? (Yes/No/NA)** | **Comments (Applicant must provide information as indicated)** | **TERL Evaluation Method** |
| --- | --- | --- | --- | --- | --- |
| The following compliance matrix criteria are for all VVDS. | | | | | |
| 1 | 995-1.1 | Equipment is permanently marked with manufacturer name or trademark, part number, and date of manufacture or serial number. |  | *Applicant may provide comments in this field.* | Physical Inspection |
| TERL Test Cases (Steps): VVDS002 (Step 1) |  |  | Init.: |
| 2 | 995-2.1 | All parts are made of corrosion-resistant materials, such as UV stabilized or UV resistant plastic, stainless steel, anodized aluminum, brass, or gold-plated metal. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 1) |  |  | Init.: |
| 3 |  | All fasteners exposed to the elements are Type 304 or 316 passivated stainless steel. |  | *Provide statement of conformance from hardware supplier that shows the product meets this requirement* | Document Review |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 2) |  |  | Init.: |
| 4 |  | If the assembly includes a cabinet, the cabinet requirements of Section 676. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Physical Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 3), VVDS002 (Step 2) |  |  | Init.: |
| 5 |  | Detector meets the environmental requirements of NEMA TS 2-2021. |  | *Provide a third party test report that demonstrates the device performs all required functions during and after being subjected to the environmental testing as described in NEMA TS2-2021 section 2.2.7, 2.2.8, and 2.2.9. Also, provide a completed Testing Laboratory and Report Checklist and NEMA TS2 2.2.7-2.2.9 Checklist.* | Document Review |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 4) |  |  | Init.: |
| 6 | 995-2.3.1 | VVDS is provided with software that allows local and remote configuration and monitoring. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 5), VVDS004 (Step 1) |  |  | Init.: |
| 7 |  | VVDS system can display detection zones and detection activations overlaid on live video inputs. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 6), VVDS004 (Step 2) |  |  | Init.: |
| 8 |  | VVDS allows a user to edit previously defined configuration parameters, including size, placement, and sensitivity of detection zones. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 7), VVDS004 (Step 3) |  |  | Init.: |
| 9 |  | VVDS retains its programming in nonvolatile memory. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 8), VVDS004 (Step 4) |  |  | Init.: |
| 10 |  | VVDS configuration data can be saved to a computer and restored from a saved file. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 9), VVDS004 (Step 7) |  |  | Init.: |
| 11 |  | All communication addresses are user programmable. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Functional Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 5), VVDS003, VVDS004 (Step 4) |  |  | Init.: |
| 12 |  | VVDS software offers an open Application Programming Interface (API) and software development kit available to the Department at no cost for integration with third party software and systems. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 10), VVDS004 (Step 9) |  |  | Init.: |
| 13 | 995-2.3.2 | Cameras that are integrated and included in a VVDS are compliant with the Code of Federal Regulations Section 200.216 Prohibition on certain telecommunications and video surveillance services or equipment. |  | *Provide a signed letter of conformance that the cameras are compliant with the Code of Federal Regulations Section 200.216.* | Document Review |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 11) |  |  | Init.: |
| 14 | 995-2.3.3 | VVDS includes a machine vision processor that allows video analysis, presence detection, data collection, and interfaces for inputs and outputs as well as storage and reporting of collected vehicle detection data. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS004 (Step 10) |  |  | Init.: |
| 15 | 995-2.3.4 | VVDS includes a minimum of one serial or Ethernet communications interface. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Physical Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 13), VVDS002 (Step 3) |  |  | Init.: |
| The following compliance matrix criteria are for VVDS with serial interface. | | | | | |
| 16 |  | Interface and connector conform to Telecommunications Industry Association (TIA)-232 standards. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Physical Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 14), VVDS002 (Step 4) |  |  | Init.: |
| 17 |  | Serial ports support data rates up to 115200 bps; error detection utilizing parity bits (i.e., none, even, and odd); and stop bits (1 or 2). |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 15), VVDS003 (Step 1) |  |  | Init.: |
| The following compliance matrix criteria are for VVDS with Ethernet interface. | | | | | |
| 18 |  | Ethernet interfaces provide a 10/100 Base TX connection. |  | *Applicant may provide comments in this field.* | Functional Inspection |
| TERL Test Cases (Steps): VVDS003 (Step 3) |  |  | Init.: |
| 19 |  | All unshielded twisted pair/shielded twisted pair network cables and connectors comply with TIA 568. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 16) |  |  | Init.: |
| The following compliance matrix criteria are for wireless communications. | | | | | |
| 20 |  | Wireless communications are secure and FCC certified. The FCC identification number is displayed on an external label and all VVDS devices operate within the FCC frequency allocation. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Physical Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 17), VVDS002 (Step 5) |  |  | Init.: |
| The following compliance matrix criteria are for VVDS with cellular communications. | | | | | |
| 21 |  | Cellular communication devices are compatible with the cellular carrier used by the agency responsible for system operation and maintenance. |  | *Provide product literature, specifications, user manual, or similar information that describes any cellular devices that are part of the system and indicates carrier(s) supported.* | Document Review |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 18) |  |  | Init.: |
| The following compliance matrix criteria are for all VVDS. | | | | | |
| 22 |  | System can be configured and monitored via one or more communications interface. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 19) |  |  | Init.: |
| 23 | 995-2.3.5 | Analog video inputs and outputs utilize BNC connectors. |  | *Applicant may provide comments in this field.* | Physical Inspection |
| TERL Test Cases (Steps): VVDS002 (Step 6) |  |  | Init.: |
| 24 | 995-2.3.6 | Detection output meets the requirements of NEMA TS2-2021, 6.5.2.26 for systems with detector card interfaces. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 20), VVDS004 (Step 11) |  |  | Init.: |
| 25 | 995-2.3.7 | System operates using a nominal input voltage of 120 volts of alternating current (VAC) and with an input voltage ranging from 89 to 135 VAC. |  | *Applicant may provide comments in this field.* | Functional Inspection |
| TERL Test Cases (Steps): VVDS005 (Steps 1-3) |  |  | Init.: |
| 26 |  | If any system device requires an operating voltage other than 120 VAC, a voltage converter is supplied. |  | *Environmental test reports must demonstrate that voltage converters required for 120V*AC *operation were subjected to NEMA TS2 environmental testing as part of the functional system.* | Document Review and Physical Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 21), VVDS002 (Step 7) |  |  | Init.: |
| The following compliance matrix criteria are for VVDS to be used as presence detectors. | | | | | |
| 27 | 995-2.9 | Detector provides a minimum detection accuracy of 98% |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 22), VVDS008 |  |  | Init.: |
| 28 |  | Detector meets the requirements for modes of operation in NEMA TS2-2016, 6.5.2.17. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 23), VVDS004 (Steps 5-7) |  |  | Init.: |
| The following compliance matrix criteria are for VVDS to be used as traffic data detectors. | | | | | |
| 29 | 995-2.10 | Vehicle detection meets the minimum total roadway segment accuracy levels of 95 % for volume, 90% for occupancy, and 90% for speed for all lanes, up to the maximum number of lanes that the device can monitor as specified by the manufacturer in accordance with 660-4.2.1 Traffic detection data is calculated in accordance with all criteria as detailed in 995-2.10 and all subsections therein. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): VVDS001 (Step 23), VVDS006 (Steps 1-7), VVDS007 |  |  | Init.: |
| The following compliance matrix criteria are for all VVDS. | | | | | |
| 30 | 660-5 | The detection system has a manufacturer’s warranty covering defects for a minimum of 1 year from the date of final acceptance by the Engineer in accordance with 5-11 and Section 608. |  | *Provide a statement of conformance in this field.* | Compliance Matrix Review |
| TERL Test Cases (Steps): VVDS001 (Step 25) |  |  | Init.: |
| 31 |  | The warranty includes providing replacements, within 10 calendar days of notification, for defective parts and equipment during the warranty period at no cost to the Department or the maintaining agency. |  | *Provide a statement of conformance in this field.* | Compliance Matrix Review |
| TERL Test Cases (Steps): VVDS001 (Step 26) |  |  | Init.: |

**Document History for:**

**Video Vehicle Detection System Compliance Matrix**

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| --- | --- | --- | --- | --- | --- | --- |
| Rev | Description | Authored and Checked | Reviewed | Approved | Approval Date | Rev More Stringent? |
| 1.0 | Conversion to word and update matrix for new 660 detection spec Conversion to word and update matrix for new 660 detection spec | D. Bremer | C. Morse  J. Morgan | J. Morgan | 03/13/2013 | No |
| 2.0 | Remove warranty language | D. Bremer | J. Morgan | J. Morgan | 05/09/2013 | No |
| 3.0 | Replaced FDOT logo with latest approved one and added CM ID # to header. Revised document approver title. | D. Bremer  K. Moser | J. Morgan | J. Morgan | 10/29/2014 | No |
| 4.0 | Updated to reflect latest FHWA approved specification (FA 6-4-15). | R. Meyer | J. Morgan | J. Morgan | 10/15/2015 | No |
| 5.0 | Moved CM to 995, FA 8-26-19. | W. Geitz | M. DeWitt | D. Vollmer | 05/10/2021 | No |
| 6.0 | Update to reflect new FA Date 7-2-20 and clarify cabinet requirements | W. Geitz | C. Raimer  M. DeWitt | D. Vollmer | 12/09/2021 | No |
| 7.0 | Corrected CM identifier. Added warranty information. | A. Burleson | W. Geitz | M. DeWitt | 02/01/2022 | No |
| 8.0 | Moved marking requirements to 995-1.1. Added CFR requirement for cameras. New FA Date 10-24-22. | W. Geitz | P. Blaiklock M. DeWitt | D. Vollmer | 02/23/2023 | Yes |
| 9.0 | Updated to latest FA date of 10-6-23 for specs 660 and 995. | W. Geitz | L. Audisio | D. Vollmer | 12/06/2023 | No |
| 10.0 | Added test cases and steps for test method. Updated TERL evaluation methods. Added references to test report checklists. | D. Pedraza | W. Geitz  L. Audisio | D. Vollmer | 08/12/2024 | No |

| REV. | DATE | DESCRIPTION | AUTHORED  BY | REV MORE STRINGENT? |
| --- | --- | --- | --- | --- |
| 1.0 | 02/14/2013 | Conversion to word and update matrix for new 660 detection spec | David Bremer | No |
| 2.0 | 03/28/2013 | Remove warranty language | David Bremer | No |
| 3.0 | 12/19/2013 | Replaced FDOT logo with latest approved one and added CM ID # to header.  Revised document approver title. | David Bremer  Kelli Moser | No |
| 3.13 | 03/17/2015 | Updated to TERL approved specification. | David Bremer | No |
| 4.0 | 10/01/2015 | Updated to reflect latest FHWA approved specification (FA 6-4-15). | Ron Meyer | No |
| REV. | DATE | DESCRIPTION | AUTHORED  BY | REV MORE STRINGENT? |
| 1.0 | 02/14/2013 | Conversion to word and update matrix for new 660 detection spec | David Bremer | No |
| 2.0 | 03/28/2013 | Remove warranty language | David Bremer | No |
| 3.0 | 12/19/2013 | Replaced FDOT logo with latest approved one and added CM ID # to header.  Revised document approver title. | David Bremer  Kelli Moser | No |
| 3.13 | 03/17/2015 | Updated to TERL approved specification. | David Bremer | No |
| 4.0 | 10/01/2015 | Updated to reflect latest FHWA approved specification (FA 6-4-15). | Ron Meyer | No |