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| --- | --- | --- |
|  | FDOT Traffic Engineering Research Laboratory (TERL) Microwave Vehicle Detection System (MVDS) 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. |

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

|  |  | **\*\* Greyed out rows in table below are for TERL use only \*\*** |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **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 MVDS. |
| 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): MVDS002 (Step 1) |       |       | Init.:       |
| 2 | 995-2.1 | All parts are made of corrosion-resistant materials, such as UV stabilized or UV resistant, 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): MVDS001 (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): MVDS001 (Step 2) |       |       | Init.:       |
| 4 |  | If the assembly includes a cabinet, the cabinet meets the requirements of Section 676. |  | *Provide the applicable compliance matrix from Specification 676 along with all supporting documentation that demonstrates this product meets this requirement, based on cabinet type.* | Document Review and Physical Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): MVDS001 (Step 3), MVDS002 (Step 2) |       |       | Init.:       |
| 5 |  | Detector meets the environmental requirements of NEMA TS-2. |  | *Provide the following:** *A third party test report that demonstrates compliance with this requirement.*
* *A completed Testing Laboratory and Report Checklist.*
* *A completed NEMA TS2 2.2.7-2.2.9 Checklist.*
 | Document Review |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): MVDS001 (Step 4) |       |       | Init.:       |
| 6 | 995-2.4 | Sidefire MVDS sensors used for data collection have a minimum 200-foot range and the capability to detect 8 lanes of traffic. |  | *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): MVDS001 (Step 5), MVDS006 (Step 2), MVDS007 (Step 2) |       |       | Init.:       |
| 7 | 995-2.4.1 | MVDS 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): MVDS001 (Step 6), MVDS003 |       |       | Init.:       |
| 8 |  | MVDS software has the capability to display detection zones and detection activations in a graphical format. |  | *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): MVDS001 (Step 7), MVDS004 |       |       | Init.:       |
| 9 |  | MVDS 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): MVDS001 (Step 8), MVDS004 |       |       | Init.:       |
| 10 |  | MVDS 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): MVDS001 (Step 9), MVDS004 |       |       | Init.:       |
| 11 |  | MVDS 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): MVDS001 (Step 10), MVDS004 |       |       | Init.:       |
| 12 |  | All communication addresses are user programmable. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): MVDS003, MVDS004 |       |       | Init.:       |
| 13 |  | An open Application Programming Interface (API) and software development kit are 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  |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): MVDS001 (Step 11) |       |       | Init.:       |
| 14 | 995-2.4.2 | Major components of the system (such as the sensor and any separate hardware used for contact closures), include 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): MVDS001 (Step 12), MVDS002 (Step 3) |       |       | Init.:       |
| The following compliance matrix criteria are for MVDS with serial interface. |
| 15 |  | Interface and connector conform to 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): MVDS001 (Step 13), MVDS002 (Step 4) |       |       | Init.:       |
| 16 |  | 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): MVDS001 (Step 14), MVDS003 (Step 1) |       |       | Init.:       |
| The following compliance matrix criteria are for MVDS with Ethernet interface. |
| 17 |  | Ethernet interface provides a 10/100 Base TX connection. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): MVDS003 (Steps 2-8) |       |       | Init.:       |
| 18 |  | 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): MVDS001 (Step 15) |       |       | Init.:       |
| The following compliance matrix criteria are for MVDS with wireless communication. |
| 19 |  | Wireless communications are secure and FCC certified. The FCC identification number is displayed on an external label and all MVDS 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): MVDS001 (Step 16), MVDS002 (Step 5) |       |       | Init.:       |
| The following compliance matrix criteria are for MVDS with cellular communication. |
| 20 |  | 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): MVDS001 (Step 17) |       |       | Init.:       |
| The following compliance matrix criteria are for all MVDS. |
| 21 |  | 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): MVDS001 (Step 18), MVDS003 |       |       | Init.:       |
| The following compliance matrix criteria are for MVDS with an integrated camera. |
| 22 |  | Camera is 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 camera is compliant with the Code of Federal Regulations Section 200.216.* | Document Review |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): MVDS001 (Step 19) |       |       | Init.:       |
| The following compliance matrix criteria are for MVDS to be used as presence detectors. |
| 23 | 995-2.4.3 | Solid state detection outputs meet the requirements of NEMA TS2. |  | *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): MVDS001 (Step 20), MVDS008 (Step 3) |       |       | Init.:       |
| The following compliance matrix criteria are for all MVDS. |
| 24 | 995-2.4.4 | MVDS will operate with a nominal input voltage of 12 VDC and with an input voltage ranging from 89 to 135 VAC. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): MVDS005 (Step 3) |       |       | Init.:       |
| 25 |  | If any system device requires 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, Physical Inspection and Functional Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): MVDS001 (Step 21), MVDS002 (Step 6), MVDS005 (Step 3) |       |       | Init.:       |
| 26 |  | MVDS is FCC-certified and has been granted authorization to operate within a frequency range established and approved by the FCC. The FCC identification number is displayed on an external label. |  | *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): MVDS001 (Step 22), MVDS002 (Step 7) |       |       | Init.:       |
| The following compliance matrix criteria are for MVDS to be used as presence detectors. |
| 27 | 995-2.9 | Detector provides a minimum detection accuracy of 98% when calculated in accordance with all criteria as detailed in 995-2.9 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): MVDS001 (Step 23), MVDS008 |       |       | Init.:       |
| 28 |  | Detector meets the requirements for modes of operation in NEMA TS2. |  | *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): MVDS001 (Step 24)  |       |       | Init.:       |
| The following compliance matrix criteria are for MVDS to be used as traffic data detectors. |
| 29 | 995-2.10.1 | 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. Traffic detection data is calculated in accordance with all criteria as detailed in 995-2.9.  |  | *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): MVDS001 (Step 25), MVDS007 |       |       | Init.:       |
| The following compliance matrix criteria are for MVDS to be used for advance detection. |
| 30 | 660-2.2.1.1.2 | Advance detectors are designed to detect vehicles at variable distances upstream of an intersection stop bar. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement. The advance detector must be capable of detecting vehicles a minimum of 300 feet from the stop line.* | Document Review and Functional Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): MVDS001 (Step 26), MVDS009 |       |       | Init.:       |
| The following compliance matrix criteria are for all MVDS. |
| 31 | 660-5 | The detection system has a manufacturer’s warranty covering defects for a minimum of 1 year from the date of final acceptance. |  | *Provide product warranty documentation that shows the product meets this requirement.* | Document Review |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): MVDS001 (Step 27) |       |       | Init.:       |
| 32 |  | 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): MVDS001 (Step 28) |       |       | Init.:       |

**Document History for:**

**Microwave Vehicle Detection System Compliance Matrix**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 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 | D. Bremer | C. MorseJ. 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. BremerK. 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 | Changed from specification 660 to 995. | W. Geitz | M. DeWitt | D. Vollmer | 09/19/2019 | No |
| 6.0 | Added cabinet requirements if used. Updated to FA date of 7-2-20.  | W. Geitz | M. DeWittC. Raimer | 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 | Clarified that ID 22 is only for presence detection. | D. Bremer | W. Geitz | M. DeWitt | 08/10/2022 | No |
| 9.0 | Update to latest FA date of 10-24-22. Added more stringent revision for camera meeting CFR requirement (CM ID 22). | W. Geitz | P. Blaiklock M. DeWitt  | D. Vollmer | 03/30/2023 | Yes |
| 10.0 | Updated to latest FA date of 10-6-23 for specs 660 and 995. | W. Geitz | L. Audisio | D. Vollmer | 12/7/2023 | No |
| 11.0 | Updated to the latest FA dates of 8-8-24 and 8-7-24 for specifications 660 and 995, respectively.  | W. Geitz | L. Audisio | M. DeWitt | 03/07/2025 | No |
| 12.0 | Added test cases/steps. | D. PedrazaL. Audisio | W. Geitz | M. DeWitt | 05/14/2025 | No |