|  |  |  |
| --- | --- | --- |
|  | FDOT Traffic Engineering Research Laboratory (TERL)  Automatic Vehicle Identification (AVI) Detection System 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 AVI detection systems. | | | | | |
| 1 | 995-1.1 | All 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): AVI002 (Step 1) |  |  | Init.: |
| 2 | 995-2.1 | All parts are constructed 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 and Physical Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): AVI001 (Step 1), AVI002 (Step 2) |  |  | 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 and Physical Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): AVI001 (Step 2), AVI002 (Step 3) |  |  | Init.: |
| 4 |  | If the assembly includes a cabinet, the cabinet must be currently listed on the APL or meet the applicable cabinet material requirements listed in 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): AVI001 (Step 3), AVI002 (Step 4) |  |  | Init.: |
| 5 |  | The AVI 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 Sections 2.2.7, 2.2.8, and 2.2.9. The test report must be less than 5 years old and meet the requirements of FDOT Product Certification Handbook (PCH), section 7.2.* | Document Review |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): AVI001 (Step 4) |  |  | Init.: |
| 6 | 995-2.6.1 | Detection system is provided with software that allows local and remote configuration and monitoring. |  | *Applicant may provide comments in this field.* | Functional Inspection |
| TERL Test Cases (Steps): AVI004 (Step 1) |  |  | Init.: |
| 7 | 995-2.6.2 | Components of the detection system (such as sensors, controllers, and processing hardware) 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 |
| *Applicant may provide comments in this field.* |
| TERL Test Cases (Steps): AVI001 (Step 5), AVI002 (Step 5) |  |  | Init.: |
| The following compliance matrix criteria are for AVI detection systems with serial interface. | | | | | |
| 8 |  | Serial 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 |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): AVI001 (Step 6) |  |  | Init.: |
| 9 |  | 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): AVI001 (Step 7), AVI003 (Steps 1, 2) |  |  | Init.: |
| The following compliance matrix criteria are for AVI detection systems with Ethernet interface. | | | | | |
| 10 |  | Wired Ethernet interface provides a 10/100 Base TX connection. |  | *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): AVI001 (Step 8), AVI003 (Steps 3-9) |  |  | Init.: |
| 11 |  | 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): AVI001 (Step 9) |  |  | Init.: |
| The following compliance matrix criteria are for all AVI with wireless communications. | | | | | |
| 12 |  | AVI wireless communications are secure and FCC certified.  The FCC identification number is displayed on an external label and all AVI devices operate within their FCC frequency allocation. |  | *Provide FCC certification or evidence the device meets this requirement.* | Document Review and Physical Inspection |
| *Indicate location of requested information in submittal.* |
| TERL Test Cases (Steps): AVI001 (Steps 10, 11), AVI002 (Step 6) |  |  | Init.: |
| 13 |  | 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): AVI001 (Step 12) |  |  | Init.: |
| 14 |  | 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): AVI001 (Step 13), AVI003 |  |  | Init.: |
| The following compliance matrix criteria are for AVI detection systems which utilize transponder readers. | | | | | |
| 15 | 995-2.6.3 | Transponder reader is compatible with multiple tag protocols, including Allegro and the protocol defined in ISO18000-6B. |  | *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): AVI001 (Step 14), AVI004 (Step 2) |  |  | Init.: |
| The following compliance matrix criteria are for AVI detection systems which utilize Bluetooth readers. | | | | | |
| 16 |  | Bluetooth reader is capable of operating using solar power or AC power. |  | *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): AVI001 (Step 15), AVI004 (Step 3) |  |  | Init.: |
| The following compliance matrix criteria are for AVI detection systems which utilize license plate readers. | | | | | |
| 17 |  | License plate reader does not require the use of visible strobes or other visible supplemental lighting. |  | *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): AVI001 (Step 16), AVI004 (Step 4) |  |  | Init.: |
| The following compliance matrix criteria are for all AVI detection systems. | | | | | |
| 18 | 995-2.6.4 | 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): AVI001 (Step 17), AVI002 (Step 7) |  |  | Init.: |
| 19 |  | Solar powered devices are capable of operating for 5 days without solar assistance. |  | *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): AVI001 (Step 18), AVI004 (Steps 5, 6) |  |  | Init.: |
| 20 | 995-2.11 | Probe data detectors establish a unique and consistent identifier for each vehicle detected and the time and location that the vehicle was detected. |  | *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): AVI001 (Step 19), AVI004 (Step 7) |  |  | Init.: |
| 21 |  | Probe data detection systems that match upstream and downstream detection of the same vehicle are able to provide a minimum match rate of 5%. Match rate 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): AVI001 (Step 20), AVI004 (Step 8) |  |  | Init.: |
| 22 |  | Probe data detection system meets a minimum total roadway segment speed and travel time accuracy level of 90% when calculated as described in section 995-2.9.1 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): AVI001 (Step 21), AVI004 (Step 9) |  |  | Init.: |
| The following compliance matrix criteria are for all AVI detection systems. | | | | | |
| 23 | 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): AVI001 (Step 22) |  |  | Init.: |
| 24 |  | 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): AVI001 (Step 23) |  |  | Init.: |

**Document History for:**

**Automatic Vehicle Identification Detection System Compliance Matrix**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Rev | Description | Authored and Checked | Reviewed | Approved | Approval Date | Rev More Stringent? |
| 1.0 | New CM | D. Bremer | C. Morse | J. Morgan | 05/09/2013 | N/A |
| 2.0 | Replaced FDOT logo with latest approved one and added CM ID # to header. | D. Bremer | J. Morgan | J. Morgan | 03/13/2014 | No |
| 3.0 | Updated evaluation methods to match most recent TM. Revised document approver title. | R. Meyer  K. Moser | J. Morgan | J. Morgan | 10/29/2014 | No |
| 4.0 | Updated to reflect latest FHWA approved specification (FA 6-4-15). No content change. | A. Burleson | J. Morgan | J. Morgan | 10/15/2015 | No |
| 5.0 | Updated with cabinet requirements and to match FA date of 7-2-20. | W. Geitz | C. Raimer  M. DeWitt | D. Vollmer | 12/09/2021 | No |
| 6.0 | Corrected CM identifier. Added warranty information. | A. Burleson | W. Geitz | M. DeWitt | 02/01/2022 | No |
| 7.0 | Added test cases and steps. Updated to latest FA Date 10-24-22. | P. Blaiklock  W. Geitz | M. DeWitt | D. Vollmer | 05/09/2023 | No |
| 8.0 | Updated to latest FA date of 10-6-23 for specs 660 and 995. | W. Geitz | L. Audisio | D. Vollmer | 02/15/2024 | No |