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Specification for Video Detection
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1.0 DESCRIPTION

- 1.1 The following will specify the minimum requirements for the certification of vehicular video detection systems.
- 1.2 Video-based detection uses a microprocessor to analyze the video image input. There are different approaches in use by video detection systems today. Some systems will analyze the video image of a target area on the pavement. Any change in the image of the target area as a vehicle passes through the target area is processed as a vehicle detection. Other systems will identify when a target vehicle enters into the video field of view and track the target vehicle through this field of view. A combination of these two methods can also be deployed by a system.
- 1.3 Manufacturers or vendors seeking approval for their system shall follow the procedures outlined on the ALDOT Materials & Tests web page.

2.0 GENERAL

- 2.1 All equipment and components shall have been verified by an independent certified laboratory to meet or exceed all NEMA TS1 & TS2, as well as Type 170/2070 environmental specifications.
- 2.2 All equipment shall be new, undamaged, and in operable condition at the time of delivery and installation.

3.0 OPERATIONAL REQUIREMENTS

- 3.1 The system shall be capable of providing both pulse and presence detection with the capability of providing delay and extend control. The detection output shall be compatible for use with traffic signal controllers for detection of traffic.
- 3.2 The video camera shall be capable of various mounting configurations, to include side-pole, mast-arm, etc.
- 3.3 The system shall be capable of operating in a temperature range of -30°F to 165°F within a relative humidity range of 0% to 95%, non condensing.
- 3.4 Shall be capable of detecting motion of every type of licensed vehicle traveling within 1 mph through 100 mph and provide an output compatible for use with NEMA TS1 & TS2 and Type 170/2070 controllers for the detection of traffic.

- 3.5 All special installation and maintenance equipment must be provided by the vendor/manufacturer and should allow for adjustments.
- 3.6 The operator shall be able to set up, monitor lane status, and retrieve data from the detector through an RS 232 and/or USB port with any IBM compatible computer. (*Optional: The detector data shall be remote accessible through a modem or ethernet connection.*)
- 3.7 The detector shall have a monitoring circuit for the transceiver that will change the output relay to the fail-safe position in the event of a component failure or power failure.
- 3.8 The video processor shall provide a video output from the interface panel for real-time NTSC or a standard compression format (ex: mpeg, avi, jpeg, etc.) for display on a monitor or PC.

4.0 **TESTING/ACCEPTANCE REQUIREMENTS**

- 4.1 The system shall operate for a period of 60 continuous days without any equipment issues. Any issues detected shall be addressed and fixed, to include firmware updates. The 60 day period will reset back to zero and start again.
- 4.2 The system shall produce a vehicle detection accuracy of 98% for a 24 hour period of time under normal day/night conditions, each approach zone. A false call shall be counted as a missed call in determining accuracy.
- 4.3 The system shall produce a vehicle detection accuracy of 95% for a minimum 4 hour period of time under adverse conditions (fog, rain, snow, ice, etc.), each approach zone. A false call shall be counted as a missed call in determining accuracy.
- 4.4 In order to obtain possible adverse conditions, items should be submitted during the Fall or Spring. Otherwise the testing time frame may be extended while waiting for adverse conditions to inspect the system.
- 4.5 The detector shall operate without operator adjustments to account for the following conditions:
 - Mast-arm, luminaire extension installation
 - Day-night transitions
 - Shadows on the roadway
 - Reflections from vehicles or pavement during rain
 - Weather changes
 - Ability to discriminate vehicular direction.
- 4.6 The sensor shall be able to tune-out stationary targets that remain within the detection zone for a minimum of 15 minutes.

5.0 **HARDWARE REQUIREMENTS**

- 5.1 The video detection system (VDS) shall consist of modular camera input video detection modules (VDM) capable of receiving inputs from 1 or more video cameras, inserted in a standard TS-1 or TS-2 vehicle detector card rack. It shall also include a power supply, shelf mounted rack option, video isolation/surge arrestors, and cabling. To include mounting brackets, wiring, control modules, set-up equipment, and hardware. If wireless cameras are used then a wireless video transmission receiver and receiver antenna shall be provided.
- 5.2 The use of silicone gels or any other material that will deteriorate under prolonged exposure to ultraviolet rays shall not be acceptable.
- 5.3 Each camera chassis shall meet or exceed IP-67 without the use of silicone gels or any other materials that will deteriorate under prolonged exposure to ultraviolet rays.
- 5.4 The camera shall be furnished with a bracket designed to mount directly to a pole or overhead mast-arm or other structure.
- 5.5 No component shall be of such design, fabrication, nomenclature, or other identification as to preclude the purchase of said component from any wholesale electronic distributor.
- 5.6 The camera enclosure shall be equipped with weather-tight connections for power and video.

6.0 **SOFTWARE REQUIREMENTS**

- 6.1 Manufacturer software shall be provided for detection zone programming and operation. One software package shall be provided for each detection system. Software update/revisions shall be provided to ALDOT as updated by the manufacturer at no additional cost. The software shall not require a licensing fee.
- 6.2 All setup, controller program, and diagnostic software shall be provided and run on MS Windows based-operating systems. Software updates shall be provided free of charge.
- 6.3 On-line help screens shall be provided as an integral part of the system software.
- 6.4 The software shall be capable of detecting vehicles in multiple lanes using only the video image. The detection zones shall be defined using only an externally attached monitor and pointing device to place the zones on a video image. A minimum of six (6) detector zones per camera view shall be available. A separate computer shall not be required to perform this function, however, it can be optional.

7.0 **DOCUMENTATION REQUIREMENTS**

- 7.1 A minimum of two (2) sets of operational and maintenance manuals shall be provided with the system. This shall cover all aspects of the system from the installation to general/special maintenance issues.

7.2 The following shall be provided by the manufacturer:

- Model & Serial numbers shall be visible on all electrical components
- Power and current requirements
- Temperature range
- Weight and dimensions
- Required mounting equipment
- Operating frequency (FCC approved, for wireless cameras)
- Detection range, angle, and pattern for both horizontal and vertical
- Response time and sensitivity
- Required software
- Manufacturers recommended capabilities
- Any limitations, requirements, or potential hazards associated with the operation or maintenance of the device.

7.3 Independent lab certification to ensure the wireless camera complies with FCC regulations.

7.4 All product documentation shall be written in the English language.

7.5 The video detection system shall be warranted to be free of defects in material and workmanship for a period of **TWO YEARS** from date of acceptance. During the warranty period, the supplier shall repair with new materials or replace at no charge, any product containing a warranty defect. All materials returned from warranty repairs shall be made through the product distributor at no additional charge. Warranty repairs/replacement shall not exceed two weeks from date of return to the distributors.

8.0 **TRAINING & SUPPORT**

A minimum 4-hour training seminar shall be provided, where required, by the vendor to provide instruction in the proper installation and programming of the video detection system.