
Special Specification 6348

Temporary Incident Detection and Surveillance System



1. DESCRIPTION

Furnish, install, relocate, operate, maintain, and remove various components of an automated, portable, real time Temporary Incident Detection and Surveillance System as shown on the plans or as directed.

Furnish a System capable of providing real time traffic data and video. The intent of the system is to provide the Traffic Management Center (TMC) with situational awareness.

The System must operate continuously when deployed. This equipment must be a packaged System that operates as a stand-alone Temporary Incident Detection and Surveillance System meeting the specifications. Conditions might exist that require multiple deployments of the System at a given time. This will be shown on the plans. The Department reserves the right to terminate this item at any time if it determines this System is not performing in accordance with this specification or the Contractor has not met the responsibilities identified in this specification.

Any necessary connections with the System must be integrated as part of this Item. The System must communicate operational information with a communication network as specified by the Engineer.

Temporary Incident Detection and Surveillance Systems used on this project will remain the property of the Contractor.

2. MATERIALS

Provide materials and software that complies with the requirements of this Special Specification and the details shown on the plans. The System must comply with manufacturer's specifications and recommendations, and National Transportation Communications for ITS Protocol (NTCIP) standards, NTCIP 1203, NTCIP 1205, and NTCIP 1209. The Contractor must maintain an adequate inventory of parts to support maintenance and repairs of the Temporary Incident Detection and Surveillance System within allowable down time limits.

Furnish, assemble, fabricate or install materials referenced under this Specification that are corrosion resistant, in good working condition and in strict accordance with the details shown on the plans or as directed.

Provide all equipment, supplies, materials, and labor to make the System operational. Assume all communication costs including cellular telephone service, FCC licensing, wireless data networks, satellite and internet subscription charges, solar power system support, and battery charging and maintenance. Additional to these requirements, the Contractor must assume all responsibilities for and all damaged equipment due to crashes, vandalism, adverse weather, etc. that may occur during the contract period.

3. EQUIPMENT

Ensure the System is comprised of all items required to provide an operational system. Any equipment furnished under this specification must be in good working condition. The equipment furnished and installed under this section must include the following:

- Power,

- Non-invasive sensors,
- Video System,
- Controller Unit,
- Portable Trailers, and
- Communication System.

3.1. **Power.**

3.1.1. **Batteries.** Provide unit equipped with heavy duty, deep cycle batteries which will power the system components 24 hr. a day for a minimum of 7 days during periods of darkness and inclement weather.

3.1.2. **Battery Regulator and Recharging System.** Provide unit equipped with an internal controller that regulates the amount of current delivered to the batteries and prevents overcharging.

3.1.3. **Solar Panels.** Provide unit equipped with solar panels which generates enough power to enable the System to continually recharge the batteries.

3.2. **Video System.** Provide a complete System that will produce video feeds. Camera must have remote pan, tilt, and zoom capabilities or a fixed camera using video analytics software for automated incident detection. The coverage area must meet the requirements shown on the plans under normal atmospheric conditions. The System will use cameras approved by the Engineer and mounted on portable trailers at the locations shown on the plans or as directed. The video system is not to record unless specified by the Engineer, per Department policy.

The camera should restart automatically in case of power failure.

3.3. **Sensors Performance.** If specified on the plans to use sensors, provide non-invasive sensors that will detect vehicles speed and traffic occupancy. The detection system will be positioned so that it detects traffic in all lanes, as defined by the plans. The System must use non-invasive sensors approved by the Engineer. Furnish units with an effective detection range that meets the areas specified on the plans. If speed is to be detected, sensors need to have a reaction speed range of 5 mph to 99 mph.

Incident detection must be triggered by falling below predetermined thresholds of speeds and occupancy.

3.4. **Controller Unit.** Provide a local remote controller unit that controls the System. The controller unit will continuously monitor detector inputs for a positive reading indicating a possible crash, stopped vehicle or road obstructions.

The controller must restart automatically in case of power failure. The controller should have automated error detection and correction mechanisms.

Provide password protected login and the ability to be remotely configured.

The controller must operate 24 hr., 7 days a week with automated continuous data acquisition.

3.5. **Portable Trailers.** Provide heavy duty portable trailers with trailer lights and delineated with retroreflective material for mounting vehicle detection devices. Other mounting options that produce cost savings or meet special conditions may be possible, but only with the approval of the Engineer.

3.6. **Environmental Requirements.**

3.6.1. **Meteorological Conditions.** Provide equipment that operates and meets all of the requirements of this specification under the following atmospheric conditions:

- Ambient Temperature: -40°F to 135°F (-40°C to 57°C),

- Relative Humidity: 5% to 90%, non- condensing,
- Rain: 3 in. per hr. rate,
- Snow: 5 in. per hr. rate,
- Fog: 200 ft. visibility, and
- Wind Velocity: AASHTO 2013 LTS Design Spec, "Wind Velocity and Ice Zones."

The System operation and accuracy must not be appreciably degraded by inclement weather.

3.7. **Communication System Requirements.**

- 3.7.1. **Communication System.** The System must be capable of providing constant communication to and from the video system, the controller, and the sensors to the Traffic Management Center (TMC).

The Communication System must have a maximum transmission lag time of no more than 10 sec. If the System is not able to operate within the 10 sec. lag time, the System must be considered inoperative. All other communications between the controller, the Traffic Management Center (TMC), the cloud, etc. may be accomplished by cellular modem, radio frequency or other means that provide reasonable performance as approved by the Engineer.

The Communication System must incorporate an error detection and correction mechanism that addresses anomalies in the detection data to insure the integrity of all traffic condition data and motorist information messages. Any required configuration of the Communication System must be performed automatically during System initialization.

4. **CONSTRUCTION**

- 4.1. **Alignment.** Allow for directional adjustment and aiming after initial installation. Perform basic alignment of the sensors and the cameras either manually or electronically. Perform this step on the sensors and the cameras per the manufacturer's guidelines and recommendations.

- 4.2. **Installation.** Install Temporary Incident Detection and Surveillance System in accordance with the manufacturer's specifications to achieve specified accuracy and reliability. Install System so that proper operation of the equipment will commence within 15 sec. after restoration of power.

Install all System's components as shown on the plans, or as directed.

Follow the Temporary Incident Detection and Surveillance System time frame and duration for System's implementation as shown on the plans or as directed.

Use established industry and utility safety practices to erect assemblies near overhead or underground utilities.

- 4.3. **Performance.** If the System fails to transmit data or video to the Traffic Management Center (TMC) for more than 24 hrs. or five times for a period of one hr. or more while the system is deployed, the Engineer may declare a System defective and require replacement of the appropriate equipment at no additional cost. Failure may be determined by any method, including but not limited to remote or direct observation, monitoring systems, and data received and collected by the Traffic Management Center (TMC).

- 4.3.1. **Report.** Provide a System capable of generating a daily report that documents equipment stoppages and resumptions, and alarms during the entire time the System is operational. Submit a report to the Department at a minimum every month or as scheduled on the plans detailing the following:

- Daily report of the System during any time the System is not operational,

- The report must indicate the date, time, and location of any activity necessary to maintain operation of the Temporary Incident Detection and Surveillance System and record the time and date stamps for any events when the System failed.
- Each entry must include the following information:
 - identify the equipment on which work was performed,
 - cause of equipment malfunction (if known),
 - description of the type of work performed, and
 - time required to repair equipment malfunction.

4.3.2. **Consequences of Failed Performance.** Failure to satisfy the performance requirements is considered a defect. Upon any notification of failure of any duration, the Contractor is required to complete a repair within the maximum allowable 24 hrs. The equipment is also subject to rejection by the Engineer. The rejected equipment may be offered again for retest provided all noncompliance has been corrected.

If a failure pattern develops in similar units within the System, implement corrective measures, including modification or replacement of units, to all similar units within the System as directed. Perform the corrective measures without additional cost or time extension of the contract period within 24 hrs. after the failure pattern is identified.

4.4. **Experience Requirements.**

4.4.1. **Contractor Experience Requirements.** Contractor or designated subcontractor must meet the following experience requirements.

4.4.1.1 **Completed Project.** Demonstrate experience from one completed project where the personnel installed, tested and integrated various network equipment combined as a system to create an operational function. This may include such systems as high-water detection and warning systems, variable speed limit systems, wrong-way detection and warning systems, roadway weather detection and warning systems, or similar applications of technology requiring specialized equipment, electrical, and networking.

Submit the names, addresses and telephone numbers of the references that can be contacted to verify the experience requirements given above.

4.5. **Documentation Requirements.** Provide a compliance matrix documenting conformance to this specification.

5. SYSTEM COORDINATOR

The Contractor's Responsible Person (CRP) identified under Item 7, "Legal Relations and Responsibilities" must designate a System Coordinator who is responsible to oversee the placement of the devices and for testing and calibrating the equipment. The System Coordinator must be locally available to maintain system components, move portable devices as necessary, and respond to emergency situations. It is the responsibility of the System Coordinator to move system components that interfere with construction operations and relocate the components to another area. The Contractor's Responsible Person (CRP) must provide a local phone number or a toll free number to the Engineer for the maintenance of the system at any time. The System Coordinator must be accessible seven days a week and 24 hrs. a day while the System is deployed, and must respond within two hrs.

Submit a schedule of implementation for approval at the pre-construction meeting. The Temporary Incident Detection and Surveillance System must be continually monitored throughout all periods of deployment. The decision to deploy, relocate, or remove field equipment is made by the Department and accomplished by the System Coordinator.

Technical Support for the System must be available for all periods of operation.

System Operator local control functions and remote management operations must be password protected per Department Policy.

6. MEASUREMENT

This Item will be measured by each Temporary Incident Detection and Surveillance System furnished and installed, or by the number of days furnished and installed. All Temporary Incident Detection and Surveillance System units must be set up in the work area and operational before the time can be considered measurable. When measurement by the day used is specified, a day will be measured for each Temporary Incident Detection and Surveillance System set up and fully operational on the worksite.

7. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for "Temporary Incident Detection and Surveillance System." This price is full compensation for the use of all equipment, including labor to set-up, furnish, operate, relocate, adjust and remove equipment, replacement parts, maintenance, all related consumables, software, programming, on site System Coordinator, and for incidentals necessary to complete the work. This price must also include any costs associated with communications (ex. cellular fees), power and damage from vandalism, weather or traffic incidents.

- 7.1. **Deduction for Failed System.** Should the System malfunction per Section 4.3, the payment for that day will be deducted.