
Special Specification 6315

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 in 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 System(s) used on this project will remain the property of the Contractor.

2. MATERIALS

Provide materials and software that comply with the requirements of this Special Specification and the details shown on the plans. The system must comply with the manufacturer's specifications and recommendations, and National Transportation Communications for Intelligent Transportation System (ITS) Protocol (NTCIP) standards, NTCIP 1203, NTCIP 1205, and NTCIP 1209. 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 the equipment, supplies, materials, and labor to make the system operational. Assume responsibility for 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. In addition to these requirements, assume responsibilities for equipment damaged due to crashes, vandalism, adverse weather, etc. that may occur during the contract period.

3. EQUIPMENT

Ensure the system is comprised of the items required to provide an operational system. Furnish equipment under this specification that is 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 a unit equipped with heavy duty, deep cycle batteries to 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 a 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 a unit equipped with solar panels which generate sufficient power to enable the system to continually recharge the batteries.

3.2. **Video System.** Provide a complete system that will produce video feeds. Provide a camera with remote pan/tilt/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 utilize 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.

Provide a camera that restarts 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 vehicle speed and traffic occupancy. Position the detection system so that it detects traffic in all lanes, as defined by the plans. The system must utilize 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, provide sensors with a reaction speed range of 5 mph to 99 mph.

Ensure incident detection is triggered by falling below predetermined thresholds of speeds or 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.

Provide a controller that restarts automatically in case of power failure and has automated error detection/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 acceptable, but only with the approval of the Engineer.

3.6. **Environmental Requirements.**

3.6.1. **Meteorological Conditions.** Provide equipment that operates and meets 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 hour rate,
- Snow: 5 in. per hour rate,

- Fog: 200 ft. visibility, and
- Wind Velocity: AASHTO 2013 LTS Design Specification, "Wind Velocity and Ice Zones."

Ensure the system operation and accuracy are not be appreciably degraded by inclement weather.

3.7. Communication System Requirements.

3.7.1. Communication System. Provide a system capable of providing constant communication to and from the video system, the controller, and the sensors to the TMC.

Provide a Communication System that has a maximum allowable transmission lag time of 10 seconds. If the system is not able to operate within the 10 seconds lag time, the system will be considered inoperative. Other communications between the controller, the TMC, the cloud, etc. may be accomplished by cellular modem, radio frequency, or other means that provide reasonable performance as approved by the Engineer.

Equip the Communication System with an error detection/correction mechanism that addresses anomalies in the detection data to ensure the integrity of traffic condition data and motorist information messages. Ensure any required configuration of the Communication System is performed automatically during system initialization.

If communication is lost for more than 10 consecutive minutes, ensure the system reverts to a fail-safe condition.

Integrate data as shown in the plans.

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 the system so that proper operation of the equipment will commence within 15 seconds after restoration of power.

Install system components as shown on the plans, or as directed by the Engineer.

Follow the Temporary Incident Detection and Surveillance system time frame and duration for the 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. In the event that the system fails to transmit data or video to the TMC for more than 24 hr., or 5 times for a period of one hour 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 to the Department. 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 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. Include in the report the date, time, and location of any activity necessary to maintain operation of the Temporary Incident Detection and

Surveillance System, and record the time/date stamps for any events when the system failed. Include in each entry 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, complete a repair within the maximum allowable 24 hr. The equipment is also subject to rejection by the Engineer. Any rejected equipment may be offered again for retest provided the 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 similar units within the system as directed. Perform the corrective measures without additional cost to the Department or time extension of the contract period within 24 hr. after the failure pattern is identified.

- 4.4. **Experience Requirements.**

- 4.4.1. **Contractor Experience Requirements.** The 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" is to designate a System Coordinator who is responsible for overseeing 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 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 7 days a week and 24 hr. a day while the system is deployed, and must respond within 2 hr. of notification.

Submit a schedule of implementation for approval at the pre-construction meeting. The Temporary Incident Detection and Surveillance System must be continually monitored throughout 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 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 day(s) furnished and installed. 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 the equipment, including labor to set-up, furnish, operate, relocate, adjust and remove equipment, replacement parts, maintenance, related consumables, software, programming, on site System Coordinator, calibration, making the system fully operational, and for materials, equipment, labor, tools, and incidentals necessary to complete the work. This price also includes any costs associated with communications (for example, cellular fees), power, and damage from vandalism, weather or traffic incidents.

- 7.1. **Deduction for Failed System.** Should the system malfunction for a period of 24 consecutive hr. without the Contractor correcting the deficiency, the payment for that day will be deducted.