

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENTAL SPECIFICATION 896
WORK ZONE QUEUE DETECTION WARNING SYSTEM**

July 15, 2016

896.01 Description

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896.01 Description. This work consists of furnishing, coordinating, installing, maintaining, operating, tracking, monitoring and subsequently removing a Work Zone Queue Detection Warning System (WZQDWS) that calculates and displays information on portable changeable message signs (PCMS) regarding stopped and slowed traffic in work zones.

896.02 Materials. Furnish materials conforming to:

Work Zone Queue Detection Warning System996

896.03 Construction. Furnish, coordinate, install, maintain, operate, track, monitor and subsequently remove the WZQDWS per the plan note and in accordance with the following requirements:

Notify the Engineer in writing 7 calendar days in advance of deployment of any component of the WZQDWS.

Provide documentation detailing the technical and operational aspects of the completed systems for Class I and Class II (Classes as defined in Supplemental Specification 996), including, but not limited to, device manuals, system diagrams, cabling diagrams, wiring diagrams, and communication network schematics. Include any and all field engineering notes specific to each component including documentation on how the system was set up, sensory ID numbers, IP addresses to all devices, port numbers, and any other documentation as required by the Department.

Place Class II WZQDWS to capture vehicle speeds in the most congested traffic lane.

Provide the Engineer with the name and contact information for a point of contact for the WZQDWS. The contact must be locally available to maintain system components, move portable devices as necessary, and respond to emergency situations. Coordinate the placement of devices in the project areas. Move system components that are impacted by construction operations and relocate the components to another area.

Provide the Engineer with the proposed corrective method procedures, including response times and notification process.

Move or expand the system with additional equipment if queues are extending beyond the sensor area, as directed by the Engineer.

Coordinate the exact locations of all devices (including PCMS and sensors) with approval of the Engineer. Parts of the WZQDWS may be outside of the project limits.

WZQDWS PCMS shall only be used to display messages for the WZQDWS. The PCMS shall not be used to display other traveler information such as, but not limited to, lane closure information.

The data polling period between the WZQDWS software and the sensors shall be set at a default of 60 seconds, but may be modified as directed by the Engineer due to site conditions and/or operational needs.

Follow all manufacturer direction and specifications for device orientation. Obtain a configuration test and quality assurance procedure checklist from the manufacturer, and provide a copy to the Engineer. Maintain all WZQDWS devices and ensure continuous operation (24 hours a day, 7 days a week). Repair or replace a damaged, vandalized, or stolen unit within 12 hours.

Maintain the WZQDWS components in good working order in accordance with the provisions of C&MS 614.07. Verify the installed WZQDWS components are functional and are in good working order on a daily/nightly basis. For Class I devices, submit daily reports to the Engineer showing graphically the sensor data (speed, volume, and occupancy) from the previous day for each sensor.

Notify the Engineer upon final removal of the WZQDWS.

896.04 Operational Test. Complete a 7 day operational test when a Class I WZQDWS is initially installed on the project. The 7 day operational test is to ensure that all WZQDWS equipment (including the PCMS, traffic sensors, software, and communication devices) is operating in a fully functional manner and in accordance with the plans for a duration of at least 7 consecutive calendar days. Provide complete operations support from the vendor during the operational test. Provide verification that the reported speeds through the work zone accurately reflects actual field conditions. If any equipment malfunctions occur for a combined period of 4 hours or more during this operational test on any day, no credit will be given for that day for the operational test period, and the 7 day operational test will reset.

Maintain records of equipment stoppages and resumptions during the 7 day operational test for submission to the Engineer. In the event that 10 percent or more of the time similar malfunctions occur that affect the proper operation of the WZQDWS, the Engineer may declare a system component defective and require replacement of the equipment at no cost to the Department. When a system component defect is declared, the 7 day operational test will begin again after all defective equipment is replaced and the system is fully operational.

1. Report. Submit a report no later than one calendar day following the completion of the operational test to the Engineer detailing the daily activity of the system during the operational test. The report must indicate the date and time of any activity necessary to maintain operation of the WZQDWS during the operational test period. Each entry is to include the following information:

- A. Identity of the equipment on which work was performed;
- B. Cause of equipment malfunction (if known);
- C. A description of the type of work performed; and
- D. Time required repairing equipment malfunctions. Once the operational test report is received and approved by the Engineer, the WZQDWS will be considered operational and the system will be accepted for use.
- E. Submit any and all sensor data collected by the system.

896.05 Method of Measurement. Measurement will begin when each unit initially begins active service after the operational testing period and will continue until the Engineer determines the WZQDWS is no longer needed, temporarily or permanently.

PCMS and traffic sensor quantities are measured by the maximum number of PCMS and traffic sensors necessary and in place at any one time during each individual sign month of use. Each PCMS and traffic sensor shall be paid for only once, per sign month, regardless of how many times it is moved/replaced, activated/deactivated or how many times the PCMS digital display is changed. Payment shall be in full sign months.

A Sign Month will be deducted if a contractor removes the PCMS or traffic sensor from the project or uses a PCMS for another purpose outside of the WZQDWS without the Engineer's determination that the WZQDWS is no longer, temporarily or permanently, needed for the project.

Any failure shall not result in one or more WZQDWS component being out of service for more than 12 hours, including weekends.

896.06 Basis of Payment. Bid price to furnish, coordinate, install, maintain, operate, track, monitor, and subsequently remove PCMS and traffic sensors shall be on a sign month basis. A sign month, for PCMS and traffic sensors, shall be a 30-day period that starts on the initial day of each PCMS and traffic sensor activation.

Payment for PCMS shall be at the contract unit price. Payment shall include all labor, materials, equipment, fuels, lubricating oils, software, hardware, and incidentals to perform the above described work including moving and adjusting PCMS.

Payment for traffic sensors includes payment for all material, communication devices, equipment, software and labor required to install, adjust, and remove each traffic sensor as depicted on the plans or as directed by the Engineer.

The Engineer may remove payment for WZQDWS components if one or more WZQDWS component is found to be in non-compliance with this Supplemental Specification. Failure to return to compliance within 12 hours may result in the removal of payment in full sign months.

No additional compensation shall be provided beyond the sign month bid item price for PCMS and traffic sensors. The Department will pay for accepted quantities at the contract prices as follows:

Item	Unit	Description
896	Sign Month	Portable Non-intrusive Traffic Sensor, Class ____
614	Sign Month	Portable Changeable Message Sign

Designer Note:

Use only in accordance with the Traffic Engineering Manual (TEM) Part 6, *Section 640-29.1*.