

**624.04.01 Measurement.** Uniformed traffic control officers will be measured on a force account basis which will be the actual cost as evidenced by copies of invoices from the law enforcement agency who performed the work. To the actual cost will be added the sum of 10% for profit and overhead with no further compensation therefore.

Rent equipment (office space) will be measured by the month.

**624.05.01 Payment.** Payment will be made under:

<b>Pay Item</b>	<b>Pay Unit</b>
Uniformed Traffic Control Officer .....	Force Account
Rent Equipment Office Space .....	Month

## SECTION 625 - CONSTRUCTION SIGNS

**625.02.03 Changeable Message Signs.** Type 1 changeable message sign (CMS) shall be a portable sign that fully complies with the requirements set forth within the Manual on Uniform Traffic Control Devices (MUTCD). The Type 1 CMS shall communicate with portable traffic sensors and be capable of storing required messages.

The Type 1 CMS shall incorporate 2 amber flashing beacons, mounted on each of the top corners of the CMS. The flashing beacons shall operate in an alternating pattern as defined within the MUTCD.

**625.03.01 General.** (a) Smart Traffic Monitoring System (STMS). Furnish, install, operate, and maintain a real time STMS consisting of a central processing system, 3 portable traffic sensors, 1 CMS, a complete communication system, hardware, software, and support necessary to make a complete and operating system that provides advance traffic information to motorists when there is a slowing of traffic due to congestion resulting from lane reductions or other conditions. The condition-responsive notification to the motorist occurs with the use of CMS activated through real-time traffic data collected by portable traffic sensors downstream of the CMS location.

The system shall have basic field and network security to protect the system against vandalism and unauthorized use.

The system shall be capable of storing ad-hoc messages created by the System Coordinator and logging this action when overriding any default or automatic advisory message. The STMS communication system shall incorporate an error detection/correction mechanism to insure the integrity of all traffic conditions data and motorist information messages. Any required configuration of the STMS communication system shall be performed automatically during system initialization.

System operator local control functions and remote management operations shall be password protected. The STMS shall be capable of acquiring traffic information and selecting messages automatically without operator intervention after system initialization. The lag time between changes in threshold ranges and the posting of the appropriate CMS messages shall be no greater than 15 seconds. The system operation and accuracy shall not be appreciably degraded by inclement weather or degraded visibility conditions including precipitation, fog, darkness, excessive dust, and road debris.

The portable traffic sensors shall be capable of collecting traffic speed data. The processed data is used to remotely control the Type 1 CMS to display user definable and locally stored messages. The message trigger thresholds shall be user configurable. The format of the data feed shall be eXtensible Markup Language (XML), with a known schema shared with the purchaser and made available to the Department. The XML data shall be made available for Department access through standard Internet connectivity and services, with the provision of a data feed address, port (if applicable), and authentication/sign-on parameters.

Obtain cellular telephone service, FCC licensing, wireless data networks, satellite and internet subscriptions, and other requirements as necessary to operate the system continuously.

Provide an on-site System Coordinator for the STMS to maintain the STMS and system components, monitor and adjust the portable devices as necessary, provide documentation in the form of a written weekly report about the system and respond to emergency situations. The System Coordinator shall either be a system vendor representative or shall have received training on the set-up and operation of the system from the system vendor or manufacturer. Provide certification of any such training to the Engineer prior to system set-up. The System Coordinator shall work with the Engineer on the operation of the STMS including when to deploy or relocate the field devices, how the system is operating, and when to remove the system. The System Coordinator shall attend pre-construction meetings facilitated by the Engineer or the Contractor. Secure approval from the Engineer on all

CMS messages prior to use. Be available 7 days a week and 24 hours a day while the system is deployed. Provide the 24/7 contact information for the System Coordinator and others responsible for maintenance of the system prior to installation of the system.

The STMS shall provide required functionality when the traffic sensors are located approximately as follows; first sensor located at the lane closure, second sensor 0.5 mile back from lane closure, third sensor 1 mile from lane closure, and a fourth sensor located 2 miles from lane closure. The CMS shall be located 2.5 miles from lane closure. The system shall provide full functionality when the sensors and CMS are relocated and field adjusted as needed to provide adequate warning to the motoring public of traffic congestion ahead. Adjust the spacing of the devices and portable CMS as needed.

The STMS shall be installed and operational prior to the start of the placement of the channelizing devices to close any travel lanes. Verify that the system is operating prior to initiating the actual lane closure. The STMS shall remain in place and operational until after the travel lane is reopened. The system shall constantly monitor traffic and update the messages on the portable CMS within 15 seconds of a traffic condition requiring a system update. Each message shall be displayed on the portable CMS for a minimum of 3 minutes.

The STMS shall be in a constant "data collection" mode. In the event communication is lost between any field equipment, provide a means and staff to manually program a CMS message. If communication is lost for more than 10 consecutive minutes, the system shall revert to a fail-safe ROAD/WORK/AHEAD message displayed on the CMS until communication is restored.

The STMS shall be monitored throughout any period of deployment. The weekly report shall include the following activities during the project:

1. Confirm/note device layout/placement
2. Confirm/note system data collection parameters that were set and adjusted
3. Confirm/note startup and validation activities
4. Note any changes/modifications made throughout the day or any unusual events that may impact the integrity of the data
5. Confirm/note system shutdown processes and identify any changes that may be needed
6. Observe device packing processes for relocation to the next work zone area and note any improvements that may be needed to improve the efficiency of the system deployment
7. Contractor requirements
8. Note any difficulties and or positive feedback that the Contractor had with the system throughout the project for Lessons Learned workshops
9. Number of and types of activations the system performed.
10. Construction work zone deployments
11. What if any field adjustments were made.
12. The effectiveness of the adjustments made as well as comments from the flagging staff on each end of the active work zone (with and without the STMS).
13. Public reaction and behavior when in the traffic control.
14. System start up and testing procedures
15. System operational procedures
16. System maintenance procedures
17. System shutdown procedures

Maintain an adequate inventory of parts to support maintenance and repair of the STMS.

**625.03.05 Contractor Design Traffic Control.** Provide a minimum of 8 changeable message signs for the project 10 days prior to construction and coordinate content and location with the Engineer.

**625.05.01 Payment.** The second and third paragraphs of this Subsection of the Standard Specifications are hereby deleted and the following substituted therefore:

Partial payment for Rent Traffic Control Devices (Lump Sum) will be made according to Subsection 109.06.