

CITY OF O'FALLON

**ROUTE M (MAIN STREET) SIGNAL UPGRADES
CMAQ-5401(645)**

City of O'Fallon, Missouri
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ADDENDA COVER PAGE

The following Addenda have been currently released for this project, and are attached to this cover page:

- Addendum #1, 11/16/2012

Please stay tuned for additional Addenda, if any, for this project. This cover sheet will reflect additional Addenda and the attachments to this cover page will include any and all current Addenda as they are published.

Note: Contractor is required to acknowledge receipt of all Addenda. Acknowledgement of addenda (addendum number and date of receipt) shall be recorded within the submitted bidder's forms within the sealed envelope, easily visible so they may be recognized and recorded at the bid opening. Failure to acknowledge receipt could result in Contractor not being recommended for award of contract.

ADDENDUM # 1

TO THE DRAWINGS AND SPECIFICATIONS FOR:
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November 16, 2012

INFORMATION

All references within the bidding documents to the 'Siemens 3168M52' controller, as the only specified model, are to be removed. All references within the bidding documents to the 'Iteris Vantage RZ-4 Advanced WDR' Please disregard the Public Interest Finding (PIF) within the bidding documents.

The following generic specification for the signal controller shall be implemented in its place. This pertains to newly specified controllers to be installed along the project only. All proposed signal controllers shall:

- The controller/cabinet unit shall meet all current AASHTO and ANSI standards applicable to the industry.
- **The controller unit shall comply with all current and applicable National Transportation Communications for ITS Protocol (NTCIP)**
- Meets NEMA TS-2 Type 1 interface and/or TS-2 Type 2 interface.
- All gaps in the controller where modules are not installed are filled with cover plates.
- Must have the ability to interface with a laptop (cable and software to be furnished to City).
- Flashing Yellow Arrow (FLA) compatible.
- Any other modules necessary for the proper programming and operation is considered incidental.

All other specifications for the controller within the JSP still apply. Upgrades to an existing controller, regardless of model type, still apply per the JSP

The attached generic specifications for video detection shall be implemented in its place. This pertains to newly specified video detection to be installed along the project only.

END OF ADDENDUM

Z. VIDEO DETECTION SYSTEM

1.0 Description. This work shall consist of furnishing, installing and placing into operation a vehicle detection system that detects vehicles by processing video images and providing detection outputs to a traffic signal controller.

2.0 System Requirements. Delete Secs. 902.13.4 and 1092.4.7.7 in their entirety and substitute the following:

902.13.4 Video Detection System. The system shall include all equipment shown on the plans and described in these specifications, plus any incidental items necessary for the satisfactory operation and maintenance of the system. All original identifying information from the packaging of each installed camera shall be placed in the signal cabinet. The video detection system shall be installed per the manufacturer's recommendations. The installer shall be certified by the video detection system's manufacturer to install the system. All coaxial cable runs (if used) shall be continuous without splice from the cabinet to the camera. If requested by the engineer, a factory certified representative from the supplier shall be available for on-site assistance for a minimum of one day during installation.

902.13.4.1 Camera. The bottom of the video camera shall be mounted a minimum of 30 feet (9.0 m) above the pavement, unless otherwise indicated on the plans or approved by the Engineer.

902.13.4.2 Extra Service Outlet. A separate grounded 120 VAC service outlet shall be provided in the controller cabinet for supplying power to the parts of the video detection system requiring AC power. Use of the grounded service outlet located on the cabinet door will not be permitted.

1092.4.7.7.1 System Requirements. The video detection system shall provide flexible detection zone placement at any location and at any orientation within the combined field of view of the image processors. Preferred presence detector zone configurations shall be a box or lines placed across lanes of traffic or lines placed parallel with lanes of traffic. Detection zones shall be capable of overlapping, and be configurable to be directional in order to prevent vehicles that approach from all but 1 direction from activating the detection zone.

1092.4.7.7.1.1 The detection zones shall be created by drawing the detection zones on the video image. A graphical user interface shall be built into the video detection system and displayed on a video monitor or computer. It shall be possible to edit previously defined detector configurations to fine-tune detection zone placement.

1092.4.7.7.1.2 When a vehicle is detected by crossing a detection zone, there shall be a visual change on the video display, such as a flashing symbol or a change in color or intensity to verify proper operation of the video detection system.

1092.4.7.7.1.3 Overall performance of the video detection system shall be comparable to inductive loops. Using camera optics and in the absence of occlusion, the video detection system shall be able to detect vehicle presence with 98% accuracy under normal day and night conditions with only slight deterioration in performance under adverse weather conditions, including fog, snow and rain. When visibility exceeds the capabilities of the camera, the video detection system shall default to placing a call on all detectors.

1092.4.7.7.1.4 The video detection system shall be capable of being programmed via remote communication through the Commission's Ethernet network via serial connection or Ethernet connection. It shall provide at a minimum 2 frames per second moving image and real time detection displays to a remote computer using supplied video detection system software through the Commission's network for all cameras. All components, existing cabinet wiring changes, and/or modules needed to communicate through the Commission's network other than Commission furnished communication gear shall be included as part of the video detection system. If provided with an IP address by the Commission, the contractor will program and connect the video detection system into the Commission supplied communication gear before project acceptance.

1092.4.7.7.1.5 In addition to presence detection, the video detection system shall be capable of performing at a minimum the following calculations in real time and store the values for each camera view for any visible lane without the addition of another device:

- a) Speed
- b) Volume
- c) Lane Occupancy
- d) Vehicle Classification

1092.4.7.7.2 Video Detection System Components. The video detection system will be defined as the complete assembly of all required equipment and components for detection of vehicles. Each video detection system shall consist of the video camera(s), lightning arrester for video cabling, processor unit(s), control device (track ball or keypad; no mouse allowed), software and license for system control via a computer (if applicable), communication components, and a color monitor. All camera views shall be obtainable without requiring the disconnection and reconnection of cables within the system.

1092.4.7.7.2.1 Video Detection System Software. The video detection system shall include software that detects vehicles in multiple lanes using only the video image. Detection zones shall be defined using a video monitor and control device to place the zones on a video image, which may include a laptop computer. A minimum of 12 detection zones per camera shall be available.

1092.4.7.7.2.2 Video Detection System Connections. All bus connections in the video detection system shall be corrosion resistant. Serial communications to a computer shall be through an RS-232/RS-422 serial port through a subminiature "D" connector with a computer running supplied system software. The port shall have the capability to access detection system data as well as the real-time imagery needed to show detector actuations. The processor shall have a RJ-45 plug using Ethernet 10/100 protocols.

1092.4.7.7.2.2.1 The equipment shall be provided with either a NEMA TS1 or NEMA TS2 interface as shown on the plans.

1092.4.7.7.2.2.1.1 For TS1 systems, the video detection system shall be equipped with a TS1 detector interface for a minimum of 16 detector outputs, or 32 detector outputs if required by Job Special Provisions. Logic output levels shall be compatible with the TS1. A subminiature "D" connector on the video detection system shall be used for interfacing to these outputs.

1092.4.7.7.2.2.1.2 For TS2 systems, the video detection system shall be equipped with a TS2 Type 1 detector interface, where detector information is transmitted serially via an RS-485 data path. A 15-pin subminiature "D" connector, meeting the requirements of the TS2 standard, shall be used for the serial detector output. A minimum of 16 detector outputs is required, with the capability of expansion to 32 outputs if required by Job Special Provisions.

1092.4.7.7.2.2.1.3 The contractor shall be responsible for any changes or additions to either an existing or new cabinet in order to provide a properly functional video detection system and monitor display. This may include, but is not limited to, additional SDLC connectors, a MMU (malfunction management unit), shelf relocation and component reorganization. No direct pay for any changes or additions. All required connections will be considered part of the video detection system installation.

1092.4.7.7.2.2.2 The video detection system shall be provided for either single camera or multiple camera installations as shown on the plans. Multiple camera installations shall be configured so that failure of 1 camera or control module shall not affect the operation of the remaining cameras or control modules.

1092.4.7.7.2.2.2.1 All video detection systems shall have a RS-170 (NTSC) video input to process another synchronous video source in real-time. The video detection system shall have at least 1 RS-170 (NTSC) video output.

1092.4.7.7.2.2.2.2 The video detection system shall be capable of providing the connection of a local surveillance camera or other non-detection video source. The video from the auxiliary input shall not be processed for video detection. The video detection system shall have an RS-170 (NTSC) composite video output, which may correspond to any of the video inputs, as selected remotely via RS-232 or locally by front panel switch. Multiple video inputs shall be routed into external video switchers (mounted to the monitor if provided).

1092.4.7.7.2.2.2.3 The video detection system shall be able to turn any detection zone in the default detector pattern on or off by internal time base control. The video detection system shall also be capable of switching to any detector pattern at the request of the user by either a menu selection with the control device or through a computer.

1092.4.7.7.2.3 Monitor. The monitor shall be a LCD active matrix with a minimum 7" diagonal screen color monitor, an NTSC-M system and BNC video in-out connections built into the housing. The unit shall be compact and lightweight, securely mounted to the cabinet shelving, have low power consumption, constructed to operate under extreme temperature conditions, and run on AC power. AC adaptor shall be included. The monitor shall be installed to automatically power on when the cabinet door is opened and automatically power off when the cabinet door is closed. A manual on/off switch shall be provided. If the video detection system is installed in a 332 or 336 cabinet or NEMA cabinet housing a master controller or in one that does not have shelf space, the screen size will be 5" diagonal with all other noted provisions unchanged.

1092.4.7.7.2.4 Video Camera and Housing. The video detection system supplier shall furnish the video camera for traffic detection. The camera shall produce a color video image of vehicles during daylight hours, with an optional production of black and white images during nighttime hours. The video shall produce a clear image for scenes with a luminance from a minimum range of 0.18 to 929 foot-candles (2.0 to 10,000 lux).

1092.4.7.7.2.4.1 The camera shall provide a minimum resolution of 430 lines horizontal (TVL) and 350 lines vertical under NTSC operation.

1092.4.7.7.2.4.2 The camera shall include an electronic shutter or auto iris control based on average scene luminance and shall be equipped with an auto iris lens.

1092.4.7.7.2.4.3 The camera shall have a variable focal length. The maximum aperture of the lens shall not be smaller than f1.8 and the minimum aperture shall not be larger than f300. The camera shall have a horizontal field of view ranging from a minimum angle of view between 5 degrees and 10 degrees wide to a maximum angle of at least 45 degrees. The adjustments for focus and focal length shall be made without opening up the camera housing.

1092.4.7.7.2.4.4 The camera shall be contained in an enclosure that is waterproof and dust-tight to NEMA-4 specifications. A minimum 5W heater shall be incorporated in the camera to prevent the formation of condensation and to assure proper operation of the lens' iris mechanism. The heater shall not interfere with the operation of the image sensor electronics, and it shall not cause interference with the video signal. The enclosure shall allow the camera to be rotated in the field during installation.

1092.4.7.7.2.4.5 The housing shall be equipped with a sun shield that prevents sunlight from directly entering the lens. The sun shield shall include a provision for water diversion to prevent water from flowing in the camera field of view, and shall be able to slide forward and back.

1092.4.7.7.2.4.6 The total weight of the enclosure, camera, lens, housing, sun shield and mounting bracket shall be less than 10 pounds (4.5 kg).

1092.4.7.7.2.5 Cable. Coaxial cable, if used, shall be a 75 ohm, precision video cable with 20 AWG (0.50 mm²) solid bare copper conductor, maximum of 10.1 ohms/m Nom. D.C.R., solid polyethylene insulating dielectric, 96% minimum tinned copper double-braided shield with a black polyethylene outer covering. The signal attenuation shall not exceed 0.8 dB per 100 feet (30 m) at 10 MHz. Nominal outside diameter shall be 0.305 inches (7.7 mm). The cable shall be in accordance with Belden Type 8281, West Penn P806 or approved equal.

1092.4.7.7.2.5.1 Seventy-five ohm BNC plug connectors shall be used with coaxial cable, if used. The supplier of the video detection system shall approve the coaxial cable, BNC connectors and crimping tool, and provide a 10% extra quantity of the needed BNC connectors with the system. The manufacturer's instructions shall be followed.

1092.4.7.7.2.5.2 Multi-conductor cable shall be per the manufacturer's recommendation and in accordance with Sec 1061.

1092.4.7.7.2.5.3 Twisted pair cable shall meet recommendations of the video detection system manufacturer. Pairs shall be untinned, with an overall shield. Individually shielded pairs will not be allowed.

1092.4.7.7.2.6 Maintenance and Support. The supplier shall maintain an ongoing program of technical support and software updates for the video detection system following expiration of the warranty period. The supplier shall maintain an adequate inventory of parts to support maintenance and repair of the video detection system.

1092.4.7.7.2.7 Warranty of Video Detection System. The video detection system shall be warranted to be free of defects in material and workmanship for a minimum of two years, with the cameras being warranted for the same for two years. During the warranty period, technical support from factory certified personnel or factory certified installers shall be available from the supplier. Ongoing software support by the supplier shall include updates for the processor unit and computer software and shall be provided at no cost during the warranty period. The update of the processor unit software to be National Transportation Communications for ITS Protocol (NTCIP) compliant shall be included.

1092.4.7.7.2.8 Training of Video Detection System. A minimum of one day of training shall be provided in the operation, setup and maintenance of the video detection system.

4.0 Construction Requirements. Construction requirements shall conform to Sec 902.

~~5.0 Method of Measurement. Method of measurement shall conform to Sec 902.~~

~~6.0 Basis of Payment. Accepted video detection systems will be made at the contract unit price for Item 902-99.02, Per Each. Payment will be considered full compensation for all labor, equipment and material to complete the described work as shown in the plans.~~

6.1 No direct payment will be made for programming the video detection system and its local intersection controller.

→ Same Basis of Payment per JSP-24. Four cameras per intersection.