PARSONS BRINCKERHOFF

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I do hereby certify that in accordance with the requirements of 23 CFR 635.411(a)(2), this patented or proprietary item is essential for synchronization with existing highway facilities.

State Design Engineer

TO: Eric Schroeter, PE
State Design Engineer

FROM: Parsons Brinckerhoff on behalf of
Lee Hillner, PE
Transportation Project Manager, MoDOT St. Louis District

SUBJECT: Route 30 ITS Expansion Project, I-270 west to State Hwy B/NN
J6Q3076
Proprietary Items (Cisco Systems & Iteris Vantage Velocity Equipment)
Public Interest Finding

With respect to the above mentioned project, we request approval of a finding in the public interest to use the communications network equipment manufactured by Cisco Systems and to use the Vantage Velocity Bluetooth Sensor equipment manufactured by Iteris.

This project includes the deployment of new intelligent transportation system (ITS) equipment including CCTV cameras, microwave vehicle detectors, Bluetooth travel time sensors, and an extension of the fiber optic cable from Gravois Rd. west to State Hwy B/NN in Jefferson County (approximately 9 miles of new fiber). This project includes the installment of new network equipment including network Layer 2 switches used to facilitate ITS device communications to the Gateway Guide system. In addition, ITS devices not currently utilizing fiber for communications will be migrated to the new fiber. These devices will provide interstate monitoring along Route 30 in southwestern St. Louis county and northern Jefferson county for the St. Louis District of the Missouri Department of Transportation (MoDOT). This project also includes the installation of 14 Bluetooth sensors for the purpose of providing travel times along the Route 30 corridor. Accurate travel times will be viewable to the public on a web-based graphical display. Installation of a travel time system is a part of the overall collection ability of the Iteris Vantage Velocity system.

CISCO NETWORK EQUIPMENT

Based on the evaluation of the current system and Cisco network equipment in place within the MoDOT central office and St. Louis District, and a consideration of the integration risks associated with using other non-Cisco products, the St. Louis District of the MoDOT respectfully requests to use the following Cisco network equipment for this project:

- Cisco IE 3000 Switch
- Cisco GLC-FE-100LX-RGD

Existing Cisco Deployment

Currently, the above referenced Cisco equipment is being utilized across the St. Louis District's ITS network to facilitate device and backhaul communications in to the Gateway Guide ITS system. On past projects, the MoDOT has provided the Cisco network equipment as part of the Commission furnished items on each contract. Throughout the system, Cisco Layer 2 switching equipment (Cisco IE 3000) is used to transport device communications to Node locations strategically located throughout the region. These node locations use Cisco Layer 3 switch equipment (Cisco 3750), as well as Cisco SONET multiplexing equipment (Cisco ONS-15454) to backhaul device communications to the Transportation Management Center (TMC) located in Chesterfield Twp, Mo.

Integration with Current System

To ensure continuity of the MoDOT's communication network, it is requested that Cisco network equipment be used to extend the network along Route 30. This project will include integration of new communication equipment at proposed locations shown on the plans. The work for this project includes the following tasks:

- Configuring Layer 2 devices at field cabinets.
- Field testing equipment post installation.
- Training staff and maintenance contractor on the use of and maintenance of equipment.
- Maintaining spare parts inventory.

Discussion of Alternatives

Research of potential alternatives indicates that other than the Cisco equipment, there is not a singular system that reasonably meets the current needs and requirements of the MoDOT's backhaul communication network. There is industry standard switching equipment that would meet specifications, but would require substantial integration with existing Cisco equipment found elsewhere in the network. This would require additional resources of staff and budget to complete the deployment and integration within a reasonable amount of time. It would also require an increase in staff training for deployment of a new vendor's product and on-going maintenance. Other vendor's products may have interoperability issues when administering protocol that may be proprietary to Cisco found elsewhere on the MoDOT's ITS network. Reconfiguring the current system to allow for a 3rd party vendor protocol to be interoperable would require a significant undertaking and is not recommended.

In conclusion, if another vendor's product is deployed on this corridor, the cost to procure, integrate, and maintain the communication equipment is expected to be significantly more than the Cisco products proposed above. Additionally, the system deployment for this project represents a small system expansion in comparison to the overall St. Louis metro area deployment.

Therefore, it is recommended that Cisco equipment be used for the expansion of the existing ITS system. Approval of this request at your earliest convenience would be appreciated. The project is scheduled for an August 2014 bid opening.

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ITERIS EQUIPMENT

Based on the evaluation of the current system and the integration risk of alternative systems, the St. Louis District of the Missouri Department of Transportation – MoDOT respectfully requests the approval of a finding in the public interest to continue to use the following Iteris equipment for the deployment along this project corridor:

- Vantage Velocity Bluetooth Sensors

Existing Iteris Deployment & Synchronization with the Current System

The St. Louis District of MoDOT currently operates an Iteris travel time system using Bluetooth-based technology in their area. Thus far, MoDOT has installed 12 of these sensors under the J6I3023 contract. As part of that installation, a collection sever provided by Iteris was installed in Jefferson City to handle all future integration of Bluetooth travel time sensors. To ensure compatibility with the existing Iteris travel time system, Vantage Velocity Bluetooth units will be required on all new travel time projects that will utilize Bluetooth-based technology. Bluetooth-based technology allows for more accurate travel times by capturing unique device identifiers at field units installed at defined segments along a roadway and calculating the travel time between origin and destination. For these reasons, the district would like to continue to utilize existing software for travel time calculations.

The installation of a travel time system is part of the overall data collection ability of the Iteris detection probes. This system consists simply of detection probes mounted to the top of traffic signal and ITS device cabinets and plugged into the MoDOT Ethernet field switches located in those cabinets. Through this connection, the system is then tied into the MoDOT communications network and data is streamed back to the central server configuration at the Central Office in Jefferson City. This server reads and accumulates the data, creates output reports and provides dynamic information to be displayed on a graphical overlay on a Google map in real-time for public use.

This investment involves all elements of the deployment, including:

1. Configuring the system database and central software
2. Field testing and calibrating the Iteris Bluetooth units
3. Training staff on the use and maintenance
4. Maintaining the spare parts inventory of equipment
5. Integrating with the Advanced Traffic Management System (ATMS) software

These above items have been coordinated and are on-going for existing intersection locations throughout the St. Louis District.

Discussion of Alternatives

Research of alternative systems indicates that other than the Iteris Vantage Velocity Bluetooth system, there is not a singular system which reasonably meets the current needs and requirements of the MoDOT travel time system for the application. There is industry standard equipment that would meet specifications, but would require substantial integration with the existing travel time server and ATMS system. This would require additional resources of staff and budget to complete this deployment and integration. It would also require an increase in staff training for deployment and maintenance. An

alternative system would also require the management of an additional spare parts inventory, and require additional staff training on the use and maintenance of those systems.

The district has made a significant investment of gathering probe data using HERE, a 3rd party service provider to provide travel times along the freeways and arterial networks throughout the metro St. Louis area. The HERE data is an alternative to the Bluetooth sensors because they can provide instantaneous speed, volume, and classification data which can be utilized by MoDOT's ATMS system to calculate travel time. The limitation with this data is that the ATMS uses an extrapolated method to calculate travel times based and speed averages/distance and would not necessarily meet the need for "accurate" origin/destination travel times as required by the project scope.

Therefore, it is recommended that the Iteris Vantage Velocity Bluetooth units be used for the expansion of the travel time system. Approval of this request at your earliest convenience would be appreciated. This project is scheduled for an August 2014 bid opening.