REPORT TO THE LEGISLATURE

VIRTUAL TRAFFIC MONITORING STATION PILOT STATUS REPORT

APRIL 2009

Prepared by the California Department of Transportation
Division of Traffic Operations
Office of System Management Planning

In response to
Item 2660-001-0042 of the Supplemental Report of the 2007 Budget Act

Report to the Legislature

Virtual Traffic Monitoring Station
Pilot Status Report
April 2009

Purpose

This is the second of two reports prepared in accordance with Item 2660-001-0042 of the Supplemental Report of the 2007 Budget Act which states:

> ***Virtual Traffic Monitoring Station (VTMS) Pilot.*** By April 1, 2008 and 2009, respectively, Caltrans shall report on the VTMS pilot to the Joint Legislative Budget Committee, fiscal subcommittees, and policy committees on transportation, as follows:
>
> (a) The number of vendors that participate in the pilot. For each contract, provide:
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> - The number of lane-miles included in the pilot, including a break out of those lane-miles that were also covered by functional loop detectors.
> - A description of the data collection method used by the vendor.
> - An analysis of whether or not the data collection method used by the vendor was more or less reliable and accurate than existing loop detector data.
> - An analysis of the annualized per-mile cost of purchasing these data from the vendor versus collecting these data using loop detectors.
> - An analysis of whether the vendor data were able to accomplish the following purposes:
> - Calculate vehicle miles traveled for use by the Federal Highway Administration to determine California's federal funding allocation.
> - Provide data that are useful to the management of traffic flow (such as ramp metering and signal timing).
> - Compute and report on congestion measures (such as delay).
> - Provide real-time information (such as travel times and roadway speeds) to travelers and other entities (such as the California Highway Patrol).
>
> (b) If multiple contracts are let, an assessment of the data collection methods that were best suited and least well suited for meeting the department's data collection needs.
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> (c) An assessment of the net cost and benefit of implementing the pilot.
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> (d) An assessment of whether VTMS is a viable long-term strategy for collecting traveler data and in what situations VTMS should replace existing loop detectors.

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Background

- The planning and operation of California's State Highway System requires extensive real-time and historical data to understand how the system operated in similar past situations, how it currently operates, and why. Data collected includes vehicle speeds, traffic volumes, vehicle classifications, trip origins and destinations, and other information.
- The California Department of Transportation (Caltrans) is required, pursuant to Title 23 United States Code (USC) Section 500.201-204, to develop, establish, implement, and continually operate a Traffic Monitoring System (TMS) for highways.
- Loop detectors are the most common TMS detection technology used by Caltrans.
- The collected data addresses the requirements of Title 23, USC Section 500.201-204 and is used by Caltrans in numerous Information Technology systems, including the Advanced Transportation Management System, the Highway Performance Monitoring System, the Traffic Accident Surveillance and Analysis System, the Performance Measurement System, and other systems.

Goals of the Project

The goals of the VTMS pilot project as outlined in the Feasibility Study Report (FSR) were to:

- Determine the possibility of purchasing vehicle speed and volume data from commercial vendors for up to 1,500 miles of the State Highway System.
- Test the reliability and accuracy of any commercially supplied vehicle speed and volume data over a two-year period.
- Determine if the cost per mile of vehicle speed and volume data could be reduced by up to 90 percent when compared with Caltrans' estimated costs of obtaining traffic data.
- Test Caltrans' ability to procure vehicle speed and volume data from a commercial vendor. Test existing business processes and their ability to facilitate the purchase of traffic data. Traffic data represents a procurement challenge that is a unique combination of a "good" and a "service."

Activities

The following activities were undertaken to deliver the VTMS pilot project:

- To keep current with the rapidly changing environment of advanced vehicle detection and data transmission technology, the Caltrans project manager contacted the department of transportation staff in other states and researchers worldwide to identify the type of traffic data being purchased and the procurement methods used.

- The technical specifications for the traffic data (speed, volume, and occupancy) being sought under the VTMS pilot project were established in such a way that the data would be of a quality and quantity that could replace the data gathered through traditional loop detection used by Caltrans.
- The Caltrans project manager worked closely with contract specialists from Caltrans' Division of Procurement and Contracts (DPAC) and the State Department of General Services (DGS) to develop an appropriate procurement vehicle for the project. It was decided that a Request for Information (RFI) would be developed and released to determine vendor interest in the project.
- The RFI was released on May 6, 2008, with final submittals made on May 27, 2008. Five responses to the RFI were received and indicated that sufficient commercial interest and ability existed to continue with the procurement. No cost estimates were included in any of the RFI responses.
- Staff from both DPAC and DGS stated that a Request for Proposal process would take at least two years to complete and recommended the use of an Invitation for Bid (IFB) process. An IFB is a procurement document within which the buyer stipulates the exact technical requirements of the goods to be purchased and the nontechnical requirements of the firms and their staff bidding on the contract. The lowest cost bid meeting all technical and nontechnical requirements is automatically selected.
- The IFB was released on August 11, 2008, with final submittals made on September 10, 2008.
- The Public Cost Opening of submitted bids was conducted on September 10, 2008.
- The Caltrans project manager, a subject matter expert, and a DGS analyst conducted a bid evaluation that was completed during the week of September 22, 2008.

Results

The results of the IFB procurement were as follows:

1. Four bids were received.
2. All bids were approximately $1,000,000 and were within approximately 11 percent of one another for the three-year period.
3. The actual annualized cost per year per mile of data coverage proposed in the bids was approximately $10,763 or a 40 percent increase over the $7,700 FSR estimate.
4. Although the estimates were made several years ago, the actual bid costs neither appear to provide any savings nor do they represent a substantial improvement over the estimates included in the FSR.
5. Bidders proposed using multiple technologies, including both loop detection and magnetometers, which do not represent a substantial departure or technological improvement over Caltrans' current system of detection.
6. Because this procurement did not meet the goals of this project, Caltrans chose not to award it. The fiscal year (FY) 2007/08 funds that had been encumbered for this purpose were disencumbered because there was no contract going forward, and the budget authority reverted ($1.365 million).

Future

When the VTMS pilot project was initiated, worldwide experience with commercial traffic data vendors was limited. Over the past several years, government agencies across the country have begun the process of procuring and testing traffic data from private sector data providers. In addition, while certain technologies such as cell phones that use towers for transmission initially held promise as inexpensive replacements for traditional loop detection, they have recently been shown to provide traffic data of lesser quality.

Caltrans has recently begun the Mobile Millennium project in partnership with the University of California Berkeley - College of Engineering, the California Center for Innovative Transportation, the U.S. Department of Transportation, Nokia, and NAVTEQ to collect vehicle speed and travel time data using global positioning system (GPS) enabled cell phones. The project will result in the design, testing, and implementation of a state-of-the-art system to collect traffic data from GPS-equipped mobile phones and estimate traffic conditions in real-time. The Mobile Millennium project was showcased at the 2008 15th Annual World Congress on Intelligent Transportation Systems in New York City. The results from the project will clearly identify the opportunity and value of purchasing hybrid traffic data.

Caltrans considered continuing the VTMS pilot project through collaboration with the Mobile Millennium project. After deliberation with the office of the State Chief Information Officer and others, it was determined that there was insufficient time available to process a Special Project Report (SPR) and an Information Technology (IT) procurement in the 2008/09 FY. Parallel processing of the SPR and IT procurement was considered to complete these processes in the FY. However, the risk of not encumbering these funds as the fiscal situation in State government became dire, led Caltrans to cancel the VTMS pilot project. Caltrans will continue to pursue the VTMS strategy and request for funding for this strategy in the future.

While Caltrans has achieved some cost reductions by implementing magnetometers in place of traditional loop detection technologies, it continues to pursue new, nonroadway-embedded technologies that hold the promise of providing high-quality data at a fraction of current costs. In addition, to deliver this type of project in the future, Caltrans will continue to pursue quicker and more flexible procurement methods that can adjust to the rapidly changing nature of technology.