Multi-State Open Advanced Traffic Management System Lowers Costs

Outcome — Demonstration of Open-source Advanced Traffic Management System software and commodity hardware components. Delivery: June 2008

Benefit — Dramatically reduce lifecycle costs of ATMS ownership. Potential savings exceed several million dollars per year.

AHMCT researchers are demonstrating the application of an Advanced Traffic Management System (ATMS) based on open standards, open software, and commodity computer hardware. This approach can greatly reduce ATMS deployment and maintenance costs, freeing funds for additional ATMS deployment. This approach also benefits public safety and mobility by enabling ATMS installation in remaining Caltrans districts at relatively little incremental cost.

Why We Are Pursuing This Research

Advanced Traffic Management Systems (ATMS) are effective in reducing congestion and collisions. Caltrans has implemented an ATMS in five of twelve Caltrans districts and would like to implement a standardized ATMS in the remaining districts. However, the current ATMS was designed in the early 1990s and uses proprietary single-source components. The price inelasticity of proprietary software leads to ever-increasing acquisition and upgrade costs, significantly impacting IT budgets. Further ATMS deployments are correspondingly constrained, which directly affects mobility, safety, and accident rates.

Technological advances in IT over the last ten years have been astonishing. Low-cost and powerful enterprise commodity servers based on the ubiquitous x86 architecture are available from numerous manufacturers. Non-proprietary operating systems, databases, and cross-platform development tools are mature, secure, reliable, scaleable, and free. Vendor lock-in is not a factor with open software. Combining a modular ATMS architecture with these advances provides strong benefits for Caltrans, taxpayers, and the traveling public.

What We Are Doing

AHMCT researchers are demonstrating the application of an Advanced Traffic Management System (ATMS) based on open standards, open software, and commodity computer hardware within a Caltrans Transportation Management Center (TMC). The objective of the research is to dramatically reduce ATMS lifecycle costs. The main focus is research, development, and demonstration of replacing high-cost proprietary single-source ATMS components with multi-sourced commodity hardware combined with open-source software, all free of yearly licensing fees. The main thrust of this effort is the application of an existing open-source ATMS package—the Minnesota DOT's Integrated Roadway Information System (IRIS)—in a demonstration project for Caltrans District 10. The IRIS software will be

enhanced as needed to work within the District 10 TMC environment in order to demonstrate the feasibility of open-source ATMS. By judicious application of open-source technologies, Caltrans and the State may achieve annual savings in the millions of dollars.
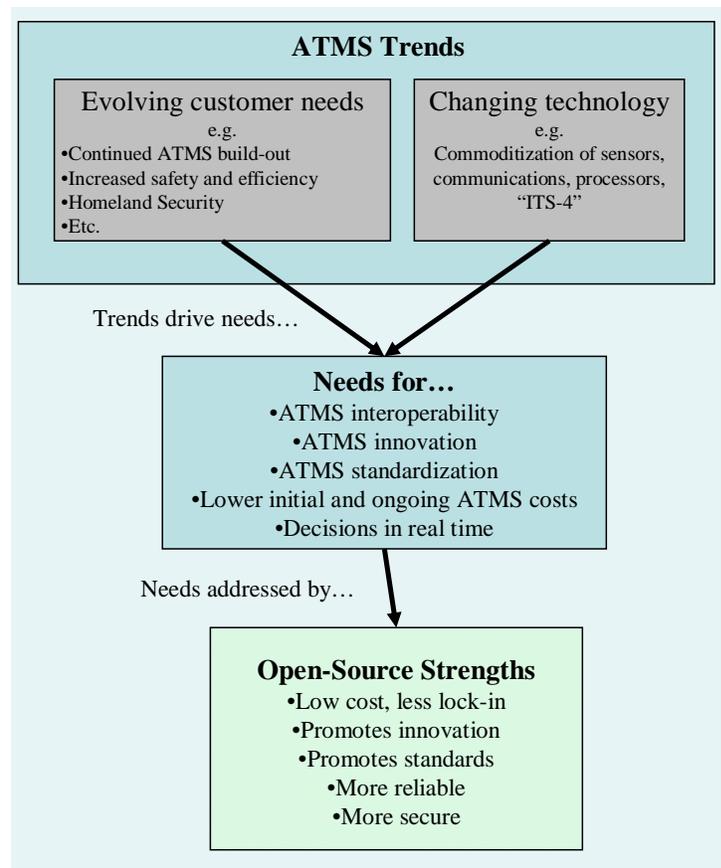
The research involves several phases:

- a review of the commercial ITS market, traffic management products, and recent ITS research and trends,

- a review of current Caltrans District 10 TMC operation and equipment, and

- enhancement and demonstration of IRIS in the District 10 TMC.

Current Status

AHMCT has completed the literature survey, and the review of the existing Caltrans District 10 TMC operations and topology. The next phase of the project focuses on the enhancement and demonstration of the IRIS open-source ATMS software in a real-world environment. AHMCT researchers will develop the testbed architecture and implementation, and participate with Caltrans Traffic Operations to evaluate the feasibility of Open-Source Software for Advanced Traffic Management Systems in the District 10 TMC. Project completion is in mid 2008.

Availability of open-source ATMS software will greatly reduce one-time and on-going operational costs. In addition, the emergence of a multi-state partnership for the continuing development and support of IRIS, and similar open-source software for transportation maintenance and operations, will lead to comparable benefits for participating DOTs.

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