Establishing an Intelligent Transportation System (ITS) Lab at LTRC Phase II

POINTS OF INTEREST:

Problem Addressed / Objective of Research / Mehodology Used Implementation Potential

PROBLEM

Intelligent Transportation Systems are integrated systems of advanced information and communication technologies to improve safety, operation, and productivity of surface transportation systems. Such systems have been deployed nationwide in metropolitan areas and are capable of collecting massive amounts of data that can be effectively used to achieve the main mission of ITS. To date, only a few states have recognized the need to mine this data for potential use in a variety of online and off-line applications, which are becoming more critical to both transportation systems users and providers. In the state of Louisiana, the ITS program at the Department of Transportation and Development (DOTD) has been rapidly growing in the past few years, and major ITS instrumentation efforts have been made on freeways and state highways in order to allow state transportation authorities to better serve the traveling public. In order to achieve this goal, there is a pressing need to secure a data warehouse to collect, store, and analyze as much ITS data as possible. Following the practice of several other states, an ITS lab has been proposed to serve as a centralized location for all ITS data from all available sources within the state of Louisiana. The lab is to be established at LTRC to facilitate the collection of data from all possible sources over the DOTD network. The first phase of the ITS lab was completed in 2009 wherein a feasibility study was completed and evaluated with the recommendation to proceed with the acquisition of all supporting equipment for full scale implementation of the ITS lab.

OBJECTIVE

The lab will address the needs of DOTD, other agencies, and the public as well as serve as a foundation to conduct "leading edge" research and training of graduate students. The lab will primarily serve as a catalyst to collect and store data from various ITS sources such as traffic monitoring systems (e.g., video detectors and cameras) as well as other sources of data and make it available to interested agencies for use in applications of their needs.

METHODOLOGY

The ultimate goal is to create a centralized location for data that can effectively support applications of immediate and long-term needs. This second phase of establishment of the ITS lab will achieve the following objectives:

- Examine the space allocated for the lab at LTRC and develop a layout for the equipment and a remodeling plan.
- Purchase and install the hardware and accessories required for the lab.
- Identify and update data sources from which the lab will be collected routinely.
- Develop a protocol and a procedure for data collection from each identified source and a mechanism to store the data on a database server for easy and efficient retrieval and analysis.
- Develop a web interface for basic data retrieval and analysis functions.
- Establish lab operating policies and protocols for data access and research conduct.

IMPLEMENTATION POTENTIAL

It is the main mission of this lab to house the regional data archive and provide public agencies the ability to retrieve information from the data archival system whenever needed. This is expected to address the needs of transportation planners, policy makers, and traffic operators. The lab will serve as a foundation for conducting research work that responds to the needs of transportation system users and providers.

In the first phase of this project, the research team identified a set of archived data user services (ADUS) based on a literature review and recommendations by other ITS labs. The list below identifies several applications that could potentially address the current needs of DOTD.

Effectiveness of ramp metering strategies on I12
Travel Time Study for Baton Rouge Road Network
Quantitative Analysis and Evaluation of the Impact of Freeway Capacity Improvement Projects in Louisiana
A Statewide ITS Data Warehouse for Traffic Operation Planning and Research Needs
Development of a Short Term Traffic Prediction Model for Travel Times on I10/I12
Utilizing ITS data to develop an Integrated Corridor Management framework for congestion mitigation
Urban Congestion Report for Louisiana
Network configuration management and related transportation issues of the states signal systems
Development of a Short Term Traffic Prediction Model for Travel Times in New Orleans and Other Urban Locations within Louisiana