

**Project Number**

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Project Manager

Elizabeth Birriel

*FDOT Traffic Engineering and Operations Office***Principal Investigator**

Mohammed Hadi

Florida International University

Florida Department of Transportation Research

Utilization of Connected Vehicle Data to Support Traffic Management Decisions

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Current Situation

Automated vehicle technology is advancing rapidly, from concept to test vehicles on the streets of American cities. Some of the underlying technologies that enable automation, such as Bluetooth communications and GPS, are already available in many car models, but true connected vehicles (CVs) will use additional technologies to communicate with other vehicles and traffic infrastructure. For the Florida Department of Transportation (FDOT), this connectedness creates opportunities for the SunGuide system, the software that FDOT traffic management centers use to integrate the exchange and processing of transportation data.

Research Objectives

Florida International University researchers assessed currently available, and expected, types of CV data and how these data can support SunGuide functions. Demonstrations of data acquisition and processing were based on a prior field deployment and in simulations.

Project Activities

The researchers focused on nine SunGuide functions that make use of field data: incident detection; traffic detection and performance measurements; ramp metering; managed lanes; Road Ranger support; road weather information; variable speed limit; wrong way driving; and safety barrier breach detection.

The researchers conducted a detailed literature review to determine the types of data that are currently available from CV technology as well as those that are being planned. They summarized the required input data for nine SunGuide functions and how each one can benefit from CV data. Available data types are governed by evolving standards, which the researchers also accounted for. Availability of CV data also depends on market penetration, or how many CVs are in the traffic stream.

A 2011 deployment of CV technology in Orlando buses provided field data for analysis on a segment of I-4. The researchers examined issues such as data type, formats, and quality. Several origin-destination sets were extracted to explore determination of traffic statistics from CV data, such as the average speed and variation of speeds on the segment. As the amount of data available increases, the quality of the information that can be gleaned from them also increases.

More advanced uses of CV data were also explored: determining link-level variation of CV market penetration; accuracy and reliability of estimated travel time; assessing the use of queue warnings when CVs are present; assessing the quality of travel time and incident detection under different demand levels; identifying a timeline for future utilization of CV data to support traffic; and estimating volume on urban streets.

Project Benefits

CVs present a data source with many possibilities for improving the understanding of traffic flows, developing advanced traffic management strategies, and designing more efficient transportation systems.

For more information, please see www.fdot.gov/research/.



CV-equipped LYNX buses provided field data used in this study.