

Florida Specific NTCIP MIB Development for Actuated Signal Controller (ASC), Closed-Circuit Television (CCTV), and Center-to-Center (C2C) Communications with SunGuideSM Software and ITS Device Test Procedure Development

PROBLEM STATEMENT

To provide hardware, software, network, systems research, and testing for multi-million dollar traffic operations, Intelligent Transportation Systems (ITS), and statewide communications investments, the Traffic Engineering and Operations Office has expanded the existing Traffic Engineering Research Laboratory (TERL) facility to include additional ITS and Statewide Communications Laboratory.

University-level advanced research support is required to provide unbiased research and development procedures to maximize the state's return on these investments. These efforts will help to develop statewide ITS device certification processes that can simplify ITS equipment testing, evaluation, and procurements.

The research team will provide FDOT with an interactive and coordinated problem-solving testing tool that will be used to ensure quick and efficient resolution to today's complex transportation engineering and ITS device evaluation problems. Critical and important research issues identified by FDOT engineers and District staff will be addressed by the research team. The coordinated efforts between the TERL staff and the professionals involved in designing, operating, and maintaining ITS systems throughout the state will help strengthen Florida's position as a leader in transportation engineering systems, and ITS.

The research team has focused on National Transportation Communications for ITS Protocol (NTCIP) research and testing across the entire life cycle of traffic operations, ITS, and statewide communications deployments. This life cycle includes design, development, operations, and maintenance. Specifically, the research efforts have provided the processes needed to allow the FDOT to test ITS software, Closed-Circuit Television (CCTV), Actuated Signal Controllers (ASC), and Center-to-Center (C2C) communications, as well as support the ongoing change management, integration, and acceptance testing of the FDOT SunGuideSM software System.

OBJECTIVES

This research project consists of research and development to support the following activities:

- Research and develop NTCIP management information base (MIB) requirements specific to Florida, for Actuated Signal Controller (ASC), Closed-Circuit Television (CCTV), and Center to Center (C2C) communications.
- Develop a change management process for NTCIP standards, hardware, SunGuideSM Software, and manufacturer's firmware changes. This process will be provided for FDOT Change Management Board's consideration and vote. Research needs of Florida-specific MIB for remaining ITS devices.
- Explore the development of ASC and CCTV testing tool kits, derived from the SwRI current XML scripts that could be used to test ITS device NTCIP and SunGuide software compatibility without applying the entire SunGuide software's network server's setup.

FINDINGS AND CONCLUSIONS

All the results and products of this research project conducted during in the two-year period, 2007 – 2009, are compiled and stored in the accompanying compact disc (CD). The summary of result and products is presented in the following table.

Area of Work	Results and Products
<p><i>Research and develop NTCIP management information base (MIB) requirements specific to Florida, for Actuated Signal Controller (ASC), Closed-Circuit Television (CCTV), and Center to Center (C2C) communications.</i></p>	<ul style="list-style-type: none"> • A draft Florida-Specific NTCIP MIB for CCTV Camera. • A paper and presentation titled “NEWLY DEVELOPED CCTV NTCIP TESTING PROCEDURES AT FDOT” by Leonard Tung at the 15th World Congress on ITS in November, 2008. • An Alternative NTCIP Testing Software (ANTS) using the scripting language Python. • A paper and presentation titled “SOFTWARE DEVELOPMENT FOR TESTING NTCIP DEVICES AT THE FLORIDA DEPARTMENT OF TRANSPORTATION TRAFFIC ENGINEERING RESEARCH LAB” by Leonard Tung at the Transpo 2008. • A draft FDOT ASC MIB and NTCIP Requirements. • A paper and presentation titled “INITIAL NTCIP TESTING FOR THE ASC AT FDOT” by Leonard Tung at the 15th World Congress on ITS in November, 2008. • A thesis titled “Testing of Actuated Signal Controllers for NTCIP Compliance” by Derek Vollmer.
<p><i>Develop a change management process for NTCIP standards, hardware, SunGuideSM Software, and manufacturer’s firmware changes.</i></p>	<ul style="list-style-type: none"> • Exerciser macros for the FDOT NTCIP-compliance testing of CCTV. • The FDOT NTCIP Testing Procedure for CCTV. • The FDOT NTCIP Testing Procedure for ASC with twenty-two test cases based on the functionalities of ASC.
<p><i>Explore the development of ASC and CCTV testing tool kits, derived from the SwRI current XML scripts.</i></p>	<ul style="list-style-type: none"> • Due to the fact that SunGuide software is in the early stage of deployment in the state of Florida and is required to be NTCIP compliant itself, it is recommended not to use the software as a part of testing tool for NTCIP compliance testing.

BENEFITS

The research activities of the project will support the Department's mandate to ensure a uniform and compliant transportation system as required by Section 316.0745, Florida Statutes.

The outcome of these efforts will be improved transportation safety and uniformity, success through gained expertise, knowledge and experience accumulated by researching and testing related devices, software, networks, specifications and standards.

The research efforts along with field experiments and evaluations to verify the functionality and performance of systems and related equipment will ensure transportation safety and efficiency.

Additional benefits resulting from these research activities are expected to eliminate many uncertainties during actual deployments and maximize the effectiveness of transportation systems throughout the state.

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