Florida Department of Transportation Research

Electrical Engineering Research Support for FDOT Traffic Statistics Office
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The Florida Department of Transportation (FDOT) monitors about 7,000 traffic count sites, including over 300 permanent telemetered traffic monitoring sites (TTMS). The monitoring equipment generally consists of traffic-actuated sensing devices imbedded in the pavement and classification equipment that captures traffic volumes, vehicle classification, and truck weights. Monitoring information is then downloaded and processed into annual average daily traffic (AADT), K-factor, T-factor, truck weight, and other pertinent measures, which are used in various forms by FDOT departments for planning, design, operations, and maintenance of highway pavements and bridges.

Researchers from the Florida A&M—Florida State University College of Engineering were contracted to provide general electrical engineering support to the FDOT Statistics Office and to improve the accuracy and reliability of the TTMS sensors and communications equipment.

The first effort undertaken by the researchers was to continue studies of the effect of lightning on TTMS operation. Surges at TTMS sites in this and previous work have been measured consistently in the low 1000s of amps with averages of up to over 30 surges per day. Results indicated a need for surge suppressors to protect count and classification equipment. Suppressors must be able to withstand lightning surges of at least 3,000 amps and sustain thousands of surges.

The second effort built on previous research which had demonstrated that a segmented sensor can improve the accuracy of vehicle classification and that it is feasible to use a more durable extruded polymer segmented sensor. In this project, researchers undertook initial steps to determine the behavior of the extruded sensor with the goal of developing an electronic interface capable of more accurately detecting segment closures.

A semi is about to drive over an electromagnetic loop embedded in the pavement. The loop is one component of a traffic monitoring site.

In a third effort, the researchers investigated application of a wireless traffic count system from Sensys Networks (Berkeley, CA) for temporary traffic counting. They were able to identify an appropriate access point and procedures for this application, which were compiled into a manual and published as part of the final project report.

In a fourth effort, the researchers cooperated with the TTMS civil engineering support team to monitor electrical characteristics of in-pavement sensors at selected TTMS sites over a period of about six months. The goal of this work was to monitor the effects of sensor sealant degradation on the electrical performance of the sensors. This work is part of long-term research to identify appropriate sealants for use with in-pavement sensor installation and to develop effective maintenance procedures to prolong the life of the sensors.

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For more information, visit http://www.dot.state.fl.us/research-center