



## Florida Department of Transportation Research Civil Engineering Support for Telemetered Traffic Monitoring Sites BDK83 977-04

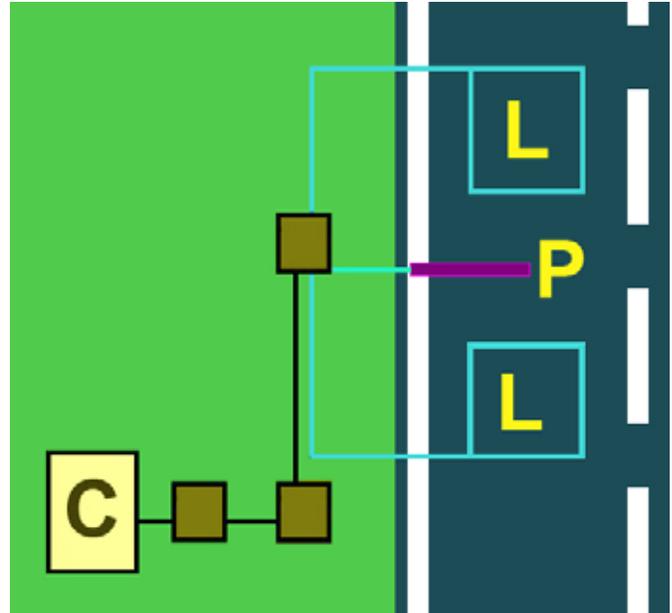
Understanding traffic flow is crucial for improving the safety and efficiency of Florida highways. An important tool in this effort is FDOT's work to collect traffic data through count stations located on the state's highways. Data collected at these sites include volume, vehicle speed, and vehicle type. Some sites also collect data on individual axle weights and overall gross vehicle weight.

Traffic monitoring sites typically consist of loops and piezoelectric axle sensors installed in the pavement, and electronics housed in a cabinet on the shoulder. Of particular concern has been the failure of loop sensors caused by the deterioration of the loop sealants. Failures have been traced to three major factors: type of sealant used, method of installation, and quality control during installation. An important question is whether or not it is beneficial to reseal exposed loops, or if replacement is the only effective option. In either case, sealant performance is a central issue.

To address these issues, researchers conducted field evaluations using a variety of loop sealants at stations 352 on I-10 and 112 on I-75. The evaluation involved conducting periodic physical observation of the bonding materials and recording electrical readings on inductance of the loop wires, ground resistance of the loop wires, and voltage amplitude of the piezos.

Preliminary results revealed unequal deterioration rates of sealants of different formulation. Electrical readings showed that ground resistance of some loop detectors was very low, particularly when readings were taken when pavements were wet. Despite low ground resistance, these loops showed reasonable inductance readings, which enabled the loops to continue collecting data accurately.

Observations of the data collection sites will continue for one year following the project period to provide a more complete evaluation of sealing materials' performance. This project is part of



*In a typical TTMS configuration, embedded in each highway lane are a pair of loop detectors (L) to measure vehicle speed and a piezoelectric sensor (P), which responds to vehicle weight. Data are collected and transmitted through a nearby cabinet (C).*

a multiyear effort to determine the methods of sensor installation and maintenance that are most effective in maintaining the flow of high quality traffic data.