



# Florida Department of Transportation Research

## Civil Engineering Support for the Traffic Monitoring Program

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### Project Number

BDV30-977-21

### Project Manager

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### Current Situation

The Florida State Highway System (SHS) is one of the most extensive and heavily traveled in the country. Each year it serves Florida's nearly 20 million residents and 100 million visitors. Traffic volumes on many of these highways are high, resulting in challenges to traffic flow. The Florida Department of Transportation (FDOT) maintains both continuous and short-term monitoring sites on Florida highways through its Transportation Data and Analytics (TDA) Office the seven FDOT districts. With many miles of SHS highway and many users, TDA faces continuing challenges of maintenance, sustainability, modernization of processes and equipment, and quality assurance of the data collected throughout the state.

### Research Objectives

In a series of four tasks, Florida State University researchers examined the systems and procedures used for acquiring vehicle and pedestrian data on the SHS.

### Project Activities

In task one, the researchers evaluated weight-in-motion (WIM) sensors at a site on US-231 in Youngstown, FL.

Researchers studied the influence of ground temperature on the weights recorded by sensors from two manufacturers. Weight and temperature data were collected over a period of nine months. The researchers found significant and consistent differences in the weights recorded by the two devices, but these differences did not correlate with temperature.

Task two also involved the accuracy of WIM sensors, but this time focusing on the effect of calibration and validation on data accuracy. In this case, the data being captured by the sensors corresponded to weight, axle spacing, and other vehicle attributes. Trucks with a known weight were used for this task, and the researchers were able to achieve good accuracy for gross vehicle weight; however, axle weight and spacing were less accurate.

In task three, the researchers examined the accuracy of vehicle classification used at over 200 monitoring stations. The various frames, wheel dimensions, and commercial vehicles present special challenges for vehicle classification, which involves collecting basic vehicle information and using a classifying procedure to place the vehicle in its standard federal classification. This is complicated by the variability in classification among manufacturers. The researchers tested devices from two manufacturers and found issues that warranted further study.

In task four, the researchers examined bicycle and pedestrian detection systems. There are numerous devices available. The researchers chose four weight-based sensors for this task. Volunteers were asked to pass the sensors (intrusive and non-intrusive passive infrared) singly and in various combinations of the pedestrians and bicycles. The devices varied in their manner of operation. Some were highly accurate at counting bicycles, but only modest accuracy was found in counting pedestrians.

### Project Benefits

Good data and proper analysis are foundations of transportation planning. Projects like this are essential to assuring that good transportation data are being collected.

*For more information, please see [www.fdot.gov/research/](http://www.fdot.gov/research/).*



*Walking in opposite directions, pedestrians test the capabilities of an embedded sensor.*