

## **HR-282** Automated Traffic/Truck Weight Monitoring Equipment

**Key Words:** Weigh-in-Motion, Classification, Piezo Cable

### **ABSTRACT**

This report documents work undertaken in the demonstration of a low cost Automatic Weight and Classification System (AWACS). An AWACS procurement specification and details of the results of the project are also included. The intent of the project is to support and encourage transferring research knowledge to state and local agencies and manufacturers through field demonstrations.

Presently available, Weigh in-Motion and Classification System are typically too expensive to permit the wide deployment necessary to obtain representative vehicle data. Piezo electric technology has been used in the United Kingdom and Europe and is believed to be the basic element in a low-cost XACS.

Low cost systems have been installed at two sites, one in Portland Cement Concrete (PCC) pavement in Iowa and the other in Asphaltic Cement Concrete (ACC) pavement in Minnesota to provide experience with both types of pavement. The system provides axle weights, gross vehicle weight, axle spacing, vehicle classification, vehicle speed, vehicle count, and time of arrival. In addition, system self-calibration and a method to predict contact tire pressure are included in the system design.

The study has shown that in the PCC pavement, the AMCS is capable of meeting the needs of state and federal highway agencies, producing accuracies comparable to many current commercial WIM devices. This is being achieved at a procurement cost of substantially less than currently available equipment. In the ACC pavement the accuracies were less than those observed in the PCC pavement which is concluded to result from a low pavement rigidity at this site. Further work is needed to assess the AWACS performance at a range of sites in ACC pavements.