

R9. Sensors, Communications, Control

UNDERSTANDING ITS/CVO TECHNOLOGY APPLICATIONS

Reference Manual

MODULE 9 - SENSORS, COMMUNICATIONS, CONTROL



US Dept of Transportation

Reference Documents and Sites

1. “Performance-based Commercial Motor Vehicle Brake Inspection Technologies” by Stephen A. Keppler (FHWA/OMC) and Steven J. Shaffer, PhD (Battelle Memorial Institute)
2. The Maryland State Highway Administration website for the Chesapeake Highways Advisories Routing Traffic:
www.chart.state.md.us
3. Website for the Advanced Regional Traffic Interactive Management & Information System (ARTIMIS) for the Greater Cincinnati Area:
www.dot.state.oh.us/dist8/arti.htm

Weigh In Motion (WIM) Comparison of Technologies

Type & Applications	Estimated cost Range		Application Speed	Accuracy
	Sensor Only	Installed, w/ electronics		
Single Load Cell Data collection, CVO sorting systems	\$35K - \$40K	\$80K - \$120K	Slow Speed	2% of applied
			Ramp Speed	3% of applied
			Mainline Speed	4% of applied
Bending Plate Data collection, CVO sorting systems	\$8K - &15K	\$40K - \$80K	Slow Speed	3% of applied
			Ramp Speed	4% of applied
			Mainline Speed	5% of applied
Piezoelectric Data collection, warning systems	\$1.5K - \$2.5K	\$35K - \$50K	Slow Speed	n/a
			Ramp Speed	15% of applied
			Mainline Speed	15% of applied

Note that proper performance is contingent upon proper road conditions, which must meet the specifications identified in ASTM E1318-94.

Application Sp[ee]ds:

Slow Speed: 2-20MPH

Ramp Speed: 25-45MPH

Mainline Speed: 50-65MPH

Cost and accuracy estimates provided by International Road Dynamics.

Maryland State Highway Administration

RWIS Roadside Weather Information Systems

Part of CHART: the
Chesapeake Highways Advisories
Routing Traffic

Material selected from presentations by the Maryland SHA

RWIS

- 51 sites statewide consisting of pavement sensors and weather towers
- Sensor data includes: pavement temperature, condition, chemical content, ice percentage
- Weather tower data includes: air temp., wind speed and direction, visibility, precipitation type
- Sensor / weather data is used for more accurate call-outs, operation planning and material management
- Resource sharing with other agencies and state DOT's

RWIS Functions

- Primary purpose is to assist with performing winter maintenance and emergency operations
- Integrated into a Statewide Advanced Traffic Management System, SOC & TOC's use data in conjunction with other traffic management systems
- Monitor pavement temperatures and atmospheric conditions for off-season maintenance

RWIS and Incident Management

- RWIS was introduced as a tool for winter maintenance
- Experience with integrating into Traffic Management arena has shown benefits beyond the winter season
- In-pavement sensors are critical in traffic and incident management for detection and monitoring of hazardous road conditions
- Public Safety is the number one concern; Clearing the freeway is one and a half

RWIS Deployment

Site Deployment was based on:

- Historical roadway problems from snow/ice
- Weather related accident studies
- High traffic / congestion areas
- Field personnel input from experience