



# CONNECTICUT DEPARTMENT OF TRANSPORTATION

## Research and Implementation Activities



In-house research projects are conducted and/or administered on a wide range of topics. A representative sample is described below. For more information on these projects, please contact the staff member listed.

### ***Automated Bridge Monitoring***



In cooperation with the FHWA and the University of Connecticut, ConnDOT is developing a network of nine in-service bridges that are being retrofitted with automated monitoring systems. They will monitor a variety of structural parameters that include vibration, strain, tilt, and temperature variations in the bridges' cross-section. Monitoring of these parameters will be done on a long-term basis. The first of these systems was installed in August of 1998. Future systems will be placed on bridges of various types and sizes. Contact Robert G. Lauzon, Ph.D., P.E. at (860) 258-0305 or [Robert.Lauzon@po.state.ct.us](mailto:Robert.Lauzon@po.state.ct.us)

### ***Quartz-Piezo Weigh-in-Motion***



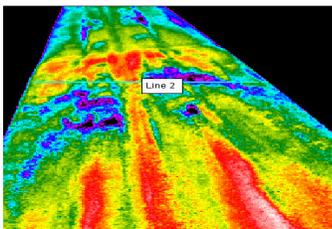
Connecticut is the first state in the nation to install a state-of-the-art Quartz-Piezo Weigh-In-Motion system on an in-service highway. In cooperation with FHWA's Priority Technology Program, sensors were installed on Route 2 in Lebanon, CT. The four lanes of installed sensors are being monitored for accuracy and survivability. The study includes the conductance of field validations using trucks of known weight. An interim report is available. Contact Anne-Marie H. McDonnell, P.E. at (860) 258-0308 or [Annemarie.Mcdonnell@po.state.ct.us](mailto:Annemarie.Mcdonnell@po.state.ct.us)

### ***Lightweight Profiler Evaluation***



As part of ConnDOT's plan to implement Quality Assurance Specifications for construction, a research study was performed on non-contact lightweight profilers for measuring pavement smoothness. The study was performed in partnership with FHWA, along with eight other states. In the next phase of this study a profiler certification procedure and a special provision to allow contractors to perform quality control testing will be developed. A report is available. Contact Donald A. Larsen, P.E. at (860) 258-0301 or [Donald.Larsen@po.state.ct.us](mailto:Donald.Larsen@po.state.ct.us)

### ***Reduction of Thermal Segregation of Hot-Mix Asphalt***



In 1998, ConnDOT began a research project titled "Development of Guidelines for Reduction of Temperature Differential Damage for Hot Mix Asphalt (HMA) Projects in Connecticut." Temperature differential damage is a mechanism related to temperature variations in the loads of HMA. ConnDOT personnel used an infrared camera to look at these temperature variations during HMA pavement construction in September 1998. Project sites will be monitored for five years to evaluate the extent of any subsequent damage. An interim report is available. Contact John W. Henault at (860) 258-0352 or [John.Henault@po.state.ct.us](mailto:John.Henault@po.state.ct.us)

### ***Digital Versatile Disk (DVD) for Photolog Image Distribution***



ConnDOT personnel continue to utilize state-of-the-art data collection techniques in its yearly pass over the state-maintained highway network. The computer-based modular design of the two photolog vehicles allows digital video cameras to capture forward, side and downward views of the roadway and its surroundings as well as other linear-referenced engineering and geometric data. To enhance use, distribution of photolog images and corresponding data is accomplished from DVD-based workstations and will be available via PC-network later in 2000. Contact Brad Overturf at (860) 258-0316 or [Bradley.Overturf@po.state.ct.us](mailto:Bradley.Overturf@po.state.ct.us)

## ***Merritt Parkway Guiderail***



Originally constructed during the 1930's, Connecticut's Merritt Parkway was designated a National Historic Landmark in 1991. In order to maintain and restore unique characteristics of the Parkway, ConnDOT has designed and crash-tested a steel-backed, rustic timber guiderail system to be installed on current and future Merritt Parkway projects. The Merritt Parkway Guiderail meets the safety performance guidelines of NCHRP Report 350 Test Level 3, and is FHWA-approved for use on the National Highway System. Several field installations have been completed. Contact Dionysia Oliveira at (860) 258-0306 or [Dionysia.Oliveira@po.state.ct.us](mailto:Dionysia.Oliveira@po.state.ct.us)

## ***Automated Stop-Sign Identification System***



ConnDOT personnel are presently testing image-processing software to automatically identify stop signs installed on the state-maintained highway system. Stop signs are an important warning sign with high tort liability potential if damaged or missing. This prototype system will filter through 1.2 million highway images collected annually by the ConnDOT photolog van to create an image subset for operator verification. Image processing using neural networks and distributed computing theory greatly reduce both computing power and time requirements. Contact Richard Hanley, P.E. at (860) 258-0374 or [Richard.Hanley@po.state.ct.us](mailto:Richard.Hanley@po.state.ct.us)

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## **Cooperative Research Program**

Under State statutes, the University of Connecticut (UConn) is authorized to perform research activities for ConnDOT under the guidance of a Joint Highway Research Advisory Council, a group composed of members from ConnDOT and the Civil and Environmental Engineering Department at UConn. Over 125 research studies have been performed under the Cooperative Research Program since its inception in the 1950's. A sampling of recent projects is presented below.

### ***Estimating Benefits of Safety Improvements***



The first phase of this project formed a procedure for predicting the success of specific accident reduction treatments, considering the features of the highway site. The focus was to determine the feasibility of using existing ConnDOT data sources to support such an analysis by selecting a few rural highway sites where specific treatments have been used. Phase 2 of this study focuses more aggressively on developing models for predicting the safety improvement potential of specific treatments such as realignment of skewed intersections.

### ***Protection of Steel Reinforcement in Concrete***



Two non-proprietary low-cost admixtures are showing great promise in the protection of steel reinforcement in portland cement concrete. Basic mix properties such as freeze-thaw durability, compressive strength, and percent of air voids have been determined. Corrosion rates are being measured using SHRP-recommended linear polarization techniques on concrete slabs, cylinders, and lollipop specimens containing #4 reinforcement. Phase 2 involves continued monitoring of specimens for corrosion development, and the use of lollipop specimens with preformed cracks.

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Questions regarding this program, as well as any of the highlighted projects, can be addressed to  
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Voice (860) 258-0309, Fax (860) 258-0399, Email [James.Sime@po.state.ct.us](mailto:James.Sime@po.state.ct.us)



For a copy of the Summary of Activities covering these programs or general information regarding the ConnDOT Research Program, contact:

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