



# 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 the period *July 1, 2003 thru June 30, 2004*. Additional information including the Annual Summary of Activities is available at the following web address: <http://www.ct.gov/dot/research>. For more specific information on these projects, please contact the staff member listed.

## ***New Technologies for Photolog Image and Data Acquisition***



An in-depth study of digital imaging acquisition hardware (high-resolution and high-definition in-vehicle cameras and image storage systems) for upgrading the current ConnDOT photolog vehicles is being conducted. High definition will allow for advanced pattern recognition of roadway and roadside features. The study will also evaluate a production version of an automated bridge under-clearance device. Identification of precise bridge clearances will aid in the routing of oversize/overweight commercial vehicles during the permitting process. Contact Brad Overturf at (860) 258-0319 or [bradley.overturf@po.state.ct.us](mailto:bradley.overturf@po.state.ct.us)

## ***CTTransit Demonstration and Evaluation of Hybrid Diesel Electric Transit Buses***



This project was initiated to procure, demonstrate and evaluate hybrid diesel-electric heavy-duty transit buses in order to identify the next generation of transit vehicles for future fleet replacement. These demonstration buses are being evaluated for operational costs, reliability, emissions, fuel economy, and maintenance/repairs. These data are being compared with similar data from standard heavy-duty diesel powered buses. A life cycle cost analysis will be performed. The research is being conducted under the direction of a project team composed of ConnDOT, Connecticut Transportation Institute, Connecticut Academy of Science and Engineering, the East Coast Hybrid Consortium, and vehicle manufacturers. Contact James Sime, at (860) 258-0309 or [james.sime@po.state.ct.us](mailto:james.sime@po.state.ct.us).

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



In cooperation with the FHWA and the University of Connecticut, ConnDOT is developing a network of 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. Four systems have been installed to-date and are on-line. Three more systems are currently under development, including an installation on the new Sikorski Bridge crossing the Housatonic River on the Merritt Parkway (a National Historic Parkway.) Contact Paul D'Attilio at (860) 258-0305 or [paul.dattilio@po.state.ct.us](mailto:paul.dattilio@po.state.ct.us).

## ***Alternative Merge Signs at Signalized Intersections***



Some signalized intersections utilize an additional through lane to increase capacity. In situations where the extra lane ends shortly beyond the intersection, a merge is required. During this research study, a prototype warning sign to improve the traffic flow and merge patterns was designed with input from a public-survey instrument, developed as a prototype, and is currently being evaluated at two intersections. These intersections, which previously contained the standard MUTCD lane ends sign, were monitored for six months via video cameras before the trial signs were installed in March 2003. The new signs are being monitored in the same manner. Contact Eric Feldblum at (860) 258-0392 or [eric.feldblum@po.state.ct.us](mailto:eric.feldblum@po.state.ct.us).

## ***Field Evaluation of Concrete Containing Disodium Tetrapropenyl Succinate (DSS)***



Field-tests were initiated after several years of successful laboratory studies of a new corrosion inhibitor (DSS). The field test will make use of DSS additive in precast f-shaped highway barriers. The single-sided barriers are being fabricated and will be installed on I-84 in Southington. The trial concrete mixtures containing DSS have demonstrated they meet the requirements for slump, workability, air entrainment and compressive strength for class f concrete specified for highway barriers. Corrosion monitoring of the reinforcing steel within the barriers will be conducted through 2008. Contact Paul D'Attilio at (860) 258-0305 or [paul.dattilio@po.state.ct.us](mailto:paul.dattilio@po.state.ct.us).

## ***Use of Streaming Media for Research Dissemination and Training***



This study evaluates streaming media production tools, plus server and client viewing software from RealNetworks, Microsoft and Apple. These technologies synchronize audio, video, text and graphics, while conserving network bandwidth. Handicapped accessibility, as it pertains to streaming media, is addressed during all phases of the study. A Department-wide server provides an Intranet streaming media capability for in-house use. Streaming media will enhance ConnDOT's Internet web-site by providing better service to the public. An interim report will be available later this year. Contact Drew M. Coleman, at (860) 258-0310 or [drew.coleman@po.state.ct.us](mailto:drew.coleman@po.state.ct.us).

## ***Long Term Pavement Performance (FHWA-LTPP) Monitoring and Weigh-In-Motion Studies***



Connecticut was a stakeholder in the Strategic Highway Research Program (SHRP) and continues to support the LTPP experiments. A report is available that documents the SHRP efforts in Connecticut from 1987-2002. In conjunction with collecting the traffic data needed for LTPP, ConnDOT conducted research on weigh-in-motion (WIM) sensor performance and durability. Through this research, Connecticut was the first state to install and evaluate quartz-piezoelectric WIM sensor technology. Reports are 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).

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## **Connecticut Cooperative Research Program**

In addition to in-house research, under CT State statutes, the University of Connecticut (UConn) is authorized to perform research activities for ConnDOT under the guidance of the Joint Highway Research Advisory Council, a group composed of members from ConnDOT and the Civil and Environmental Engineering Department at UConn. Over 140 research studies have been performed under the Cooperative Research Program since its inception in the 1950's. Three currently active projects are highlighted below.

### ***A Laser-Based 3D Data Acquisition System for the Analysis of Pavement Distress and Roughness***

This study is evaluating a 3D laser-based imaging sensor and the algorithms for processing the data acquired from the sensor. A lab prototype will be assembled and measurements will be made on real samples with the prototype. Contact Bahram Javidi at (860) 486-2867.

### ***Designing Roads that Guide Drivers to Choose Safer Speeds***

The objective of this research study is to determine: how the prevailing road characteristics, such as geometry and roadside environment, influence the actual vehicle travel speeds; how the actual travel speeds along with these road characteristics influence the incidence of crashes; and, how to design the safest road for a given condition. Contact John Ivan at (860) 486-2074.

### ***Comparison of Ultrafine Particle Emissions from Hybrid-Electric and Particle-Trap Diesel Connecticut Transit Buses***

This study compares the engine, fuel and after treatment configurations available to the CTTransit fleet in terms of ultrafine particulate matter emissions in order to determine the combination that will best meet current and likely future particulate matter emission standards. Contact Britt Holmen at (860) 486-3941.



Questions regarding this program, as well as any of the highlighted projects, can be addressed to:

**Mr. James M. Sime, P.E.**

**Manager of Research**

Voice (860) 258-0309, Fax (860) 258-0399, Email [James.Sime@po.state.ct.us](mailto:James.Sime@po.state.ct.us)

Additional information including the Annual Summary of Activities is available at the following web address: <http://www.ct.gov/dot/research> or contact:

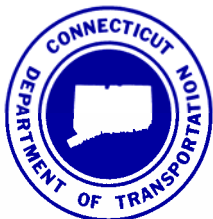
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