

ODOT Research News

Fall Quarter 2003

ODOT Research News is a quarterly newsletter to bring you the latest research and resources from the Oregon Department of Transportation's Research Unit. The Research Unit manages over 40 active research projects, providing new information and methodologies to improve how ODOT works.

The [underlined links](#) throughout the newsletter will take you to different parts of the [Research Web Page](#). There you will find updates on current projects, links to reports and research notes, information on staff specialties, and links to send us questions or suggestions for research. You can also call us at 503-986-2700.

The 2004 Northwest Transportation Conference (NWTC) will be held February 10-12 at Oregon State University's CH2M-HILL Alumni Center in Corvallis. The conference theme is *Partnerships in Transportation*. In line with that theme, there will be sessions on outsourcing, innovative contracting, incident/event coordination, homeland security, accessible transportation, and other sessions that highlight federal, state and local cooperation, coordination with natural resource agencies, and public-private partnerships. Four of the sessions are organized by ITS America, Oregon Chapter and will feature aspects of Intelligent Transportation Systems technology.

With the 18 different sessions, the conference will also include two pre-conference workshops on Retro-Reflectivity and High-Speed Rail Crossings. A



student poster competition will be held, recognizing outstanding transportation research by students of northwest universities. The Maintenance Innovations Showcase, consisting of practical tool displays, equipment modifications, and new techniques developed and used in the field by public agencies will be on display throughout the conference. The student poster and annual innovation awards will be presented during the Wednesday Luncheon.

Vendor displays will be open throughout the conference with hosted breaks. Free Professional Development Hours are also available; one hour of instruction equals 1-PDH.

For more information and online registration visit the NWTC Website at <http://www.odot.state.or.us/tddresearch/NWTC>



Project Accomplishments:

Truck Trip Data Collection Study Nearing Completion

Last year ODOT Research launched a project with Washington State University to investigate the most effective ways to collect data on truck movements. Freight movement is a significant issue in transportation planning in Oregon. Information is limited, however, on truck travel – their origins and

destinations, routes traveled, and commodities carried, especially in metropolitan areas. The objectives of this study were to identify the most promising truck trip data collection methods for metropolitan areas and to field test their effectiveness.

First the study reviewed the literature on the strengths and limitations of various data collection methods, with a focus on their applicability to freight modeling and planning in metropolitan areas. Two types of data collection methods were identified as most promising, one for each type of freight movement in an urban region – inter-regional (into and out of the region) and intra-regional (within the region). The project then commenced field testing of these methods – roadside interviews for inter-regional truck movements, and mail survey methods for intra-regional truck movements.

The results of the field tests showed that roadside interviews generally provided the most complete



origin-destination information, identification of routes used, commodity, and vehicle weight and configuration. The mail survey method provided good information on the land use designation of origin and destination points, the volume of shipments from these points, commodity, vehicle weight and configuration.

A final report from the project is expected in January 2004. A consortium of transportation planning agencies in the Portland metropolitan area plans to

use the findings to guide the implementation of a full-scale freight data collection effort. The data will help ODOT and Portland in its freight modeling and planning efforts. For more information, call [Alan Kirk](#) at 503-986-2843.

Coastal Landslides

Large sections of the Oregon coast are affected by landslides each year. Movement of these landslides result in costly repairs and road closures. The ODOT Research Unit and DOGAMI are conducting a multi-year research project to better understand the causes of these disruptions. A section of Highway 101 on the Oregon coast is being monitored for the project. This past year several tasks for the project were completed, including the installation of the following devices: piezometers (which record the accumulation of water in the ground), extensometers (which record landslide movement), and a rain gauge. One of the early findings is the strong temporal correlation between heavy rainfall, an accumulation of ground water, and the accelerated movement of the landslide. Data has shown that heavy rainfall is



followed immediately by a rise in the ground water, which is followed by movement of the landslide.

The fact that landslides move in response to rainfall events is not a new finding. The objective of the research project is to combine detailed observations of this phenomena with equally detailed observations of the geology and topography to understand the overall landslide process better. The intent is to develop more cost effective measures of dealing with similar landslides on the coast. Likewise this greater understanding will allow unproductive and costly approaches to be avoided. These and other aspects of the landslide have been documented and will continue to be monitored and studied for the next three and a half years. Contact Research Coordinator, [Matthew Mabey](#) for information about this project at 503-986-2847.

First Milestone Completed for the Evaluation of ODOT Project Delivery

In July, 2002, ODOT Research started a project with Oregon State University to investigate and evaluate the methods used to deliver OTIA projects and the Statewide Transportation Improvement Program (STIP). The end products will be an evaluation of ODOT project delivery effectiveness and the establishment of guidelines for successful insourced and outsourced project delivery. Recently, the first of several interim reports was published. Highlighting the progress so far, the interim report focuses on an extensive literature review and the results of DOT surveys and interviews.

Outsourcing of project delivery has become a popular concept nationally among state transportation agencies. The increased use of outsourcing has resulted from two major factors. Most states have been legally restrained from increasing the size of the work force, even though project load has sometimes increased dramatically. The second factor is that capital improvement programs may be funded with strict schedule restraints that may only be met through the use of outsourcing. An extensive literature review was conducted to gather

information about three delivery methods: traditional insourced design-bid-build, outsourced design-bid-build, and outsourced design-build.

A national survey of state DOT's was conducted. The results of the survey were used to make follow-up interviews with 14 states about their project delivery experiences. The most significant information came from South Carolina, Louisiana, Oklahoma, Florida, Connecticut, and Indiana.

The next task for the research project will be monitoring OTIA and STIP projects that are outsourced through design-build and design-bid-build models and tracking them alongside ODOT's traditional in-house delivered projects.

The interim report is available through the Research Webpage at www.odot.state.or.us/tddresearch. For more information on this research project, contact [Kevin Haas](#) at 503-986-2848.



New Research Notes: (click on underlined items to go to the notes)

The ODOT Research Unit has been investigating the option of washing bridges to remove chloride from coastal bridges. [Washing Bridges to Reduce Corrosion](#) reports the findings of the project thus far. An interim report is also available on the ODOT Research Website.



Recently Published Reports: (click on underlined items to go to electronic reports)

ODOT recognized the difficulty in selecting the correct concrete patching material and developed a [Concrete Patching Guide](#) to help maintenance personnel determine which product to use. The selection tool is based on a Microsoft Excel spreadsheet and matches the attributes of specific products to the needs of a particular patching job. An output report is generated that provides a list of qualified and conditional products from the QPL.

The project, [The Effect of Law Enforcement Deployment Patterns on Motorists' Speeds](#), investigated whether a relationship exists between motorists' speeds and law enforcement levels. The study deployed enhanced law enforcement patrols at six study sites in Oregon. The findings showed that enhanced patrols resulted in small, but statistically significant reductions in speed at most of the test sites.

Chloride ions are known to promote the corrosion of steel in reinforced concrete. The study, [Washing Bridges to Reduce Chloride](#), was undertaken to investigate the efficacy of washing, to reduce chloride content and chloride ion uptake. This interim report documents the results thus far. The field testing will be discontinued, but the laboratory testing will be continued for two more years.

The study, [Shear Capacity Assessment of Corrosion-Damaged Reinforced Concrete Beams](#), investigated how the shear capacity of reinforced concrete bridge beams is affected by corrosion damage to the shear stirrups. Analysis methods incorporating quantified corrosion damage predicted reasonably well the shear capacity of the large-size beams. Recommendations were presented for improved inspection practices to allow for estimating shear capacity of corrosion-damaged sections in reinforced concrete bridges.

An interim report for the project, [Evaluation of Oregon Department of Transportation Project Delivery](#), summarizes a review of literature regarding outsourcing by DOTs, with particular emphasis on outsourcing of project delivery, and performance measures. The report also summarizes information obtained from a brief survey of the 50 US DOTs, and a follow-up, more detailed questionnaire survey. This information lays the groundwork for a comparative evaluation, over the next three years, of projects delivered by ODOT using different delivery methods.

The goal of the project, [Evaluation of Intrusion Detection Technologies for High Speed Rail Grade Crossings](#), was to evaluate methods for detection of objects on railway tracks where they are crossed by a roadway. Laboratory and field tests were conducted with mixed success. The study concluded that existing video and microwave-based traffic monitoring systems may have potential for use in a railroad intrusion detection application, but further refinement of the technologies is needed.



T2 – Technology Transfer

The Research Unit also manages the Technology Transfer Program which provides resources for local governments on transportation, particularly: roads, streets and bridges. The T2 Center offers training through its *Roads Scholar* and *Circuit Rider* programs; and provides a lending service for publications and videos on safety, maintenance and other transportation topics. Additional information can be obtained by calling [Bob Rath](#) at 503-986-2854, [Andrea Bollman](#) at 503-986-2855 or by visiting the T2 program website at: www.odot.state.or.us/tddt2. The current issue of the *Oregon Roads* newsletter providing the latest T2 Center news as well as past issues are accessible via a link from that website.



Questions? Problems?

Got a transportation-related work problem that you think should be researched? Need a resource to answer a question? Call or e-mail the Research Unit and we may be able to help.

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For more information on ODOT's Research Program and Projects,
check the website at <http://www.odot.state.or.us/tddresearch/>