ODOT Research News

Spring 2004

ODOT Research News has changed to a semi-annual newsletter (Spring & Fall), bringing 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.

2004 Northwest Transportation Conference a Success! The 2004 conference was held February 10-12 in Corvallis, Oregon. An estimated 250 people attended the biennial conference. Some highlights of the conference included a Segway HT (Human Transporter) demonstration which allowed participants the chance to ride a Segway HT.

Segway HT demonstration

The banquet included guest speaker Jonathan Nicholas, Founder and President of Cycle Oregon. The Wednesday luncheon also included a presentation by, ODOT Senior Historian Robert A. Hadlow entitled, *"Elegant Arches, Soaring Spans: C.B. McCullough and His Bridges"*.

The conference proceedings, including individual presentations, are now available on the Internet via the Research Unit website. The theme for this year's conference was "Partnerships in Transportation" and included several breakout sessions in the areas of:

- Roadway Design
- Weather Monitoring and Decision Making
- Bicycle and Pedestrian Design
- Contracting and Project Delivery
- Incident and Special Event Management
- Accessible Transportation
- Homeland Security and Transportation
- Geologic Hazards
- Partnerships for System Operations
- Machine Guidance and Control
- Freight Movement
- Rail Crossings and Train Controls
- Oregon's Cracked Bridges
- Innovative Funding for Transportation
- Emergency Preparedness
- Fish Passage
- Transportation Issues for an Aging Population

To view the conference proceedings go to:
www://odot.state.or.us/tddresearch/NWTC/presentations.htm

Six New Research Projects to Start in July

Each year, the ODOT Research Advisory Committee prioritizes a slate of projects to begin during the following fiscal year. Based on preliminary budget estimates for fiscal year 2005, six new projects were selected from more than 100 problem statements submitted by ODOT staff, local governments, universities and others interested in transportation research. "The number of problem statements is higher, compared to numbers received in previous years, and the quality and the diversity of research ideas continues to improve," said Barnie Jones, Research Manager.

As Problem statements were received, they were sorted and assigned to one *or more* of six general subject matter areas, including:

1. Structures
2. Construction and Maintenance
3. Pavements and Materials
4. Roadway Design, Hydraulics, Geotechnical and Environmental
5. Traffic, Safety, Human Factors, and ITS
6. Policy Analysis and Multimodal Planning

For each of the six areas, Expert Task Groups (ETG) reviewed the problem statements, selecting two for further development. Detailed problem statements were further reviewed and prioritized by the Research Advisory Committee. Based on estimated funding levels, the following six projects were selected for fiscal year 2005:

- Establishing Guidelines for Incentive/Disincentive Contracting at ODOT
- Effective Design Treatments for Transitioning from Rural Areas to Urban Areas on State Highways
- Investigating Premature Pavement Failure Due to Moisture
- Acoustic Emissions Testing for Reinforced Concrete Bridges
- Evaluation of the Effectiveness of the Driver Improvement Program
- Truck Load Model for Oregon

Projects not selected were also considered for other possible research funding, such as the Experimental Features Program, the ODOT State Research Program, or the National Comprehensive Highway Research Program (NCHRP). Additional projects, from the pool of submittals, are likely to be selected this fall, based on funding availability.

For more information on the project selection process and other research currently underway, see the Research web page.

Project Accomplishments:

DMV Trip Permit Study

In January 2002, the ODOT Driver and Motor Vehicle Services Division (DMV) established a new system of issuing trip permits. One purpose of a trip permit is to provide a vehicle owner a legal way to drive the vehicle after failing a DEQ emissions test, to allow time for the needed repairs. Under the new, computerized system, two 21-day trip permits may be issued for a vehicle during a 12-month period. Prior to 2002, a vehicle owner could get permits covering up to 120 days in a 12-month period, and the permits were not monitored.

Portland State University is currently studying the impacts of DMV's revised Trip Permit Program on vehicle registrations, operations and emissions. Under the old system, vehicles that failed DEQ emissions tests could continue to operate under one trip permit after another. The study is evaluating whether the new system has resulted in more vehicles complying with DEQ vehicle emissions rules, or whether non-complying vehicles are simply being operated without registration.

To date, the study has assembled a body of DEQ vehicle inspection data and DMV trip permit records. The volume of DMV trip permits issued in 2002 was 55% less than the 2001 volume within the DEQ Vehicle Inspection Program areas. Vehicles that failed emissions tests are being matched to DMV registration information to determine what happened before and after the new rules went into effect. To supplement this data, the study will also conduct a survey of vehicle owners who failed emissions tests to determine what was done with their vehicles. The study is scheduled to be completed in the fall of 2004. For more information, contact Research Coordinator Alan Kirk.

Graduated Licensing Program

Oregon's teen licensing laws went into effect on March 1, 2000. The program is intended to reduce crash fatalities and injuries among teen drivers and to promote safe driving.
Driving a motor vehicle is a complex task—one that requires knowledge, specific motor skills, specific perceptual skills, judgment and maturity. Traditional driver licensing systems expose young drivers to many of the most difficult driving tasks very early in their learning process. This exposure to potentially risky situations has resulted in an unfortunate number of deaths and injuries. Sixteen year-old drivers, for example, have almost four times the crash involvement rate of those drivers who are 20 to 24 years of age (35 crashes vs. 9 crashes per million vehicle miles). Younger drivers are more likely to speed, tailgate, and engage in otherwise risky behaviors.

The Graduated Driver Licensing (GDL) system provides an approach that permits younger drivers to learn safe driving in a logical, more controlled way. Unlike traditional driver licensing, GDL allows young drivers to practice over an extended period of time; increases the amount of supervised training (especially during higher-risk [e.g., nighttime] hours); increases basic and advanced driving skills and knowledge; and rewards safe driving by allowing those with good driving records to graduate to a full, unconditional drivers license.

Currently there are two independent research groups studying Oregon's GDL program - the Traffic Injury Research Foundation (funded by the AAA Foundation for Traffic Safety) and the Center for Applied Research (funded by NHTSA). The findings are expected to be out in 2005. For more information on this research, contact Research Coordinator Rob Edgar.

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

The research note, **Shear Capacity of Corrosion-Damaged RC Beams,** reports on the research that 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.

Minimizing the Impacts of Highway Construction and Maintenance on the Traveling Public focused on two recent reports and an ODOT/FHWA workshop. A May 2003 ODOT report on Nighttime Construction reported on the criteria that ODOT uses to aid the decision making process for shifting construction and maintenance activities to nighttime hours. An FHWA report on Full Road Closures profiles highway projects in 6 states, including Oregon that used complete road closures to expedite construction and lessen the impacts to the public. In October 2003, FHWA hosted a workshop on "Making Work Zones Work Better". The goal of the workshop was to engage public agencies in aggressively anticipating and mitigating congestion caused by highway work zones.

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

The project **Permanent Deformation Characteristics of Oregon Mixes Using the Asphalt Pavement Analyzer** assessed the suitability of the Asphalt Pavement Analyzer (APA) as a tool for evaluating mixtures during the mix design phase, and judged the effects of varying mix properties on APA results. The research suggested that the APA is relatively insensitive to changes in mix properties when the test temperature does not match the high temperature rating of the binder.

The report **Truck Trip Data Collection Methods** identifies the freight data attributes necessary for both urban region truck modeling and freight planning efforts, and evaluates alternative data collection methodologies for providing these necessary data attributes. Two pilot studies were conducted in the Portland, OR metropolitan area to test truck trip data collection methodologies. The results from the different freight data collection methodologies are also presented and evaluated in the report.

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. The center also provides a lending service for publications and videos on safety, maintenance and other transportation topics. Additional information can be obtained by calling Bob Raths 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, is 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.

Oregon Department of Transportation

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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/***

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