

ODOT Research News

Winter Quarter 2002

Welcome to ODOT Research News, a quarterly newsletter to bring you the latest research and resources from the Research Group. 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.



Project Accomplishments:

ODOT uses partnering on construction projects to enhance working relationships with contractors. The research project, *Improving the Effectiveness of Partnering*, is collecting data to assess the current partnering practices and areas for improvement.

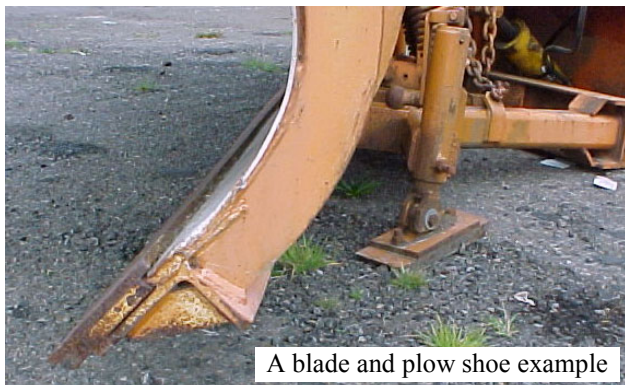
In November, researchers surveyed 42 contractors and 132 ODOT project managers, inspectors and others, to learn their views on what works well and what needs improvement in ODOT partnering efforts.

Currently, [Andrew Griffith](#) and his team are examining 12 recently-completed partnered projects as case studies. For six, the partnering effort was deemed successful, while

the other six were considered unsuccessful. For each project, the contractor's representative, the ODOT project manager and the partnering facilitator are being interviewed about the partnering process on that project. In addition, the case studies will review the project history and contract files. The goal of the case studies is to uncover fundamental reasons about why partnering is successful for one project, yet fails on another. The case study analysis will also help define the attributes of successful partnering and the constraints that limit the program's effectiveness.



Snowplows are under large loads and stresses from continuous winter road maintenance. Plow shoes support the blade and keep the cutting edge slightly above the pavement, optimizing plowing while minimizing pavement damage. Each year, repairing and replacing plow shoes can cost ODOT more than \$10,000 per maintenance section. A longer-lasting plow shoe could significantly reduce costs.



A blade and plow shoe example

The Idaho National Engineering and Environmental Laboratory has developed a steel coating process known as *Super Hard Steel* that provides a wearing surface much tougher than conventional steel.

Super Hard Steel can be sprayed onto a variety of metal surfaces using thermal spray technologies. It performs better than existing coatings in wear, corrosion, and impact resistance, and costs much less than hard ceramics, such as tungsten carbide. This technology could provide a low-cost treatment that extends the life of plow shoes, minimizing repair and replacement costs.

District 14 and the Research Group are testing whether Super Hard Steel can extend the life of snowplow shoes, thus reducing material and labor costs for repairing snowplows. [Kevin Haas](#) can provide more information on this project.

FreezeFree Field Demonstration. ODOT is participating in a FHWA/HITEC grant program to evaluate the FreezeFree anti-icing spray system. The system provides measured applications of anti-icing liquids on targeted areas to prevent icing before it happens. The proposed ODOT test site is on eastbound Interstate 84 near Cascade Locks.



Interstate 84 eastbound looking at structure over Eagle Creek

The combination of Columbia Gorge winter climate and the test site topography create a highway segment with a high frequency of crashes. The maintenance supervisor estimated that prior to using anti-icing chemicals five years ago, about 20 to 30 crashes per month occurred in this area. With anti-icing chemicals, this has been reduced to 15 to 20 serious crashes per winter season, still leaving room for improvement.

ODOT will be testing a fully automated system, linked to road and weather information system (RWIS) equipment such as pavement sensors to monitor pavement temperature. ODOT provided 20% of the total materials and installation costs, and labor for site preparation, installation of the pump house, piping, and conduits. In addition, the ODOT Research Group will monitor and evaluate this technology as part of the HITEC evaluation panel. For more information, contact [Kevin Haas](#).

The **Automated Data Collection** project is studying systems to automate the collection of pavement condition data. In the last newsletter, we reported that vendors who offer equipment and services showed their equipment and ran several test sections. Staff from Research, Pavement Services and Transportation Data are reviewing the vendors' pavement data and images to assess if the quality is acceptable for ODOT use.

Currently, a [survey](#) of ODOT data users is collecting information on data needs and uses. For more information, call [Cole Mullis](#) at 503-986-3116.



Examples of video and pavement data equipment.



Cracked bridges. To help in the fight against [Oregon's cracked bridges](#), the Research Group started a two-year project with Oregon State University in September. In October, OSU and ODOT conducted testing on the Willamette River Bridge at Newberg to understand how a cracked bridge behaves. The cracks were accurately mapped; then sensors were installed to measure how much the steel reinforcement stretches and how much the cracks open when vehicles drive over the bridge.

In addition, computer modeling helped explain how various bridge parameters affect the behavior of a cracked bridge. In January, Dr. Christopher Higgins presented the results-to-date to the Bridge Section.

For more information on this project, contact [Steve Soltesz](#), 503-986-2851.



Measurement equipment at Willamette River Bridge



Events:

The **2002 Northwest Transportation Conference** held February 5-7 at Oregon State University was quite a success, with over 350 people in attendance. Transportation Commissioner Gail Achterman provided the keynote speech about how sustainability can speed project delivery. Bruce Warner moderated a discussion with Representatives Earl Blumenauer and Peter Defazio, and Senators Ron Wyden and Gordon Smith. Conference attendees heard



the delegation's plans for the next reauthorization, and had opportunities to offer comments and ask questions. The conference featured workshops on all transportation modes, innovations, and new environmental research. Portland City Commissioner Charlie Hales spoke at the banquet about growth, sustainability, context sensitive design and livable neighborhoods.

The next Northwest Transportation Conference will be held in February 2004.

The Northwest Transportation Conference was also the kick-off for the **Showcase of Innovations**. Transportation professionals are invited to share maintenance and construction innovations with their counterparts in federal, state, and local agencies. The deadline for submitting applications has been extended until September 1, 2002. [Glenn Boyle](#) is available to

help document your innovation. All innovations will be shared with cities and counties, and [can be seen](#) on the Research web site.

Awards for the best tool, best equipment and best process innovations will be presented in the fall. Be the first to win the traveling trophy for the best overall innovation for 2002!



The **Research Project Solicitation** yielded almost 100 problem statements. These have been assigned to one or more [Expert Task Groups](#), who will prioritize them, with the top priorities being developed for consideration by the Research Advisory Committee. Although the formal solicitation has closed, your

questions and research problems can be [sent in anytime](#). Use these links to a [description of the process](#) and to a [form](#) for problem submission. Find out [who represents your area of expertise](#) and our [research priorities](#). You can also browse through this year's [new problem statements](#) at the research web site.



Recently Published Reports:

[Rockfall Catchment Area Design](#). An extensive multi-state research project. The data from rolling over 11,000 rocks off of various slopes with 3 different catchment areas has been used to develop design charts for guidance in areas prone to rockfall. [Appendices A-G](#) are also available. A separate version of the report using [metric measures](#) can be obtained upon request.

[Alternatives to the Motor Fuel Tax](#). As vehicles are becoming increasingly fuel efficient or use alternative fuels, road financing methods must be re-evaluated. New technologies also offer potential alternative ways to collect revenues. This study focused on equity and implementation issues to be considered in designing an alternative revenue source to motor fuel taxes.

[Precast Concrete Barrier Crash Testing](#). This report documents the crash testing of the Oregon Standard (32-inch) and the Oregon Tall (42-inch) F-shaped precast concrete barriers against NCHRP Report 350 standards. FHWA acknowledged both barriers as having the best performance of any free-standing barrier. The Tall barrier also passed a Test Level 4 crash test using an 8,000 kg single-unit truck.

[Roadway Applications of Vegetation and Riprap for Streambank Protection – Synthesis Report](#). Streambank protection using environmentally friendly methods is important in areas with threatened or endangered species. This report includes vegetation alternatives for each ODOT Region.



New Research Notes:

[Methods for Traffic Stripe Removal](#). Four methods of removing traffic stripes were tested at the Woodburn Maintenance yard. Rate of removal, degree of removal and pavement scarring were measured for each method.

[New Guidance on Managing Rockfall](#). This multi-state project resulted in new guidance and procedures for slope and ditch configuration design to retain rockfall. The full report can be accessed by clicking on the link above, or a [CD-ROM version](#) is available on request.



Other Good Resources:

Transportation Research Information Services (TRIS)

TRIS Online is a great resource for information on transportation topics. <http://ntl.bts.gov/tris>. At the TRIS search engine, enter key words to get a list of books, reports, articles and Web sites related to that subject. For more information on using TRIS, check our Research Note, [Information at Your Fingertips](#).

The Arizona Transportation Research Center provides 2-page reviews of research reports on a wide variety of topics. Their database can be searched by date, subject, key word or transportation mode. These reviews can be found in the Transportation Research Digest, at <http://www.dot.state.az.us/ABOUT/atrc/DocRev/index.htm>.

The Research Group receives many reports from other states. Here's a [link to the list of reports](#). Or if you'd like help finding a report, send us the topic, and we'll do the search for you.



T2 – Technology Transfer

The Research Group also manages the Technology Transfer Program, which provides resources for local governments on transportation, particularly roads, streets and bridges. T2 recently implemented the [Roads Scholar Program](#), and offers [publications](#) and [videos](#) on safety, maintenance and other transportation topics.



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 Group 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/>