



2010 – 2011 Annual Report



OTREC

OREGON TRANSPORTATION RESEARCH
AND EDUCATION CONSORTIUM

OTREC supports innovations in sustainable transportation through advanced technology, integration of land use and transportation, and healthy communities.

Mission OTREC is committed to providing relevant and high-quality research to assist local, state and regional agencies in their work and expanding the pool of highly trained graduates who choose to work in transportation-related fields. OTREC seeks to build upon our collective efforts and expertise to make Oregon a place where innovation, creativity and multidisciplinary collaboration lead to more sustainable, livable communities. OTREC serves its mission by supporting research, training and outreach in a wide variety of transportation-related disciplines.



Contents

- Message from the Director 4
- OTREC by the Numbers 5
- OTREC Theme 6
- Integration of Transportation
and Land Use 7
- Healthy Communities 8
- Advanced Technology 9
- OTREC Initiatives 10
- Recently Completed Projects 11
- 2010-2011 Year in Review 12
- Educational Programs 14
- Educational Innovations 15
- Student Achievement 16
- Student Groups and Activities 17
- OTREC's Staff and Structure 18
- Year 6 Outlook 20
- OTREC Award Winners 22
- Results and Impacts 23

The Oregon Transportation Research and Education Consortium (OTREC) is a national University Transportation Center sponsored by the U.S. Department of Transportation's Research and Innovative Technology Administration.

Consortium Partners
 Portland State University
 University of Oregon
 Oregon State University
 Oregon Institute of Technology

This publication is a report of OTREC's transportation research, education and technology transfer activities for October 1, 2010 – September 30, 2011.

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Message from OTREC Director Jennifer Dill

In preparing this year's message, I re-read what I wrote last year, highlighting the uncertainty surrounding the federal transportation program. One year later, uncertainty is still a theme. The immediate future of the university transportation center (UTC) program is a little clearer in some ways; we know that U.S. DOT's Research and Innovative Technology Administration is reviewing applications (including ours) for what will end up being 22 UTCs. That's 37 less than there are today. We know that

OTREC has just started its last round of projects under the SAFETEA-LU funding and will have one year after that to "close-out" the grant. Of course, we are hopeful that we will simultaneously be starting a new UTC grant.

What we are certain about is what we've accomplished to date, particularly the profound and lasting impact on our students. Since OTREC was established, enrollment in transportation courses at our four campuses has doubled, reaching nearly 1,500 in 2010-11 (see Page 14). Our graduates work in all levels of government—city, MPO, state, transit agency, federal—as well as private consulting and nonprofit organizations. They have titles ranging from transportation engineer to associate transportation modeler to assistant professor. (See a few of them on Page 16.) And, though over half of them stay in Oregon, our alumni work all over the U.S. and as far away as Morocco. OTREC students have won national awards from the National Science Foundation, the Eno Foundation, the American Planning Association and the American Institute of Certified Planners for their transportation work. Fourteen of our students have received prestigious Eisenhower Fellowships. Here's what a few of our alumni shared about the effect of OTREC's programs on their careers:

"Graduate study and research at Portland State University set my career firmly in the field of transportation. Before becoming involved in transportation research ... I was a civil engineering student with no clear path."

"My assistantship provided me with the transportation modeling skills and knowledge needed to be almost immediately employable ... in the middle of one of the greatest job slumps in recent history."

"I developed both a broad understanding of regional transportation planning as well as discrete technical skills that I use every day in my professional life. Research projects funded through OTREC enabled me to work with professionals in the field and to learn the necessary skills to be a transportation planner."

"The support and encouragement to attend conferences ... allowed me to get a broader view of the transportation field, and network with other students and transportation professionals."

"The variety of coursework and directed study projects expanded my view of transportation issues. Professors challenge students to think broadly about the issues facing transportation managers today, as well as how to develop flexibility in design for future needs."

As our students continue their careers in transportation, I'm confident they will have a lasting influence on creating more sustainable and livable transportation systems. I'm proud that we've given them the opportunity, through the classroom, research, and student group activities (see Page 17), to explore new ideas, develop their knowledge and skills, and get excited about transportation as a career.

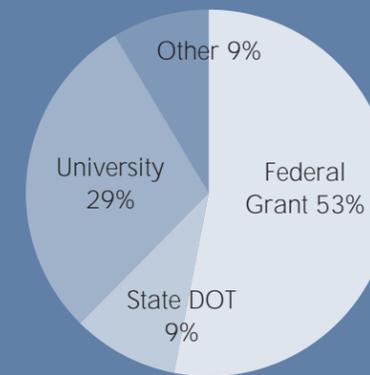
Jennifer Dill, Ph.D.
Director, Oregon Transportation Research and Education Consortium
Associate Professor, Nohad A. Toulon School of Urban Studies and Planning
Portland State University

OTREC by the Numbers

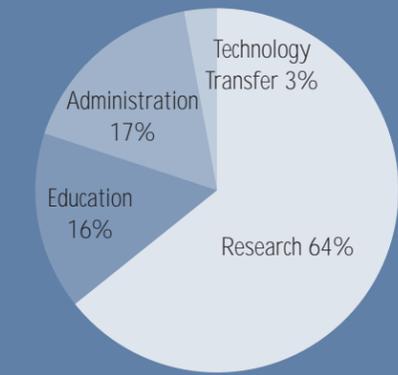
An overview of the Oregon Transportation Research and Education Consortium's accomplishments.

	2011-2012	2010-2011	Cumulative
Proposals received	42	44	307
Research projects funded	13	20	118
Multi-campus projects	3	5	37
Multi-Principal Investigator projects	9	15	92
Research projects partnered with ODOT	4	9	56
Dollars awarded: research projects	\$1,543,292	\$2,069,837	\$9,781,786
Faculty partners (running total)	90	89	90
External sponsors participating (running total)	42	42	42
Labs and research groups (running total)	13	13	13
Education projects funded	1	3	20
Dollars awarded: education projects	\$26,734	\$102,606	\$597,244
Technology transfer projects funded	1	1	15
Dollars awarded: technology transfer projects	\$41,566	\$65,642	\$828,301
Graduate students involved in projects	81	157	760
Undergraduate students involved in projects	97	107	612

Finance



Funding Sources
(Inception to Sept. 30, 2011)



Expenditures
(Oct. 1, 2010 to Sept. 30, 2011)

OTREC Theme

Integration of Transportation and Land Use

OTREC supports innovations in sustainable transportation through the integration of land use and transportation, healthy communities and advanced technology.

Integration of Land Use and Transportation

Oregon has earned a national reputation for considering land use and transportation together. With state laws emphasizing the importance of transportation and land use in addressing greenhouse gas emissions, OTREC investigators play a critical role in examining this issue so Oregon can continue to innovate, particularly in the area of modeling and forecasting tools.



Healthy Communities

Active forms of transportation such as walking, biking and transit connections are vital elements of healthy, livable communities; that is, places that achieve economic prosperity, environmental quality and social equity. To create safe places for these modes, OTREC projects examine the connections between community design, active transportation and potential health implications.

Advanced Technology

Technologies and the strategies they support, such as improving incident response or providing travelers with real-time information, help transportation agencies do more with less. By looking at how technology can improve the safety and performance of transportation systems, OTREC's work supports progress on national priorities such as transportation choices, economic competitiveness and energy independence.



Improving Land-Use and Transportation Decisions in Metro Areas

Leadership from elected officials and access to federal and state funding are crucial components for successful transportation and land use planning in urban areas, according to an OTREC-funded research study. The study, "Regional Transportation and Land Use Decision Making In Metropolitan Regions: Findings From Four Case Studies" examined how four urban areas coordinate land use and transportation via governance, growth centers and transportation improvement programs. Rich Margerum and Robert Parker of UO, and Susan Brody and Gail McEwen of PSU's National Policy Consensus Center, looked at agencies in the Seattle, Denver, San Diego and Portland, Ore., regions for the project. The team examined literature and reports, conducted 40 interviews and an online survey of over 450 individuals, and held a symposium with representatives from the four regions, the U.S. Department of Transportation, Environmental Protection Agency and other transportation officials.



Finding the Right Avenue for Neighborhood Electric Vehicles

Because neighborhood electric vehicles often look more like passenger cars than golf carts, their drivers and other road users might think they're just as safe. But should these vehicles share roads and highways with heavier, faster ones? In many situations, concluded OSU researcher Kate Hunter-Zaworski, the answer is "no." Hunter-Zaworski examined the vehicles, called neighborhood electric vehicles or low-speed electric vehicles, in an OTREC project cosponsored by the Oregon DOT. Oregon regulations should limit the vehicles to roads with a speed limit of 25 mph and only allow them to cross faster roads at four-ways stops or traffic lights, she found. She also urges transportation authorities to commit to separated transportation networks for all lower-speed transportation, including neighborhood electric vehicles. Such networks can connect neighborhoods to workplaces, schools and services with little use of busy arterials.



Approaching Advisory Speed Signs with Caution on Rural Highways

Signs warning drivers of recommended speeds are common before curves on two-lane Oregon highways. The speeds posted, however, aren't developed based on safety performance and don't always cause drivers to behave more safely, OSU's Karen Dixon and her team found in this project. The team developed a model to link physical characteristics at curves with the number of crashes and found that advisory speeds contribute to predicting crashes at these locations. Where there is a big difference between the speed limit and the posted advisory speed, drivers take advisory speeds seriously, resulting in decreased crashes. Drivers disregard advisory speeds that are close to the speed limit, even for obviously tight curves. The team recommended replacing the existing method for placing advisory signs with one it developed based on safety performance that depends on road geometry and operations. It also concluded that advisory signs are sometimes unnecessary or even counterproductive, as when familiar drivers perceive the posted speed as lower than appropriate for the site conditions and drive faster.



A Few Extra Feet from Cars Can Clear the Air for Cyclists



Moving cyclists just a few feet from automobiles can make a big improvement in air quality, an OTREC research project found. That's the distance between a traditional bike lane and a separated cycle track. PSU's Linda George and her team examined the microscopic particles, called ultrafine particles (UFP), given off by automobile engines along Portland's Broadway cycle track. Those tiny particles can get deep into lungs and other tissues and contribute to a host of ailments. Cyclists are doubly at risk: they bike through some of the high-

est concentrations of UFP while their exertion causes them to breathe more heavily, introducing more of the particles into their systems. George and her team, which included Miguel Figliozzi and Christopher Monsere of PSU, looked at whether distance and barriers affect the amount of UFP that cyclists encounter. The team created a new technique to compare the particle levels of both a traditional bike lane and the cycle track at the same time and found the levels in the cycle track were significantly lower.

Collecting Travel-Time Data From Personal Wireless Devices

Bluetooth-enabled devices such as cell phones, personal digital assistants and GPS navigation systems are nearly ubiquitous in vehicles traveling our roadways. Each of these devices carries a unique media access control (MAC) address, presenting an opportunity to estimate travel times better than existing methods. OSU researchers David Porter, David Kim and Mario Magaña improved a data-collection unit developed earlier, making the way it collects addresses more efficient, checking for duplicate addresses and cleaning up the code. They also set procedures for gathering and storing addresses that protect travelers' privacy. Because there's no way to make sure travelers' personal devices are all pointed in the same direction, having a good antenna to collect data would seem critical. However, the research team tested the performance of six types of antenna and found that even though devices might be pointed in any direction, this fact doesn't affect antenna performance as much as had been thought. The team also prepared a user's manual with instructions on how to assemble, configure and troubleshoot the data-collection unit.



Research Project Finds a Better Way to Track Freight Over Highways



Managing the freight transportation system requires understanding trucks' movements. However, existing tracking methods are expensive and raise privacy concerns. PSU's Christopher Monsere and his research team used data from existing weigh-in-motion stations. They then developed and applied algorithms to match truck measurements at separate sites, allowing them to reidentify vehicles at other weigh stations. The team found that the algorithms can match 95 percent of total trucks with around 90 percent accuracy. The algorithms also can yield greater accuracy by reducing the total number of trucks matched. Even though trucks often stop to refuel or make deliveries, thus changing their weight, the methods perform well enough to be put into practice. The methods identified in this research are cheap and unobtrusive, as they don't involve buying new equipment or requiring trucks to carry transponders, which can have privacy implications.

OTREC Initiatives

In addition to research, education and technology transfer projects, OTREC also supports three strategic programmatic initiatives to build capacity across our institutions. The initiatives, at <http://otrec.us/research/initiatives>, are designed to attract and retain students, generate technology transfer and research opportunities, and establish long-term financial sustainability.



Transportation Electrification Initiative

The transition from a petroleum-based transportation system to one based on electricity requires a coordinated effort between public and private organizations. The Transportation Electrification Initiative tests promising mobility projects focusing on urban freight, consumer behavior, intelligent vehicle systems and the effect of electrification on the electrical grid in a living laboratory. The initiative builds capacity within the Oregon University System and supports students and faculty as they research, plan for, field test, evaluate, experience and report on transportation electrification. The collaborative and cross-disciplinary approach speeds the adoption of electric vehicles and the development of a smart mobility system within a smart grid while providing policy and technical guidance to the state and nation.

Sustainable Cities Initiative

The Sustainable Cities Initiative is a cross-disciplinary initiative that promotes education, service, public outreach and research on the design and development of sustainable cities. The initiative addresses sustainability issues across multiple scales, from the region down to the building, recognizing that creating the sustainable city cannot happen within any single discipline. Goals include conducting multidisciplinary research to meet local, regional and national goals for sustainable city design and function; providing service and technical assistance to Oregon and the nation; attracting and training the nation's best students interested in sustainable cities; and engaging national experts in a discourse and exchange of ideas.



Oregon Modeling Collaborative

The Oregon Modeling Collaborative brings together experts from universities, public agencies and private consultants to support and enhance Oregon's nationally acclaimed program of developing methods and analytical tools for transportation planning and analysis. The collaborative provides a comprehensive and coordinated approach to the research and development needs of the modeling and planning community to support the innovative and expanding Oregon modeling program. The collaborative draws on OTREC university partnerships around the state and within the Oregon Modeling Steering Committee, a consortium of federal, state and local agencies with transportation/land use responsibilities or interests.



Recently Completed Projects

Projects completed between Oct. 1, 2010 and Sept. 30, 2011

"Evaluation of Safe Routes to School Programs: Qualitative and Quantitative Analysis of Parental Decision-Making"
Lynn Weigand, PSU; Noreen McDonald, University of North Carolina

"Safety Evaluation of Curve Warning Speed Signs"
Karen Dixon, Ida van Schalkwyk, OSU

"Development of a Model to Predict and Mitigate Environmental and Public Health Impacts of Traffic Flows and Traffic Management Policies in Urban Transportation Microenvironments"
Linda George, Miguel Figliozzi, Christopher Monsere, PSU

"Factors for Improved Fish Passage Waterway Construction"
David Sillars, OSU; Hamid Moradkhani, Trevor Smith, PSU

"Transportation Planning Through Mobile Mapping Technology"
Marc Schlossberg, Ken Kato, Nico Larco, UO

"Wireless Data Collection System for Real-Time Arterial Travel Time Estimation"
David Porter, David Kim, Mario Magaña, OSU

"Overlooked Density: Re-Thinking Transportation Options in Suburbia, Phase 2"
Nico Larco, UO

"Increasing Capacity In Rural Communities: Planning for Alternative Transportation"
Megan Smith, Keavy Cook, Bethany Johnson, UO

"Assessment and Refinement of Real-Time Travel Time Algorithms for Use in Practice, Phase 2"
Kristin Tuft, PSU, Soyoung Ahn, University of Arizona

"Development of an Open Source Bridge Management System"
Michael Scott, OSU

"Exploratory Methods for Truck Re-identification in a Statewide Network Based on Axle Weight and Axle Spacing Data to Enhance Freight Metrics"
Christopher Monsere, PSU; Mecit Cetin, University of South Carolina; Andrew Nichols, Marshall University

"Evaluation of Bike Boxes at Signalized Intersections"
Jennifer Dill, Christopher Monsere, PSU

"Freight Distribution Problems in Congested Urban Areas: Fast and Effective Solution Procedures to Time-Dependent Vehicle Routing Problems"
Miguel Figliozzi, PSU

"Healthy Communities and Urban Design: A Multi-Disciplinary National Analysis of Travel Behavior, Residential Preference and Urban Design"
Jessica Greene, Marc Schlossberg, UO; Daniel Rodriguez, University of North Carolina

"No More Freeways: Urban Land Use-Transportation Dynamics Without Freeway Capacity Expansion"
Lei Zhang, Currently at University of Maryland

"Impacts of Neighborhood Electric Vehicles on Transportation Infrastructure Safety and Regulation"
Kate Hunter-Zaworski, OSU; Lyn Cornell, Oregon Department of Transportation Research

"Performance Enhancement of Bridge Bracing Under Service and Extreme Loads"
Peter Dusicka, PSU

"Trail Planning and Community Service Curriculum"
Lynn Weigand, PSU

"Bicycle and Pedestrian Education Program"
Lynn Weigand, Jennifer Dill, PSU; Marc Schlossberg, UO; Karen Dixon, OSU

"Operational Analysis of Transit Bus Collisions"
James Strathman, PSU

All OTREC final reports at: http://otrec.us/research/final_reports

2010-2011 Year in Review



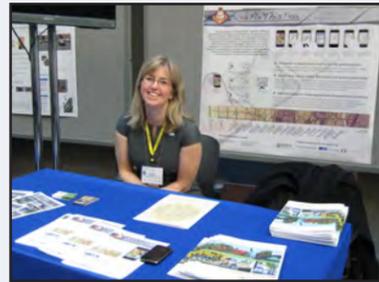
11.12.10 RITA Administrator Peter Appel visits OTREC to help launch the Oregon Modeling Collaborative. Above: PSU President Wim Wiewel, Kelly Clifton, Jennifer Dill and John Gliebe listen to Appel's remarks.



01.23.11 OTREC faculty, students featured in 37 sessions at TRB annual meeting. Above: OTREC affiliates at the Region X reception.



02.18.11 Region X Student Conference draws 70 to Corvallis. Above: OSU student Sahar Nabae presents data from her research.



04.06.11 "Fix This!" smart-phone app featured at RITA Technology Transfer Day. Above, OTREC's Jennifer Dill staffs the booth.



06.13.11 OTREC hosts Council of University Transportation Centers national summer meeting. Above, Alasdair Cain and Michael Baltes compare notes during a break.



05.17.11 Visiting Scholar Jim Gattis (above) shares lessons from NCHRP geometric design of driveways project



08.17.11 Electric cars get a charge out of the launch of Electric Avenue at PSU. Above, PGE President Jim Piro plugs in.



09.09.11 The third annual Oregon Transportation Summit drew 275 people. The plenary session on the transportation implications of the census featured Johanna Zmud (RAND) and Council President Tom Hughes (Metro). Mark Ovenden, above, author of "Transit Maps of the World," gave the keynote. Nine breakout sessions and 19 posters featured OTREC-related research.

10.12.10 Christopher Monsere of PSU wins Engineering Education Advocate award

12.18.10 Metro partners with OTREC to host Federal Highway Administration regional summit to address adaptive signal control technology

03.04.11 Professors Ethan Seltzer (PSU) and Daniel Carlson (University of Washington) develop a two-campus high-speed-rail workshop, with students traveling between campuses

07.25.11 OTREC participates in the 2011 Annual Meeting of AASHTO's Research Advisory Committee

2010

10.18.10 OTREC well represented at RITA Spotlight Conference in Washington, D.C. Below: Marc Schlossberg with the SCI poster.



12.11.10 UO's Sustainable Cities Initiative lands national Partners for Livable Communities Bridge Builders Award

11.18.10 PSU students win Traffic Bowl, OIT takes third. Below: Winning students display their trophy.



2011

02.23.11 OTREC's Jon Makler teaches high-school students during "National Engineers Month"

01.30.11 Seat belt safety advertisement wins PSU team national honors from NHTSA. Below: Parents in a focus group rate their impressions of the advertising concept.



04.11.11 Gabe Klein brings lessons from Oregon to lead Chicago Transportation Department. Below: Klein, second from left, takes a bicycle tour of Eugene with LiveMove students.



06.14.11 OTREC works with ODOT to craft testimony presented to the U.S. House of Representatives Subcommittee on Technology and Innovation

05.26.11 Jessica Bloomfield (UO) and Kristina Currans (PSU) earn Women's Transportation Seminar scholarships. Below: Bloomfield meets Ray LaHood.



07.28.11 OTREC researchers Dill, Clifton, Margerum and Hunter-Zaworski participate in World Symposium on Transport and Land Use Research

07.10.11 OSU Student Chapter wins ITE Western Region Student Chapter of the Year. Below from left: Ioana Cosma, Lacy Brown, District President Edgar Perez, Jon Mueller and Halston Tuss.



09.08.11 OTREC hosts retreat for researchers from all four partner campuses. Faculty pictured below participate in a "speed dating" activity to learn more about each others' research.



Educational Programs

PORTLAND STATE UNIVERSITY

Department of Civil and Environmental Engineering
Maseeh College of Engineering and Computer Science

- Bachelor of Science (BS) in Civil Engineering
- Master of Science (MS) in Civil and Environmental Engineering
- Master of Engineering (MEng) in Civil and Environmental Engineering
- Master of Engineering (MEng) in Civil and Environmental Engineering Management
- Ph.D. in Civil and Environmental Engineering

Toulan School of Urban Studies and Planning
College of Urban and Public Affairs

- Master of Urban and Regional Planning (MURP)
- Master of Urban Studies (MUS)
- Ph.D. in Urban Studies

School of Business Administration

- Supply and Logistics Management (BA/BS)

Interdisciplinary Programs

- Dual Master's Degree in Urban and Regional Planning and Civil and Environmental Engineering
- Graduate Certificate in Transportation

UNIVERSITY OF OREGON

Department of Planning, Public Policy and Management
School of Architecture and Allied Arts

- Master of Community and Regional Planning (MCRP)

OREGON STATE UNIVERSITY

School of Civil and Construction Engineering
College of Engineering

- Bachelor of Science (BS) in Civil Engineering
- Master of Science (MS) in Civil Engineering
- Master of Engineering (MEng) in Civil Engineering
- Ph.D. in Civil Engineering

OREGON INSTITUTE OF TECHNOLOGY

Department of Civil Engineering and Geomatics

- Bachelor of Science (BS) in Civil Engineering
- Master of Science (MS) in Civil Engineering

Sustainable City Year

Sustainable City Year, a program of the Sustainable Cities Initiative (see Page 10), marshals the resources of existing courses across disciplines and campuses to help a single city address sustainability issues. For 2010-2011, the University of Oregon-led Sustainable City Year partnered with the city of Salem, Ore. Seven city departments identified 16 different projects and more than 600 students contributed over 80,000 hours as part of 30 different courses from eight disciplines at two universities. At right, Salem City Traffic Engineer Kevin Hottman works with students in a transportation safety class.



The transportation portfolio included three of the 16 projects: two UO classes looked at downtown park connectivity while classes from PSU examined traffic safety and bicycle and pedestrian circulation. These projects identified barriers to Salem's livability goals and opportunities for improvement.

In 2011-12, Sustainable City Year will shift to Springfield, Ore., where several transportation projects have been identified: a bike and pedestrian accessibility and connectivity plan, main street corridor land use analysis, citywide wayfinding and electric vehicle charging sites.

Visiting Scholar Program



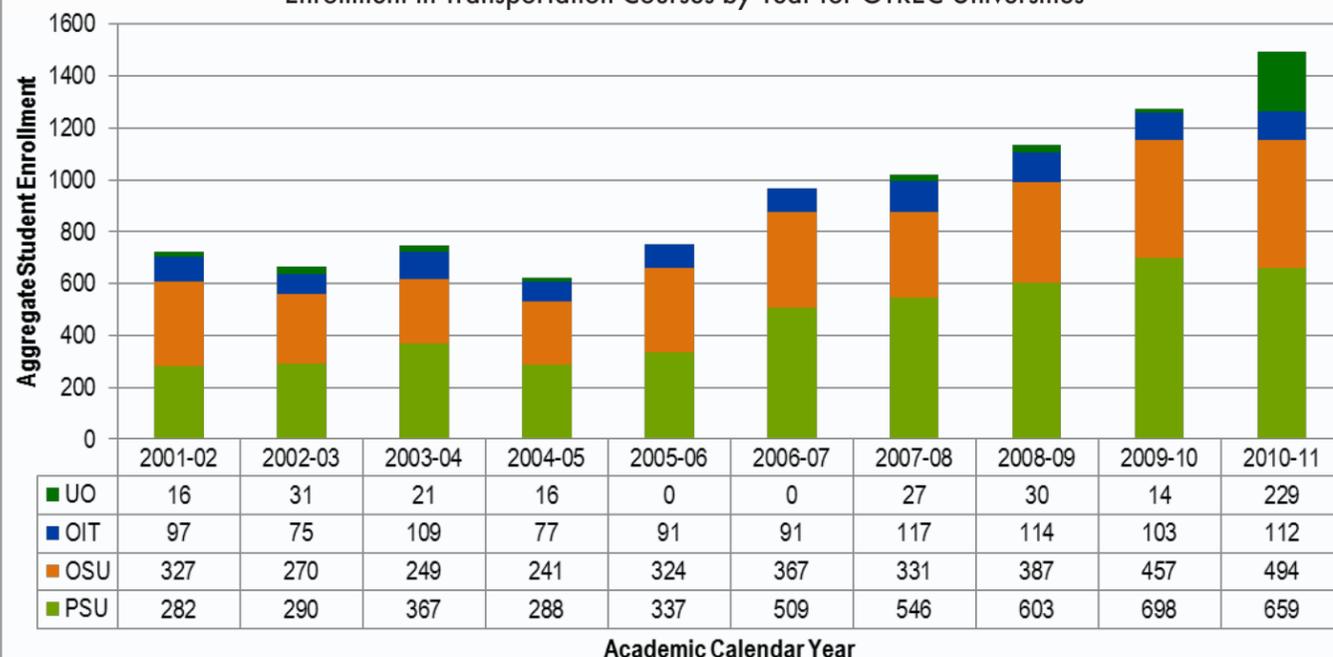
For another year, OTREC's Visiting Scholar Program helped diversify educational opportunities for students, transportation professionals and interested neighbors and businesses by bringing experts to our campuses. In 2010-2011, we placed a greater emphasis on bringing visitors to multiple campuses during their time in Oregon. For example, Gabe Klein (pictured at left), now Commissioner of the Chicago Department of Transportation, came to the University of Oregon as the Sustainable Cities Initiative's Expert in Residence and also gave two talks at Portland State University. Jim Gattis of the University of Arkansas presented from his work on driveway design at both Oregon State University and Portland State University.

Other Visiting Scholars who presented at PSU's Friday Transportation Seminar series are:

- Peter Jacobsen: "Vision Zero: Towards Zero Deaths"
- Robert Schneider, UC Berkeley: "How Do People Choose a Travel Mode? Factors Associated with Routine Walking and Bicycling"
- Peter Lagerwey, Toole Design Group: "Emerging Trends in Developing and Implementing Bicycle Master Plans"

At the University of Oregon, the student group, LiveMove, continued to provide effective leadership of their speaker series. In addition to Gabe Klein, they also hosted Andy Clarke, the executive director of the League of American Bicyclists, and Dan Burden, executive director of the Walkable and Livable Communities Institute.

Enrollment in Transportation Courses by Year for OTREC Universities



Student Achievement



2011 Outstanding Student of the Year: Cortney Mild, University of Oregon

Cortney Mild is OTREC's 2011 Student of the Year. In her first year at the University of Oregon's Master of Community and Regional Planning program, Mild led LiveMove's monthly speaker series. In her second year, she serves as the group's president. She has distinguished herself in the classroom and beyond. In 2011, she participated in a UO Study Abroad course in Amsterdam and then completed an internship with a Dutch consulting firm that specializes in bicycle and pedestrian facility design. Mild's thesis research is examining the mechanisms by which international study tours influence domestic practice in the area of bicycle and pedestrian planning. Mild graduated from the University of Utah with a Bachelors of Fine Arts in Ballet and performed as a professional dancer before choosing planning and the UO for graduate school.

Alumni Highlights



ERIN WARDELL, PSU: Erin Wardell graduated in 2006 with a master's in urban and regional planning. She is a travel demand modeler at Parsons Brinckerhoff, working on model development and application projects. "My experience in the MURP program was invaluable to my professional career," Wardell said. "Through connections I made while in the program, I got an internship which turned into a permanent position at my current firm. The coursework was rigorous, but even more valuable were the collaboration skills and professional relationships I developed."



KEVIN BELANGER, UO: Kevin Belanger graduated in 2010 with a concurrent master's in community and regional planning and environmental studies. He works at CH2M HILL. "Many of the projects I worked on in grad school were directly funded by OTREC," Belanger said. "I appreciated the emphasis on sharing and celebrating results, and feeling part of a larger academic community. I was continuously impressed by the work faculty and students were doing with OTREC, and seeing familiar faces at conferences around the country solidified that sense of community."



NEIL COPPER, OSU: Neil Copper graduated in 2010 with a master's in civil engineering. He does design work for the city of Austin, Texas, bicycle program. "OTREC provided many great opportunities to attend and present research at technical conferences," Copper said. "These conferences resulted in new ideas for my research and provided valuable insight into effective communication strategies. Whether speaking with other engineers or Austin residents, I regularly apply the communication skills I learned from explaining and questioning ideas with my peers."



LAURA JO PRUSAKIEWICZ, OIT: Laura Jo Prusakiewicz graduated in 2010 with a bachelor's in civil engineering. She works for the Oregon Department of Transportation. "OTREC provided me with the opportunity to participate in events throughout Oregon and on campus," Prusakiewicz said. "Some examples: participating in the ITE Traffic Bowl, going to the Asphalt Paving Association of Oregon conference and bringing speakers to OIT's campus. After taking my first transportation classes and attending my first speaker at OIT, I knew that I wanted to focus on transportation for my career."

Student Groups and Activities

While OTREC enriches the educational opportunities for students in many ways – funding the development of new courses, including students in research, supporting travel to the Transportation Research Board annual meeting – some of the most rewarding experiences are student-led.



The 19th annual William C. Kloos Traffic Bowl was held by the Oregon Section of the Institute of Transportation Engineers in November. The 2010 student team from PSU won the Jeopardy-style tournament and OIT placed third. In January 2011, 47 students from the four OTREC campuses traveled to Washington, D.C. to attend the TRB annual meeting. OSU's ITE student chapter hosted 70 students for the eighth annual Region X Student Conference in February. The conference theme was "How It All Connects" and Galen McGill, ITS Program Manager for the Oregon DOT, gave the keynote address. The conference also featured three workshops (high speed rail, accessible transportation, OSU's driving simulator) and eight student presentations.

Transportation student groups are a big part of student life on each OTREC campus. Activities include field trips, guest speakers, job fairs and social activities. Group profiles below include the name of the group leader for 2010-2011:



Students in Transportation Engineering and Planning (STEP) is the name of PSU's group. In 2010-11, STEP repeated as champions of the Oregon Traffic Bowl. Among several field trips, highlights included a bike tour of green infrastructure in Portland, a Gingerbread Transit Station Competition, Urban Olympics and an ascent of the Fremont Bridge with ODOT bridge engineers. 2010-11 Leader: Adam Moore (MSCE '11).



Transportation and Livability Student Group (LiveMove) is the UO's group. This year's highlights included a bike rack design competition, an ongoing speaker series (this year's theme was "Movers and Shakers: Connecting People and Places") and a field trip tour of the EmX bus rapid transit (BRT) service (with peers from OSU and OIT). 2010-11 Leader: Nick Garcia (MCRP '11).



OSU's ITE Student Chapter hosted the annual Region X Student Conference, hosted eight events with guest speakers, took field trips to Portland International Airport, a railroad yard in Albany, Ore., and the EmX BRT service in Springfield and Eugene. The group launched a new website as well as a Facebook page and participated in a number of on-campus outreach activities, such as Engineering Awareness Week. 2010-11 Leader: Ioana Cosma (MSCE '12).



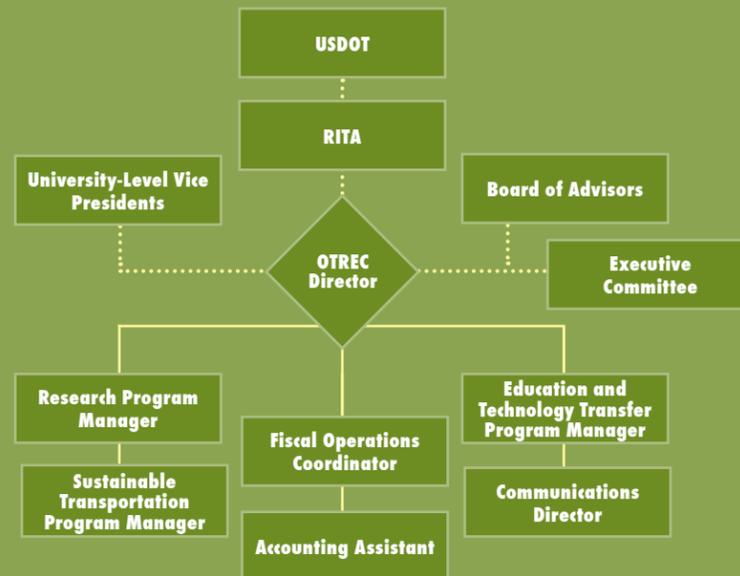
OIT's ITE Student Chapter utilizes OTREC's support to send students to events such as the annual Traffic Bowl (where the team placed third) and on field trips. In addition to the joint tour of the EmX BRT service, OIT students this year toured Oregon DOT's Highway 39 Partial Viaduct construction site. 2010-11 Leader: Zach Davis (BSCE '12).

Visit these student group Web pages at http://otrec.us/for_students/groups

OTREC Staff and Structure

Organizational Chart

OTREC is a National University Transportation Center under the U.S. Department of Transportation's Research and Innovative Technology Administration. Jennifer Dill directs OTREC. An Executive Committee is made up of one faculty member from each partner institution, an ODOT representative and a FHWA representative. The OTREC Board of Advisors consists of representatives from transportation-related organizations. Each university's vice president for research (or equivalent) and their staff also devote time and energy to OTREC's administration and oversight.



Executive Committee



Marc Schlossberg, Ph.D.
Associate Director,
University of Oregon



Chris Higgins, Ph.D., P.E.
Associate Director,
Oregon State University



Roger Lindgren, Ph.D., P. E.
Associate Director,
Oregon Institute of Technology



Jennifer Dill, Ph.D.
Director,
Portland State University



Satvinder Sandhu
Oregon Division, Federal
Highway Administration



Bernie Jones
Research Manager, Oregon
Department of Transportation

Key Personnel



Jennifer Dill, Ph.D.
Director



Hau Hagedorn
Research Program
Manager



Jon Makler, AICP
Education and Tech
Transfer Program
Manager



John MacArthur
Sustainable Transportation
Program Manager



Justin Carinci
Communications
Director



Carol Wallace
Fiscal Operations
Coordinator



Margaret Sanger
Accounting
Assistant



Ryan Gratzer
Program Administrator

Board of Advisors

Mike Baltes Director
Office of Technology, Federal Transit Administration

Jerri Bohard Interim Deputy Director of Operations
Oregon Department of Transportation

Phillip Ditzler Administrator
Oregon Division, Federal Highway Administration

Lavinia Gordon System Management Director
City of Portland Bureau of Transportation

Ruth Harshfield Executive Director
Oregon Alliance for Community Traffic Safety

Mike Hogle Research Director
Metro

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City of Eugene

Susie Lahsene Senior Manager
Transportation and Land Use Policy, Port of Portland

Jay Lyman Chief Operating Officer
David Evans & Associates

Randy McCourt Principal
DKS Associates

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TriMet

Lynn Peterson Chair
Clackamas County Board of Commissioners

G. Scott Rutherford Interim Director
Transportation Northwest (TransNow)

Tom Schwetz Director of Development Services
Lane Transit District

Bill Upton Chair
Oregon Modeling Steering Committee

Year 6 Outlook

New Projects

Assessing Transit Agencies' Climate Change Adaptation Needs

The objective of this study is to generate a baseline understanding of policy and program responses to climate change impacts at the public transportation agency level. Specifically, do transit agencies include climate change impacts or vulnerability in their decision and planning processes or collect relevant data?

Investigator: John MacArthur, Portland State University

Partner: TriMet

Bus Safety Performance Monitoring and Analysis

To assess the extent to which operator-perceived safety risks can be represented by archived data, the project will develop a spatial framework to monitor and analyze bus safety performance. The framework would be applicable to stop, segment, route and system levels, with safety issues identified and analyzed for each.

Investigator: James Strathman, Portland State University

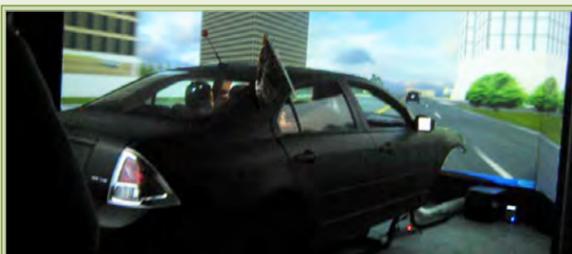
Partner: TriMet

Development of Pedestrian Planning Tools for Use in Travel Demand Modeling

There is a need for analytical modeling tools that can predict likely traveler responses at a smaller level of detail, including travel that has been obscured in travel demand modeling systems. This project aims to fill this gap by developing robust pedestrian planning tools to improve the mode choice capabilities of existing trip-based models with respect to pedestrian trips.

Investigator: Kelly Clifton, Portland State University

Partners: Metro, Toole Design Group



Activity-Based Learning Module for Human Factors in the Introductory Transportation Engineering Course

This project will develop a new framework for teaching the fundamentals of transportation engineering for sustainable and livable communities. This will include creating activity-based learning materials for traffic operations that elicit critical thinking about the broader impacts on society.

Investigator: David Hurwitz, Oregon State University

Partner: Oregon State University



Application of Smart Phone Truck Data for Freight Performance Measures and Transportation Planning

Oregon is one of the few states that charge a commercial vehicle miles traveled tax. Truck Road Use Electronics is a pilot project simplifying this tax collection using a smart phone application with a global positioning system device. This research examines the potential for data integration and development among existing databases.

Investigator: Miguel Figliozzi, Portland State University

Partner: Oregon Department of Transportation

Improved Pedestrian Safety at Signalized Intersections Operating the Flashing Yellow Arrow

In Oregon, the flashing yellow arrow has been used to indicate permissive left turns for approximately 10 years. With the addition of the arrows in the 2009 Manual of Uniform Traffic Control Devices, its use will continue to increase nationally. This research investigates factors that influence driver behavior in the context of the permissive-left-turn conflict with pedestrians and will propose recommendations for what situations will warrant additional pedestrian protection, such as exclusive phasing.

Investigators: David Hurwitz, Oregon State University; Christopher Monsere, Portland State University

Partner: Washington County

Integrated Multimodal Transportation, Air Quality, and Livability Corridor Study Phase II

The second phase of this research project will evaluate the corridor performance after implementation of the Sydney Coordinated Adaptive Traffic System (SCATS). The unique contribution of this research is to provide a detailed and integrated view of a multimodal urban transportation corridor in terms of traffic and air quality performance. This includes modeling short-term air quality trends (e.g. seasonal or daily variations), long-term air quality trends and health impacts in terms of traffic characteristics and composition (e.g. changes in automobile fleet composition, fuel efficiency, or electric vehicle market penetration).

Investigators: Miguel Figliozzi, Linda George and Christopher Monsere, Portland State University

Partner: City of Portland

Operational Guidance for Bicycle-Specific Traffic Signals

This research will develop engineering guidelines regarding the need for, and design of, bicycle-specific traffic signals; it will also develop operational guidelines for timing and phasing of bicycle-specific traffic signals. The research will also consider modifications to existing signals that would better accommodate bicycles.

Investigators: Christopher Monsere and Miguel Figliozzi, Portland State University

Partner: Oregon Department of Transportation

Pedestrian and Bicycle Master Planning: Training for Practitioners

This project will create a workshop and handbook to provide comprehensive training for planners and engineers to produce pedestrian and bicycle master plans. The handbook can be used as a reference for practitioners and as a text for faculty to integrate bicycle and pedestrian topics into graduate and undergraduate engineering and planning courses.

Investigator: Lynn Weigand, Portland State University

Partners: Alta Planning+Design, Initiative for Bicycle and Pedestrian Innovation

Relocation of Homeless People from Oregon Department of Transportation Rights of Way

State transportation department staff members deal with a persistent challenge, albeit one that isn't always visible: what to do with homeless people living in public rights of way and rest areas. In 2010, a broad-based group that works on homeless issues relocated 37 homeless households from a rest area near Wilsonville, Ore. The relocation provides an opportunity to consider how best to respond to issues of this nature. Research objectives are to a) determine how much homeless encampments pose an operational and safety concern for transportation staff; b) research best practices by DOT staff in other states, and c) prepare a case study of the 2010 relocation. The findings will be used to produce a best practices guide for use by DOT staff in Oregon and other states.

Investigators: Ellen Bassett and Andree Tremoulet, Portland State University

Partner: Oregon Department of Transportation



Promoting Active School Travel by Making it Cool: A Quasi-Experimental Study Using Boltage

This project investigates how social learning can increase the rates of children walking or biking to school and to inform and refine active travel programs. It will use a novel device called Boltage, which uses scanning technology to track a student's school trips by active modes. With its capacity to constantly collect travel data and raise the visibility of active school travel behavior through incentives, the Boltage program provides an ideal research setting and tool to examine peer effects.

Investigators: Yizhao Yang, Ihab Elzeyadi, Robert Parker, University of Oregon; Lynn Weigand, Portland State University

Partner: Active Living Research program of Robert Wood Johnson Foundation



Commute Friendly Gas-Electric Hybrid Vehicle

This study aims to develop a new hybrid drive system from mostly off-the-shelf components. The project will validate, verify and optimize the new Green Lite hybrid vehicle platform, funded by Green Lite Motors and Oregon BEST, to evaluate and improve the two-seat, three-wheeled vehicle.

Investigators: James Long and Hugh Currin, Oregon Institute of Technology

Partners: Green Lite Motors, Oregon BEST

Wider Dissemination of Household Travel Survey Data Using Geographical Perturbation Methods

This project aims to develop a methodology to permit dissemination of spatially explicit data to a wider range of public constituents while, at the same time, protecting the identities of study participants. Making use of these data, this project will use geographical perturbation methods to add noise to the original data to protect confidentiality while at the same time allowing the detailed geo-spatial referencing to be included in the disseminated data.

Investigators: Nebahat Noyan and Kelly Clifton, Portland State University

Partners: Oregon Department of Transportation, Institute of Metropolitan Studies

OTREC Award Winners

For the past three years, OTREC has recognized those who make a difference in the transportation field with awards presented at the Oregon Transportation Summit. We honor a partner agency that has made OTREC projects possible and a researcher who exemplifies our research and education goals. In addition, we award the Congressman Peter DeFazio Transportation Hall of Fame Award to an Oregonian whose leadership reflects Rep. DeFazio's values and advances OTREC's theme.



DeFazio Hall of Fame: Gail Achterman

As chair of the Oregon Transportation Commission, Achterman provided policy guidance to move the Oregon Transportation Department toward a sustainable future, expanding the focus beyond highways to include a complete multimodal transportation system. Achterman championed an aggressive program to advance Oregon's sophisticated integrated models for transportation, land use and the economy. The program boosted efforts to address greenhouse gas emission reductions, research into least-cost planning for transportation, and congestion-pricing pilot programs. With equal vigor, Achterman has served as a spokeswoman for the benefits of transportation system management and intelligent transportation systems. Thanks in part to Achterman's guidance on the commission, ODOT is a recognized national leader in development and application of integrated models at the state and metropolitan planning organization levels.

Partner of the Year: TriMet

TriMet, the Portland metropolitan area's transit agency, is nationally renowned for innovation in planning and operations. In addition, TriMet supports a culture of open-source analysis and entrepreneurship by sharing its transit data with the research and developer communities. The agency has relied on OTREC research to continually improve its service, partnering on topics such as safety, environment and operations. TriMet is also working with OTREC on a new program to monitor and analyze safety performance. In professional development, TriMet has volunteered hundreds of hours of staff time, in coordination with OTREC, for the development of urban light rail short courses. At right, General Manager Neil McFarlane accepts the award from OTREC Director Jennifer Dill.



Researcher of the Year: Christopher Monsere

Portland State University's Christopher Monsere has earned a reputation for outstanding research on highway, road and bicycle safety. Over the past five years, Chris has been the principal investigator on 13 and coinvestigator on nine OTREC projects. He has also worked on OTREC-funded projects with 15 other faculty members from three partner campuses and three other universities from across the country. His multidisciplinary collaborations span planning, computer science, economics, and environmental sciences and include partners such as the city of Portland, Oregon Department of Transportation, and the Institute of Transportation Engineers. Monsere's research is a shining example of successful multimodal, multidisciplinary transportation work.

Results and Impacts

Research leads to better use of sensors to predict travel time on highways

The Oregon Department of Transportation depends on system management strategies and advanced technologies to enhance the productivity of its existing infrastructure. Through



collaboration with students and faculty at PSU's Intelligent Transportation Systems Lab, ODOT is relying on OTREC research to predict travel times on area highways. Kristin Tufte, a Research Assistant

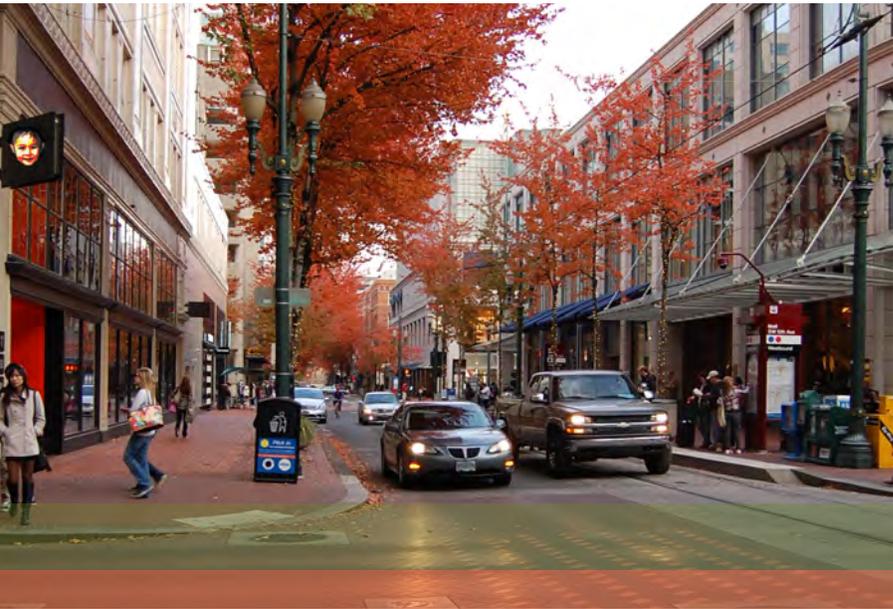
Professor at PSU, examined the data generated by ODOT's existing monitoring equipment. Tufte's team found that the primary barrier to accurately predicting travel times on Portland area highways is the limited number of monitoring devices currently deployed. Because ODOT only installed inductive loop detectors in the vicinity of on-ramps, huge data gaps occur where interchanges are further apart. A similar problem exists for dynamic message signs that display travel time predictions: there aren't enough, especially at the locations where drivers could choose an alternate route. The research is especially valuable because ODOT can't afford to deploy hardware to meet every need. Tufte's research has identified the more unreliable stretches of highway in the region and spots where accurate travel time predictions can have the most benefit for the movement of people and goods. The impact goes to ODOT's bottom line and the state has begun to make strategic investments, installing detectors where they will provide the most useful information first.

Driver absence study findings help transit agency save time and money

OTREC researchers have had a long, fruitful relationship with TriMet, the Portland metropolitan area's transit agency, as described on Page 22. That relationship has enabled OTREC research to be put directly into practice. One project looked at the reserve pool of transit-vehicle operators to determine how best to match the workforce with the work to be done. Regular operator absences of one to three days account for much of the work that reserve operators must fill, and those absences have been increasing over the years. Understanding these absences is key to managing the reserve pool. Researcher James Strathman found that operators who work split shifts are the most likely to be absent. In addition, absences are highest on Thursdays, Fridays and Saturdays and are also more likely before an operator's regular day off. Operators with a pattern of recent complaints are more likely to miss work, as are those who have had their fitness for duty questioned recently. Strathman concluded that

allowing operators to switch from full- to part-time status without losing seniority would help, as would economic incentives to promote attendance. TriMet has taken the findings to heart. "OTREC research has allowed us to improve scheduling of our operators' shifts, increasing safety and job satisfaction while saving money for the agency and our riders," said General Manager Neil McFarlane.





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