



## 2009 – 2010 Annual Report

## 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.

The Oregon Transportation Research and Education Consortium (OTREC) is a national University Transportation Center (UTC) 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, 2009 – September 30, 2010.

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# OTREC: An Overview

The Oregon Transportation Research and Education Consortium is a national University Transportation Center and a partnership between Portland State University, the University of Oregon, Oregon State University and the Oregon Institute of Technology. In recognition of the attributes that make the State of Oregon unique and wonderful, the Center's theme is advanced technology, integration of transportation and land use, and healthy communities.

OTREC's core mission is its research program. The program is heavily rooted in the principles of rigorous peer review, both in selecting projects and in the conduct of the research itself. OTREC received 157 peer reviews for the 44 proposals that were submitted for funding in Fiscal Year 2011, of which 24 were selected.

The research program also reflects the Consortium's commitment to partnership and collaboration. OTREC's principal investigators continue to demonstrate the vital role that universities can play in supporting the research needs of public agencies. In September 2010, OTREC recognized the Portland Bureau of Transportation as its Partner of the Year, noting that the city is a partner on five of OTREC's funded research projects in Fiscal Year 2011 alone.

For the first time, OTREC's funded projects include three strategic programmatic initiatives aimed at



building research and education capacity across our partner institutions. These initiatives—the Oregon Modeling Collaborative, the Sustainable Cities Initiative and the Transportation Electrification Initiative—help advance our focus on transportation livability and sustainability and emphasize collaboration between campuses and external partners.

Bridging academia and practice is the guiding force for OTREC’s education and technology transfer programs. OTREC built on the success of last year’s inaugural Oregon Transportation Summit, hosting the second annual summit in September 2010 in partnership with the local chapters of the Women’s Transportation Seminar, American Planning Association and Institute of Transportation Engineers.

As a complement to OTREC’s newsletters, website and communications via Twitter ([twitter.com/otrec](http://twitter.com/otrec)) and Facebook ([facebook.com/otrec](http://facebook.com/otrec)), this annual report serves to provide a sample of OTREC’s noteworthy accomplishments between October 1, 2009 and September 30, 2010. The document is organized in four sections: an Executive Summary, a review of activities in each of OTREC’s three theme areas, an in-depth look at OTREC’s educational opportunities and a final section that documents OTREC’s personnel, project portfolio, finances and other UTC information.



# 2009-2010 Year in Review

In its fourth year, OTREC further developed its work on its theme while extending its reach into three hot topics. A commitment to sustainable transportation allows OTREC to address the emerging topics of livability, green infrastructure and electric vehicles. This year also saw OTREC increasingly bringing its work to the public through classes, discussions and other events:

In December 2009, OTREC hosted a Context Sensitive Solutions National Dialog. The workshop featured an overview of the Federal Highway Administration initiative, plus case studies from the Northwest that exemplify the principles of shared vision, understanding of context, communication and collaboration, and flexibility and creativity.

2010 started on a high note: the Transportation Research Board annual meeting (photo 3, below). A dozen OTREC faculty presented their research at the conference and OTREC students also attended in large numbers. OTREC Student of the Year Nathan McNeil of Portland State University was honored at the Council of University Transportation Centers banquet.

In May, OTREC offered a professional development course on the design of light-rail transit facilities in partnership with transit agency TriMet and engineering firm David Evans and Associates. The course included tours of local light-rail facilities (photo 1) and lectures on topics including alignment design, bridges and structures, track design, roadway and traffic engineering, operations and maintenance, sustainability and long-term maintainability.

A June screening of the film “Beyond the Motor City,” a documentary in the acclaimed PBS “Blueprint America” series provided OTREC an opportunity to involve the broader community in discussions around the future of sustainable transportation. OTREC hosted the film, with 400 people in attendance, at the historic Bagdad Theater (photo 2) and organized a panel with the film’s director and local transportation luminaries following the film to discuss how Oregon is helping forge a new vision for transportation.

Also in June, OTREC held the first listening session in the West under the Sustainable Communities Partnership, the effort to get federal agencies working together on green transportation and housing projects. The U.S. Department of



Transportation, Department of Housing and Urban Development and the Environmental Protection Agency announced the unique partnership in 2009 to help guide coordinated policy on livability principles. More than 150 people attended the daylong dialogue, which was held at Willamette University in Salem and which featured spirited discussion and plenty of active listening (photo 4).

In September, faculty from all four OTREC campuses convened for a faculty retreat at the University of Oregon's campus in Portland. The faculty retreat, held in advance of the second annual Oregon Transportation Summit, brought researchers together for a variety of presentations and exercises on this year's theme, communication. Speakers stressed the need to communicate research results beyond academia to ensure continued relevance among transportation professionals and the general public. U.S. Rep. David Wu (photo 5) spoke of his commitment to research and commended the faculty present for their contribution to the field of transportation.

Finally, OTREC took a giant step in the fall with the launch of its new website, <http://otrec.us>. The site, state of the art among University Transportation Centers, allows for easy navigation to OTREC researchers, projects, final reports, news and events. It also allows OTREC to communicate research results directly with transportation practitioners and policymakers and to add to the community discussion on issues surrounding transportation and land use.

### Other highlights featured in the report:

Second Oregon Transportation Summit draws even more people than last year's inaugural summit (pages 8-9)

Student group hosts regional conference (page 27)

Acclaimed Sustainable City Year takes on Oregon's capital (page 30)

Visiting Scholars Program brings distinguished guests to Oregon (page 31)



# Oregon Transportation Summit



In just its second year, the Oregon Transportation Summit has become one of the region's premiere transportation events. The second annual Summit followed in the footsteps of 2009 inaugural summit, bringing academics and transportation professionals from a wide range of disciplines together to share their work. The 2010 summit drew 300 people, up from the 250 who attended the first.

New Yorker writer Peter Hessler gave the keynote address, reading and recounting stories from his book "Country Driving." Sometimes somber, often hilarious, Hessler's presentation enchanted the luncheon crowd at Portland State University's Smith Memorial Student Union Sept. 10. The luncheon also featured the presentation of the 2010 OTREC awards. The city of Portland Bureau of Transportation was honored as Partner of the Year. Nico Larco of the University of Oregon was named OTREC Researcher of the Year. Stefano Viggiano of Lane Transit District received the Peter DeFazio Hall of Fame Award.

In the plenary session, Joshua Schank of the Bipartisan Policy Center gave a frank assessment of performance management in transportation and the chance for change in a deeply divided Congress. Terry Moore of ECONorthwest gave a detailed and entertaining local response.

Popular breakout session topics included a lively discussion over Oregon's unique Transportation Planning Rule and sessions on performance-based decision-making and transportation governance.



Qualitative and quantitative data both point to the success of the summit. Perhaps most encouraging was input by attendees that they would attend future summits. In a survey, a full 83 percent of respondents agree or strongly agree that they'll return for the 2011 summit. That's compared to the 43 percent of 2010 participants who attended in 2009.

Participants rated the breakout workshop sessions as the most valuable aspect of the summit, followed by the morning plenary session, the networking opportunities and the luncheon program. Hessler's keynote address also received high marks.

Photos, from left to right: Author Peter Hessler touches on highlights from his book, "Country Driving," during the keynote address; OTREC director Jennifer Dill poses with award winners Lavinia Gordon (Portland Bureau of Transportation), Nico Larco (University of Oregon) and Stefano Viggiano (Lane Transit District); participants register before the first sessions; and the plenary session crowd packs the Smith Memorial Student Union ballroom.



## Message from OTREC Director Jennifer Dill

Preparing OTREC's fourth annual report has provided us some needed time to reflect on our accomplishments between Oct. 1, 2009 and Sept. 30, 2010. While it has been a year of continued growth and great things, we're entering a time of increased uncertainty. OTREC was authorized under SAFETEA-LU, which was passed in 2005 and expired in September 2009. We're still operating under the original bill's funding, so there is no immediate threat to our programs. But progress on reauthorization is slow. The Highway Trust Fund, which funds the federal program, is bankrupt, requiring transfers from the general fund. And prospects for raising revenues, particularly the federal gas tax, are not great. This raises questions about every aspect of federal transportation spending, including research and the University Transportation Center (UTC) program. What does it mean for OTREC?

- **We must continue to produce research that matters.** This report highlights how our work is creating a safe and sustainable transportation system. Every OTREC project requires an equal share of non-federal funding. Many of our projects are matched by the very agencies that will implement the findings, assuring the usefulness of our work.
- **We need to ensure that the people who can use our work know about it.** Too often, research results appear only in technical reports and academic journals. While those avenues are important, they may not always reach the engineers, planners and decision makers who can use the findings. To address this, OTREC shares our research using a growing variety of tools, including project briefs, social media, a new website, and events for professionals. We're also helping our faculty communicate more effectively with our many audiences.
- **Collaboration is key.** Since day one, OTREC has emphasized the value of collaboration between disciplines, campuses and external partners. As a member of the Region X Transportation Consortium, we also work closely with our neighboring UTCs. We'll work to strengthen these relationships and build new ones so the larger research and practice community informs our work.
- **We must keep looking forward.** A UTC is greatest when it is more than the sum of its projects. For that reason, we funded three initiatives to increase the capacity for research and education at our campuses. Follow the progress of these initiatives at <http://otrec.us/research/initiatives>.
- **OTREC's impact is a function of our educational mission.** The transportation problems we face as a nation are serious. Our education programs, including our degrees and professional development courses, are essential for solving them. As a faculty member, my greatest joy comes from seeing former students become leaders in the transportation profession. As long as they continue to do so, I remain optimistic about our future despite the uncertainty of today.

I hope you enjoy this year's report. I encourage you to find more about us on the Web, Twitter, Facebook, at conferences, in the classroom and in print. And please let us know how we're doing!

A handwritten signature in black ink that reads "Jennifer Dill". The signature is fluid and cursive.

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

A progress-to-date overview of the Oregon Transportation Research and Education Consortium accomplishments through September 30, 2010.

	<b>2010-2011</b>	<b>2009-2010</b>	<b>Cumulative</b>
Proposals received	44	47	281
Research projects funded	20	15	100
Multi-campus projects	5	10	32
Multi-PI projects	15	15	78
Research projects partnered with ODOT	9	8	47
Dollars awarded to research projects	\$2,069,837	\$1,613,285	\$7,783,569
Faculty partners (running total)	89	82	89
External sponsors participating (running total)	42	34	42
Peer reviewers invited	226	319	1,270
Peer reviews received	143	157	863
Labs and research groups (running total)	13	13	13
Education projects funded	3	4	19
Dollars awarded to education projects	\$102,606	\$132,319	\$570,510
Graduate students involved in projects	59*	70	211
Undergraduate students involved in projects	33*	18	89
Technology transfer projects funded	1	4	14
Dollars awarded to technology transfer projects	\$65,642	\$353,191	\$786,735

\*Estimates based on principal investigator proposals



THEME:

# INTEGRATION OF TRANSPORTATION



## AND LAND USE

The integration of transportation and land use has helped Oregon earn a national reputation within planning circles and beyond. With state laws emphasizing the importance of transportation and land use in addressing greenhouse gas emissions, OTREC researchers play a critical role in examining this issue so that Oregon can continue to innovate, especially in the area of modeling and forecasting tools.

Photo: David Evans and Associates

# THEME: INTEGRATION OF TRANSPORTATION AND

## Developing Trip-Generation Rates That Better Serve Urban Planning Goals

Kelly Clifton, Portland State University

Planners, architects and developers are increasingly embracing a compact urban form, marked by mixed-use developments, access to transit and few vehicle trips. However, local governments often lag behind, tied to trip-generation rates better suited for low-density suburbs. Because it's difficult to gather new data and there are no set formulas to adjust rates to different situations, governments tend to stick with the current Institute of Transportation Engineers rates. In addition, city and regional goals encouraging mixed-use, transit-oriented centers can conflict with state rules that any zoning changes may not lower the performance of state-owned facilities. Portland State University's Kelly Clifton is developing an alternative: trip-generation rates that better reflect an urban mix of land use, transportation and travel demand. Her research will account for how the built environment influences travel behavior and will determine trip-generation rates that reflect the entire spectrum of activity in different places. The research could lead to better-planned transportation and land-use systems, more dense mixed-use areas with more transportation choices, and fewer barriers to urban planners.



Richard Walker, Manager of Modeling and Forecasting, Metro

“As the agency responsible for regional modeling, Metro has taken advantage of the OTREC program to help fund transportation model improvements that capture the influence of urban form on travel decisions. The Dynamic Tour Based Model and Regional Bike Model are two prime examples of this work. This research is instrumental in helping Metro address regional mobility and environmental issues.”

## Creating New Visions for Suburbia

Nico Larco, University of Oregon

Suburbia conjures up images of single-family homes, nuclear families, strip malls and office parks. But suburban multifamily housing is already common and becoming more so. Although this density holds promise for active transportation and mixed-use development, the promise is rarely realized. Nico Larco of the University of Oregon focused on the roots of suburban multifamily site design to analyze the barriers to creating integrated and connected communities. Studying five case study sites in four different states, he found that suburban multifamily residents walk and cycle more frequently than do single-family residents. Most residents surveyed said that they would walk and cycle more if local amenities were easier to get to. The level of connectivity of the developments plays a critical role in the type of transportation residents choose. The research suggests that more-connected developments may further promote walking and biking. Increasing connectivity is linked with greater physical activity, decreased obesity and increased non-motorized travel, all aspects that contribute to a positive quality of life.



## Understanding Delivery Routes in Urban Areas

Miguel Figliozi, Portland State University

Commercial vehicles account for around 10 percent of total vehicle miles traveled (VMT) in medium to large urban areas and they rack up most of these miles on multi-stop tours. However, the literature did not adequately address the average distance of vehicle routing problem solutions for actual customers and different levels of routing constraints. Miguel Figliozi of Portland State University examined how to approximate the length of these trips and to estimate how the window of time and size of delivery affect the miles traveled. His project proposed and successfully tested formulas that can be used to estimate the impact of the number of time-window constraints and the demand level on the number of additional routes needed. The formulas can be used for a wide range of planning scenarios and new technologies. For example, researchers are already applying these results to study the feasibility of electric commercial vehicles and their energy and emissions benefits.



THEME: **ADVANCED TECHNOLOGY**



Advanced technologies and the strategies that they support, such as aiding incident response and providing travelers with real-time information, help transportation agencies do more with less. By examining how technologies can enhance safety and improve the performance of infrastructure, OTREC's work supports progress on national priorities such as transportation choices, economic competitiveness and energy independence.



## THEME: ADVANCED TECHNOLOGY

### Selecting Freight Performance Measures to Help Agencies Make Better Investments

B. Starr McMullen, Oregon State University

Agencies faced with the task of selecting and prioritizing freight projects in capital improvement programs and plans face a series of difficult decisions, often with little guidance. Those agencies would benefit from freight performance measures. These measures judge the performance of all modes used to transport freight, including air, rail, trucking and waterways. In this study, B. Starr McMullen of Oregon State University focused on measures that let agencies assess the performance of the entire freight system so they can make informed decisions on how to allocate resources. Her research found that freight planning goals mostly fall into five categories: safety; maintenance and preservation; mobility, congestion and reliability; accessibility and connectivity; and environment. She selected a total of 48 ideal freight performance measures. Of those, data are available for 36 measures, either with or without some manipulation and analysis needed. Of the remaining measures, data on four could be generated from a simulation or model and data on the remaining eight need to be collected. To build on this research, the next step is to test these measures to determine which ones can be implemented in a cost-effective manner.

Photos (l-r): Port of Portland



### Oregon Freight Data Mart: Putting the Data to Use

Miguel Figliozzi, Portland State University

While large amounts of data are crucial to transportation planning decisions, collecting the data is only one step in the process of making it useful to policymakers. A vital next step is integrating diverse data sources into a user-friendly visual medium. Because data collection methods are highly variable in terms of time frame, format and quality, it can be difficult to incorporate the data to produce useful information. However, while technology has improved data collection, it also holds the promise for managing, manipulating and visualizing those data through geographic information systems and tools such as Google Maps and Google Earth. In this project, Miguel Figliozzi of Portland State University and his research team demonstrated the merits of using Internet-based spatial data tools for data integration and visualization. For this purpose, the research team developed a prototype and the related system architecture. The team confronted the balance between the quality of a map and its computational requirements. Although rich, detailed maps are readily available, they require powerful systems on the user's end and potentially long loading times. The project's result, the Oregon Freight Data Mart, uses an innovative design to combine a searchable database with the visualization capabilities of a publicly available online mapping browser, Google Maps. It also provides links to relevant contextual information.

## Lowering the Earthquake Risk to Highway Bridges

Scott Ashford, Oregon State University

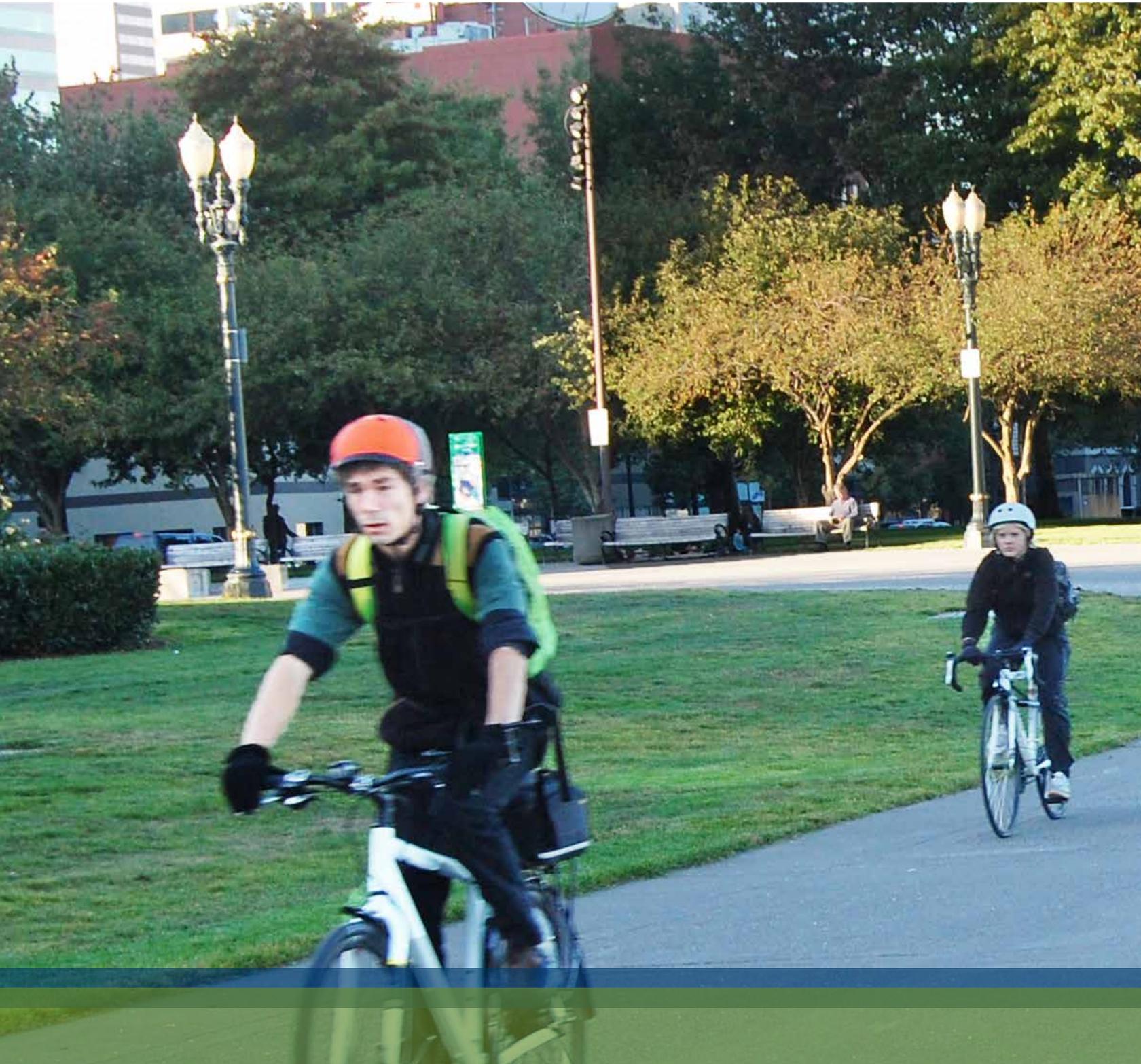
With many of Pacific Northwest's roads and bridges built on an active fault called the Cascadia Subduction Zone, a major earthquake could cause serious damage to the region's transportation system. Aware of this danger, the Oregon Department of Transportation started considering in 2004 the effects of soil liquefaction that could result from an earthquake in its bridge design. However, more than 90 percent of the department's bridges were designed before 2004. To address both the vulnerability of existing bridges and the design of new bridges, Scott Ashford and Michael Scott of Oregon State University are researching the tools needed to assess pile foundations that would be affected by liquefaction. The team, which also includes researchers at the University of California Davis and San Diego campuses, intends to produce an easy-to-use graphical user interface that would provide designers several strategies to counter earthquake-caused liquefaction, along with simple charts and design examples. The research will provide recommendations on the best ways to counter effects of earthquakes by offering alternatives best suited for each specific site. In addition, the researchers will work to revise the graphical user interface throughout the trial period and then provide training for users of the new tool.



**Steve Callas,**  
TriMet Service Performance Manager

“OTREC is a great assistance to us in our research at TriMet. OTREC research has provided great insight into the way our operation works and we have been able to provide better service as a result. It gives us a new perspective. I look at the researchers I work with at OTREC as fellow colleagues and people I can call for great advice.”

THEME: HEALTHY COMMUNITIES





Active modes of transportation such as walking and bicycling are vital elements of healthy, livable communities, which are places that achieve economic prosperity, environmental quality and social equity. To help create these kinds of places—which also feature safe and sustainable infrastructure as well as limited pollution—OTREC projects examine the connections between community design, active transportation and the potential health implications.

## THEME: HEALTHY COMMUNITIES

### Using Transit System Data to Analyze Collisions and other Incidents

James Strathman, Portland State University

Many factors can influence bus crashes and other incidents. James Strathman of Portland State University examined 4,631 collision and non-collision incidents between 2006 and 2009 in the Portland-area TriMet system to determine how operator demographics, employment status, assignment characteristics, service delivery, performance indicators, temporal factors and customer information influence the frequency of incidents. Of the incidents, 57 percent involved collisions, half of those with another vehicle. Non-collision incidents included passenger slips, trips and falls. Among Strathman's findings: the frequency of incidents decreases for a driver's first 33 years of service and then starts increasing. Drivers' frequency of incidents decreases until they reach 33.3 years of age and then similarly increases. The average driver has 10.2 years of experience and is 49.4 years old. Strathman recommends refresher training courses for drivers and steps designed to reduce absenteeism, which causes the agency to rely more heavily on substitute drivers. He cautions that steps taken to save operating costs, such as scheduling split shifts and other variable work assignments, have a tradeoff in the form of higher safety costs. He also asserts that drivers' adherence to tight schedules can be a safety concern, as drivers who start to fall behind schedule may take more risks to make up for lost time.



Roger Geller,  
City of Portland Bicycle Coordinator

“A city goal is to make bicycling more attractive than driving for trips under 3 miles, and a big part of that depends on the user experience. We introduced bike boxes, which visibly indicate that cyclists are expected and welcome there. A big part of introducing new tools is evaluating their effectiveness and being able to proceed with them. OTREC research indicated that bike boxes are effective tools, and good research is leading to their widespread use; close to 20 cities in the country are using bike boxes modeled after what Portland has done. The more people riding means more physical health and better economic health, because people spend less money supporting their automobiles. And OTREC is contributing good quantitative analysis on the economic benefits of bicycling.”

## Making the Choices That Change Lives

Yizhao Yang, University of Oregon

Four decades ago, few parents drove their children to school. Today, most children get to school by private vehicle. Although walking or biking requires living close to school, little research has focused on housing location in this context. Yizhao Yang of the University of Oregon looked at how much parents consider school travel options when deciding where to live. Her project team conducted surveys, focus groups and interviews to explore this issue. Overall, only 15.4 percent of parents surveyed reported that their child walks or bikes to school, even though about 70 percent said that they preferred their child walk or bike to school. When parents considered active school commuting early on in their housing search, Yang found, children were much more likely to walk or bicycle to school. Her research reveals the limitations of environment-based strategies for changing school travel behavior. Many programs focus resources on improving physical infrastructure for walking. However, the influence of walkability on travel patterns is limited when compared to that of home-school distance and active-school-commuting preference. That points to a need to devote more resources to changing parents' attitudes and preferences.



## How Effective are Bike Boxes at Intersections?

Jennifer Dill and Christopher Monsere, Portland State University

In 2008, Portland became the first city in the United States to take on a large-scale installation of so-called “bike boxes,” advanced stop boxes designed to place bicyclists ahead of motor vehicles at intersections. Jennifer Dill and Christopher Monsere of Portland State University evaluated the bike boxes and found that motorists and cyclists alike appear to understand and comply with the boxes. Nearly three quarters of motorists stopped behind the bike box and roughly the same percentage of cyclists stopped at the proper location ahead of the motor vehicle stop line. In addition, the number of conflicts at the intersections decreased and drivers yielded more to bicycles after the boxes were installed. User perceptions of safety also improved. Researchers sorted through 918 hours of video data taken before and after the boxes were installed for their analysis. They also surveyed 468 cyclists near the bike boxes and 721 motorists who were recruited by e-mail.



# Education



The educational mission of every University Transportation Center is to support a multi-disciplinary program of course work and experiential learning that reinforces that center's transportation theme. Across its four campuses, OTREC seeks to do this by increasing the number of courses and degrees available to both graduate and undergraduate students. OTREC is also committed to creating opportunities for students to participate in research projects and attend conferences and networking events.



# Student of the Year

## 2009 Outstanding Student of the Year: Nathan McNeil, Portland State University



Nathan McNeil was chosen as OTREC's 2009 Student of the Year in his second year of the Master of Urban and Regional Planning program at Portland State. He holds a Bachelor of Art in history from Columbia University. He worked with Professors Jennifer Dill and Christopher Monsere to evaluate Portland's "bike boxes." He was the recipient of the 2008-2009 Rex Burkholder and Lydia Rich Scholarship, awarded through the Initiative for Bicycle and Pedestrian Innovation at PSU. In 2009, he received an award at the Region X Student Conference for best poster. Nathan conducted an assessment of neighborhoods in Portland and Copenhagen to identify policies for improving active transportation outside of central city areas, and to examine how bicycling can be incorporated into the application of walkable "20-minute" neighborhoods. Nathan's completed projects include formulating a strategy for Portland's MPO, Metro, to incorporate climate change concerns into planning activities, and surveying Portland stakeholders on how Portland State University can serve the region in the area of sustainability. When he lived in New York, Nathan worked for a community economic development nonprofit, worked in social policy research and served as a performance auditor for the New York Metropolitan Transportation Authority Office of the Inspector General.

## 2010 Outstanding Student of the Year: Alex Bigazzi, Portland State University



Eisenhower Fellow Alex Bigazzi is OTREC's 2010 Student of the Year. Bigazzi is currently in his second year of the Master of Science program in civil engineering at Portland State. He holds bachelor's degrees in civil engineering, from Portland State, and music, from the University of Miami. He has had four journal articles accepted for publication, two as lead author. He has made 12 presentations at transportation conferences, including presentations in Sweden and Portugal. Bigazzi had an internship at Delft University of Technology in The Netherlands which resulted in a journal article and three conference papers with international coauthors from academia and the private sector. In 2009, he received a Dwight D. Eisenhower Graduate Fellowship and a National Science Foundation research fellowship. His primary interests are motor-vehicle emissions and human exposure to traffic-related air pollution and he is currently involved in several research projects on these topics. Alex has shown leadership in organizing student activities, including a biweekly discussion meeting among transportation students at Portland State he organized in 2009. He has been active with the Portland State chapter of Engineers Without Borders and took a service trip to Nicaragua.

# 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.

University of Oregon student group LiveMove hosted the seventh annual Region X Student Conference in November 2009. The conference theme was “Moving People,” and Jim Whitty, manager of ODOT’s Office of Innovative Partnerships and Alternative Funding, gave the keynote address. That same month, OTREC students geared up for Oregon ITE’s 18th annual William C. Kloos Traffic Bowl. The preparation paid off big as PSU took first place and OSU came in third. The Jeopardy-style tournament tests students on their knowledge of transportation engineering and history with a sprinkling of arcane facts for good measure. Student teams from OIT, the University of Washington and the University of Portland competed as well. Students from PSU and OSU also attended the biennial Northwest Transportation Conference, held February 2010 in Corvallis.



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 2009-10, STEP won the Oregon Section and Western District ITE Traffic Bowls and 21 students traveled to Washington, D.C. in January for TRB. The group took field trips to the Port of Portland, the Morrison Bridge, and a TriMet maintenance facility. 2010-11 Leader: Adam Moore.



Transportation and Livability Student Group (LiveMove) is the UO’s group. This year’s highlights included hosting the 7th Annual Region X Student Conference, sponsoring a monthly Transportation Speaker Series, cosponsoring the Bike Music Fest (attended by 14,000) and sending eight members to facilitate a transportation planning summit in the Columbia River Gorge. 2010-11 Leader: Nick Garcia.



OSU’s ITE Student Chapter members took field trips to Portland to see the ODOT Region 1 Traffic Management Operations Center and TriMet’s Ruby Junction maintenance facility. Three students, Raul Avelar, Jon Mueller and Neil Copper were selected to present their research at the Oregon Transportation Safety Conference in October in Hood River and Neil was given the Best Student Presentation award. 2010-11 Leader: Ioana Cosma.



OIT’s ITE Student Chapter sponsored four students to attend the Region X Student Conference at UO in November and six students to attend the Oregon Asphalt Pavement Conference in Eugene in February. The group traveled to Medford for a tour of Knife River Resource’s warm mix and hot mix asphalt pavement production facilities. The chapter also hosted a lecture by Greg Halsted of the Portland Cement Association.

Visit these student group Web pages at [http://otrec.us/for\\_students/groups](http://otrec.us/for_students/groups)

# 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



# Alumni Highlights



**KATE LYMAN, PSU '07** Kate Lyman graduated with a Master of Urban and Regional Planning in 2007 and currently works as a transportation planner in the Portland office of CH2M HILL, an engineering, construction and operations firm. Before taking the job in 2010, Lyman worked for three years with URS Corporation, where she did National Environmental Policy Act reviews and alternatives analysis and high-level visioning for transit. She works on transit projects for CH2M HILL, including alternatives analyses for the Spokane (Wash.) Transit Authority and Sound Transit in Tacoma, Wash. and the environmental assessment for the St. Louis trolley. Her interest and focus is transit planning, both long-term planning and project development. While earning her master's, Lyman interned with Metro and then Parsons Brinckerhoff. She started working at URS just a week after graduation.



**PRICE ARMSTRONG, UO '10** Price Armstrong graduated with a Master of Public Administration degree and currently works as a planning and development intern at Lane Transit District. Armstrong is working on a long-range plan to provide transit elements for the transportation plans being updated by the cities of Eugene and Springfield. He's also working on the transportation options chapter of the regional transportation plan and on public involvement for the West Eugene extension of the Emerald Express bus rapid transit system. While studying at UO, Armstrong interned twice in the Oregon legislature, once each in the Senate and House of Representatives. He's interested in pursuing the policy side of transportation, politics in particular.



**JOSHAN ROHANI, OSU '07** Joshan Rohani graduated with a Bachelor of Science in civil engineering in 2006 and a Master of Science in civil and transportation engineering in 2007. He now works as a transportation analyst and engineering task leader for engineering firm David Evans and Associates in Portland. At Oregon State, Rohani researched advisory-speed posting techniques, looking into how consistently the advisory speeds are posted across the state and what a statewide standard should be. He also worked on research projects for associate professor Karen Dixon. Rohani joined DEA after graduation and started working on traffic engineering and transportation planning projects. He did the traffic engineering and long-range planning for the AmberGlen Community Plan in Hillsboro and has worked on the Willamette River Crossing alternatives analysis in Corvallis and the recently completed Albany Multimodal Transportation Center. He's working on an atlas of bottleneck areas and improvement strategies along the Interstate 5 and Interstate 205 corridors.



**JAMIE GIBBS, OIT '09** Jamie Gibbs graduated with a Bachelor of Science in civil engineering in March 2009 and currently works as a graduate engineer for the Oregon Department of Transportation. In her first rotation, Gibbs worked as a signal timer, studying the controllers that run most of the department's signals and determined timing plans for best traffic flow. In her second rotation, she inspected construction projects, including large freeway projects. She currently investigates sites in Oregon with the most dangerous crashes and determines ways to make the intersection or stretch of highway safer. After a rotation in traffic analysis, Gibbs has a guaranteed job in signal timing, putting her in charge of timing signals from Astoria to Salem. Before starting with ODOT, Gibbs worked as a project manager/drafter intern at ATI Wah Chang for five years and as a drafter for Tyco Simplex Grinnell for three months.

# Sustainable City Year



A program of the Sustainable Cities Initiative at the University of Oregon, one of three OTREC-funded initiatives, Sustainable City Year chooses one Oregon city per year to make its classroom. The program directs coursework from across the university to help speed that city's transition to more sustainable practices.

Sustainable City Year represents a new model of putting the resources of universities directly into serving communities while, at the same time, eliminating the gap between student learning and application of knowledge. This innovative approach to real-world problem solving has earned the Sustainable Cities Initiative national and international awards and coverage in major media outlets. The New York Times described the initiative as “perhaps the most comprehensive effort by a U.S. university to infuse sustainability into its curricula and community outreach.”

In 2009-2010, the program joined with the city of Gresham, working on nine city projects, including:

- Redevelopment and design plan for the Rockwood neighborhood,
- Programming and potential designs for a new city hall,
- Mixed-use transit-oriented development adjacent to a light-rail station,
- Sustainable development recommendations for the Springwater area and
- City-wide projects related to commercial design standards, housing prices and walkability, and climate-preparedness.

Oregon's capital, Salem, was chosen for the second Sustainable City Year. For 2010-2011, the program will coordinate 32 courses and 27 faculty members across 10 disciplines, directing more than 600 students and providing more than 100,000 combined hours of effort on sustainability projects in Salem. Over the course of the year, the program will tackle 14 projects, including an integrated plan for safe bicycle and pedestrian access to downtown parks and paths. Other projects include:

- Redevelopment plans for areas north and south of downtown,
- Restoration efforts on a city island,
- A city-wide civic-engagement strategic plan, and
- Design ideas for city departments and a new police station.

# Visiting Scholar Program

OTREC's Visiting Scholar Program continued to bring exciting academics and practitioners from around the country (and beyond) to speak at Portland State University's weekly transportation seminars, which are available as live and archived webcasts. Speakers during this year included:

- Gill Hicks, Cambridge Systematics: "The Alameda Corridor: Lessons Learned"
- Michael Anderson, New York State Department of Transportation: "Tappan Zee Bridge—I-287 Corridor Project: A Bridge to the Next Century"
- David Kurth, Cambridge Systematics: "Modeling High Speed Rail Ridership and Revenue in California: An Overview"
- Shawn Turner, program manager, Texas Transportation Institute: "Comparing Active Transportation Approaches in China and Europe"
- Rick Willson, California State Polytechnic University, Pomona: "Transit-Oriented Development 2.0"
- Joan Walker, University of California, Berkeley: "The Power and Value of 'Green' in Promoting Sustainable Travel Behaviors"
- David Strayer, University of Utah: "The Multi-Tasking Driver: Are We Being Driven to Distraction?"
- Eric Dumbaugh, Texas A&M University: "Urban Form and Traffic Safety: Examining the Design and Developmental Factors that Influence Crash Incidence"

Please visit [http://otrec.us/professional\\_development/visiting\\_scholars](http://otrec.us/professional_development/visiting_scholars) for more information, including archived webcasts.



## OTREC-Monash Exchange Examines Sustainable Transportation

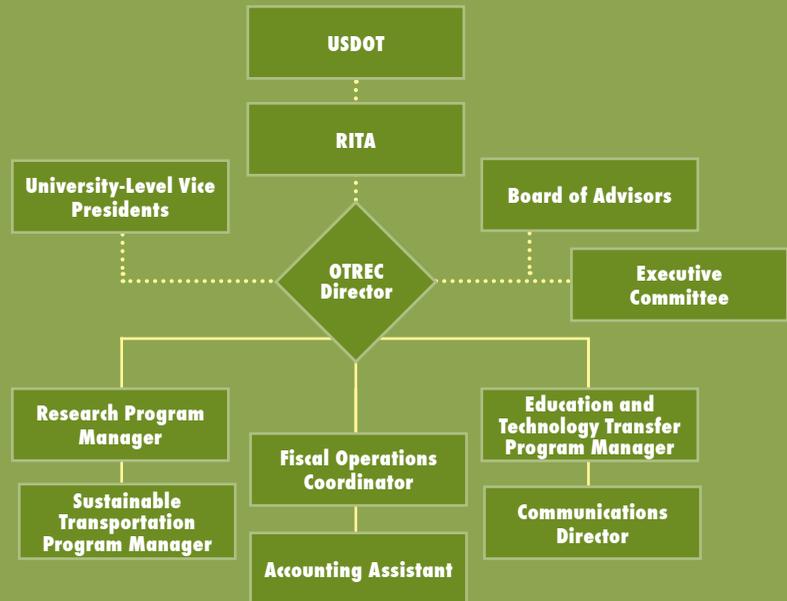
Geoff Rose, Director of the Institute for Transportation Studies at Monash University in Melbourne, Australia, spent two months in the Spring of 2010 at Portland State University. Then, in August, Monash University hosted OTREC Director Jennifer Dill to give the Ogden Transport Lecture. In addition to interacting with local academics and practitioners, Dill and Rose used their visits to lay the foundation for future collaborations between individual faculty members and the centers themselves.



# 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.



## Key Personnel Our principal staff:



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

## 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



Barnie Jones  
Research Manager, Oregon  
Department of Transportation

## Board of Advisors

Mike Baltus 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 Director  
System Management, City of Portland Bureau of  
Transportation

Ruth Harshfield Executive Director  
Oregon Alliance for Community Traffic Safety

Mike Hoglund Research Director  
Metro

Rob Inerfeld Transportation Planning Manager  
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

Neil McFarlane General Manager  
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

# Investigators and Partners

## Year 5 Investigators:

Scott Ashford, Civil and Construction Engineering, OSU  
Kelly Clifton, Civil and Environmental Engineering, PSU  
Karen Dixon, Civil and Construction Engineering, OSU  
Jennifer Dill, Urban Studies and Planning, PSU  
Peter Dusicka, Civil and Environmental Engineering, PSU  
Miguel Figliozzi, Civil and Environmental Engineering, PSU  
James Gattis, College of Engineering, University of Arkansas  
Linda George, Environmental Science and Management, PSU  
Ashely Haire, Civil and Environmental Engineering, PSU  
Christopher Higgins, Civil, Construction and Environmental Engineering, OSU  
Kate Hunter-Zaworski, Civil and Construction Engineering, OSU  
Jason Ideker, Civil and Construction Engineering, OSU  
Ken Kato, Geography, UO  
David Kim, Industrial and Manufacturing Engineering, OSU  
Nico Larco, Architecture, UO  
Roger Lindgren, Civil Engineering, OIT  
James Long, Computer Systems Engineering Technology, OIT  
John MacArthur, PSU  
Mario Magaña, Electrical Engineering and Computer Science, OSU

B. Starr McMullen, Agricultural and Economic Resources, OSU  
James Meacham, Geography, UO  
Christopher Monsere, Civil and Environmental Engineering, PSU  
Michael Olsen, Civil and Construction Engineering, OSU  
Robert Parker, Community Service Center, UO  
J. David Porter, Industrial and Manufacturing Engineering, OSU  
Marc Schlossberg, Planning, Public Policy and Management, UO  
Michael Scott, Civil, Construction and Environmental Engineering, OSU  
Jennifer Tanner, Civil and Architectural Engineering, University of Wyoming  
Kristin Tufte, Computer Science and Civil and Environmental Engineering, PSU  
Lynn Weigand, Initiative for Bicycle and Pedestrian Innovation, PSU  
Asha Weinstein Agrawal, Urban and Regional Planning, San Jose State University

## Year 5 Partners

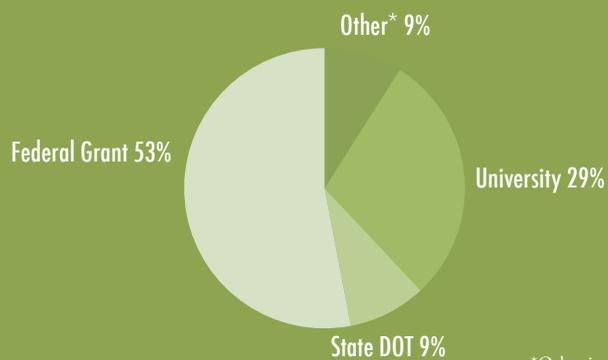
City of Hillsboro  
City of Lake Oswego  
City of Milwaukie  
City of Portland  
City of Springfield  
City of Tigard  
King County Metro  
Lane Transit District  
Metro

National Cooperative Highway Research Program  
Oregon Department of Transportation  
Oregon Institute of Technology  
Oregon State University  
TriMet  
Portland State University  
University of Oregon  
University of Wyoming

# Finance

## Funding Sources (Inception to September 30, 2010)

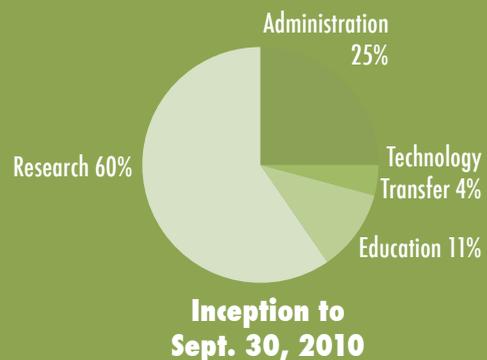
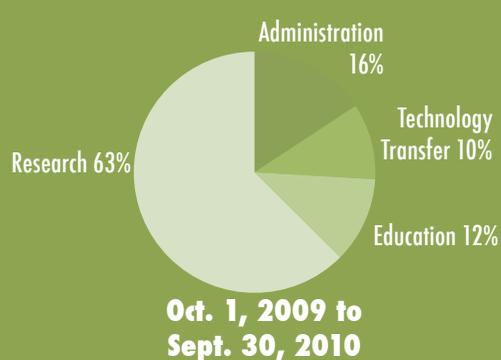
OTREC's funding sources include the federal UTC grant as well as matching funds from many sources, including the four universities in the consortium, the Oregon Department of Transportation and numerous public and private matching partners.



\*Other includes cities, counties, MPOs, transit agencies as well as private and non-profit organizations.

## Expenditures

Since its strategic plan was approved on December 1, 2006, OTREC has funded 100 research projects, 19 education projects and 14 technology transfer projects. Expenditures reflect our priorities in these three key areas.



# New and Ongoing Projects

## New Projects (Year 5)

### Research

- 398: Real-Time Change and Damage Detection of Landslides and Earth Movements Threatening Public Infrastructure. Michael J Olsen, OSU
- 405: Wireless Data Collection System for Travel Time Estimation and Traffic Performance Evaluation. David S Kim, J. David Porter and Mario E. Magaña, OSU
- 407: Contextual Influences on Trip Generation. Kelly J. Clifton, PSU
- 411: Economic Benefits of Cycling. Kelly J. Clifton, PSU
- 412: Oregon Modeling Collaborative. Kelly J. Clifton, PSU
- 417: The Relationship Between VMT and Economic Activity. B. Starr McMullen, OSU
- 419: Transportation Electrification Initiative. John MacArthur, PSU, Robert Parker, UO, James Long, OIT
- 420: Tools for Gusset Plate Evaluation, Phase 2: Strengthening. Christopher Higgins, OSU, Peter Dusicka, PSU
- 423: Evaluation of Bike Boxes at Signalized Intersections: Phase 2. Christopher Monsere, PSU
- 425: Part II: Durability Assessment of Recycled Concrete Aggregates for use in new Concrete. Jason H. Ideker, OSU, Jennifer Tanner, U of Wyoming
- 428: Reducing Seismic Risk to Highway Mobility: Assessment and Design Tools for Pile Foundations Affected by Lateral Spreading. Scott A. Ashford, Michael Scott, OSU
- 429: Livability Performance Metrics for Transit. Marc Schlossberg, UO, Jennifer Dill, PSU, Nico Larco, UO
- 430: Multimodal Data at Signalized Intersections: Strategies for Archiving Existing and New Data Streams to Support Operations and Planning. Christopher Monsere, Kristin A. Tuft, PSU
- 433: Influence of Road Cross Section on Access Spacing. Karen Dixon, OSU, James Gattis, U of Arkansas
- 440: Overlooked Destinations: Suburban Nodes, Centers, and Trips to Strips. Nico Larco, Robert Parker, UO
- 441: Transit Bus Fleet Management and Optimization Models Addressing New Engine Technologies and Emissions Constraints. Miguel Andres Figliozzi, Ashley Haire, PSU
- 442: Integrated Multimodal Transportation, Air Quality, and Livability Corridor Study: Measuring, Understanding, and Modeling. Miguel Andres Figliozzi, Linda George, Chris Monsere, PSU
- 444: Prioritization for Seismic Retrofit with Statewide Transportation Assessment. Peter Dusicka, PSU
- 446: Increasing Bicycling for Transportation: The Role of Cyclist Type and Infrastructure. Jennifer Dill, PSU

### Education

- 400: University of Oregon Transportation Speaker Series. Marc Schlossberg and Nico Larco, UO
- 401: Enhancing Bicycle and Pedestrian Education through Curriculum and Faculty Development. Lynn Weigand, PSU
- 406: Sustainable Cities Initiative. Nico Larco and Marc Schlossberg, UO
- 437: Bicycle and Pedestrian Engineering Design Curriculum Expansion. Ashley Haire, PSU.

## Technology Transfer

- 434: Development of Mobile Mapping Technology to Facilitate Dialog Between Transportation Agencies and the Public. Ken Kato, Marc Schlossberg and James Meacham, UO

## Ongoing Projects

### Research

- 30: Hurricane Wave Forces on Highway Bridge Superstructure. Daniel Cox, OSU
- 37: Characteristics of Transitions in Freeway Traffic. Robert Bertini, PSU, Soyoung Ahn, ASU
- 43: Factors for Improved Fish Passage Waterway Construction. David Sillars, OSU, Hamid Moradkhani and Trevor Smith, PSU
- 53: Performance Enhancement of Bridge Bracing Under Service and Extreme Loads. Peter Dusicka, PSU
- 79: Identify and Address Institutional Barriers Delaying Incident Clearance. Karen Dixon and Lei Zhang, OSU
- 102: Operational Analysis of Transit Bus Collisions. James Strathman, PSU
- 108: Empirical Observation of the Impact of Traffic Oscillations on Freeway Safety. Christopher Monsere, PSU, Soyoung Ahn, ASU
- 115: Application of WIM Data for Improved Modeling, Design, and Rating. Christopher Monsere, PSU, Christopher Higgins, OSU, Andrew Nichols, Marshall University
- 130: Value of Reliability. Robert Bertini, PSU, David Levinson, U of M
- 133: Freight Distribution Problems in Congested Urban Areas: Fast and Effective Solution Procedures to Time-Dependent Vehicle Routing Problem. Miguel Figliozzi, PSU
- 137: Dynamic Activity-Based Travel Forecasting System. John Gliebe, PSU
- 145: Assessment and Refinement of Real-Time Travel Time Algorithms for Use in Practice, Phase 2. Kristin Tuft, PSU, Soyoung Ahn, UA
- 148: Seismic Damage State Models for Oregon Bridges. Peter Dusicka, PSU
- 156: Development of an Open Source Bridge Management System. Michael Scott, OSU
- 161: Hurricane Wave Forces on Highway Bridge Superstructure: Repair and Retrofit of Existing Bridges, Phase 2. Daniel Cox and Solomon Yim, OSU
- 163: No More Freeways: Urban Land Use-Transportation Dynamics without Freeway Capacity Expansion. Lei Zhang, OSU
- 176: Expanding Development of the Oregon Traffic Safety Data Archive. Christopher Monsere, PSU
- 196: Access Management Best Practices Manual. Karen Dixon, OSU
- 216: Overlooked Density: Re-Thinking Transportation Options in Suburbia, Phase 2. Nico Larco, UO
- 221: Factors for Improved Fish Passage Waterway Construction, Phase 2. David Sillars, OSU, Hamid Moradkhani and Trevor Smith, PSU
- 224: Healthy Communities and Urban Design: A Multi-Disciplinary National Analysis of Travel Behavior, Residential Preference, and Urban Design. Jessica Greene and Marc Schlossberg, UO, Daniel Rodriguez and Noreen McDonald, UNC
- 226: Maintaining Safe, Efficient and Sustainable Intermodal Transport through the Port of Portland. David Jay and Jiayi Pan, PSU
- 227: Evaluation of Bike Boxes at Signalized Intersections. Jennifer Dill and Chris Monsere, PSU

229: Implementation of Active Living Policies by Transportation Agencies and Departments. Jennifer Dill, PSU, Deborah Howe, Temple University

230: Exploratory Methods for Truck Re-identification in a Statewide Network Based on Axle Weight and Axle Spacing Data. Chris Monsere, PSU, Mecit Cetin, USC, Andrew Nichols, Marshall University

232: Expanding Development of the Oregon Traffic Safety Data Archive, Phase 2. Chris Monsere, PSU

239: The Effectiveness of Vertebrate Passage and Prevention Structures: a Study of Boeckman Road in Wilsonville. Catherine de Rivera, PSU

243: A Novel Design Strategy for Integrating Freight Rail Into Urban Settings: A Capping Study. John Jeffrey Schnabel, PSU

248: Value of Reliability, Phase 2. Robert Bertini, PSU, David Levinson and Kathleen Harder, U of M

249: Improving Regional Travel Demand Models for Bicycling. John Gliebe and Jennifer Dill, PSU

252: Hurricane Wave Forces on Highway Bridge Superstructure: Pseudodynamic Testing for Bridge Subassembly. Daniel Cox and Tim Maddux, OSU

255: Calibrating the Highway Safety Manual (HSM) Predictive Methods for Oregon Highways. Karen Dixon, OSU, Chris Monsere, PSU

256: Advisory Speed Safety Study. Karen Dixon and Ida van Schalkwyk, OSU

257: Future Flooding Impacts on Transportation Infrastructure and Traffic Patterns Resulting from Climate Change. Heejun Chang, Martin Lafrenz and Miguel Figliozzi, PSU

261: Combined Seismic Plus Live Load Analysis of Highway Bridges. Michael Scott, OSU

269: Exploiting a Next Generation Intelligent Transportation Systems (ITS) Data Warehouse for Improved System Performance and Congestion Monitoring. Robert Bertini, David Maier and Kristin Tufte, PSU

270: Seismic Hazard Assessment of Oregon Highway Truck Routes. Peter Dusicka and John Gliebe, PSU

276: Analyzing and Quantifying the Impact of Congestion on Less-Than-Truckload (LTL) Industry Costs and Performance in the Portland Metropolitan Region. Miguel Figliozzi and Chris Monsere, PSU

277: Analysis of Travel Time Reliability for Freight Corridors Connecting the Pacific Northwest. Miguel Figliozzi, PSU

299: Evaluation of Safe Routes to School Programs: Qualitative and Quantitative Analysis of Parental Decision-Making. Lynn Weigand, PSU and Noreen McDonald, UNC

302: Impacts of Neighborhood Electric Vehicles (NEVs) on transportation infrastructure safety and regulation. Katharine Hunter-Zaworski, OSU and Lyn Cornell, ODOT

305: Green and Economic Fleet Replacement Modeling. David Kim and J. David Porter, OSU and Miguel Figliozzi, PSU

310: Incorporating New Data Needs into Travel and Activity Surveys. Jennifer Dill, PSU and Asha Weinstein Agrawal, SJSU

318: Extraboard Management. James Strathman, PSU

326: Wireless Data Collection System for Real-Time Arterial Travel Time Estimation. J. David Porter and David Kim, OSU

327: Exploratory Methods for Truck Re-identification in a Statewide Network Based on Axle Weight and Axle Spacing Data to Enhance Freight Metrics: Phase 2. Christopher Monsere, PSU, Mecit Cetin, ODU, and Andrew Nichols, Marshall U

335: Fusion and Integration of Arterial Performance Data. Kristin Tufte and Peter Koonce, PSU

339: Durability Assessment of Recycled Concrete Aggregates for Use in New Concrete. Jason Ideker, OSU and Jennifer Tanner, UW

340: Regional Transportation and Land-use Decision Making: a Multistate Analysis. Richard Margerum, Robert Parker, and Terry Moore, OSU and Susan Brody, Gail McEwan, PSU

345: 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, and Christopher Monsere, PSU

361: Tools for Gusset Plate Evaluation. Christopher Higgins and Michael Scott, OSU and Peter Dusicka, PSU

370: A Study of Headway Maintenance for bus Routes: Causes and Effects of Bus Bunching in Extensive and Congested Service Areas. Miguel Figliozzi, Martin Lafferriere, and Wu Feng, PSU

373: Green Schools in Gray Zones: Assessing Alternative Transportation & Land Use Credits of LEED® and non LEED® Rated K-12 Schools on Student Health & Academic Performance in Oregon. Ihab Elzeyadi and Marc Schlossberg, UO, Yvonne Michael, Drexel University

383: Climate Change Impact Assessment for Surface Transportation in the Pacific Northwest and Alaska. John MacArthur, OTREC, Phillip Mote and Jason Ideker, OSU, Miguel Figliozzi, PSU, and Ming Lee, UA Fairbanks

### Education

97: Closing the Gap: Developing a Transportation Curriculum for the Oregon Young Scholars Program. Carla Gary, Bethany Johnson and Chuck Kalnbach, UO

126: Bicycle and Pedestrian Education Program. Lynn Weigand, PSU, Jennifer Dill and Marc Schlossberg, UO, Karen Dixon, OSU

144: Traffic Engineering Training for Rural Communities. Roger Lindgren, OIT

223: Trail Planning & Community Service Curriculum. Lynn Weigand, PSU

247: designBridge: Integrating Transportation into Service Learning Design/Build Projects. Nico Larco and Juli Brode, UO

254: Rural Young Women Transportation Education Outreach. Roger Lindgren & Katie Edwards, OIT & William Mac Brock, National Park Service

298: Development, Deployment, and Assessment of a New Educational Paradigm for Transportation Professionals and University Students. Ashley Haire, PSU

313: Electric Vehicle Charging Infrastructure Community Needs Assessment. Robert Parker and Juli Brode, UO

357: Sustainable Cities Lecture Series 2009-2010. Mark Gillem, UO

### Technology Transfer

13: Developing a Coordinated Professional Development Program for OTREC. Robert Layton, OSU, Christopher Monsere, PSU

173: Options for Integrating Urban Land Use and Travel Demand Models. John P. Gliebe, PSU

175: Increasing Capacity in Rural Communities: Planning for Alternative Transportation. Megan Smith, Keavy Cook, Bethany Johnson, OSU

320: Transportation Planning Through Mobile Mapping Technology. Marc Schlossberg, Ken Kato, and Nico Larco, UO

323: Overlooked Density: Re-Thinking Transportation Options in Suburbia, Phase 3. Nico Larco, UO

333: Expanding Development of the Oregon Traffic Safety Data Archive: Phase 3. Christopher Monsere, PSU

347: A Comprehensive Roadmap for the Development of Low/no Emission Vehicle Infrastructure in the Portland Metro Region. John MacArthur, OTREC, Peter Murchie and George Beard, PSU

# Completed Projects

## Research

- 2007-01: From Arterial to Asset: Examining the Role of the Multiway Boulevard in Coordinated Transportation and Land Use Planning. Mark Gillem, UO
- 2007-03: Socioeconomic Effect of Vehicle Mileage Fees. B. Starr McMullen and Lei Zhang, OSU
- 2007-14: Using Existing Intelligent Transportation Systems / Commercial Vehicle Operation (ITS/CVO) Data to Develop Statewide (and Bi-State) Truck Travel Time. Christopher Monsere and Robert Bertini, PSU
- 2007-20: Influence of Community Walkability and Safety on Active Transportation Among Low Income Children. Jessica Greene, UO
- 2007-33: Understanding and Measuring Bicycling Behavior: a Focus on Travel Time and Route Choice. Jennifer Dill, PSU
- 2007-45: Influence of Environmental Effects on Durability of Composite Reinforced Fiber Polymer (CFRP) for Shear Strengthening of Reinforced Concrete (RC) Girders. Chris Higgins, OSU
- 2007-57: Assessment and Refinement of Real-Time Travel Time Algorithms for Use in Practice. Kristin Tufte, PSU
- 2007-64: Improving Travel Information Products via Robust Estimation Techniques. David Maier and Kristin Tufte, PSU
- 2007-68: Coevolution of Transportation & Land Use. Lei Zhang, OSU
- 2007-80: Evaluation of the Oregon DMV At-Risk Driver Program. James Strathman, PSU
- 2008-81: Socioeconomic Effect of Vehicle Mileage Fees, Phase 2. B. Starr McMullen and Lei Zhang, OSU
- 2008-91: Evaluation of the Oregon DMV At-Risk Driver Program, Phase 2. James Strathman, PSU
- 2008-93: Analysis of TriMet Bus Operator Absence Patterns. James Strathman, PSU
- 2008-116: Understanding Driver Behavioral Changes Associated with Road User Fees. Anthony Rufolo, PSU
- 2008-131: Oregon Freight Data Mart. Miguel Figliozzi and Robert Bertini, PSU
- 2008-134: Practical Approximations to Quantify the Impact of Time Windows and Delivery Sizes on Freight Vehicle Miles Traveled (VMT) in Urban Areas. Miguel Figliozzi, PSU
- 2008-147: Influence of Environmental Effects on Durability of Composite Reinforced Fiber Polymer for Shear Strengthening of Reinforced Concrete Girders Phase 2. Christopher Higgins, OSU
- 2008-152: Overlooked Density: Re-Thinking Transportation Options in Suburbia, Phase I. Nico Larco and Marc Schlossberg, UO
- 2008-154: Food Delivery Footprint: Addressing Transportation, Packaging, and Waste in the Food Supply Chain. Madeleine Pullman, Darrell Brown and Scott Marshall, PSU
- 2008-155: Instrumentation for Mechanistic Design Implementation. Todd Scholz, OSU
- 2008-160: Long term Evaluation of Individualized Marketing Programs for Travel Demand Management. Jennifer Dill and Cynthia Mohr, PSU

2008-184: Understanding School Travel: How Residential Location Choice and the Built Environment Affect Trips to School. Yizhao Yang and Marc Schlossberg, UO

2008-190: Using Archived Intelligent Transportation Systems (ITS) Data to Measure the Operational Benefits of a System-wide Adaptive Ramp Metering System. Robert Bertini and Chris Monsere, PSU

2008-192: Evaluating the Effectiveness of the Safety Investment Program Policies for Oregon. Chris Monsere, PSU, Karen Dixon, OSU

2008-195: Freight Performance Measures: Approach Analysis. B. Starr McMullen, OSU, Christopher Monsere, PSU

2009-242: Financing Mechanisms for Capacity Improvements at Interchanges. James Strathman, PSU

## Education

2007-02: City Design Lecture Series: Linking Transportation and Land Use Planning. Mark Gillem, UO

2008-187: Distribution Logistics Course. Miguel Andres Figliozzi, PSU

2009-223: Trail Planning & Community Service Curriculum. Lynn Weigand, PSU

2009-264: Expanding Service Learning Models in Transportation. Robert Parker and Terry Moore, UO

2009-279: Bicycle and Pedestrian Design Curriculum Expansion. Lynn Weigand, PSU

2010-317: designBridge: Integrating Transportation into Service Learning Design/Build Projects. 2010-317: designBridge: Integrating Transportation into Service Learning Design/Build Projects. Nico Larco and Juli Brode, UO

## Technology Transfer

2007-18: Active transportation, neighborhood planning and participatory Geographic Information Systems (GIS). Phase 1. Marc Schlossberg, UO

2007-21: Road Ecology Course and Seminar Series. Mark Sytsma, PSU

2007-41: Application of Load and Resistance Design Factor Design (LRF) Principles for Deep Foundations in Oregon: Phase 1. Trevor Smith and Peter Dusicka, PSU

2007-51: Linking Experiential Learning to Community Transportation Planning. Robert Parker, UO.

2007-67: Initiative for Bicycle and Pedestrian Innovation. Jennifer Dill, PSU, Marc Schlossberg, UO and Karen Dixon, OSU

2008-98: Active Transportation, Neighborhood Planning and Participatory Geographic Information Systems (GIS), Phase 2. Marc Schlossberg, UO

2008-138: Oregon Transportation Planning Experience. Carl Abbott, Samuel Lowry, PSU

2009-214: Transferring Geographic Information Systems (GIS) / Community-Based Transportation Assessment Tools Nationwide. Marc Schlossberg and Nico Larco, UO

# Results and Impacts

## Model Helps Policymakers Account for Bicycles

Regional travel demand models, the primary tool public agencies use to plan urban transportation systems, have been inadequate in accounting for bicycle trips. This has meant that planners have had a difficult time evaluating infrastructure options that involve cyclists. In the Portland



area, this is changing. Metro, the area's regional government responsible for transportation and land-use planning, will now make decisions with the help of a new bicycle-specific module developed for its travel

demand model. The module was developed by John Gliebe and Jennifer Dill, both of Portland State University, based on their earlier work determining why and where people cycle.

## Project Helps Regional Governments Coordinate Transportation Planning

A project regarding regional coordination of transportation and land use planning is finding its way into policy. Richard Margerum of the University of Oregon and Susan Brody of Portland State University examined how regions across the country coordinate land use and transportation. They then held a forum in Portland in September 2010 to share their findings and to bring together researchers and case-study practitioners to discuss implications of those findings. Already this project has found resonance among public and private practitioners: When the Lane County Board of Commissioners proposed creation of the Lane Area Commission

on Transportation, the county's project consultant reached out to Margerum for his expertise gleaned from this project. Margerum reviewed and commented on the draft bylaws and provided some suggestions on how to reach agreement among the various stakeholders in the process. That's in line with the project's goal of improving the integration of regional decision making.



U.S. Reps. James Oberstar and Peter DeFazio speak during a September 2010 forum organized by Richard Margerum and Susan Brody.

## Sorting Out a Busload of Transit Problems

The problem known as “bus bunching” often plagues transit districts: instead of evenly spaced buses arriving at regular intervals, two buses arrive one after the other.

Miguel Figliozi examined data from a bus route in the Portland-area TriMet system to find causes of this problem.

They found that the main causes of bus bunching are the

leading bus leaving late from the previous stop and the following bus spending less time at the current stop. This information helps TriMet address the issues that lead to bus bunching so it can improve its operations.





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