



2013 – 2014 Annual Report



OTREC

OREGON TRANSPORTATION RESEARCH
AND EDUCATION CONSORTIUM

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

Mission OTREC provides relevant and useful research to assist local, state and regional agencies and expand the pool of graduates in transportation-related fields. OTREC builds upon its collective efforts and expertise to make Oregon a place where innovation, creativity and multidisciplinary collaboration lead to sustainable, livable communities. OTREC serves its mission by supporting research, training and outreach in a wide variety of transportation-related disciplines.

Key Personnel

Jennifer Dill, Ph.D. Director	Margaret Sanger Financial Program Administrator
Hau Hagedorn Research Program Manager	Susan Peithman Research and Education Program Administrator
John MacArthur Sustainable Transportation Program Manager	Renata Tirta Tech Transfer Program Assistant
Justin Carinci Communications Director	Lacey Friedly Communication Program Assistant
Carol Wallace Fiscal Operations Coordinator	

Executive Committee

Jennifer Dill, Ph.D. Portland State University	Roger Lindgren, Ph.D., P. E. Oregon Institute of Technology
Marc Schlossberg, Ph.D. University of Oregon	Satvinder Sandhu Federal Highway Administration
Chris Higgins, Ph.D., P.E. Oregon State University	Michael Bufalino Oregon Department of Transportation

The Oregon Transportation Research and Education Consortium is a university transportation center based at Portland State University and sponsored by the U.S. Department of Transportation.

This publication is a report of OTREC's transportation research, education and technology transfer activities for October 1, 2012 – June 30, 2014.

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Message from OTREC Director Jennifer Dill

This annual report doubles as a final report on a grant program that became so much more than a grant program: the OTREC grant lent its name to our center and breathed life into an experiment of unprecedented collaboration across Oregon universities, across disciplines and program areas, and with the public, private and nonprofit partners essential to every project in our history. And, of course, among students. To see the legacy of relationships we've fostered within the future transportation workforce, look at our students interacting at poster displays at our Oregon Transportation Summit, or the OTREC-sponsored and student-organized Region X Student Transportation Conference. Look at the biggest stage, the annual meeting of the Transportation Research Board, where dozens of our students light up poster sessions and presentations. And look at our alumni bringing their experience to inform decisions that will shape our transportation system for generations.

It is with reverence that I've led this center, whose roots and name tap the transformational early 1970s, when Oregon redefined what planning and transportation could mean for communities. The ground-breaking transportation research and education taking place on Oregon's campuses coalesced in 2006, under the guidance of founding Director Robert Bertini and the efforts of Rep. Peter DeFazio. They engendered a center, based at Portland State University, with partners at University of Oregon, Oregon State University and the Oregon Institute of Technology, to be known as OTREC. This consortium strengthened each of its members and cemented Oregon's national reputation as a leader in sustainable transportation.

Our center has evolved with the times, growing into a research and education powerhouse that twice competed successfully to maintain its position as a nationally designated center. Those competitions began the National Institute for Transportation and Communities grant program. Along the way, we consolidated and expanded transportation endeavors at Portland State, outgrowing our physical offices and, eventually, the OTREC name. We continue, inspired by the visionaries who imagined what our center could be and those who labored to make that vision a reality. We move forward locally and nationally as TREC, Portland State's transportation research and education center, leading the national NITC grant program, the Initiative for Bicycle and Pedestrian Innovation, and numerous other programs and ventures to come. We thank everyone who helped us get here and who joins us now on our journey.

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

The Congressman Peter DeFazio Transportation Hall of Fame Award

The DeFazio Hall of Fame Award is given each fall to an Oregonian whose leadership reflects Rep. DeFazio's values and advances OTREC's theme.



2014
Robert Bertini, Portland State University

2013
Bruce Starr, Oregon Senate

2012
Andy Cotugno, Metro

2011
Gail Achterman, Oregon Transportation Commission

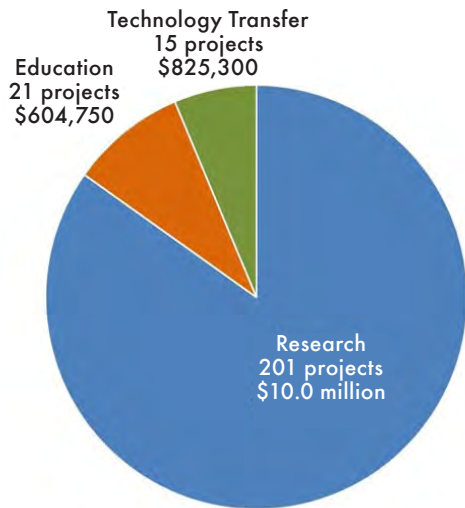
2010
Stefano Viggiano, Lane Transit District

2009
Dick Feeney, TriMet

OTREC by the Numbers

An overview of the Oregon Transportation Research and Education Consortium.

Our Projects



65 percent of the 366 proposals received were funded through our peer-review process.

Our Impact

82 peer-reviewed articles resulting from OTREC projects

293 citations from those 82 projects

1,437 Oregon Transportation Summit attendees

30 Friday transportation seminars since Fall 2012

6,890 attendees and online views of those seminars



Collaboration

37 multi-campus projects

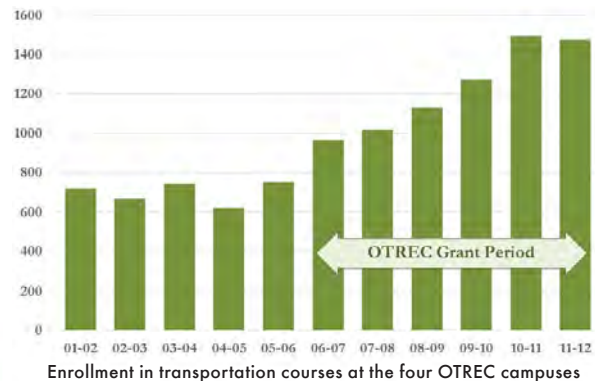
92 multi-investigator projects

52 external sponsors

Our most common disciplines:



Our Students



276 transportation master's and doctoral degrees awarded

Education projects

Sustainable City Year

The Sustainable City Year program, part of the University of Oregon's Sustainable Cities Initiative, works with cities to help address sustainability issues. The program combines the resources of existing courses from different disciplines and campuses. In the previous three years of the program, students have worked successfully with the cities of Gresham, Salem and Springfield, Oregon. In 2013-2014, the fourth year of the program, the University of Oregon partnered with Medford, Oregon, a city located in the Rogue Valley with a population of 75,920. More than 400 students worked on 15 projects for Medford on a range of topics. Architecture students worked to design a new fire station; a planning, public policy and management course created a strategic plan for the Medford Fire Department; and a journalism class evaluated the community's emergency preparedness and developed an outreach plan for emergency preparation and response. More planning students geocoded Medford's attractions and updated maps for wayfinding, while another group provided plans for new development of urban properties. A law and urban planning student focused her capstone project on increasing the amount of open space available to city residents. Teams of economic students mapped out Medford's existing Neighborhood Watch programs and wrote a plan for developing new ones, while another team proposed solutions for connecting Medford's city parks, trails, and bicycle paths. Geography students modeled the projected results of transit-oriented development options, and more planning students examined the feasibility of introducing bus rapid transit to Medford's congested Highway 99 corridor. Since the inception of the Sustainable City Year program, service learning programs based on the Sustainable City Year model have been created in 15 other states.



Bicycle and Pedestrian Education Projects

OTREC researcher Lynn Weigand specializes in exploring how community design and planning can encourage active transportation for environmental, economic and physical health. Her series of education projects offers a wealth of information for communities and professionals looking to increase and promote walking and bicycling. The projects include a training course for practitioners, which focuses on context-sensitive solutions and design in roadway planning; a module-based curriculum for bicycle and pedestrian planning topics in university courses; a faculty development program designed to help university instructors integrate bicycle and pedestrian topics into existing courses; a qualitative and quantitative analysis of Safe Routes to School programs; a trail planning and community service guide; and a bicycle and pedestrian education program with an internship as well as support opportunities for doctoral students to conduct research in the area of bicycle and pedestrian transportation. Weigand also expanded the bicycle and pedestrian design curriculum at PSU by turning an existing three-credit course into a five-credit course with an applied lab. The new course gave students the opportunity to apply the knowledge they gained in class to real projects in their community. Working in teams, the students developed projects that focused on improving bicycle and pedestrian connections to the PSU campus. The course received excellent reviews from the students, and the department recognized the course's value by offering it again the following year.



Alumni Achievement



Price Armstrong earned his MPA in transportation policy from the University of Oregon in 2010 and since has worked as a transit planner for Lane Transit District in Eugene, as the programs director for the Massachusetts Bicycle Coalition, and most recently as the Transit and Capital Analyst in the MassDOT Rail and Transit Division.

“The support the University of Oregon received through OTREC has been essential to my success as a transportation professional. Thanks to OTREC, I received a graduate fellowship, traveled to numerous transportation conferences through the student group LiveMove, and was engaged in real-world transportation projects through the UO Sustainable Cities Initiative.”



Kristie Gladhill received an MS in Civil Engineering and Transportation from Portland State University in 2010. As Region 1 Transportation Safety Coordinator for ODOT, her job responsibility at the highest level is to reduce fatal and serious injury crashes, working both within ODOT and with partners throughout the Region.

“An important part of my work is crash data analysis, to inform strategies for reducing crashes. My graduate research on calibrating the HSM (Highway Safety Manual), an OTREC project, was a great introduction to the ODOT crash data, which I work with in nearly all the crash data analysis work I do.”



Brooke Jordan received a masters of urban and regional planning with a specialization in transportation and land use from Portland State University in 2013. She now works for the Oregon Department of Transportation as a research coordinator, managing several research projects including a connected vehicle project and a road user charge project.

“During my time at OTREC, I developed skills critical to my success as a transportation professional. I conducted research on intelligent transportation systems and energy, supported the implementation of Oregon’s 10-year Energy Action Plan, and worked with various transportation officials from both local and state agencies, which had a positive and enduring effect on my career.”



Eric Leaming graduated from OIT in 2005 with a BS in civil engineering. He has worked for ODOT doing traffic modeling, traffic signal design and operations, work zone design and traffic analysis, and recently received attention from the FHWA for tools he has developed to help calculate curve advisory speeds. He is currently ODOT’s Traffic Devices

“My favorite part of my job is working on engineering tools and solutions for active transportation, something that caught my interest at an OTREC-sponsored trip to TRB. OTREC research is a primary resource for new and innovative active transportation designs to help inform my decisions and conversations with other engineers.”



Patrick Marnell received his MSCE from Oregon State University in 2013. His research focus was safety and driver distraction, and he co-authored the OTREC report “Improved Pedestrian Safety at Signalized Intersections” and presented it at a Driving Assessment conference in Lake George, NY. He now works for Kittelson & Associates.

“OTREC helped support my studies at Oregon State University and gave me the freedom to focus on research and academics. After graduating I joined Kittelson and Associates where I have been involved in a variety of projects including signal systems, micro-simulation, research, and development services.”



Cortney Mild earned an MCRP from the University of Oregon in 2012 and now works for Chattanooga-Hamilton County Regional Planning Agency in Tennessee, where she is helping to update the comprehensive plan. Assisting Chattanooga’s newly formed transportation department, she provides guidance on Complete Streets and bicycle infrastructure.

“Thanks to OTREC support I got to go to two TRB conferences, an Eno fellowship in DC, and the WTS International Conference. The network that I’ve built up through these OTREC-funded opportunities is invaluable, and I know that it will continue to shape my career and my work into the future.”

Student Group Accomplishments

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.



Students in Transportation Engineering and Planning (STEP) is the Portland State University student group, led during the 2013-2014 school year by Joel Barnett. The year was marked by a strong presence at conferences. PSU sent around 20 students to the annual meeting of the Transportation Research Board (TRB) in Washington, DC, giving Portland State one of the biggest student presences at the biggest transportation research conference in the country. STEP members also presented research at the Oregon Transportation Summit and made appearances at the Active Living Research Conference in San Diego, the NW Transportation Conference in Corvallis, the Oregon Active Transportation Summit in Portland, The Region X Transportation Conference in Seattle, the METTRANS

conference in Long Beach, Calif., the Transportation Planning Land Use and Air Quality Conference in Charlotte, N.C., and the World Symposium on Transport and Land Use Research in Delft, Netherlands, where PSU also sends a transportation study abroad course every year.

The University of Oregon transportation and livability student group, LiveMove, was headed this year by Nick Meltzer. For their work on the 13th Avenue cycle track project, the students of LiveMove won the Oregon American Planning Association's Student Achievement in Planning award in 2014. LiveMove sponsored and volunteered at various events including Eugene's Disaster Relief Trials, Sprout Food Hub's Anniversary Event, multiple Bike Program events, and Earth Week. Through OTREC sponsorship, members of LiveMove were able to attend the Oregon Transportation Summit, National Bike Summit, American Planning Association Conference, Oregon Active Transportation Summit, and Oregon APA Conference. The LiveMove speaker series also had a successful year, drawing in transportation and livability experts from around the country.

Sarah McCrea is the outgoing president of the Oregon State University Student Chapter of ITE, which also enjoyed an eventful year. Speakers from the Federal Highway Administration, Kittelson & Associates, Lancaster Engineering and ODOT were brought into chapter meetings, and student ITE members were able to go on selected field trips including a tour of the Coral Sales Highway Safety company, a Sellwood Bridge tour with David Evans & Associates, and a visit to Ergoneers (a company that creates and sells software and hardware to enhance data collection in driving simulators). The chapter did some community outreach, too, including volunteering for ASCE PNW, editing papers for the Chinese Overseas Transportation Association, and entering a contest sponsored by Carmanah Traffic—in which they placed as finalists—to receive funding for a rectangular rapid flash beacon for a dangerous midblock crossing on the OSU campus.

Oregon Tech's ITE Student Chapter had an active year under the leadership of Michael Eagle. They spent the spring preparing for the ITE Traffic Bowl with staff from Kittelson & Associates, and competed in the Western district competition. They also delved deeply into traffic analysis: a speaker was brought in from Traffic Technology Solutions, a company that blends traditional traffic engineering with computer science and data analytics, and three students began work on an unmanned aerial drone designed to collect traffic data via aerial photography.

Learn more about OTREC student programs at http://otrec.us/for_students



OTREC Research: On Topic

OTREC was founded with a unique three-part theme: Integration of Transportation and Land Use, Advanced Technology and Healthy Communities. We look back at a few of the contributions our research and technology transfer projects have made in each theme area, starting with 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. OTREC research has played a critical role in examining how transportation plays into the decisions that shape our communities. While land use and transportation have always been intertwined, this research has provided new insight into a complicated, shifting landscape. Nowhere is this more evident than on the topic of climate change. OTREC led a four-state research effort culminating

in the publication, in January 2012, of “**Climate Change Impact Assessment for Surface Transportation in the Pacific Northwest and Alaska.**” The report, which drew upon the expertise of four state transportation departments, two university transportation centers and multiple universities, gave transportation agencies and planners the tools to adapt to changing weather patterns and make better decisions to head off costly future disruptions.

Of course, transportation and land use planning is always complicated, especially when it crosses

jurisdictional boundaries. The study, **“Regional Transportation and Land Use Decision Making in Metropolitan Regions: Findings from Four Case Studies,”** looked at efforts by regional agencies in four urban areas to coordinate land use and transportation through governance, growth centers and transportation improvement programs. The study found that leadership from elected officials and state funding are crucial components for successful planning.

Even with leadership and funding, planning efforts can be hampered by ineffective modeling and forecasting tools. The study **“Contextual Influence on Trip Generation”**

found that commonly used Institute for Transportation Engineers trip-generation rates aren't well suited for urban, multimodal settings. This research provided a means to adjust ITE's Trip Generation Handbook to better reflect the relationship between land use, transportation and travel demand.

The integration of transportation and land use theme area also produced some research leading directly to technology transfer efforts. The **“Overlooked Density: Rethinking Transportation Options in Suburbia”** series of research projects explored the often-overlooked suburban multifamily housing. That research culminated in the creation and publication of a handbook designed to help users navigate the challenges of designing multifamily

housing for livable, connected neighborhoods.

In transportation, as with other fields, researchers and research centers face the challenge of keeping the lessons gleaned from research and experience alive for future generations. With this in mind, OTREC funded a technology transfer project to support the transportation chapters of a planned written history of Oregon land use planning, written to make the transportation planning profession relevant to a popular audience. The result was an unusual and engaging report titled **“A Brief Portrait of Multimodal Transportation Planning in Oregon and the**

Healthy, livable communities are places that achieve economic prosperity, environmental quality and social equity. To help create these kinds of places, OTREC projects examine the connections between community design, active transportation and potential health implications.

Healthy communities, as a theme area, draws upon not only the safety of transportation system users, but the ability of the communities themselves to support well-being. Active forms of transportation can promote health but also pose a safety challenge in roadway networks designed primarily for private

automobiles. Infrastructure that doesn't accommodate multiple modes systematically can put bicyclists and pedestrians at risk where they interact with larger vehicles. Over the years, transportation agencies have turned to OTREC for solutions. Eager to prevent right-turning automobiles from striking bicyclists, the city of Portland, Ore., in 2008 installed advanced stop lines called “bike

boxes” to place bicyclists in front of motor vehicles at intersections. The city turned to OTREC to evaluate its effort. The resulting research, **“Evaluation of Bike Boxes at Signalized Intersections,”** found that motorists and cyclists alike appear to understand and comply with the boxes.

Continued on next page

The balance between safety and convenience came into play in a research project “**Improved Pedestrian Safety at Signalized Intersections Operating the Flashing Yellow Arrow.**”

The research, conducted in an advanced driving simulator, found that drivers sometimes failed to look for pedestrians at intersections that allow left turns while pedestrians have a “walk” signal.

Collisions, of course, aren’t the only hazard related to automobiles. Pollution is also a concern, especially in urban areas. Traditional on-street bicycle lanes put cyclists

near tailpipe emissions. A study, “**Environmental and Public Health Impacts of Traffic Flows and Traffic Management Policies,**” found that moving bicycles a few feet from cars (via a parking-separated lane) can make a big improvement in air quality. Freeway noise barriers had similar positive effects.

Bicycle facility planners have had little research to indicate whether cyclists would use proposed routes. OTREC researchers showed cyclists will detour 26 percent to use a separated path and 18 percent to use a bike boulevard. That research has been incorporated into regional travel demand models that help inform transportation investments.

Other technology transfer efforts include advancement of the Initiative for Bicycle and Pedestrian Innovation and the creation of a user guide for developing pedestrian and bicycle master plans.

“**Active Transportation, Neighborhood Planning and Participatory GIS**” projects developed tools to assess the walking and cycling environment and enhance public involvement. A subsequent project, “**Transportation Planning Through Mobile Mapping,**” developed and tested the “Fix This Tool,” an iPhone application that lets users direct public officials’ attention to the portions of the transportation system most in need of repair or improvement.

Research yields wealth of insight into transit safety and operations



OTREC has funded a series of transit research projects carried out by researcher James Strathman of Portland State University. The project “**Bus Safety Performance Monitoring and Analysis**” used results from a bus operator survey to address

agency safety. “**Analysis of TriMet Bus Operator Absence Patterns**” found correlations between missing work and factors including sex, age, race, working split shifts and number of complaints. In “**Operational Analysis of Transit Bus Collisions**” Strathman expanded that research to find that age, length of service, absence hours, fatigue, irregular shifts, and running late all influence the frequency of crashes. Among the findings of “**Bus Safety Performance Monitoring and Analysis**”: bus-only lanes and signal priority showed safety benefits and most incidents occurred at stops. Findings from these projects, and “**Extraboard Management,**” are helping transit agency TriMet save nearly \$1 million per year by better managing its reserve operator pool.

Advanced Technologies help transportation agencies do more with less. By examining how technology can enhance safety and improve infrastructure performance, OTREC helps advance national priorities such as transportation choices, economic competitiveness and energy independence.

The advanced technologies theme area covers intelligent transportation systems and other innovation that can help solve transportation problems. One such problem is dwindling gas tax revenues, pushing states to seek other solutions. An Oregon task force identified a vehicle-miles-traveled fee as the most promising alternative. **“Techniques for Assessing the Socioeconomic Effects of Vehicle Mileage Fees,”** found that such a change would not adversely affect poor or rural residents or drive down sales of alternative-fuel cars. **“Factors Affecting Behavioral Changes in Response to Road Fees”** offered additional analysis of data from an Oregon Department of Transportation vehicle mileage fee experiment.

Changing technology offers many opportunities to improve traveler information. The study **“Wireless Data Collection System for Real-Time Arterial Travel Time Estimates”** deployed and improved devices for collecting data from passing Bluetooth-enabled devices. In **“Operational Benefits of a System-Wide Adaptive Ramp Metering System,”** researchers used archived data to assess adaptive ramp meters, finding that metering can reduce delay and improve reliability if used appropriately.



Researchers used Portland’s Southeast Powell Boulevard as a living laboratory, coordinating research on seemingly disparate topics—such as advanced traffic signal controls, transit signal priority and air quality—and assessing the interactions between elements and their effect on corridor performance.

OTREC research also helped address a frustrating occurrence for transit passengers: having buses on the same route “bunch” and arrive at the same time. **“A Study of Headway Maintenance for Bus Routes”** found causes for bus bunching and offered solutions, such as limiting boarding in late-running buses.

A technology transfer project offered a way to help Oregon save money while upholding the safety of the state’s newly designed bridges. **“Application of LRFD Foundation Engineering Principles for Oregon,”** found that new design requirements used a resistance factor that was too low and that would lead to expensive, overdesigned bridges. The project described the magnitude of the cost increase, educated others on the science involved and built support for increasing the resistance factor. 🌀

More information on each of these projects is at <http://otrec.us/research>.

Our Projects

RESEARCH

A Novel Design Strategy for Integrating Freight Rail Into Urban Settings: A Capping Study: **John Jeffrey Schnabel**

A Study of Headway Maintenance for Bus Routes: Causes and Effects of “Bus Bunching” In Extensive and Congested Service Areas: **Miguel Figliozi**

Access Management Best Practices Manual: **Karen Dixon**

Advisory Speed Safety Study: **Karen Dixon**

Analysis of Travel Time Reliability for Freight Corridors Connecting the Pacific Northwest: **Miguel Figliozi**

Analysis of TriMet Bus Operator Absence Patterns: **James Strathman**

Analyzing and Quantifying the Impact of Congestion on LTL Industry Costs and Performance in the Portland Metropolitan Region: **Miguel Figliozi**

Application of WIM Data for Improved Modeling, Design, and Rating: **Christopher Monsere**

Assessing Transit Agencies’ Climate Change Adaptation Needs: **John MacArthur**

Assessment and Refinement of Real-Time Travel Time Algorithms for Use in Practice, Phase 2: **Kristin Tufte**

Assessment and Refinement of Real-Time Travel Time Algorithms for Use in Practice: **Kristin Tufte**

Bus Safety Performance Monitoring and Analysis: **James Strathman**

Calibrating the HSM Predictive Methods for Oregon Highways: **Karen Dixon**

Characteristics of Transitions in Freeway Traffic: **Robert Bertini**

Climate Change Impact Assessment for Surface Transportation in the Pacific Northwest and Alaska: **John MacArthur**

Coevolution of Transportation and Land Use: **Lei Zhang**

Combined Seismic Plus Live Load Analysis of Highway Bridges: **Michael Scott**

Contextual Influences on Trip Generation: **Kelly Clifton**

Cracking Susceptibility of Concrete Made with Recycled Concrete Aggregates: **O. Burkan Isgor**

Data Driven Illustrations for Climate-Smart Communities Scenarios: **Nancy Cheng**

Dissertation: Determinants of Recent Mover Travel Mode Choice: **Arlie Adkins**

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**

Development of an Open Source Bridge Management System: **Michael Scott**

Development of Pedestrian Planning Tools for Use in Travel Demand Modeling: **Kelly Clifton**

Durability Assessment of Recycled Concrete Aggregates for use in New Concrete: **Jason Ideker**

Durability Assessment of Recycled Concrete Aggregates for use in New Concrete, Phase 2: **Jason Ideker**

Dynamic Activity-Based Travel Forecasting System: **John Gliebe**

Economic Benefits of Cycling: **Kelly Clifton**

Empirical Observation of the Impact of Traffic Oscillations on Freeway Safety: **Christopher Monsere**

Evaluating the Effectiveness of the Safety Investment Program (SIP) Policies for Oregon: **Christopher Monsere**

Evaluation of an Eco-Driving Program: Changing Knowledge, Attitudes, and Behavior: **Donald Truxillo**

Evaluation of Bike Boxes at Signalized Intersections: **Jennifer Dill**

Evaluation of Bike Boxes at Signalized Intersections: Phase 2: **Christopher Monsere**

Evaluation of Safe Routes to School Programs: Qualitative and Quantitative Analysis of Parental Decision-Making: **Lynn Weigand**

Evaluation of the Effect of Supportive Services on the Success of Apprentices in a Highway Trade: **Maura Kelly**

Evaluation of the Oregon DMV At-Risk Driver Program: **James Strathman**

Evaluation of the Oregon DMV At-Risk Driver Program, Phase 2: **James Strathman**

Expanding Development of the Oregon Traffic Safety Data Archive Phase 2: **Christopher Monsere**

Expanding Development of the Oregon Traffic Safety Data Archive: **Christopher Monsere**

Exploiting a Next Generation ITS Data Warehouse for Improved System Performance and Congestion Monitoring: **Kristin Tufte**

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**

Exploratory Methods for Truck Re-identification in a Statewide Network Based on Axle Weight and Axle Spacing Data to Enhance Freight Metrics: **Christopher Monsere**

Extraboard Management: **James Strathman**

Factors for Improved Fish Passage Waterway Construction: **David Sillars**

Factors for Improved Fish Passage Waterway Construction, Phase 2: **David Sillars**

Financing Mechanisms for Capacity Improvements at Interchanges: **James Strathman**

Food Delivery Footprint: Addressing Transportation, Packaging, and Waste in the Food Supply Chain: **Madeleine Pullman**

Freight Distribution Problems in Congested Urban Areas: Fast and Effective Solution Procedures to Time-Dependent Vehicle Routing Problems: **Miguel Figliozi**

Freight Performance Measures: Approach Analysis: **B. Starr McMullen**

From Arterial to Asset: Examining the Role of the Multi-Way Boulevard in Coordinated Transportation and Land Use Planning: **Mark Gillem**

Fusion and Integration of Arterial Performance Data: **Kristin Tufte**

Future Flooding Impacts on Transportation Infrastructure and Traffic Patterns Resulting from Climate Change: **Heejun Chang**

Green and Economic Fleet Replacement Modeling: **David Kim**

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**

Healthy Communities and Urban Design: A Multi-Disciplinary National Analysis of Travel Behavior, Residential Preference, and Urban Design: **Jessica Greene**

Hurricane Wave Forces on Highway Bridge Superstructure: **Daniel Cox**

Hurricane Wave Forces on Highway Bridge Superstructure: Pseudo-dynamic Testing for Bridge Subassembly: **Daniel Cox**

Hurricane Wave Forces on Highway Bridge Superstructure: Repair and Retrofit of Existing Bridges, Phase 2: **Daniel Cox**

Identify and Address Institutional Barriers Delaying Incident Clearance: **Karen Dixon**

Impacts of Electric Vehicle Charging on Electric Power Distribution Systems: **Robert Bass**

Impacts of Neighborhood Electric Vehicles (NEVs) on Transportation Infrastructure Safety and Regulation: **Kate Hunter-Zaworski**

Implementation of Active Living Policies by Transportation Agencies and Departments: **Jennifer Dill**

Implementing Oregon's Energy Plan: Opportunities for Operations and ITS: **Jon Makler**

Improved Pedestrian Safety at Signalized Intersections Operating the Flashing Yellow Arrow: **David Hurwitz**

Improving Regional Travel Demand Models for Bicycling: **John Gliebe**

Improving Travel Information Products via Robust Estimation Techniques: **David Maier**

Incorporating New Data Needs into Travel and Activity Surveys: **Jennifer Dill**

Increasing Bicycling for Transportation: The Role of Cyclist Type and Infrastructure: **Jennifer Dill**

Influence of Environmental Effects on Durability of CFRP for Shear Strengthening of RC Girders, Year 2: **Christopher Higgins**

Influence of Environmental Effects on Durability of CFRP for Shear Strengthening of RC Girders: **Christopher Higgins**

Influence of Road Cross Section on Access Spacing: **Karen Dixon**

Instrumentation for Mechanistic Design Implementation: **Todd Scholz**

Integrated Multimodal Transportation, Air Quality, and Livability Corridor Study: Measuring, Understanding, and Modeling the Interactions: **Miguel Figliozi**

Lightweight Buckling Restrained Brace Prototype Evaluation: **Peter Dusicka**

Livability Performance Metrics for Transit: **Marc Schlossberg**

Long-term Evaluation of Individualized Marketing Programs for Travel Demand Management: **Jennifer Dill**

Maintaining Safe, Efficient and Sustainable Intermodal Transport Through the Port of Portland: **David Jay**

Multimodal Data at Signalized Intersections: Strategies for Archiving Existing and New Data Streams to Support Operations and Planning: **Christopher Monsere**

No More Freeways: Urban Land Use-Transportation Dynamics without Freeway Capacity Expansion: **Lei Zhang**

Operational Analysis of Transit Bus Collisions: **James Strathman**

Operational Guidance for Bicycle-Specific Traffic Signals: **Christopher Monsere**

Oregon Freight Data Mart: **Miguel Figliozi**

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

Overlooked Density: Rethinking Transportation Options in Suburbia: **Nico Larco**

Overlooked Destinations: Suburban Nodes, Centers, and Trips to Strips: **Nico Larco**

Dissertation: Pedestrian and Bicyclist Connectivity in the High-Speed Rail Alternatives Analysis: **Jonathan Mueller**

Performance Enhancement of Bridge Bracing Under Service and Extreme Loads: **Peter Dusicka**

Practical Approximations to Quantify the Impact of Time Windows and Delivery Sizes on Freight VMT in Urban Areas: **Miguel Figliozi**

Our Projects

Prioritization for Seismic Retrofit with Statewide Transportation Assessment: **Peter Dusicka**

Promoting Active School Travel by Making it Cool: a Quasi-Experimental Study Using Boltage : **Yizhao Yang**

Real-time Change And Damage Detection Of Landslides and Other Earth Movements Threatening Public Infrastructure: **Michael Olsen**

Reducing Seismic Risk to Highway Mobility: Assessment and Design Tools for Pile Foundations Affected by Lateral Spreading: **Scott Ashford**

Regional Transportation and Land Use Decision Making: A Multistate Analysis: **Richard Margerum**

Relocation of Homeless People from ODOT Rights-of-Way: **Ellen Bassett**

Seismic Damage State Models for Oregon Bridges: **Peter Dusicka**

Seismic Hazard Assessment of Oregon Highway Truck Routes: **Peter Dusicka**

Socioeconomic Effect of Vehicle Mileage Fees: **B. Starr McMullen**

Socioeconomic Effect of Vehicle Mileage Fees, Phase 2: **B. Starr McMullen**

The Application of Smart Phone Truck Data to Develop Freight Performance Measures and Support Transportation Planning: **Miguel Figliozi**

The Effectiveness of Vertebrate Passage and Prevention Structures: a Study of Boeckman Road in Wilsonville: **Catherine de Rivera**

The Influence of Community Walkability and Safety on Active Transportation Among Low-Income Children: **Jessica Greene**

The Relationship Between VMT and Economic Activity: **B. Starr McMullen**

Tools for Gusset Plate Evaluation: **Christopher Higgins**

Tools for Gusset Plate Evaluation, Phase 2: Strengthening: **Christopher Higgins**

Transferring GIS / Community-Based Transportation Assessment Tools Nationwide: **Marc Schlossberg**

Transit Bus Fleet Management and Optimization Models Addressing New Engine Technologies and Emissions Constraints: **Miguel Figliozi**

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Understanding and Measuring Bicycling Behavior: A Focus on Travel Time and Route Choice: **Jennifer Dill**

Understanding Driver Behavioral Changes Associated with Road User Fees: **Anthony Rufolo**

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Value of Reliability: **Miguel Figliozi**

Value of Reliability, Phase 2: **Miguel Figliozi**

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Wireless Data Collection System for Real-Time Arterial Travel Time Estimation: **David Porter**

Wireless Data Collection System for Travel Time Estimation and Traffic Performance Evaluation: **David Kim**

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Commute Friendly Gas-Electric Hybrid Vehicle: **James Long**

Integrated Multimodal Transportation, Air Quality, and Livability Corridor Study, Phase II: **Miguel Figliozi**

Examining Consumer Behavior and Travel Choices: **Kelly Clifton**

From Transit Stop to Urbanity Node. A Study of Perceived Livability, Access, Safety and Socialization at the Transit Stop: **Deni Ruggeri**

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EDUCATION

Better Representation of the Pedestrian Environment in Travel Demand Models: **Kelly Clifton**

An Activity-Based Learning Module for Human Factors in the Introductory Transportation Engineering Course: **David Hurwitz**

Bicycle and Pedestrian Design Curriculum Expansion: **Lynn Weigand**

Bicycle and Pedestrian Education Program: **Lynn Weigand**

Bicycle and Pedestrian Engineering Design Curriculum Expansion: **Ashley Haire**

City Design Lecture Series: Linking Transportation and Land Use Planning: **Mark Gillem**

Closing the Gap: Developing a Transportation Curriculum for the Oregon Young Scholars Program: **Carla Gary**

designBridge: Integrating Transportation into Service Learning Design/Build Projects, Phase 2: **Nico Larco**

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

Distribution Logistics Course: **Miguel Figliozzi**

Electric Vehicle Charging Infrastructure Community Needs Assessment: **Robert Parker**

Enhancing Bicycle and Pedestrian Education through Curriculum and Faculty Development: **Lynn Weigand**

Expanding Service Learning Models in Transportation: **Robert Parker**

Linking Experiential Learning to Community Transportation Planning: **Robert Parker**

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Sustainable Cities Lecture Series: **Mark Gillem**

Traffic Engineering Training for Rural Communities: **Roger Lindgren**

Trail Planning & Community Service Curriculum: **Lynn Weigand**

University of Oregon Transportation Speaker Series: **Marc Schlossberg**

TECHNOLOGY TRANSFER

Development of Mobile Mapping Technology to Facilitate Dialog between Transportation Agencies and the Public: **Ken Kato**

A Comprehensive Roadmap for the Development of Low/No Emission Vehicle Infrastructure in the Portland Metro Region: **John MacArthur**

Active Transportation, Neighborhood Planning and Participatory GIS, Phase 2: **Marc Schlossberg**

Active Transportation, Neighborhood Planning and Participatory GIS: **Marc Schlossberg**

Application of LRFD Principles for Deep Foundations in Oregon: Phase 1: **Trevor Smith**

Developing a Coordinated Professional Development Program for OTREC: **Robert Layton**

Development of Mobile Mapping Technology to Facilitate Dialog between Transportation Agencies and the Public: **Ken Kato**

Expanding Development of the Oregon Traffic Safety Data Archive: Phase 3: **Christopher Monsere**

Increasing Capacity In Rural Communities: Planning for Alternative Transportation: **Megan Smith**

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Overlooked Density: Re-Thinking Transportation Options in Suburbia, Phase 3: **Nico Larco**

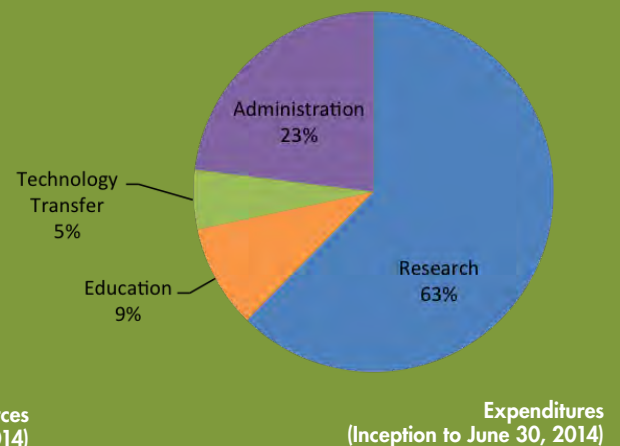
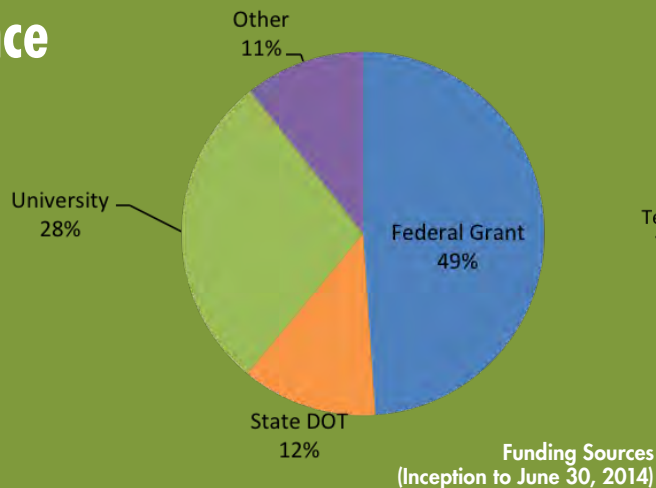
Pedestrian and Bicycle Master Planning: Training for Practitioners: **Lynn Weigand**

Sustainable Cities Initiative (SCI): **Robert Liberty**

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