



OTREC

OREGON TRANSPORTATION RESEARCH
AND EDUCATION CONSORTIUM

OTREC NEWS

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Spring 2007

www.otrec.us



OTREC Begins Operation as National University Transportation Center

OTREC's Strategic Plan was approved by the U.S. Department of Transportation's Research and Innovative Technology Administration (RITA) on December 1, 2006, officially setting in motion OTREC program activities. Later the same day, OTREC released its first Request for Proposals (RFP) for research, education and technology transfer projects, and in January received 54 proposals from faculty at its partner universities. The 2006-2007 proposals went through a vigorous peer-review process, awards were announced in early April, and OTREC released its 2008 RFP in mid-April. OTREC's first staff members have been brought on board, a web site domain established, and a unique logo chosen.

Collaboration is a key component of all OTREC activities. Created in August

2005 under the federal transportation act SAFETEA-LU, OTREC is based at Portland State University (PSU), and is a partnership between PSU, the University of Oregon (UO), Oregon State University (OSU) and the Oregon Institute of Technology (OIT). OTREC is dedicated to stimulating and conducting collaborative multi-disciplinary research on multi-modal surface transportation issues, educating a diverse array of current practitioners and future leaders in the transportation field and encouraging implementation of research results. OTREC was granted \$16 million over five years through SAFETEA-LU, and will focus funding on activities that support its theme.

**OTREC Theme:
Advanced Technologies,
Integration of Land Use
and Transportation,
Healthy Communities**



Congressman Peter DeFazio speaks at PSU Event to announce \$16M grant for Oregon UTC

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Collaboration is a Top Priority

Throughout this first newsletter, evidence can be found of OTREC's commitment to collaboration. Working together to address key transportation research and education issues in Oregon and beyond is a high priority for all OTREC programs. With the announcement of the University Transportation Center creation, an OTREC Executive Committee was established, which includes representatives from each partner university, the Oregon Department of Transportation (ODOT) and the Federal

Highway Administration (FHWA). Together with transportation faculty and external stakeholders, the Executive Committee developed OTREC's theme and program goals for the Strategic Plan (available on the OTREC web site). Combined expertise of faculty from across campuses and from a variety of disciplines, often partnered with outside transportation agencies and organizations, will enhance OTREC's ability to address transportation challenges. OTREC benefits from strong existing ties to key transportation agencies including ODOT, City of Portland, City of

Eugene, TriMet, Lane Transit District, Port of Portland, Metro, other cities and counties, as well the transportation industry. OTREC is pleased to note that approximately 20% of proposals for the first RFP were multi-campus and more than 50% included multiple principal investigators. Peer reviewers from across the country (and a few out of the country!) responded to our request for expert proposal review. Students will benefit from these partnerships as participants in a variety of high-quality research and education programs.

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OTREC is a National University Transportation Center, and is a partnership between Portland State University, the University of Oregon, Oregon State University and the Oregon Institute of Technology



Director's Corner

On behalf of our students, faculty, and staff, welcome to the inaugural issue of OTREC News! We are very excited about OTREC's progress in the past several months, and are looking forward to seeing results of our first year's funded research, education and technology transfer projects. Future issues of OTREC News will feature reports on our research results, and will be aimed at introducing our many constituencies to our terrific students, faculty researchers, and educational programs available to the transportation profession. I believe that Oregon is known for innovations in transportation and land use, and OTREC hopes to help continue that innovation in a multimodal context and also describe lessons learned and best practices to a broader audience.

I would like to acknowledge the OTREC staff for their dedication and excellent work in getting OTREC off the ground. The establishment of a statewide transportation center in Oregon was a dream of mine when I first came to PSU, so the creation of a four-university partnership, and the recent finalization of our Memorandum of Understanding between the partners was a true milestone. I appreciate the efforts of the PSU research and sponsored projects staff to put the MOU and contractual mechanisms in place. I'd like to recognize my colleagues on the Executive Committee who have helped develop a highly collaborative and positive environment. We have faculty in nearly 30 disciplines who are engaged with us, and we are proud of our partnerships with ODOT, USDOT, and other UTCs here in the Northwest. OTREC is truly multimodal, multidisciplinary and collaborative.

We are thankful for the numerous public and private transportation agencies/organizations who have supported the development of OTREC, along with elected officials, our Northwest regional partners, and other UTCs who have been generous sharing their experiences. This is an exciting time at OTREC. We hope that you will join us for our journey—we welcome your input, feedback, and involvement. Feel free to contact me (bertini@pdx.edu, 503-725-4249) directly if you have ideas or are interested in working with us. With our theme—advanced technology, integration of land use and transportation, and healthy communities—we are looking forward to making a difference in the transportation field in our local communities, all across Oregon and in support of national transportation priorities. We'll be sharing the results of our work as our center unfolds.

First OTREC Student of the Year

OTREC is pleased to announce the selection of its first Student of the Year, Max Coffman. Max is a master's student in Urban and Regional Planning at Portland State University, and has been an active member of the Intelligent Transportation Systems (ITS) Lab. Max presented a paper entitled, *State of ITS: Telling Intelligent Transportation Systems Success Story for Portland, Oregon* (Session 384) at the 86th Annual Meeting of the Transportation Research Board (TRB) in January. Max is also the



Norman Y. Mineta (left) and Max Coffman

2007 ITS Oregon Scholarship winner, and was recently selected to participate in the annual Eno Foundation Leadership Development Conference in Washington, D.C. OTREC is pleased to sponsor him for this opportunity. As an undergraduate in Washington, D.C.,

Max grew accustomed to being within walking distance of cultural, shopping, entertainment and community resources, and would like to never go back to an automobile-dependent life. In the future, he hopes to contribute his energy and skills to improving the Portland area's transportation services and making it an even lovelier place to live. Max has interned as a policy analyst at the Portland Office of Transportation and as a Transportation Staff Associate for Portland City Commissioner Sam Adams. The award was presented as part of the annual Council of University Transportation Centers (CUTC) Banquet at the TRB Annual Meeting. For the past 15 years, the U.S. Department of Transportation (USDOT) has honored an outstanding student from each UTC at this special ceremony. The guest of honor at this year's banquet was Norman Y. Mineta, former Secretary of Transportation.

Max says about the Student of the Year Award and TRB: "This trip was a truly memorable experience, and I cannot overstate the value of the presentation and networking opportunities it created for me."

"Collaboration" continued from Page 1

OTREC is proud to be part of a newly re-activated Northwest Universities Transportation Consortium, which is made up of UTCs in Alaska, Washington, Idaho and Oregon. State DOTs, and representatives from the USDOT also participate. The consortium's goal is improving transportation research collaboration in the Pacific Northwest. Members of the consortium met most recently at a workshop in Portland to continue planning. OTREC is also working to connect its activities with the needs and priorities of modal administrations within the USDOT, including FHWA, FTA, MARAD and others, and OTREC faculty attend relevant USDOT workshops. OTREC also participates actively in the Council of University Transportation Centers (CUTC). More about the Consortium and federal workshops can be found on our web site. OTREC is a collaborative effort and we look forward to reporting partnership success stories in future newsletters.

2006-2007 OTREC Projects

OTREC issued its first RFP in December 2006, and received over 50 proposals. The total proposal request was close to \$2.6 million. There were 38 principal investigators, 30 proposals with multiple principal investigators, and 10 multi-campus proposals. Proposals were sent to at least three expert peer reviewers (including one federal representative). In early April the Executive Committee met to make the final funding decisions, based on the rigorous peer review, OTREC theme priorities and program goals. OTREC is pleased to announce the 2006-2007 project awards listed below. Review criteria (found in the OTREC Strategic Plan), and detailed abstracts for the projects can be found on the OTREC web site: www.otrec.us

RESEARCH

- 07-01 From arterial to asset: examining the role of the multi-way boulevard in coordinated transportation and land use planning.
PI: Mark Gillem, UO
- 07-03 Socio-economic effect of vehicle mileage fees. PI: B. Starr McMullen, OSU; Co-PI: Lei Zhang, OSU
- 07-14 Using existing ITS commercial vehicle operation (ITS/CVO) data to develop statewide (and bi-state) truck travel time.
PI: Christopher Monsere, PSU; Co-PI: Robert Bertini, PSU
- 07-18 Active transportation, neighborhood planning and participatory GIS. PI: Marc Schlossberg, UO
- 07-20 The influence of community walkability and safety on active transportation among low income children.
PI: Jessica Greene, UO
- 07-30 Hurricane wave forces on highway bridge superstructure. PI: Daniel Cox, OSU
- 07-33 Understanding and measuring bicycling behavior: a focus on travel time and route choice. PI: Jennifer Dill, PSU
- 07-37 Characteristics of transitions in freeway traffic. PI: Robert Bertini, PSU; Co-PI: Soyoung Ahn, ASU
- 07-43 Factors for improved fish passage waterway construction. PI: David Sillars, OSU; Co-PIs: Hamid Moradkhani and Trevor Smith, PSU
- 07-45 Influence of environmental effects on durability of CFRP for shear strengthening of RC girders. PI: Chris Higgins, OSU
- 07-53 Performance enhancement of bridge bracing under service and extreme loads. PI: Peter Dusicka, PSU
- 07-57 Assessment and refinement of real-time travel time algorithms for use in practice. PI: Kristin Tufte, PSU
- 07-64 Improving travel information products via robust estimation techniques. PI: David Maier, PSU; Co-PI: Kristin Tufte, PSU
- 07-68 Co-evolution of transportation and land use. PI: Lei Zhang, OSU
- 07-79 Identify and address institutional barriers delaying incident clearance. PI: Karen Dixon, OSU; Co-PI: Lei Zhang, OSU
- 07-80 Evaluation of the Oregon DMV at-risk driver program. PI: James Strathman, PSU

EDUCATION

- 07-02 City design lecture series: linking transportation and land use planning. PI: Mark Gillem, UO
- 07-21 Road ecology course and seminar series. PI: Mark Sytsma, PSU
- 07-51 Linking experiential learning to community transportation planning. PI: Robert Parker, UO; Co-PI: Bethany Johnson, UO

TECHNOLOGY TRANSFER

- 07-13 Developing a coordinated professional development program for OTREC. PI: Robert Layton, OSU; Co-PI: Christopher Monsere, PSU
- 07-41 Application of LRFD principles for deep foundations in Oregon: phase 1. PI: Trevor Smith, PSU; Co-PI: Peter Dusicka, PSU
- 07-67 Initiative for bicycle and pedestrian innovation. PI: Jennifer Dill, PSU; Co-PIs: Marc Scholssberg, UO, Karen Dixon, OSU

Faculty Profile – John Gliebe

Dr. John Gliebe joined the PSU School of Urban Studies and Planning last fall, bringing with him six years of transportation and land use modeling experience with Parsons Brinckerhoff. Dr. Gliebe has a master's degree in urban planning from the University of North Carolina Chapel Hill and a Ph.D. in Civil Engineering from Northwestern University. Dr. Gliebe is developing a transportation and land use modeling lab, and is teaching a new course in discrete choice modeling. He has taught other grad courses this year, including Urban Transportation Planning and Travel Demand Modeling, and is involved in the weekly transportation seminar series. Dr. Gliebe's research interests are on the development of advanced travel demand modeling methods, such as activity-based models and integrated land use and transportation models. His objective is to improve the behavioral realism of modeling practices, with the underlying goal of offering better tools for policy analysis. Dr. Gliebe has extensive experience with statewide modeling for the Federal Highway Administration and a demonstration project that was supported by Metro and ODOT. He will be working to create strong relationships with community partners in the Portland region. Contact Dr. Gliebe at: gliebej@pdx.edu.



CTS Transportation Seminar Series at PSU

The Center for Transportation Studies at Portland State University offers weekly transportation seminars on Fridays at noon each term. The seminar is broadcast live on the web, and is open to the public. Viewers may submit questions by e-mail before or during the seminar. More than 130 seminars are archived in streaming video on the CTS website. The Fall and Winter term seminars were host to over 20 guest speakers from a variety of places including the Technical University of Crete (Greece), OSU, SeSequential BioFuels, Flexcar, University of Washington, Kittelson & Associates, Inc., Washington State DOT, HDR, Inc., Oregon Department of Environmental Quality, TriMet and ODOT. PSU faculty and students also presented their projects and research. In addition to students registered for credit, more than 330 professionals and guests also attended the lectures over the course of the fall and winter quarters. OTREC sponsored three of the speakers as part of our Visiting Scholar Program, highlighted below. The upcoming seminar schedule, as well as archived streaming videos of past seminars is available on the web: <http://www.cts.pdx.edu/seminars.htm>. Join the CTS e-mail list at: <http://www.cts.pdx.edu/seminars.htm>.

OTREC Visiting Scholar Program Hosts Seminar Speakers

"Commuting in America" Author Alan Pisarski

Alan Pisarski, author of *Commuting in America III*, visited PSU in October 2006 as part of the OTREC Visiting Scholar Program. Pisarski is a transportation expert known for his major studies of American commuting patterns. During his visit, he spoke at a



Women's Transportation Seminar (WTS) breakfast meeting, visited with students in the PSU ITS Lab, and was the guest speaker for the weekly CTS Transportation Seminar. Pisarski summarized changes and trends in commuting patterns in the United States and noted such statistics as lengthening average daily commutes, (many are more than 90 minute or "extreme" commutes), increase in carpooling and transit use, shifts in city to suburb vs. suburb to city commuters and increase in numbers of people working at home. Pisarski's research shows that transportation is influenced significantly by economic and social phenomena.

Donald Shoup: "High Cost of Free Parking"

Donald Shoup, Professor of Urban Planning at UCLA, was a guest speaker and OTREC Visiting Scholar in February 2007. During his visit to Portland, Professor Shoup spoke to 130 members of the Lloyd District Transportation Management Association (TMA), and was the speaker at a WTS breakfast round table. Shoup's presentation at the CTS Seminar, *The High Cost of Free Parking*, drew interested questions and comments from the audience. Shoup presented his thoughts on parking issues in our country, showing aerial photos of gigantic parking lots that do little to enhance communities, giving examples of on-street/off-street parking discrepancies in northwest Portland and explaining how "free" parking is not really free to anyone, including businesses, consumers and drivers. He noted that planning requirements for minimum parking can be arbitrary and contrary to the best urban design practices, and showed how smart parking pricing can benefit communities and those of us trying to find a parking spot.

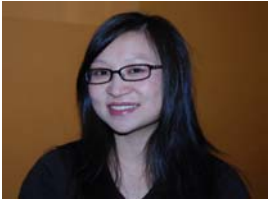
ITS Expert Joseph Sussman

Professor Joseph Sussman, JR East Professor of Civil and Environmental Engineering and Engineering Systems at Massachusetts Institute of Technology, was the CTS seminar guest speaker and OTREC Visiting Scholar on March 9, 2007. Dr. Sussman has been instrumental in developing Intelligent Transportation Systems (ITS) in the US, and is the author of several books on the subject. Dr. Sussman met with engineering faculty to discuss OpenCourseWare, MIT's large-scale, web-based publication of course materials, and trends in civil engineering education. The PSU Students in Transportation Engineering and Planning (STEP) Group hosted an interactive discussion with Professor Sussman which was followed by his seminar, *Where Transportation is Going: Transportation in the CLIOS System Era*. CLIOS is short for "Complex, Large-Scale, Interconnected, Open, Socio-technical Systems," and his presentation illustrated how complex transportation issues can be. After the seminar, ITS Oregon hosted a lunch in the ITS Lab for Dr. Sussman, ITS Oregon members, faculty and students.



OTREC is pleased to have partnered with WTS Oregon, ITS Oregon and Lloyd TMA for fall and winter Visiting Scholar events.

OTREC Staff On Board



Hau Hagedorn is OTREC's Research Program Manager. Hau is working to build strong collaborative relationships among OTREC faculty, researchers, students, and staff at the four partner campuses, developing relationships with government and industry partners, and overseeing the peer-reviewed Request for Proposal process and research reporting. Prior to this role, she spent over nine years working in the private and public sector on Intelligent Transportation Systems (ITS) initiatives. Her work at the Oregon Department of Transportation (ODOT) primarily focused on coordinating and implementing an operations management system. The intent of the system was to assist ODOT in better understanding the impacts and benefits of operations-based approaches within the agency. Previous work at Castle Rock Consultants focused primarily on advanced traveler information systems, road weather information systems, and ITS planning. She has a B.S. in Civil Engineering from the University of Minnesota, is an active member of ITS Oregon, and was the state chapter president in 2006.



Jenny Kincaid joined OTREC in October 2006 after nine years as the Executive Assistant in the Department of Civil and Environmental Engineering (CEE) at PSU. Ms. Kincaid had various budgetary, personnel, outreach and communication responsibilities in CEE. As OTREC's Communication and Education Coordinator, Jenny is coordinating and developing all communication, publications and outreach materials, including newsletters, brochures and annual reports. She is coordinating OTREC outreach and technology transfer programs, managing the web site, and collecting performance data for RITA. Jenny is originally from Illinois, and has a B.A. in English from the University of Chicago.

TRB Appointment for Hagedorn

Hau Hagedorn, Research Program Manager for OTREC, has been appointed to the Committee on Conduct of Research (ABG10) at the Transportation Research Board (TRB). The Committee's scope is to increase the quality and effectiveness of research through encouragement of better planning, management, and operational practices by organizations engaged in transportation research programs. The Committee assists TRB in its role of stimulating research and serving as a national clearinghouse for research activities.

Historic MOU Signed

"We are excited to be working with our sister institutions to benefit transportation in Oregon," said Bill Feyerherm, Vice Provost for Research at PSU. *"A number of the proposals involve investigators from more than one institution. These collaborations will benefit all OTREC partners as well as Oregon and the region."*

In March 2007 OTREC's four partner universities—PSU, UO, OSU and OIT—all part of the Oregon University System, signed a historic Memorandum of Understanding (MOU) committing the four institutions to a collaborative partnership as a National University Transportation Center. Each university's Vice President for Research (or equivalent) has been active in encouraging the partnership and working closely with one another to make certain that OTREC is successful.

The MOU reflects the collaborative nature of OTREC. Not only is the MOU a national model for statewide transportation research collaboration, but it provides a model for future collaboration between the state Universities. The participation of the chief research officers at each institution demonstrates the institutions' full commitment to the collaborative process. Tina Frost, PSU Contract Specialist, led the effort to complete the MOU negotiations.



As part of the effort to streamline contracting procedures and encourage cross-campus collaboration, OTREC and PSU staff from the pre and post-grant award offices traveled to Corvallis



(OSU—above) and Eugene (UO—left) to get acquainted with university research services staff and to give an introduction to the OTREC proposal process. A good spirit of collaboration, along with questions and discussion helped OTREC and university staff better understand each other's grant processes and timelines. OTREC thanks OSU and UO for their hospitality, and looks forward to many years of working together.

UO Professor Receives Outstanding Paper Award at TRB

Prof. Marc Schlossberg (University of Oregon, pictured below) and Vanessa Bekkouche (UO graduate student), along with team members from San Jose State University, Asha Weinstein (faculty, pictured below) and Katja Irvin (student), were awarded the 2007 Committee on Pedestrians Outstanding Paper Award at the Transportation

Research Board 86th Annual Meeting. The paper is entitled *How Far, by Which Route, and Why? A Spatial Analysis of Pedestrian Preference*. The committee selected two out of fifty-two papers for this award.

Marc Scholssberg, UO (right) and Asha Weinstein (SJSU)



OSU Proposes to Host TRB 10th International Conference for Low Volume Roads

The OSU College of Engineering, through the Kiewit Center and the Department of Forest Engineering, is preparing a proposal to host the TRB 10th International Conference on Low Volume Roads in Portland in 2011. Co-hosts of the conference would include OTREC, and possibly ODOT, Washington DOT, FHWA, county associations, and state and federal natural resource management agencies. The Low Volume Roads Conference, with approximately 400 participants, is held every four years. This year, the 9th Low Volume Roads

Conference will be in Austin, Texas. Topics include planning and administration, energy and the environment, design, materials, construction and maintenance, and operations and safety. The conferences usually include pre-conference workshops and field trips. Proceedings are published in the Transportation Research Record. For additional information contact Chris Higgins, Director of the Kiewit Center, chris.higgins@oregonstate.edu.

Dixon to Chair TFHRC Lab Assessment

Associate Professor Karen Dixon, OSU, has been nominated to chair an expert review for the Turner-Fairbank Highway Research Center (TFHRC) Laboratory Assessment Process. The lab assessment will provide feedback and suggestions to lab managers, allow an exchange of views among technical experts, and provide opportunities for FHWA and stakeholders to provide

input to research and related program activities. The Turner-Fairbank Highway Research Center is a federally owned and operated research facility in McLean, Virginia, and is the home of the FHWA's Office of Research, Development, and Technology.

Hunter-Zaworski Research Results Implemented on Boeing Planes

OSU Associate Professor Kate Hunter-Zaworski's recent research results at the National Center for Accessible Transportation (NCAT) on accessible lavatory design will be featured on all new Boeing 787 Dreamliner commercial airplanes. Accessible features such as universally designed door handles for those with limited hand agility and "touchless" faucets and toilet flushing are included. Read the whole story at: <http://oregonstate.edu/events/newsevents/ncat.html>.

PSU Students Attend TransNow Student Conference

By Delia Chi

On March 2, 2007, six students in the Masters of Urban and Regional Planning and Masters of Civil and Environmental Engineering programs from PSU attended the TransNow Student Conference in Boise, Idaho. This year's conference was hosted by students at the University of Idaho. Students gave presentations of completed or current work, listened to presentations by the Idaho Department of Transportation, Washington Department of Transportation, and ITS America. Highlights from these professional presentations included learning about a transportation planning project in Spokane, WA, what the

transportation profession entails and life after graduation, and the future of intelligent transportation in the United States. While students spent much of the day learning about transportation, there was a lot of time spent getting to know the approximately 20 other students through a fun icebreaker event and an intense battle of "Family Feud", transportation style. Students had to predict the answers to common transportation questions such as, "which state has the most miles of freeway?" Portland State University students would like to commend the University of Idaho on a great job in planning the conference. Participating students were: Delia Chi, Ujwalkiran Dharnikota, Laurie Miskimins, Nicole Prehoda, Sandeep Puppala and Benjamin Zielke.

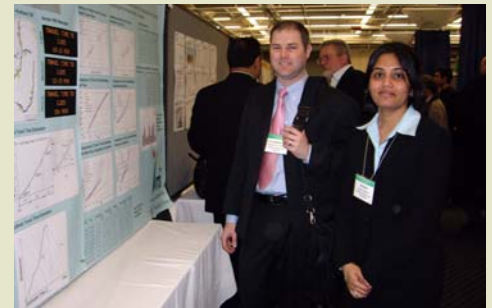
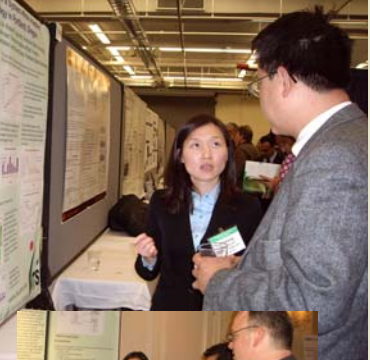
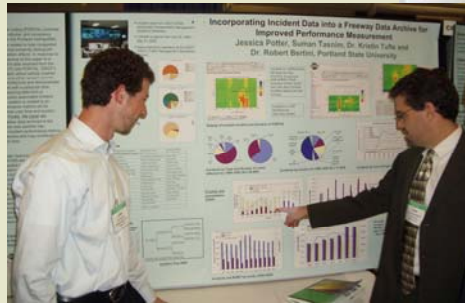


OTREC Well-Represented at TRB 2007

Oregon was well-represented at the Transportation Research Board's 86th Annual Meeting in January 2007. Faculty participated and presented research in numerous poster sessions and workshops and served as presiding officers for various sessions, committees and subcommittees. Many students also attended and presented research work in poster sessions (seven students were partially sponsored by the OTREC education program).

The TRB Annual Meeting program covers all transportation modes, with more than 2,800 presentations in 500 sessions addressing topics of interest to policy makers, administrators, practitioners, researchers, and representatives of government, industry, and academic institutions.

OTREC staff attended the annual meeting of the Council of University Transportation Centers (CUTC) where Director Robert Bertini presented *Improving Collaboration in the Northwest*. The OTREC Student of the Year, Max Coffman, was recognized at the CUTC banquet (see page 2). In addition, OTREC hosted its own reception at the beginning of the conference week, and many colleagues and friends dropped by to say hello.



OTREC Executive Committee

OTREC wishes to acknowledge and thank the Executive Committee for their input and support during our first year of operation. The Committee was instrumental in forming the Strategic Plan, theme and programmatic goals, as well as playing a key role in the first RFP and project funding decisions. Pictured below are several members of the Committee at the TRB Annual Meeting in January 2007.

Dr. Marc Schlossberg (far left)
OTREC Associate Director
University of Oregon

Dr. Roger Lindgren (third from left)
OTREC Associate Director
Oregon Institute of Technology

Dr. Chris Higgins (second from left)
OTREC Associate Director
Oregon State University

Barnie Jones (second from right)
Research Manager
Oregon Department of Transportation



Dr. Robert Bertini (far right)
OTREC Director

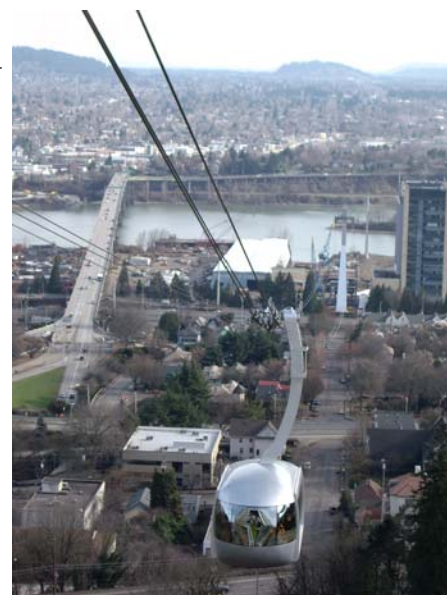
Satvinder Sandhu (not pictured)
Community Planner
Oregon Division, FHWA

Nathaniel Price (also representing FHWA, not pictured)
ITS Operations Engineer
Oregon Division, FHWA

How to Get Involved

Whether you are a student pursuing a degree, a professional seeking technical skills enhancement, a principal investigator with a great research idea, or an engaged citizen wanting to learn more about transportation planning and technologies for livable communities, we welcome your participation.

- For updates and announcements, join the OTREC email list.
- Check our web site for the schedule and streams of our continuing education programs.
- Employers offering internships and professionals offering mentorships to gifted undergraduate and graduate students should contact us by e-mail.
- Donors wishing to sponsor transportation scholarships, please contact us by e-mail.
- Researchers may submit topics on our web site:
http://survey.oit.pdx.edu/ss/wsb.dll/bertini/otrec_ideas.htm
- Consider enrolling in a transportation specialization course in Portland, Eugene, Corvallis, or Klamath Falls. Courses are offered through departments such as urban studies and planning, civil and environmental engineering, public policy and management, sociology, computer science, mathematics, economics, geography, and more. Distance learning options are available for some courses. For details, contact OTREC.



New aerial tram in Portland, OR

OTREC is a National University Transportation Center sponsored by the U.S. Department of Transportation's Research and Innovative Technology Administration

Web site: www.otrec.us ▪ E-mail: otrec@pdx.edu

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