



Program Progress Performance Report for University Transportation Center at Portland State University

Submitted to: U.S. Department of Transportation
Office of the Secretary-Research

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Project Title: National University Transportation Center
National Institute for Transportation and Communities (NITC)

Consortia members: Portland State University (PSU), University of Oregon (UO), University of South Florida (USF), Oregon Institute of Technology (OIT), University of Utah (UU)

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Submitting Official: same as above

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Recipient Organization: Portland State University
PO Box 751
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Grant Period: October 1, 2013 – September 30, 2018

Reporting Period End Date: March 31, 2016

Report Term: Semi-annual

Signature:

A handwritten signature in black ink, appearing to read "J. Dill".

1. ACCOMPLISHMENTS: What was done? What was learned?

The information provided in this section allows the RITA grants official to assess whether satisfactory progress has been made during the reporting period.

What are the major goals of the program?

The major goals for NITC as described in our application fall into six categories:

Research

- **Build and extend our current research through Year 1 Projects.** During the first year, we will undertake research projects that build upon and extend our current work, and reflect priorities identified by our external advisory board. All Year 1 project work plans will be peer-reviewed.
- **Competitive, peer-review project selection process in Years 2 and 3.** Our projects in Years 2 and 3 will be selected through an open RFP process to consortium faculty. These funds will be available for projects consistent with our theme.
- **Transportation for Livable Communities Pooled-Fund Research.** We will continue the Transportation for Livable Communities Pooled-Fund Research program. This program provides regional and local agencies, such as metropolitan planning organizations and municipalities, more opportunity to be invested in research.

Leadership

- **High Standing within National and International Arenas of Transportation.** NITC faculty are well regarded nationally and internationally as leaders in their fields. They will continue to demonstrate this leadership through publishing in the top journals and presenting their work at conferences. NITC takes the concept of leadership far beyond academic circles, as evidenced by the wide dissemination of research results in professional, technical and general publications and other media.

NITC faculty help address national transportation problems through volunteer leadership on TRB committees and in other positions. By serving on these committees, faculty will help set national research agendas and connect with agency leaders and practitioners on pressing research issues. To continue and reinforce this practice, NITC will mentor our new, junior faculty to apply for committee and panel membership and recognize the activities of all faculty members.

- **Solving Regional and National Transportation Problems.** NITC researchers have a long history of conducting research that is useful in solving the problems practitioners and decision-makers face every day. NITC's director and staff will serve as points of contact for agency leaders and policymakers regionally, statewide and nationally. When we identify needs that match the expertise of our researchers, we will make a connection. We will work with key staff at the DOT modal

administrations, both in Washington, D.C., and within our regions to determine the most effective way for our researchers to learn from and inform agency activities.

- **Future Leaders.** We recognize the investment we must make in our young faculty and students by prioritizing research projects that include them. We will support students traveling to conferences to present their work, a key activity in developing the next generation of leaders.
- **Development and Delivery of Programs.** We demonstrate our leadership in innovating transportation education, workforce development, deployment of research results and conducting research.

Education and Workforce Development

- **Offer Degrees and Courses in Multiple Disciplines.** NITC will continue to offer a rich array of degrees that serve the transportation profession.
- **Provide Experiential Learning.** A key component of our education strategy is experiential learning, which will help attract and retain students. Our campuses will continue to provide these opportunities, and NITC will seek ways to expand them.
- **Develop Innovative New Curriculum.** We will develop new, innovative curriculum consistent with transportation and livable communities that can be tested and shared among NITC and other universities.
- **Educate Professionals.** NITC will maintain a vibrant program of seminars, workshops, professional courses and other training opportunities that provide transportation practitioners with the latest tools and techniques.
- **Attract and Support Undergraduate Students.** NITC will build upon existing and effective mechanisms to expose K-12 students to transportation, attract and retain new undergraduate students to our degree programs, and involve undergraduates in our research.
- **Attract and Support Graduate Students.** NITC will support graduate students directly through research assistantships working on projects. We will provide dissertation fellowships for students to research surface transportation topics that fit under the NITC theme. This will be a competitive process open to Ph.D. students at NITC universities.
- **Sponsor a Transportation and Livable Communities Student Competition.** To further attract students to transportation-related professions and to promote integrated education into transportation and livability issues, NITC will sponsor an annual competition on transportation and livable communities.

Technology Transfer

- **Move Research into Practice.** Each research project will include a well-defined scope of work that identifies the problem the research will solve, how the research will address the problem and how the results will be implemented. We will continue

our practice of having every final report peer reviewed by at least one academic and one practitioner with relevant knowledge. We will also identify "implementation champions" the influential decision makers, executives and other top officials who can cut through organizational obstacles to deploy research results. We will provide these champions yearly summaries of our deployment successes as a reminder of the value of our research. Researchers working closely with practitioners and champions throughout the project ensures that our research stays current with the changing needs of practice and delivers research results in the optimal format.

- **Use Innovative Approaches to Communicate Research Results.** NITC will embark on an ambitious program of sharing information through traditional and new media.

Collaboration

- **Collaborating within our consortium.** NITC's governance structure is cooperative and leadership is distributed. The Executive Committee includes one faculty member from each campus. The Executive Committee provides overall direction for the Center, makes project funding decisions, and selects Center award recipients, including student of the year. They will meet in person at least once a year, rotating the location between campuses, and hold regular conference calls. Each Executive Committee member will be responsible for representing and supporting their respective campus
- **External collaboration.** In addition to the partnerships that occur through individual projects and the pooled-fund program, NITC will foster collaboration with a range of "end-users" of our work through an External Advisory Board.

Diversity

- **Attract underrepresented students to transportation careers.** We aim to attract underrepresented middle through high school students to transportation as a career through our partnerships with STEM and WTS.
- Priority funding to research with an equity focus. We give priority to funding research projects that have an equity focus by awarding them additional points in the RFP process. In addition, three of our projects selected for the first year directly address equity issues.

What was accomplished under these goals?

Research

- **Build and extend our current research through Year 1 Projects.**
Thirteen projects were selected for Year 1 funding. The total allocation of NITC funds for these projects is \$870,266. As of March 31st, 2016, three projects are complete with published reports and the remaining ten projects in progress are on average, 73% complete. The complete projects include:

- Encouraging Low-Income Households to Make Location-Efficient Housing Choices, Andree Tremoulet, Portland State University.
- Integrating Freight into Livable Communities, Kristine Williams, University of South Florida.
- Do TODs make a Difference? Phase 2, Arthur Nelson and Reid Ewing, University of Utah and Jenny Liu, Portland State University.

The projects in progress include the following:

- Generalized Adaptation of an Electric-Hydraulic hybrid drive system, James Long and David Culler, Oregon Institute of Technology.
 - Improving Bicycle Crash Prediction, Krista Nordback, Portland State University.
 - Improving Trip Generation Methods for Livable Communities, Kelly Clifton, Portland State University and Nico Larco, University of Oregon
 - Transportation Cost Index: A Comprehensive Performance Measure for Transportation and Land Use Systems and its Application in OR, FL, and UT, Liming Wang and Jenny Liu, Portland State University.
 - Creating Livable Communities through Connecting Vehicles to Pedestrians and Cyclists, John MacArthur, Portland State University.
 - Modeling and Analyzing the Impact of Advanced Technologies on Livability and Multimodal Transportation Performance Measures in Arterial Corridors, Miguel Figliozzi, Portland State University
 - Metropolitan Centers: Evaluating local implementation of regional plans and policies, Richard Margerum and Rebecca Lewis, University of Oregon, and Keith Bartholomew, University of Utah.
 - Developing a model for Transit Oriented Development in Latino Immigrant Communities: A National Study of Equity and TOD, Sandoval, Gerardo.
 - Changing attitudes toward sustainable transportation: The impact of meta-arguments, David Sanbonmatsu and David Strayer, University of Utah.
 - Rapidly Expanding Mobile Apps for Crowd-sourcing Bike Data to New Cities. Sean Barbeau, University of South Florida.
- **Competitive, peer-review project selection process in Years 2 and 3.**

A request for proposals (RFP) for the NITC National Year 2 funds was released in January of 2015 for research and technology transfer projects. NITC requires that all proposals fit within the NITC theme of livability, safety and environmental sustainability. The NITC Advisory Committee provided guidance at the December 2014 meeting that the RFP give priority for research funding that examines the economic impact of transportation and livable communities. Fifty-eight abstracts and 39 proposals, requesting more than \$4 million. Sixteen projects were selected through a competitive, peer review process with approval from the executive committee on June, 10th. Funded projects with an economic focus area looked at urban greenways, location affordability in shrinking cities, transportation affordability in developments near transit, smart-parking programs and effects of bus rapid transit on surrounding property values. Many of the projects started

August 1, 2015. Each project is between 12 and 18 months in duration. As of March 31st, 2016, the 16 projects are on average, 28% complete. The projects in progress include the following:

- Understanding the Economic Impacts of Urban Greenway Infrastructure, Jenny Liu, Mike Paruszkiewicz and Jeff Renfro, Portland State University.
- How Does Transportation Affordability Vary Between TODs, TADs, and Other Areas, Brenda Scheer and Reid Ewing, University of Utah
- Integrating Title VI and Equitable Investment in Transportation Alternatives into the MPO Transportation Planning Process, Kristine Williams, University of South Florida, and Aaron Golub, Lisa Bates and Liming Wang, Portland State University
- Building Planner Commitment: Are Oregon's SB 1059 & California's SB 375 Models for Climate-Change Mitigation? Keith Bartholomew, David Proffitt and Reid Ewing, University of Utah
- Racial Bias in Drivers' Yielding Behavior at Crosswalks: Understanding the Effect, Kimberly Barsamian Kahn, Portland State University
- The Economic and Environmental Impacts of Smart-Parking Programs, Nicole Ngo, University of Oregon
- What do we Know About Location Affordability in U.S. Shrinking Cities? Joanna Ganning, University of Utah
- Framing Livability: A Strategic Communications Approach to Improving Public Transportation in Oregon, David Remund, Kelli Matthews, Deb Morrison and Nico Larco, University of Oregon
- Effectiveness of Transportation Funding Mechanisms for Achieving National, State, and Metropolitan Economic, Health, and Other Livability Goals, Rob Zako and Rebecca Lewis, University of Oregon
- Multimodal Trip Generation, Vehicle Ownership and Use: Characterizing The Travel Patterns of Residents of Multifamily Housing, Kelly Clifton, Portland State University
- Incorporate Emerging Travel Modes in the Regional Strategic Planning Model (RSPM) Tool, Liming Wang, Kelly Clifton and Jennifer Dill, Portland State University
- Evaluating Efforts to Improve the Equity of Bike Share Systems, Nathan McNeil, John MacArthur and Jennifer Dill, Portland State University
- Evaluation of roadway reallocation projects, Miguel Figliozzi, Portland State University
- Impacts of Bus Rapid Transit (BRT) on Surrounding Residential Property Values, Victoria Perk and Martin Catala, University of South Florida
- Addressing Bicycle-Vehicle Conflicts with Alternate Signal Control Strategies, Sirisha Kothuri, Christopher Monsere and Krista Nordback, Portland State University and Ed Smaglik, Northern Arizona University
- Planning Ahead for Livable Communities Along the Powell-Division BRT: neighborhood conditions and change, Lisa Bates and Aaron Golub, Portland State University

The NITC National Year 3 RFP was released in January of 2016 for research projects. Twenty seven proposals were submitted, requesting \$2.7 million with \$3.5 million available for match. Proposals are currently in the peer review process. The final project selection meeting will take place with the NITC executive committee on June 21st, 2016. Projects are slated to start August 1st, 2016.

A small starts competition was held for to assist researchers who are interested in transportation but have not had an opportunity to undertake a small project that supports safe, healthy and sustainable transportation choices to foster livable communities. These projects were selected in November of 2015. The following projects were selected for funding:

- Travel to Food: Transportation Barriers for the Food Insecure in Tampa Bay, Kevin Salzer, University of South Florida
 - How Do Stressed Workers Make Travel Mode Choices That Are Good For Their Health, Safety, and Productivity?, Liu-Qin Yang, Portland State University
 - Narratives of Marginalized Cyclists: Understanding Obstacles to Utilitarian Cycling Among Women and Minorities in Portland, Oregon, Amy Lubitow, Portland State University
 - Active and Public Transportation Connectivity between North Temple TOD and Jordan Park River Trail, Ivis Garcia Zambrana, University of Utah
- **Transportation for Livable Communities Pooled-Fund Research.**

This program provides regional and local agencies more opportunity to be invested in research that has a national impact. The program offers a process by which cities, counties, MPOs and other regional or local agencies can pool relatively small pots of research dollars to leverage NITC funds for a single project. Partnering agencies work with NITC staff to develop a clear problem statement and identify match partners. NITC then issues the request for proposals (RFP) for a response from faculty at our partner universities.

NITC staff worked with the lead agency, Portland Bureau of Transportation, to secure \$125,000 in cash match from the municipalities and partners including the cities of Los Angeles, Chicago, Seattle, Washington, D.C., Portland, Oakland and Cambridge; TriMet; Metro; Washington County; and SRAM Foundation to support the problem statement Contextual Guidance at Intersections for Protected Bicycle Lanes. Two proposals were received from teams at our NITC partner campuses. The technical advisory committee consisting of members from partner cities selected the Portland State University team led by Civil and Environment Engineering Chair, Professor Christopher Monsere. The Portland State team also includes Jennifer Dill and Nathan McNeil.

There are two objectives of this research. The first is to identify the context in which the intersection treatments are most effectively employed. This will ideally result in quantitative guidance about motor vehicle and bicycle speeds, volumes, turning

movements and delay, intersection geometry, interactions with transit stops and other factors that will indicate the best treatment. The second objective is to identify the critical elements and dimensions of each treatment so the design treatments can achieve a uniformity and level of standardization across jurisdictions.

We anticipate that this research will provide cities around the country with better, evidence-based, information with which to design intersection treatments for protected bike lanes, allowing for safer and more comfortable bicycling conditions.

Leadership

- **Shape national & international conversations on transportation research and education.**

Highlighted examples of how NITC researchers are leading the way:

Kelly Clifton's work on multi-modal trip generation has made a significant contribution to the state of the practice. Trip generation methods have always been challenged to provide adequate support for sustainable development and multi-modal transportation. Dr. Clifton and her team has been asked to participate in a number of national forums led by the Institute of Transportation Engineers, Caltrans and the National Association of City Transportation Officials (NACTO) on how to revise current methods in light of her research. Her work was included in the latest edition of the ITE Trip Generation Handbook. Additionally, her work on pedestrian modeling has received interest from across the globe. Her aim is to advance the analytical tools available for non-motorized modes in order to plan for the safety, health, and environment of all transportation system users. Dr. Clifton and her team have presented this work at numerous domestic and international conferences including the United Kingdom, Chile, and Portugal. Because the methods developed in this research are designed to integrate with existing demand modeling tools, the work has been well received by professional and academic audiences alike.

Bike share systems are sweeping the nation but there is also significant discussion on how access to and utility derived from bike share is not equitably distributed. Research from Nathan McNeil will shed light on which of these efforts have been most effective in getting people to use bike share, and what current barriers to bike share exist for these communities. Practitioners around the country will be able to use this information to better shape and direct their outreach and programming to be most effective to underserved communities.

Lisa Bates participated in an expert panel of reviewers convened to advise PolicyLink, an equity think tank, on its work linking health, housing displacement, and planning for projects like transit oriented developments.

One of the NITC education projects developed a course that exposes students to the use of location-based technologies for facilitating sustainable transportation. Location aware technologies such as smartphones are playing an ever increasing role in how commuters obtain information about transportation and how

transportation agencies in turn learn information about their riders. This course developed a curriculum that will be part of the bigger conversation on how to implement sustainable transportation and location aware technologies in the higher education classroom.

- **Serve on national committees and panels.**

- Faculty members and students at the five NITC member campuses currently serve on 72 TRB committees/task forces and 9 NCHRP/SHRP2/NCFRP/TRB panels.
- Twenty-five NITC faculty and staff serve on editorial, policy and other advisory boards.
- NITC staff are active in the AASHTO-RAC liaison group.
- NITC faculty are part of the team (led by ICF International) developing FHWA's Strategic Agenda for Pedestrian and Bicycle Transportation.
- NITC's Director, Jennifer Dill, serves on the Executive Committee of the Council of University Transportation Centers (CUTC) and the Board of Trustees for the TransitCenter.

- **Solving Regional and National Transportation Problems.**

The majority of NITC funded research works to solve a transportation problems that can have a direct impact at the regional and national level. Highlighted examples below will prove to have near immediate impact in communities across the county.

NITC researcher Krista Nordback focuses on bicycle and pedestrian counting and safety. She investigates metrics that best capture bicycle and pedestrian travel on roads and paths in both urban and rural areas. Her work has brought attention to the need for improved collision measures and a source of such information which is currently underused, count data. Her NITC research illustrates how such data can be aggregated and used to estimate annual bicycle and pedestrian volumes at locations where only short duration counts were collected. This information is critical for integrating bicycling and walking in to planning, design, operation, and maintenance systems which currently focus almost exclusively on motor vehicles.

Kelly Clifton's NITC funded research provides resources to local governments on how to better account for the travel demand of new development. Her work provides a methodology to better estimate vehicular trip generation when development is in urban contexts that support multimodal transportation. Her team has been asked to assist local governments in revising their transportation system development charges to better reflect sustainable priorities and a more equitable development pattern. Additionally, Dr. Clifton's team is now working with Caltrans to investigate travel demand associated with affordable housing. All of this work collectively contributes to solving transportation issues associated with supporting more sustainable and livable development patterns.

NITC staff are currently in the planning stages of The Transportation and Communities Summit (formerly the Oregon Transportation Summit) to be held on

September 8th and 9th, 2016 at Portland State University. The goal of the Summit is to educate professionals, advance the state of research and to facilitate a conversation between practitioners and researchers to shape future research.

Education and Workforce Development

- **Offer Degrees and Courses in Multiple Disciplines.**

The five-university consortium offers 13 graduate and 6 PhD degrees in transportation, closely related fields, and many dual degree options. Sixty undergraduate and 71 graduate level transportation-related courses are offered among the university.

- **Provide Experiential Learning.**

Our campuses continue to incorporate access to community partners and employment opportunities in a number of ways. The support for the student groups and student scholars are our priority method for accomplishing this goal.

The student groups are also active in hosting events and attending conferences. The University of Utah student group, Point B, hosted and/or participated in the following events during the reporting period:

- Fall Mixer
- Attended the National Walking Summit in Washington DC
- Attended the Transportation and Communities Summit at Portland State University
- Attended the National Association of Railroad Passengers' spring council meeting in Washington, DC.
- Transportation Research Board Annual Meeting
- Ride to Ogden on the light rail line
- S-Line Walk

The student group continues their partnership with the local WTS chapter and participates in the TransportationYOU program with middle school girls in the Sale Lake City area.

The University of Oregon student group, LiveMove, hosted and/or participated in the following events during the reporting period:

- Walk and Bike to School Day
- Eugene Bicycle Pedestrian Advisory Council Presentation
- Transportation Day
- ITE Oregon Traffic Bowl and student conference
- Lunch and Learn With Shane MacRhodes and Emma Newman
- LiveMove Member Happy Hour!
- Lunch and Learn! -- Move LA guru Denny Zane
- Speaker Series! – Gerik Kransky, BTA Advocacy Director

The Oregon Institute of Technology student group hosted and/or participated in the following events during the reporting period:

- NAPA Sustainable Asphalt Pavement conference, Portland
- Antlers Bridge Tour
- Annual civil engineering fall banquet
- ITE Oregon Traffic Bowl and student conference
- High School Traffic Safety Outreach at Klamath Union
- WTS Winter Gala
- Fern Valley Interchange Tour
- Transportation Research Board Annual Meeting
- ITE Western Student Leadership Summit
- Engineer's Week
- Guest Lecture: Dr. Robert Bertini
- Guest Lecture: Jared Jones

The Portland State University student, STEP, group hosted and/or participated in the following events during the reporting period:

- ITE Traffic Bowl Tryouts
- ITE Oregon Traffic Bowl and student conference
- Fall Social
- Transportation Research Board Annual Meeting
- TRB Aftershock!
- Monthly Young Transportation Professionals Happy Hours

The University of South Florida chapter of LiveMove hosted the following events during the reporting period:

- Ybor City Walk Tour
- Riverwalk Night Tour
- History Bike Tampa Ride

At Portland State University, the College of Urban and Public Affairs continues to offer the Pedestrian and Bicycle Planning Lab. The source provides the opportunity to participate in a workshop-based planning process and is taught by top professionals in the field of bicycle and pedestrian planning and design.

- **Develop Innovative New Curriculum.**

NITC supported curriculum development initiatives at the five campuses for the 2015 winter, spring and summer terms. These curriculum projects include the following:

- Introduction to Scientific Computing for Planners, Engineers, and Scientists, Liming Wang, Portland State University

- Graduate-level Civil Engineering Transportation Course Development- Oregon Tech, Roger Lindgren, Oregon Institute of Technology
- Pedestrian and Transit Oriented Design, Keith Bartholomew, University of Utah
- Multimodal Transportation Planning Curriculum for Urban Planning Programs, Kristine Williams, University of South Florida
- Advanced GIS: Smart Transportation, Chris Bone, University of Oregon

Education year two projects were awarded in August of 2015. These projects include:

- Dynamic Evaluation of Transportation Structures with iPod-Based Data Acquisition, Charles Riley, Oregon Institute of Technology
- Design for an Aging Population, Trygve Faste, University of Oregon
- Establishing Graduate Certificate in Sustainable Transportation, Keith Bartholomew, University of Utah
- Phase 2 Multimodal Transportation Planning Applications Curriculum for Urban Planning Programs, Kristine Williams, University of South Florida
- Pedestrian Observation and Data Collection Curriculum, Jennifer Dill, Portland State University

- **Educate Professionals.**

During the reporting period, NITC supported 24 events that offered 9 continuing education credits. A total of 1,073 people attended one of these events. Specifics of these events are detailed below.

- NITC hosted 6 webinars/seminars on funded research between October 2015 and March, 2016. These events were attended by practitioners and policymakers.
 - Transport Cost Index: A New Comprehensive Performance Measure for Transportation and Land Use, 38 attendees
 - Transportation Academy: Lessons from the Portland Traffic and Transportation course, 52 attendees
 - Crowdsourcing the Collection of Public Transportation Data, 35 attendees
 - Development of a Pedestrian Demand Estimation Tool, 68 attendees
 - Strategies and Perspectives on Balancing Freight and Livability, 56 attendees
 - Edged Out: Location Efficient Housing and Low Income Households in the Portland Region, 47 attendees (co-hosted as a Friday Transportation Seminar)

- Each Friday during the quarter, Portland State University holds a Friday Transportation Seminar that is open to the public. We do a live webcast of the event. The fall seminar and winter seminars had 871 non-student participants (primarily professionals) at either the in-person event or live webcast.
- **Attract and Support Undergraduate Students.**
The NITC program supports projects and initiatives that expose students to transportation concepts and careers. These efforts aim to attract and retain new undergraduate students to transportation-related degree programs and increase the number of women and students of color in these programs. Exposing these students to transportation concepts at a young age will eventually expand the workforce pool and diversity of new professionals.

NITC supports the following programs:

National Summer Transportation Institute Program

The National Summer Transportation Institute (NSTI) at Portland State is a free two-week day camp for 15 to 25 girls entering 9th through 12th grade. The program provides experiential learning on transportation that supports livable communities, connects high school girls with women in transportation-related fields and attracts young women from diverse backgrounds to transportation-related course work in their higher education pursuits. The program is currently in its planning phase. The NSTI program will be held from July 11th to July 22nd, 2016.

ChickTech Workshops

NITC supported researchers and PhD students are developing and hosting a workshop in May 2016 with the Portland chapter of ChickTech for high school girls interested in technology. ChickTech's high school program focuses on events that pose engineering challenges to get girls excited about technology. The program breaks down stereotypes and provides opportunities to encourage girls to consider technology-based fields. The Portland State workshop, led by Sirisha Kothuri (research associate) and Kristi Currans (civil engineering Ph.D. student), focuses on engineering concepts and basic transportation modeling.

Transportation YOU events

Both the University of Utah and Portland State University partner with local WTS Transportation YOU chapters. Transportation YOU is a hands-on, interactive, mentoring program that introduces girls ages 13 to 18 to a wide variety of transportation careers. Both the NITC funded student group Point B at the UU and NITC staff design and host an after-school activity at a Transportation YOU middle

school annually. NITC staff hosted a pedestrian audit for the 2016 TransportationYou school in Portland, Oregon on March 3rd, 2016.

Investigations in Transportation

NITC supported the development of a program called “Investigations in Transportation,” a collaboration with the Portland Metro STEM Partnership. The program includes curriculum development and implementation in Portland area elementary classrooms. The curriculum applies science inquiry, engineering design and mathematical practices to transportation-related topics and directly addresses Next Generation Science Standards and Common Core State Standards.

- **Attract and Support Graduate Students.**

During the 2015-2016 academic year, NITC has awarded scholarships to support student-led research projects. Eighteen scholarships went to Portland State University, 2 to University of Oregon, 7 to University of Utah, 7 to the Oregon Institute of Technology and 2 to the University of South Florida. Each student who receives a NITC scholarship develops a research product (such as a thesis or conference paper) that fits within the NITC themes.

During the reporting period we solicited proposals for the Fall 2015 and Spring 2016 Dissertation Fellowship program. We awarded fellowships to the following PhD candidates:

- Tara Goddard at the Toulon School of Urban Studies and Planning, Exploring Drivers’ Attitudes and Behaviors toward Bicyclists: The Effect of Explicit and Implicit Attitudes on Self-Reported Safety Behaviors
 - Kristina Currans at Maseeh College of Engineering & Computer Science, Data and Methodological Issues in Assessing Multimodal Transportation Impacts for Urban Development
 - Patrick Singleton at Maseeh College of Engineering & Computer Science, Exploring the positive utility of travel and mode choice
- **Sponsor a Transportation and Livable Communities Student Competition.** NITC staff have been working with leaders from the student groups to develop a student video competition for the fall of 2016 in conjunction with the Transportation and Communities Summit.

Technology Transfer

- **Move Research into Practice.**

Twenty presentations on NITC National research reaching 1349 people have been given at professional and trade conferences.

- **Use Innovative Approaches to Communicate Research Results.**
12% of the NITC website traffic was generated by social media. Most of this traffic came through two social media, Twitter and Facebook. Twitter accounted for the majority of social traffic, just over 50 percent, with Facebook following at 36 percent. LinkedIn came in third, at 7 percent. Other referrers included Blogger and Disqus (2 percent); and Naver, Weebly and Reddit (1 percent each).

Visitors arriving via social media stayed active longer than our other visitors. Those arriving through Twitter stayed on the site 1 minute, 43 seconds per visit, slightly longer than the overall site average of 1 minute, 40 seconds. Those arriving through Facebook stayed 2 minutes, 13 seconds.

Collaboration

- **Collaborating within our consortium.**
The Executive Committee met via conference call on December 14th. An in-person meeting is scheduled at the University of Utah campus on June 21st, 2016.
- **External collaboration.**
The following people and organizations were members of the NITC Advisory Board during this reporting period:
 - Alan Lehto, Director of Planning & Policy, TriMet
 - Brian Saelens, Professor of Pediatrics and Psychiatry & Behavioral Sciences, Seattle Children's Hospital
 - Cameron Kergaye, Director of Research, Utah DOT
 - Charles Pattison, Policy Director, 1000 Friends of Florida
 - Craig Honeyman, Legislative Director, League of Oregon Cities
 - Gabe Rousseau, Safety Operations Team Leader, FHWA
 - James Christian, Division Administrator, FHWA-Utah Division
 - Jon Peterson, Research Manager, Washington Department of Transportation
 - Kevin Desmond, General Manager, King County Metro Transit
 - Matthew Hardy, Program Director, Policy and Planning, AASHTO
 - Michael Baltes, ITS Program Manager, Office of Mobility Innovation, Federal Transit Administration
 - Michael Bufalino, Research Section Manager, Oregon Department of Transportation
 - Robin Hutcheson, Director, Transportation Division, Salt Lake City
 - Susan Handy, Director, National Center for Sustainable Transportation
 - Susan Herbel, Principal, Cambridge Systematics
 - Ted Knowlton, Sustainability Director, Wasatch Front MPO
 - Ted Trepanier, Director of Product Management, Traffic, Inrix
 - Tom Schwetz, Planning & Development Manager, Lane Transit District
 - Tyler Deke, Executive Director, Bend MPO
 - Wayne Kittelson, Founding Principal, Kittelson & Associates, Inc.

- Wendy Cawley, Traffic Safety Engineer, Portland Bureau of Transportation
- Yin Hai Wang, Director, PacTrans

Diversity

- **Attract underrepresented students to transportation careers.**
One of the key objectives of the 2016 summer program is to attract underrepresented students to transportation careers. The partnership with Oregon MESA is critical in developing an outreach plan to attract young women and students of color. The weeklong residential program will also be at no cost to the participants in order to reduce any financial barrier to participation. NITC's partnerships with WTS Portland and ChickTech focuses on attracting female students to the transportation workforce. NITC also provides grants to faculty who wish to include an underrepresented, undergraduate student in their research project.
- **Priority funding to research with an equity focus.**
Two of our Year 1 projects address equity issues. The research project Encouraging Low-Income Households to Make Location-Efficient Housing Choices and Developing a model for Transit Oriented Development in Latino Immigrant Communities are in progress.

Five of the Year 2 projects address equity issues. These research projects include:

- Integrating Title VI and Equitable Investment in Transportation Alternatives into the MPO Transportation Planning Process
- Racial Bias in Drivers' Yielding Behavior at Crosswalks: Understanding the Effect
- What do we know about Location Affordability in U.S. Shrinking Cities?
- Evaluating Efforts to Improve the Equity of Bike Share Systems
- Planning ahead for livable communities along the Powell-Division BRT: neighborhood conditions and change

How have the results been disseminated?

Three projects from the Year One research program are complete. The PIs of these projects presented the results at 10 conferences and reached nearly 600 fellow academics, practitioners and policy makers.

Co-PI and former NITC scholar, Alex Carroll presented on the NITC project Integrating Freight into Livable Communities at a March, 31st, 2016 webinar focused on freight innovation.

Andree Tremoulet presented at the Friday Transportation Seminar on her NITC research, Location Efficient Housing and Low Income Households in the Portland Region on March 3rd, 2016.,

What do you plan to do during the next reporting period to accomplish the goals?

Expected highlights for the next reporting period include:

- Selection of Year 3 General Research projects
- Selection of Summer 2016 Dissertation research awards
- Publish Year 1 research reports and disseminate findings
- Organize 2016 Transportation and Communities Summit

2. PRODUCTS: What has the program produced?

Publications, conference papers, and presentations

Twenty presentations on NITC National research reaching 1349 people have been given at professional and trade conferences. Eight articles have been published in academic journals and one article has been published in a trade publication.

Website(s) or other Internet site(s)

The website for NITC is located here: <http://nitc.us>

Technologies or techniques

Nothing to report for this period.

Inventions, patent applications, and/or licenses

Nothing to report for this period.

Other products

Nothing to report for this period.

3. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS: Who has been involved?

What organizations have been involved as partners?

The members of the consortium include Portland State University, University of Oregon, Oregon Institute of Technology, University of Utah, and the University of South Florida. Each NITC-funded research project is required to have 120% match. Match partners for current Year 1 and Year 2 projects include the following:

- American Automobile Association
- City of Flagstaff
- Cleveland State University
- District Department of Transportation
- Florida Department of Transportation
- Greater Cleveland Regional Transit
- Hillsborough County MPO
- Intel
- Lane Transit District

- NACCO Industries
- Natural Resources Defense Council
- Northern Arizona University
- Oregon Department of Transportation
- Oregon METRO
- Portland Bureau of Planning and Sustainability
- Portland Bureau of Transportation
- People for Bikes
- Tampa Bay Network to End Hunger
- Transportation for America
- University of California, Davis
- University of Colorado, Denver
- University of Arizona
- Utah Transit Authority
- Vancouver Housing Authority

Have other collaborators or contacts been involved?

Nothing to Report for this period.

4. IMPACT: What is the impact of the program? How has it contributed to transportation education, research, and technology transfer?

What is the impact on the development of the principal discipline(s) of the program?

Nothing to Report for this period.

What is the impact on the development of transportation workforce development?

NITC continues to lead the education of the current and next generation of bicycle and pedestrian professionals. There is widespread recognition that transportation planning and engineering courses lack multimodal topics, and traditionally focuses on the design of the transportation for vehicles. The bike-ped topics workshop trains university faculty to help them expand their curriculum to include multimodal topics. This is essential to helping update outdated curriculum. Further, NITC faculty and students were recently tapped to write the chapters on Pedestrian and Bicycle Transportation in the 2015 release of *The Routledge Handbook of Transportation*. As it relates to existing professionals, NITC's support of continuing education workshops for transportation professionals who work on bicycle and pedestrian transportation is another way of ensuring that the latest research results get into the hands of practitioners. For example, much of the applied research relating to bicycle infrastructure safety and similar topics are directly shared with practitioners in these workshops who then use this information to help design better bicycle facilities in their communities.

What is the impact on physical, institutional, and information resources at the university or other partner institutions?

Nothing to Report for this period.

What is the impact on technology transfer?

During the reporting period, NITC supported 24 events that offered 9 continuing education credits. A total of 1,073 people attended one of these events.

What is the impact on society beyond science and technology?

Nothing to Report for this period.

5. CHANGES/PROBLEMS

Changes in approach and reasons for change

Nothing to Report for this period.

Actual or anticipated problems or delays and actions or plans to resolve them

Nothing to Report for this period.

Changes that have a significant impact on expenditures

Nothing to Report for this period.

Significant changes in use or care of human subjects, vertebrate animals, and/or biohazards

Nothing to Report for this period.

Change of primary performance site location from that originally proposed

Nothing to Report for this period.

Additional information regarding Products and Impacts

Nothing to Report for this period.