



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

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

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

The information provided in this section allows the OST-R 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?**

The following progress was made under each of the above state goals.

#### *Research*

- **Build and extend our current research through Year 1 Projects.**

Thirteen projects were selected for NITC National Year 1 funding. Of these projects, ten projects have been completed of which two are being prepared for publishing on NITC's website. One project was cancelled, because the PI passed away and the necessary expertise was not anymore available at the university to complete the project. (See [Appendix](#) for project list.)

- **Competitive, peer-review project selection process in Year 2**

Sixteen projects were selected for NITC National Year 2 funding. Of the funded projects, nine projects have been completed and are currently in different stages of the publishing process. The remaining five projects are, on average, 71% complete.

NITC also issued a call for Small Starts research proposals. The purpose of the Small Starts grant is to assist researchers who are interested in transportation but have not yet had an

opportunity to undertake a small project that supports safe, healthy, and sustainable transportation choices to foster livable communities. Four Small Starts projects were funded, and all projects are completed, three are already published and one is awaiting final revisions prior to its publication on NITC's website. (See [Appendix](#) for project list.)

- **Competitive, peer-review project selection process in Year 3**

Eleven projects were selected NITC National Year 3 funding. Of these projects, one is completed and the remaining 10 are, on average, 64% completed. (See [Appendix](#) for detailed list.)

Two Small Starts projects were selected in September 2016 and started in November 2016. One project provides Autumn Shafer, UO, the opportunity to apply her expertise in communication and persuasion in the field of transportation. The objective of her project is to identify age-appropriate communication strategies and tactics to increase the interest of youth in transportation systems. The second project allows engineering faculty, Matthew Sleep, from the Oregon Tech to assess if Mt. Mazama volcanic ash can be used as an environmental neutral and economic beneficial alternatives to Portland cement to repair and stabilize roads in the Klamath Basin. These projects are, on average, 63% completed.

- **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. Specifically, it 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 project **Contextual Guidance at Intersections for Protected Bicycle Lanes**. In response to the RFP, two proposals were received from teams at our NITC partner campuses. The technical advisory committee, consisting of members from partner cities, selected the proposal of Portland State's team, lead by Civil and Environmental Engineering Chair, Professor Christopher Monsere that also includes Nathan McNeil from Urban Studies and Planning.

The goal of this research is to 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. To this end, the research will identify the context in which the intersection treatments are most effectively employed as well as the critical elements and dimensions of each treatment so the design treatments can achieve a uniformity and level of standardization across jurisdictions.

The project is currently 65% percent completed and has made significant progress towards its goal. The team has completed a comprehensive inventory of protected bike lanes and bus stops in Salt Lake City, Denver, Portland, Seattle and Chicago. These data provide an

inventory of design options the team has used to identify design variations and generate a data collection and analysis tool plan.

Using this framework, the team has moved towards data collection and building research analysis tools. The key focus here is to identify treatment characteristics that may impact user comfort levels, including comfort for different cyclists and potential cyclists. To this end, observational video has been collected in Salt Lake City, Denver, and Portland for further analysis. The team has also developed a survey that will gather data from cyclist and potential cyclists for further input. To support the surveys, videos were collected from Salt Lake City, Denver, Portland and Seattle. The survey has been approved by the Institutional Review Board and will be launched once it is finalized. In addition, a base simulation model has been developed.

Lastly, NACTO has invited the team to discuss protected bicycle lane intersection as part of the Cities 4 Cycling committee meeting.

### *Leadership*

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

Highlighted examples of how NITC researchers are leading the way:

Traditionally the discussion about affordability has focused on housing, but HUD's Location Affordability Index (LAI), released in 2012, helped to elevate the conversation by expanding the focus to include households' transportation costs. Yet, the applicability of the LAI, particular to previously dense urban areas that have experience significant population loss, has not yet been tested. Joanna Ganning, UU, set out to take a closer look at the index in her NITC project: **What do we know about Location Affordability in US Shrinking Cities?** Her report shows the transportation costs estimated by the LAI cannot be reproduced, and partially depend on data that are either not publicly available or have unacceptably large margins of error. In addition, survey results conducted in Cleveland, OH, indicate the LAI over-estimates transportation costs by as much as 100%. Regardless, households struggle with unaffordable costs in shrinking cities, often giving up necessities or under-paying or not paying bills to pay for transportation and housing. Furthermore, transit agencies in shrinking cities face a difficult challenge in connecting workers to jobs in a region with a stable or declining population and persistently suburbanizing jobs, pushing the transit service area farther from the core. The report provides policy recommendations to help transit authorities overcome these obstacles, such as ridesharing and van pools, bike share programs and better bicycle and pedestrian infrastructure.

Driving and stopping involve fast-paced decisions, rife with distractions, and may be perceived as discretionary, which are conditions under which implicit attitudes can be predictors of behavior. Kimberly Kahn, a psychologist and NITC-supported researcher from PSU, set out to examine to what extent implicit bias influences the stopping behavior of drivers. Her NITC Small Starts project (Tier 1 funded) revealed a racial bias in stopping behavior of drivers: Black pedestrians were passed by twice as many cars and experienced wait times that were 32% longer than White pedestrians. A more extensive follow-up study supported by this grant (**Racial Bias in Drivers' Yielding Behavior at Crosswalks:**

**Understanding the Effect**) replicated her previous findings. Furthermore, it added some striking details: Female pedestrians were more likely to have the first car stop for them than male pedestrians. More cars passed by black men in particular. With a black pedestrian, cars were also more likely to stop after the stop bar, infringing on the pedestrian's crossing space. With white pedestrians, the cars were leaving more of a buffer for the pedestrian to safely cross. The important implication of this study is that the differences in stopping behavior may reflect implicit biases of drivers. Safety designs should therefore consider this potential bias. Installing signals like rectangular rapid flash beacons could aid by making drivers feel more compelled to stop for everyone, thereby reducing the effects of racial and gender biases on decisions to yield.

Most NITC research engages graduate students with the goal of training future transportation professionals. Tara Goddard, a graduate student involved in Kahn's research, was inspired by her work and chose to study implicit bias and social psychology as it relates to transportation behavior as part of her dissertation research. Goddard's dissertation, **Exploring Drivers' Attitudes and Behaviors toward Bicyclists**, measured drivers' explicit attitudes and self-reported behaviors, and then used methods drawn from psychology to test drivers' subconscious biases about bicyclists. Not surprisingly, one result from her dissertation was that drivers who sometimes biked for transportation themselves had more positive attitudes about cyclists on the roads. A finding that was less predictable, however, was that trip purpose of these cyclists made a big difference. Commuting or running errands by bike improved people's attitudes while recreational bike riding did not. Frequent bicycling—at least once a week—also made a significant difference in drivers' attitudes. Hence, weekly bicycling can make people safer drivers.

Research by Kahn and Goddard stands to improve practitioners' ability to create safer pedestrian and travel environments by providing a more robust understanding of the underlying psychology behind driving decisions. The significance of this work has already been recognized as Kahn has been selected to be a distinguished speaker at the symposium "Status and Stigma: Multi-Method Perspectives on Race and Gender" as part of the Society for Personality and Social Psychology (SPSP)'s Annual Convention that will be held in Atlanta, Georgia, in March of 2018. Goddard's research was supported by a NITC dissertation fellowship and an Eisenhower fellowship. She graduated with her Ph.D. in the Spring of 2017 and has since moved on to the Texas A&M University in College Station, TX, as an Assistant Professor.

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

- Faculty members and students at the five NITC member campuses currently hold 70 TRB volunteer memberships and serve on 44 different TRB committees/task forces and 12 different NCHRP/SHRP2/NCFRP/TRB panels. Four faculty members serve as Chair or Co-Chair on panels or committees.
- Forty-four 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) that developed 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 Transit Center.

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

The majority of NITC research works to solve 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.

While the number of public bike share systems in the United States grew considerably in recent years, early evidence indicated that many systems were not serving the diverse populations of cities, particularly lower-income residents and people of color. Nathan McNeil, Jennifer Dill and John McArthur, PSU, conducted a large scale study **Evaluating Efforts to Improve the Equity of Bike Share Systems** that involved surveying the stakeholders of bike share, operators, users and residents, to better understand the barriers to ride. Their study included surveys of people living in lower-income communities of color in Philadelphia, Chicago, and Brooklyn, including many people who are not currently using bike share. Their findings provide insights into what strategies can be effective in attracting new and diverse users, and what benefits bike share can offer these potential participants. This is the first comprehensive study addressing equity in bike share and will be instrumental in shaping the implementation of bike share nationally.

The goal of the project, **Impacts of Bus Rapid Transit (BRT) on Surrounding Residential Property Values**, led by Victoria Perk and Martin Catalá of the Center for Urban Transportation Research, USF, in partnership with Lane Transit District and the Florida Department of Transportation, was to provide a more robust understanding of how BRT services in the U.S. affect surrounding residential property values. The team found that the EmX line had a statistically significant positive impact on property values, which stands to benefit the community as a whole: The related taxes can be used to pay for transportation and other infrastructure, further enhancing the economic development of the community. These related benefits, referred to as 'marginal effects,' have a positive impact on the livability of the community. This research shows that the closer a residence is to a BRT station, the greater the marginal effects on its estimated sale price. The project is significant on a national scale because it is only the third U.S. study on this particular topic for the BRT mode within the last ten years. Two other relatively recent econometric studies using similar techniques have been published on BRT systems in Pittsburgh and Boston; this study represents the first of its kind on the West Coast.

In the NITC report, **The Economic and Environmental Impacts of Smart-Parking Programs**, researcher Nicole Ngo, UO, investigate the effects of the demand-responsive pricing program on transit usage and congestion. The study focused on metered, on-street parking and used the timing of SFpark's pricing changes as a natural experiment. Researchers observed effects on three important aspects of urban transportation: parking availability, transit bus ridership and congestion. Results show that SFpark was effective at reducing parking occupancy range; since the program's implementation, more areas met the target occupancy range of 60-80%. Ngo also found the program affected transit ridership. An increase in meter rates was associated with a modest increase in ridership, suggesting

people are substituting between transit and non-transit travel and that meter rates factor into mode choice. These results have important implications for transportation policy as cities continue to expand and implement demand-responsive pricing programs globally.

#### *Education and Workforce Development*

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

The five-university consortium offers 11 bachelor, 15 graduate and six PhD degrees in transportation, closely related fields as well as seven dual degree options. Two of the degree programs offered by the University of Utah receive support from another USDOT funded UTC program. During the 2016-2017 academic year, 81 undergraduate- and 73 graduate-level transportation-related courses were offered among the universities that reported a total of 1,907 undergraduate and 634 graduate enrollment.

- **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. During this reporting period, the following student group events and activities were supported by NITC funding.

The **UU** student group, **Point B**, utilized student funds to support a workshop and student attendance at conferences:

- Point B organized a regional workshop on designing protected bike intersections that was co-sponsored with WTS and Salt Lake City (27 attendees)
- Two students attended the Mountain Town & Resort Planners Summit in Jackson Hole
- One student presented at the George Wright Society annual conference in Norfolk, VA
- Six students were able to attend the APA National Planning Conference in New York

The **UO** student group, **LiveMove**, organizes a diverse range of events to connect students and the public with professionals that focus on sustainable transportation. During this reporting period, the group hosted seven events:

- Q & A and bike ride with Jeff Tumlin (10 students)
- Screening of the Ovarian Psycos Bicycle Brigade Documentary followed by a Q&A with Ova Core (25 students)
- Organized a Kidical Mass bike ride to celebrate 9 years of family biking in Eugene, OR (30 students; co-sponsored with Safe Routes to School)
- Five students attended the American Planning Association conference in New York
- Two Planner's Pub sessions allowed students to learn from local planners and include discussions with:
  - Members of the Resource Assistance for Rural Environments (RARE) Program (25 students)
  - Rob Inerfeld (20 students)
- End of Year Event, a social gathering of student group members (15 students)

The **Oregon Tech** student group, **ITE**, organized, hosted, or supported student attendance at several events:

- Klamath Falls Bike/Walk to work day, a community outreach activity that was co-sponsored by Blue Zones Project and Sky Lakes Medical Center (16 participants)
- Students attended three webinars:
  - Converting paved roads to unpaved roads. Rural Road Safety Center (8 students)
  - Concrete pavement structures and foundations (7 students)
  - Prediction of Thermal Behaviors of Pervious Concrete Pavements in Winter (5 students)
- Students to attend two conferences:
  - WTS Annual Meeting NY, NY (2 students)
  - NITC's Transportation and Communities Summit, Portland, OR (2 students)
- Students hosted a luncheon meeting with a presentation and Q/A featuring guest speakers Miranda Barrus, a Oregon Tech graduate, and Matt Kittelson from Kittelson Associates (28 students)

The **PSU** student group, **STEP**, hosted and/or supported student attendance at the following three events:

- A showing of Nova's special "Super Tunnel" brought students together to consider and discuss the restrictions and challenges of transportation planning and engineering, specifically those encountered in London during the building of Cross Rail (20 students)
- Ice cream social & transportation discussion with the focus on encouraging the mingling of students from engineering and planning fields (20 students)
- Two students attended the ITE Western District Annual Meeting in San Diego, CA, presented their research and participated in the regional traffic bowl competition

At **PSU**, the College of Urban and Public Affairs continues to offer the Pedestrian and Bicycle Planning Lab. The lab 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.

The **USF** chapter of **LiveMove** used the funds to host an event and supported student attendance at a conference:

- A Roundabout, Walkabout, Bikeabout, Driveabout Tour was conducted in conjunction with a transportation planning course to examine multi-modal transportation planning at key locations in Tampa. LiveMove members, along with CUTR Director Robert Bertini, attended the tour and examined areas with successful implementation of upgrades to streets to accommodate pedestrians, bicyclists, and transit users (17 students)
- Four students attend the American Planning Association National Planning Conference in New York

- **Develop Innovative New Curriculum.**

In Year 1 and Year 2, ten education projects were awarded. Of these projects, nine projects are completed, and the last project is currently undergoing final revisions. Three education projects were funded in the summer of 2016 (Year 3) and are, on average, 60% completed (*see [Appendix](#) for project list*).

- **Educate Professionals.**

During the reporting period, NITC supported 23 events offering 149.5 professional development hours. The events are detailed below:

Each Friday during the academic year, PSU holds a **Friday Transportation Seminar** that is open to the public and is streamed live on-line. During this reporting period, PSU held 10 Friday seminars that were attended (in-person or live-streamed) by 830 individuals, including 457 non-student participants, primarily professionals.

NITC hosted five **webinars** on funded research between April 1<sup>st</sup>, 2017 and Sept. 30<sup>th</sup>, 2017. The webinars attracted 529 attendees, primarily practitioners (fig. 1).

- Economic Impacts of Bike Improvements, Jenny Liu, PSU (91 attendees)
- Dynamic Structural Evaluation, CJ Riley, Oregon Tech (18 attendees)
- Land Use Mix and Pedestrian Travel Behavior, Steve Gherke, PSU (121 attendees)
- Bike Share Equity, Nathan McNeil, PSU (154 attendees)
- Parking, transit usage and congestion: Evidence from SFpark, Nicole Ngo, UO (96 participants)

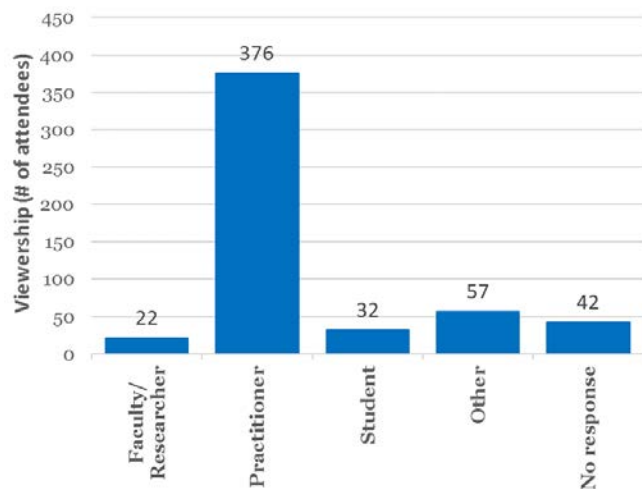


Fig. 1. Number of individuals attending the NITC webinars hosted during this reporting period.

The **Initiative for Bicycle and Pedestrian Innovation (IBPI)** at PSU sponsored three workshops during the summer of 2017 that were attended by 55 practitioners or faculty:

- Small Town and Rural (STAR) guide Training, Bend, OR, that provided comprehensive training on FHWA’s Small Town and Rural Multimodal Networks Guide (23 attendees)
- Integrating Bike-Ped Topics into University Transportation Courses drew attendees from across the country (13 attendees)
- Comprehensive Bikeway Design 2.0 that was attended by faculty from across the county, Canada and Columbia, South America (19 attendees)

PSU offered a two-week **data science course**, Aug 23 – Sept 1, 2017, that met for four hours each day and was attended by 11 professionals. The course was developed and taught by Liming Wang and funded by a NITC Education grant. Its topics included best practices in scientific computing (Part 1) and the design and implementation of data analysis pipelines in R, an open-source programming language and software environment for statistical computing (Part 2). The materials for this course are hosted on Github, an open source software that provides free access to all course materials (see <https://cities.github.io/datascience2017/>).

NITC's 9<sup>th</sup> annual **Transportation & Communities Summit (TCS)** was held on September 11-12, 2017 on the PSU campus. TCS was attended by 268 practitioners, policy makers and researchers and 47 students. The first day offered participants a selection of nine breakout sessions, each focusing on a timely transportation topic. During each session, speakers presented a talk relevant to the session topic and a moderator facilitated the Q&A during or after the presentations. In addition, a poster session featured 16 posters presented by practitioners, faculty or students. A PechaKucha session used a new, fast-paced-storytelling approach to present six additional presentations that addressed a mix of transportation topics. In her keynote address, the generational expert Hannah Ubl offered insights into how to motivate and communicate across generations and offered strategies for conflict resolution and peer management for Millennials, Generation Xers and Baby Boomers in the transportation workforce.

The second day of TCS included three full-day and four half-day workshops that were attended by a total of 116 participants. Topics consisted of:

- Using novel data sources to support transportation planning and analysis
- Walk, don't run? Advancing the state of the practice in pedestrian demand modeling
- Data Analysis for Smarties who Forgot what they Learned in College
- Community Engagement: Strategies to design your path to success
- Systemic Safety Analysis: A comprehensive method for safety planning and implementations
- Tactical Urbanism

- **Attract and Support Undergraduate Students.**

NITC recognizes that transportation workforce development does not always take place at the university level. Students' interest in transportation can start much earlier, which is why NITC aims 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. As a result, NITC continues to offer two programs that provide high school students the opportunity to gain technical skills and explore different topics in transportation:

- **ChickTech Workshops.** NITC developed and hosted its first Chicktech workshop in May 2016 with the Portland chapter of ChickTech for high school girls. ChickTech's high school program focuses on events that pose engineering challenges to get girls excited about technology. NITC's workshop combined an introduction to GIS with solving a transportation problem to expose girls to opportunities in the transportation field. To help breaking down stereotypes, the program is taught by women in the field.
- **National Summer Transportation Institute (NSTI).** NSTI provides experiential learning of topics in transportation that support 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 was first offered last summer at PSU as a free two-week day camp for 15 to 25 girls entering 9th through 12th grade. For 2017, NITC

expanded the program by offering it statewide, making it a 2-week residential program and partnering with Oregon Institute and Technology and the UO to assist with outreach and recruitment.

NITC's workforce and education development manager, Lisa Patterson, focused during this reporting period on identified additional K-12 outreach opportunities that educate students about career opportunities in transportation. Specific outcomes related to these events as well as the above programs are detailed in the [\*Diversity: Attract underrepresented students to transportation careers.\*](#)

- **Attract and Support Graduate Students.**

During the 2016-2017 academic year, NITC continued to award scholarships to support student-led research projects. To date, NITC has awarded 102 scholarships, including 50 awarded to students at PSU, 19 to the UO, 13 to UU, 14 to Oregon Tech and five to USF. Each student who receives a NITC scholarship develops a research product (such as a thesis or conference paper) that fits within NITC themes.

NITC funded four Ph.D. fellowships through this grant. Three dissertation fellows have successfully defended their dissertation in the spring or summer of 2017 and have moved on to tenured track positions at the University of Arizona in Tucson, AZ (Kristina Currans), Texas A & M University in College Park, TX (Tara Goddard) and Utah State University in Logan, UT (Patrick Singleton).

#### *Technology Transfer*

- **Move Research into Practice.**

NITC researchers gave 75 presentations on their NITC funded research at professional and trade conferences reaching 9732 people. This research has been published in 21 peer-reviewed journal articles and as five publications in trade journals or on professional or agency websites.

- **Use Innovative Approaches to Communicate Research Results.**

NITC uses its website, Twitter (2,529 followers), Facebook (570 followers), LinkedIn (61 followers) and YouTube (372 subscribers) to communicate and promote center specific events, research results and to raise awareness of important transportation issues and findings. For example, publications of NITC reports are promoted using Twitter and LinkedIn, and these platforms as well as Facebook are used to promote events and other activities. YouTube is used to host videos from recorded seminars and webinars as well as promotional videos.

During this reporting period, the NITC website was visited 10,313 times. Users initiated sessions primarily by navigating directly to the NITC website (45%) or by entering relevant search terms into their browser (36%). Social media generated 9% of visits to the NITC website, with nearly all social referrals coming from Facebook (58%) or Twitter (40%). Facebook saw a larger number of new users than Twitter (57% versus 40%), a pattern opposite what we have seen during previous reporting periods. Facebook and Twitter users visited about the same number of pages (2.06 & 2.14, respectively), but Facebook users

stayed on the site longer than Twitter users (2:30 versus 1:59 min.). The site-wide average session lasted 2 minutes, 15 seconds.

### *Collaboration*

- **Collaborating within our consortium.**

As NITC is moving to closing out this grant, the focus has been towards guiding PIs towards successful completion of their projects. As a result, most communication between the Executive Committee regarding this grant has occurred via email, because more extensive discussions of programmatic or administrative issues were not necessary.

- **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  
Michael Baltes, ITS Program Manager, Office of Mobility Innovation, Federal Transit Administration  
Michael Bufalino, Research Section Manager, Oregon Department of Transportation  
Wendy Cawley, Traffic Safety Engineer, Portland Bureau of Transportation  
Tyler Deke, Executive Director, Bend MPO  
Susan Handy, Director, National Center for Sustainable Transportation  
Matthew Hardy, Program Director, Policy and Planning, AASHTO  
Susan Herbel, Principal, Cambridge Systematics  
Craig Honeyman, Legislative Director, League of Oregon Cities  
Cameron Kergaye, Director of Research, Utah DOT  
Wayne Kittelson, Founding Principal, Kittelson & Associates, Inc.  
Ted Knowlton, Sustainability Director, Wasatch Front MPO  
Brian Lagerberg, Director, Public Transportation Division, WSDOT  
Alan Lehto, Director of Planning & Policy, TriMet  
Ivan Marrero, Division Administrator, Utah Division, Federal Highway Administration  
Gabe Rousseau, Safety Operations Team Leader, FHWA  
Brian Saelens, Professor of Pediatrics and Psychiatry & Behavioral Sciences, Seattle Children's Hospital  
Tom Schwetz, Planning & Development Manager, Lane Transit District  
Ted Trepanier, Director of Product Management, Traffic, Inrix  
Yinhai Wang, Director, PacTrans

### *Diversity*

- **Attract underrepresented students to transportation careers.**

NITC is committed to recruit underrepresented students into transportation careers. In pursuit of this goal, NITC offered the following activities and programs during this reporting period:

**K-12 Outreach.** NITC's workforce and education development manager, Lisa Patterson, gave a transportation careers presentation to 40 high school students (sophomores and juniors), who are part of the Upward Bound (UB) program at PSU. UB is a college preparation

program for high school students that serves low income, first generation high school students. Ms. Patterson also used an information table during MESA Day 2017 to drum up support for NITC's high school workshops and to provide students information about opportunities in transportation. MESA Day is an event designed to attract middle and high school students to science, technology and engineering career and is an ideal platform to reach students. The event was attended by 300 students this year.

**Chicas Workshop.** The Chicas Youth Development Program (Chicas) offered a summer camp focused on providing Latina youth an opportunity to explore and discover different forms of education to further their goals and motivation of higher education. Lisa led a transportation workshop that reached 75 students, including elementary, middle, and high school students. Based on their grade level, they had the opportunity to engage in different aspects of transportation. Activities ranged from brainstorming about modes of transportation, drawing magic versions of modes that solved specific problems, creating maps routes to their school, to discussing transportation career options and the steps needed to pursue them.



**ChickTech Workshop.** Kristina Currans (on left with a student) and Sirisha Kothuri from PSU and Becky Hewitt and Kyra Schneider of Angelo Planning Group gave high school girls a GIS “crash” course. This included showing the girls how to use vehicle crash data from the City of Portland to do spatial mapping and analysis using ArcGIS. Once the girls acquired adequate skills, they were challenged to create their own Google maps. A total of eight girls participated in the workshop, who came from different high schools in the Portland Metro area. This is the second time Drs. Currans and

Kothuri taught this workshop. They are both previous NITC dissertation fellows with PhDs in Civil and Environmental Engineering, making them perfectly poised to show high school girls the possibilities of higher education in transportation.

**National Summer Transportation Institute.** The weeklong residential program immersed 19 teenage girls from high schools across the Portland Metro area and Willamette Valley in transportation topics and problems via lectures, tours, city outings, projects, and other group activities. Female practitioners and other transportation professionals helped break down stereotypes and shared their expertise with the girls during guest lectures and tours. The final project at the end of the program allowed the girls to dig deeper into a transportation topic of their own choice. For example, NISTI students, Josselyn Studer (on right), Isabella Grundseth and Nova Huynh, designed a double-decker, low-emission, electric hybrid TriMet bus. In addition to researching the cost efficiency, secondary effects and multi-level benefits of their





proposed vehicle, they also researched the related legislation and found American manufacturers to help the transit agency meet purchasing requirements.

NITC is also continuing its partnerships with WTS Portland with a focus on attracting female students to the transportation workforce.

NITC continues to provide grants to faculty who wish to include an underrepresented, undergraduate student in their research project.

- **Priority funding to research with an equity focus.**

Eight NITC projects directly address equity issues. All but one of these projects have been completed.

- Encouraging Low-Income Households to Make Location-Efficient Housing Choices Developing a model for Transit Oriented Development in Latino Immigrant Communities (*published*)
- Planning ahead for livable communities along the Powell-Division BRT: neighborhood conditions and change (*published*)
- What do we know about Location Affordability in U.S. Shrinking Cities? (*published*)
- Integrating Title VI and Equitable Investment in Transportation Alternatives into the MPO Transportation Planning Process (*awaiting publication*)
- Racial Bias in Drivers' Yielding Behavior at Crosswalks: Understanding the Effect (*published*)
- Evaluating Efforts to Improve the Equity of Bike Share Systems (*completed, final report in preparation*)
- Evaluating and Enhancing Public Transit Systems for Operational Efficiency, Service Quality and Access Equity (*active*)

### **How have the results been disseminated?**

To date, NITC has published 28 final research reports on its website. For 16 of the research reports, NITC also creates a project brief that summarizes its key components, findings and recommendations in a one-page document designed for practitioners and policy makers. Project briefs provide the reader quick access to the essential components of a report and are also used to promote the research at events and via social media.

In addition to the final reports, this research has also been published in 21 in peer-reviewed academic journals and in seven trade publications or on professional/agency websites. NITC researchers gave 75 presentations at conferences that reached nearly 9,732 fellow academics, practitioners and policy makers.

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

Expected highlights for the next reporting period include:

- Publication of research reports
- Promote NITC final reports through social media and webinars
- Identify and implement specific research results with partner agencies
- Organizing the 2018 Transportation and Communities Summit

- Highlights from the TRB 2018 meeting

## **2. PRODUCTS: What has the program produced?**

### **Publications, conference papers, and presentations**

A total of 28 final reports have been published on NITC's website and PDX Scholar, PSU's online archive for scholarly publications. This research was also shared in 21 peer-reviewed articles in academic journals and as five papers in trade publications or on professional or agency websites. In addition, a total of 75 presentations on NITC National research reaching 9,732 people have been given at professional and trade conferences.

### **Website(s) or other Internet site(s)**

The NITC website can be accessed via <http://nitc.trec.pdx.edu>. This site provides comprehensive information about NITC's programs that is continually updated. Specific program areas covered include news, events, education and professional development activities. It also provides access to NITC's research portfolio (<http://nitc.trec.pdx.edu/research>).

Other Internet sites include:

- Twitter, <https://twitter.com/TRECpdx>
- Facebook, <https://www.facebook.com/TRECpdx>
- YouTube, <https://www.youtube.com/user/askotrec>
- LinkedIn, <https://www.linkedin.com/company/4845328/>

### **Technologies or techniques**

With the assistance of Transportation of America, Robert Zako and Rebecca Lewis, UO, developed a toolkit for practitioners that outlines how to integrate performance measures, especially measures of outcomes, into all phases of transportation decision-making. The toolkit not only draws on what the team learned during its research but also incorporates findings of others into a coherent framework that provides decision-makers step-by-step guidance, including planning, governing & finance, programming and reporting, to make transportation investments that serve the public better.

In a detailed technical brief, **A Practitioner's Guide to Urban Trip Generation**, Kristina Currans, PSU, addresses the issues that plague the collection and application of methods and data traditionally used to quantify urban trips. In addition to discussing data limits and concerns, she provides detailed guidelines how to collect relevant data to practitioners. These include specific sampling design, sampling variables to include in the data collection protocol as well as words of caution about using archived data.

### **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 PSU, UO, Oregon Tech, UU, and the USF. Each NITC-funded research project is required to have 120% match; other projects require a 100% match. Match partners for projects funded to date include the following:

American Automobile Association	OPAL Environmental Justice Oregon
Caltrans	Oregon Department of Transportation
City of Cambridge	Oregon METRO
City of Chicago	People for Bikes
City of Eugene	Portland Bureau of Planning and Sustainability
City of Flagstaff	Portland Bureau of Transportation
City of Los Angeles	SRAM
City of Oakland	Summit Foundation
City of Seattle	Tampa Bay Network to End Hunger
City of Tigard	Transportation for America
Cleveland State University	TriMet
District of Columbia Department of Transportation	University of Arizona
Florida Department of Transportation	University of Colorado, Denver
Hillsborough County MPO	Utah Department of Transportation
Institute of Sustainable Solutions (PSU)	Utah Transit Authority
Intel	Vancouver Housing Authority
Lane Transit District	Wasatch Front Regional Council
NACCO Industries	Washington County
Natural Resources Defense Council	

#### **Have other collaborators or contacts been involved?**

Many NITC researchers also working closely or are supported in their research efforts by a variety of stakeholders above and beyond match partners. This includes non-profit organizations, private industry, public agencies, research centers or other university partners. Below is a list of these partners.

Bedford Stuyvesant Restoration Corporation in Brooklyn, New York	ParkOregon Modeling Collaborative (OMC)
Bicycle Product Suppliers Association (BPSA)	Philadelphia IndeGO Bike Share
Bicycle Transportation Alliance	Portland Business Alliance
Chicago Department of Transportation	Portland Development Commission
City of Arlington, VA	Robert F. Bennett Institute for Transportation and Development
City of Gresham, OR	Sacramento Area Council of Governments (SACOG)
Cleveland Regional Transit Authority	San Francisco Public Health Department
Community Cycling Center	Sustainable Cities Initiative
Department of Land Conservation and Development (DLCDD)	Toole Design Group

GTFS-realtime communities (online community)	Town of Rockville
Land Conservation Development Commission (LCDC)	Town of Springdale
Mark O. Hatfield School of Government Center for Public Service (PSU)	Twin Cities Metropolitan Council
National Park Service, Zion National	University of Idaho
	University of Wisconsin at Milwaukee
	Venture Portland

**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 new to report for this period.

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

NITC continues to lead the education of the current and next generation of bicycle and pedestrian professionals. During this reporting period, NITC implemented three summer workshops for academics and professionals that focus on enhancing multimodal education, getting the latest research into the hands of professionals, and illustrating how information can be used to help design better bicycle facilities in communities. These workshops were offered through the Initiative of Bicycle and Pedestrian Innovation (IBPI) on PSU's Campus. The geographic reach of these workshops as well as the enthusiastic feedback of participants are a testimony to how valuable these workshops are to the professional community in general as well as individual participants.

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

Nothing to new to report for this period.

**What is the impact on technology transfer?**

During the reporting period, NITC supported 23 events that were attended by 3,176 people. These events included five webinars that highlight NITC sponsored research and were attended by 480 individuals. One AICP credit was offered per webinar.

**What is the impact on society beyond science and technology?**

NITC's research has a broad reach and ultimately impacts the livelihood and daily lives of individuals. For example, bike share has the potential to benefit disadvantaged communities if service could better match their needs. Bike share can serve as an important link to transit and to work: a survey of users in four North American cities found that trips to/from work or school were the most common trip purpose. It has also been identified by underserved groups in Philadelphia as a potentially lower-cost, more reliable substitute for transit. Our research into bike share provided key insights into how to make bike share more equitable setting the stage to move towards breaking down the barriers that currently limit access of underrepresented groups to bike share.

## **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.

## **6. Additional information regarding Products and Impacts**

Nothing to Report for this period.

## APPENDIX

### List and Status of Year 1 projects

*Completed* projects include:

- Changing attitudes toward sustainable transportation: The impact of meta-arguments, David Sanbonmatsu and David Strayer, University of Utah (*published*)
- Developing a model for Transit Oriented Development in Latino Immigrant Communities: A National Study of Equity and TOD, Gerardo Sandoval, University of Oregon (*published*)
- Do TODs make a Difference? Phase 2, Arthur Nelson and Reid Ewing, University of Utah and Jenny Liu, Portland State University (*published*)
- Encouraging Low-Income Households to Make Location-Efficient Housing Choices, Andree Tremoulet, Portland State University (*published*)
- Improving Trip Generation Methods for Livable Communities, Kelly Clifton, Portland State University and Nico Larco, University of Oregon (*published*)
- Integrating Freight into Livable Communities, Kristine Williams, University of South Florida (*published*)
- Metropolitan Centers: Evaluating local implementation of regional plans and policies, Richard Margerum and Rebecca Lewis, University of Oregon, and Keith Bartholomew, University of Utah (*published*)
- Modeling and Analyzing the Impact of Advanced Technologies on Livability and Multimodal Transportation Performance Measures in Arterial Corridors, Miguel Figliozi, Portland State University (*published*)
- Rapidly Expanding Mobile Apps for Crowd-sourcing Bike Data to New Cities. Sean Barbeau, University of South Florida (*published*)
- 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 (*published*)

*Active* projects include:

- Creating Livable Communities through Connecting Vehicles to Pedestrians and Cyclists, John MacArthur, Portland State University
- Improving Bicycle Crash Predictions, Sirisha Kothuri, Portland State University

The following project was *cancelled*:

- Generalized Adaptation of an Electric-Hydraulic hybrid drive system, James Long and David Culler, Oregon Institute of Technology.

### List and Status of Year 2 projects

*Completed* projects include:

- 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 (*published*)
- Planning Ahead for Livable Communities Along the Powell-Division BRT: neighborhood conditions and change, Lisa Bates and Aaron Golub, Portland State University (*published*)

- How Does Transportation Affordability Vary Between TODs, TADs, and Other Areas, Brenda Scheer and Reid Ewing, University of Utah (*published*)
- Impacts of Bus Rapid Transit (BRT) on Surrounding Residential Property Values, Victoria Perk and Martin Catala, University of South Florida (*published*)
- What Do We Know About Location Affordability in U.S. Shrinking Cities? Joanna Ganning, University of Utah (*published*)
- The Economic and Environmental Impacts of Smart-Parking Programs, Nicole Ngo, University of Oregon (*published*)
- Racial Bias in Drivers' Yielding Behavior at Crosswalks: Understanding the Effect, Kimberly Barsamian Kahn, Portland State University (*published*)
- 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 (*report finalized, awaiting publication*)
- Evaluation of roadway reallocation projects, Miguel Figliozzi, Portland State University (*report finalized, awaiting publication*)
- Evaluating Efforts to Improve the Equity of Bike Share Systems, Nathan McNeil, John MacArthur and Jennifer Dill, Portland State University (*2 reports published, 3<sup>rd</sup> report in preparation*)
- 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 (*toolkit published, report in peer review*)

*Active* projects include:

- Understanding the Economic Impacts of Urban Greenway Infrastructure, Jenny Liu, 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
- Multimodal Trip Generation, Vehicle Ownership and Use: Characterizing The Travel Patterns of Residents of Multifamily Housing, Kelly Clifton, Portland State University
- Addressing Bicycle-Vehicle Conflicts with Alternate Signal Control Strategies, Sirisha Kothuri, Christopher Monsere, Portland State University, Krista Nordback, University of North Carolina, and Ed Smaglik, Northern Arizona University
- Framing Livability: A Strategic Communications Approach to Improving Public Transportation in Oregon, Deb Morrison, Kelli Matthews and Nico Larco, University of Oregon

**List and Status of Year 3 projects**

*Completed* project include:

- Does Compact Development Increase or Reduce Traffic Congestion? Reid Ewing, University of Utah and Shima Hamidi, University of Texas (*published*)

*Active* projects include:

- Overcoming Barriers for the Wide-Scale Adoption of Standardized Real-time Transit Info, Sean Barbeau, University of Southern Florida
- Transferability & Forecasting of the Pedestrian Index Environment (PIE) for Modeling Applications, Kelly Clifton, Portland State University

- V2X: Bringing Bikes into the Mix, Stephen Fickas, University of Oregon
- The Contribution of Transportation and Land Use to Citizen Perceptions of Livability in Oregon MPOs, Rebecca Lewis and Robert Parker, University of Oregon
- Understanding Economic and Business Impacts of Street Improvements for Bicycle and Pedestrian Mobility, Jenny Liu and Jennifer Dill, Portland State University
- Electric Bicycle Nationwide Survey, John MacArthur, Portland State University and Christopher Cherry, University of Tennessee
- Biking and Walking Counts: Data Quality, Nathan McNeil and Kristin Tufte, Portland State University
- Rapid Transportation Structure Evaluation Toolkit, Charles Riley, Oregon Institute of Technology
- Evaluating and Enhancing Public Transit Systems for Operational Efficiency, Service Quality and Access Equity, Ran Wei, University of Utah and Liming Wand and Aaron Golub, Portland State University
- SEGMENT: Applicability of an Existing Segmentation Technique to TDM Social Marketing Campaigns in the United States, Philip Winters and Amy Lester, University of Southern Florida

#### **List and Status of Small Starts projects**

- Narratives of Marginalized Cyclists: Understanding Obstacles to Utilitarian Cycling Among Women and Minorities in Portland, Oregon, Amy Lubitow, Portland State University (*completed & published*)
- Travel to Food: Transportation Barriers for the Food Insecure in Tampa Bay, Kevin Salzer, University of South Florida (*completed & published*)
- Active and Public Transportation Connectivity between North Temple TOD and Jordan Park River Trail, Ivis Garcia Zambrana, University of Utah (*completed & published*)
- How Do Stressed Workers Make Travel Mode Choices That Are Good For Their Health, Safety, and Productivity? Liu-Qin Yang, Portland State University (*completed, in final revisions*)
- Engaging Youth to increase their Transportation System Support, Understanding, and Use, Autumn Shafer, University of Oregon (*active*)
- The Use of Mt. Mazama Volcanic Ash as Natural Pozzolans for Sustainable Soil and Unpaved Road Improvement, Matthew Sleep, Oregon Institute of Technology (*active*)

#### **List and Status of Education projects**

- Multimodal Transportation Planning, Kristine Williams, University of South Florida, The course is completed and is now also included in a new Sustainable Transportation concentration and certificate program now available to MURP and transportation engineering graduate students at USF (*completed & published*)
- Phase 2: Multimodal Transportation Planning Curriculum for Urban Planning Programs, Kristine Williams, University of South Florida; this course introduces students to specific applications in multimodal planning that are reinforced through community projects (*completed & published*)



- Graduate-level Civil Engineering Transportation Course, Roger Lindgren, Oregon Institute of Technology *(completed & published)*
- Dynamic Evaluation of Transportation Structures with iPod-Based Data Acquisition Charles Riley, Oregon Institute of Technology *(completed & published)*
- Advanced GIS: Smart Transportation, Christopher Bone, University of Oregon *(completed & published)*
- Design of an Aging Population, Trygve Faste and Kirsten Muenchinger, University of Oregon, this is a studio course that challenges students to find solutions to the many problems aging adults face as they use the bus system *(completed & published)*
- Pedestrian and Transit Oriented Design, Keith Bartholomew, University of Utah *(completed & published)*
- Graduate Certificate in Sustainable Transportation, Keith Bartholomew, University of Utah, this project laid the groundwork for establishing a Graduate Certificate in Sustainable Transportation *(completed)*
- Introduction to Scientific Computing for Planners, Engineers, and Scientists Liming Wang, Portland State University *(completed, report is being finalized)*
- Pedestrian Observation and Data Collection Curriculum, Jennifer Dill, Portland State University; this course will help students relate to travel behavior, traffic safety, urban planning and design, or civil engineering while also gaining research experience and collecting valuable data for the research and transportation community *(completed, report is being finalized)*
- Instructional Modules for Obtaining Vehicle Dynamics Data with Smart Phone Sensors, Roger Lindgren, Oregon Institute of Technology *(active)*
- A Smart Bike Project for Grades 6-12, Stephen Fickas, University of Oregon *(active)*
- Collaborative Regional Planning: Tools and techniques for teaching collaborative regional planning to enhance livability and sustainable transportation, Danya Rumore, University of Utah *(active)*