



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

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

Grant Number: 69A3551747112

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

Consortia members: Portland State University (PSU), Oregon Institute of Technology (OR Tech), University of Arizona (UA), University of Oregon (UO), University of Texas at Arlington (UTA), University of Utah (UU)

Program Director: Jennifer Dill, Ph.D.
Professor, Portland State University
Director, National Institute for Transportation and Communities (NITC)
jdill@pdx.edu
503-725-2855

Submitting Official: same as above

Submission Date: June 30, 2017

DUNS: 05-222-6800

Recipient Organization: Portland State University
PO Box 751
Portland, OR 97207-0751

Grant Period: November 30, 2016 – September 30, 2022

Reporting Period End Date: May 30, 2017

Report Term: Semi-annual

Signature:

A handwritten signature in blue ink, appearing to read 'Jennifer Dill'.

Table of Contents

1	ACCOMPLISHMENTS: <i>What was done? What was learned?</i>	3
1.1	What are the major goals of the program?	3
1.1.1	Research	3
1.1.2	Leadership	3
1.1.3	Education and Workforce Development.....	4
1.1.4	Technology Transfer	4
1.1.5	Collaboration	5
1.1.6	Diversity.....	5
1.2	What was accomplished under these goals?.....	6
1.2.1	Research	6
1.2.2	Leadership	6
1.2.3	Education and Workforce Development.....	7
1.2.4	Technology Transfer	8
1.2.5	Collaboration	8
1.2.6	Diversity.....	9
1.2.7	How have the results been disseminated?	9
1.2.8	What do you plan to do during the next reporting period to accomplish goals? ...	9
2	PRODUCTS: <i>What has the program produced?</i>	10
2.1	Publications, conference papers, and presentations	10
2.2	Website(s) or other Internet site(s).....	10
2.3	Technologies or techniques.....	10
2.4	Inventions, patent applications, and/or licenses	10
2.5	Other products.....	10
3	PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS: <i>Who has been involved?</i> .	10
3.1	What organizations have been involved as partners?.....	10
3.2	Have other collaborators or contacts been involved?	11
4	IMPACT: <i>What is the impact of the program? How has it contributed to transportation education, research, and technology transfer?</i>	12
4.1	What is the impact on the development of the principal discipline(s) of program?...	12
4.2	What is the impact on other disciplines?.....	12
4.3	What is the impact on the transportation workforce development?	12
4.4	What is the impact on physical, institutional, and information resources at the university or other partner institutions?	12
4.5	What is the impact on technology transfer?.....	13
4.6	What is the impact on society beyond science and technology?.....	13
5	CHANGES/PROBLEMS	13
5.1	Changes in approach and reasons for change	13
5.2	Actual or anticipated problems or delays and actions or plans to resolve them.....	13
5.3	Changes that have a significant impact on expenditures	13
5.4	Significant changes in use or care of human subjects, vertebrate animals, and/or biohazards	13
5.5	Change of primary performance site location from that originally proposed.....	13
6	Additional information regarding Products and Impacts	14

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.

1.1 What are the major goals of the program?

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

1.1.1 *Research*

Build and extend existing research through Year 1 projects. The first year of funding will lay the foundation for our center's agenda, aiming to make a significant impact in advancing research and practice. The projects extend some of our existing work, demonstrate our new partnerships and were developed collaboratively by the NITC Executive Committee. We will also use a competitive peer-review process to select additional projects proposed by faculty of our consortium.

Competitive, peer-review project selection process in Years 2 through 5. Our projects in Years 2 through 5 will be selected through a request for proposal (RFP) process to consortium faculty. These funds will be available for projects consistent with our theme.

Pooled-Fund Research. In addition to the regular RFP, we will continue the 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.

1.1.2 *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 also 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.

1.1.3 *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 and Learning Opportunities. 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 support projects and initiatives that expose middle- and high-school students to transportation concepts and careers. The efforts aim to attract and retain new undergraduate students to our degree programs, involve undergraduates in our research, increase the number of women and students of color in these programs, and expand the diversity and capacity of the transportation workforce.

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.

1.1.4 *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 or practitioner with relevant knowledge. We recognize that many researchers do not have the right skills and knowledge of practice to help with implementing research results. Rather, we need to bridge research and practice with a liaison who can interpret results and identify who and how it can be best applied in practice. Our Tech Transfer Manager has professional transportation experience and will work with researchers and our partners to implement research results, identify the

most promising research results and work directly with professionals to develop a plan to get the results implemented. This may include developing some additional products (e.g. a spreadsheet tool or implementation handbook), in addition to our existing practices of webinars, project briefs, conference presentations, etc.

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

1.1.5 *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. The Vice President of Research (or equivalent position) at each university will provide oversight for NITC. This level of oversight is meant to encourage substantive collaboration, coordinate institution-level arrangements such as cost-sharing and administrative support and connect NITC’s activities to other campus and statewide initiatives.

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. As the National UTC for improving the mobility of people and goods, NITC will work with OST-R staff to foster collaboration between all the UTCs focusing on this DOT priority. Primary aims of this effort will be to avoid duplication of efforts and identify opportunities to collaborate between UTCs.

1.1.6 *Diversity*

Attract underrepresented students to transportation careers. We aim to attract underrepresented students to transportation through programs that target middle, high-school, or elementary school students. We do this by providing extra funds to researchers who engage underrepresented students in their projects, collaborating with STEM, WTS and education experts, and expanding our National Summer Transportation Institute Program (NSTI) to our partner campuses.

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.

1.2 What was accomplished under these goals?

1.2.1 Research

Build and extend existing research through Year 1 projects.

The NITC Executive Committee selected 11 projects that build on our existing work and demonstrates our new partnerships. The total allocation of NITC funds for these projects is close to \$2,000,000. One project started in June 2017, nine projects will start September 1, 2017 and one project is scheduled to begin January 2018. These projects include:

- Access to Opportunities: Redefining Planning Methods and Measures for Disadvantaged Populations, Arlie Adkins (UA) and Stephen Mattingly (UTA)
- Bringing Bikes into the V2X Smart City Conversation, Stephen Fickas (UO) and Marc Schlossberg (UO)
- Economic and business impacts of non-motorized bike/pedestrian infrastructure, Jenny Liu (PSU) and Jennifer Dill (PSU)
- Evaluating Improved Transit Connections for Ladders of Opportunity, Stephen Mattingly (UTA) and Yi-Chang Chiu (UA)
- Foundational Smart Cities Platform for NITC, Kristin Tufte (PSU), John MacArthur (PSU) and Larry Head (UA)
- From Knowledge to Practice: Rethinking Streets for People on Bikes, Marc Schlossberg (UO) and Roger Lindgren (OR Tech)
- Improving Integration of Transit Operations and Bicycle Infrastructure at the Stop Level, Chris Monsere (PSU) and Miguel Figliozzi (PSU)
- Key Enhancements to Four-Step Travel Demand Models, Reid Ewing (UU)
- Network effects of disruptive traffic events, Juan Medina (UU) and Cathy Liu (UU)
- Non-Motorized Data Archive and Tools, Jennifer Dill (PSU) and Stephen Mattingly (UTA)
- Social-Transportation Analytic Toolbox (STAT) for Transit Networks (Cathy Liu & Ran Wei (UU) and Aaron Golub & Liming Wang (PSU)

A RFP was issued on March 1, 2017. NITC required that all proposals fit within the NITC theme of improving mobility of people and goods to build strong communities. Forty-eight preliminary abstracts were submitted in April that led to the final submission of 22 proposals in May 2017, requesting a total of \$1,531,114 in funding. Funding decisions were made in June 2017 and will be reported in the next PPPR.

Competitive, peer-review project selection process in Years 2-5

Nothing to Report.

Transportation for Livable Communities Pooled-Fund Research.

Nothing to Report.

1.2.2 Leadership

High Standing within National and International Arenas of Transportation.

Many of the consortium's faculty members and students serve on national committees and panels and other volunteer positions.

- Faculty members and students at the six NITC member campuses currently hold 70 TRB volunteer memberships and serve on 59 different TRB committees/task forces and 11 different NCHRP/SHRP2/NCFRP/TRB panels. Three faculty members serve as Chair or Co-Chair on panels or committees.
- Fifteen 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. She is also a member of the Planning Committee for Advancing Obesity Solutions through Investments in the Built Environment and Transportation: A Workshop, National Academies of Sciences.

Shape national & international conversations on transportation research and education.

NITC's director, Jennifer Dill, chaired the University Transportation Spotlight conference held in Washington D.C. December 1-2, 2016. Portland State had nine researchers on the agenda presenting on seven topics, a testament to the university's leadership on active transportation research.

NITC researchers provided also a significant presence at the 2017 TRB meeting in Washington, DC. Thirty-one presenters from the NITC consortium disseminated their research findings in 12 lectern sessions, 30 posters and 5 workshops. Eleven of the presentations offered results that were practice ready. The diversity of contributors also highlighted NITC's commitment to support current and future leaders in transportation research. Presenters included seasoned and early career academics, research associates and students. Thirteen students presented 18 research projects; students were lead authors on all of the projects they presented. Graduate student, Patrick Singleton, PSU, received the best presentation award for his dissertation research in the Transport Modeling and Traveler Behavior session.

Solving Regional and National Transportation Problems.

Nothing to Report.

1.2.3 *Education and Workforce Development*

Offer Degrees and Courses in Multiple Disciplines.

The six-university consortium offers a total 1 certificate, 13 bachelor, 26 graduate and 8 PhD programs in transportation and closely related fields, including several dual degree options. Seven of the programs are offered by the **University of Texas at Arlington** and receive support from other DOT funded UTC programs.

Provide Experiential Learning.

During this reporting period, programs and activities at **Portland State University, Oregon Institute of Technology, University of Oregon, and University of Utah** were funded by the NITC MAP-21 grant and are reported on those grant reports. NITC's new consortium members, **University of Arizona and University of Texas at Arlington**, are currently working on organizing their student groups, with the goal of supporting student group activities for the 2017-2018 academic year.

Develop Innovative New Curriculum and Learning Opportunities.

Nothing to Report.

Educate Professionals.

During this reporting period, programs and activities in this category were funded by the NITC MAP-21 grant and are reported on the NITC MAP-21 grant reports.

Attract and Support Undergraduate Students.

During this reporting period, programs and activities in this category were funded by the NITC MAP-21 grant and are reported on those grant reports.

Attract and Support Graduate Students

NITC issued its first request for proposals for dissertation fellowships supported by this grant in May 2017. The RFP will close on June 30th. 2017.

1.2.4 *Technology Transfer*

Move Research into Practice.

Nothing to Report.

Use Innovative Approaches to Communicate Research Results.

NITC uses its website, Twitter (2,529 followers), Facebook (551 followers), LinkedIn (56 followers) and YouTube (327 subscribers) to communicate and promote center specific events and research results and to raise awareness of important transportation issues and findings.

The NITC website was visited 9,645 times during this reporting period. Users initiated sessions primarily by navigating directly to the NITC website (45%) or by entering relevant search terms into a browser (36%). Social media generated twelve percent of visits to the NITC website, with nearly all social referrals coming from Facebook (53 percent) or Twitter (46 percent). Facebook saw a smaller number of new users than Twitter (43 percent versus 55 percent), but users arriving via Facebook viewed more pages per session than those arriving via Twitter (3:26 vs. 1:54) and stayed on the site longer (3:26 versus 1:03). The site-wide average session lasted 2 minutes, 20 seconds.

1.2.5 *Collaboration*

Collaborating within our consortium.

The Executive Committee met during the TRB annual meeting on January 8, 2017 and held a conference call on May 18, 2017. The meetings focused on the next steps in the partnership,

discussing timelines and status updates for campus awards and projects and the selection of new board members.

The consortium also developed a Memorandum of Understanding between all six campuses regarding the operation of NITC and a master agreement between PSU and each campus to facilitate the transfer of funds between the campuses.

More than half of Year 1 projects that have already been selected include investigators from more than one consortium member (55% of projects).

External collaboration.

We are currently working on developing the advisory board that will expand upon the relationship developed with previous DOT funding. The advisory board will be key in identifying partners for external collaboration. We expect to have the advisory board identified in the next few months with the first board meeting taking place in the fall of 2017 in Portland, Oregon.

1.2.6 Diversity

Attract underrepresented students to transportation careers.

NITC awarded one Diversity grant in May 2017 that will support a female undergraduate student at **Portland State University**. The student will receive specialized training and perform complex laboratory tests as part of a transportation project.

Priority funding to research with an equity focus.

Three of the currently selected Year 1 projects address equity issues. These research projects include:

- Access to Opportunities: Redefining Planning Methods and Measures for Disadvantaged Populations
- Evaluating Improved Transit Connections for Ladders of Opportunity
- Social-Transportation Analytic Toolbox (STAT) for Transit Networks

1.2.7 How have the results been disseminated?

Nothing to Report.

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

Expected highlights for the next reporting period include:

- Selections of projects of the Year 1 competitive review projects.
- All but one of the Year 1 projects will have started
- Hold several IBPI summer workshops
- Host the 2017 National Summer Transportation Institute (NSTI; August 2017)
- Host the 2017 Transportation and Communities Summit (September 2017)

2 PRODUCTS: *What has the program produced?*

2.1 Publications, conference papers, and presentations

Nothing to Report.

2.2 Website(s) or other Internet site(s)

The **NITC website** can be accessed via <http://nitc-utc.net>. 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>).

Twitter, <https://twitter.com/TRECpdx>, is used to announce and promote NITC sponsored research, publications, reports, and events and to engage our audience in discussions of topics that are trending. We also tweet to share news from consortium members, including achievements of students, student group activities and ongoing projects.

General announcements and promotions announced via Twitter are also posted on **Facebook**, <https://www.facebook.com/TRECpdx>. A significant focus of Facebook is also to share photos of NITC sponsored events and to connect with other organizations, researchers and practitioners.

NITC hosts videos from recorded seminars and webinars and promotional videos on **YouTube**, <https://www.youtube.com/user/askotrec>.

NITC uses **LinkedIn**, <https://www.linkedin.com/company-beta/4845328>, to target professionals and shares information relevant for this audience, including tools and practical information as well as announcements of the publication of new NITC reports.

2.3 Technologies or techniques

Nothing to Report.

2.4 Inventions, patent applications, and/or licenses

Nothing to Report.

2.5 Other products

Nothing to Report.

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

3.1 What organizations have been involved as partners?

Each NITC-funded general research project is required to have 120% match; other projects require a 100% match. For current projects, a range of partners from outside of the consortium provide match or contribute in other ways to projects (Table 1).

Table 1: Organizations partnering with NITC projects

Organization		Type of Contribution					
Name	Location	Financial	In-kind	Facilities	Collaborative research	Personnel exchanges	Other
Alliance for Walking and Biking	Washington, DC						x ¹
Association of Pedestrian Bicycle Professionals	Lexington, KY						x ¹
City of Eugene	Eugene, OR	x					x ¹
City of Springfield	Springfield, OR						x ¹
League of American Cyclists	Washington, DC						x ¹
Metropia	Tucson, AZ		x		x		
Mountainland Association of Governments	Orem, UT				x		
Oregon DOT	Salem, OR						x ¹
Resource Systems Group (RSG)	Salt Lake City, UT				x		
Rowell Brokaw Architects	Eugene, OR	x					x ²
Smart Growth America	Washington, DC						x ¹
TriMet	Portland, OR						x ²
Utah DOT	Salt Lake City, UT	x	x		x		
Utah Transit Authority	Salt Lake City, UT	x			x		x ²

¹Resource partner (provides input into research at various stages of project), ²Assistance with data collection and/or processing

3.2 Have other collaborators or contacts been involved?

Many of the currently selected Year 1 projects include investigators from more than one consortium member (55% of projects; Table 2) and/or are multidisciplinary include investigators from more than one discipline within the consortium (82% of projects).

Table 2: Projects involving multiple consortium members and/or disciplines

Project type	Project title	Consortium members	Disciplines
Research	Access to Opportunities: Redefining Planning Methods and Measures for Disadvantaged Populations	UA, UTA	Engineering, Planning, Social Work
Research	Bringing Bikes into the V2X Smart City Conversation		Computer Science, Planning
Research	Economic and business impacts of non-motorized bike/pedestrian infrastructure		Economics, Planning
Research	Evaluating Improved Transit Connections for Ladders of Opportunity	UA, UTA	Engineering, Social Work
Research	Foundational Smart Cities Platform for NITC	PSU, UA	Computer Science, Engineering
Research	From Knowledge to Practice: Rethinking Streets for People on Bikes	OR Tech, UO	Engineering, Planning
Research	Network effects of disruptive traffic events		Engineering, Geography
Research	Non-Motorized Data Archive and Tools	PSU, UTA	Economics, Planning
Research	Social-Transportation Analytic Toolbox (STAT) for Transit Networks	PSU, UU	Engineering, Geography, Planning

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

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

Nothing to Report.

4.2 What is the impact on other disciplines?

Nothing to Report.

4.3 What is the impact on the transportation workforce development?

Nothing to Report.

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

NITC held an information session at **Portland State University** in March 2017. This session was advertised across campus with the goal of reaching faculty from a wide variety of disciplines, including those that have not traditionally participated in transportation research. The outreach effort succeed in engaging 21 faculty from 15 different disciplines.

Faculty were introduced to NITC's research theme, funding opportunities and funding cycles with the goal of encouraging faculty to participate in Center's research. The opportunity to engage in multidisciplinary research was discussed.

In April, NITC staff visited our new consortium members, the **University of Arizona** and the **University of Texas at Arlington**. The goal of this visit was to introduce faculty to NITC in general and, more specifically, explain its research theme, funding opportunities, and funding cycles. This visit also provided the opportunity to review DOT's financial requirements with the financial teams and discuss communication and promotion strategies with the communications teams at the partner institutions. Most importantly, the visit provided the opportunity to make personal connections that will be instrumental in facilitating collaborative relationships as NITC moves forward with these new partnerships.

4.5 What is the impact on technology transfer?

Nothing to Report.

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

NITC uses its website and social media presence to raise awareness of important transportation issues in the context of NITC's research program, events and activities. For example, NITC's annual Transportation and Community Summit (TCS) will be held on September 11-12, 2017 in Portland, OR. One of the Summit's sessions will address the question "*What will the future with Autonomous Vehicles look like?*" - a topic that has nationwide relevance and surrounds significant controversy. We have been using Twitter as a platform to promote this TCS session while also directing followers to blogs, tweets, news articles and online research forums that discuss this question.

5 CHANGES/PROBLEMS

5.1 Changes in approach and reasons for change

Nothing to Report.

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

Nothing to Report.

5.3 Changes that have a significant impact on expenditures

Nothing to Report.

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

Nothing to Report.

5.5 Change of primary performance site location from that originally proposed

Nothing to Report.

6 Additional information regarding Products and Impacts

Nothing to Report.