



# NCTR

NATIONAL CENTER for  
TRANSIT RESEARCH

**Program Progress Performance Report  
for University Transportation Centers  
National Center for Transit Research (NCTR)  
University of South Florida  
a Tier I Transit Focused University Transportation Center**

**Grant Number DTRT12-G-UTC22**

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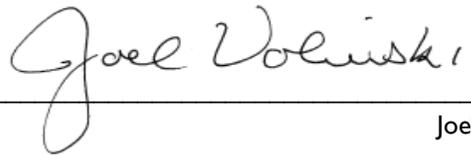
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**Reporting Period:** July 1, 2016 – December 31, 2016, 6-Month Progress Report

Signature of Submitting Official: \_\_\_\_\_



Joel Volinski, NCTR Program Director

## Accomplishments

### What are the major goals and objectives of the program?

The major goals of the National Center for Transit Research are:

- To select and conduct research intended to make public transit and alternative means of transportation safe, efficient, effective, desirable, and secure. This will be done by receiving input from the Federal Transit Administration, the Florida Department of Transportation, the Illinois Department of Transportation, the North Dakota Department of Transportation, the Illinois Department of Transportation, the NCTR Advisory Board, and transit professionals from throughout Florida and the nation. Research will be subjected to peer review.
- To contribute to the education and preparation of the next generation of transportation professionals and to workforce development initiatives that will help attract, retain, and train employees in the fields of public transportation in particular.
- To disseminate the results of research as broadly as possible to fulfill the goal of making public transportation and alternative forms of transportation safe, efficient, effective, desirable, and secure. In addition, NCTR will continue to invest in projects that result in new patents and licenses that advance the quality of transportation services while creating new technology and employment opportunities.

### What was accomplished under these goals?

The grant time period was extended to May 30, 2017 to allow for the completion of a few remaining research projects. This six month reporting period has been particularly busy in terms of completing research projects. By the time of this six month reporting period (July 1, 2016 – December 31, 2016) all consortium partners have completed or have very nearly completed all of the following federally funded research projects they lead or participate in as summarized below.

**2013 Rural Transit Fact Book – NDSU** - completed July 2013.

**Improving Veteran Mobility in Small Urban & Rural Areas – NDSU**- completed in February 2014.

**Cost-Benefit Analysis of Rural and Small Urban Transit – NDSU** – completed July 2014.

**Evaluating the State of Mobility Management and Human Service Transportation Coordination – NDSU**

In collaboration with USF and UIC (based on FTA proposal), the project was completed in October 2014.

**Workforce Development and Succession Planning to Prepare the Rural Transit Industry for the Future**  
– completed July 2016

**Intercity Transit Services Demand in North Dakota** - completed August 2016.

**Estimating Ridership of Demand-Response Transit Services** – completed August 2016

**Low-cost Ride-Quality Characterizations for Transit** - completed August 2016.

**Rural Intercity Bus Demand: Phase II** - This study, which also serves as the doctoral dissertation for the author, incorporates a previously estimated mode choice model into a North Dakota statewide travel demand model to identify corridors in the state with the greatest demand for intercity bus service and to estimate the effects of service changes and external factors on intercity bus demand. The final draft was completed in December 2016, is undergoing final editing, and will be completed in the next reporting period.

**Texas Transportation Institute Annual Congestion Study: Measuring Transit's Impact – USF** - The methodology report and analysis developed by USF were completed and that document is published and has been shared with Texas A&M.

**Developing Guidelines for Incorporating Managing Demand into WSDOT Planning and Programming: Transportation Demand Management Guidance for Corridor Planning Studies – USF** - completed February 2016.

**Evaluation of Automated Technology for Transit – 2016 Update (April 2016)** - In January 2015, NCTR published a report summarizing the state of public transportation vehicle automation entitled “Evaluation of Automated Vehicle Technology for Transit.” The 2016 update presents the latest information on this topic and was completed April 2016.

**Funding for the creation and operation of the following centers and clearinghouses hosted at USF** was initially provided through the Transit Focused UTC grant, but all activities during this reporting period were supported by the subsequent UTC Livability grant awarded to USF:

- National Transit Safety Research and Assistance Center
- Advanced Transit Energy Portal (ATEP)
- National Transportation Demand Management and Telework Clearinghouse
- GIS in Transit Clearinghouse

**Development of Training Manuals for Transit Planning and Scheduling – FIU** – completed October 2016.

**Transit Service Reliability: Analyzing Automatic Vehicle Location (AVL) Data for On Time Performance and to Identify Conditions Leading to Service Degradation – FIU** as the lead with assistance from USF (based on FTA proposal) - The final report was completed in November 2016.

**State of Good Repair Performance Measures: Assessing Asset Condition, Age, and Performance Data – FIU** - completed July 2016.

**Transit Value Capture Coordination: Case Studies, Best Practices, and Recommendations – UIC** – This study was completed in July, 2015.

**Adapting Transit to Climate Change Impacts – National Survey of Transit Agency Extreme Weather Risks and Experiences - UIC** as the lead with assistance from USF (based on FTA proposal) - completed in July 2016 .

**An Online Tool for Computing and Presenting Regional Accessibility Measures (UIC)** - This project led to development of an online tool that allows users to gauge accessibility to Chicago neighborhoods, suburbs, or other parts of the metropolitan area using different modes of transportation accessed at <http://urbanaccessibility.com>.

**Optimal Rail Service Planning in a Passenger-Freight Shared Corridor (UIC)** - This research resulted in a paper that led to development of a two-level hyper graph model to address optimal use of shared passenger and freight rail corridors. The paper is entitled: "Integrated Modeling of High Performance Passenger and Freight Train Operation Planning on Shared Use Rail Corridors: A Focus on the US Context."

**Examining Pedestrian Behavior at Railroad Crossings (UIC)** – The final report will be published in March 2017. The report was sent to CTA for review and the research team is in the process of meeting with CTA to address any concerns. The report will provide the CTA and urban planners with greater insight on ways to improve safety for cyclists and pedestrians at rapid transit train grade crossings.

#### **CPS Travel Training Evaluation Project (UIC)**

Researchers are studying how to encourage physically challenged Chicago public school children to use existing forms of public transportation on fixed rapid transit and bus routes over paratransit options. To date researchers have completed an integrated evaluation framework and are analyzing the data. A report is anticipated to be produced in March 2017.

**Many other projects have either been completed or are being completed using matching funds from the state Departments of Transportation of the consortium members.** All research projects will be completed by May 2017 when the grant expires. Provided below is a list of the projects funded by the Florida Department of Transportation (FDOT) that have been undertaken at **USF** as match to the grant. The clearinghouse activities are now being funded through the USF UTC Livability grant and are therefore described in the PPPR prepared for that grant:

1. **Improving the Cost Effectiveness of Financial Incentives in Managing TDM** – completed in October 2013.
2. **Analysis of Transit Contracting Models and Proper Incentives for Long-term Success** – completed in November 2013.
3. **Improved Traffic Control Measures to Prevent Incorrect Turns at Highway-Rail Grade Crossings** - completed in December 2013.
4. **Impacts of Dialysis Transportation on Florida's Coordinated Public Transportation Programs** - completed in April 2014.
5. **Bus Operator Safety Critical Issues Examination and Model Practices** - completed in January 2014.

6. **Evaluation of Rear-end Bus Collisions and Identifying Possible Solutions and Assessing the Effectiveness of Bus Pull-out Bays in Reducing Collisions** – completed in March 2014.
7. **Best Practices in Enhancing Transit in Multimodal Transportation Elements** – completed in June 2014.
8. **Investigation, Quantification, and Recommendations - Performance of Alternately-fueled Buses** – completed in August 2014.
9. **Florida Transit Safety Network** – This program, which provides thousands of hours of safety training each year, is now funded through the Livability grant and described in that PPPR.
10. **Technology Application Among Florida Community Transportation Providers** – completed in October, 2015.
11. **Impact of Transportation Demand Management (TDM) Elements on Managed Lanes Toll Prices** - completed in December 2015.
12. **Smart Parking Guidance System Demonstration** - completed in January 2016.

FIU is engaged in the following research projects undertaken with local match:

1. **Informed Traveler Program and Applications – FIU** - \$265,261 - The University City Prosperity Project addresses transportation mobility and safety problems facing Miami-Dade County and the Southeast Florida Region. One of the major components of this project was the development of a first phase of the Informed Traveler Program and Applications (ITPA). ITPA will provide personalized, timely information and advice regarding the most efficient and cost effective travel paths for consumers in advance of their travel decision points. The program's software will be predictive in nature, allowing users to make better travel decisions before they decide whether or not to get in their private vehicles. The Work Plan Development for Phase I for the Informed Traveler Program and Applications task was completed in late 2014. The project will be completed by May, 2017.
2. **Analysis of Movable Bus Stop Boarding and Alighting Areas – FIU** - completed in May 2013.
3. **Guidelines for Bus Transit Stops in Highway Construction Zones – FIU** - completed in December 2014.

The following projects have been undertaken by UIC with matching funds from the Illinois DOT. These projects provide a full 100% cash match to the federal grant projects being implemented by UIC:

1. **Igo Car Sharing: Feasibility of Charging Stations for Hybrid Cars** – completed in June 2014.
2. **Modeling of Transit Mode Choice in Greater Chicago** - completed in June 2015.
3. **Transportation Needs Assessment** - A report, "Planning Transportation to Meet the Needs of an Aging Illinois: An Assessment," was completed in the first quarter of 2015.

4. **Green Hospitals** - A report entitled: "Exploring Commuting-Related Environmental Impacts in the Healthcare Sector" also resulted in a journal article that was published in the Journal of Occupational and Environmental Medicine (February 2016).
5. **Pedestrian Facilities** - The research resulted in a ranking process and method to measure proposed pedestrian and cyclist projects in order to increase their effectiveness within the community and make the best use of available funds. A report, "Development of an Analytical Framework to Rank Pedestrian and Cyclist Projects," was completed in October 2015. An article was written about this work in Next City (May 25, 2016).
6. **Nature Express** – This project will identify transit strategies to connect low-income individuals, disadvantaged families and people of color to Cook County Forest Preserves in a meaningful way. PIs have finished a draft report for the project. Preliminary findings have been shared with the Forest Preserves of Cook County to help with the Long Range Plan development for Cook County. The findings of this project are likely to provide the basis for gauging accessibility issues for disadvantaged population groups living in Cook County to Forest Preserves in the County.
7. **Increased Mobility Through Enhanced Transit Connectivity (previously referred to as “Regional Transit Service Integration”** – The research for this paper was guided by the goal that everyone in the Chicago area should have integrated, ubiquitous, and affordable mobility options where public and private resources are used efficiently and effectively toward that end. The report identifies practical ways to give more travel options to people that are underserved by transit. The report was completed in August 2016.
8. **Study of Integrated Corridor Management/Mobility Case Studies in Greater Chicago Area** - Research is still in progress and is expected to be completed by March 2017. This study will attempt to increase interconnectivity between various transit modes to attract more new riders off existing roads, reduce travel times for existing riders, and create more travel opportunities for all commuters and travelers.

**North Dakota State University has worked on the following match projects:**

- **Regional Transit Coordination Pilot Project** - completed in December 2014.
- **Identifying and Satisfying the Mobility Needs of North Dakota’s Transit System** - completed in April 2015.

**What opportunities for training and professional development has the program provided?**

NCTR continued providing training during the six month period in the areas of transit, leadership, and commuter assistance programs, though USF’s activities were funded through the NCTR Livability UTC grant and is being reported on through the PPPR for that grant to avoid double counting. NDSU completed the training funded through the Transit-focused grant in June 2016 and therefore is not reflected in this report, though the contact hours are reflected in the statistics for all of 2016.

- Dr. Jill Hough of NDSU completed the development of a **national transit course** that will be able to be delivered by any transportation faculty at universities around the country. This course was offered for the first time in the spring semester of 2016 at NDSU and is being evaluated.
- The scopes for virtually every research project noted in this report incorporated **student research assistants** to help prepare them for careers in transportation.
- **The NCTR Scholars program** was initiated the fall of 2013, providing students who have career aspirations in public transportation to obtain a Masters degree in Civil Engineering with an emphasis on public transportation. Matthew Kessler continues his course work while three other scholars continue their program (Ibrahim Hinds, Katrina Corcoran, and Austin Dibble) in this reporting period.
- USF hosted 5 **free webcasts** in its bi-weekly series in subject areas related to the transit-focused NCTR theme. An average of approximately 50 people viewed each webcast live, while the recorded versions are generally viewed by even more people as their schedules allow:
  - Closing the Loop: Improving Transit Through Crowd-Sourced Information (7-7-16)
  - Idle Reduction Practices in Public Transit (8-4-16)
  - What Transit Administrators Say Prevents them from Pursuing Social Justice (8-18-16)
  - A Framework for Mobile Payment Pilot Implementation (9-15-16)
  - Dealing with Difficult Transit Customer Situations (12-8-16)
- **Florida Transit Operator Trainer Training Program** – The accomplishments of this program, which includes thousands of hours of training and was started through the Transit Focused grant, are now reported through the Livability grant which has continued funding this program.
- **Transit Manager Certificate Program** - The accomplishments of this program, which includes thousands of hours of training, and was started through the Transit Focused grant, are now reported through the Livability grant which has continued funding of this program.
- **Florida Statewide Transit Training and Technical Assistance Program** - The accomplishments of this program which were formerly reported through the Transit Focused grant are now reported through the Livability grant PPPR.

**Florida Commuter Choice Training Program** – CUTR at USF provides training and instruction annually on Commuter Choice related topics primarily using a combination of live instruction, net conferences, and/or asynchronous distance learning methods (e.g., self-paced online courses). This project is now reported as part of the activities funded through the NCTR Livability grant.

### **How have the results been disseminated? If so, in what ways?**

PIs for all projects have established peer reviewers who are most likely to be interested in the results and in a position to implement findings. PIs have also been instructed to identify opportunities to share results of research through webinars, conferences, and direct notification to lists of professionals that have been identified in advance of conducting the research. USF's webcasts are free to all participants

and can be viewed in real time, or viewed as a recording at the viewer's convenience. This grant is winding down and there are fewer presentations since most of the research is completed. During this six month reporting period, consortium members made 14 presentations at state and national professional conferences and through webinars.

USF's TDM program has developed a knowledge base (KB) to reduce the inquiry burden on Clearinghouse staff by providing an intelligent self-service option by providing information on hundreds of frequently asked questions as well as case studies and examples. This approach provides a means to reduce the total number of basic inquiries or repeat requests that require personal attention. It also allows staff to respond quickly to inquiries drawing on the information in the KB. The objective is to be more cost-effective and to handle more interactions by providing lower cost transactions with the KB's self-service feature.

NCTRCUTR – YouTube Channel – 87 subscribers, 141 videos, and 6,846 views for a total of 34,633 minutes of watch time during 2016. The metrics table reports all other statistics of dissemination of results.

NDSU faculty staffed a table at the Midwest Transit Conference in Kansas City, MO, August 13-16 to provide information regarding the research and training activities being funded through NCTR to all registered for the conference.

### **Presentations**

Members of the consortium made 17 presentations of completed research at a variety of venues including the Association for Commuter Transportation International Conference, the Commuter Services of Pennsylvania Annual Awards Banquet, the 26th Annual UCLA Lake Arrowhead Symposium, the ITE Annual Awards Breakfast, the Lewis Center for Regional Policy Studies, the ACT conference in Boston, Massachusetts, the Florida American Planning Association Annual Meeting, and the EV Transportation and Technology Summit.

### **SURTC Blog**

SURTC continues to maintain and use its weblog that was launched September 2009. The blog keeps readers up-to-date on SURTC's research, training, and outreach efforts as well as news and information on developments in small urban and rural transit. Dr. Steve Polzin also wrote a number of blog posts on travel behavior during the reporting period.

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

- During the next five months all of the research projects that have been approved as part of the grant will be completed. The end date of the grant is May 30, 2017.
- NCTR will energetically share the results of the research projects with sponsors and with all other parties that can benefit from the findings through every technology transfer avenue available. Webinars featuring results from these projects will be held every two weeks, and opportunities to present findings at professional transportation conferences will also be pursued.

- Final drafts of all research projects will be peer reviewed.
- The ongoing training programs will continue in the next three months based on input received from operating agencies requests, though they are now recorded as part of the Livability Grant.
- The evaluation of the national public transit course developed and taught by NDSU will be completed and changes to the course will be made as necessary.
- The NCTR website will be updated to include the completed research reports from all four consortium members.
- A new editorial board will be constituted for the Journal of Public Transportation which will require a considerable amount of modifications if it is to be continued in the future with no UTC grant funding.

## Products

### Publications

Two editions of the Journal of Public Transportation (Volume 19, issues #3 and #4) were produced during this progress report period featuring a total of 21 papers. Activities associated with the Journal have been funded by USF's Livability Grant over the past two years and all statistics associated with it are reported in the PPPR for that grant. Given the news that USF's application for a new UTC grant in the 2016 competition was not approved, the Editor has contacted authors indicating that new papers are not being accepted until a new way of producing the Journal is identified.

The following reports were published and/or completed by members of the NCTR Consortium in the six month reporting period:

- **Workforce Development and Succession Planning to Prepare the Rural Transit Industry for the Future** – completed July 2016
- **Intercity Transit Services Demand in North Dakota** - completed August 2016.
- **Estimating Ridership of Demand-Response Transit Services** – completed August 2016
- **Low-cost Ride-Quality Characterizations for Transit** - completed August 2016.
- **Development of Training Manuals for Transit Planning and Scheduling** – FIU – completed October 2016.
- **Transit Service Reliability: Analyzing Automatic Vehicle Location (AVL) Data for On Time Performance and to Identify Conditions Leading to Service Degradation** – FIU as the lead with assistance from USF (based on FTA proposal) - The final report was completed in November 2016.
- **State of Good Repair Performance Measures: Assessing Asset Condition, Age, and Performance Data** – FIU - completed July 2016.

- **Adapting Transit to Climate Change Impacts – National Survey of Transit Agency Extreme Weather Risks and Experiences - UIC** as the lead with assistance from USF (based on FTA proposal) - completed in July 2016 .
- **Increased Mobility Through Enhanced Transit Connectivity (previously referred to as “Regional Transit Service Integration”** – completed August 2016

The following paper was published during the reporting period: Mattson, Jeremy, Ranjit Godavarthy, and Jill Hough. “A Method for Estimating Statewide Transit Needs and Investment Priorities for Rural and Small Urban Areas.” In *Transportation Research Record: Journal of the Transportation Research Board*, No. 2543, Transportation Research Board of the National Academies, Washington, D.C., 2016, pp. 25-33. In addition, two papers submitted to TRB this year are currently under consideration for publication in TRR, and they are generated from NCTR reports:

Mattson, Jeremy. “Estimating Ridership of Rural Demand-Response Transit Services for the General Public.” Transportation Research Board 96<sup>th</sup> Annual Meeting, 2017.

Mattson, Jeremy. “Estimating Demand for Intercity Bus Services in a Rural Environment.” Transportation Research Board 96<sup>th</sup> Annual Meeting, 2017

## Websites

The website for NCTR ([www.nctr.usf.edu](http://www.nctr.usf.edu)) has been in place since 1999 and remains very active. NCTR is rated #1 for “transit research” results on Google, Bing and Yahoo search engines. It includes information on the center’s history, key personnel, research activities, links to all reports and webinars, the various programs and clearinghouses hosted by NCTR, all volumes of the Journal of Public Transportation, and a section on career opportunities in transit. It includes links to the websites of all consortium partners (<http://www.surtc.org/>; <http://lctr.eng.fiu.edu/>; <http://www.utc.uic.edu/>). Those websites also include information on key personnel, active research, downloadable reports, student participation in their programs, and webinars that can be viewed. The NCTR website will continue to be updated to include all projects completed by consortium members and the projects yet to be undertaken through the federal grant and matching funds. However, all reporting of statistics for the website in the text six month reports is now being done through the UTC Livability grant since that is the funding source for its activities, though the metrics report does include statistics for the full calendar year.

A number of other websites initially funded through NCTR Transit Focused grant have been established, but are now being supported by the Livability grant. The PPPR for the Livability grant should be reviewed to see the level of activity on each.

## **Technologies or Techniques**

During the reporting period the following technologies or techniques were developed as a result of research conducted through the UTC grant:

The network model used to estimate boardings for the intercity bus network is new and was published in August 2016.

The training manuals for transit planning and scheduling provide techniques for planners and schedulers to use to make their transit operations as efficient as possible.

The report entitled “State of Good Repair Performance Measures: Assessing Asset Condition, Age, and Performance Data” provides transit agencies with techniques to keep track of the condition of their assets to enable better capital budget planning and ensure reliable facilities and vehicles.

Methods to estimate ridership of demand-response services were made available through the report entitled “Estimating Ridership of Demand-Response Transit Services.”

Techniques to prepare for turnover of personnel at transit agencies were provided through the report entitled “Workforce Development and Succession Planning to Prepare the Rural Transit Industry for the Future.”

A method to determine the demand for intercity bus service in rural areas was provided in the report entitled “Intercity Transit Services Demand in North Dakota.”

Techniques to help prevent degradation of bus service were provided in the report entitled “Transit Service Reliability: Analyzing Automatic Vehicle Location (AVL) Data for On Time Performance and to Identify Conditions Leading to Service Degradation.”

## **Inventions, Patent Applications, and/or Licenses**

NCTR research has resulted in 16 patents in the past five years, all of which are related to the research funded through NCTR. The University of South Florida ranked 10<sup>th</sup> among universities worldwide for U.S. patents granted. However, no new patents were issued during this reporting period.

## **Other Products**

Nothing beyond the many reports completed during this reporting period to describe.

## **Participants and Collaborating Organizations**

### **What organizations have been involved as partners?**

The National Center for Transit Research (NCTR), through its transit-focused grant, is a consortium/partnership of four universities as follows:

- University of South Florida located in Tampa, Florida, featuring the National Center for Transit Research (NCTR), a Tier I UTC that is part of the Center for Urban Transportation Research.
- North Dakota State University located in Fargo, North Dakota, featuring the Small Urban & Rural Transit Center (SURTC).
- University of Illinois at Chicago located in Chicago, Illinois, featuring the Urban Transportation Center (UTC) in the College of Urban Planning and Public Affairs.
- Florida International University located in Miami, Florida, featuring the Lehman Center for Transportation Research (LCTR).

As described earlier in this report, the four universities have collaborated on four different projects, lending their expertise toward completing research reports. Collaboration with other parties has been quite extensive as noted below:

1. **The Federal Transit Administration** – The FTA has been the source of federal funds for the program as well as a source of ideas for research projects. FTA staff have served as peer reviewers of the projects. NCTR faculty conduct evaluations for BRT projects funded by FTA.
2. **State Departments of Transportation** – FDOT has been a vital partner in the development, selection, and funding of the majority of the research conducted by USF and FIU researchers. It also provides project managers for each project to oversee the completion of each project done by USF and FIU. Similar arrangements have been made with the Illinois and North Dakota Departments of Transportation. **IDOT** is providing a full cash match to UIC's portion of the grant, while **NDDOT** is providing approximately one-third cash match.
3. **The Florida Public Transportation Association** – FPTA, in conjunction with FDOT, is collaborating on a number of training projects through the engagement of various public transit networks (e.g., Transit Operations Network, Planning Network, Maintenance Network, Marketing Network, and Safety Network) to serve as advisors and peer reviewers of research projects. Several Florida transit agencies are also providing vital information for some of the research projects.
4. Consortium members have worked closely with the **American Public Transportation Association** on the Higher Education Subcommittee of the Human Resources Committee (Dr. Jill Hough of NDSU is the Chair of that subcommittee); with the Research and Development Committee on making a closer connection between UTC transit research results and APTA members (NCTR Director Joel Volinski is Chair of the University Liaison subcommittee); with the Alternative Fuels Committee in providing information for NCTR's Advanced Transit Energy Portal; and with the Bus Safety Committee.
5. NCTR Director Joel Volinski participated as part of the Problem Statement Screening Panel in August 2016 to help ensure no projects selected for TCRP would duplicate ongoing research.
6. NCTR Director Joel Volinski participated as a member of the Executive Board of the National Institute for Transportation and Communities in June/July 2016 to select research projects funded through NITC. He served as immediate Past-President of the **Council of University Transportation Centers** as a member of the CUTC Executive Committee. Dr. Jill Hough of NDSU now serves as the President of CUTC.

7. CUTR's Transportation Program Evaluation and Economic Analysis program, partially funded through NCTR projects dealing with alternative fuels, staffs a statewide legislatively created committee to make recommendations on cleaner transportation fuels to the governor and state legislature; works with FDOT on an ongoing project to evaluate the performance of alternatively fueled buses; assists FTA with its transit electrification research plan and other fuel-related research; serves as staff to the Tampa Bay Clean Cities Coalition.

Many organizations have lent their considerable experience and expertise to NCTR by agreeing to have representatives serve on the NCTR Advisory Board. Included among them are:

Lou Sanders – American Public Transportation Association; Public Transportation Office – Illinois Department of Transportation; Tim Garling, Director, Broward County Mass Transit Division; Ed Coven, Manager, Public Transportation Office, Florida Department of Transportation; Darryll Dockstader, Manager, Research Office, Florida Department of Transportation; Bill McCloud, Senior Vice President, Transdev Corporation; Jon Martz, Vice President, Van Pool Services, Inc.; Joe Calabrese, GM/CEO, Greater Cleveland Regional Transit Authority; Michael Baltes, Director – Office of Technology, Federal Transit Administration; Dr. Minnie Fells Johnson, Chair, Project for Public Spaces; Perry Maull, Director – Indiana University Bus Services

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

Yes. Three projects completed by NDSU during this reporting period also engaged the following contacts:

Twenty-seven transit agencies in North Dakota and 38 transit agencies in Florida completed surveys for the project entitled “Developing a Method for Assessing National Demand-Response Transit Level of Service” and another 160 small transit agencies responded to surveys for the project entitled “Workforce Development and Succession Planning to Prepare the Rural Transit Industry of the Future.”

The report entitled “Low-cost Ride-Quality Characterizations for Transit” required contact and collaborations with the following people and organizations: Julie Bommelman (Transit Administrator of the City of Fargo), James Gilmour (Planning Director of the City of Fargo), and Gregg Schildberger (Senior Transit Planner for the City of Fargo) who provided access to the buses for roughness measurements and to conduct surveys. In addition, the following reviewers helped to improve the clarity and value of the report: Kirk Burcar (Director of Production Engineering at New Flyer – a bus manufacturer), Dr. Nima Kargah-Ostadi, P.E. (Research Engineer at Fugro Roadware Inc. – a leading automated pavement ride quality evaluation company in the United States), Todd Belvo (Engineering Manager at BWI North America – a premier supplier of vehicle chassis, suspension, brakes, and other automotive parts to manufacturers), Eric Beaton (Senior Director of Transit Development for the New York City Department of Transportation), and Dr. Marcela Munizaga (Associate Professor at the University of Chile and President of the Chilean Society of Transportation Engineering).

Projects completed by FIU during this reporting period worked closely with the following transit agencies to obtain data and to receive feedback on their draft reports:

Massachusetts Bay Transportation Authority for their support in furnishing data for the report entitled “State of Good Repair Performance Measures: Assessing Asset Condition, Age, and Performance Data”.

Miami-Dade Transit and the Hillsborough Area Regional Transit Authority for their assistance with data and feedback on the project entitled “Analyzing AVL Data for On-time Performance and Identifying Conditions Leading to Service Degradation.”

Miami-Dade Transit and Palm Tran (Palm Beach County Transit, Florida) for their assistance with data and feedback on the report entitled “Development of Training Manuals for Transit Planning and Scheduling.”

The report produced by UIC entitled “Adapting Transit to Climate Change Impacts – National Survey of Transit Agency Extreme Weather Risks and Experiences” involved collaboration with the Chicago Transit Authority and the Utah Transit Authority in particular, but also involved a survey that collected data from approximately 900 transit professionals who work in planning, operation, maintenance, and engineering in 273 transit agencies in the U.S. Survey items captured data on recent experiences with extreme weather events, perception of weather risks to the local transit system, assessment of the agency’s capacity and challenges in dealing with weather risks, and organizational responses and adaptation to extreme weather events and potential climate risks. A total of 352 individuals representing 197 transit agencies responded to the survey (41% response rate) resulting in a rich and unique dataset on extreme weather and transit.

The report produced by UIC entitled “Increased Mobility through Enhanced Transit Connectivity” required contacting and collaborating with the following people and agencies to complete: the Chicago Regional Transportation Authority, the Chicago Transit Authority, Metra, Pace, the Chicago Department of Transportation, the Center for Neighborhood Technology, Adam Heckman of Microsoft and Eliot Dam of UI Labs/City Digital, as well as Bill Baltutis and Tim Grzesiakowski of the TMA of Lake-Cook.

## **Impact**

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

The National Center for Transit Research is housed at the Center for Urban Transportation Research, a very active center established in 1988 that addresses a multitude of issues. The consortium partners are also parts of well established, long-standing research centers. The work being performed through the grant is primarily research on policy and management issues, as well as clearinghouse activities that serve to share information collected from hundreds of sources with those who have signed up for participation on Listservs. Consequently, while the grant has allowed the consortium members to do more of the type of work they have been doing which has been very beneficial to the transportation industry and particularly the public transportation community, it has not necessarily had a major impact on the principal disciplines of the program. The federal grant has helped NCTR secure additional matching funds from the respective state DOTs which has enabled each consortium member to do more of what they have been doing, and has enabled the program to accept more students to work on the increased number of projects as research assistants.

**What is the impact on other disciplines?**

Nothing to report.

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

The results of the various training programs conducted by USF and NDSU were documented in the section entitled “**What opportunities for training and professional development has the program provided?**” The metrics report also includes data on the results of the training programs.

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

All of the consortium partners represent well established universities with long standing research programs. The grant has not resulted in any significant capital improvements, but it has provided the funds to permit research faculty to manage things such as listservs and webinar series that provide a wealth of information to the thousands that participate at no cost to the participants.

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

NCTR has been a leader in providing webinars that are free and can be watched on a live or recorded basis. This helps to minimize expense to those who participate since they can do so from their offices or other remote locations. Over 400 people have watched the webinars during the six month reporting period. NCTR has also been a leader in the management of listservs that allow flexible and frequent communication among transportation professionals on a variety of subjects. Some decisions cannot wait many months or years for research to be completed, but the listservs allow participants to share current information and provide mutual assistance by providing all participants with the best information available. All statistics associated with NCTR’s listservs, websites, and webinars are now reported through the PPPR for Livability UTC grant in terms of the six month text reports. The metrics report for the full year contains statistics that also cover the first six months of 2016..

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

The “Best Workplaces for Commuters” designation acknowledges employers who have excelled at implementing green commuter programs. These programs include ridesharing, transit benefits, biking/walking/teleworking, flexible work schedules and other transportation demand management strategies designed to decrease traffic congestion and improve traffic related air pollution levels. By offering these commuter benefits, the recognized employers are committing to regional pollution reduction, greater economical savings related to commuting costs and lessening employee stress caused by single occupant vehicle travel to and from work. Over 230 employers, some with multiple worksites, (many of the largest companies in the country) throughout the country have earned the designation as a Best Workplace for Commuters.

Go Hillsborough is an initiative of the Transportation for Economic Development Policy Leadership Group, which includes all seven Hillsborough County Commissioners; the mayors of Plant City, Tampa and Temple Terrace; and the chair of the HART board. NNTA is a transportation management initiative of public and private members. USF's TDM Team provides technical support to NNTA. This group helps to identify and implement solutions to transportation challenges in the north Tampa area.

The **Tampa Bay Clean Cities Coalition (TBCCC)** promotes the use of advanced transportation fuels and technologies in the Tampa Bay region. CUTR is a partner along with the Environmental Protection Commission of Hillsborough County and TECO Energy. This group continues to identify opportunities to implement greener technologies, improving the air quality in the Tampa Bay area.

A great deal of the research and training completed provided by NCTR results in more efficient and safer public transportation. This results in the provision of more and better transit service, providing alternative mobility for people open to non-SOV transportation. NCTR's TDM program is dedicated to finding ways to help reduce Single Occupant Vehicle use, and/or to redistribute or reduce the amount of times it is used. These efforts result in less congestion on our highways resulting in safer conditions.

## **Changes/Problems**

### **Changes in approach and reasons for change**

Nothing to report

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

A number of research projects have been granted no-cost time extensions, but all projects are scheduled to be completed by the end date of the grant, September 30, 2016.

### **Changes that have a significant impact on expenditures**

Nothing to report.

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

Nothing to report.

### **Change of primary performance site location from the originally proposed**

Nothing to report.

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

### **Outputs**

Nothing more to report

**Outcomes**

Nothing more to report.

**Impacts**

Nothing more to report

**Special Reporting Requirements**

Nothing to report.

