

2020

## Livable Communities UTC - October 1, 2019–March 31, 2020

NCTR

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### Scholar Commons Citation

NCTR, "Livable Communities UTC - October 1, 2019–March 31, 2020" (2020). *NCTR Livable Communities UTC*. 24.

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**U.S. Department of Transportation**  
Office of the Assistant Secretary for Research and Technology  
University Transportation Centers Program

**Program Progress Performance Report for University  
Transportation Centers**

**National Center for Transit Research (NCTR)**

Tier 1 Livability University Transportation Center  
University of South Florida in partnership with  
Texas A&M University • University of Illinois at Chicago • Florida International University

**Grant Number: DTRT13-G-UTC56**

**DUNS** 06-968-7242 • **EIN** 59-3102112 -F5 (Tampa Campus)

**Submitted to**

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**Submission Date:** April 30, 2020

**Grant Period:** September 30, 2013–September 30, 2020

**Reporting Period:** October 1, 2019 – March 31, 2020, Thirteenth Semi-Annual Progress Report

Signature of Submitting Official:



*Robert L. Bertini, Ph.D., P.E., Center Director*

<b>1. ACCOMPLISHMENTS:</b> What was done? What was learned?
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The information provided in this section allows assessment as to whether satisfactory progress has been made during the reporting period.
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This PPPR for NCTR’s Livability UTC grant, covering the period from October 1, 2019 to March 31, 2020, represents the thirteenth semi-annual report. Substantial work has been done with the resources the grant provides as reported herein. We intend to submit our final semi-annual report on September 30, 2020 which is the end date for this grant.

### **COVID-19 Impacts on NCTR Operations**

CUTR moved to full remote operations on March 17, 2020, with few challenges. Our building is closed. Some staff required purchase of laptops, transport of desktop computers and monitors, and purchase of headsets and other productivity related items. As many CUTR faculty teach, and all CUTR students are enrolled in courses, we were all affected by USF’s move to remote learning on March 23, 2020. All USF pre-award, post-award, contracting, and legal review services are up and running in the remote work format. Most NCTR reports are in the final stages of review, and seminars and webinars could easily be converted to fully virtual production. Faculty, staff and students have all quickly adapted to the use of technology like MS Teams and Blackboard Collaborate Ultra which are the official USF remote communications tools. We developed an internal online resource webpage (in wiki format) that is a “one stop shop” for all aspects of working remotely. CUTR also has instituted successful weekly “all hands” staff meetings to check in with everyone, and project/program team meetings are continuing in virtual format.

In terms of impacts, we have programmed a small amount of remaining funds to one new mini-project, and FIU is working to rapidly reprogram one task that was intending to rely on data collection (the original plan would not be valid under social distancing and shut down conditions). NCTR faculty and staff are working actively to support the FDOT emergency operations in the area of public transportation, and have produced the [COVID-19 Emergency Management Tips and Practices for Bus Transit Systems](#) for FDOT that has been disseminated to Florida’s transit agencies, APTA, FTA, CTAA, National RTAP, and transit agencies across the country. NCTR faculty also participate in daily FDOT COVID-19 briefings. On May 6, 2020 at 2:00 PM NCTR faculty will be hosting an “Emergency Preparedness, Mitigation, and Response – COVID-19 and other Pandemics” webinar in collaboration with USF’s College of Public Health. NCTR faculty will be conducting an “FDOT/CUTR COVID-19 Innovative Mitigation Strategies” webinar on May 7, 2020 at 2:00 PM. Our program faculty continue to adapt to the new conditions and have been rising to the occasion and continuing to serve the transportation community.

### **A. What are the major goals of the program?**

The goal of the NCTR program has been to conduct research leveraging the strengths of its members in all forms of public transportation, transportation demand management (TDM), and active transportation. Public transportation and TDM make livable communities possible; indeed, we regard these transportation modes as prerequisites to communities being safe, livable, and more equitable. The NCTR consortium includes a multidisciplinary team with extensive experience in transportation research, education and UTC participation, enabled by dedicated full-time research faculty. Our research addresses U.S. DOT’s goal of supporting Livable Communities as well as environmental sustainability and

safety. Research performance metrics are shown in Table 1. Our research has addressed many of the objectives of the U.S. DOT Strategic Plan section on Livable Communities:

- Help improve the performance of, and passenger experience with, public transportation to help increase ridership and mode share.
- Reduce motorized trips by developing tools and policies to improve facilities for pedestrians and other non-motorized modes of travel.
- Improve access to transportation for people with disabilities, older adults, and low-income populations.
- Improve the relationship between land use and transportation and develop multimodal networks to serve communities.
- Promote market-based strategies and information technologies to manage demand on congested roadways.

The research activities conducted by NCTR are undertaken through collaboration among the four universities, with student research assistants involved in almost every project undertaken.

**Table 1: Performance Metrics for Research**

Measure	Methods/Sources for Tracking
NCTR papers and research reports published	All reports posted to NCTR website; papers monitored quarterly
Presentations of NCTR research results at professional academic and industry association conferences	Quarterly PI reports on presentations
NCTR reports downloaded from NCTR websites	Google Analytics and Scholar Commons
Students participating in NCTR research projects	PIs required to maintain statistics
NCTR awards and distinctions received	Faculty reporting of awards/distinctions
NCTR citations in other professional papers/media	Google Scholar and Scopus
Number of patents issued based on NCTR research projects	U.S. Patent Office, USF Technology Transfer
Policies/practices changed as a result of NCTR research	Responses to inquiries from NCTR website

NCTR measures its leadership through the number of national professional committees that our consortium members lead, the number of significant roles our research faculty play in forums designed to identify transit research needs, the number of professional development workshops and conferences for which we develop programs, the number of presentations and papers published, and the research agendas prepared in consultation with FTA and state DOTs. Faculty members maintain documentation of these activities, shown in the below:

Leadership Activity	Faculty
Member, OneBusAway Open-source Project Board of Directors	Barbeau
Member, Project Leadership Committee, OpenTripPlanner Open-source Project	Barbeau
Member, APTA Research & Technology Committee	Barbeau
Member, National Academy of Inventors	Barbeau
Member, Hillsborough County MPO ITS Committee	Barbeau
Member, Hillsborough County MPO, Data Business Plan Committee	Barbeau
Friend of TRB committees TRB ABJ30, ABJ50, ABJ70, AND20	Barbeau



Civil and Environmental Engineering with a focus on public transportation. The goals for workforce development and education are shown in Table 2.

**Table 2: Performance Metrics for Education**

Measure	Methods/Sources for Tracking
Number of students who graduate from transportation-related programs or worked on NCTR projects and placement in industry	Reports from respective universities sent to NCTR Director at completion of each semester
Number of students to serve as interns or technical assistants to transit agencies within proximity of consortium members	Reports from respective universities sent to NCTR Director at completion of each semester
Number of students who participate in public transit courses	Reports from respective universities sent to NCTR Director at completion of each semester
Number of people participating in training programs offered by consortium, contact hours, and how they have responded to training program customer satisfaction surveys	Attendance to be recorded at all training sessions; evaluations of all training programs; information forwarded to NCTR for compilation
Number of transportation-related courses offered that were taught by faculty and/or teaching assistants associated with NCTR	Reports from respective universities sent to NCTR Director at completion of each semester
Number of students participating in transportation-related projects funded by grant	Reports from respective universities sent to NCTR Director at completion of each semester
Number of graduate students supported by grant	Reports from respective universities sent to NCTR Director at completion of each semester
Number of students supported by grant who received degrees	Reports from respective universities sent to NCTR Director at completion of each semester
Number of attendees at MOSI Exhibit	Visits recorded through interactive exhibit

With regard to technology transfer, the goals have included:

- Assertive management of a number of clearinghouse and information centers including the National TDM and Telework Clearinghouse, the National Transit Safety Research and Assistance Center, the GIS in Transit Clearinghouse, the Advanced Energy Transit Portal, and the Integrated Mobility Clearinghouse dedicated to collecting information on the experience public transit agencies are having in efforts to coordinate with transportation network companies and provide “mobility on demand.”
- The continued digital publication of the *Journal of Public Transportation* and establishing the new *Journal of Transportation Demand Management Research*
- The development of patents and licenses for location aware software applications that help all users to better navigate their transportation system and services
- The management of numerous Listservs that allow for the easy and free exchange of information among over 10,000 professionals and students across the nation and the world
- Sponsoring of bi-weekly webinars and weekly seminars featuring the results of research from not only NCTR members, but other UTCs as well
- The development and management of a bi-annual GIS in Transit Conference co-sponsored by TRB and private sector companies held in Washington, D.C.
- Presentations of completed research at various state and national professional forums



### B. ***What was accomplished under these goals?***

This NCTR Livability grant was originally awarded on September 30, 2013, and the current approved grant end date will be September 30, 2020. Projects have been established for USF, Texas A&M, FIU, and UIC. The 15 final projects under this grant are all completed or in final phases, with substantial progress to be reported. These include 13 projects funded using UTC funds, and two projects funded as match projects by the Florida Department of Transportation (FDOT). One UIC project has been completed (in peer review), one UIC project is at completion (awaiting final report for peer review) and the last FIU project is also ongoing. See Table 3. With a small amount of remaining funds, we are completing a mini project in light of COVID-19 to understand the impact of the pandemic on travel behavior. All project final reports have been or will be peer reviewed and will be posted in Scholar Commons with a persistent Digital Object Identifier (DOI). Each project will have a Policy Brief and an associated webinar led by the principal investigator posted on the NCTR website.

**Table 3: Continuing NCTR Projects for 2018–2020**

No.	Title	PI	End Date	Status
N5	Campus Automated Shuttle Service Deployment Initiative	Lin	5/31/20	Peer review complete, final task investigating intention to use, willingness to pay and safety due 6/30/20.
N8	Florida’s Public Transit and Women’s Safety – Real and Perceived Concerns	Perk	7/31/19	Awaiting final peer review.
N9	Improving the Quality and Cost Effectiveness of Multimodal Travel Behavior Data Collection	Barbeau	11/30/19	Complete.
N9A	Impact of COVID-19 on Travel Behavior, and Shared Mobility Systems: Investigating the Role of ICT in the Changing Travel Landscape	Menon	7/31/20	Mini project added in light of COVID-19.
N10	Improving Transportation Access to Health Care Services	Williams	4/30/19	Complete.
N11	Increasing the Desirability of Transit and All Other Travel Choices via Best Workplaces for Commuters	Winters	9/30/19	Awaiting final report.
N12	Media Framing of Fatal Bicycle Crashes in Hillsborough County: A Critical Discourse Analysis	Bond	10/31/18	Complete.
N14	Public Transit in America	Godfrey	5/31/19	Complete.
N15	Smartphone Based Connected Bicycle Prototype Development for Sustainable Multimodal Transportation System	Kourtellis	5/31/19	Awaiting final peer review.
N99	Transportation Webcast Series	Lewis	9/30/20	Project ongoing.
F1	Enhancing Cybersecurity in Public Transportation	Barbeau	11/30/19	Complete.
F2	Understanding Ridership Trends in Transit	Polzin	3/15/19	Complete.

UIC1	An Assessment of Intercity Bus Services in Illinois	Sriraj UIC	9/30/19	Awaiting final peer review.
UIC2	Deficiencies in Public Transit Accessibility of Healthcare Facilities in Chicago	Sriraj UIC	5/1/20	Awaiting final report.
FIU1	Safe and Accessible Pedestrian Facilities Inventory Model (SAPFIM): Development	Cevallos FIU	4/30/18	Complete.
FIU2	Using Microtransit Electric Low Speed Vehicles as a Means for Improving Quality of Life in Miami-Dade County	Cevallos FIU	5/31/20	Project ongoing.

### Journal of Public Transportation

Publication of the **Journal of Public Transportation** is now in its 23rd year, supported by various UTC grants and during this reporting period by the UTC Livability Grant, as another successful knowledge sharing/technology transfer project. Dr. Robert Bertini serves as Editor-in-Chief. Four new sponsors have been secured to continue the journal for the next four years, and we are grateful to these four UTC partners for their support:

- Upper Great Plains Transportation Institute, North Dakota State University
- Mineta Transportation Institute, San Jose State University
- Center for Transportation Equity, Decisions and Dollars, University of Texas at Arlington
- Teaching Old Models New Tricks, Arizona State University

Over this reporting period, 592 papers and full issues (works) had a total of 41,837 downloads from 165 countries.

We have reconstituted the Journal of Public Transportation editorial board and have moved paper submission and review into an online portal. We received 74 submissions and the following table shows the latest event recorded in the online portal.

Last event	Total
Accepted	1
Editor assigned	2
Initial submission	30
Major revisions required	2
Rejected	25
Review completed	5
Reviewer commits to review	3
Reviewer reminded to review	2
Revision uploaded	4
<b>Grand Total</b>	<b>74</b>

The following table lists the top 10 papers over this reporting period:



Title	Downloads
Bike-sharing: History, Impacts, Models of Provision, and Future	1744
What Do Passengers Do During Travel Time? Structured Observations on Buses and Trains	1023
Service Quality Attributes Affecting Customer Satisfaction for Bus Transit	866
The Crisis of Public Transport in India: Overwhelming Needs but Limited Resources	771
A Worldwide State-of-the-Art Analysis for Bus Rapid Transit: Looking for the Success Formula	736
Not If, but When: Autonomous Driving and the Future of Transit	706
To Predict with Confidence, Plan for Freedom	585
Assessment of Passenger Satisfaction with Intra-City Public Bus Transport Services in Abuja, Nigeria	553
Review of Urban Transportation in India	545
Transit Deserts: The Gap between Demand and Supply	542

The Journal of Public Transportation is published online. The articles were moved to open-access journal (ScholarCommons) in March 2015. Since then a total of 317,866 downloads have been recorded. All past issues of JPT are posted on the USF Scholar Commons site, in an open access format, available to anyone, anywhere, free. The refreshed editorial board aims to continue to improve the impact factor and visibility of the journal.

Editor-in-Chief: Robert L. Bertini, University of South Florida, USA  
 Associate Editors: Candace Brakewood, University of Tennessee, USA  
 Oded Cats, Delft University of Technology, the Netherlands  
 Ehab Diab, University of Saskatchewan, Canada  
 Ahmed El-Geneidy, McGill University, Canada  
 Marcela Munizaga, Universidad de Chile, Chile  
 Kari E. Watkins, Georgia Institute of Technology, USA  
 Alejandro Tirachini, Universidad de Chile, Chile

#### Editorial Board

- Alireza Khani, University of Minnesota, USA
- Eric Lind, Metro Transit, USA
- Jeremy Mattson, North Dakota State University, USA
- William Millar, USA
- Neema Nassir, University of Melbourne, Australia
- Hilary Nixon, San Jose State University, USA
- Laurel Paget-Seekins, Massachusetts Bay Transportation Authority, USA
- Christopher Pangilinan, Uber, USA
- Steve Polzin, U.S. Department of Transportation, USA
- Zhen (Sean) Qian, Carnegie Mellon University, USA
- Jan-Dirk Schmoecker, Kyoto University, Japan
- Amer Shalaby, University of Toronto, Canada
- P.S. Sriraj, University of Illinois at Chicago, USA
- James G. Strathman, Portland State University, USA
- Niels van Oort, Delft University of Technology, the Netherlands
- Vukan Vuchic, University of Pennsylvania, USA

- Yu Zhang, University of South Florida, USA

### Journal of Transportation Demand Management Research

NCTR also started publishing a new journal entitled the *Journal of Transportation Demand Management Research*. Two papers have been published and others are in various stages of review. Since April when the first paper was published, the two articles have had a total of 202 downloads from 17 countries.

Title	Downloads
Low-Income Access to Employer-Based Transit Benefits: Evidence from 10 Large Metropolitan Regions	152
Toward Car Free Key West	50

Managing Editor: Eric Schreffler, ESTC

Editorial Board

- John Attanucci, Massachusetts Institute of Technology (MIT)
- Lori Diggins, LDA Consulting
- Jennifer Dill, Portland State University
- Karen Frick, University of California, Berkeley
- Satoshi Fujii, Kyoto University
- Aljaz Plevnik, Urban Planning Institute of Slovenia (UIRS)
- Nicholas Ramfos, Metropolitan Washington County of Governments (MWCOG)
- Geoff Rose, Monash University
- Tom Rye, Napier University
- Peter van der Waarden, Eindhoven University of Technology
- Philip L. Winters, Center for Urban Transportation Research (CUTR), University of South Florida

### Publication Archives

Over the past year, we have worked diligently with our USF Library to create repositories for all CUTR and NCTR publications within ScholarCommons to make them more accessible to the transportation community. The **CUTR Publications Archive** consists of 151 reports. Those works have been downloaded 245 times. Below are the top 10 downloads.

Title	Downloads
Evaluation of red RRFB Implementation at Freeway Off-Ramps and Its Effectiveness on Alleviating Wrong-Way Driving	52
Identification of Factors in Road Accidents through In-Depth Accident Analysis	48
Improvement Assessment of Bus Serviceability by Proposing Route Revision	29
Educational Campaign for Improving Pedestrian Safety: A University Campus Study	26
An Unconventional Design for Bus U-Turns at Signalized Intersections	24
Analysis on the Influence Factors of Accident Severity: Evidence from Urban River-Crossing Tunnels in Shanghai of China	17
Understanding Interactions between Drivers and Pedestrian Features at Signalized Intersections	17
An Overview of Yield-to-Bus Programs in Florida	16

Investigation Motorcycle Safety at Exit Ramp Sections by Analyzing Historical Crash Data and Rider's Perception	9
Exploring Factors Contributing to Lane Changes during Left Turns on Quadruple Left-Turn Lanes at Signalized Intersections	7

Since July 2019, 247 NCTR reports have been added to the new **NCTR Research Reports Archive**. Those works have been downloaded 1,414 times. Below are the top 10 downloads.

Title	Downloads
Advantages and Disadvantages of Fare-Free Transit Policy	207
Improving Transportation Access to Health Care Services	135
Media Framing of Fatal Bicycle Crashes in Hillsborough County: A Critical Discourse Analysis	47
Analysis of the Florida Department of Transportation Transit Corridor Program/Projects: Technical Memorandum #1 Review and Summary of Transit Corridor Plans	21
Flexible Public Transportation in Florida	18
Performance Measures and Best Practices for Incorporating Transit into the FDOT DRI Review Process	16
Rideshare/511 Signage in the U.S. and Canada	15
GIS Applications at Florida's Transit Agencies: Scope, Trends, and Issues	14
Implications to Public Transportation of Emerging Technologies	12
Evaluation of Electronic Data Recorder for Incident Investigation, Driver Performance, and Vehicle Maintenance	12
Routes to New Networks: A Guide to Social Media for the Public Transportation Industry	12
Advantages and Disadvantages of Fare-Free Transit Policy	207
Improving Transportation Access to Health Care Services	135
Media Framing of Fatal Bicycle Crashes in Hillsborough County: A Critical Discourse Analysis	47
Analysis of the Florida Department of Transportation Transit Corridor Program/Projects: Technical Memorandum #1 Review and Summary of Transit Corridor Plans	21

### Clearinghouses and Technical Assistance

The following summarizes the level of activity for the public transportation related listservs hosted by NCTR for the period October 1, 2019 through March 31, 2020.

Listsर्व	Add	Autodel	Delete	Post	Sign-Off	Current Total
Access Management	1	6	0	18	6	161
Best Workplaces for Commuters	2	26	0	8	5	459
Bus Fleet Maintenance (BFM-General)	5	20	0	51	4	321
Bikewalk	52	0	16	0	0	50
Bus Rapid Transit (BRT)	0	0	0	0	1	629
BWC-Champions	0	16	0	7	4	100

Florida Operations Network (FTSON)	24	0	2	336	8	331
Location Aware	0	0	0	0	0	77
Florida Transit Maintenance	5	6	0	49	0	167
New North Transportation Alliance (NNTA-Board)	4	0	12	17	0	51
Parking	1	0	0	0	3	418
Substance Abuse Management	17	1	0	33	2	130
Telework	51	35	1	21	3	399
Transit GIS	3	0	0	0	1	898
Transportation Demand Management	201	100	2	373	64	2013
TOTALS	366	210	33	913	101	6204

- ADD records track list add operations (those who are manually added by the list owner, but not those who subscribe themselves to the list).
- AUTODEL records track users who have been autodeleted from the list. If Auto-Delete is not enabled for the list, there will not be any AUTODEL entries.
- DELETE records track list delete operations (those who are manually deleted by the list owner, but not those who unsubscribe themselves from the list).
- POST records track all successful postings to the list.
- SIGNOFF records track list unsubscribe operations (those who unsubscribe themselves from the list, but not those who are manually deleted by the list owner).

### Social Media

@CUTRUSF Twitter has 1,030 followers, CUTRUSF on Facebook has 1,822 Follows. CUTR has begun using Facebook Live to broadcast weekly graduate seminar series at USF and guest speakers. CUTR's LinkedIn page has 974 followers, on YouTube we have 154 subscribers, and our new Instagram page has 120 followers.

### CUTR Transportation Webcast Series

The following webinars were conducted this reporting period, as part of the CUTR Transportation Webcast Series. Webinars are interactive such that participants can ask questions and they are also archived for permanent future access. An average of 40 people participate in the webinars on a live basis, and a bit more view the webinar on a recorded basis.

Date	Title	Speakers
10/15/19	<a href="#">Florida Clean Cities Volkswagen Mitigation Plan</a>	Alexander Kolpakov, Tampa Bay Clean Cities/CUTR; JP Fraites, Florida Department of Environmental Protection; and Doug Kettles, Central Florida Clean Cities Coalition
11/14/19	<a href="#">Enhancing Cybersecurity in Public Transportation</a>	Sean Barbeau, Ph.D., CUTR; Jarred Ligatti, USF
1/30/20	<a href="#">Smartphone Based Connected Bicycle Prototype Development for Sustainable Multimodal Transportation System</a>	Achilleas Kourtellis, Ph.D., CUTR

2/27/20	<a href="#">The Healthy Buddy Program: Addressing Immobility in Transportation-Disadvantaged Older Adults through a Community-Based Initiative</a>	Si Won Jang, Ph.D., CUTR
4/2/2020	<a href="#">Florida's Public Transit and Women's Safety – Real and Perceived Concerns</a>	Victoria Perk, Ph.D., CUTR
Pre-recording	<a href="#">Campus Automated Shuttle Service Deployment Initiative</a>	Pei-Sung Lin, Ph.D., CUTR
Pre-recording	<a href="#">Improving the Quality and Cost Effectiveness of Multimodal Travel Behavior Data Collection</a>	Sean Barbeau, Ph.D., CUTR
Pre-recording	Increasing the Desirability of Transit and All Other Travel Choices via Best Workplaces for Commuters	Phil Winters, CUTR

### **CUTR Transportation Seminar Series**

CUTR co-sponsors a weekly transportation seminar, held every Friday during the academic year at 12:00 noon, and streamed live on Facebook Live. In addition to the 40+ in person participants, the seminars presented during this reporting period reached hundreds of people live and in archived forms. The streams are archived for permanent access.

Date	Speaker	Title
10/4/2019	ITE Student Chapter	Student Competition
10/11/2019	Alfredo Cely	Pavement, Construction
10/18/2019	Peng Chen	Personalized Incentive-Based Peak Avoidance and Driving Time-Savings
10/25/2019	Sean Qian	Connected/Automated Vehicles
11/1/2019	Sarah Brammell	Environmental Analysis of Transportation Systems
11/8/2019	Dave Knorr	NextGen Implementations and Further NAS Moderation
1/17/2020	Ms. Danya Shi, AICP	Walk Your Way
1/24/2020	Dr. Xiaopeng Li	Trajectory Planning for Connected Autonomous Modular Vehicles: Theory, Modeling, and Experiments
1/31/2020	Tolga Ercan	Connected Wise LLC
2/14/2020	Steve Lockwood	Beyond ITS: Major Trends in TSMO and CAV
2/21/2020	Trang Luong Divyamitra Mishra	Analysis of Leisure Activity using Social Capital Measures/An Inferential Study of the Potential Consumer Value of Free Charging for Users of Public EV Charging Infrastructure
3/6/2020	Jiangchuan Hu	Forecasting Florida State Safety Performance
3/13/2020	Yanshuo Sun	
3/27/2020	Dr. Cara Wang	The Evolving Freight Demand
4/3/2020	Chunfu Xin	<a href="#">Post-Overlay Flexible Pavement Performance Modeling</a>
4/10/2020	Jim Halley, A.A.E., ACE	Considering Technology and Resilience in the Florida Transportation Plan

4/17/2020	Brian Staes	Measuring Transportation Network Performance During Emergency Evacuations
4/24/2020	Xiaowei Shi	Measuring Trajectory Planning for an Autonomous Vehicle with Conflict with Moving Objects over a Fixed Path

### **USF Transportation Courses**

USF offers a wide array of transportation courses for undergraduates, graduates and working professionals. Most courses are available in online formats, making the curriculum accessible to individuals who are not able to come to the Tampa campus. Here is a list of the courses offered during Fall 2019 and Spring 2020 semesters along with the name of each instructor and course enrollment. Like most universities nationwide, USF moved to remote learning on March 23, 2020.

<b>Transportation Courses</b>	<b>Number</b>	<b>Fall 2019</b>	<b>Spring 2020</b>
<b>Graduate Courses</b>			
Public Transportation	TTE 6651		
Multimodal Transportation Planning	URP 6711	Williams 11	
Transportation and Land Use	URP 6930		Chen 16
Traffic System Engineering	TTE 5205	Lin 23	
Transportation Planning and Economics	TTE 5501	Menon 33	
Transportation Safety	TTE 6315		Wang 14
GIS in Transportation	CGN 6933		
Traffic Flow Theory	CGN 6933	Li 8	
Transportation and Infrastructure Network Analysis	CGN 6933		
Pavement Design	TTE 6835	Lu 18	
Asphalt and Asphalt Mixes	TTE 6833		
Infrastructure Systems Management	TTE 5305		Lu 20
Statistics and Econometrics Method I	TTE 6307	Mannering 22	
Statistics and Econometrics Method II	TTE 6501		Mannering 8
Discrete Choice Models of Behavior	TTE 6505		
Travel Demand Modeling	TTE 6507		
Data Science for Civil Engineers	CGN 6933	Maness 11	Kamrani 29
Air Transportation	TTE 5620		Zhang 8
Airport/Port Operations and Management	CGN 6933		
Sustainable Transportation	TTE 6657		Jackman 16
Sustainable Urban Mobility	CGN 4/6933		
Graduate Transportation Seminar	TTE 6930	Zhang 7	Li 13
Automated/Connected Transportation Seminar	TTE 4/6933		Li 6
Advanced Geometric Design of Highways	CGN 6933	Behzadi 8	



Computer Applications in Traffic Engineering	CGN 4/6933		
<b>Undergraduate Courses</b>			
Transportation and Society	TTE 4006	Islam 35	
Capstone Trans/Geotech	CEG 4850		Lu/Cely 33
Transportation Engineering I	TTE 4004	Bertini 49/ Maness 49	Kourtellis 20
Trans Engineering II	TTE 4004		Menon 52/ Chen 21

**C. How have the results been disseminated?**

Results are disseminated through publications, presentations, newsletters, social media, web postings, and through teaching and training. As examples of NCTR dissemination, the TDM Knowledge Base provides thousands of answers to questions asked by members of the TDM Listserv. The *Journal of Public Transportation* continues to be published. Our CUTR newsletter and email notifications for JPT reach over 3,000 transportation academics and professionals. JPT papers were downloaded many times. Research reports are posted to the NCTR Scholar Commons archive, posted in TRID, and promoted through social media and webinars. NCTR maintains an alerting service to almost 2,000 subscribers who ask to be advised when a new report is available.

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

The next report will be the final report for NCTR as all activities will be completed by September 30, 2020. We plan to complete our last few research projects, post the peer reviewed final reports, move all RIP entries to TRID, complete Policy Briefs for each project and conduct webinars led by each PI. We plan to finalize the archive for all NCTR research projects on USF's Scholar Commons platform and continue to document their impacts. The NCTR website has been moved to an archive status, and all past performance reports are now available on Scholar Commons. As we close out NCTR after many years, we are excited about launching the new National Institute for Congestion Reduction (NICR), awarded by U.S. DOT in October of 2019.

The *Journal of Public Transportation* has resumed the regular unsolicited journal process in 2019 with the reconstituted Editorial Board. Continuing efforts are underway to strengthen the funding base for the journal. The new *Journal for Transportation Demand Management* is nearing completion of its first published issue. These efforts are sustainable and will continue after NCTR closes down. We have been grateful for the opportunity to conduct all of the work under the NCTR grant.

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

Publications are the characteristic product of research projects funded by the UTC Program. OST-R may evaluate what the publications demonstrate about the excellence and significance of the research and the efficacy with which the results are being communicated to colleagues, potential users, and the public, not the number of publications. Many research projects (though not all) develop significant products other than publications. OST-R may assess and report both publications and other products to Congress, communities of interest, and the public.

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

During this reporting period the numbers of publications, conference papers and presentations were fewer than in the past due to the completion of most research projects. Final reports, webinars and seminars shown above were completed.

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

The following websites are continuing to provide resources to the transportation community.

Website
National Center for Transit Research
Best Workplaces for Commuters
CommuterServices.com
National Bus Rapid Transit Institute
Florida Transit Safety and Operations Network (ftson.org)
Transit Maintenance Analysis Resource Center (tmaarc.org)
National Transit Safety Research and Technical Assistance Center (www.transitsafetycenter.org)

The NCTR (nctr.usf.edu) website is visited by people seeking information on public transit and other modes of non-single occupant vehicle transportation. When people query “transit research,” NCTR’s website is the top listing on Google, Bing, and Yahoo! search engines. The NCTR website contents, especially the final reports and the U.S. DOT reporting have been archived in the Scholar Commons platform.

The Best Workplaces for Commuters website, the CUTR website, the National Transit Safety Research and Technical Assistance Center website all receive large numbers of visits and downloads. The Florida Transit Safety and Operations Network also has a website that attracted many users. The Advanced Transit Energy Portal website, and the Transit GIS Clearinghouse also receive strong levels of attention.

### **C. Technologies or techniques**

Social media interactions are described above.

### **D. Inventions, patent applications, and/or licenses**

USF remains in the top 15 universities worldwide for receiving patents with 17 granted for work funded through NCTR.

### **E. Other products**

OneBusAway is an open source platform for real time transit information. NCTR did not create the software but continues to contribute to its improvements and to helping disseminate its availability. This software enables a low-cost provision of real time information. It is growing in popularity and used by over 400,000 transit passengers in 10 different cities including New York.

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

OST-R needs to know who has worked on the project to gauge and report performance in promoting partnerships and collaborations.

**A. What organizations have been involved as partners?**

NCTR works with many organizations including the Florida Department of Transportation, the City of Tampa, Hillsborough County, the Hillsborough MPO, most transit agencies in the State of Florida and many agencies, firms and organizations around the Tampa Bay Area, the State of Florida and the U.S. USF holds master agreements with FDOT, the City of Tampa, Hillsborough County, HART and PSTA to enable streamlined collaboration and contracting.

**B. Have other collaborators or contacts been involved?**

NCTR has worked closely with the Association for Commuter Transportation to plan and produce webinars that are hosted by NCTR faculty and to plan their conference programs. The Florida Public Transportation Association (FPTA) works closely with NCTR faculty in the development and production of the Annual Professional Development Workforce conference will be held in a virtual format in June – July 2020.

NCTR works closely with the FDOT and the Florida Public Transportation Association to administer training programs for bus operators, maintenance technicians, planners, and trainers. FDOT provides the funding and oversees the programs that are administered by NCTR faculty at USF.

Hillsborough Community College (HCC) coordinates with the Transit Maintenance Analysis and Resource Center (TMAARC) program that provides transit technicians with quality training and information to facilitate their advancement in the public transit arena. Participants learn skills to keep up with the rapidly changing bus technology and can also earn an AA degree from HCC in the process of earning program credits.

NCTR and the Hillsborough Area Regional Transit Authority (HART) work cooperatively to institute and improve the OneBusAway software to provide transit users with real time information on the arrival time of the next bus at any bus stop. Other transit agencies in Florida have expressed interest in using this software after seeing the success in Tampa.

USF/CUTR/NCTR faculty and students are now involved with three Tier I UTCs, including ones led by the University of Texas at Arlington (CTEDD), Cornell University (CTECH), and Arizona State University (TOMNET). USF is now leading a new National UTC, the National Institute for Congestion Reduction (NICR) with partners U.C. Berkeley, Texas A&M University and the University of Puerto Rico.

More than two hundred public and private employers from across the country, participate in the Best Workplace for Commuters program and share best practices with all members. Certification maintenance credits (CM) are awarded to members of the American Planning Association (APA) with the American Institute of Certified Planners (AICP) professional credential for completing MCTR TDM courses. CM credits increases participation by providing the incentive for planners to attend the training. AICP planners must obtain 32 hours of CM credits every two years.

Several agencies have worked with FIU for its project on pedestrian facility inventory including FDOT District 6, the FHWA Florida Division, and the Broward County MPO. The National Transit Safety Research and Technical Assistance Center works closely with U.S. DOT's Transportation Safety Institute when putting curriculum together for safety training courses, and also work together to certify transit personnel to become safety instructors.

The NCTR Advisory Board is comprised of professionals from TRB, APTA, FPTA, FTA, FDOT, private transit management companies, and private consultants. We are planning one last NCTR Advisory Board meeting during the summer of 2020 to wrap up the grant and discuss the products of this program.

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

Over the years, this base of knowledge, techniques, people, and infrastructure is drawn upon again and again for application to commercial technology and the economy, to health and safety, to cost-efficient environmental protection, to the solution of social problems, to numerous other aspects of the public welfare, and to other fields of endeavor. DOT uses this information to assess how the research and education programs:

- increase the body of knowledge and techniques;
- enlarge the pool of people trained to develop that knowledge and techniques or put it to use; and,
- improve the physical, institutional, and information resources that enable those people to get their training and perform their functions.

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

NCTR partners have had a long history of transit research and education, which, in addition to their successful track record of producing first rate research, providing leadership in the industry, and graduating students who contribute to the transportation field, was no doubt part of the reason it was selected for the UTC grant. Consequently, the grant does not necessarily contribute to the *development* of the disciplines of the program, but the resources of the grant allow NCTR to remain an important resource to the public transit industry and the public.

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

NCTR, with its 45-member full time research faculty, has long been populated with a variety of disciplines including but not limited to civil engineering, urban planning, computer science, geography, public administration, economics, mathematics, and anthropology. In addition, NCTR faculty have worked with other disciplines at member universities when their talents can add to the value of a research project. As noted in the previous question, the UTC grant does not necessarily impact other disciplines, but it does allow the faculty with such multiple disciplines to be able to apply their skills to a variety of transportation challenges.

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

NCTR, in partnership with the Florida Department of Transportation, the Florida Public Transportation Association, the Association for Commuter Transportation and TRB provide training to practicing professionals at a variety of levels. In addition to the training received at the venues noted above, NCTR faculty made presentations at state, regional, and national professional conferences. NCTR and CUTR continue produce webinars on a bi-weekly basis and weekly transportation seminars that feature the results of transit research and program technical assistance.

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

Nothing to report.

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

The publication of the *Journal of Public Transportation* was supported with funds from this grant. The grant also supports the administration and maintenance of the various Listservs that allow the exchange of information among over 10,000 transportation professionals in the areas of transportation demand management, safety, etc., resulting in an incredible amount of transfer of knowledge among practicing professionals, university researchers, and students.

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

Efforts to encourage the use of transit and alternative and active modes of transportation should result in the reduction of congestion, energy consumption and emissions. The information collected and shared helps transit agencies to be more efficient and safer in their provision of service, while information on alternative fuels helps reduce the costs of transit as well as its carbon footprint, resulting in cleaner air and a step toward slowing global warming. NCTR training enables practitioners in the field to perform their functions more efficiently and effectively, resulting in better quality of service to the public.

<b>5. CHANGES/PROBLEMS</b>
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**1. Changes in approach and reasons for change**

NCTR faculty, staff and students have moved to full remote operations since March 17, 2020.

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

A final no cost extension through September 30, 2020 was approved in order to complete work at UIC and FIU, and to complete archiving of all NCTR reports and products in Scholar Commons. No problems are anticipated in completing all grant activities by then.

**3. Changes that have a significant impact on expenditures**

Nothing to report.

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

Nothing to report, and no anticipation of the need to report in the future since no projects will be dealing with these subjects.

**5. Change of primary performance site location from that originally proposed**

Nothing to report.

<b>Additional information regarding Products and Impacts</b>
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UTCs are encouraged to consider identifying program results by outputs, outcomes or impacts as suggested by the examples below. Impacts should be linked to National goals expressed in the Secretary's Strategic Goals.
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We are excited about the array of new projects that have moved toward completion during this reporting period. These projects will provide significant impacts and will position CUTR well for the future to compete for research projects at the state and national levels. The impacts of the training offered through the TDM program and other transit safety programs will result in less congestion, reduced pollution, fewer accidents, and equipment that can be kept in service for the maximum amount of years, thereby reducing capital costs for transit systems.

**6. SPECIAL REPORTING REQUIREMENTS**

Nothing to report.