STRIDE | Southeastern Transportation Research, Innovation, Development and Education Center

Technology Transfer Final Report

STRIDE Project A2

Changing Access to Public Transportation and the Potential for Increased Travel

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1. Project Description

With nationwide declines in public transportation ridership, transit may be falling behind in its ability to help cities deal with congestion. Increasing real-estate values are causing the economic displacement of low-income populations, those most closely associated with transit ridership. A plethora of new mobility options are providing alternatives for transit riders *who can afford them* and even for those who require subsidy. But how are access to transit, ridership, and congestion impacted by these shifts in demographics and the introduction of new mobility services? Researchers from four universities in the STRIDE consortium addressed access to public transportation issues through research in four focus areas: suburbanization of poverty, Transportation Network Companies (TNCs), healthcare access, and vulnerable populations.

In thrust 1, the team assessed the impacts of low-income individuals and families moving to the periphery of communities, i.e., the suburbanization of poverty, on public transit. In addition, this thrust provided a detailed analysis of sociodemographic and accessibility changes over time. In thrust 2, the study team developed a novel approach to understand how levels of transit service and demographics impact transit ridership on a highly specific spatial and temporal scale. In thrust 3, the study team developed a better understanding of the interactions between public transit and TNC providers. In thrust 4, the study team documented the rapid evolution of paratransit services available to access healthcare. Although the research in all four thrusts focused on specific areas of the southeast US, the results are applicable nationally to aid transit and regional planning agencies.

2. Performance Metrics

Metric	# Completed
Product(s): Number of new or improved tools, technologies, products, methods, practices, and processes created or improved	4
Technical Report: Number of client-based technical reports published	1 (STRIDE Final Report)
Body of Knowledge: Number of trainings for transportation professionals	3 (MARTA, Eno, STRIDE)
Professionals Trained: Number of professionals participating in trainings	418
Stakeholders: Number of stakeholders you met with to encourage adoption or implementation of product(s)	6 stakeholders (ITRE, MARTA, LYNX, GoTriangle, GoDurham, Orange County Dept of Aging, NCDOT; 10 meetings with stakeholders)
Adoption/Implementation: Number of incidences outputs of research have been implemented or adopted	2 agencies (MARTA, Minneapolis METRO)

3. Products

Product 1: Methodology - In many areas, increasing real-estate values have caused the economic displacement of low-income populations to suburban areas. While this is happening in the Raleigh-Durham-Chapel Hill region of North Carolina, efforts have also been made to expand and improve the transit system. Dr. Eleni Bardaka's team at North Carolina State University developed a methodology to assess whether these two simultaneous changes were making it easier or harder for low-income residents to access public transportation. Researchers found that although accessibility to transit increased over time, accessibility to qualified jobs by transit decreased. Researchers shared their findings with GoTriangle, the regional transit agency, in order to help plan for future transit improvements.

Product 2: Model - Ridership on public transportation has been on a steady decline resulting in fewer dollars to invest back into transit improvements. In the past, transit agencies have had limited tools to determine how best to improve service in a cost-effective way. Dr. Kari Watkins' team at Georgia Tech developed a model to more accurately analyze ridership over time and space. Applying the model in four different metropolitan areas – Portland, OR; Miami, FL; Atlanta, GA; and Minneapolis/St. Paul, MN – researchers were able to identify specific corridors that would benefit from service changes. The Metropolitan Atlanta Rapid Transit Authority (MARTA) is currently using the results within their research and service planning units. The model will provide transit agencies with an opportunity to understand the causes of ridership decline and identify strategies to reverse the trend.

Product 3: Geospatial Model - Transportation Network Companies (TNCs), such as Uber and Lyft, are adding to the field of transportation options, but little is known about how they may impact public transit and specialized transportation services or if they can meet the needs of the transportation disadvantaged. By interviewing transit and social service agencies in Florida, a research team led by Dr. Ruth Steiner and Dr. Ilir Bejleriat the University of Florida established requirements and challenges associated with TNC partnerships. A geospatial model was developed to identify specific service gaps facing the transportation disadvantaged and opportunities for how improved TNC partnerships could potentially fill these gaps in metro Orlando. Researchers discussed preliminary results with the staff of LYNX, a bus system run by the Central Florida Regional Transportation Authority, and modified the model based upon the discussion.

Product 4: Typology - Transportation to medical services is a critical need for many, particularly those with acute medical needs. Technological advances and shared mobility are reshaping paratransit and dial-a-ride services in the U.S. Ridesourcing options are appearing in electronic medical record workflows of clinicians and they are becoming a part of the choice set for patients through formal partnerships with care providers, insurance companies, and transit agencies. Dr. Noreen McDonald and doctoral student Mary Wolfe at the University of North Carolina Chapel Hill conducted a national review of these emerging services and developed a typology of innovations including three strategies in which medical transportation could be provided by TNCs. The typology has been shared with practitioners nationwide. New mobility solutions promise cost saving potential for insurers and more reliable access for patients; however, it is unclear whether these services could be financially viable in low-density, non-urban areas.

4. Body of Knowledge & Professionals Trained

1) On October 17, 2019, a lunch-learn was held at MARTA for employees from multiple units at MARTA. (30 participants)

2) Eno Webinar: "Analyzing Bus Ridership Decline" was presented by Simon Berrebi, Ph.D., Postdoctoral Fellow at the Georgia Institute of Technology and Alice Grossman, Ph.D., Senior Policy Analyst, Eno Center for Transportation on November 11, 2019.
Abstract: Following six years of consecutive decline, bus ridership in the United States attained its lowest level ever recorded in history last year. In this webinar, Dr. Berrebi will explain reasons and potential solutions to this decline through analysis of passenger count data between 2012 and 2018 at 50,000 bus stops in four cities: Portland, Miami, Minneapolis/St. Paul, and Atlanta. Data show that in all four cities, neighborhoods with high proportions of white residents lost ridership at the fastest rate. In Miami and Atlanta, places with high concentrations of college-graduates also correlate with ridership decline. These results suggest that changes in the travel behavior of choice riders may explain the bulk of the decline. Dr. Berrebi will discuss the inelasticity between frequency and ridership and recommend service, policy, and infrastructure solutions for transit agencies. (370 participants)
YouTube:
https://www.youtube.com/watch?time_continue=13&v=OphPBVsIKWY&feature=emb_logo

3) STRIDE webinar - Dr. Simon Berrebi, Georgia Tech, presented "Modeling Bus Ridership Trends on a Hyper-Local Level Between 2012 and 2018" on April 1, 2020. (18 participants)

5. Stakeholder Engagement

Date of Activity	February-April 2019	Approximately six meetings took place at ITRE during Spring 2019 to collect and compose the data necessary for Thrust 1.
Type of Activity	in-person meeting	
Location	ITRE	
Stakeholder(s)	Kai Monast, Joe Huegy, Terry Karlson, ITRE	
Date of Activity	May 2, 2019	A meeting took place to present the results of the frequency and demographic analysis on MARTA ridership change.
Type of Activity	in-person meeting	
Location	MARTA headquarters	
Stakeholder(s)	Rob Goodwin, Director of Research, MARTA Multiple members of his team	
Date of Activity	June 14, 2019	A presentation was done to bring results from this work and earlier work to transit agencies for their use in decision-making.
Type of Activity	in-person meeting	
Location	MARTA headquarters	
Stakeholder(s)	About 40 members of the Eno MAX program	
Date of Activity	June 28, 2019	A meeting took place to share the experiences and knowledge of LYNX with the UF research team regarding TD services and interactions with TNCs. (Thrust 3)
Type of Activity	phone meeting	
Location		
Stakeholder(s)	Norman Hickling, Director of Mobility Services at Lynx (Central Florida	

	Regional Transportation Authority), Nanette Stephens, Selita Stubbs, and Myles O'Keefe	
Date of Activity	2/25/19	Thrust 4 provided examples of transit agencies using the research in their policies, etc.
Type of Activity	in-person meeting	
Location	GoDurham	
Stakeholder(s)	Brian Fahey, Transit Administrator, Go Triangle	
Date of Activity	4/12/19	Discussion about data request for Thrust 4.
Type of Activity	phone meeting	
Location		
Stakeholder(s)	Kai Monast, Program Manager (Public Transportation Group), ITRE	
Date of Activity	6/12/19	Informed Orange County Medical Transportation Working Group about research project
Type of Activity	in-person meeting	
Location	Seymour Center, CH, NC	
Stakeholder(s)	Lisa Berley, Orange County Dept. for Aging	
Date of Activity	5/13/19	Updated NCDOT staff about research at Carolina including STRIDE-funded projects.
Type of Activity	in-person meeting	
Location	Raleigh, NC	
Stakeholder(s)	Julie White Depute Secretary for Multimodal Planning, Hanna Cockburn, Public Transit, Ped/bike	
Date of Activity	October 8, 2019	A meeting took place to present the final results of the frequency and demographic analysis on MARTA ridership change.
Type of Activity	in-person meeting	
Location	MARTA headquarters	
Stakeholder(s)	Rob Goodwin, Director of Research, MARTA Multiple members of his team	
Date of Activity	October 17, 2019	The PI conducted a lunch-and-learn at MARTA to present the final results of the study.
Type of Activity	in-person meeting	
Location	MARTA headquarters	
Stakeholder(s)	About 30 people from multiple units in MARTA	
Date of Activity	various	Discussed data sharing and results. Metro in Minneapolis expressed interest in incorporating results.
Type of Activity	Phone meeting & emails	
Location	phone	
Stakeholder(s)	Tri-met, Metro in Minneapolis, and Miami-Dade Transit	

6. Adoption/Implementation

Product 1: Methodology – The developed methodology has improved the understanding of regional and local transit agencies on the level of accessibility they provide to transportation disadvantaged populations. Implementation of this product will be further encouraged in future interactions with the transit agencies through webinars or in-person meetings.

Product 2: Ridership Model – Both MARTA and Minneapolis METRO Transit have used the ridership model to understand where ridership decreases are taking place within their systems to react to outside influences. The project team continues to follow up with all four agencies involved in the study to clarify the results and help them respond through service allocations.

Product 4: Typology – GoDurham has consulted the innovate healthcare mobility services typology to understand best use cases of ridehailing collaboration with paratransit. Most notably, they have looked at cost effectiveness examples we provided to understand local feasibility.

7. Broader Impacts

Product 1: Methodology – This methodology is bringing awareness to transit agencies on the limited accessibility to transit that the low-income suburbanized population is experiencing. This improved understanding will ideally result in transportation agencies thinking about how to make improvements through the use of emerging mobility technologies such as on-demand transit and car-sharing programs. When implemented, such solutions will positively impact the suburban populations and lead to overall traffic reductions.

Product 2: Ridership Model – The positive impact of reacting to reductions in transit ridership is to make the transit services more efficient and effective at serving riders. Ideally, this will impact the overall sustainability of the transportation system as transit ridership has positive social and environmental impacts. In the longer term, we are continuing to use the model to help agencies who show an interest in the results to reallocate their service.