PROMOTING BEHAVIOR CHANGE AMONG CAMPUS COMMUTERS

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ABSTRACT

This paper presents initial research findings of a multi-year, multi-site interdisciplinary project designed to promote alternative transportation (AT) and to encourage mode shift from single occupancy vehicle commuting to transit, carpooling, walking or biking. The research is designed to lay the groundwork towards developing effective interventions to promote transportation behavior change, especially for those who are currently *not* ready for such a change.

This study of students and staff at two public universities in the Northeast is designed to develop and test the methodology of applying the Transtheoretical Model (TTM), to transportation behavior. This behavior change model has been highly successful in the area of health promotion. In this study, it is combined with geospatial modeling to maximize impact on commuters.

Transportation surveys at two New England universities measured commute patterns, behaviors, attitudes towards AT and geographical information (e.g., residence locations) among university commuters. The authors assigned survey participants to one of five *Stages of Change*, a key TTM measure. Two additional constructs, *Decisional Balance* and *Self-Efficacy,* were also assessed. Participants' residence, demographics, and commuting information was collected and analyzed in light of TTM measures.

At the two universities, students, staff and faculty showed different commute patterns and attitudes toward AT. Students displayed the most readiness to use AT according to the TTM. Students had the shortest commute distances and practiced AT more frequently compared to staff and faculty. Overall, commute distance negatively influenced both the use of and readiness to adopt AT. Other geographic location factors also affected AT usage and commuters' behavior and attitudes toward AT. Using geospatial models, the authors identified many AT users and greater readiness to use AT in towns where there was adequate public transit connectivity to the campuses. Commuters who lived near transit stops were more likely to use AT as their primary transportation mode. When comparing the two universities, there were more AT commuters in the university with a more developed transit system. The impact of the transit system was greater among students than among faculty and staff.

The assessment of AT behaviors provides a foundation for developing transportation interventions to promote AT usage, not only within, but also beyond the campus setting. This

work will permit targeting not only current AT users, but those who are not yet ready to use AT, and move them towards greater readiness to change their commuting behavior. An important finding in this pilot study is that the survey data for AT fit the TTM based model, which has been successfully applied to numerous other behaviors. Once implemented, this model and interventions based on it have has great promise of being scaled to a modal shift among commuters outside a campus environment.

The authors are currently developing interventions which will provide individualized targeting of commuters based on TTM and geospatial information. Once developed, these interventions could provide an effective and low-cost, individualized way to reach commuters and to encourage sustainable transportation. This project can help transportation professionals change commuter behavior in a time of limited resources and increasing interest in encouraging mode change to reduce traffic, conserve fuel, and promoting active transportation modes.

INTRODUCTION

Due to disruptions prompted by demographic patterns, aging infrastructure, Climate Change, and a growing 'green' culture, there has been considerable interest in encouraging sustainable transportation alternatives. This quest has not yet translated into substantive behavior change. In order to achieve widespread adoption of alternative transportation (AT) choices, population-based changes in individuals' knowledge, attitudes, and behaviors are essential.

Transportation has been the fastest-growing source of US greenhouse gas emissions since 1990, and it contributes approximately 27% of greenhouse gas emissions in the US (EPA, 2006). It is also a primary source of pollution, congestion, injury and premature death. Many approaches exist to reduce greenhouse gas emissions from transportation, such as developing energy efficient vehicles and tax incentives to promote alternative fuel (*e.g.*, electric, hybrid and natural gas) vehicles. However, a key strategy is reduction of single occupancy vehicle (SOV) miles traveled, by shifting transportation modes to walking, biking, transit and carpool. This work is designed to promote readiness for alternative transportation. In this project, two comparable transportation surveys were conducted among students, staff and faculty at the University of New Hampshire (UNH) and the University of Rhode Island (URI). Comparative examination of survey results shows the differential impact of commute distances, geographic information, status, and stage of readiness for alternative transportation on commute patterns.

Surveys covering transportation topics such as transit ridership, commute patterns, satisfaction and awareness of transportation services, traffic demand model measures and parking were conducted at both the University of New Hampshire (UNH) and the University of Rhode Island (URI). The surveys incorporated key measures from the TTM. Based on these surveys, the authors' first goal is to identify differences in commuting behaviors among different university constituencies (students, staff and faculty). Given that students typically live close to campuses, the authors expected students are more likely to have pro-AT behaviors compared to staff and faculty. This hypothesis is tied to the second goal of the paper, which is to show that geographical location affects commute behaviors. Two hypotheses are related to geographical locations: (*i*) long commute distances discourage the use of AT and (*ii*) public transportation infrastructures have a strong effect on AT usage.

BACKGROUND

The Transtheoretical Model (TTM) has been recognized as one of the world's leading approaches to changing health behaviors. In order to systematically develop instruments and interventions to promote change in individual transportation behavior, TTM and geospatial modeling are used to compare transportation choices and behaviors at two New England state universities with considerable variation in transportation infrastructure and travel patterns.

One key construct of the TTM is *Stage of Change***.** Longitudinal studies have found that people move through a series of five stages when modifying behavior on their own or with the help of formal intervention (Prochaska & DiClemente, 1983; Prochaska *et al*, 2008). In *Precontemplation*, individuals may deny a problem and be resistant to change; they may be unaware of the negative consequences of their behavior, or have given up on change because they are demoralized. They are not intending to change in the foreseeable future. Individuals in *Contemplation* are more likely to recognize the benefits of changing. However, they continue to overestimate the costs of changing and, therefore, are ambivalent and not yet ready. Individuals in *Preparation* have decided to change soon, and have begun to take small steps toward that goal. People in *Action* are overtly engaged in modifying their behavior and are working to prevent relapse. Those in *Maintenance* have sustained change for some time and may not need to work as hard to prevent relapse. The TTM improves the likelihood of behavior changes by tailoring or targeting interventions to each individual's *stage of change*. Meta-analyses across a series of randomized trials including a range of different health behaviors have found that TTM tailored interventions are more effective than non-tailored interventions (Krebs *et al*, 2010; Noar *et al*, 2007).

A TTM based intervention study in the U.K. to increase active commuting among employees was proved effective. Mutrie et al. (2006) demonstrated that a TTM-based self-help intervention did effectively help those people who were either in the contemplation or preparation stages to initiate active commuting (walking or bicycle riding)to work.

Two Australian studies demonstrated the potential utility of TTM in reducing single occupancy vehicle (SOV) as a primary mode of transportation. Shannon et al. (2006) assessed the potential for change as well as barriers and motivators affecting transportation choices of 1,040 students and 1,170 staff at the University of Western Australia in Perth. A strong predictable relationships between stages of change for adopting active modes of transportation (walking, biking, public transit use) and pros and cons of change and self-efficacy (confidence in using active modes) resulted. Students (46.8%) and staff (21.5%) engaged in “active modes” of transportation. Attitude and behavior patterns were favorable compared to the U.S., but they also illustrate the potential for reaching out to those not yet engaged in active modes of transportation.

Rose (2008) utilized a software package *TravelSmart* to target 2,977 incoming University students at Monash University, Australia, to encourage the use of AT modes and reduce SOV travel. Students received individually tailored travel information, as well as various incentives. A single tailored intervention produced progress for those at each stage of change over the course of the school year.

UNH and URI Campuses

UNH’s main campus is located in Durham, NH, with 14,467 students and 3,577 staff and faculty. UNH has a good public transportation system and a well-established culture of sustainability. According to the 2007 UNH Transportation Report (UNH, 2007), UNH Transit provided over 1 million transit trips to the surrounding community in 2006-2007, making UNH the largest transit system in the state and reducing a significant amount of SOV miles from the roads. Over 50% of off-campus students lived within walking distance of a UNH transit stop and only half of off-campus students commuted by driving alone. On the other hand, most of staff and faculty commuted by SOVs.

There are three nearby towns (5-11 miles away) in the UNH Durham campus area—Dover, Newmarket and Portsmouth. UNH Transit covers these towns with frequent schedules, providing convenient AT options to students, staff and faculty living there. Rochester and Exeter are two other towns close by (12-15 miles away). Manchester and Concord (35-40 miles away) are two urban centers housing many UNH commuters. Some UNH personnel also commute from Massachusetts and Maine.

South Kingstown, where URI's main campus is located in the village of Kingston, has the third-largest commuter population among RI State Employees—many of them URI staff and faculty. Underclassmen tend to live in campus housing. Most off-campus students live in Narragansett, often in 'Winter Rentals' near beaches and coastal recreation areas. Due to zoning there is very little off-campus student housing in South Kingstown, which means that a typical commute for off-campus students from Narragansett is somewhere between 5 and 8 miles—just beyond comfortable biking range. In-state commuters often travel from their native communities throughout the state. Public transportation to URI is limited in availability and usage. Buses are operated by the Rhode Island Public Transportation Authority. Transit connectivity between URI and RI communities is limited: one bus line connects with the capital of Providence (30 miles away) and continues to the southern part of South Kingstown. Another line connects URI with its Bay Campus in Narragansett and the city of Newport (18 miles away). Both buses run about hourly. Coordination with class schedules is very limited. The most suitable form of AT for most off-campus students would be carpooling. There is virtually no transit connectivity to the Western and Southwestern part of the state.

This collaboration between URI and UNH provides a unique opportunity within the framework of the TTM Behavior Change model. UNH has a good public transportation system and a well-established culture of sustainability. However, faculty and staff are still reluctant to use AT. URI has limited public transportation connectivity and has only recently begun to embrace a sustainability culture. Faculty, staff and off-campus commuters are also reluctant to use AT. Examined within the framework of the TTM model, this may mean that participants are at different Stages of Change for alternative modes of transportation and/or that participants value the Pros and Cons of AT differently. It also means that external conditions for change are more favorable at UNH. Both campuses may require differential tailoring of interventions. A comparative study has tremendous value in adapting this model to transportation.

METHOD

Sample and Recruitment

The target population consists of 14,469 UNH students, 3,577 UNH staff and faculty, 16,294 URI students and 2,543 URI staff and faculty studying and/or working at the main Durham (UNH) and Kingston (URI) campuses. Visitors were also welcome to participate in the surveys. Both UNH's and URI's institutional review boards approved all procedures and surveys for compliance with human subjects concerns. Data were collected in Spring 2011 over a 4 week period in April and May to minimize the impact of New England weather and holidays.

Both online and phone surveys were used at UNH, while online surveys only were used at URI. Online surveys were conducted using a popular online surveying website. UNH phone surveys were conducted through UNH's Survey Center targeting only staff and faculty. A list of staff and faculty office phone numbers were obtained from UNH's Human Resources Department and the staff at the Survey Center called a random sample of these phone numbers to recruit a target sample of 400 participants. Phone surveys were much more costly compared to online surveys but they could target a specific group of participants. In prior UNH transportation surveys, staff and faculty participation had been recruited using phone surveys and the 2011 survey continued this recruitment method for longitudinal comparison purposes. Given the 2011 survey was URI's first campus wide transportation survey, phone surveys were not used to reduce cost.

Newsletters, email social media advertisements were the main recruiting methods for the online survey at UNH. Flyers were also posted throughout the UNH campus. Incentives were also used: UNH survey participants could win prizes. URI recruitment included emails and class announcements to participate in an anonymous, voluntary online survey. Several email announcements were sent to out to the campus community, and a link was posted on the campus website. In addition, departments approached their faculty and staff and encouraged their participation. Students were also reached by web and email. In a number of classes, students received extra credit or research credit for survey participation.

Survey Description and Development

The UNH and URI 2011 transportation surveys were a collaboration between UNH and URI. Since 2001, UNH has been regularly conducting campus wide transportation surveys with the latest attempt in 2007. The 2011 surveys were adapted based on UNH 2007 Transportation Survey (UNH, 2007) with some new TTM measures for AT developed at URI. The goals of past surveys were to assess community attitudes regarding UNH's transportation system and campus mobility and accessibility issues. Efforts were made to repeat questions from the past survey for longitudinal comparison. The 2011 surveys covered transportation topics such as transit ridership, commute patterns, satisfaction and awareness of transportation services, traffic demand model measures and parking. The URI version of the survey was adapted to reflect the uniqueness of the URI campus and transportation system. Comparable questions were included in both surveys to facilitate comparison between the two campuses.

A pilot survey of 588 URI students in December 2010 was conducted in order to develop TTM measures of AT. Through measurement development analyses using split-half cross validation procedures, they developed two internally consistent measures: a 20-item AT decisional balance measure and an 8-item self-efficacy scale. Both AT decisional balance and self-efficacy confirmed predicted associations with stage of change for AT. The resulting scales were incorporated into the URI and UNH surveys.

Behavioral Model: Stages of change

The stages of change for AT were assessed using the following item: "Alternative transportation includes any way of getting to [URI or UNH] other than driving by yourself (single occupancy vehicle use). So walking, biking, public transportation (bus/subway/train) and carpooling are all means of Alternative Transportation." Then, participants chose one statement that best reflected their situation:

(1) I do not regularly use AT and I do not intend to start within the next six months (Precontemplation);
(2) I am thinking about using AT regularly within the next six months (Contemplation);
(3) I plan to use AT regularly within the next 30 days (Preparation);
(4) I use AT regularly and have been for less than 6 months (Action); or
(5) I use AT regularly and have for 6 months or more (Maintenance).

Geospatial Analyses (distance and location)

Survey participants (off-campus residents) were asked to enter address information of their residence — the closest cross streets and zip codes. Such information is used to obtain geographic information such as longitudes and latitudes. Due to privacy concerns, only closest cross streets of participants' residence were requested. Figure 1 shows locations of UNH and URI participants' residences. Given that block sizes varies in different towns and individuals' variation in identifying nearest cross streets, the authors acknowledge the inherent errors in this method of collecting geospatial information.

The geospatial variables were calculated with the self-reported closest cross streets of participants' residence. Given the uneven distribution of residence locations, the geospatial analyses are based on scattered points instead of uniformly spaced grid points. Spatial gaps, such as unpopulated regions, were automatically excluded as there are no survey data in these areas.

There were two main types of geospatial analyses in this paper. One is a simple representation of variables in a geographic format (*i.e.*, on a map). Such representations can show concentration of some variables (*e.g.*, concentrations of public transit commuters living in towns with good public transportation options). Another analysis requires geospatial averaging of variable values. The averages were calculated within a 2mile× 2 mile area centered at participants' residence. A 2 × 2 mile area is used because it covers a 1 mile radius from the center point. Finer (*e.g.*, 1 mile × 1 mile) or coarser (*e.g.*, 3 mile × 3 mile) scales can be used to produce more localized or generalized spatial averages respectively. Geospatial averaging can help describe trends or patterns in different regions; however, similar to most averaging methods, geospatial averaging can be skewed by outliers, especially in regions with few responses.

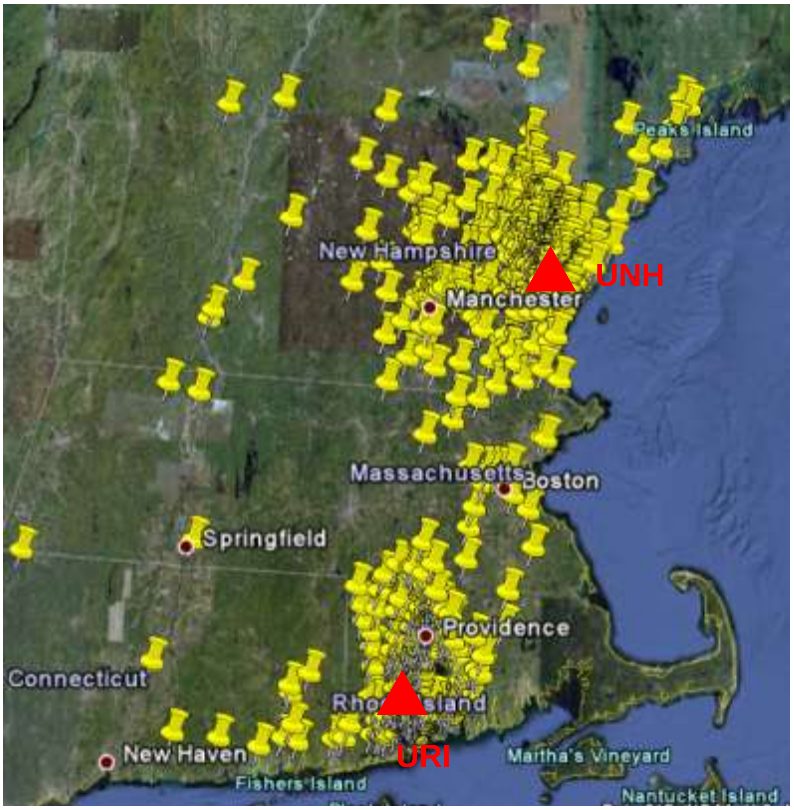

Figure 1: UNH and URI Survey participants' residence (base image from Google Earth®)

RESULTS

Survey Sample

A combined total of 2008 subjects participated in the UNH and URI transportation survey in Spring 2011 (1111 subjects at UNH and 897 at URI). Table 1 presents demographics of survey participants. There were more female participants than males in both surveys, and URI has a higher percentage of female participants than UNH does. URI's subjects were younger with an average of 28.06 year old compared to UNH's 40.1 year old average. This age difference partially reflected the fact that staff was the largest group (56%) at UNH while students comprised the largest group (66%) at URI. Participants who are both employed by the universities and taking courses are typically graduate students. At both UNH and URI, most participants were off-campus residents and many of them lived away from the Durham (70.2%) and Kingston campus (60.2%). Over 80% of subjects were Caucasian on both campuses.

Table 1: Survey demographic

	UNH		URI	
	N	%	N	%
Gender				
Male	465	43.6%	261	36.2%
Female	601	56.4%	459	63.8%
Age				
Mean	40.1		28.06	
SD	15.6		13.7	
Range	18-98		18-74	
Status				
Student	310	27.9%	551	66.0%
Faculty	137	12.3%	87	10.4%
Staff	578	52.0%	136	16.3%
Employed and Taking Classes	67	6.0%	32	3.8%
Visitors or others	19	1.7%	29	3.5%
Residence				
Living in university housing in Durham or Kingston (on-campus residents)	172	15.5%	212	28.0%
Living in non-university housing in Durham or Kingston (off-campus residents)	159	14.3%	89	11.8%
Living outside of Durham or Kingston (off-campus residents)	780	70.2%	456	60.2%
Ethnicity				
White	591	83.2%	646	89.7%
Black or African American	2	0.3%	22	3.1%
Asian	29	4.1%	11	1.5%
Hispanic Latino	8	1.1%	22	3.1%
Native Hawaiian or Other Pacific Islander	3	0.4%	1	0.1%
American Indian or Alaska Native	2	0.3%	3	0.4%
Other	75	10.6%	15	2.1%

Note: Given that some questions are skipped by participants, each category may have a slightly different subject total (N)

Commuting modes and distances

Figure 2 breaks down the main commuting modes at UNH and URI among students, staff and faculty. Students used AT much more often than staff and faculty at both UNH and URI. At UNH, only 34% of students drove alone to school compared to faculty (74%) and staff (85%). All URI commuters used SOVs more than UNH commuters did. URI students commuted by SOVs at 53%, and URI faculty and staff were at 82% and 85%, respectively.

Students represented the largest difference (18%) using AT among all groups between UNH and URI. At UNH, 31% of students walked or biked to school compared to 25% of URI students. Almost a quarter (24%) of UNH students rode university transit. In comparison, only 9% of URI students reported using university or public transit. On the other hand, URI students carpooled (13%) more frequently than UNH students (9%) did.

At UNH, significantly fewer faculty (74%) drove alone to campus compared to staff (84%). Meanwhile, comparable proportions of URI faculty and staff drove alone to work (82% of faculty and 85% of staff). UNH faculty (25%) used AT more often than their URI counterparts (17%). More UNH faculty walked, biked, and rode public transit than URI faculty did. For staff, UNH (84%) and URI (85%) showed similar AT usage. UNH staff walked more and URI staff took public transit more often.

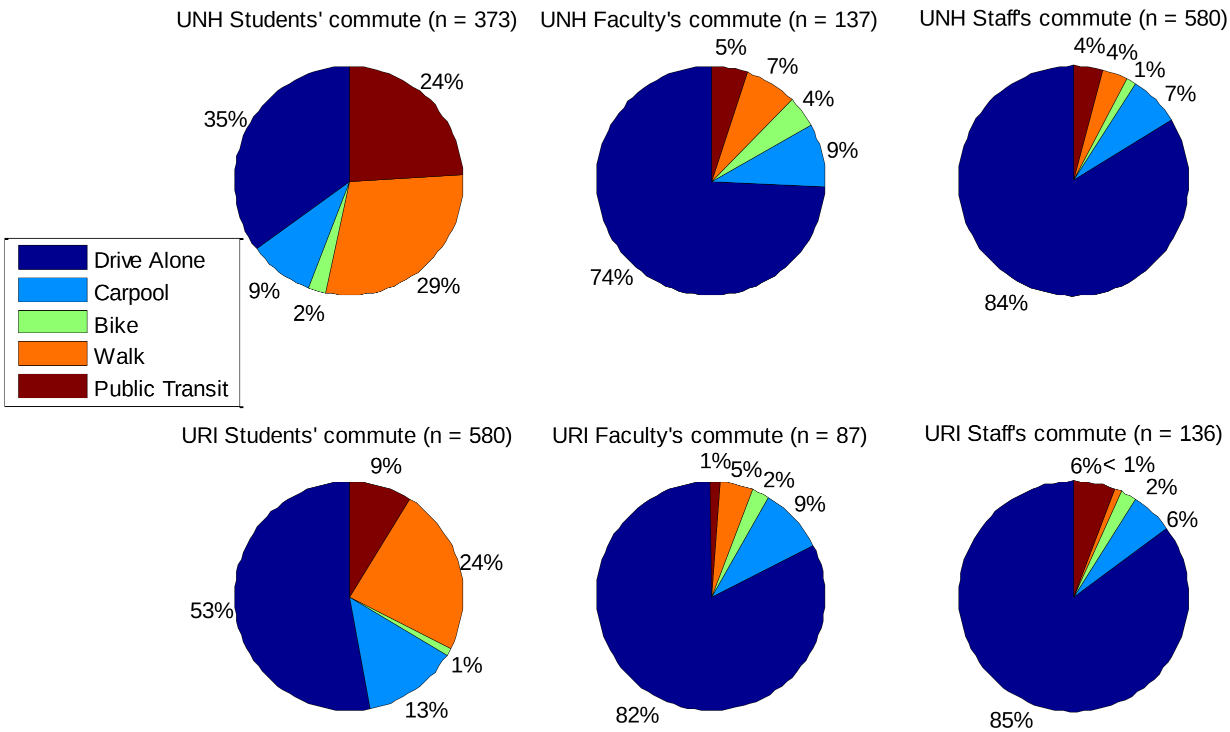

Figure 2: Main commute modes by group

Figure 3 illustrates the average commute distances by off campus student, faculty and staff residents at UNH and URI. At UNH, students lived closest to campus followed by faculty and staff who lived the farthest. At URI, students also lived the closest to campus while faculty and staff lived similar distances from campus. In all groups, UNH commuters lived closer to campus compared to URI commuters.

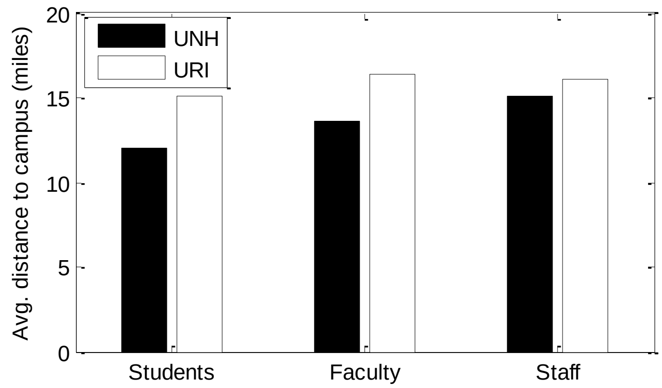

Figure 3 Commute distances by group (off-campus residents only)

The authors hypothesized that commute distances had an impact on commuting choices. In Figure 4, main commute modes were compared to commute distances for UNH and URI respectively. At both UNH and URI, average commute distances followed similar trends for four commute modes: SOV, carpooling, biking and walking. Among these four modes, SOV commuters live the farthest from campus, followed by carpooling and biking commuters. Walking commuters live at the shortest distances from campuses. UNH and URI commuters who used public transit had different commute distances. The average commute distance of UNH's "Public Transit" mode was in between "Bike" and "Carpool" distances. At URI, commuters who rode public transit had the longest commute distance at 27.5miles.

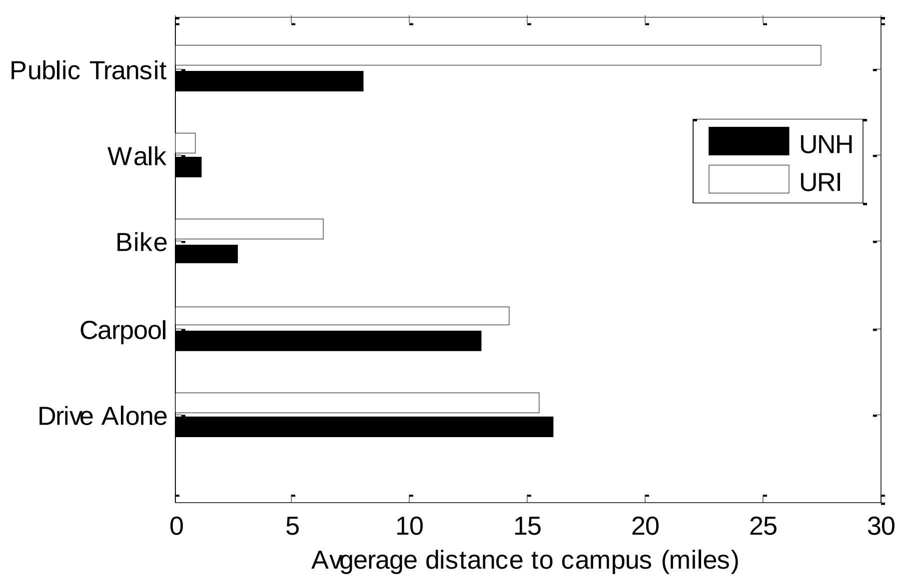

Figure 4: Main commute modes VS average commute distances (off-campus residents only)

Commute and locations

Other than commute distances, the effect on commute modes by residence locations was also studied. Using the residence locations shown in Figure 1, the authors plotted commute modes according to commuters' reported residence in Figures 5 and 6. Similar to Figure 4, walking commuters lived closer to campuses while bikers lived slightly farther than the walking commuters. SOV and carpooling commuters lived throughout the regions at both UNH and URI. However, no carpooling commuters were reported in Manchester and Concord (two large NH cities) and in Newport (a large city near URI). At UNH, there are three nearby towns (Dover, Portsmouth and Newmarket) housing many public transit commuters. At URI, Providence and Newport house many public transit commuters.

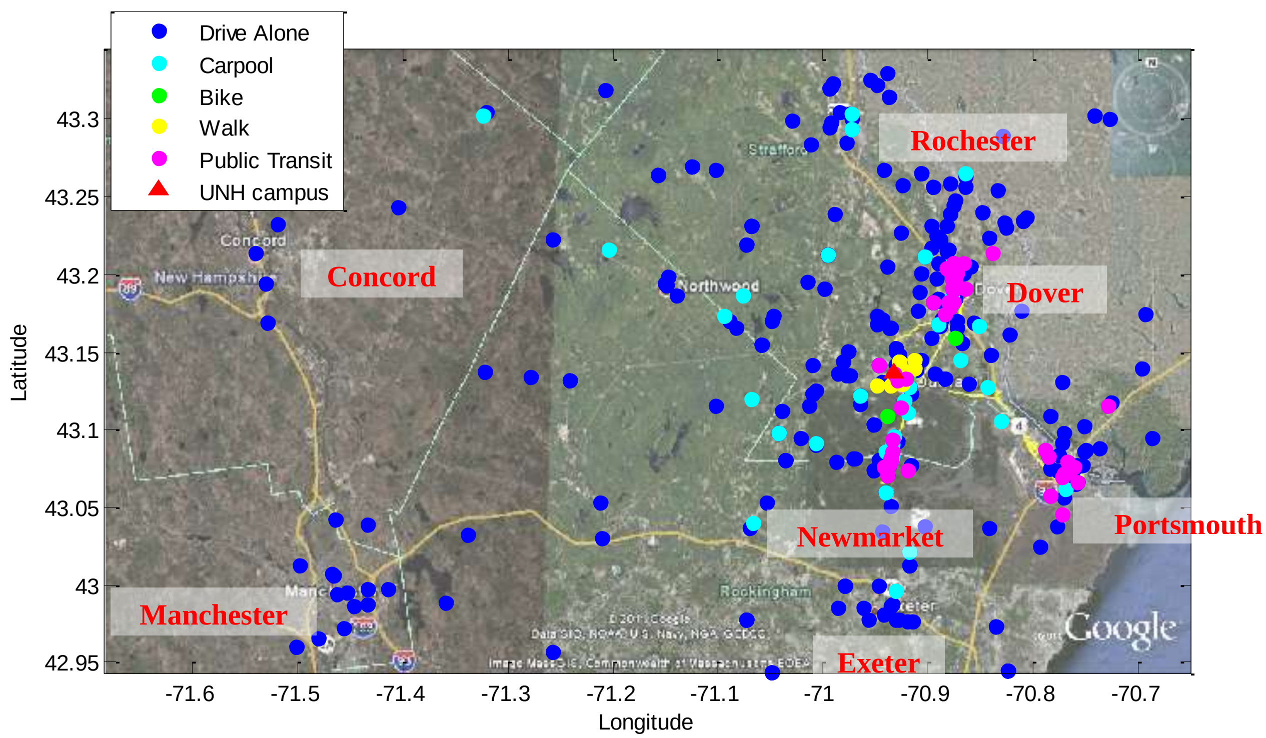

Figure 5: UNH main commute modes by locations (off-campus residents only); base image from Google Earth®

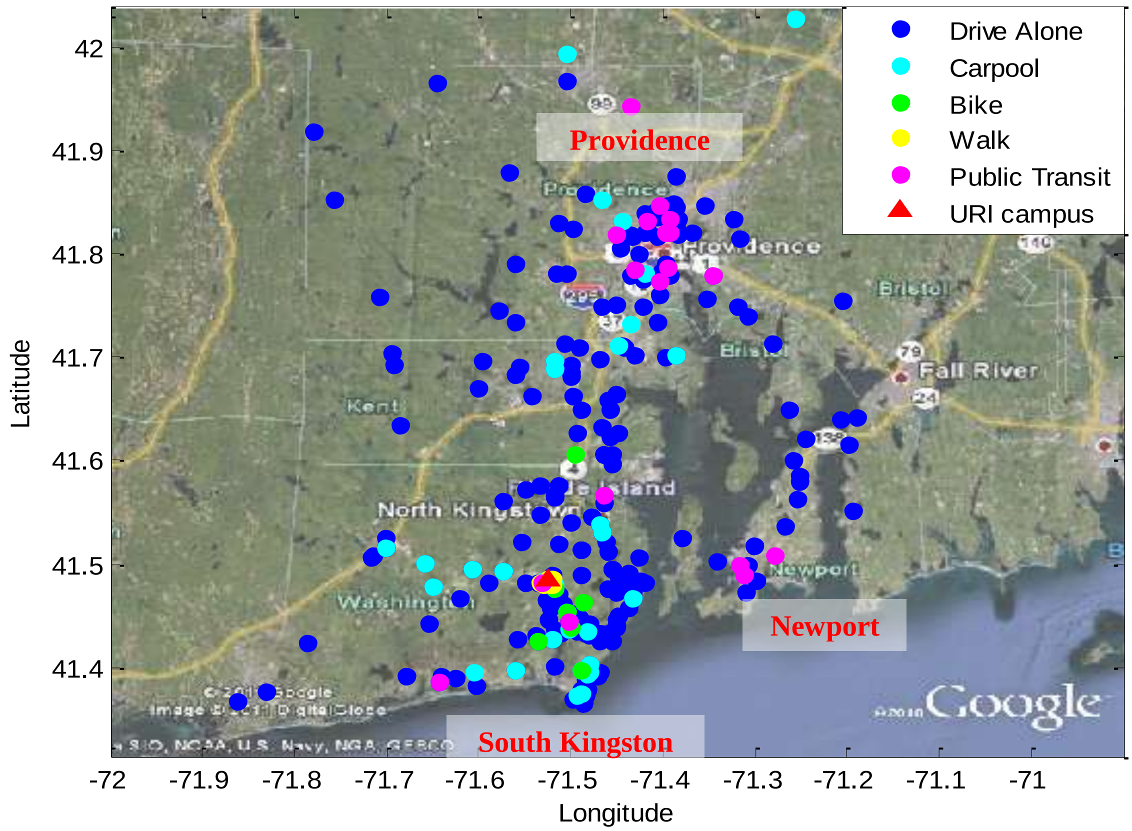

Figure 6: URI main commute modes by locations (off-campus residents only); base image from Google Earth®

Other than commute modes, the stages of change were also plotted geographically (Figures 7 and 8 for UNH and URI respectively). Each square in the figures represents the average value of the stages (a value of 1 for the precontemplation stage, 2 for contemplation, 3 for preparation, 4 for action, and 5 for maintenance) in a 2 mile × 2 mile area. A high average stage value indicates positive behaviors and/or attitudes toward AT by the residents living in this square area; a low average stage value reflects residents' lower levels of readiness for using AT.

At UNH (Figure 7), the stage values were the highest (in the "action" stage) in Durham close to campus, reflecting that the many residents in this area were actively using AT. In the three nearby towns (Dover, Portsmouth and Newmarket) that are covered by UNH transit, the stage values were also high. Portsmouth and Newmarket were in the "preparation" stage while Dover was slightly lower in between "preparation" and "contemplation." For other nearby towns without university transit coverage, residents at Rochester had higher stage values (slightly above "contemplation") compared to Exeter (between "contemplation" and "precontemplation"). Manchester and Concord residents were mostly in "precontemplation." Generally, areas far away from campus had lower stage values. However certain less populated areas had relatively high stage values despite being far from campus; this is likely due to the small number of data points in these areas.

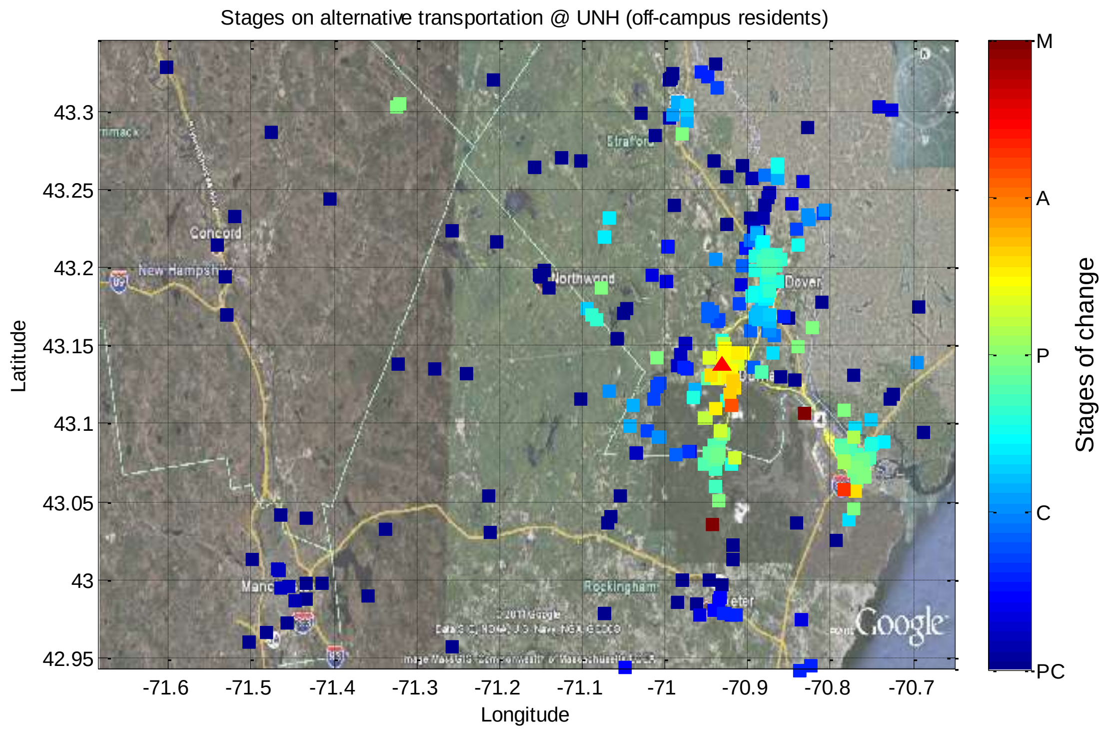

Figure 7: UNH stages by locations (off-campus residents only); notation: precontemplation (PC), contemplation (C), preparation (P), action (AC), maintenance (M); ;base image from Google Earth®

At URI (Figure 8), there were four towns with average stage values well above “precontemplation”: Kingston, Providence, Newport and South Kingston. All four towns had similar stage values in between “preparation” and “contemplation.” Providence residents had the highest stage values. South Kingston was separated into two regions with different stage values. The east part of South Kingston was between “contemplation” and “precontemplation” while the west part was close to “preparation.” There are individual areas with “maintenance” values but they consist of single data points. Similar to UNH, sparsely populated areas that were far away from campus havd lower stage values.

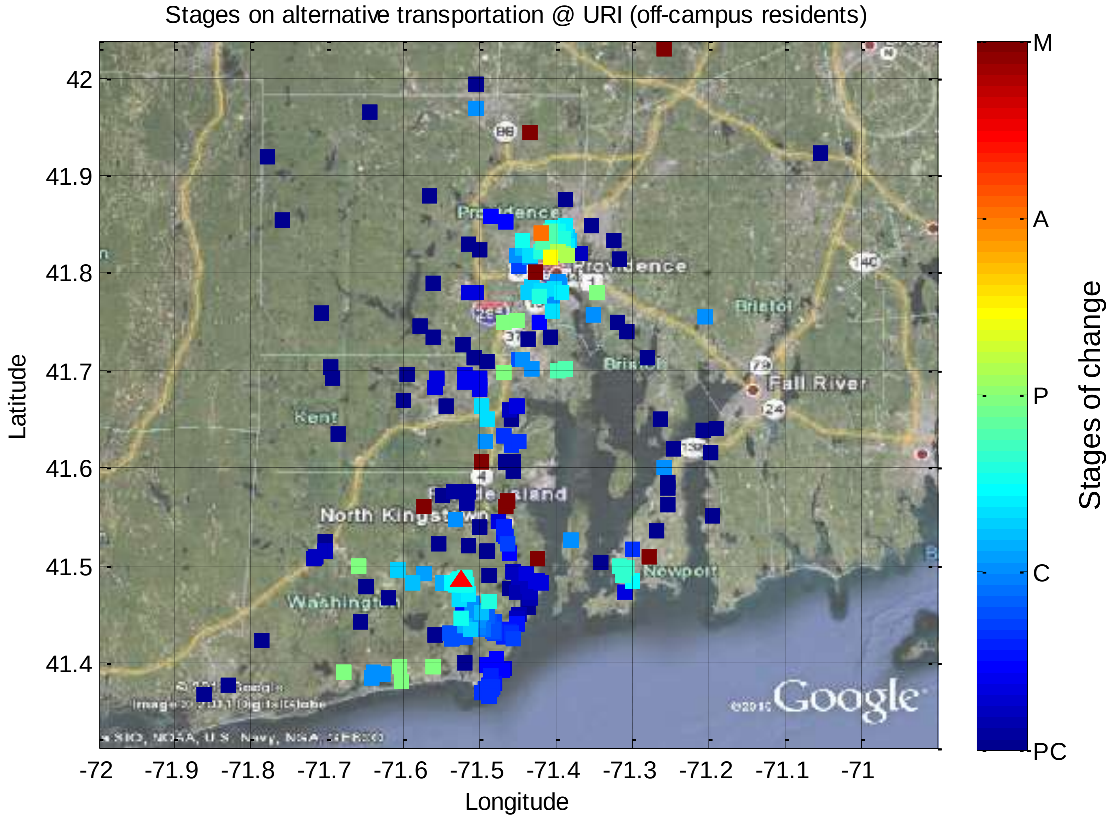

Figure 8: URI stages by locations (off-campus residents only); notation: precontemplation (PC), contemplation (C), preparation (P), action (AC), maintenance (M); base image from Google Earth®

DISCUSSION

This integration of transportation and behavioral science ideas has demonstrated that both fields contribute important components towards improved understanding of transportation choices and ultimately, more sustainable transportation choices. Commute distances and transportation infrastructure at both universities strongly influenced commute choices and readiness for alternative transportation.

The results of UNH and URI's 2011 transportation surveys showed that students, staff and faculty have different commute behaviors at both universities. Figure 2 showed that students used AT more often than staff and faculty at both universities. This was largely due to the fact that students were more likely to live on campus. It is also possible that students' attitudes are more 'green' compared to faculty/staff, however, this remains to be demonstrated. At UNH, 41.5% of students lived on campus while only 2.5% of staff and faculty lived on campus. At URI, 29.4% of students lived on campus while almost no staff or faculty (0.6%) did. Even among off-campus residents, students tended to live closer to campus than staff and faculty (Figure 3). Given that there were more on-campus UNH student residents (Table 1) and UNH off-campus student residents lived closer to campus compared to URI students (Figure 3), Figure 2 also showed that more UNH students used AT than their URI counterparts did.

Commute behaviors were also different between staff and faculty with different commute distances. Figure 3 showed that at UNH faculty lived closer to campus compared to staff and more faculty used AT than did staff. At URI, faculty and staff lived at similar distances from campus and there was only a very small difference (3%) between faculty and staff in using AT.

Figure 4 further confirmed the hypothesis that long commute distances discouraged AT usage. SOV commuters had the farthest commutes (17 miles at UNH and 15 miles at URI) compared to all other commuters using AT with the lone exception of public transit commuters at URI. This exception was largely due to two popular public transit routes from Providence (30 miles away) or Newport (18 miles away) to URI. This showed that, in addition to commute distances, public transportation infrastructure influenced AT behaviors.

The maps in Figures 5 and 6 showed concentrations of public transit commuters in towns with adequate public transportation infrastructures. In UNH's nearby towns (Dover, Portsmouth and Newmarket), there is an excellent UNH transit system and many of these residents commuted by transit. At URI, many Providence and Newport residents rode public transit to campus. Given that UNH transit is free of charge to UNH commuters and its covered towns are relatively close (5-11 miles) to campus, more UNH commuters chose transit (24% of students and 4.8% of staff and faulty) compared to URI commuters (9% of students and 4.1% of staff and faulty). This presents an opportunity for URI in the future to improve its transit infrastructure.

The TTM measures also showed that commute distance and public transportation infrastructure influenced AT behaviors and attitudes. Figures 7 and 8 showed an overall trend of more readiness for AT at shorter distances to both campuses. These figures also displayed better AT readiness at towns (Dover, Portsmouth and Newmarket in NH and Providence and Newport at RI) with adequate public transportation infrastructure. These conclusions matched initial hypotheses.

CONCLUSION AND FUTURE WORK

Adaptation of alternative transportation (AT) such as walking, biking and public transit can significantly improve sustainability. There are many barriers for commuters to choose AT such as long commute distances and inconvenient public transportation options. Understanding the commute behaviors and decision making process for choosing commuting modes is essential to effectively encourage AT among commuters. Recent transportation surveys conducted at two New England universities—UNH and URI included behavioral measures (Transtheoretical Model) and geographical information queries (*e.g.*, residence locations) to assess AT behaviors among students, staff and faculty. At both campuses, students had the shortest commute distances and practiced AT more frequently compared to staff and faculty. Geographic locations also affected the use of AT and commuters' behaviors and attitudes toward AT. Consistent with Transtheoretical Model based predictions, commuters living in towns with adequate university/public transit connectivity to the campuses showed the highest levels of readiness to use AT. The assessment of commute patterns and behaviors shown in this paper is the first step in a program of research that aims to encourage AT behaviors in universities and ultimately, communities. Future work will develop and evaluate individual and policy interventions to promote AT based on commute patterns, behavioral models and geographic information.

ACKNOWLEDGEMENT

The authors gratefully acknowledge the partial support by the New England University Transportation Center and the University of Rhode Island Transportation Center. Any opinions, findings, and conclusion or recommendations expressed herein are those of the authors and do not necessarily reflect the views of the New England University Transportation Center or the University of Rhode Island Transportation Center.

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