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ABSTRACT

Over 54 million U.S. citizens report living with at least one disability. The Americans with Disabilities Act stipulates legislation that prohibits the discrimination of persons on the basis of disability. Rather than riding the bus in areas that offer a fixed-route bus system, individuals with disabilities often rely on expensive and limited paratransit services, or on family and friends. It has been proposed that with improvements in bus accessibility, riders with disabilities could use the fixed-route system more often and increase their options for independence and community participation. During their 2008 spring semester, participants in the University of Florida College of Public Health and Health Professions' course, Assessment and Surveillance, partnered with the Center for Independent Living (CIL) of North Central Florida to conduct an accessibility study of the Gainesville, Florida fixed-route bus system. Students focused on factors that make bus stops user-friendly for persons with disabilities. This paper presents the rationale, methods, and findings from this accessibility study and efforts undertaken to forge a mutually beneficial partnership among UF-PHHP students and the CIL.

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Introduction

One in five persons in the U.S. is living with at least one disability (U.S. Census Bureau, 2008). Historically, persons living with disabilities have been among the most disadvantaged populations in the U.S. (Iezzoni, 2003, Institute of Medicine, 2007; National Center on Birth Defects and Developmental Disabilities, 2003). In 1990, Congress passed the Americans with Disabilities Act (ADA) thereby advancing the first comprehensive civil rights legislation that prohibits the discrimination of persons on the basis of disability. Title II of the ADA concerns public transportation and states that public transit authorities may not deny service to persons with disabilities within specific parameters (e.g., the combined weight of an individual and his or her mobility aid may not exceed the 600 pound rating for bus lifts) (Department of Justice [DOJ], 2009; Regional Transit System [RTS], (n.d.)).

The specific regulations require that city buses must meet accessibility standards and that complementary paratransit services must also be provided for persons unable to access the fixed-route bus system (DOJ, 2009). To support and enhance the social and economic quality of life for all Americans, a mission of the Federal Transit Administration (FTA) is to ensure non-discriminatory and equitable access to safe transportation for persons with disabilities (Federal Transit Administration [FTA], 2006).

In Gainesville, Florida, the fixed-route bus system is operated by the Regional Transit System (RTS), and is the city's primary form of public transportation. With the overall mission to provide the community a "safe, courteous, and reliable" alternative means of transportation, RTS has been providing transportation within the city and adjacent county areas for over 31 years, and currently operates 88 diesel buses that run on a 36-route system covering a 74 square mile area. In 2003, RTS developed a broad vision statement that strives for continuous improvement by providing transportation options that promote flexibility, accessibility and comfort (RTS, 2006).

In achieving this vision, RTS complies with ADA regulations by providing paratransit services, reduced rider bus fares, and accessible buses (RTS, n.d.). RTS offers complementary paratransit services throughout the city and extends three-fourths of a mile from a fixed bus route outside the city limits (RTS, 2006). The paratransit services provided include door-to-door, advanced reservation, pre-scheduled, non-emergency transportation services (RTS, n.d.). Whereas "complementary" refers to the provision of both bus and paratransit options, it does not imply that paratransit services are cost-free. Riders desiring paratransit services must complete an

ADA certification screening and obtain an ADA Identification Card. Paratransit travel costs are incurred by both the actual traveler and the City of Gainesville. Due to increased fuel expenses, these costs have increased substantially since October 2008. For individual riders, one-way trip costs increased from $2.00 to $3.00 (RTS, n.d.). Costs to the City of Gainesville, for the provision of paratransit services, increased from $19.75 to $27.15 for each ambulatory one-way trip, and from $22.51 to $30.80 for trips that involve riders using mobility devices (M. Crawford, personal communication, February 17, 2009). Costs for riding a bus on the fixed-route system are substantially lower than those for paratransit service. Individuals who have an ADA identification card are able to ride free of charge. Persons with disabilities, who do not have an ADA card, are offered a reduced fare (75 cents instead of $1.50) without having to show any proof of their disability (RTS, n.d.).

Not only is riding the bus an economically practical option, it also offers flexibility and convenience that is relatively limited with a paratransit system. Paratransit service users are required to phone in their travel requests by the close of the business day prior to their scheduled trip (RTS, n.d.). As a result, spontaneous plans and last-minute trips are virtually impossible. In addition, wait times for pickup to and from the travel destination can be up to several hours. Nevertheless, in areas that offer a fixed-route bus system, rather than riding the bus, individuals with disabilities often rely on expensive and limited paratransit services, or on family and friends. In fact, during FY 2007, RTS provided approximately 8.9 million rides, yet only 125,000 were to riders with disabilities (RTS, 2007). According to the U.S. Census Bureau (2007), the estimated population of Gainesville during 2007 was 114,375, and between 2005 and 2007, it is estimated that 13% of the population (aged 5 years and older) were living with a disability (U.S. Census Bureau, American Community Survey, n.d.). Extrapolating these figures into the domain of transportation, one expects that a significant portion of RTS riders should be persons with disabilities. If bus riding accessibility were improved, consumers with disabilities could use the fixed-route system more often, and decrease their reliance on the ADA paratransit system while increasing their independence and options for community participation.

Partnerships

The University of Florida's College of Public Health and Health Professions (UF-PHHP) and the Center for Independent Living of North Central Florida (CIL) have a history of partnership that strives to fulfill a mission to "*maximize health and independence, participation, and access to quality care*" within the disability community. The CIL is a not-for-profit, consumer-controlled organization that has been serving 16 North Central Florida counties for over 25 years. To achieve its governing mission to "*empower people with disabilities to exert their individual rights to live as independently as possible, make personal life choices, and achieve full community inclusion*" the CIL delivers four core services that include advocacy, information and referral, peer support, and independent living skills education (Center for Independent Living of North Central Florida [CIL], n.d.).

Aligned with its mission and core services, the CIL facilitates all ADA Paratransit eligibility screenings for the City of Gainesville and other area municipalities. To assist with the implementation of the ADA and its significant impact on transportation, the CIL works with members of the community on transportation issues that directly affect persons with disabilities. This process is one by which the CIL, other organizations, and citizens can effectively implement the FTA and ADA regulations as they relate to a person's civil right to have access to, and use of, public transportation (CIL, n.d).

The mission of UF-PHHP is to "*preserve, promote, and improve the health and well being of populations, communities, and individuals by fostering collaborations*" (UF-PHHP, 2009). The Master's of Public Health Assessment and Surveillance course, offered through the program's Social and Behavioral Science concentration, places significant emphasis on ensuring that students gain competence in community-based research, and experience in fostering mutually beneficial academic and community collaborations (Institute of Medicine, 2003). The following description of this course highlights an assessment project that students conducted in collaboration with the CIL.

The Assessment and Surveillance Course

Assessments are typically conducted to obtain valid and reliable information to facilitate better targeting of services and programming efforts (Soriano, 1995). When conducted in collaboration with service providers, community leaders and other community members, the assessment process can foster ownership among all stakeholders. Moreover, participation can help ensure that priority issues are explored and addressed in ways that appropriately build on strengths and promote community engagement and capacity (Samuels, 1998).

The main objective of the Assessment and Surveillance course was to provide opportunities for

students to gain understanding and knowledge about community assessment and public health surveillance through both in-class and real-world experience.

In-class Experience

To provide students with the skills and knowledge necessary to conduct a community assessment, the in-class curriculum included readings, lectures, workshops, guest speakers, and small group activities. Course assignments covered topics such as developing a community profile using secondary data sources, applying for institutional review board for human subjects (IRB) approval for protocol and materials, and using a variety of methods to collect primary data. Data collection strategies included participant observation, focus groups, in-depth interviews, surveys, and town-hall meetings. Students also gained skills in developing sampling strategies, assessing community resources, managing and analyzing quantitative and qualitative data, interpreting and assessing trustworthiness of findings, writing a comprehensive report of findings, and planning and conducting interactive findings forums.

Real-world Experience

Community-based work challenges students to apply the knowledge and skills they acquire in-class to real-world situations. Specifically, while working in small teams, students assisted in forging collaborative partnerships with community-based organizations. The goal was for students to appropriately use at least two data collection strategies covered in class to conduct a community needs and assets assessment that is culturally sensitive and useful to the organization. At the completion of the semester, each small group was required to submit a comprehensive and useful report to their partner organization, and to host a community findings forum. The objectives of the forum were to present back results and recommendations in a meaningful and interactive way that engaged participants and stakeholders in critical discussion of findings and their implications for future research and service endeavors (López, Parker, Edgren, & Brakefield-Caldwell, 2005).

Although students were welcome to develop their own assessment projects, in most cases, the instructor connected with local community-based organizations and identified priority areas or questions on which assessment projects were based. Once the organizations decided to work with the class, an informal agreement/informational document was developed to ensure all participants (organization, course instructor, and students) had mutual understanding. This document laid out the following information that pertained to both the organization and the class: history, mission, assessment needs, and expectations. One such stipulation, for example, stated that the course instructor expected the organization to understand that students were not providing a professional service, and that projects would last only one semester. With this understanding, they were asked to commit to providing students with an attentive preceptor, entrée into the community, and patience – as students were learning new skills. Concomitantly, the organization expected students to be respectful, to develop all protocol and materials with guidance from preceptors, and to effectively share all findings with the organization and community. During the first class sessions of the semester, organizational representatives were invited to visit the class to help introduce their organization and their assessment project so that students were able to make an informed choice among potential project options.

CIL - Identifying Bus Stop Accessibility as a Priority Issue

With improvements in bus accessibility, consumers with disabilities could use the fixed-route system rather than relying on more expensive and limiting paratransit services. The CIL's ADA Paratransit Director expressed interest in better understanding the accessibility issues pertaining to the local fixed-route bus system; specifically, the factors that make their bus stops user-friendly for persons with disabilities that limit mobility.

Methods

Under the guidance of the course instructor and their preceptor, the CIL's ADA Paratransit Director, four small groups of 4-6 students used primary and secondary data collection methods to understand the strengths and limitations of the RTS fixed-route bus system better as well as how they impact accessibility for persons with disabilities. Each group undertook at least one unique data collection activity to learn more about the public transportation needs and experiences of persons with different types of disabilities. Students made multiple systematic observations while riding the bus on varied days and times, surveyed bus riders with disabilities, conducted focus groups with staff members at a local behavioral health care facility, and focus groups with residents of an independent living facility for seniors and individuals with disabilities. All protocol and materials used in their assessments were developed specifically for this course project and were approved by the University of Florida's Institutional Review Board for Human Subjects. As appropriate, informed consent was gained prior to data collection activities.

The main data collection activity involved each group conducting a systematic accessibility assessment of the bus stops located on one of four routes (RTS Routes 1, 13, 15, and northbound 75). Each bus route was chosen because of its historically high volume of riders with disabilities and/or its connectivity to destinations frequented by persons with disabilities. Route 1 was chosen because of its connection between downtown and a major shopping plaza. Route 13, the southernmost route, was chosen for its connectivity to a behavioral healthcare facility. Route 15, the northernmost route, was chosen for its connectivity between downtown and a major in-door mall. Finally, route 75, one of the longest routes, was chosen for its connectivity with Route 1. Together, these four routes constitute 19.3% of total city (non-University of Florida campus) ridership for RTS (RTS, 2007). Overall, the four groups of students systematically assessed 254 bus stops.

With direction from their preceptor, the students developed a bus stop evaluation checklist specifically for their course project. Questions were drawn from those detailed in a comprehensive Bus Stop Checklist published by Project ACTION within their *Toolkit for Assessment of Bus Stop Accessibility and Safety*. (Easter Seals Project ACTION, n.d.). Project ACTION (Accessible Community Transportation in Our Nation) is an independent agency founded by Easter Seals, and funded through a cooperative agreement with the US Department of Transportation and the FTA (Easter Seals, 2008). Project ACTION encourages collaboration between disability communities and transportation industries and advocates for accessible transportation by providing resources and technical assistance to communities with the purpose of increasing mobility for people living with disabilities (Easter Seals, 2008). Many of the ADA standards for bus stop accessibility involve safety features such as level paved surfaces, clearly defined and slip resistant landing pads and wait areas, and the elimination of obstacles and travel hazards (Easter Seals Project ACTION, n.d.). Once created to meet accessibility standards, the bus stop must be maintained.

The students' checklist included a total of 38 questions that were deemed relevant, and asked for information that students could answer objectively without additional training. For example, the checklist included the question "How wide is the sidewalk at this bus stop? (No sidewalk, less than 3', between 3'-5', 5' or greater)," It did not include questions such as "How even is lighting distributed?"— as this subjective assessment would require additional training and expertise. The items on the students' checklist were organized within five domains: Pedestrian access features, Pedestrian connections, Safety and security features, Amenities, and Information/Kiosks.

Ultimately, to determine an overall accessibility rating for each bus stop, seven criteria (of the 38 items included in the checklist) were assessed; each meeting the ADA standard for being essential to accessibility for persons with mobility limitations and economically feasible to fix, if necessary. These criteria were located within the domains Pedestrian Access Features and Pedestrian Connections, and included the following items:

- landing pad (the surface on which the bus stop is located and connects to the street) (Easter Seals Project ACTION, n.d.) is at least five feet wide and eight feet deep;
- landing pad is made of concrete;
- landing pad is on the curb (above the street);
- side walk exists and is at least five feet wide;
- sidewalk exists and is in good or excellent condition;
- landing pad connects to sidewalk; and
- curb cuts are available at nearest intersection.

Bus stops were designated as accessible if they met all seven criteria. It should be noted that an eighth criteria, "Bus stops in bus lane/pull off area," was deemed essential, but not feasible to fix if necessary. Thus, this item was not included in the final analysis.

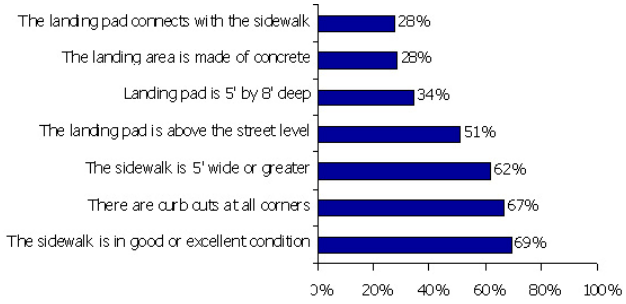
The four student groups assessed all of the bus stops on their designated routes. Each bus stop was evaluated for the 38 checklist items. In addition, digital photographs were taken at each bus stop to use as examples and for clarification if questions arose. The groups then coded and entered their assessment data into four identical Microsoft Excel spreadsheets. These four databases were later transposed into a single SPSS data file where the data were cleaned and analyzed by a student who was trained in data analysis. All analyses were completed using SPSS 15.0, and involved generating descriptive statistics.

Results

Of the 254 bus stops assessed along the four bus routes, only 15 (5.9%) met all seven of the "essential and feasible to fix" criteria. When assessed individually, the number of accessible stops was similar across the routes. Specifically, for Route 1, three (4.8%) of the 63 stops were deemed accessible. For Route 13, five (13.9%) of the 36 stops were deemed accessible. For Route 15, four (5.1%) of the 79 stops were deemed accessible. Finally, for Route 75 Northbound, three (3.9%) of the 76 stops were deemed accessible.

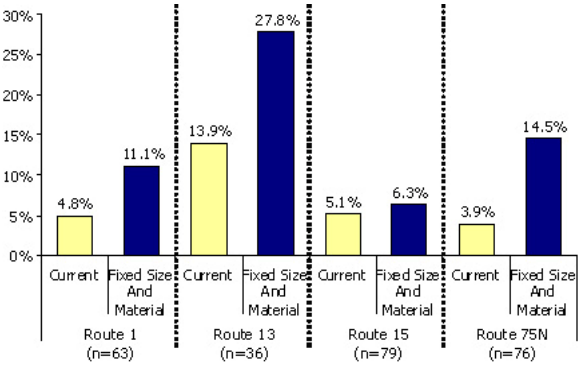
As Figure 1 shows, when each of the seven criteria was assessed across all 254 bus stops, stops were most likely to have a sidewalk that was in good or excellent condition (69%), but least likely to have a landing pad that connected with the sidewalk (28%) or a landing pad made of concrete (28%).

Figure 1. Percentage of Bus Stops Meeting Accessibility Criteria (N=254)



As Figure 2 illustrates, analysis conducted to determine which specific changes would represent the greatest impact on accessibility found that by fixing the landing pads (increasing the size to be 5' x 8' and changing the material from grass or other materials to concrete) the number of bus stops deemed accessible would more than double for each Route (with the exception of Route 15), and for the combined 254 bus stops (from less than 6% to 13%).

Figure 2. Expected Change in Bus Stop Accessibility if Size and Material of Landing Pads Were Fixed



Presenting Findings to the Community

At the completion of the study, the students in partnership with the CIL hosted an interactive community forum to share their findings, raise awareness about the access issues faced by riders with disabilities, and discuss recommendations for bus stop modifications that would give the "biggest bang for the buck." Approximately 25 individuals from the community attended the forum which included a 50-minute presentation by the students followed by a question, answer, and comments session. During the presentation, results from the focus groups, surveys and naturalistic observations were presented.

Primary attention was focused on sharing and discussing the results and possible solutions that emerged from the bus stop assessment. Based on the findings, specific recommendations proposed by the students included the following: fixing the size and material of landing pads, as required and feasible on existing bus stops; and ensuring that all new and renovated bus stops meet all ADA regulations deemed essential. Another recommendation was to conduct community-level activities such as forums, seminars, media campaigns, and Adopt-a-Bus Stop programs that are similar to those developed for maintaining highways with the goals of informing the broader community about the importance of accessible transportation for persons living with disabilities and the barriers they face to using fixed route bus services; and fostering public support and volunteerism for making required changes. In addition, forum participants shared their own perspectives and ideas for improving the fixed bus route system that included: broadening the focus beyond physical disabilities to also include those that are sensory and cognitive; demanding that the city commissioners invest more attention and resources to bus stop accessibility; and having RTS offer an online tutorial that would provide the background and opportunity for community members to be involved in solving problems related to transportation accessibility.

To conclude the presentation, students engaged participants in an interactive game that involved showing photographs of actual bus stops and asking participants to determine whether or not the bus stops were partially, fully, or not at all accessible; based on the seven criteria used in the project (Figure 3). Upon ending the forum, participants were invited to complete a brief evaluation. Of the eight evaluations completed, all or most participants indicated that they found the presentation interesting and understandable, they learned something new, and that the presentation inspired them to think about taking action (writing a letter, sharing what they learned with others).

One of the highlights of the assessment project occurred after the forum when a city commissioner in attendance invited the students to make a formal presentation during a City Commission meeting. The students made this presentation in August 2008. Although they addressed the commission under a "no action-required" agenda item, their presentation and the ensuing discussion among commissioners

resulted in a motion carried that required RTS to submit a report on the current ADA compliance of their bus stops, along with cost estimates for making suggested improvements. From this experience, students learned about the protocol required when addressing a public decision-making body (creating an agenda item, compiling background information and submitting 10 copies, developing a brief, yet informative presentation). Most importantly, they also gained a sense of how their work can impact practice and policy at the community- and population-level.

Figure 3: Examples of accessible and inaccessible based on seven criteria

Discussion

"*For people with disabilities, inaccessible bus stops often represent the weak link in the system and can effectively prevent the use of fixed-route bus service*" (Easter Seals Project Action, n.d.).

Despite provisions set forth by the ADA, individuals living with disabilities persistently face transportation barriers that impact their access to local services and to opportunities for employment and social engagement (Lawlers, Pransky, Peterson, & Himmelstein, 2003). Here, we described the rationale, process, findings, and outcomes from a community assessment project conducted by MPH students at the UF-PHHP in partnership with the local CIL.

For their community assessment project, four groups of students used multiple data collection strategies that they learned about during a public health community assessment course. The purpose was to gain both outsider's and insiders' perspectives about the fixed-route bus system and its ability to serve riders with disabilities. This paper focused primarily on their systematic assessment of 254 bus stops located along four bus routes that have historically served high volumes of riders with disabilities. When evaluated on seven essential and financially feasible accessibility criteria, only 15 (6%) of the 254 bus stops that were evaluated were found to be accessible for persons with disabilities that limit mobility. Further analysis revealed that by making relatively small and low-cost structural changes to inaccessible bus stops (e.g., fixing the size and material of landing pads), the number of accessible stops would increase substantially. It should be noted that although these seven criteria were informed by ADA regulations, other criteria might be equally essential and feasible. This expanded set of criteria would be particularly relevant when conducting needs assessments to evaluate bus stop accessibility for persons with disabilities other than those that are of a physical nature (e.g., assessing whether or not route/schedule/map information is available in alternative formats for persons with sensory limitations).

We also strongly emphasize that it is not the purpose of this paper to portray RTS in a negative light. Many of the issues revealed during the bus stop assessment are those that must be addressed at a macro-level, and are beyond the full control of RTS. Noteworthy are results from the students' surveys and focus groups (not reported in this paper) that found many riders with disabilities to be satisfied with the quality of RTS's bus services, as one respondent expressed, *"I want to keep up with riding the bus because one day I won't be able to drive and so far I have had a good experience riding the bus."* Although students invited RTS to be involved in the development and implementation of this assessment, RTS was not able to participate. They did, however, have an administrator in attendance at the community forum. To ensure that RTS perspectives were incorporated into the assessment, the students worked under the guidance of the CIL's ADA Paratransit Director who maintained contact with RTS management throughout the assessment process.

In addition to conducting this assessment project, a principle objective was to forge a mutually beneficial partnership among MPH students and the CIL. Within this partnership, students were able to apply the knowledge and skills they gained in the classroom to a real world situation that addressed a priority concern identified by the CIL. Students

gained practical experience and competence in navigating and negotiating the ethics, etiquette, and challenges of community-based research while developing an enhanced sensitivity to the challenges faced by persons with disabilities. As the students' preceptor expressed, "*This project was a great way to link the students with the community. These Public Health students, wherever they end up, will be dealing with folks who use public transportation, and it's important for them to understand what their clients have to go through to get there. If the bus is late and the client misses an appointment, they don't have physical resources to get there another way*" (CIL, ADA Paratransit Director, Personal Communication, January 28 2009).

For the CIL, they gained useful information and data that will assist them in advocating for positive change that will result in increased independence and opportunities for civic engagement for their consumers. They also developed a trusting relationship with the UF-PHHP and its students; many of whom can now be considered for future projects and even paid employment opportunities. One limitation is that the students were able to commit only one semester to this unfunded project. Although the Assessment and Surveillance course is one of a series of three courses that covers the continuum of assessment, program planning, and evaluation, these courses are not yet coordinated to enable students to see a project through from formative research through program development, implementation, and evaluation. Everyone involved in the project (students, course instructor, and CIL preceptor) agrees that such coordination would be not only beneficial to all partnering organizations, but would result in a more satisfactory and well-rounded learning experience for the students.

To ensure that findings from this assessment benefitted not only the students and the CIL, but also the Gainesville community, the students shared and discussed results during an interactive community forum. The forum was held at the CIL in one of their accessible meeting rooms during a time when a CIL-sponsored advocacy group regularly holds its meetings. Via an eye-catching, visually accessible PowerPoint® presentation and engaging discussion, the students were able to relay findings in a manner that was interactive and informative. Forum participants indicated, verbally and in written evaluations, that they found the forum to be an informative and inspiring experience and that they enjoyed having the opportunity to discuss important transportation issues.

For everyone involved, the City Commission's interest in the students' bus stop accessibility project was an unexpected, but gratifying outcome of the work. As one student expressed, "*Everyone was excited and proud that our work reached the attention of those with the ability to effect change in our community. It was a validation of all that we strive to do as public health majors*" (Student, Personal Communication, 2008).

Conclusion

In Gainesville, and other communities that offer outstanding medical facilities, community services, and opportunities for education and civic engagement, ensuring that the primary form of public transportation (in this case, the fixed-route bus system) is accessible is not only ethical, but essential. By providing students the knowledge, skills, and support to conduct actual community-based projects, they were given the opportunity to truly experience how their work can significantly change the quality of service and quality of life of the individuals and groups they strive to serve. This perspective was shared by the City of Gainesville Mayor, Pegeen Hanrahan, who praised the students after their presentation to the commissioners by stating, "*It's always great when your hard work leads to some positive public action.*"

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