

Public Transportation: An Investigation of Barriers for People With Disabilities

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Abstract

The physical accessibility of public transportation increased nationwide following the passage of the Americans With Disabilities Act (ADA) in 1990. Despite removal of many physical barriers within fixed-route systems, significant barriers to overall access of public transportation systems are still widespread. The purpose of the current study was to provide a full description of barriers experienced by individuals with disabilities when using the public transportation and the complementary paratransit services. An online survey was developed and disseminated to contacts of the National Network of ADA Centers, and 4,161 individuals responded. Results highlight significant barriers for people with disabilities who use public transportation and complementary paratransit services. Barriers to these transit systems are physical and attitudinal in nature, and as a result, modifications to the physical environment and educational opportunities to reduce negative attitudes toward individuals with disabilities are recommended.

Keywords

public transportation, accessibility, barriers, disability

Transportation is essential for people of all ages and backgrounds to live a fulfilling and satisfying life. It plays a vital role in many aspects of daily life including access to employment, education, health care, shopping, social occasions, and multiple recreational activities. Put simply, transportation is a requirement for full participation in a community (Jansuwan, Christensen, & Chen, 2013). Despite the obvious importance, many people in the United States do not have access to adequate transportation, and this experience is disproportionate for some groups. Individuals with disabilities represent approximately 40% of the 15 million people in the United States who have difficulty getting adequate transportation services (U.S. Department of Transportation & Bureau of Transportation Statistics, 2003).

According to the U.S. Census Bureau (2011), approximately 36.3 million Americans experience one or more disabilities, which is equivalent to one out of every eight Americans. Further research indicates 30% of individuals with disabilities have difficulty accessing transportation (U.S. General Accounting Office, 2003). In addition, people with disabilities travel less frequently and rely on public transportation more than the general population (Penfold, Cleghorn, Creegan, Neil, & Webster, 2008). As a result, barriers to public transportation quickly affect the ability of people with disabilities to fully experience the social, economic, and political environments of their community (Christensen, 2014). It is estimated that 560,000 people do not even leave home as a result of transportation difficulties (U.S. Department of Transportation & Bureau of Transportation

Statistics, 2003). Adequate, accessible public transportation is essential to fully address social and economic disparities that exist among individuals with disabilities (National Council on Disability [NCD], 2005a). By increasing independence, transportation can serve to mediate these inequalities based upon impairment and subsequently experienced as disability (Aldred & Woodcock, 2008).

Barriers to Public Transportation

Public transportation has increased physical accessibility nationwide following the passage of the Americans With Disabilities Act (ADA) in 1990. The ADA clearly changed the landscape of public transit, and the NCD indicated,

As a consistent theme in most transit systems across the United States, the Americans with Disabilities Act of 1990 (ADA) has spawned great improvements . . . As a result of the ADA, the past decade has brought about real improvements in access to transportation for people with disabilities, and access to public transportation has improved significantly since implementation

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of the ADA transportation provisions. (NCD, 2005a, pp. 13, 20)

Despite removal of many physical barriers within fixed-route systems, significant barriers to overall access to public transit systems are still being reported. Barriers to public transportation for people with disabilities are widespread, but documentation in many parts of the country are lacking. A recent report from NCD (2015) provides information from select cities regarding problems and barriers to public transportation for people with disabilities. Problems with fixed-route bus transportation include inoperable lifts and ramps, false claims of inoperable lifts or ramps to avoid boarding a person with a disability, failure to stop for a traveler with a disability, attitudinal barriers among drivers, steep slope for ramp use, failure to clear wheelchair securement zones for people with disabilities, failure to provide stop announcements, and failure to provide route identification. Problems also exist with fixed-route rail systems including failure to provide level-entry boarding at new or altered stations, lack of an accessible alternative when level-entry boarding is not possible, inaccessible stations and cars, problems with reservations, and failure to provide dual-mode communication in the station or on the track (NCD, 2015). Without an improved understanding of these problems, along with policies to remove barriers such as those stated above, individuals with disabilities continue to lack full access to public transportation.

Barriers to Complementary Paratransit

In addition to the requirements of public transit systems described above, the ADA also requires public transit systems to provide complementary paratransit, which are demand-responsive transportation services for people who are unable to board a bus, or do not have an accessible path to a transit stop. Complementary paratransit services must be provided to eligible users within three fourths of a mile corridor of existing bus routes and during the same hours of service of those bus routes. In addition, transit providers cannot impose restrictions on the type of trip taken, and eligible riders cannot be refused service due to budget restrictions, despite the potentially high cost of complementary paratransit for public transit systems. Initially, complementary paratransit services were intended to provide transportation services to people with disabilities while transit systems became more accessible; however, many people with disabilities now use complementary paratransit services as their primary mode of transportation (Rosenbloom, 2007).

Complementary paratransit services are a lifeline for many individuals with disabilities, but despite the importance of these services, barriers are frequently encountered, which prevent individuals from having necessary transportation to

meet daily needs. Reports from cities such as Orlando, Florida, indicate travelers often experience untimely pickups, excessive trip lengths, and missed trips (NCD, 2015). Additional barriers include problems with eligibility for paratransit services, denials of requests for paratransit services by eligible individuals, excessive hold times to arrange trips over the phone, lack of communication accessibility when arranging trips by phone, lack of door-to-door service when necessary, attitudinal barriers among drivers, and a lack of driver training (NCD, 2015). Problems such as these prevent individuals with disabilities, who are eligible for paratransit, from obtaining adequate and necessary transportation for a variety of needs.

Despite passage of the ADA in 1990, which led to significant improvements in public transportation for people with disabilities, problems and barriers to public transportation and complementary paratransit services still exist with documentation from select cities across the nation (Rosenbloom, 2007). To adequately address the barriers encountered by individuals with disabilities in public transit and complementary paratransit systems, a closer look at these problems is essential. The purpose of the current study is to use a national sample of individuals with disabilities to provide a full description of barriers experienced when using the public transportation and the paratransit services to inform and influence transportation reform at the regional and national levels.

Method

Participants

The initial sample for the current study consisted of 6,884 participants who responded to the email invitation for the web-based survey. Due to focus of the current study, the initial sample size was reduced to only include individuals with disabilities who reported using public transportation. A total of 4,161 respondents met these criteria and were included in the sample for the current study. The mean age of participants was 49 years ($SD = 15$ years). Additional demographic information of respondents is presented in the following section.

Instrumentation

A web-based survey containing 33 questions was created by staff and advisory committee members at Meeting the Challenge under a Federal Transit Administration cooperative agreement (Project CO268001). The survey tool used for administration was Survey Gizmo (Widgix LLC, 2009), and specific questions were created following an extensive review of the literature of similar assessment tools and current barriers in accessibility of public transportation (Denson, 2015; NCD, 2005b; Rogers, 2002; Transit

Cooperative Research Program, 2005). The resulting survey was a branched instrument, which directed participants to different questions dependent on their use of public transit systems and complementary paratransit within the past 12 months. Of the 33 questions, 29 were multiple choice and four were open ended. The survey included four sections with items investigating use of public transportation, use of complementary paratransit services, perceptions of transportation accessibility, and demographic items. It was operational from March 11 through March 31, 2009, which indicates a rapid rate of response by all participants.

Procedure

The web-based survey was disseminated to participants using the National Network of ADA Centers. The ADA Centers are a national network of 10 regional centers that provide information, referrals, resources, and training on the ADA to businesses, employers, government entities, media and news reporters, and individuals with disabilities. Meeting the Challenge operates one of the 10 regional centers, the Rocky Mountain ADA Center. Using this network allowed distribution of the survey to extend nationwide in an effort to collect data reflective of the state of transit for people with disabilities across the country. Each regional ADA Center distributed the survey invitation email to community groups including disability, transit, advocacy organizations, and service providers as well as to individuals with disabilities. Email recipients were encouraged to forward survey information to any individual with a disability or to any groups serving individuals with disabilities with interest in public transit accessibility issues.

Data Analysis

The SPSS version 21.0 for Windows was used to perform all data analyses. Descriptive statistics were computed for all items, including measures of distribution, central tendency, and variation where applicable. In addition, Pearson's chi-square analyses were conducted to investigate differences between expected and observed results, and all significant tests utilized an alpha threshold of .01.

Results

As previously indicated, a total of 4,161 individuals responded to the branched survey, which asked participants to respond to different questions based on their use of public transportation and paratransit services, and 92% of respondents completed the survey. Demographic information was collected from all participants as part of the current study. Specific information regarding gender, disability status, employment, education, and city size are presented in Table 1.

Table 1. Demographic Information of Respondents.

Characteristic	%	<i>n</i>
Gender		
Male	40.8	1,696
Female	59.2	2,463
Not answered		
Disability status		
Mobility disability	42.5	1,769
Blind/low vision	32.0	1,333
Deaf/hard of hearing	12.3	512
Communication disability	11.7	488
Mental health disability	25.6	1,066
Other	19.4	806
Employment status		
Full time	28.2	1,174
Part time	19.4	808
Self-employed	5.2	217
Student	13.0	542
Volunteer	17.0	709
Unemployed	13.5	563
Retired	10.9	453
Education		
Bachelor's degree	21.1	878
Graduate degree	21.7	902
Associate's degree	7.5	310
Some college	17.5	727
High school diploma	16.0	664
City size		
<50,000	20.9	869
50,000–100,000	14.8	614
101,000–250,000	10.4	431
250,001–1,000,000	11.8	493
1,000,000+	11.0	459

Public Transportation

Initial results provide a description of the type of use of public transportation by individuals with disabilities. In the past year, 36.7% of respondents indicated they rely on public transportation, whereas 20.1% reported frequent use, 17.9% occasional use, and 15.6% indicated rare use. The most common form of public transportation utilized by respondents was the bus (74.0%), followed by paratransit services (35.6%), taxis (28.9%), light rail (21.2%), and subways (19.5%).

More important, the current survey provided detailed information regarding barriers encountered by individuals with disabilities when using public transportation. Table 2 depicts the frequency of barriers cited by all respondents when using public transportation in the previous 12 months to the administration of the survey, in descending order.

Further analysis uncovered significant differences in the experience of barriers in public transportation according to type of disability. When compared with other disability

Table 2. Public Transportation Barriers Encountered by Disability Type (N = 4,161).

Type of barrier	All	Vision	Hearing	Communication	Mobility	Mental/learn
Inadequate transit system	47.9% (1,994)	58.9%*	44.1%	45.7%	47.9%	47.3%
Drivers not calling out stops	30.2% (1,257)	53.1%*	33.0%	20.5%	22.3%	21.4%
Inappropriate driver attitude	26.7% (1,111)	31.8%*	29.3%	27.0%	29.9%*	23.6%
No accessible route to stop/station	26.0% (1,080)	31.4%*	23.2%	24.6%	29.6%*	23.6%
Climate conditions	25.2% (1,050)	25.1%	24.0%	26.6%	34.8%*	24.2%
Drivers lack of knowledge	23.0% (957)	31.4%*	21.5%	24.4%	25.9%*	17.5%
Inability to navigate public system	20.1% (838)	22.1%	22.5%	27.7%*	19.0%	25.9%*
Inaccessible stop/station	19.8% (825)	20.0%	17.8%	17.8%	26.9%*	15.7%
Gap or step to vehicle	18.9% (788)	21.2%	18.0%	13.3%	28.8%*	14.3%
Problems with lifts	17.2% (717)	8.8%	13.3%	18.2%	34.0%*	11.1%
Vehicle full	14.7% (612)	11.1%	18.0%	16.4%	23.1%*	13.8%
Drivers refuse to stop	14.1% (588)	18.5%*	12.9%	9.0%	13.9%	13.6%
Not eligible for paratransit	8.1% (337)	7.3%	7.6%	12.3%*	9.2%	10.5%*
Unable to secure wheelchair	7.6% (315)	3.8%	6.1%	11.3%*	15.4%*	5.0%
Service animal problems	5.6% (232)	10.2%*	9.2%*	4.5%	5.5%	3.7%
Wheelchair is too big/heavy	3.3% (138)	2.4%	3.3%	4.1%	6.6%*	2.5%
No barriers	12.1% (502)	8.4%	10.2%	16.2%	9.3%	16.8%

Note. Percentage for all disability types equals the proportion of respondents who encountered this barrier in the past 12 months; respondents could check multiple responses if more than one barrier was encountered. For each disability type, indicated significance denotes higher percentages in the experience of that barrier when compared with other disability types.

* $p < .01$.

types using chi-square tests of independence, individuals who are blind or have low vision reported significantly elevated rates of certain barriers. Individuals who are deaf or hard of hearing reported similar rates of barriers when compared with other disabilities, with the exception of increased reports of problems with service animals compared with those with other types of disabilities. Individuals with communication disabilities reported elevated rates of wheelchair securement issues, ineligibility for paratransit services, and inability to navigate public transit systems. Respondents with mobility disabilities showed significantly higher rates of most barriers to public transportation, whereas participants with mental health disabilities reported slightly lower rates of most barriers with the exception of significantly higher rates in the inability to navigate the public transit system and not being eligible for paratransit. Table 2 provides a comprehensive review of all the barriers to public transportation according to disability type.

Results also indicated additional differences between urban and rural public transportation as defined by the 2010 Census classification of “urbanized areas,” an area of 50,000 or more people (U.S. Census Bureau, n.d.). Urbanized areas had significantly elevated rates of drivers not calling out stops (34.5% vs. 25.1%), $\chi^2(1) = 24.57$, $p < .01$; vehicles being too full or wheelchair areas occupied (16.7% vs. 11.3%), $\chi^2(1) = 14.04$, $p < .01$; drivers lacking knowledge (25.9% vs. 16.9%), $\chi^2(1) = 27.67$, $p < .01$; and inappropriate driver attitude (28.2% vs. 20.4%), $\chi^2(1) = 19.59$, $p < .01$, whereas nonurbanized (rural) areas had

significantly higher rates of not being eligible for paratransit services (11.3% vs. 7.1%), $\chi^2(1) = 14.09$, $p < .01$.

Complementary Paratransit Services

In addition to barriers to public transportation services, the current study also investigated barriers to paratransit services. Of the initial sample for the current study, 36.1% of the participants reported utilizing complementary paratransit services in the last 12 months, and as a result, 1,503 serves as the sample size for this section. Initial results indicate 65.6% of these respondents use paratransit services more than once a month, and 31.6% use it more than two times a week. Respondents also report using paratransit services for general access to the community (51.6%), completion of important daily activities (i.e., medical appointments; 48.8%), and transportation to work (36.3%), whereas 13.7% of respondents report paratransit services as their exclusive form of transportation.

Similar to public transportation services, a large majority of respondents reported some type of barrier to the use of paratransit services. Table 3 provides a description of specific barriers and related frequency as experienced by people with disabilities when using paratransit services. Results also indicate significant differences in the experience of barriers to paratransit services based on disability type. When compared with other disability types, individuals who are blind or have low vision reported significantly higher rates of the pick-up window being missed and

Table 3. Paratransit Service Barriers Encountered by Disability Type ($N = 1,503$).

Type of barrier	All	Vision	Hearing	Communication	Mobility	Mental/learn
Scheduling problems	54.7% (822)	58.6%	58.8%	54.4%	59.3%*	51.8%
Long wait times	49.8% (749)	53.1%	52.3%	49.7%	51.0%	47.3%
Pick-up window missed	36.0% (541)	42.9%*	38.6%	34.7%	34.9%	33.5%
On bus for too long	35.1% (527)	37.5%	36.6%	33.2%	36.7%	30.4%
Inadequate times of service	32.2% (484)	36.6%*	36.6%	30.1%	31.3%	31.0%
Inappropriate driver attitude	29.4% (442)	32.5%	37.9%	30.6%	29.4%	30.0%
No-show policies	18.3% (275)	19.9%	19.6%	22.8%	17.7%	20.8%
Removed from eligibility	4.5% (67)	4.5%	7.8%	7.8%	4.2%	7.3%*
No barriers experienced	13.6% (205)	10.8%	12.4%	11.9%	13.9%	15.3%

Note. Percentage for all disability types equals the proportion of respondents who encountered this barrier in the past 12 months; respondents could check multiple responses if more than one barrier was encountered. For each disability type, indicated significance denotes higher percentages in the experience of that barrier when compared with other disability types.

* $p < .01$.

inadequate times of service for individual needs. Individuals with mobility disabilities reported significantly higher rates of barriers in scheduling and negotiating reservations, and those with mental health disabilities reported significantly higher rates of being removed from eligibility for paratransit services. Individuals who are deaf or hard of hearing and those with communication disabilities reported no significant differences in barriers to paratransit services at the threshold level. Table 3 provides a comprehensive review of these results.

Results also indicate significant differences between barriers to paratransit services experienced by urbanized and nonurbanized users. Specifically, paratransit users in urban areas show elevated rates of their pick-up window being missed (39% vs. 30.3%), $\chi^2(1) = 6.71$, $p < .01$; inappropriate driver attitudes (32.3% vs. 20.8%), $\chi^2(1) = 13.28$, $p < .01$; long wait times due to the window of availability (52.4% vs. 41.9%), $\chi^2(1) = 9.11$, $p < .01$; and being on the vehicle too long during trips (39.7% vs. 25.4%), $\chi^2(1) = 18.31$, $p < .01$.

Discussion

The present study explored the primary barriers that are experienced by people with disabilities who use public transportation and complementary paratransit services in their daily lives. Although public transportation is frequently used and in many cases relied upon by people with disabilities, substantial barriers persist. These most significant barriers to public transportation and complementary paratransit services continue to negatively affect active community participation. The findings reflect a need for changes to existing physical environments, systems, and attitudes to afford equal access and opportunity to public transportation. The perspective offered here may provide insight to guide public priorities, funding, and decision making in an attempt to reduce transportation concerns and

inequalities for people with disabilities (Rosenbloom, 2007).

Barriers to Public Transportation

Although the ADA paved the way for change in public transportation, it is evident that existing facilities and systems are still not meeting the needs of people with disabilities. Nearly half (47.9%) of the respondents reported the public transportation system was inadequate, meaning that it did not get them where they needed to go, when they needed to get there, and in a reasonable amount of time. Further compounding the problem, many said that routes to stops and stations were inaccessible (26%), along with inaccessible stops and stations themselves (20%). The observations of the survey are paralleled by findings from the NCD (2015) and highlight the persistence of these problems. For people with disabilities who rely on public transportation, this directly and adversely affects autonomy, community participation, and socioeconomic position.

Results also indicate three out of the top six barriers to public transportation experienced by people with disabilities were related to characteristics of the driver, including drivers not calling out stops, inappropriate driver attitude, and driver's lack of knowledge. Alerting passengers about upcoming stops is a basic necessity for travel, and was reported as a barrier by more than 30% of respondents. The driver's lack of knowledge, which was frequently cited as a barrier, encompasses factors such as understanding disability etiquette and needs of specific disability types, alternate communication strategies, and proper use of assistive equipment on public transit vehicles. Without sufficient training and knowledge, drivers are unable to properly assist individuals with disabilities, creating further challenges and potentially leading to frustrating or embarrassing incidents.

As evidence from literature suggests, societal attitudes remain a significant barrier for people with disabilities

(Chan, Livneh, Pruett, Wang, & Zheng, 2009), despite laws prohibiting discrimination in public transportation services. An inappropriate driver attitude was a significant barrier reported by more than a quarter of participants, and this barrier was disproportionately higher for people living in urban environments. These results are consistent with research showing some bus drivers expected people with disabilities to be “difficult passengers” and admitted to feeling insecure when interacting with them (Tillman, Stoppler, Kvas, & Monniger, 2013). These negative attitudes or prejudice toward people with disabilities may contribute to behaviors that are discriminatory (Chan et al., 2009) and are felt as barriers by those with disabilities.

The results indicate people who are blind/have low vision and people with mobility impairments/used wheelchairs experience a higher number of barriers to public transportation than other disability categories, suggesting greater need for interventions related to these populations. In many cases, barriers were related to features of specific disabilities, such as people who are blind/have low vision having greater service animal issues and not being alerted to stops. Unexpectedly, participants who are blind/have low vision and those with mobility disabilities/wheelchairs also experience more problems with drivers than other disability types (driver’s attitudes and lack of knowledge). This is likely related to the visibility of the disability and subsequent stigma formation (Livneh & Wilson, 2003).

Barriers to Complementary Paratransit Services

Results of the current study also indicate that people with disabilities who utilized paratransit services reported frequent barriers. Specifically, more than one third of respondents indicated issues with scheduling reservations, long wait times, drivers missing pick-up windows, and lengthy travel times, and results from the current study parallel findings from the NCD (2015). The source of these problems may be inadequate funding, resulting in providers being understaffed, lacking the sophistication to manage door-to-door service in a consistent and effective manner, and being overloaded with passengers. The ADA requirement of complementary paratransit service is an unfunded federal mandate, leaving funding decisions and support to state and local governments. Complementary paratransit systems appear to be more overwhelmed in higher demand, urban environments, as evidenced by the results indicating elevated rates of barriers in these locations. These barriers are likely connected to increasing cost for services at a time when the demands are growing and funding is increasingly scarce (Denson, 2015).

Individuals with disabilities who rely on paratransit services typically have to schedule and plan out their activities well in advance to receive transportation services. Despite these efforts, many people with disabilities still frequently

encounter barriers, such as those described above. Many individuals with disabilities find complementary paratransit services are undependable and typically arrive late or not at all (Scheer, Kroll, Neri, & Beatty, 2003). As a result, individuals with disabilities may fail to engage in social events, obtain or maintain employment, attend to health care needs, or participate in recreational activities, which clearly prevent full participation in a community (Anaby et al., 2013; Jansuwan et al., 2013).

Limitations

Although the sample size for the current study was large, it was a convenience-based sample, which affects the generalizability of results. In addition, data were collected using an online survey, and as a result, individuals with disabilities who do not have access to a computer were not included in the sample. More specifically, the sample for the current study may have been skewed as a result of the survey methodology. The sample included participants with a higher level of education and increased rate of employment, as compared with the general population and current employment statistics for individuals with disabilities (Kraus, 2015; U.S. Census Bureau, 2016). The sample also included a larger percentage of individuals with mobility disabilities and people who are blind/have low vision. The sample also did not include individuals with intellectual disabilities (IDs) due to limited reading proficiencies among this population. The research design was descriptive in nature, and as a result, interpretations cannot be made regarding predictive or casual relationships among variables. In addition, data were only collected from individuals with disabilities, and as result, comparisons cannot be made with the experience of people without disabilities who use public transportation. Measurement was also exclusively self-report, which presents a certain degree of bias and error that must also be taken into account.

Implications for Policy Development

Despite legislation mandating accessible public transportation for individuals with disabilities, the current transportation system continues to present significant barriers. Individuals with disabilities may choose not to travel to avoid these problems, and others may struggle to meet their daily needs due to significant barriers in the transportation system (Christensen, 2014; U.S. Department of Transportation & Bureau of Transportation Statistics, 2003). As a result, changes need to be made to improve accessibility of public transportation across the nation, and these changes must be enforced by state and local governments. In addition, attention must be paid to shifts in demographic groups, which enhance the significance of barriers to the public transportation system. More specifically, the

population of older adults is expected to double by 2050 (Ortman, Velkoff, & Hogan, 2014), which will further highlight physical barriers to public transportation including inaccessible stops and stations. In addition, the population of nonnative English speakers in the United States nearly tripled from 1980 to 2010, and is expected to further increase in coming years (Ryan, 2013), which will increase the need for alternate communication strategies in public transportation systems. Demographic shifts such as these must be incorporated into future planning and policy development.

Advanced technology. Of the areas in need of reform, being alerted to upcoming stops is a frequent and substantial barrier for many people with disabilities using public transportation. This modest hurdle could be addressed through combined efforts of vehicle modifications and assistive technology. Public transportation vehicles could be equipped with stop signals and text to alert passengers with auditory disabilities. In addition, personal assistive devices and applications (e.g., cell phone applications) could be developed to provide feedback directly to the individual. Cell phone applications (i.e., apps) are currently being evaluated for utility in planning travel routes, reading and understanding signs, and calculating the time to get to your destination (Gallup, Lamothe, & Gallup, 2015). Carmien et al. (2005) initiated a "Mobility-for-All" project, which utilized global positioning system (GPS) to provide mobile prompts for bus stops with the goal of assisting people with cognitive disabilities to become independent commuters. Using similar protocol, an app could be developed with GPS or locator signaling to help people identify each public transit stop to address these significant barriers.

Professional development. Results of the current study also indicate a strong need for additional training programs for drivers and other personnel, which could address the accessibility needs of specific disabilities and the importance of clear and consistent calls at all stops. The resolution of attitudinal barriers is a much more challenging task, which cannot be "fixed" through any single action, but rather through deliberate forward progress in public education and advocacy efforts. Chan et al. (2009) cite evidence for using multidimensional strategies around (a) increasing contact, (b) education, (c) social influence, (d) disability simulations, (e) protests, (f) political efforts, and (g) impression management to decrease the impact of negative attitudes toward individuals with disabilities. These principles can be used in the public transportation systems by creating training interventions for all drivers of public transportation vehicles, which will address and begin to change negative attitudes toward people with disabilities. In a qualitative study of drivers' attitudes toward people with IDs, Tillman et al. (2013) concluded that bus drivers are an essential part

of the social support system for people with ID, and valid information, communication, and social interaction skills training should be required additions to training programs. It may prove useful to initially implement trainings in urban environments based on findings from the present study indicating drivers' negative attitudes were of more consequence in urban areas for those who are blind or have low vision and for those with mobility impairments or who used wheelchairs.

With attention to the implications previously discussed, the implementation of specific policy recommendations is an essential next step in improving accessibility to public transportation. For example, creating outreach programs for key stakeholders will allow service providers to develop a complete understanding of barriers to public transportation in specific regions. These programs may include opportunities for drivers and riders of public transportation to discuss resolutions in an open, public forum. Incorporating strategies such as contact, education, and social influence may target negative attitudes toward individuals with disabilities and further improve these opportunities for policy development (Chan et al., 2009). Policy recommendations must also address the use of public transportation in emergency evacuations to assist individuals with disabilities. As previous research indicates, emergency planning and preparedness for individuals with disabilities is lacking in many communities across the nation (Fox, White, Rooney, & Rowland, 2007), and the use of public transportation must be incorporated into efforts creating and improving emergency plans addressing individuals with disabilities to promote safe and effective evacuations in the event of an emergency.

Implications for Future Research

Future research investigating barriers to public transportation and paratransit services is also needed to address many of the unanswered questions and uncover any changes or improvements made since data collection for the current study in 2009. For example, collecting information regarding public transportation of individuals without disabilities would allow comparisons to be made between individuals with and without disabilities. This examination would also tease out problems inherent to public transportation, rather than problems encountered only by individuals with disabilities. Additional systems-level investigations could examine the cost-effective nature of alternatives to paratransit services. Accessible versions of Uber or Lyft may eliminate some of the barriers identified in this study and may provide a useful alternative. Further investigation of the impact of winter weather on the accessibility of public transportation is also warranted to provide improved services in these regions. Future research could also collect input from individuals with disabilities regarding current

and future policies intended to improve accessibility to public transportation. Focus groups or individual interviews would provide input from key stakeholders and ensure policies lead to improved accessibility.

Conclusion

The current investigation of barriers to public transportation and complementary paratransit services provides an excellent foundation for identification and resolution of significant problems in these systems. Information was collected from 4,161 individuals with disabilities across the nation, and critical feedback was provided. Participants reported physical and attitudinal barriers to public transportation, which affected people with a variety of disabilities. Results from the current study confirm previous reports of barriers to public transportation and complementary paratransit services, and also go further in describing important attitudinal barriers and systems barriers, and identifying differences in barriers for specific disability categories (NCD, 2015), which emphasizes the importance of these challenges. Although passage of the ADA led to significant improvements to physical barriers in the fixed-route systems, individuals with disabilities still experience barriers to public transportation, and improvement efforts have plateaued in the last 10 years (NCD, 2005a). Without more attention to these problems, individuals with disabilities will continue to be denied full community participation, economic stability, and social inclusion.

Opportunities to address accessibility concerns are extensive and include a variety of potential improvements. Equipping public transportation vehicles with stop signals and text will greatly assist passengers with auditory disabilities, and cell phone applications with GPS capabilities could be developed to provide feedback directly to the individual. Trainings for drivers and other personnel, along with outreach efforts to connect key stakeholder groups, may also begin to improve negative attitudes toward individuals with disabilities. Efforts such as these must become a priority to state and local governments to increase accessibility of public transportation, which, in turn, will allow individuals with disabilities to experience full inclusion in their community.

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