Mass Transit: The Blind Person's Car

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Vital to the quality of life in a large urban environment, mass transit takes on particular importance to blind people leading active, productive lives. Using practical, straightforward techniques, blind persons can travel safely, confidently, and competently on any mode. Blind transit riders can use sounds, feel, and other physical characteristics as excellent landmarks, especially on rail transit. Ongoing implementation of the Americans with Disabilities Act (ADA) has raised issues related to verbal and written communication with blind transit riders: Braille and raised print or audio/video signs and publications in alternative formats. ADA also has raised controversy among the blind about modifying the built environment, especially regarding raised, truncated-dome detectable warnings, ostensibly to alert blind persons approaching or walking along platform edges. Technological advances in the transit industry, such as automatic fare collection and passenger-activated doors, highlight the need to work with blind people and resolve information access and travel issues. With imagination and a positive attitude about blindness, the industry can continue making mass transit the blind person's car.

The increasing awareness of and emphasis on disability issues lead to questions about the population percentage or number of people who might use related "accommodations"—services, programs, or facilities. The blind community makes up a very small portion of the population at large, as well as a small portion of the estimated population of more than 40 million people with disabilities. Federal population statistics estimate the number of blind people at two per thousand, or about 500,000 nationwide. This number, however, gives no indication of the percentage of blind people who ride transit.

At best, the transit industry has sketchy, incomplete data on possible numbers of blind riders. Since 1975 the Metropolitan Transportation Authority (MTA) in New York has issued 13,600 half-fare cards to blind riders, about 80 percent of these in New York City. MTA, however, has no count of blind persons who ride but have not applied for half-fare cards. Baruch College Computer Center for the Visually Impaired, which is producing a few system and line subway maps for MTA, estimates that about 5,000 blind people use the subway daily.

The Americans with Disabilities Act (ADA) Accessibility Guidelines (ADAAG) do not have a quantitative threshold, either in terms of population percentages or actual numbers, at which they become effective. This paper, therefore, will address transit issues pertinent to blind passengers from a qualitative rather than quantitative perspective. It is vital to the quality of life in a large urban environment, but mass transit takes on particular importance to blind people leading active, productive lives. Most notably, the National Federation of the Blind (NFB) has developed a decades-long history of advocacy, at the national, state, and local levels, for more and better transit service.

Methods and Techniques

Environmental Cues as Landmarks

Whether traveling with canes or dog guides, blind people use many practical, straightforward techniques and

methods to ride rail transit safely and effectively. By listening, they ascertain the direction from which the train approaches, determine whether they board toward the front or rear, and locate the opening doors. Not seeing directional and informational signage, they maintain orientation by paying attention to compass directions, especially while walking through stations and riding trains as they round curves or switch tracks. The physical characteristics of the railway, sounds and feel, make excellent landmarks—for example, the echo and louder sound of subway tunnels; the vibration and slight rocking when riding through track switches; the crossing over from one track to another, as track switches guide the train along its route at terminal stations or junctions; the "clickety-clack" of jointed rail, with a rail joint usually about every 12 m (39 ft); the resonance of elevated structures and bridges; the smooth, quiet ride of welded rail (usually in sections of several hundred feet); and the quiet ride of ballasted track, with rails mounted on wooden or concrete ties set in crushed ballast rock.

Blind transit riders can note such landmarks along the way, just as sighted drivers note buildings or street names. Continuing this analogy, riding on the right-hand track of a two-track railroad compares with driving in the right-hand lane of a two-lane road. On a center platform station with two tracks, the passenger would face the desired direction and take the train on the right. Likewise, riding on the right-hand outside or inside track of a four-track operation corresponds to driving in the right-hand outside or inside lane of a four-lane road.

Canes

Blind people who use canes extend them to find the platform edge, walk straight, and keep a safe distance from it. Thus, they avoid the many fixtures and facilities typically installed toward the center of platforms: windbreaks on outdoor platforms, stairs, escalators, elevators, supervisor booths, trash cans, newspaper stands, benches, and advertising or informational signage or kiosks. Alternatively, some older subway stations have support pillars every few feet near platform edges. Blind people can locate these pillars with canes and walk a straight line just inside them. Canes also enable blind people to distinguish open doorways from the spaces between cars, as well as to negotiate the gap between platform edge and cars. This method works, regardless of whether trains have between-car barriers such as gates or springs.

Cane tips, especially metal ones, make an excellent sharp tapping sound on hard surfaces, the echo from which provides excellent auditory cues to blind people walking through stations. These auditory cues become especially useful on island platforms where other passengers insist on lining up and waiting along the edges, keeping blind persons from using them as a guide.

Dog Guides

Blind people who use dog guides avoid passengers and fixtures because dogs have received training to guide their users around obstacles. They also keep a safe distance from the platform edge because dogs respect the drop-off beyond it. When boarding trains, dogs guide their users away from spaces between cars and toward open doors.

Information Access

Publications in Alternative Formats

The Chicago Transit Authority (CTA) now produces and distributes several publications in such alternative formats as Braille, computer disk, large print, and audio cassette. CTA's *Rapid Transit Guide* covers all the rail routes, listing station name, street address coordinates, numbers of connecting CTA and Pace suburban bus routes, and information about connecting Metra commuter rail and other transportation services. CTA makes this guide available in Braille and computer disk, updating it as service changes.

Informational Announcements

Blind people have stressed the importance of bus operators' calling stops. Years before ADA, CTA's bus operator training and rules promoted the positive notion that announcing stops benefits all riders while providing more accessible service to blind people and others with disabilities. More than 1,300 buses that CTA received in the 1990s have public address systems.

All CTA railcars have had public address systems since the 1950s. All CTA cars in regular service also have outdoor speakers mounted near passenger doors to enable train personnel to make announcements directly to waiting passengers on the platform and, incidentally, focus their attention on the location of train car doors. Conductors or operators advise passengers about closing doors, standing clear of doors, priority seating, and no smoking or radio playing. They announce a train's run number, all station stops, transfer points to other rail lines, delays, reroutes, station closings, and major points of interest.

Audio/video station signs automatically announce the direction of train arrival and eventually may give delay information. In the winter and spring of 1995, CTA conducted a demonstration at the Merchandise Mart Station, using different male voices for southbound and northbound service.

Braille and Raised Print Signage

CTA will install Braille and raised print numbers in all buses, on the passenger side of the driver's barrier and on the panel behind the rear door, facing the stairs. These numbers will enable blind riders to identify buses when reporting incidents. The two new series, being delivered in 1995, have number plates, with white digits on a black background, mounted on stainless steel panels. CTA also will put these numbers on older buses, using stainless steel plates with no color contrast.

CTA train cars have their numbers written in raised print and Braille, 1.52 m (5 ft) from the floor on the panel to the right, as passengers leave the train. Riders may note the car number to report the condition of the car or activity on the train. The newest cars, in use on the Brown, Orange, and Yellow lines, have intercoms located toward the end of each car near the wheelchair positions and operators' cabs. Passengers may use these intercoms to communicate with the personnel operating the train. These intercom positions also have raised print and Braille instructions, as well as car numbers.

CTA planning, architectural, and engineering staff have explored messages, materials, and methods of installing Braille and raised print signs in rapid transit stations. Suggested locations include entrances; exits; points of level change; decision points, such as diverging paths toward side platforms; and boarding areas.

Truncated-Dome Detectable Warnings

Current ADAAGs require installation of raised, truncated-dome detectable warnings along the edges of train platforms at "key stations." These materials have heavy, bumpy texture—ostensibly to alert blind persons approaching or walking along platform edges. Some systems, including PATH and BART, already have installed these along all their station platforms. Others, such as New Jersey Transit, MARC/Mass Transit Administration in Maryland, Metra in the Chicago area, and Long Island Railroad, have installed these at many key station sites and may well install them in future construction projects.

Three completely rebuilt CTA stations have raised, truncated-dome detectable warnings along the entire length of their platform edges. Two other stations have demonstration projects, partial installations of raised, truncated domes made of various materials. Several other stations, new construction and reconstruction projects designed and funded before the effective dates of the ADAAG, do not have such materials, even though the work took place during the 1990s. As such, CTA staff have contemplated submitting a request for "equivalent facilitation" to the Federal Transit Administration (FTA) to retain existing edge treatments at these recently constructed outdoor sites. In 1992 CTA convened a task group to seek comment and suggestions from the blind community. Significantly, most task group members, blind and sighted alike, complained strongly that truncated domes endanger passengers, catching their cane tips and heels of shoes when they walk along platform edges or board trains.

NFB has long held that public entities, such as transit systems, could help blind persons more by allocating limited resources for general improvements than by wasting such dollars for unnecessary, expensive modifications of the built environment, which serve only to perpetuate negative myths about blindness. Blind persons have amply demonstrated that given proper training and opportunity, they can use public transportation and lead active, normal lives alongside their sighted colleagues. Recognizing this perspective and experience, skepticism and opposition to raised truncated domes have increased among government standard-setting bodies and operators of rail passenger service. In 1992 the American National Standards Institute removed the detectable warning requirement from its list of accessibility standards.

In July 1994 the Washington (D.C.) Metropolitan Area Transit Authority (WMATA) received an extension on the installation of truncated domes at key stations. Since then WMATA has analyzed this issue and has sought public participation. It installed two demonstration sites, one underground and the other outside, containing several detectable warning designs and materials, including truncated domes. The Battelle Memorial Institute conducted a platform edge study of a variety of detectable warning textures and materials 61 cm (24 in.) wide that concluded, in part, that "in terms of stopping distances for blind participants, no statistically reliable differences between warning surfaces were noted" (*1*). Battelle's second study concluded, in part, that "in terms of mean stopping distances from the platform edge, for participants who are blind or have low vision, no practical difference between 46-cm (18-in) and 61-cm (24-in) Flame Finish warning surfaces was noted" (*2*).

WMATA held public hearings on March 3 regarding its proposal to request equivalent facilitation for the current granite platform edge. Most testimony strongly supported this position. WMATA's news release pro-

claiming that the Federal Transit Administration (FTA) had decided in its favor began: "The [FTA] announced yesterday that [WMATA] would not be required to make any structural changes to the platform edges in its Metrorail system" (*3*).

On May 12, the Architectural and Transportation Barriers Compliance Board, or access board, considered NFB's petition to rescind the "raised, truncated dome" specification. CTA, WMATA, and the Southeastern Pennsylvania Transportation Authority, all of which operate extensive rail systems, submitted supporting petitions calling for the retention of existing platform edges instead.

James Gashel, NFB's Director of Governmental Affairs, reports that, in response to these petitions, the access board initiated a review process to consider whether to remove or modify this provision. It passed a resolution directing its communications subcommittee to develop a performance standard, reflecting the ultimate goal instead of the current descriptive standard requirement.

Observations and Recommendations

Fare Automation

The transit industry increasingly has turned toward automatic fare collection. New rapid transit systems of the late 1960s and 1970s have brought automatic fare card vending machines and ticket-activated fare gates into common use. Some older rail systems also have followed this trend. Metra Electric, formerly the commuter rail service of the Illinois Central, instituted a fare card system in the late 1960s. CTA is now developing a debit card system, planned for implementation in 1996. New York City Transit has an ongoing debit card demonstration project with specially equipped turnstiles in several stations. New light rail systems of the 1980s and 1990s commonly feature European-style barrier-free stations with inspectors riding trains and checking tickets. All these rail systems now have or will have automatic fare card vending machines.

How has the transit industry addressed information access for the blind passenger who previously asked a readily available fare-collecting employee the essential question, "What's the fare?" On a bus or streetcar with a farebox up front, the blind passenger, upon boarding, may ask questions of the operator about fares or transfers. On commuter trains with conductors who sell and collect tickets or handle cash fares, or at stations where agents handle currency and fare media, the blind person also may ask questions of personnel. Some rapid transit and commuter rail systems have station attendants; others have telephones at ticket or fare card vending machines. Either way, personnel can assist passengers, blind and sighted alike, with operating these machines and using the fare media.

A blind person purchasing a ticket at an unattended light rail station, with no Braille or speech on the vending machine and no telephone to call for assistance, can look for a passer-by or fellow passenger to help, or otherwise board the train without a ticket and try to convince the fare inspector or police officer of the circumstance. Moreover, a blind person riding a light rail train for the first time might not know about ticket vending machines and thus would anticipate buying a ticket from a conductor on board, as on a commuter train.

The transit industry cannot consider assistance from the sighted public to be the primary method of information access to blind passengers using automatic fare-collection equipment. In the interest of common sense, as well as ADA compliance, transit systems must give blind passengers a way to pay their fares independently. Some light rail and rapid transit systems have placed detailed Braille fare instructions on ticket or fare card vending machines. Writing these instructions on a panel of the machine poses the potential problem of giving outdated information unless the transit property updates the machines' hardware by physically changing out the material containing the Braille when fares change.

Depending on the variety of transactions that the fare structure offers, a blind person still may need assistance from a sighted person because, to date, these machines have had no synthetic speech. They give audible confirmation only by their mechanical operation, as they accept or reject currency and issue tickets. CTA's debit card program will include ticket vending machines with Braille instructions and speech on demand for a particular transaction, when a person presses the "audio" button. This compromise keeps the machine from announcing every fare transaction, an important security consideration for a passenger who may purchase a debit card with a large dollar amount, such as $20 or $40, at night in an inner-city station.

Light Rail Operation

Light rail offers a variety of service possibilities between traditional streetcar and rapid transit or commuter rail. Boarding light rail cars in "street running" resembles boarding buses, whereas boarding them on private right of way resembles boarding trains. In any event, all rail systems have certain common features: track, cars, and platforms (or at least car stops).

A primary difference between the older style of streetcar service and modern light rail is in boarding the car. The blind passenger, who usually boards the bus or

streetcar on which the operator opens the front doors, as well as the rapid transit or commuter train on which all doors open, might be daunted at the prospect of locating buttons on the outside of cars to open doors. The transit system could alleviate this situation by having light rail train cabs equipped with door controls that the operator could use if a passenger, blind or sighted, has difficulty opening the doors from outside the car. When doors do not open, passengers obviously do not step off the car, and the boarding blind passenger does not have these sound cues. In this instance, a subtle auditory cue might assist blind people while benefiting other passengers as well. Perhaps the same circuit that enables passengers to press the button and open doors could activate a soft bell or tone located at the car door.

Alternatively, outdoor speakers mounted near doors similar to those on several systems' cars might serve a dual purpose. While alerting passengers to the location of doors, outdoor speakers can facilitate announcements of train direction and destination to waiting passengers at platforms where several routes stop or on outlying single-track sections on which trains travel in either direction.

Linear Path

In the context of accessible design, transit planners have expressed concern about incorporating clear, linear paths along platforms and through rail stations. A common-sense design and approach benefits all passengers, including blind people and others with disabilities. As such, primary travel paths should have as few turns as possible, allowing passengers to move efficiently and directly between essential elements of stations: entrances, fare controls, facilities of level change, and boarding areas. Whenever possible, these travel paths should run parallel with or perpendicular to major rights of way, streets or tracks, and platforms. For example, passengers can enter and exit stations and maintain their orientation more easily when fare controls, gates, and turnstiles face parallel with the direction of rail travel through stations. Clear, direct travel paths facilitate efficient passenger circulation across or perpendicular to the direction of travel in several situations: subway mezzanines, between entrances on or adjacent to sidewalks at street level and platform or platforms beneath the street, concourses serving several platforms at major terminals, and grade crossings at light rail stops or commuter train stations. The most efficient linear paths along platforms depend on station characteristics such as platform width as well as placement of support pillars, fixtures, and facilities of level change.

Transit Information

A telephone call to transit information, important to anyone needing directions, is even more important to blind passengers. When giving directions, transit information generally advises a sighted person to observe the signs. A blind person, therefore, may ask for more specific information about services and facilities: location of bus stops with relation to intersecting streets, location and layout of light rail stops, and location of entrances and platforms of elevated or subway stations. In many systems, transit information operators have extensive personal experience with their routes and service areas, along with detailed schedules and maps. In some systems transit information operators may refer blind callers to staff who can give such information. For example, the Travel Information Center in Chicago sometimes refers blind callers with detailed questions to CTA Customer Assistance. As part of a multifaceted travel-training program, WMATA proposes to establish a hotline for blind persons and others with disabilities who request detailed directions.

Conclusions

Blind people can provide the best solutions for their travel needs. The transit industry should take advantage of this valuable resource. With imagination and a positive attitude about blindness, light rail and other modes of transit can be made viable, safe, and effective for blind people. The author's experience is by no means unique. Thousands of blind persons throughout the country travel safely and confidently by mass transit every day. They are self-sufficient and independent and lead active, productive lives; they consider mass transit the blind person's car. Let's get in and go for a drive.

References

1. *The Impact of Transit Station Platform Edge Warning Surfaces on Persons with Visual Impairments and Persons with Mobility Impairments.* Battelle Memorial Institute, 1995.
2. *Detectability of 18-in. and 24-in. Flame Finish Granite Warning Surfaces for Use in Transit Stations.* Battelle Memorial Institute, 1995.
3. *Metro To Keep Existing Platform Edge: Federal Transit Administration Decides in Favor of WMATA Request.* News Release. Washington (D.C.) Metropolitan Area Transit Authority, April 26, 1995.