

Wheelchair Access: Improvements, Standards, and Challenges

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Wheelchair access on transit buses and paratransit is getting more complicated every year. Service providers are faced with accommodating more passengers with an ever-increasing diversity of mobility aids. Some of the problems facing transit systems and customers are:

- Larger and less maneuverable wheelchairs, as well as those that are difficult or impossible to secure are becoming increasingly common.
 - Larger and more varied types of non-wheelchair mobility devices are being carried on transit
 - Securement is often time consuming, physically challenging, and intrusive to passengers
 - Securement on buses is often performed improperly, and unsecured/improperly secured wheelchairs (especially scooters) are prone to tipping over, causing serious injuries
 - The rationale for U.S. securement rules (i.e. ADA), are not clearly connected with existing safety data, and there is confusion about the implementation differences between safety and civil rights objectives
 - There is a lack of awareness of the need to promote the use of wheelchairs equipped with tie-down attachment points that conform to voluntary industry standards
 - The perception exists that mobility aid usage on public transit should be governed by mandatory standards and/or regulations that ensure the ability to safely accommodate them. However, such rules do not exist, and there is no consensus as to where, how, and by whom they would be implemented.
- Better securement equipment, such as four-point tiedowns, is being refined by manufacturers
 - The rear-facing alternative to traditional wheelchair securement shows promise
 - More and better education and training - of both operating personnel and passengers
 - Wheelchair marking and tether strap programs
 - Wheelchair transit accessibility standards, research, and development
 - Coordinated industry approaches to access and securement, including best practices guidelines and possible regulatory changes

Some of the emerging solutions and areas for further efforts are:

- New generations of low-floor buses, featuring better access and maneuverability

WHEELCHAIR SECUREMENT REGULATIONS AND ISSUES

Regulatory Issues

The Americans with Disabilities Act (ADA) requires that wheelchairs be transported, whether they can be adequately secured or not. However, the regulations also state that wheelchair users may be denied transportation if they do not allow their chairs to be secured. A Federal Transit Administration (FTA) bulletin on wheelchair securement indicates that transit providers must have a formal policy in order to require securement (“Questions and Answers Concerning Common Wheelchairs and Public Transit”, available at http://www.fta.dot.gov/14863_ENG_HTML.htm).

Conversely, the FTA bulletin allows transit providers to have a policy that securement of the wheelchair itself is at the option of the passenger. However, this is from the civil rights perspective, and safety/liability concerns are leading many transit systems to adopt the mandatory securement approach. In 2004, a San Jose, Calif. jury awarded \$2.1 million to an injured passenger whose unsecured scooter tipped over.

With either policy, transit agencies must provide securement assistance to any passenger who needs or

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requests it. A problem can arise, however, when trying to enforce mandatory securement policies on fixed route buses. Once a passenger is on board, there are usually no practical or legal ways to unilaterally remove them from the vehicle (refusing to abide by system policies other than those covered by laws are not enforceable infractions). Some transit systems are responding by developing procedures to inform the passenger that they are taking on an added safety risk, and documenting it in case there is a problem. This is an area that could benefit from development of recommended best practices or industry guidelines.

Wheelchair Marking and Tether Straps

A common problem for transit personnel is not knowing where to attach tie down straps on many wheelchairs and scooters. This is a steadily worsening situation, as most new wheelchair designs do not have the type of frame joints that tie-down systems were originally designed for. Many transit systems and disability organizations offer wheelchair marking and/or tether strap programs for wheelchair users.



Figure 1. Wheelchair with markings (rear) and tether straps (front)

The first component of these programs is markings for appropriate attachment points on customers' chairs with color-coded tape, stickers, wire ties, or some other identifier. If there is no good place for attachment of belts or hooks, a fabric webbing "tether strap" can be installed on the mobility aid. This approach, while not as good as having proper mechanical tie-down points built in or attached to wheelchairs, serves to make "best efforts" to keep wheelchairs in the securement area, as encouraged by the ADA regulations.

Care must be taken, however, to make sure that tether strap installations do not cause more problems than they solve. The type and length of straps must be chosen to fit various wheelchair frame sizes, and personnel who install

the straps should be familiar with both wheelchair design and bus tiedown equipment.

Oversize Wheelchairs and Non-Wheelchair Mobility Aids

A recent report by Easter Seals Project ACTION also examined issues related to oversize and overweight wheelchairs. (Project ACTION is funded through a cooperative agreement with the FTA to promote cooperation between the transportation industry and the disability community to increase mobility for people with disabilities under the ADA and beyond). A copy of the Issue Synthesis is available at: http://projectaction.easterseals.com/site/PageServer?pagename=ESPA_fact_sheets.

This issue is emerging along with the proliferation of non-wheelchair mobility aids that are appearing more frequently with patrons attempting to access transit. These items include Segways, "go-ped" scooters (as opposed to traditional wheelchair alternatives for the disabled), walkers with seats, and even bicycles. Some advocates have called for increasing the 30"x48" size envelope and/or 600 lb. weight limit for "common wheelchairs", partly due to the growth in size of some of these devices.

The concept of increasing the wheelchair size "envelope" was recently advanced in a report entitled, Standards and Anthropometry for Wheeled Mobility, by the Center for Inclusive Design and Environmental Access at The State University of New York. The report was funded by the U.S. Access Board, which is responsible for developing and updating regulations such as the vehicle specifications required by the ADA. One of the recommendations was to consider expanding the clear floor space requirement for wheelchairs in U.S. standards to 31.5" x55". Adopting such a larger envelope could have a major impact on transit vehicle interior design.

Issues are also emerging with non-wheelchair mobility aids. The rules of most transit systems require walkers and other non-wheelchair devices to be folded or otherwise placed out of the aisle, similar to the rules for shopping carts and baby strollers. However, an increasing number of patrons are using all types of devices for mobility or for carrying shopping or personal items, often in bags or baskets affixed to a mobility device. Segway "personal transporters" are also being considered "official" mobility aids in some locations.

Using the wheelchair space in buses is often a pragmatic answer for accommodating non-wheelchair devices, but as competition for this space increases, the potential for conflicts also increases. A 2004 ruling by the FTA stated that a transit system erred in denying access to a patron with a walker that couldn't be stowed out of the

way, saying that it met the definition of a “common wheelchair”. This brings up a number of serious questions; beginning with whether the walker should be allowed to take up the space needed by wheelchair users, or if such walkers must be treated as wheelchairs in terms of the passenger sitting in it and being secured. Other large devices such as Segways bring up these and other concerns, such as how they board using lifts or ramps.

WHEELCHAIR STANDARDS AND RESEARCH

Transportable Wheelchair Standards and Research

Programs such as wheelchair markings and tether straps are increasingly used by transit agencies to deal with difficult-to-secure wheelchairs. Recent improvements in tie-down products have also helped. However, markings and tether straps are not nearly as good as having proper mechanical tie-down points built in or attached to wheelchairs. Standard No. WC-19: “Wheelchairs Used as Seats in Motor Vehicles” was developed by the ANSI/RESNA Committee on Wheelchairs and Transportation (COWHAT), and was approved by the American National Standards Institute (ANSI) in 2000 as a voluntary U.S. national standard. It specifies strength and geometric requirements for at least 4 securement points and seat/shoulder belt anchorage points that can withstand crash forces, as well as accessible geometry that can receive a securement hook or buckle.



Figure 2. Wheelchair with WC-19 “Transit Option” securement

So far, only a limited number of wheelchair models are available with the securement “loops” specified by WC-19, dubbed the “Transit Option” by some wheelchair

manufacturers. The voluntary nature of the standard has led to a “chicken or egg” situation, where manufacturers are reluctant to offer the option across the board. They have cited the cost of development and testing (crashworthiness is an important factor) in light of minimal demand from consumers. A particular issue is also the lack of awareness or acceptance of the need for the transit option by health care prescribers and funders. An example is the fact that Medicare funding for wheelchairs limits them for “in-home” use only.

COWHAT has identified a major need to increase awareness of this as an essential part of any wheelchair or scooter that will potentially be used while traveling on public transportation. A brochure describing the standard, entitled “RideSafe”, is available at www.travelsafer.org.

COWHAT, along with the International Standards Organization (ISO) and the RERC-WTS (see below), is also studying and developing draft standards for potential “docking” technology that can automate the securement process. For more information, visit: www.wheelchairstandards.pitt.edu/WCS_T/WCS_Thome.html

These standards activities and related research are supported by the Rehabilitation Engineering Research Center on Wheelchair Transportation Safety (RERC-WTS). This project is funded for 5 years by The National Institute on Disability and Rehabilitation Research (NIDRR), and is sponsored by the Universities of Pittsburgh and Michigan. Information is available at www.rercwts.pitt.edu and www.wheelchairnet.org.

The RERC-WTS sponsored a “State-of-the-Science” workshop in January 2005. Approximately 55 people attended, including researchers, disability advocates, wheelchair and transit manufacturers, transit and school bus industry representatives, health care/rehabilitation professionals, and five participants in the recently formed APTA Wheelchair User Issues Subcommittee.

The workshop addressed the issue of barriers to the widespread use of “transit-safety technologies” (TST) that comply with existing voluntary standards for “transit wheelchairs” (WC-19) and wheelchair tiedown/occupant restraint systems. It also examined what future directions for securement should be, along with strategies to move forward. Conclusions drawn from a prioritization process involving all of the participants included the following (among other) objectives. Many of them will require cooperation between diverse interests in transportation, manufacturing, research, disability advocacy, and government:

- Educate users, transit providers, third party payers, and government agencies regarding the costs vs. benefits of TST, to enable

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funding/reimbursement, encourage R&D, and develop regulations

- Promote the concept that transportation safety should be included in the base price of wheelchairs
- Adopt **regulations that mandate** the use of TST (note that this is a common theme among participants and observers, but one that is potentially controversial – which sector will be mandated, and to do what?)
- Coordinate federal requirements for all transportation providers – including regulations of the FTA, FDA, NHTSA, VA, Medicaid, Medicare, etc.
- Conduct and disseminate the results of demonstration projects on wheelchair docking technology, and establish a US industry docking standard (note that this is a long-term development issue)
- Update and harmonize USDOT’s ADA vehicle regulations with new industry standards for rear-facing securement in large buses (US Access Board staff participated in the workshop and stated that the 49 CFR Part 38 Accessibility Specifications For Transportation Vehicles will soon be reviewed for updating, including the existing “embryonic” guidelines for rear-facing securement)

Rear-facing Securement Alternative

COWHAT, ISO, and the RERC-WTS are also researching a draft standard for the rear-facing securement “compartmentalization” option used in European and Canadian fixed-route buses. This option shows promise as an alternative in dealing with the time-consuming, physically demanding, and sometimes intrusive aspects of traditional strap-type tie-downs. User independence can be enhanced, while bus operator assistance can be minimized or even eliminated. This is especially important for emerging Bus Rapid Transit (BRT) services. A recent US Transportation Research Board (TRB) report, TCRP Synthesis 50: “Use of Rear-Facing Position for Common Wheelchairs on Transit Buses” describes the international state of this practice on large transit buses and identifies issues related to its transferability to the U.S. context. (http://gulliver.trb.org/news/blurb_detail.asp?id=2311)

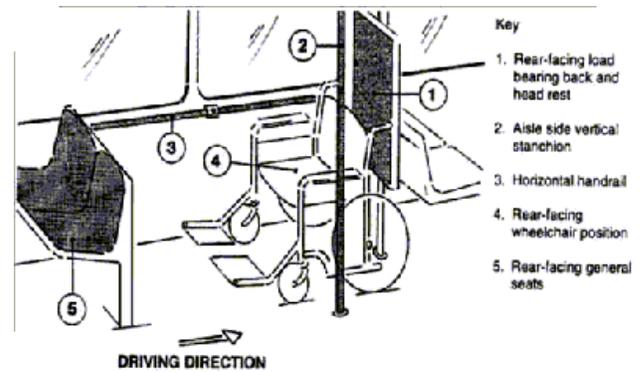


Figure 3. Rear Facing Wheelchair Position Concept

The National Center for Accessible Transportation (NCAT) at Oregon State University recently completed a study under the TRB Transit IDEA program, entitled “Rear Facing Securement for Bus Rapid Transit Vehicles” (IDEA Project 38). NCAT covers accessibility to public transportation, including intra-city bus, over-the-road-buses, trains, and air travel (see: <http://ncat.oregonstate.edu/about/>). OSU researchers also developed early bus securement docking technology that demonstrated the feasibility of the automated approach.

IDEA Project 38 evaluated “passive” rear-facing securement for BRT usage, including responses of both wheelchairs and wheelchair users under actual and test operating conditions. Results showed that the rear-facing approach has good feasibility for BRT applications, but that mobility aids need containment on 3 sides of the station. Without aisle-side stabilization, wheelchairs are prone to tipping or swinging during severe driving movements. Some types of wheelchairs, especially 3-wheeled scooters, are subject to tipping even during normal turning movements.

The study concluded that more work is needed to identify the best ways to minimize movement of wheelchairs. This is based on the fact that past European designs such as full-height aisle stanchions and folding armrest-style barriers are not satisfactory for some wheelchairs, and can also be problematic for interior circulation and other reasons in US-style bus applications. This information will be useful in the development of new designs and standards such as those described above.

FUTURE DIRECTIONS

Transit Industry Involvement

In response to the increase of these types of issues, the Access Committee of the American Public Transportation Association (APTA) formed a Wheelchair User Issues Subcommittee (WUIS). The group meets at the annual Bus and Paratransit Conference each spring.

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Participants include transit system staff, disability advocates, researchers, consultants, and manufacturers of transit securement, seating, and vehicles. The group's mission is to serve as a focal point and coordinating venue for APTA to consider wheelchair user issues in public transportation.

One aim for the group is to help clarify wheelchair space and maneuvering needs, as well as proper securement equipment placement, in APTA's Standard Bus Procurement Guidelines. This could help deal with the perception that the ADA "common wheelchair" envelope is too small (the basic ADA guideline calls for a 30" x48" minimum space, which is the same as the maximum wheelchair size, leading to some confusion). For information on the subcommittee, contact Lynne Morsen at APTA, (202) 496-4853, lmorsen@apta.com.

Easter Seals Project ACTION Study

In January 2006, Project ACTION requested proposals for a comprehensive national report on the

status of the current use of wheelchairs and other mobility devices on public and/or private fixed-route and paratransit vehicles including taxis. The report will cover existing policy, standards and "best practices" that bear on the purchase and safe and secure use of wheelchairs, other mobility devices and durable equipment that contribute to meeting the test of being "transit friendly" or "transit ready."

The purpose of the study will be to assist agencies and individuals in the development and implementation of policies and practices regarding the purchase and use of safe and secure wheelchairs, other mobility devices and durable medical equipment used and/or carried on transportation vehicles. This represents the first time the issue has received a concentrated focus by either the disability or transit communities, and it holds great promise for increasing understanding of the issues and fostering coordination and cooperation among the diverse interests involved.