Developing a Wheelchair Marking and Tether Strap Program

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A common problem for transit personnel is not being able to identify, or reach, where to attach tie-down straps on many wheelchairs and scooters. Newer wheelchair designs often do not have the type of frame joints that tie-down systems were originally designed for. Now there is a voluntary industry standard for specially designed attachment points, ANSI/RESNA "WC19", but wheelchairs complying with it are not yet in wide usage.

Some transit systems and disability organizations offer wheelchair marking and/or tether strap programs as a "best effort" approach to providing as much safety and comfort as possible. The objective is to make securement of mobility devices faster, easier, and safer to perform; to provide as stable and safe a tie-down as possible, and to make the process more consistent and convenient for transit customers who use mobility devices.

< Wheelchair with markings (rear) and tether straps (front)

ADA REQUIREMENTS FOR MOBILITY DEVICE SECUREMENT

The Americans with Disabilities Act (ADA) requires vehicles to be accessible to mobility device users, and for service to ensure that passengers can take advantage of those features. The following are selected provisions related to mobility device securement:

Vehicle Accessibility: 49 CFR PART 38: ADA Accessibility Specifications For Transportation Vehicles; Subpart B, Buses, Vans and Systems; Sec. 38.23 Mobility aid accessibility, (d) Securement devices.

NOTE: The US Access Board is the agency responsible for these guidelines, as codified at 36 CFR Part 1192. Meanwhile, implementing regulations of the US DOT are shown at 49 CFR Part 38, with the vehicle guidelines as an appendix. The two documents are identical, except for minor editorial differences and the number prefix, after which the numbering systems are parallel. For example, Section 1192.23 in this document corresponds to 38.23 in the DOT regulation. The Access Board is also currently revising the guidelines, a draft of which will be released for public comment sometime around late 2009: http://www.access-board.gov/transit/

Service Accessibility:

- 49 CFR Sec. 37.165: Lift and securement use:
- "Interpretive" Appendix D to Part 37 - Background as to purpose of the regulations, has force of law.
- FTA "Questions and Answers" bulletin (FTA.gov/ Civil Rights & Accessibility →Americans with Disabilities Act →ADA Technical Assistance → FTA Bulletins)

Note: ADA does NOT require specific performance, such as a minimum number of tie-down points. Nor does it specify a particular level of safety for wheelchair users. Rather, the guidelines are intended to make wheelchairs comparable to regular vehicle seats, which are solidly attached to the floor. The principle is stated as a "securement system to ensure that the wheelchair remains within the securement area." (However, from beyond the civil rights perspective of ADA, there are many safety and liability issues to be concerned about.)

INDUSTRY STANDARDS

Standards for Transportable Wheelchairs

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 tie-down points built in or attached to wheelchairs. The use of tether straps should be considered a "stopgap" measure, until users are able to obtain wheelchairs and scooters with integral (or manufacturer-installed) tie-down points.

Standard No. WC19: "Wheelchairs Used as Seats in Motor Vehicles" 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. A brochure describing the standard and securement principles, entitled "RideSafe", is available at www.travelsafer.org.

< Modern power chair with WC19 attachment points

Detail of WC-19 "Transit Option" loop and labeling >

So far, only a limited number of wheelchair models are available with the securement "loops" specified by WC19, dubbed the "Transit Option" by some wheelchair manufacturers. A listing of wheelchair models that have been designed and tested to meet WC-19 is available at http://www.rercwts.org/WC19.html

< WC19 promotional logo

Acceptance of WC19 in the marketplace has been slow, due to the voluntary nature of the standard, the cost of development and testing (crashworthiness is an important factor), and lack of awareness and therefore demand from consumers. Another issue is the lack of awareness and acceptance by health care prescribers and funders. An example is the Medicare funding limitation for wheelchairs as "primarily for in-home" use only. In general, the federal government has shied away from this issue, and meaningful regulation does not seem to be forthcoming anytime soon.

Standards for Vehicle Securement Equipment

In addition to the ADA vehicle specifications, since 1996 there has been a voluntary industry standard for vehicle-mounted securement systems: Society of Automotive Engineers (SAE) Recommended Practice J2249: Wheelchair Tie-down and Occupant Restraints (WTORS). It is planned for incorporation as Part 18 of ANSI/RESNA Volume 4: Wheelchairs and Transportation, which will locate it adjacent to the WC19 and related wheelchair standards.

SAE J2249 covers WTORS sold as after-market equipment, since WTORS are not covered by OEM safety requirements of the Federal Motor Vehicle Safety Standards (FMVSS). A few of the sections apply to specific types of tie-downs, such as docking devices or four-point strap systems only, but most of it applies to systems that use all types of tie-down devices, as long as they are used with forward-facing wheelchairs. Note that it does NOT allow attachment to mobility device WHEELS -- therefore, compliant equipment tends to be strap- and docking-types, not the older wheel clamp styles, which are technically still allowable under the ADA.

WHEELCHAIR MARKING AND TETHER STRAPS

The first component 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 attaching tie-down belts or hooks, a nylon or polyester webbing "tether strap" can be installed on the mobility device. The following steps can be useful in developing a comprehensive approach:

Program Components and Responsibilities

The first task is to define objectives and get buy-in from staff and customers, especially wheelchair users and disability advisory or advocacy groups. Having everyone understand the reasons for the program will help keep it on track. Local consumers can help pilot the program and evaluate choices that must be made.

A consideration is whether to offer the program free of charge, or to require a fee. Systems that offer it at no charge have found that customers are more eager to participate, and that the cost is minimal compared

to the many benefits:

- Customer comfort
- Speedier boarding
- Operating personnel safety and convenience
- Minimization of accidents

Venues for installing markings and straps

A key decision is where, and by whom, markings and straps will be installed. The best choice is usually to offer markings and tether straps as a "permanent", one-time installation by trained staff in an unhurried environment. This approach can be called the "centralized" method, and allows time for evaluating the best tie-down attachment points. It also allows for determining whether markings, straps, or both, are needed on individual mobility devices. It is helped by "trying on" the actual tie-down equipment used in transit and paratransit fleets. In some cases, markings may be needed on one end of the wheelchair, and straps on the other end.

The centralized method also enhances working with customers to identify any problems with their mobility device being accommodated on vehicles. It also gives a chance to identify any issues that may need to be addressed by qualified mobility device technicians before markings or straps can be safely installed. Another benefit is the ability to record and document what is installed, and to interact with customers regarding their general riding experiences.

Offering convenient locations for customers to visit for installations is important. Some customers can't or won't travel far to participate. Transit agencies may offer the program via appointments throughout the community, at either their offices or at transit centers, as well as at public facilities like community centers or disability service organizations. In some cases, a local disability-oriented organization may wish to actually perform installations, either as a public service, or as a contractor to the transit system. However, liability concerns can deter agencies or firms other than the transit system from wanting to be responsible.

Alternatives to the centralized model are: a) installation by customers themselves, or b) by vehicle operators. Some transit agencies distribute marking media and/or tether straps to customers for self-installation. Others provide straps as equipment for vehicle operators to carry. While these approaches may require less staff and facility commitment, they tend to not allow for as much control and documentation, and can place more responsibility on consumers, who may not be familiar enough with vehicle tie-down equipment.

The "onboard" method typically uses only tether straps, on an as-needed basis. It precludes the "pre-marking" approach, which is often preferable to using tether straps, since direct attachment of tie-downs is always best. This is because adding to the effective securement length of wheelchairs and introducing more flexibility when it's not necessary can result in less-than-desirable tie-down mechanics, and excess movement.

Attempting to use tether straps at the time of each passenger's trip can also be time-consuming and physically challenging for drivers, depending on the mobility device. On-board deployment may be more feasible in smaller systems, where customers and their mobility devices are well known to vehicle operators. It is also sometimes used as a back-up, where a centralized program is the primary mode.

Oversight and coordination

Whichever approach is selected, it's important for legal and risk management staff to understand the program and give their blessing prior to implementation. Key to discuss is the overall liability the agency will have with the program, as compared to without it.

The purpose of such a program is to reduce the number of incidents and accidents that may occur with unsecured or under-secured mobility devices. Tip-overs and other hazardous movement by wheelchairs (especially scooters, either 3- or 4-wheeled) during normal operations are the most common types of incidents. Tether straps can also reduce injuries to vehicle operators by minimizing the physical difficulty of attaching tie-downs.

The benefit of preventing catastrophic accidents almost always outweighs perceived liability created by the application of markings or tether straps (CAVEAT: as long as installation is done CORRECTLY.) The fact that tie-down manufacturers offer tether straps as aids in using their products is one argument in favor of adopting a strong program. Another argument is very successful implementation in various locations throughout the country. Agencies contemplating their own program can easily learn from others that have already done it.

Taking the liability aspect to its logical conclusion, the implementing agency should maintain as much control and oversight as possible. Installation of markings and straps should be done by qualified staff who understand <u>both</u> wheelchairs <u>and</u> how tie-downs work (in "real world" vehicles, not just the classroom). Also key are establishing consistent training and procedures, documentation of what is installed, and communication of rules and responsibilities to customers.

Another important issue is coordination with adjacent agencies (or professionals) serving customers who receive markings or tether straps. Travel trainers, either in-house or at outside agencies, should be aware of and support the program. If a fixed-route transit system or department sponsors the program, it should coordinate with paratransit providers that may serve the same customers. Likewise, nearby transit systems should be aware of how to treat wheelchairs with the "home" system's markings and tethers. Nearby transit agencies should also be encouraged to coordinate features of markings and tether straps they may implement themselves (colors, marking materials, etc.)

Program Materials and Resources

Marking and tether strap choices

The first choices to be made are for the style, sizes, and colors of markings and straps to be used. Marking can be done with color-coded tape, stickers, plastic wire ties, or paint. Considerations include ease of installation and removal, acceptance by customers, and durability.

Two colors of markings can be used, the first being for the basic marking that is coordinated with the color of tether straps. The second marking color can be used for placing underneath where "permanent" type tether straps are installed. This enables tethers to be re-installed properly when removed for cleaning or replacement, and so that locations marked thusly are not confused with the basic markings for "where to attach tie-downs".

Tether straps are marketed by most of the major vehicle securement equipment manufacturers. They are sold with names such as "webbing loop", "secure loop", and "quick strap". The straps are also sometimes called "Stokes Straps", after Bill Stokes, a disability advocate and consultant who helped popularize the concept in the Phoenix area. Multiple lengths of tether straps are often needed, due to wide variations in wheelchair frame sizes and configurations. This is especially important when the straps will be left on wheelchairs "permanently".

The protruding loop of the strap should be kept as short as needed to allow for attaching tie-downs. This is important for a number of reasons. First, excess length and flexibility can contribute to less secure tie-downs (for this same reason, markings should always be tried first, and tether straps used only when markings aren't feasible). Second, straps that are too long can get caught on other parts of the wheelchair or other objects, or can drag on the ground and become damaged. For comparison, attachment points on WC19 compliant wheelchairs are about 2.5 inches long and 1 inch wide. This size allows for both hooks and the types of buckles used on older tie-down systems. Tether straps are usually best kept to a usable length of around 3 to 4 inches (except for sometimes on central seat pillars, which may require slightly longer ones to facilitate access).

Some styles of straps have features that help keep them in place when used on a "permanent" basis. Colors can be chosen to promote visibility, and lighter/brighter colors can make them easier to see and use. The straps sold by tie-down manufacturers are tested to appropriate standards, specifically SAE J2249. Using straps that are not certified could create additional liability.

< Variety of tether strap styles, lengths, and colors

Other tools and aids

In addition to a supply of marking materials and tether straps, installers should have examples of each of the major types of tie-downs used in local fleets (or at least the smallest, "most restrictive" example). These are used to determine if the mobility device can accept tie-downs. If they can, markings can be applied. This includes marking any WC19-style attachment loops that may be built into the wheelchair. The reason for this is so markings are consistent on all wheelchairs, and so they're easily visible (WC19-compliant labeling is often small, and not visible from various angles in actual on-board environments).

< Older power wheelchair with markings only (yellow tape)

If tie-downs cannot be properly attached to the mobility device, tether straps can be used. It's important to test the various types and models of tie-downs customers may encounter, because small variations in hook/buckle shapes or sizes can affect attachment capabilities.

< Wheelchair with tether straps installed

A digital camera can be used to take photos of the final installation for filing. Standardized forms should be developed for recording all pertinent information. Other useful items are scissors, cleaning supplies for preparing marking locations, a kneeling pad or cushion (*installation can require getting down on the floor!*), a tape measure for checking securement dimensions, and small hand tools for working tethers into tight spaces.

Training and Education

Training is vitally important for any staff members who will perform installation of markings or tether straps. Staff selected should have familiarity with vehicle operations and accessibility, and should have good customer service skills. Staff should be assigned to this task on an ongoing basis, since the "experience base" of working with the variety of mobility devices will build CUMULATIVELY. It is best to have the job done by a small number of people who can confer with each other, for consistency and identifying issues.

Training can be done with the same wheelchairs used for securement training for vehicle operators (as long as at least three or four of the basic types are included). Even better is a visit to a local wheelchair dealer for practicing with the wide variety of wheelchair shapes and sizes available today. This approach also allows the dealer to explain wheelchair and scooter construction features, while at the same time themselves learning about the transit agency's program and overall accessibility. Education can be done via brochures, flyers, posters, press releases, website information, and vehicle postings. Promotional and educational materials can be targeted to various audiences, such as customers, vehicle operators and supervisors, and community agencies. *(end)*