# Travel Hazards

## Before safe passage can be defined, the industty must first quantify the risk involved for wheelchair users traveling in public transit vehicles.

**By Greg Shaw, Ph.D.**

*I'm a belt and suspenders man . . . don't want to take a chance.*

*-Comedian Justin Wilson*

Every time we travel, we run the risk of being injured in an accident. We accept that this is the price of convenient and rapid transportation. Government regulators attempt to ensure that ever faster and more efficient vehicles are also reasonably safe. Research shows that people who ride in vehicles while seated in wheelchairs, scooters and strollers are at increased risk unless their chair is safety-secured. In response, numerous state and national standards mandate the use of significantly improved wheelchair tie-downs and occupant-restraint systems (WTORS).

WTORS that comply with both the Americans With Disabilities Act and the new Society of Automobile Engineers WTORS standard (J2249) can substantially decrease the risk of injury in severe frontal crashes. Unfortunately, most systems are difficult and time-consuming to operate. Preliminary evidence suggests that WTORS that comply with these standards might provide more protection than is needed for large, heavy, and usuallyslow-moving public transit vehicles. More information is needed to help balance safety with barrier-free access to public transportation.

Several existing strap-type WTORS have been developed for compliance to ADA static strength requirements or to withstand the severe crash events occasionally experienced by passenger vans (as required by the October 1996 published SAE J2249 WTORS Standard). These systems, requiring the use of four straps to secure the wheelchair in addition to a lap and shoulder belt for occupant restraint, are cumbersome and cannot be used independently by most wheelchair users. Numerous attempts to create easier-to-use systems (e.g., automatic docking systems) have failed to gain wide acceptance because of the seemingly insurmountable problem of accommodating the variety of wheelchairs. Scientists at the University of Virginia's Automobile Safety Laboratory Transportation Rehabilitation Engineering Center believe that WTORs that must meet the stringent requirements of the ADA and SAE J2249 are well-justified for use in passenger vans, but are over-designed for use in large transit buses.

Transit buses are an exceedingly safe means of transportation because of their large mass and low average speed relative to most other vehicles. Accident data suggest that transit buses are about 30 times safer than passenger vans in terms of fatalities per mile. There have been no documented cases of wheelchair-user deaths aboard transit buses and few injuries. Although the lack of death and injury data may be a result of deficient data collection methods regarding wheelchair passengers and the low exposure relative to other passengers, there is no evidence to suggest that wheelchair-user injury aboard transit buses is a major concern.

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Although it is universally accepted that transit buses are safe, there has been no systematic analysis and quantification of bus safety in terms of the injury-producing environment. The University of Virgina's researchers recommend that bus safety be quantified in terms of frequency and magnitude of injury-causing events such as collisions and vehicle maneuvers including emergency braking. This information is sorely needed to establish reasonable targets for WTORS design and policies for their use.

### Benefits of Wheelchair Safety Aboard Large Buses

The benefits of correctly estimating the required level of protection include more economical and less cumbersome WTORS for transit buses. User-friendly systems that can be operated by the

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wheelchair user will be used more frequently and consistently than the present cumbersome ADA/SAE belt-type products. Therefore, in addition to improved convenience and independence, these new systems might provide an overall reduction in risk. Other benefits include:

- Interested parties, wheelchair passengers and their caregivers, policy-makers, standards writers, transit operators, and WTORS and wheelchair manufacturers would have a better idea of the level of crash protection (in terms of injury risk reduction) that current WTORS provide, and the risk of using only the wheelchair tie-down component. Although ADA regulations require that occupant restraints be provided, no regulation mandates their use. Some passengers elect not to use the occupant restraint for reasons related to their disability or for reasons of "equal access." (If other passengers ride without lap belts, then why should I?)
- Better estimates could be made of risk to special-case wheelchair users. The ADA requires that all commonly used wheelchairs be transported on public transit vehicles. Because of the increasing diversity of wheelchairs, bus drivers are challenged to find suitable securement points for the tie-downs and clear paths for the lap and shoulder belts. Wheelchair users with extensively modified wheelchairs that might tilt or recline present additional variations to the common configuration. There is virtually no information regarding the risk of using standard WTORS on nonstandard wheelchairs and wheelchair occupants with unique positioning requirements and medical conditions. For example, should a person who breathes with the aid of a respirator use a shoulder belt? Because a reasonable estimate of potential collision forces has not been established, it is not known whether the requirement for upper body restraint should take precedence over the concern that the shoulder belt may dislodge the breathing tube.

  Another example illustrates a problem situation regarding "wheelchair" users who might or might not have a disability. A West Coast bus operator is currently attempting to formulate a policy regarding children's strollers. Would children be better protected in strollers secured in the wheelchair securement area, sitting on a bus seat, or sitting on their parent's lap? Should the parents have a choice? Establishment of an accident severity level that represents a reasonable risk would help to answer these and other questions.
- Policy-makers would have better information with which to assess the cost-benefits of wheelchair transportation regulations. Significant expenses are incurred in complying with regulations such as those of the ADA. Other costs include (in some cases) increased time and difficulty required securing the wheelchair and passenger-a potential barrier to transit accessibility. Policy-makers could more accurately determine if the costs of regulations are justified in terms of overall transit rider safety. In the present political climate of government downsizing and regulation reduction, it is important that a clear and defensible case be made for wheelchair user safety. The U.S. Access Board has indicated that the ADA wheelchair transportation regulations will be reviewed and welcomes better risk information.

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A growing number of manufacturers and public transit policy-makers consider wheelchair transport safety a priority issue. A better understanding of real-world risk would help these people balance the need for improved safety with the need for easier access to transportation.

The University of Virginia working in cooperation with the Cleveland Clinic and the University of Pittsburgh, has initiated studies that will establish an appropriate level of occupant protection for wheelchair-users in transit buses based on real-world risk. We feel that this is the necessary first step toward the elusive goal of adequate safety and easy access to public transportation.

## References:

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# Amtrak Extends Discounts

**Passengers with mobility impairments can now take advantage of increased discounts when traveling on Amtrak.**

**The carrier's 15 percent discount for disabled passengers is now available to their adult companions. Amtrak has also discounted its rate for accessible bedrooms by 30 percent.**

**The accommodations are a settlement of the 1996 class-action lawsuit filed against Washington, DC-based Amtrak by the Disability Rights Education and Defense Fund of Berkeley, Calif.**

**"We decided to sit down with DREDF to see what some of the unmet needs were," said Amtrak spokesman Chris Kirkpatrick. "There had been some lack of access. To correct that, we [brought] them price-wise on par with other accommodations."**

**The accessible bedrooms on Amtrak rail cars have maneuvering room for a wheelchair, an accessible private restroom, grab bars and room service. The newly discounted rate is per room, which sleeps two, not per person. "At least one of those cars is available on every train," saidKirkpatrick.**

**Amtrak does not provide wheelchair tie-downs,butdoesprovidesufficientopen space for passengers to sit safely or transfer themselves, alone or assisted, into a standard seat, Kirkpatrick told TeamRehab Report. "We do ask them to bring in their ownsecuringdevice,"henoted.**

**The discounts became effective July 28 and will continue through October 28, 2001. "We have received a very positive response already . . and are projecting a ridership increase," said Kirkpatrick.**

**Amtrak's 24-page booklet *Access* Amtrak outlines the new policies and programs. Contact the Office of Amtrak Access, 60 Massachusetts Ave. N.E., Washington, DC 20002; 800/872-7245; e-mail: Access@w0.amtrak.com; Web site: www.amtrak.com**

*-Brandy Marcum*