

# TASK: T-4 RESEARCH AND COORDINATION RELATED TO STANDARDS DEVELOPMENT FOR WHEELCHAIR TRANSPORTATION TECHNOLOGY

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## Rationale

In 1993, there were no voluntary industry standards for wheelchair securement devices or for wheelchairs used as seats in motor vehicles. Through the adoption of voluntary wheelchair transportation standards by the involved industries, the safety of those using wheelchairs as seats in motor vehicles will begin to approach that of non-disabled persons using OEM vehicle seats. This task has been committed to improving the safety and convenience of wheelchair transport through facilitating the development and adoption of voluntary industry standards on a worldwide scale.

## Goals

1. Provide research and administrative support in the development of voluntary product performance standards that will ultimately facilitate the safe transport of those using wheelchairs as vehicle seats, and
2. Facilitate the implementation of the standards throughout the user and service provider communities.

## Outcomes Summary

The RERC on Wheeled Mobility has provided working group leadership and research support towards the following standards development:

- The Society of Automotive Engineers (SAE) J2249 Wheelchair Tiedown and Occupant Restraints Systems (WTORS) for Motor Vehicles standard has been adopted as a recommended practice (completed January 1997). This standard serves as a benchmark for design and testing of four point strap-type wheelchair securement systems. A companion applications guideline for J2249 is due for completion in January 1999 (revised draft in process).
- SAE J2252, provides the details on the design and construction of the surrogate wheelchair used in the testing of WTORS to the J2249 standard.
- The ANSI/RESNA Subcommittee on Wheelchairs and Transportation (SOWHAT) has completed the transportable wheelchair standard (ANSI/RESNA WC-19). A collaborative research effort between the University of Pittsburgh, University of Michigan and University of Virginia has led this effort with support from private and federal sources. A draft companion document describing the rationale for transport wheelchair standards is currently under development. This document will provide wheelchair users, care givers, transporters and manufacturers with practical guidance on the use of the standard. It will be available for general distribution in spring 1999.
- A parallel WTORS standard's effort (ISO 10542, parts 1&2), conducted under the auspices of International Standards Organization (ISO), has been under way since 1985. The effort on parts 1&2 (general requirements and requirements for strap-type WTORS) is now proceeding to the final stages of international approval and is due for completion in 1999. Due to collaborative efforts by the RERC and others, this standard has been closely harmonized with the U.S. recommended practice document, WTORS-SAE J2249.
- ISO 7176/WC-19, Wheelchairs Used as Seats in Motor Vehicles standard, which parallels ANSI/RESNA WC-19, is also moving forward at the ISO level. This standard is scheduled for completion in spring 2000.

- The progress, current status (meeting minutes), and most recent working group versions of the above standards and companion documents can be viewed and downloaded from the RERC's WWW site (<http://www.rerc.upmc.edu/>).

## **Publications**

Hobson DA, Wheelchair Transport Standards; What Are They All About?, *Proceedings of the RESNA '96 Annual Conference*, Salt Lake City, UT, June 1996.

Hobson, DA, Wheelchair Transit: An Unresolved Challenge in a Maturing Technology. Guest Editorial, *J Rehabil Res Dev*, 34(2), April 1997.

Schneider L., Hobson D.A. SAE J2249—WTORS

Schneider L, Hobson D., Bertocci G.—SAE J2249 WTORS companion document

Schneider L., Hobson D. ANSI/RESNA WC-19

Shaw G., Schneider, L, Bertocci, G, Hobson D. WC-19 Companion

Hobson D., Schneider L, ISO 7176/19