

Schneider, L., Hobson, (2003) **Development of voluntary standards for improved transportation safety of wheelchair-seated occupants.** In R. Simpson (Ed.), *Proceedings of the RESNA 26th International Conference: Technology and Disability: Research, Design, Practice and Policy.* Arlington, VA: RESNA Press. NARIC Accession Number: O15644. Project Number: H133E010302.

Abstract: Paper summarizes the history, goals, and rationale for the development of the initial national and international standards for improved transportation safety for wheelchair-seated travelers who are driving or riding in motor vehicles. Directions for future standards are also discussed. This paper was presented at the 2003 annual conference of RESNA, the Rehabilitation Engineering and Assistive Technology Society of North America and is available on CD-ROM.

Abeson, A., Bosk, E. (2005) **Impact: Feature issue on meeting transportation needs of youth and adults with developmental disabilities.** 18(3). NARIC Accession Number: O16266. Project Number: H133B031116.

Abstract: This issue focuses on strategies for removing transportation barriers to community inclusion and participation. Topics include: (1) the role of transportation in inclusion, (2) federal transportation policy and people with disabilities, (3) a national initiative to coordinate human service transportation, (4) the promise and limitations of transportation, (5) developing an individualized travel plan, (6) supporting independent travel through skills training, (7) mobility management, (8) success stories from across the country, and (10) resources.

(2005) **State of the science workshop on wheelchair transportation safety: Final report 2005.** NARIC Accession Number: O16318. Project Number: H133E010302.

Abstract: Report compiles the white papers and results of a state-of-the-science workshop on wheelchair transportation safety. Panelists addressed 4 themes: (1) barriers to the development, marketing, purchase, and proper use of transit safety technologies; (2) wheelchair seating systems for use in transportation; (3) wheelchair securement for use in public transport vehicles; and (4) future wheelchair transportation. For each theme, this report presents the white paper and its reference bibliography, followed by the workshop outcomes of the theme panel. The questions addressed by the panel are presented along with the top five responses or ideas generated for these questions. The overall top three ideas for each of the four themes were determined by a vote all attendees in a final plenary session.

(2006) **NCAT news.** NARIC Accession Number: O16517. Project Number: H133E030009.

Abstract: Newsletter of the National Center for Accessible Transportation (NCAT) provides information on the development and implementation of technologies to make public transportation accessible for all. In this issue: (1) state-of-the-science conference on accessible public transportation; (2) updates on projects involving: biomechanics of transfers, boarding technology, surveys, accessible lavatory design, communication, and passenger assistance training; (3) recent NCAT activities, and (5) upcoming NCAT staff presentations.

(2005) **Toolkit for operating a rural transportation voucher program.** NARIC Accession Number: O16526. Project Number: H133B20002. Abstract: Manual and attached CD-ROM provide information for implementing a voucher system that provides transportation for people with disabilities in rural area. In the voucher model, eligible riders received a checkbook with an allocation of miles from a sponsoring agency. The sponsoring agency helps the rider identify and potential volunteer drivers and negotiates with public or private transportation providers to accept the voucher checks as payment for rides. Key implementation steps include: develop partnerships, set goals, identify funding, develop policies, publicize, print checks, contract with providers, and work with riders. Special considerations and program management are also discussed.

NIDRR Grantees on the Cutting Edge

Southeastern Michigan Traumatic Brain Injury System (SEMTBIS) *Wayne State University and Rehabilitation Institute of Michigan* (H133A020515) led by Robin A. Hanks, PhD. Delores Watkins, Project Officer.

Abstract: The Southeastern Michigan Traumatic Brain Injury System (SEMTBIS) program conducts projects developed with the help of SEMTBIS consumers, as well as other members of the Detroit community. Among the principal studies during this grant cycle is research in resumption of driving after brain injury: This study examines correlates of driving after brain injury: barriers, fitness to drive, and community rapport. Participatory action is a central component of project implementation, evaluation, and dissemination. SEMTBIS participates in clinical and systems analysis studies of the TBI Model Systems by collecting and contributing data to the uniform, standardized national database.

Find out more at: www.semtbis.org

National Center for Accessible Public Transportation *Oregon State University* (H133E030009) led by Katharine Hunter-Zaworski, PhD Richard Johnson, EdD, Project Officer.

Abstract: This RERC addresses the need for improvements in the accessibility of public transportation. The transportation focus of this RERC is inter-city travel via air, rail, and bus. Air, rail, and over-the-road buses (OTRB) account for nearly all of the inter-city public transportation. Accessibility issues focus on persons with mobility, agility, and hearing disabilities and account for a large percentage of persons with disabilities. Two areas of research are addressed: (1) the biomechanics of wheelchair transfers in confined spaces; and (2) the perceptions, reactions, and attitudes of subjects towards existing and proposed accessibility solutions. The biomechanics studies include the use of a sophisticated eight-camera motion analysis system in conjunction with force plates to determine the motions and forces involved in dependent and independent transfers in confined spaces, such as an aircraft aisle. The survey-based study includes comprehensive surveys of groups that are directly involved with accessibility issues including travelers with disabilities, non-travelers with disabilities, and employees of airlines and airports. Drawing on results of their research, the RERC focuses on four development topics: (1) vehicle boarding technologies; (2) real time passenger information and communications systems; (3) accessible lavatories; and (4) passenger assistance training tools and techniques. The accessible lavatory project has two main components; regulations and new designs for the next generation of aircraft.

Find out more at: ncat.oregonstate.edu/

The average American driver travels 14,500 miles per year, most of it running errands, usually in trips of 29 miles and around 55 minutes.
National Household Transportation Survey, 2001 (www.bts.gov)

Please note: These abstracts have been modified. Full, unedited abstracts, as well as any available REHABDATA citations, are available at naric.com.

Thousands of additional resources on these topics are available from NARIC's resource pages at www.naric.com/public

Rehabilitation Engineering Research Center on Wheelchair Transportation Safety

University of Michigan (H133E060064) led by Lawrence W. Schneider, PhD (Michigan); Patricia Karg, PhD (Pittsburgh); Gina Bertocci, PhD (Louisville); William V. Schutz, PhD, MSW, MPH, Project Officer.

Abstract: Research conducted by the RERC on Wheelchair Transportation Safety (RERC WTS) advances the safety, usability, and independence of people who remain seated in their wheelchairs when traveling in motor vehicles. Research and development projects involve close collaboration with manufacturers, transit providers, vehicle modifiers, clinicians, and consumers to ensure quick translation of results into meaningful solutions that benefit travelers with mobility disabilities. Projects range from developing innovative solutions for forward-facing and rear-facing wheelchair passenger stations in large accessible transit vehicles, to investigating issues of school-bus transportation for children seated in WC-19 compliant and noncompliant wheelchairs, and to improving frontal- and rear-crash protection for occupants in private vehicles. Continuing research from previous grants, the RERC WTS extends the in-depth investigations of adverse events involving wheelchair-seated travelers, but also conducts a study of the transportation experience of wheelchair users in large public transit vehicles, including the process of entering and exiting the vehicle, accessing the wheelchair station, securing the wheelchair and restraining the occupant, and traveling to and from destinations. The RERC is a partnership of the University of Michigan Transportation Research Institute, the University of Pittsburgh, the University of Louisville, and the University of Colorado.

Find out more at: www.ercwts.pitt.edu

Driving after Stroke Wayne State University (H133G050134) led by Lisa J. Rapport, PhD David W. Keer.

Abstract: The purpose of the study is to evaluate driving after stroke. The primary target population is adults who drove a motor vehicle prior to the onset of a stroke. The study samples 150 pairs of survivors and their significant others, recruited at inpatient discharge and from the outpatient clinic of an urban rehabilitation hospital. Barriers to driving, driving status, and community integration are assessed at six months post stroke. A subsample of 90 survivors who seek to resume driving is also given a comprehensive driving evaluation. The objectives of this study are to identify the barriers to driving after stroke and the extent to which these barriers influence driving status (i.e., decision to drive), actual driving risk, and community integration. The project outcomes identify barriers to driving that are unwarranted or remediable and facilitate decision-making based on valid information, both of which are important to improving functional mobility and adaptation to changes associated with stroke. The long-term goal is the development of interventions that maximize independence and community integration, while protecting public and survivor safety.

Universal Access to Passenger Rail Marshall Elevator Company (H133S050136) led by Linda van Roosmalen, PhD Thomas Corfman, Project Officer.

Abstract: Freight rail shares train tracks with passenger rail cars. The differences in car width result in horizontal gaps between passenger rail cars and boarding platforms. This gap creates safety hazards not only for wheelchair users but also for the elderly, for individuals with visual impairment, and even for other passengers boarding rail cars. This project continues the research on the Phase I prototype QuickRamp™. Phase II activities optimize QuickRamp's™ strength, durability, and drive mechanisms; and evaluate the system for safety and usability. This technology provides a universal solution to the rail access problem and solves platform-to-rail car access for all potential rail passengers including individuals using wheeled mobility, children, individuals with visual impairment, and the elderly. Additionally, it eliminates rail personnel assistance for individuals with disabilities boarding or exiting trains, ensuring passenger independence for all train riders.

Find out more at: www.3rivers.com

The Association for Driver Rehabilitation Specialists has 11 downloadable fact sheets on driving and disability. They cover stroke, TBI, alzheimers/dementia, SCI, multiple sclerosis, rheumatoid arthritis, aging, spina bifida, amputation, cerebral palsy, and ADHD. Visit www.driver-ed.org to download.



Photo Credit: JHB, Greater Praetoria, South Africa



Photo credit: Vedrana Bosnjak, Stobrec, Croatia

Drive on!

According to the Bureau of Transportation Statistics, 72% of driving-age adults with disabilities drive, and most drive every day.

Where Can I Find More?

A quick keyword search is all you need to connect to a wealth of disability and rehabilitation research. NARIC's databases hold more than 75,000 resources. Visit www.naric.com/research to search for literature, current and past research projects, and organizations and agencies in the US and abroad.

Current Literature - Selections from REHABDATA

Coleman, R., Rapport, L. (2002) **Predictors of driving outcome after traumatic brain injury.** *Archives of Physical Medicine and Rehabilitation*, 83(10), 1415-1422. [NARIC Accession Number: J44381](#). Project Number: H133A020502.

Abstract: Report identifies predictors of driving status, frequency, and safety following traumatic brain injury (TBI). Data collected from patients with TBI, their driving records, and their significant others was analyzed. The significant other's perceptions of the patient's fitness to drive were the strongest predictor of which patients resume driving and how often they drive. However, number of years since injury, disability at discharge, and current neuropsychological functioning best predicted driving safety.

Van Roosmalen, L., Reed, M. (2005) **Pilot study of safety belt usability for vehicle occupants seated in wheelchairs.** *Assistive Technology*, 17(1), 23-36. [NARIC Accession Number: J49455](#). Project Number: H133E010302.

Abstract: Study examined the usability of wheelchair occupant restraint systems (WORS), which are safety belt systems that prevent the occupant from sliding out of the wheelchair during motor vehicle transit. Ten subjects were observed and interviewed while performing reach and manipulation tasks associated with WORS usage. Participants provided feedback on ease of use and comfort. Results showed that various problems were encountered related to occupant restraint use for individuals who have reduced upper-extremity function. Safety belt usability problems were associated with grasping latch plates and connecting latch plates into buckles. The findings provide guidance to occupant-restraint manufacturers and wheelchair designers regarding belt-restraint usability.

Rapport, L., Hanks, R. (2006) **Barriers to driving and community integration after traumatic brain injury.** *Journal of Head Trauma Rehabilitation*, 21(1), 34-44. [NARIC Accession Number: J50231](#). Project Number: H133A020515.

Abstract: Study identified barriers to driving after traumatic brain injury (TBI) and examined the extent to which these barriers affected driving status and community integration. Correlational analyses of driving status, community integration outcomes, and survivor characteristics indicated that drivers had better objective community integration outcomes, reported fewer barriers to driving, and used alternative transportation less often than did non-drivers. Social barriers, such as directives against driving from significant others, accounted for the most variance in driving status among TBI survivors. Decisions to cease driving were more common among those with no formal driving evaluation than among those who had been evaluated.

Mann, W., McCarthy, D. (2005) **Relationship of health status, functional status, and psychosocial status to driving among elderly with disabilities.** *Physical & Occupational Therapy in Geriatrics*, 23(2/3), 1-24. [NARIC Accession Number: J50472](#). Project Number: H133E010106.

Abstract: The Consumer Assessment Study Interview Battery was administered to 697 community-dwelling older adults to measure health, functional status, and mental and psychosocial status. These variables were compared for three groups based on driving status: those still driving, those who had ceased driving, and those who had never driven. Overall, participants who were still driving had better health, functional status, and mental capacities than those who had ceased driving or had never driven. Significant differences were found among the 3 groups for age, gender, race, home ownership, income, educational level, and living situation.