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Estimating the Number of Vehicles Adapted for Use by Persons with Disabilities

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The Americans with Disabilities Act (ADA) of 1990 was passed, among other things, to increase access to public facilities for persons with disabilities. The Census Bureau estimates that as of the end of 1994, about 54 million non-institutionalized persons were living in the U. S. with some type of disability, 9.9% with a severe disability. Along with the increase in access to public facilities, persons with disabilities are being employed in increasing numbers. In 1995, the Census Bureau estimated that 26.1% of those persons between the ages of 21 and 64 with severe disabilities are employed, approximately 3.7 million persons. In addition, the Census Bureau estimates that 25.9% of the 2.3 million long term users of mobility equipment (wheelchair, cane, walker crutches) in this age group are employed, almost 600,000 persons.

Many persons with disabilities need specific types of modifications made to and/or adaptive equipment added to their motor vehicles to meet their transportation needs. NHTSA is interested in estimating the size of the population of vehicles adapted specifically for transporting persons with disabilities, as it is not presently known how many vehicles have such adaptations. NHTSA is also interested in the safety of vehicles with adaptive equipment. Most motor vehicle modifications to accommodate the use of the vehicle by persons with disabilities, either as a driver or a passenger, are made "aftermarket", i.e., adaptations to the vehicle are made after the vehicle is purchased from the original manufacturer. The motor vehicle modification and adaptive equipment industry is a small segment of the overall automotive market.

Most of the businesses in the vehicle modification and adaptive equipment industry are small businesses, made up of alterers (manufacturers of vehicles certified to the Federal Motor Vehicle Safety Standards), manufacturers of adaptive equipment, and "aftermarket" vehicle modifiers. Three of the major U. S. automotive manufacturers, Ford, Chrysler, and General Motors, also offer "rebates" or reimbursements to vehicle owners for a portion of the cost of adaptive equipment modifications for persons with disabilities. The adaptive equipment modification businesses are advised by occupational therapists, specialized driver trainers and vocational rehabilitation specialists on what equipment and vehicle modifications are necessary to meet the transportation needs of an individual with a disability.

NHTSA is frequently asked "how many vehicles are modified with adaptive equipment to be used by and or transport persons with disabilities?" NHTSA's National Center for Statistics and Analysis (NCSA) recently compared data from three different sources to answer this question: NHTSA's National Automotive Sampling System Crashworthiness Data System (NASS/CDS), the National Center for Health Statistics (NCHS), and the Census Bureau. Estimates of the number of vehicles with adaptive equipment from these three data sources are presented below, along with the 95% confidence limits for each estimate.

NCHS estimates, based upon a 1990 survey of the American public on a variety of national health issues, that approximately 211,000 persons with

disabilities (95% confidence interval is from 158,000 to 264,000) used some type of adaptive equipment with their motor vehicles. This estimate is considered conservative at this time, since ADA has now been in place for a considerable amount of time, thereby increasing the mobility of persons with disabilities as a consequence of the increased access to public facilities. NHTSA expects to obtain an update of this estimate when more recent NCHS survey data become available.

The Census' 1992 Truck Use Survey obtained data from a sample of respondents on the use of adaptive equipment in trucks. Based upon Census' survey, it is estimated that approximately 184,000 trucks (95% confidence interval is from 117,000 to 251,000) are operated with some type of vehicle adaptation. The extent to which these vehicles are used for personal business versus for professional business or employment is not known. Since this number includes only trucks, comparison between the NCHS and Census estimates suggests an increase took place between 1990 and 1992 which, presumably, may be continuing.

Data from NHTSA's NASS/CDS on the presence or absence of adaptive equipment in vehicles were also examined to obtain a more recent estimate. NASS/CDS collects an extensive amount of detailed information using in-depth investigations of a probability sample of approximately 6,000 crashes every year, involving light vehicles (passenger cars, light trucks, and vans) towed due to damage as a result of the crash. In NASS/CDS for the period 1995-1996, almost 2/10 of one percent of the vehicles involved in tow-away crashes were found to have some type of adaptive driving equipment installed (hand controls, steering controls, joy-stick steering). [Since the NASS/CDS collects data only on vehicles that have been in a crash, a SUDAAN© statistical test was performed for independence between single vehicle crashes and the presence of adaptive equipment. There was no evidence of any association ($p = 0.39$). Therefore, it is reasonable to assume that vehicles with adaptive equipment are neither over nor under represented in crashes.] This estimate of the percent of vehicles involved in tow-away crashes from NASS/CDS can then be applied to the total number of motor vehicle registrations in the U. S. for 1995 to determine the percent of all registered vehicles equipped with adaptations. In 1995, 201,530,021 vehicles were registered in the U. S. (See *Highway Statistics Summary to 1995*, U. S. Department of Transportation, Federal Highway Administration, Pub. #FHWA-PL-97-009, August 1997.) Applying the percent of vehicles with the presence of adaptive equipment to the number of registered vehicles yields 382,907 vehicles estimated to have some type of adaptive equipment present. All estimates based upon data from the NASS/CDS have a standard error associated with them. Using the standard error for the percent of vehicles with adaptive equipment present applied to the number of registered vehicles yields a 95% confidence interval of an estimated 100,765 to 665,049 vehicles with adaptive equipment. The NASS/CDS estimate, along with those from NCHS and Census are presented in the following table.

Table 1
Comparison of Estimates of the Number of Vehicles With Adaptive Equipment

Data Source & Year	Estimated No. Of Vehicles
Census 1992 Truck Use Survey	184,000
NCHS 1990	211,000
NASS/CDS 1995-96	383,000(1)

1/ Estimate is rounded.

The NCHS and Census estimates of the numbers of vehicles with adaptive equipment fall within the range of the lower and upper 95% confidence limits for estimate of vehicles with adaptive equipment based upon data from NASS/CDS. The NASS/CDS estimate of approximately 383,000 vehicles with adaptive equipment, however, is based upon the most recent data of the three sources. It is expected that the number of vehicles with adaptive equipment will continue to increase, as a larger proportion of the population begins to age and as access to employment, travel, and recreation continues to improve for persons with disabilities as a result of the ADA. NHTSA plans

to continue to study this issue, as more recent data from a variety of sources become available.

For additional copies of this research note, please call (202) 366-4198 or toll free, 1-800-934-8517. Questions regarding this research note may be directed to Ellen Hertz at (202) 366-5360 or Gayle Dalrymple at (202) 366-5559. This research note and other traffic safety information is available to Internet users at http://www.nhtsa.dot.gov/people/ncsa and http://www.nhtsa.dot.gov/cars/rules/adaptive. Drivers of vehicles with adaptive equipment are invited to visit the Internet site to complete a questionnaire on the use of their vehicles.

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