TRB Study

IMPROVING SAFETY AND MOBILITY FOR OLDER PEOPLE

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Older persons experience far greater than average risk in using the nation's highway-oriented transportation system, and they also pose a special danger to other drivers in many situations. These problems will intensify in the coming decades as the number and the proportion of older persons increase. Now is the appropriate time for the nation to reconsider its highways, vehicles, and driver-licensing practices so that appropriate facilities and practices can be phased in to fit future needs. Changes are particularly important in regions where the population of older residents is most concentrated.

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BACKGROUND

Older people are the fastest growing segment of the U.S. population. Although there is no precise definition of "older," Census Bureau figures show that between 1960 and 1980 the number of people over 65 years of age grew 54 percent. People over 75 are the nation's fastest growing age group; their numbers are expected to double by the end of the century.

During the last decade and a half the health and the welfare of the elderly have improved to the extent that many older people are able to participate fully in the normal activities of life. This has

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led to an increase in motor-vehicle ownership and use by the elderly, and a resultant increase in motor-vehicle deaths and injuries. Vehicle use has also been stimulated by the increasing suburbanization of the elderly; suburban older people now outnumber their central city counterparts for the first time in history.

Countless vehicle improvements made throughout the years simplify the physical task of driving and add to the mobility of older people. Power steering, power breaks, and automatic transmissions have greatly reduced the physical strength needed to operate a vehicle.

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THE PROBLEM

Older drivers are experiencing severe traffic safety problems. National Highway Traffic Safety Administration figures confirm that on a mileage-driven basis, the crash rate of older drivers is the highest of any age group over 24 years of age. Although the number of U.S. traffic fatalities dropped 14 percent from 1980 to 1982, there was no decrease for drivers over 65, and women over 65 experienced a 14 percent increase in the number of deaths.

Older people are physically vulnerable and are more likely than younger people to be killed in the event of a car crash. Although people over 65 account for 7 percent of those involved in accidents, they account for 12 percent of those killed. In fatal accidents in which one driver is over 65, the older driver is 3.5 times more likely to be killed than is the younger driver. Motor-vehicle injuries are the leading cause of accidental death for people aged 65 to 74 and of almost half of the accidental deaths for those 75 and older.

The same holds true for pedestrians. Older pedestrians have special problems related to turning vehicles and judging the speed of approaching vehicles. The death rate for the population of oldest pedestrians is triple that for the general population.

There are substantial financial costs associated with these problems. The U.S. Department of Transportation calculates that medical costs for motor-vehicle accidents involving those 65 and older total $168 million per year.

And not only are elderly drivers themselves at special risk; they also pose a growing problem to the safety of other motorists. Older drivers have distinctive crash and traffic-violation patterns. They are involved in multivehicle crashes more often than are other drivers—and are more often at fault. They are more commonly cited for failure to yield or stop for other motorists and are overrepresented in crashes at low speeds. Older people are frequently not familiar with recent changes in traffic-control devices and practices.

Although there are no sharp distinctions in terms of the age at which physical and behavioral changes take place, certain characteristics are clearly associated with aging. Some of these aging characteristics are directly related to an individual's ability to cope successfully with modern traffic. Physical performance is less important than nerve or sensory operation in carrying out driving tasks. With aging there is a loss in intuitive power and basic sensitivity functions. Loss of visual acuity is perhaps the most important of these; about seven-eighths of the sensory input needed to drive comes from the eye. With aging quality of night vision declines, there is more sensitivity to glare, and peripheral vision narrows. Adaptation to darkness takes longer and more illumination is needed to see an object in darkness. Aging is also accompanied by reduced hearing and reduced range of motion. And older people are more affected by alcohol.

Many older drivers compensate for reduced driving ability by cutting back on driving under certain conditions. However, there is often a misperception of the driving risk and a changed ability to recognize important features in a

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complex situation. Although older people generally have adequate knowledge of driving rules, they may exhibit inappropriate behavior in traffic. Further, many elderly drivers do not fully recognize their physical limitations and do not compensate for the additional risk they face.

FAILURE TO MEET THE NEEDS OF ELDERLY MOTORISTS AND PEDESTRIANS

The rapidly expanding mobility of the elderly has not yet been fully dealt with by the interrelated vehicle-highway-driver system. In the roadway environment, for example, older people have difficulty seeing, interpreting, and responding to many traffic-control devices. Traffic-signal visibility and timing are designed for a population with a younger average age. The speed needed to react to a yellow traffic light, the vision needed to read a pedestrian signal, and the agility needed to cross a street safely in the time provided are not always found among the elderly.

Technical standards for safe sight distance at intersections and on curves reflect the reaction times of persons younger than many of those driving today. Lighting levels, legibility of traffic signs, and location of traffic-control devices commonly are inadequate for the needs of elderly drivers.

Driver-licensing, testing, and training systems that affect the elderly often fail to meet the safety needs of motorists. Current practices for identifying the critical characteristics of aging that influence driving performance are of limited effectiveness. Vision tests, for example, usually fail to measure the conditions that most affect the behavior of older drivers. Systems to identify "problem" drivers are not fully utilized by state driver-licensing agencies. Driver-license examinations are rarely used to full advantage as an opportunity to inform motorists about the factors they need to be aware of and compensate for in their driving practices. Recent studies suggest that a number of popular older-driver improvement programs have not changed driver performance, but have the potential to do so if recent knowledge on the critical ingredients for the successful education of older citizens were to be utilized.

The failure of the response systems to fully serve the driving and walking needs of the elderly reflects, among other things, a failure to make full use of current information about the special transportation needs and behavior of the elderly. Two institutional problems have hampered the use of human factors research in highway transportation activities. The first problem is the diverse nature of studies on aging. Many studies have been undertaken without special regard for their potential value in the traffic safety situation. In some cases in which there has been a transportation consideration, the elderly have been combined with the physically handicapped, with most of the attention being given to the special needs of the latter.

A second problem is the complexity of the highway transportation system. Driving and walking combine a host of highway, vehicle, and human factors. The responsibility for dealing with these factors is highly fragmented. Interrelationships are often overlooked or unknown. Standard practice for timing pedestrian signals, for example, probably fails to reflect the walking speeds of most elderly people, who may be the predominant users of certain crosswalks. Whole industries and bureaucracies have grown up to deal with one or another segment of the mobile population, and one group may act without a clear understanding of how its actions will affect the others. In addition, problems of the aging are seldom the top priority of any of these groups.

POTENTIAL SOLUTIONS

A number of projects have been undertaken or proposed to identify the safety-critical physical and behavioral aspects of aging. Additional evaluation and or-

ganization of this information is necessary to put it to use by those who create and operate the highway transportation environment. Among the potentially promising actions are:

- Upgrading the visibility of highway signs, markings, and signals;
- Improving the timing and phasing of traffic and pedestrian signals and special pedestrian protection;
- Modifying highway design and operational practices dealing with safe sight distances;
- Modernizing driver-testing practices to account for critical vision characteristics;
- Updating driver-education techniques to emphasize self-appraisal of driving ability under different travel conditions and to reflect new knowledge about educating older people;
- Increasing the use of safety belts and the proper use of other safety equipment;
- Building in an increased level of vehicle occupant protection; and
- Modifying vehicle lighting, instrument displays, and controls.

Such steps will not yield dramatic, immediate gains. Our highway, vehicle, and driver-pedestrian systems are large and change relatively slowly. The typical Interstate highway is rebuilt every 20 years. It takes 11 years to renew the automobile fleet. Almost 90 percent of older drivers have held their licenses for more than 3 decades. The long time period required to phase changes into the nation's immense vehicle-highway-driver system makes it all the more imperative that the nation act now to anticipate the demographics of drivers in the next decade. Early action will also have immediate application in those states or cities where there are large concentrations of elderly drivers.

NEXT STEPS

The Transportation Research Board is planning a major, 2-year study to review research on and experience with older drivers and pedestrians and to recommend actions that should be taken in anticipation of future population characteristics. The National Research Council, of which TRB is a part, has agreed to contribute financial support to this activity. Additional support is being sought from government agencies and industries that have a stake in these issues. Once the necessary support arrangements are completed, TRB will assemble a committee of experts in gerontology, human factors, highway engineering, law, vehicle design, traffic operations, public transportation, driver licensing, driver education, and other fields to:

1. Comprehensively evaluate available data and research on the safety needs of the aging in traffic;
2. Identify the most promising, cost-effective, and practical measures to improve highways, vehicles, and driver and pedestrian performance;
3. Evaluate the public policy questions on costs, trade-offs between safety and other mobility objectives, and the sometimes-conflicting needs of individuals and the general public;
4. Recommend improvements in highway conditions and practices, vehicle design, and licensing, testing, and education activities; and
5. Identify promising areas for further research on the needs of the elderly in traffic and the ways to meet those needs.

The final report for this study will carefully identify professional practices and public policies that can help resolve the problems of mobility for the elderly. Wherever the supporting data are strong enough to permit definitive recommendations, specific design, administrative, or regulatory steps will be proposed. When such recommendations cannot be made because they involve political judgments or trade-offs, the effects of alternative actions will be described and evaluated. Together these recommendations and evaluations will enhance the basis for sound public choices.

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