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Identifying Countermeasure Strategies to Increase Safety of Older Pedestrians

Pedestrian deaths accounted for 13% of all traffic fatalities in 2010. While adults 65 and older made up 13% of the U.S. population, they accounted for 19% of all pedestrian fatalities in 2010. This age group is rapidly expanding in size and is expected to almost double by 2030 as the last of the "Baby Boomers" reach retirement age, which means there will be a substantial increase in older pedestrian fatalities if the fatality rate remains constant.

The objective of this study was to identify intervention strategies targeted toward the prevention of crashes involving older pedestrians, defined in this study as those people 65 and older. A review of literature was conducted identifying countermeasures that have been used to educate or change the behavior of older adults in a variety of areas. This included studies that looked at age ranges other than 65 and older, but whose findings help to inform the older-pedestrian issues explored. In addition, interviews were conducted with people having expertise in the fields of aging, occupational therapy, transportation safety, traffic engineering, aging and ophthalmology, gerontology, and older pedestrian safety. Detailed results from evaluation of specific programs are contained in the study report. A general summary of the findings is presented below.

Age-Related Factors Affecting Pedestrian Safety

The effects of aging on pedestrian safety are not likely due to any one or two changes, but to general declines experienced across functional dimensions. Interviewed experts hypothesized that in the area of age-related changes those changes that are important to consider when discussing older adult pedestrian safety include:

- Diminishing strength, agility, and endurance;
- Diminishing bone density, increasing fragility;
- Diminishing proprioception (i.e., the body's sense of its location within space, such as awareness of foot position);
- Decreasing range of motion; and
- Increasing risk of multiple medical conditions.

These changes can affect functional capabilities, and lead to:

- Slower walking speed and use of walking aids that may slow them further;
- Difficulty walking more quickly to meet situational demands; and
- Increased propensity to fall due to imbalance or unsteadiness on their feet.

Declining field of vision, visual acuity, contrast, and visual information processing may also inhibit safe road crossing. Some of the experts interviewed felt that visual and hearing deficits reduce the ability to detect threats (oncoming vehicles), as well as the ability to identify or interpret walk signs or traffic control device signals. Cognitive declines in older adults result in increased time for decision-making and lengthen crossing time. Older adults typically experience declines in spatial awareness and attentional abilities, especially the ability to complete tasks involving divided attention. This may result in increased difficulty anticipating movements of vehicles as well as judging their speeds, which could result in uncertainty or reluctance to cross the street, delaying their start and slowing their progress when crossing.

Older pedestrians may become aware of some but not all of the changes they experience as they age. In part, this may be due to the gradual nature of some of the changes. Older pedestrians are likely to be more aware of physical changes such as slowing of physical movement. However, they are less likely to recognize changes in some aspects of visual processing and cognition because these changes are more gradual, and many of these processes occur outside of conscious awareness.

Multi-Faceted Approach

Because no single pedestrian fatality cause stands out, no single countermeasure alone would likely make a substantial impact on the number of older pedestrian crashes. A successful countermeasure program may need to use a mix of environmental, educational, and enforcement mea-

sures to improve pedestrian safety. A number of successful health promotion and pedestrian safety campaigns were comprised of multiple components including media, community-based interventions, engineering countermeasures, and program evaluation.

Communicating to Older Adults

Consultation with the target population via focus groups or other interactive means is the basis for formulating an effective message. Many of the programs reviewed in the literature for this study engaged older adults in the developmental stages of the campaign or program, providing them ample opportunity to be heard.

The message should be simple and direct, include answers to relevant questions, and address specific issues and concerns that older adults have as a group. Many older adults ignore the messages of national campaigns, believing that they are intended for a younger audience.

Older adults have said in focus groups that real-life images and stories of people are effective in promoting a change in behavior. Images and stories that are realistic and empathetic while conveying a simple and clear message are often seen as more credible, and credibility is an important basis for the design of media messages to induce safety and health behavior.

Health communication programs may be community-based; utilize education and training; or employ local professionals, stakeholders, or advocates. There is no single correct answer as to which mode is most suitable. There also is no standard method for delivering the message. Some health campaigns used brochures that focused on issues and questions which concerned older adults, and used photos of older adults to complement the information presented in the brochure. Older adults have said that this was an effective strategy given that many older adults rely on medical brochures and reading material for health-related information. When developing handouts, brochures, and/or display cards one should consider the visual and cognitive declines experienced by older adults. The design of the handouts should be simple. The font should be slightly larger than standard and increase contrast. The paper material selected should have a low glossiness to reduce glare.

Other campaigns have used advertising via newspapers, television, and radio to communicate a single message. These techniques may have been used in combination with community-based activities such as press conferences, educational programs, and presentations by local health professionals at community centers. Many older adults respond well to community outreach programs that allow professionals to personally interact with them in locations where the older adults reside or socialize.

Some older adults indicate that printed material is their preferred channel for communication, while others point to television, community programming, physicians, and even the Internet. Each of these modes is unique and should be tailored to the target population. Internet communication has the potential to allow for more personal messaging; however, older adults do not use it as often as do younger adults.

Engineering Countermeasures

Engineering countermeasures have the potential to improve safety and walkability for older adults. Among the most effective solutions reported in the literature are traffic calming measures whose main goal is to separate vehicular traffic from pedestrians, separating them either by space or time. Other engineering designs are directed towards increasing the conspicuity of pedestrians or reducing the speed of vehicles. Common engineering countermeasures include roundabouts and lane narrowing and improvements to intersections such as extended traffic signals for pedestrian crossings, the addition of refuge islands, and increased lighting at pedestrian crossings. Many of the successful pedestrian safety programs incorporated audits or evaluation of walkability of roads in neighborhoods with a high percentage of older adult residents. A review of local infrastructure issues allows for prioritizing engineering countermeasures and long-term planning.

How to Order

Download a copy of *Identifying Countermeasure Strategies to Increase Older Pedestrian Safety* (49 pages) prepared by Westat, Inc., from www.nhtsa.gov/Driving+Safety/Research+&+Evaluation. Alan Block was the project manager for this study.

U.S. Department of Transportation
National Highway Traffic Safety Administration
1200 New Jersey Avenue SE., NTI-132
Washington, DC 20590

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