Infrastructure improvements for older drivers

The extent to which engineering countermeasures accommodate the needs and abilities of older road users looms as one of the most important determinants of the safety of the USA's surface transportation system in the years ahead. Planners and designers who are cognizant of present demographic trends understand that the 85th percentile or 'design driver' of the early 21st century will be a 75-year-old; they have sought guidance in identifying best practices with a potential to mitigate the expected increase in traffic fatalities resulting from age-related changes, both due to the decline in functional abilities needed to drive safely and to the heightened vulnerability of crash victims to incapacitating and life-threatening injuries. In 2001, the Federal Highway Administration published and began to disseminate hard copy and web-based versions of the Highway Design Handbook for Older Drivers and Pedestrians[1-2] to help meet this need.

Among advocates for age-sensitive policies to enhance traffic safety are those who view emerging, 'assistive' technologies as key to progress in this area. Head-up displays to reduce 'eyes away from the road' time, night vision systems to detect hazards beyond the limits of vision in the road ahead, and a variety of collision avoidance warning devices are just some of the examples that can be cited. Though intriguing, it may be years until the hoped-for benefits in safety and mobility for seniors are realized from these technologies. In the meantime, there are indications that increased workloads, information processing demands, and interface designs that are less-than-optimal for older users can actually interfere with safe driving.

In contrast, infrastructure improvements recommended in the FHWA Highway Design Handbook for Older Drivers and Pedestrians describe modifications to streets and highways that can make an immediate difference in their safety and ease of use—for drivers of all ages—at a cost that often exceeds only modestly, if at all, what is spent on current practices. The photograph above shows an advance intersection warning sign with accompanying street name sign, as advocated in the Design Handbook. Because wholesale changes to the infrastructure

would be cost-prohibitive, these recommendations are keyed to new construction, reconstruction of existing facilities; regularly-scheduled maintenance activities, and 'spot treatments' where there are crashes or other demonstrated safety problems, or where a proactive approach to avert future problems is desired by State or local transportation authorities.

Two broad areas of improvements deserve priority: a) changes which reduce the probability of a crash and b) changes which reduce the severity or consequences of a crash. The recommendations found in the Highway Design Handbook for Older Drivers and Pedestrians focus on reducing crash rates through engineering practices that give explicit consideration to the sensory, perceptual/cognitive, and physical limitations of [older] drivers, in areas of highway design and operations where crash data analyses indicate the most significant safety problems exist and where survey and focus group data show that the mobility of seniors is most affected. Best practices have accordingly targeted geometric elements and traffic control devices at urban and suburban intersections, operations at pedestrian crossings, violations of expectancy at highway work zones, and nighttime driving difficulties across a variety of settings.

The Handbook provides its most extensive set of recommendations at urban and suburban intersections, where the greatest safety problems are associated with left-turn movements. Removing conflicts between turning and through vehicles by providing 'protected' signal phasing (turn arrows) is most desirable. Where capacity requirements dictate the use of 'permissive' phasing, and left turning drivers must choose safe gaps in oncoming traffic, Handbook recommendations focus on practices that improve sight distance. These include the consistent use of a 2.5 sec perception-reaction time value in formulas for intersection design, and a positive offset of opposing left turn lanes to insure that a driver's view of oncoming traffic is not blocked by vehicles waiting to turn left across the intersection.

Additional recommendations highlight the need for better delineation and channelization practices to indicate the proper paths for designated movements at intersections; overhead lane use control signs and advance (mid-block) street-name signing to reduce driver uncertainty; limiting the angle with which intersecting roads meet to no more than a 15° 'skew' from perpendicular, because reduced head/neck flexibility makes scanning to the sides a great deal more difficult; eliminating right turn on red where any skew exists; implementing more prominent signing to reduce wrong way movements at intersections; and the use of larger stop signs and backplates for traffic signals to improve the conspicuity of these devices.

Practices to improve safety at pedestrian crossings take into account the slower walking speed of older persons, the broad misunderstanding of pedestrian control signal indications by the general public, and the need to reduce conflicts between pedestrians and same-direction vehicles that are turning right at the intersection. Key recommendations include the use of an assumed walking speed of 0.85 m (2.8 ft) per second for signal timing; the use of a 'leading pedestrian interval' at intersections with high ped volumes, to allow pedestrians to start across the intersection before (same-direction) traffic is permitted to move; and instructional placards posted on corners and median refuge islands that explain crossing signal operation.

Recommended practices to improve safety for older drivers_and all drivers_in highway work zones seek to reduce information processing demands during the approach to, and increase path following cues during the travel through, these sites. First, the number of phases (pages) on electronic changeable message signs should be limited to two, the total number of unique ideas or units of information presented should be limited to four, and each phase should be displayed for a minimum of 3 seconds. The use of positive barriers to separate traffic; appropriate spacing of channelizing devices (barrels, cones, etc.) to define a path, without excessive clutter; and placement of a flashing arrow panel at the beginning of a lane closure to provide early warning to motorists on high-speed and divided highways are also stressed in the Handbook.

The Handbook recommends a number of practices to increase the ease and safety of nighttime driving. The brightness of painted markings on the pavement and on curbs, medians, and other raised surfaces near the roadway is most important_specific levels of contrast for such markings with their surrounding visual background that should be maintained to provide a high probability of detection by an older driver at night are recommended in the Handbook for roads with, and without, overhead lighting. At curves and other decision points, supplemental reflectors on the pavement surface and/or beside the road are recommended. The ability of older motorists to read signs, always an issue, is challenged the most at night. A minimum letter height of 15 cm or 6 in is recommended for post-mounted street-name signs; and on highway signs, 25 mm or one

inch of letter height should be provided for each 10 m or 33 ft of desired legibility distance. Finally, the nighttime conspicuity of critical traffic control devices such as stop and yield signs should be increased through the use of more highly (retro-)reflective material on the sign face; and, the installation of overhead lighting at intersections, especially those with pedestrian crosswalks, is an important safety countermeasure.

In addition to the roadway improvements highlighted above, best practices addressing freeway operations, highway-rail grade crossings, and numerous other geometric and operational elements may be found in the Highway Design Handbook for Older Drivers and Pedestrians. An Implementation Guide is also provided to support decisions about when such improvements deserve priority for transportation planning at the local, corridor, or State level.

Loren Staplin PhD,
Texas Transportation Institute, USA
e-mail: L-staplin@ttimail.tamu.edu

Source:

1. Staplin L, Lococo K, Byington S. Older driver highway design handbook. Washington, DC: U. S. DOT Publication No. FHWA-RD-97-135; 1998
2. Publication FHWA-RD-01-103. U.S.DOT: Washington, D.C., 2001. The contact information to obtain copies of this document is as follows: Federal Highway Administration RD&T Report Center, HRTS, 9701 Philadelphia Court, Unit Q, Lanham, MD 20706, USA, Phone: +1 (301) 577-0818

Alois Alzheimer MD PhD (1864 – 1915)

Alzheimer's disease is the most common cause of dementia in western civilization. One famous contemporary who suffers from it, is former U.S. President Ronald Reagan. How did this disease get its name? Below the story of the name giver, Alois Alzheimer.

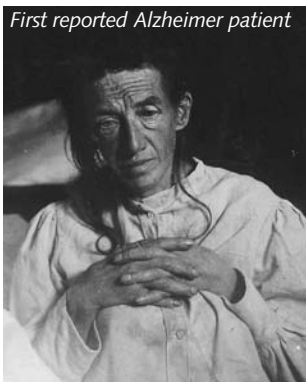
Early in the morning of June 14, 1864, little Aloysius was born to the notary public Eduard Alzheimer and his second wife Theresia in Marktbreit (currently: Ochsenfurter Straße 15a), Bavaria, Germany. Here the christening celebration was also held. Ignaz Ruland, canon of Würzburg, baptized the child and Alois Alzheimer, curate at Sulzfeld, acted as godfather. In 1989, on the occasion of Alois Alzheimer 125th birthday, the house was fitted with a memorial plaque and may be visited since.

Family Alois Alzheimer

Alois Alzheimer obtained his high school diploma in 1883 in Aschaffenburg, and subsequently studied in Berlin, Tübingen, and Würzburg, where he successfully defended a doctoral thesis on ceruminal glands in 1887[1]. In December 1888 Alzheimer started his education in psychiatry and neuropathology at the City Mental Asylum in Frankfurt am Main, headed by Emil Sioli (1852-1922). Alois was appointed director in 1895.

In April 1894, Alois Alzheimer married Cäcilia S. Nathalie Wallerstein (1860-1901), widow and heir of the wealthy banker Geisenheimer. It made Alois financially independent. Three children were born. One of them, Gertrude, later married the Breslau physician Georg Stetz, who obtained the Psychiatry Chair in Munich in 1946.

Alzheimer left Frankfurt in 1903, and, following a short-term stay in Heidelberg, moved to Munich to continue his scientific and medical activities at the Royal Psychiatric Clinic (Director: Emil Kraepelin, 1856-1926) where he also obtained his PhD (Habilitation) in 1904[2].



First reported Alzheimer patient