Supporting seniors in safe driving
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Objective
Presentation of the approach and framework for the development of a handbook for safe driving at an older age.

Greek Road Safety Indicators
- During the period from 2001 to 2010 the number of road fatalities fell by 37%.
- This improvement was among the lowest in the EU and Greece remains one of the worst performing countries among the 27 members with 130 fatalities per million, compared to a European average of 70 fatalities per million (2009).

Handbook for Safe Driving at an Older Age
The aims of the Handbook are:
- to help older drivers increase their self-awareness of the effects of age-related changes on their driving safety, and of the need to adapt their driving behavior;
- to help drivers improve their knowledge and develop appropriate concern for their own safety;
- to guide them to make informed driving decisions.

The Handbook for Safe Driving at an Older Age was based on:
- self-screening and educational material for older drivers;
- the results of a study on the driving behavior of active older drivers, aged 65-74, on a freeway in Greece.

Increasing Self-Awareness of the Need to Adapt
The Handbook focuses on driver attitudes which – it is assumed – are strongly influenced by knowledge. To this end, the Handbook:
- Addresses factors that determine the main task demands and the driver capabilities required to meet them.
- Provides information on how to deal with or avoid certain situations (e.g. intersection negotiation);
- Stress the advantage of safe-driving practices, while explaining that what is considered safe and responsible driving takes into account the expectations of other road users and other drivers.
- Prompts drivers to address their concerns to professionals (doctors, occupational therapists, driving instructors).
- Presents older persons with safe transportation alternatives.

Improving Knowledge
The information given in the Handbook covers:
- maneuvers that are known to be dangerous or that pose difficulties to older drivers in general, such as intersections, yielding, left turns and defensive driving techniques;
- freeway maneuvering, visual search and hazard recognition;
- new traffic rules that have come into force, particularly on freeways;
- negative implications of age-related changes in visual, physical and mental abilities on safe driving;
- the implications of human-factor variables for driving safety (e.g. alcohol consumption, medicines and fatigue).

Offering Advice and Guidance
The Handbook uses short tips containing clear and simple messages to offer advice and guidance, including suggestions on how to control task difficulty. Specifically, shows and:
- offered strategies to compensate for certain functional declines, e.g. driving in areas with good lighting conditions in good weather, avoiding peak hours and unfamiliar areas and adjusting driving speed;
- advice to control exposure under temporary impairment conditions (e.g. fatigue, emotions, medicines);
- encouraged to maintain physical condition and good health and to visit their doctors for assessment, assistance and guidance;
- advised to assess and improve their driving performance with the help of a driving instructor and consider alternative means of transportation when driving is not a safe preferred option.

Existing Situation for Older Drivers in Greece
- Senior drivers represent 15.5% of road fatalities (2010).
- Older people account for more than 50% of pedestrian fatalities.
- Given the expected growth of the elderly population (30% in 2050) and the expanding freeway network, there is an urgent need for initiatives to address training and education needs for older drivers.
- Under the license renewal procedure in Greece, a medical examination by two doctors (a genetic practitioner and an ophthalmologist) is mandatory at the age of 65. The renewed term is three years, provided that functional ability to drive is not questioned during that period.
- There are currently no educational programs in the public or private sectors to promote safe driving strategies for older drivers.

How the Handbook Works
Readers of the Handbook are asked to:
- think about their own potential problems and difficulties;
- apply information about the effects of age-related declines in driving ability as well as advice regarding: a) tactical and strategic driving choices, b) evaluation of their driving abilities, c) transportation activities;

Specific Contents of the Handbook
The Handbook for Safe Driving at an Older Age covers:
- Safety within the car – seat belt use, keeping the vehicle in good condition; dealing with accidents.
- Safety in traffic – driving at intersections; keeping safe distances; paying attention to other road users; priority rules; checks and use of mirrors; slow driving.
- Safe practices on freeways – traffic rules and traffic signs; lane changing; entering maneuvers; exiting maneuvers;
- Driving and emotions – dealing with anger; dealing with anxiety.
- Driving in good condition – influence of medicines, good health practices.
- Driving problems and age-related changes – slower reaction times while driving; vision problems; memory problems; worrying thoughts while driving; difficulties while driving in adverse weather, or in the rain, or in heavy traffic; fatigue while driving; difficulties while driving in traffic; difficulty assessing a specific sign; difficulties in turning the head to look to the side of the rear difficulties in using the pedals and the steering wheel.
- Indications of serious concern about driving ability – including concerns of family and friends about an older driver; traffic violations or accidents in the last or two years; eye diseases; chronic diseases; awareness of health conditions; preparing for a transition to restricted driving or stopping altogether.
- General information – procedures for driving license renewal; using public transport; ways of getting around.


Some of the driving difficulties and problems addressed in the Handbook were identified in a study on the behavior of active senior drivers.

On – road Trial, study participants:
- forty male drivers aged 65-74; licensed; active in good health; not involved in a recent accident; own car used;
- forty male drivers aged 65-74; licensed; active in good health; recruited from a nearby town; promoted by Vardaki (2009); 15 trials/2011; 50 traffic situations; 4000km;
- freeway driving tasks: driving on the freeway and exit finding; lane changing;
- freeway entering and exiting maneuvers at various interactions;
- at three freeway exits, two maneuvers in quick succession.

The study investigated:
- the correlation between compensatory behavior and safe driving;
- the correlation between actual and self-assessed driving performance on a freeway;
- perceptions regarding road safety issues and their relationship to actual and self-assessed driving performance.

Approach:
- A three-phase approach was used:
  - questionnaire regarding their perceptions of road safety issues
  - on-road trial to assess performance on the freeway
  - self-assessment questionnaire regarding their performance assessment and feelings of danger.

The main findings of the study:
- There were indications that study participants were aware of their performance inadequacies when driving on the freeway.
- Performance deficiencies on the freeway were found to correlate with drivers’ less favorable self assessment and with the feeling of danger that drivers experienced.
- The correlation between compensatory behavior and study participants’ perceptions of their driving ability as being less safe, implies that older persons may perceive their driving in dangerous situations.
- The perceptions between actual and self-assessed driving performance and perceptions of problems related to knowledge of new traffic rules and signs indicated that drivers recognize the need to improve their performance.
- A factor analysis indicated that ‘ability in maneuvering and reaching correctly in adverse driving conditions’, ‘ability in maintaining correct lateral position’ and ‘ability in adapting their speed to traffic’ were influenced by the study participants’ driving behavior on the freeway and their self-assessment.


Study objectives, study participants:
- Identification into drivers’ attitudes after they read the Handbook.
- Identification of individual characteristics (that people who could/might be able to recognize potential problems or difficulties in their driving after reading the Handbook, and who intend to read the Handbook in the future.
- 64 active drivers (50 male and 14 female), aged 65-74, with normal cognitive functioning, other inclusion criteria.

Approach
- Participants were asked to fill out a questionnaire.
- Questions were given the MMSE (Mini Mental State Exam).
- Questionnaires were considered valid for drivers with MMSE score indicating a normal/cognitive function (27 or above, to account for age and education).

Results
Participants generally reported the Handbook to be useful and interesting, providing pertinent knowledge and information regarding safe-driving practices, compensation strategies and the effects of aging on driving. A binary logistic regression analysis showed that:
- The odds correctly estimating who will report increased awareness are higher for more active drivers, with higher scores in the MMSE, with more reported accidents and fewer years of driving experience.
- The older actively participating who will report an intention to read the Handbook in the future are higher for those drivers who have had no accidents in the previous year.

Follow up
Within the study sample represents the actual ratio of male to female drivers in this age group (65-76) in Greece, there are no data available concerning, in particular, the educational level, exposure, health status, age of residence and income of the senior driver population. Future research in the influence of the Handbook use should examine behavior and decisions after a period of several months. The driving strategies adopted change over time; the driving style and driving practices; control of temporary impairing conditions; concerns addressed to doctors and driving instructors; the use of alternatives to driving and re-use of the Handbook.

In summary
Following a study of actual and self-assessed driving performance, a Handbook has been developed as an educational intervention that is believed to be the first in the area of improving of active older drivers. Its aim is to help this group increase their self-awareness of the effects of age-related changes on driving and assist them in making decisions that lead to appropriate compensatory behaviors.

Posterior evidence suggests that repeated use of the Handbook is likely, which holds promise in promoting the ideas of regular self-screening.

In Response: The Greek Road Safety Strategic Plan
The Strategic Plan for the improvement of road safety for the period 2011-2020 has been developed for the Ministry of Infrastructure and Transport by the Department of Transportation Planning and Engineering at the National Technical University of Athens (NTUA).

The Greek Road Safety Strategic Plan has adopted the following objectives for reducing the burden of road traffic accidents in Greece:
- The plan proposes infrastructure improvements and educational initiatives to promote older driver safety.

Within this framework, the Handbook for Safe Driving at an Older Age was developed as part of a research project funded by the Greek Ministry of Infrastructure and Transport.