Inquiry into Road Safety for Older Road Users

September 2003

ROAD SAFETY COMMITTEE
Members of the Road Safety Committee

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Front row: (from left) Mr. Alistair Harkness MP, Mr. Ian Trezise MP (Chair), The Hon. Graeme Stoney (Deputy Chair)
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Committee Members

This inquiry was conducted during the term of the 54th and the 55th Parliament. The 54th Parliament was prorogued on 2 November 2002.

Committee Members of the 55th Parliament:

- Mr Ian Trezise, MP Chair
- Hon. Graeme Stoney, MLC Deputy Chair
- Hon. Barry Bishop, MLC
- Hon. John Eren, MLC
- Mr Alistair Harkness, MP
- Mr Craig Langdon, MP
- Mr Terry Mulder, MP

Committee Members for the 54th Parliament:

- Hon. Andrew Brideson, MLC Chairman
- Mr Craig Langdon, MP Deputy Chairman
- Hon. Elaine Carbines, MLC
- Mr Don Kilgour, MP
- Mr Tony Plowman, MP
- Mr Garry Spry, MP
- Mr Ian Trezise, MP

Staff

- Ms Alexandra Douglas Executive Officer
- Mr Graeme Both Research Officer
- Mr Sean Coley Research Officer from 22 April 2002 until 24 January 2003
- Mrs Lois Grogan Office Manager until 2 May 2003
- Ms Beth Klein Office Manager from 27 May 2003
The Road Safety Committee

The Victorian Road Safety Committee is constituted under the Parliamentary Committees Act 1968, as amended.

The Committee comprises seven Members of Parliament drawn from both houses and all parties. The Chairman is elected by Members of the Committee.

Section 4EE of the Parliamentary Committees Act 1968 describes the functions of the Committee as:

The functions of the Road Safety Committee are to inquire into, consider and report to the Parliament on any proposal, matter or thing concerned with road trauma or safety on roads and related matters, if the Committee is required or permitted so to do by or under this Act.

Committee Address

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This and previous reports of the Committee are on the internet site of the Victorian Parliament at: www.parliament.vic.gov.au/parlrsc.
Terms of Reference

The Governor in Council, under Section 4F of the *Parliamentary Committees Act 1968*, requests that the Road Safety Committee of Parliament: –

Inquire into, consider and report to the Parliament on the issues affecting the safety of older road users, and in particular to report on:

- The extent to which older drivers, older pedestrians and other older road users are involved in motor vehicle accidents on Victorian roads, and the factors affecting severity of crash outcome for all older road users;
- Strategies and programs which assist older road users to retain their mobility;
- The suitability of the current arrangements for competency and medical testing for older drivers;
- The duration of licences issued to drivers, and the issue of restrictions, including those that can currently be placed on the licence, based on impairment of a driver’s ability to drive safely;
- The role of health services and government and other agencies in assisting older drivers to manage the transition from driver to non-driver;
- The mobility options available for older persons who give up driving, including public transport and the road safety implications of any alternative means of transport; and
- The need for change to legislation or statutory requirements to implement any recommendations made as a result of this inquiry.

In conducting the inquiry, the Committee is requested to seek information from Government, non-Government Agencies, the community, aged care organisations, interstate and overseas jurisdictions and public transport providers.

The Committee is required to report to Parliament by 30 September, 2003.

Dated 15 April 2003
Responsible Minister
Steve Bracks, MP
Premier
This inquiry commenced under similar terms of reference in the 54th Parliament. Following the prorogation of the Legislative Council and dissolution of the Legislative Assembly on 5 November 2002 the 54th Parliament ceased to hold office and all uncompleted inquiries lapsed as from that date.

The 55th Parliament of Victoria was opened on 25 February 2003. On 28 April 2003 the Committee of the 55th Parliament, under section 4S of the Parliamentary Committees Act 1968, resolved to accept evidence that had been submitted for the previous inquiry.

Agencies and individuals who made submissions were invited to submit further evidence, amend their submission or advise the Committee that their previous submission made to the Committee could stand.

**Previous Terms of Reference**

The terms of reference in the 54th Parliament were:

The Governor in Council under Section 4F(1)(a)(ii) of the Parliamentary Committees Act 1968 refers an inquiry into improving the safety of older road users in accordance with the terms of reference in Schedule 1 of this order.

The Victorian Government recognises that many older road users continue to drive and use Victoria’s roads safely for many years. However, changes associated with the ageing process may affect the safety of some older users of the road network.

As Victoria’s population ages it is important that the Government and the Parliament seek ways of maximising the continued safety and mobility of older road users.

The Governor in Council under Section 4F of the Parliamentary Committees Act 1968, refers the matters outlined below to the Road Safety Committee.

To inquire into, consider and make recommendations on the issues affecting the safety of older road users and in particular to report on –

1. The extent to which older drivers, older pedestrians and other older road users are involved in motor vehicle accidents on Victorian roads, and the factors affecting severity of crash outcome for all older road users.

2. Strategies and programs which assist older road users to retain their mobility.

3. The suitability of the current arrangements for competency and medical testing for older drivers.
4. The duration of licences issued to drivers, and the issue of restrictions, including those that can currently be placed on the licence, based on impairment of a driver’s ability to drive safely.

5. The role of health services and government and other agencies in assisting older drivers to manage the transition from driver to non-driver.

6. The mobility options available for older persons who give up driving, including public transport and the road safety implications of any alternative means of transport.

7. The need for change to legislation or statutory requirements to implement any recommendations made as a result of this inquiry.

In conducting the inquiry, the Committee is requested to seek information from Government, non-Government Agencies, the community, aged care organisations, interstate and overseas jurisdictions and public transport providers.

This Order is effective from the date on which it is made.

Dated 22 May 2001
Responsible Minister
Steve Bracks, MP
Premier
Chair’s Foreword

The Inquiry into Road Safety for Older Road Users commenced in 2001 during the course of the 54th Parliament and essentially the same terms of reference were re-issued to the Committee in the 55th Parliament.

The Road Safety Committee of both Parliaments consulted widely with the Victorian community, through public hearings, gathered evidence from interstate and overseas and conducted a two-day conference with keynote speakers, including international experts.

Over 180 submissions were received and discussions held with more than 160 people. The Committee expresses its grateful appreciation to all those who made written submissions and/or appeared as witnesses.

The Committee in determining it’s recommendations was faced with balancing the need for continued mobility of older citizens with the safety of all road users, whether drivers, passengers, motorcyclists, bicycle users, pedestrians or users of motorised pedestrian mobility devices. A major challenge for the Committee was to determine the key issues and identify the most appropriate course of action.

The most controversial issues, those associated with driver licensing and medical testing, were often the ones where there was very little evidence to assist in decision making. A wide variety of viewpoints were put to the Committee but in many instances there was no supporting evidence or arguments. As such, the Committee made its recommendations on the basis of the best information available, while always keeping the issue of improving road safety foremost in our deliberations.

A number of research proposals recommended by the Committee, or currently underway, should provide a firmer basis for future decision making.

The Inquiry has resulted in 41 recommendations covering a range of driver licensing, health, mobility, infrastructure and education issues. The Committee believes these recommendations are practical and can be readily implemented.

However the ageing of both the overall and the Victorian driving population with changing circumstances, will continue and the issue will need to be revisited as the demand for transport grows rapidly, vehicle technologies advance and transport infrastructure evolves.

Personally, I thank the Members of both Committees, all of whom participated fully in the process of the Inquiry, including the Chairman of the previous Committee, my predecessor the Honourable Andrew Brideson.
I also thank the Committee staff, Alexandra Douglas, Graeme Both, Lois Grogan and Beth Klein for their contribution to the work of the Committee.

Ian Trezise, MP
Chair
Executive Summary

Setting the Scene

How best to achieve the lowest possible road trauma in Victoria and community risk management are key issues for the safety of older road users. The challenge, if new measures are to be implemented, however, is to limit the adverse personal consequences on mobility and general well-being of the older person, at minimal additional costs to the community.

The ageing of the population is now a significant policy issue for government, both nationally and state level, with considerable implications for the workforce, health and social welfare systems. Consequently, the road safety and mobility implications are a growing concern.

The population of Victoria is ageing and the number of people in the older age groups will increase rapidly in future decades. The proportion of the older population with a driving licence will continue to increase, particularly for women.

Older people living in rural areas are more likely to drive and less likely to use public transport, cycle or walk than older Melbourne residents. The travel patterns of older people may change as the generation who grew up with cars and licences from their teenage years, becomes older.

Road Crashes and Risk

In 2002 there were 397 road fatalities, of which 79 or nearly 20% were aged over 60.

Older people account for a disproportionate share of pedestrian casualties. Those aged 65 years and over represent approximately 35% of pedestrian fatalities.

People aged 60 years and over currently make up about 17% of Victoria’s population, and approximately 20% of fatalities. Transport Accident Commission data shows 16% of hospitalisation claims and nine per cent of minor injury claims are for people over 65 years. The more serious road trauma is due to older people’s frailty, in only some circumstances.

In 85% of fatal crashes involving a driver 80 years or older, the driver was considered to be responsible. Australian data shows that, beyond middle age, driver responsibility increases with age for such crashes.

The number of older drivers involved in casualty crashes has risen over the past decade, and to a greater extent than the rise in the number of older Victorians or the numbers of older licence holders.
Older drivers are involved in a higher proportion of intersection crashes, usually because they fail to give way and a lower proportion of speeding, unsafe overtaking and drink-driving crashes.

Crash injuries of older people are generally more severe than for younger people, due to their frailty and the type of crash, such as side-impact.

Improvements are needed in the way in which older road user crashes are recorded and published, analyses of crash risks undertaken and information published about who is responsible for crashes.

**Health Issues for Older People**

It is important that older people maintain as much mobility, whether as a pedestrian or a driver, for as long as possible to avoid feelings of depression, isolation and increased health problems.

The mobility of older people may be progressively impaired by general physical changes experienced in the ageing process. Significant for road safety are the loss of agility, flexibility and endurance, reduced cardio-respiratory capacity, postural mechanisms and deteriorating balance.

Drivers and other older road users with poor vision, cognitive difficulties and some other physical and mental impairments have a higher risk of being involved and responsible for a collision. These risks can increase markedly as health worsens.

The two main functional areas on which to concentrate research and road safety countermeasures are visual and cognitive abilities. The effects of multiple conditions, medications, multiple medications and medications with low levels of alcohol also need further research.

**Health Assessments**

A national licence re-assessment procedure for older and disabled drivers is currently being developed by Austroads, the national association of road authorities in Australasia. The model does not include age-based re-licensing tests and is essentially the current VicRoads medical review process, with improved methods to refer potentially unsafe drivers to VicRoads, better driver assessment tools and a more client-friendly process. A feasibility trial of the assessment tools and the use of case managers to assist clients should be undertaken in Victoria.

The introduction of mandatory reporting of medically unfit drivers by health professionals is not supported, but the professions should be encouraged to adhere to ethical issues.
Health professionals need further education to assist in discussing road safety concerns with clients. The role of health professionals is to conduct medical examinations and provide a report to be forwarded, by the driver, to the licensing agency. This process needs to be clear in the minds of drivers and health professionals.

The Commonwealth funded annual health assessment for those people 75 years and over, provides a forum to regularly discuss fitness to drive or walk, with their health professionals. The scheme covers a significant proportion of older people most likely to have health-related difficulties with mobility. The Committee questions however, whether information about the scheme has been widely disseminated throughout the community and would urge the Federal government to actively promote it.

Age-based Assessments

All Australasian jurisdictions, except Victoria, have some form of age-based health assessment, using a wide variety of methods and at different ages. Interstate comparisons of older driver crash rates have attempted to determine the effect of these practices. However, interpretations of the results vary and the studies do not enable the Committee to determine which, if any, of these practices are successful, and have a beneficial road safety impact.

Practices also vary overseas, with many jurisdictions using a combination of methods, again at different ages. Medical certificates are common in Europe and Canada while vision screening is more common in America.

The lack of information about the true medical fitness needed to drive, of the Victorian driving population, is a crucial element in the current debate. Development of a standard medical examination to assess fitness to drive for those aged 80 years who wish to renew their licence would target those most likely to be affected by medical conditions, while minimising the number of fit people needing to obtain medical certificates.

The current driver eyesight screening fails to take account of peripheral vision, congenital vision defects and other eye diseases. Improved vision assessment methods and standards need to be developed and implemented for all licence renewals.

Self-reported health condition questionnaires at licence issue and renewal should be introduced as a means of better identifying drivers, of all ages, with medical conditions that may affect their ability to drive safely.
Executive Summary

There is insufficient evidence of the road safety benefits of mandatory age-based on-road testing and road knowledge testing of drivers, to justify their introduction in Victoria.

As a pro-active measure VicRoads should use its crash, traffic conviction and demerit point records to identify and investigate potentially unsafe licence holders.

Mobility Options

Finding the right balance between measures that maintain or increase mobility for older people, and those that restrict their mobility, is a key challenge.

A number of essentially local schemes attempt to meet the mobility needs of older Victorians, including those who have ceased driving. However, they lack co-ordination and a long term commitment and strategy.

Some other Australian and overseas jurisdictions have transport schemes and information services which could provide suitable models for use in Victoria.

A membership-based alternative transport scheme originating in Portland, Maine in the United States provides individualised car-based service to members. There are also innovative shared ride and taxi club schemes in Australia and elsewhere. An alternative local transport service should be piloted in Victoria.

Older drivers need to be encouraged to become familiar with public transport and other alternative means of travel before they cease driving.

Managing the Transition

The transition from driver to non-driver can be a major life event, but one few older Victorians currently plan for in advance.

A range of resources and services are needed to help older drivers, their family, health professionals and community care and advice organisations, to assist in this transition. A comprehensive action plan is needed to co-ordinate the activities of health services, government and other agencies.

Safer Roads

Older drivers need to be better informed about what constitutes vehicle safety. Older occupant safety can be improved by increasing the usage rate of seatbelts, better seat belt systems, greater use of airbags,
improved head restraints, use of larger and more modern passenger cars and improved vehicle compatibility.

Australian vehicle manufacturers should be developing cars with options that meet the specific needs of older drivers and passengers.

Reduction in harm to pedestrians involved in crashes with vehicles may be possible through better design of the front of passenger vehicles. Bullbars represent an increased hazard to other road users. Their fitment on vehicles predominantly used in urban areas is not justified and should be discouraged by a publicity campaign. VicRoads should also investigate a permit scheme for bullbars on vehicles registered in the Melbourne metropolitan area.

**Safer Roads**

Older drivers have reported numerous difficulties interacting with the road environment as current road design practices rarely take into account the specific needs of older road users. The road system needs to be adapted to their needs.

Strategic road safety policy approaches such as Sweden’s Vision Zero and The Netherlands’ Sustainable Safe Road Transport Systems deserve further consideration in Victoria.

Regular quality assured maintenance and road safety audits and reviews are needed. Examples include easy-to-read signs and pavement markings.

While many of the planning changes required to improve the safety and mobility of older road users have been identified, they have not been translated into the policy agenda of Victorian land use planning organisations as they should.

A range of infrastructure improvements may increase the road safety of older pedestrians. A reduction in general traffic speeds, upgrading technology, adjusting traffic signal settings and improving the visibility of crosswalks are just a few examples.

Improved paths and ramps are needed for pedestrians, cyclists and users of an ever-growing diversity of pedestrian mobility devices.
## Recommendations

### Road Crashes and Risk

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>That age-related road crash statistics be monitored and categorised by smaller sub-sets of age groups.</td>
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<tr>
<td>2</td>
<td>That VicRoads gather comprehensive data on older road users travel patterns and associated crash risks in metropolitan, regional and rural areas of Victoria.</td>
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<tr>
<td>3</td>
<td>That government agencies investigate, record and publish, statistics on the responsibility of all types of crashes for all age groups.</td>
</tr>
<tr>
<td>4</td>
<td>That VicRoads undertake research to improve the reliability of crash rate information by:</td>
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<tr>
<td></td>
<td>• Determining the number of licence holders who drive by the various age groups; and</td>
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<tr>
<td></td>
<td>• Developing crash risk measures based on the annual distances travelled by those groups.</td>
</tr>
<tr>
<td>5</td>
<td>That in order to provide more insight into why and where crashes occur, crashes involving only property damage, in which a vehicle is towed away, be reported to Victoria Police and recorded in VicRoads crash databases.</td>
</tr>
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</table>

### Health Issues for Older People

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<tr>
<td>6</td>
<td>That VicRoads undertake research to better understand the crash risks for older road users associated with various types and levels of visual impairment.</td>
</tr>
<tr>
<td>7</td>
<td>That VicRoads undertake research to better understand the effects on pedestrian and driving performance and crash risk of older people who have various types and levels of cognitive impairment.</td>
</tr>
<tr>
<td>8</td>
<td>That VicRoads undertake research to better understand the effects various types and levels of:</td>
</tr>
<tr>
<td></td>
<td>• Specific medical conditions;</td>
</tr>
<tr>
<td></td>
<td>• Multiple conditions;</td>
</tr>
<tr>
<td></td>
<td>• Medications; and</td>
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</table>
Multiple medications and medications together with low levels of alcohol, have on an older person's walking and driving abilities.

**Health Assessments**

9. That VicRoads trial the Austroads model licensing procedure in Victoria and, if successful, adopt the model.

10. That the Minister for Transport request the Federal Minister for Health and Aged Care to include questions relating to driving and walking into the Commonwealth Government funded annual health assessment now available for older Australians. That those who qualify be made aware of this service.

11. That VicRoads develop cognitive screening and assessment tools for driver licensing purposes.

**Age-based Assessments**

12. That VicRoads, in conjunction with relevant organisations, develop and implement a standard medical assessment to determine fitness to drive for those aged 80 years and over who wish to renew their licence.

13. That driver eyesight standards and assessment methods in Victoria be comprehensively reviewed and an assessment be developed and implemented to replace the current acuity test.

14. That eyesight assessments be required prior to renewing a licence.

15. That mandatory age-based on-road driver testing or road knowledge testing not be introduced in Victoria at this time.

**Licensing Issues**

16. That VicRoads introduce a five year licence period, phased in by 65 years of age and the licence period be further reduced to two years from 80 years of age.

17. That all drivers be required to complete a health questionnaire when renewing their licence. This questionnaire should be available in other languages.
18. That VicRoads use crash records, traffic conviction records and demerit point scores to identify and assess licence holders who may no longer be safe to drive.

19. That a wider range of driving licence condition codes be investigated by VicRoads.

20. That VicRoads investigate the effectiveness of licence restrictions, and associated assessment methods and processes, in reducing driver crash risk.

21. That VicRoads expand the information provided in *The Victorian Older Drivers’ Handbook* and distribute it with licence renewal forms to those drivers 60 years and over. This handbook should also be translated into other languages.

22. That VicRoads develop education and publicity strategies to address older road user safety issues for drivers, health professionals, families, friends and caregivers. To ensure the success of these strategies targets be set on how to reach the correct audience and the programs be evaluated.

23. That VicRoads investigate the value of educational sessions as part of the licence renewal requirements for older drivers.

**Mobility Options**

24. That VicRoads, in relation to motorised mobility devices:
   - Develop safety standards;
   - Regulate their use on public roadways and pathways;
   - Investigate third party insurance aspects of their use; and
   - Conduct an awareness campaign focusing on the rights and responsibilities of users, for both the user and the public.

25. That the Department of Infrastructure undertake a partnership with the Transport Accident Commission to develop and pilot an alternative local transport service for older Victorians.

26. That the Department of Infrastructure provide older drivers with realistic incentives, support and encouragement to use public and alternative transport
before they are in a position of no longer being safe to drive.

27. That the Department of Infrastructure develop a long term strategy and statewide action plans to meet the mobility needs of older Victorians. These should include:

- Public transport, community transport and alternative transport services, including possible use of taxis;
- Supporting local communities to ensure that older people have access to transport, wherever they live in Victoria; and
- Provide information on the services available for older travellers.

Managing the Transition

28. That a whole-of-government approach be taken, in consultation with relevant organisations and community groups, to develop policy to assist Victorian drivers with the transition from driving to non-driving.

Safer Vehicles

29. That a publicity campaign, supported by enforcement, be developed to encourage older vehicle occupants to correctly wear seatbelts.

30. That VicRoads investigate all the issues associated with the possible safety benefits of daytime running lights.

31. That older people be encouraged through campaigns to purchase safer vehicles by:

- Agencies producing and distributing brochures on safer vehicles that include information on side impact protection, seatbelts, airbags and head restraints; and
- Encouraging ANCAP to develop publications focusing on the specific safety needs of older road users.

32. That the Minister for Transport request the Federal Government to encourage Australian vehicle manufacturers to consider producing cars with safety
and ease of use options for older people, such as simplified controls and instrumentation and swivel seats.

33. That a publicity campaign be conducted on the unnecessary fitment of bullbars and the appropriateness of fitting them on vehicles used solely in urban areas.

34. That VicRoads investigate a permit scheme for the use of bullbars on motor vehicles registered in the Melbourne metropolitan area.

**Safer Vehicles**

35. That the safety for older drivers, their passengers and other road users be improved through road design and operation improvements, by:

- Providing more fully-controlled right turns at signalised intersections;
- Further use of lower speed limits at hazardous intersections;
- Larger and more visible letters on road signs and standardised letters and colours for street names;
- Allowing for slower driver reaction times; and
- Conducting safety reviews of existing roads on a regular basis with particular emphasis on older road user needs.

36. That the Government conduct an inquiry into the most appropriate way of developing long term road safety strategies, such as the Vision Zero and Sustainable Safety concepts.

37. That land use planning by the Department of Sustainability and the Environment and all municipalities take greater account of the needs of an ageing population by such measures as:

- Improving arterial road layout and residential sub-divisional design;
- Encouraging services and amenities to be provided closer to where older residents live, including those in retirement villages; and
- Making it easier for older people to shop and change modes of transport.
<table>
<thead>
<tr>
<th>Safer Pedestrian and Cycle Facilities</th>
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<tbody>
<tr>
<td>38. That in order to reduce older pedestrian fatalities and injuries, the general road speed environment in built-up areas be lowered by:</td>
</tr>
<tr>
<td>• Reducing vehicle speeds on those arterial roads where there has been a history of pedestrian crashes or the environment has been identified as hazardous to pedestrians;</td>
</tr>
<tr>
<td>• Increasing the use of lower residential area speed zones in the more densely developed areas;</td>
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<tr>
<td>• Introducing lower permanent or variable speed zones in strip shopping streets and locations with a high concentration of older pedestrians; and</td>
</tr>
<tr>
<td>• Implementing traffic calming measures in areas of high pedestrian activity.</td>
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<tr>
<td>39. That in order to improve the safety for older pedestrians crossing a road, VicRoads and Local Government:</td>
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<tr>
<td>• Upgrade pedestrian traffic signals using Puffin technology, where required;</td>
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<tr>
<td>• Modify existing pedestrian crossings and their signal settings; and</td>
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<tr>
<td>• Provide more pedestrian refuges, painted median strips and kerb extensions.</td>
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<tr>
<td>40. That VicRoads review the safety needs of older pedestrians wanting to cross at, or near, roundabouts.</td>
</tr>
<tr>
<td>41. That municipalities take greater account of the needs of an ageing population by providing suitable paths and ramps for pedestrians, cyclists and users of motorised mobility aids.</td>
</tr>
</tbody>
</table>
Definitions and Abbreviations

Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Arthritis</td>
<td>Inflammation of the joints.</td>
</tr>
<tr>
<td>Auditory</td>
<td>Hearing, sound.</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>Of, or relating to the heart and blood vessels.</td>
</tr>
<tr>
<td>Cataract</td>
<td>A condition in which the eye-lens becomes progressively opaque, resulting in blurred vision.</td>
</tr>
<tr>
<td>Cerebrovascular</td>
<td>Blood flow to and in the brain.</td>
</tr>
<tr>
<td>Cognition</td>
<td>The ability to process information, learn, problem solve, understand concepts, and make appropriate decisions.</td>
</tr>
<tr>
<td>Cognitive Impairment</td>
<td>Disordered thinking, reduced either through normal ageing, or a medical impairment.</td>
</tr>
<tr>
<td>Dementia</td>
<td>A brain disorder marked by memory failure, personality changes and impaired reasoning. Dementia results in impaired cognition.</td>
</tr>
<tr>
<td>Glaucoma</td>
<td>An eye condition, resulting from increased pressure within the eyeball, which may cause gradual loss of sight.</td>
</tr>
<tr>
<td>Gopher</td>
<td>A 3 or 4 wheeled form of motorised pedestrian device, also sometimes known as a ‘mobility’ scooter.</td>
</tr>
<tr>
<td>Macular degeneration</td>
<td>Macula is the region of greatest visual acuity (sight) in the retina. Degeneration Macular is an eye disease affecting the central retina.</td>
</tr>
<tr>
<td>Motor scooter</td>
<td>A two-wheeled ‘step-through’ style vehicle, similar to a motorcycle, predominantly used for short urban trips.</td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>Related to muscles and bones.</td>
</tr>
<tr>
<td>Neurological</td>
<td>To do with the nervous system.</td>
</tr>
<tr>
<td>Neuromuscular</td>
<td>Relating to both nerves and muscles.</td>
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<tr>
<td>Pathway</td>
<td>Path used for pedestrians, bicycles or shared use.</td>
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<tr>
<td>Term</td>
<td>Definition</td>
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<td>-------------------------------</td>
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<tr>
<td>Polypharmacy</td>
<td>Being issued with, or taking, several medications.</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>Relating to the lungs (breathing)</td>
</tr>
<tr>
<td>Retinopathy</td>
<td>A disorder of the retina, part of the eye.</td>
</tr>
<tr>
<td>Roadway</td>
<td>Section of a road reserve designed for vehicle travel.</td>
</tr>
<tr>
<td>Transport Accident Commission</td>
<td>A statutory body who fund treatment and services for people injured in transport accidents.</td>
</tr>
<tr>
<td>VicRoads</td>
<td>Registered business name of Roads Corporation, the statutory body that manages the Victorian arterial road network, vehicle registration and driver licences</td>
</tr>
<tr>
<td>Visual acuity</td>
<td>Sharpness of vision/sight.</td>
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**Abbreviations**

- **AAA**: Australian Automobile Association
- **AAMVA**: American Association of Motor Vehicle Administrators
- **AARP**: American Association of Retired Persons
- **ABS**: Australian Bureau of Statistics
- **ADR**: Australian Design Rule
- **ALGA**: Australian Local Government Association
- **AMA**: Australian Medical Association
- **ANCAP**: Australian New Car Assessment Program
- **ARRB**: Australian Road Research Board (now ARRB Transport Research)
- **ATSB**: Australian Transport Safety Bureau
- **Austroads**: The association of Australasian road authorities
- **BTE**: Bureau of Transport Economics
- **BROEM**: A voluntary driving and health assessment course run in the Netherlands, for older drivers.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>CCMTA</td>
<td>Canadian Council of Motor Transport Administrators</td>
</tr>
<tr>
<td>CERA</td>
<td>Centre for Eye Research, University of Melbourne</td>
</tr>
<tr>
<td>COTA</td>
<td>Council on the Ageing</td>
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<tr>
<td>CTP</td>
<td>Community Transport Program</td>
</tr>
<tr>
<td>DADHC</td>
<td>Department of Ageing, Disability and Home Care (New South Wales)</td>
</tr>
<tr>
<td>DETR</td>
<td>Department of Transport, Environment and the Regions (United Kingdom)</td>
</tr>
<tr>
<td>DHS</td>
<td>Department of Human Services</td>
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<tr>
<td>DOI</td>
<td>Department of Infrastructure</td>
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<tr>
<td>DRL</td>
<td>Daytime Running Lamps</td>
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<tr>
<td>DTUPA</td>
<td>Department of Transport, Urban Planning and the Arts (South Australia)</td>
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<tr>
<td>ECE</td>
<td>Economic Commission for Europe (United Nations)</td>
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<tr>
<td>ECMT</td>
<td>European Conference of Ministers of Transport</td>
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<tr>
<td>EPAMD</td>
<td>Electronic Personal Assistance Mobility Devices</td>
</tr>
<tr>
<td>ETSC</td>
<td>European Transport Safety Council</td>
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<tr>
<td>FCAI</td>
<td>Federated Chamber of Automotive Industries</td>
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<tr>
<td>FHWA</td>
<td>Federal Highways Administration (USA)</td>
</tr>
<tr>
<td>FORS</td>
<td>Federal Office of Road Safety (now ATSB)</td>
</tr>
<tr>
<td>GP</td>
<td>General Practitioner</td>
</tr>
<tr>
<td>GRIMPS</td>
<td>Gross impairment screening tests which assess physical, visual and cognitive functions</td>
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<tr>
<td>HACC</td>
<td>Home and Community Care</td>
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<tr>
<td>ITN</td>
<td>Independent Transportation Network</td>
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<tr>
<td>ITS</td>
<td>Intelligent Transport System</td>
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<tr>
<td>LGPro</td>
<td>Local Government Professionals (Victoria)</td>
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<tr>
<td>LTSA</td>
<td>Land Transport Safety Authority, (New Zealand)</td>
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<tr>
<td>MAA</td>
<td>Motor Accidents Authority (New South Wales)</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>MAV</td>
<td>Municipal Association of Victoria</td>
</tr>
<tr>
<td>MAVIS</td>
<td>Mobility Advice and Vehicle Information Service (United Kingdom)</td>
</tr>
<tr>
<td>MMSE</td>
<td>Mini Mental State Examination</td>
</tr>
<tr>
<td>MPTP</td>
<td>Multi-Purpose Taxi Program</td>
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<tr>
<td>MSD</td>
<td>Melbourne Statistical Division</td>
</tr>
<tr>
<td>MUARC</td>
<td>Accident Research Centre, Monash University</td>
</tr>
<tr>
<td>NARI</td>
<td>National Ageing Research Institute, University of Melbourne</td>
</tr>
<tr>
<td>NCAP</td>
<td>New Car Assessment Program (Europe)</td>
</tr>
<tr>
<td>NHTSA</td>
<td>National Highway Transport Safety Authority (USA)</td>
</tr>
<tr>
<td>NRMA</td>
<td>National Roads and Motorists’ Association (New South Wales)</td>
</tr>
<tr>
<td>NRTC</td>
<td>National Road Transport Commission (now National Transport Commission)</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>PACTS</td>
<td>Parliamentary Advisory Council for Transport Safety, United Kingdom</td>
</tr>
<tr>
<td>RACV</td>
<td>Royal Automobile Club of Victoria Ltd</td>
</tr>
<tr>
<td>REAAA</td>
<td>Road Engineering Association of Asia and Australasia</td>
</tr>
<tr>
<td>RTA</td>
<td>Roads and Traffic Authority (New South Wales)</td>
</tr>
<tr>
<td>SAGE</td>
<td>Safer Driving with Age, Gloucestershire, United Kingdom</td>
</tr>
<tr>
<td>UCSR</td>
<td>Used Car Safety Rating</td>
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<tr>
<td>UFV</td>
<td>Useful Field of View</td>
</tr>
<tr>
<td>VATS</td>
<td>Victorian Activity and Transport Survey</td>
</tr>
<tr>
<td>VIFM</td>
<td>Victorian Institute of Forensic Medicine</td>
</tr>
<tr>
<td>VIP</td>
<td>Vision Improvement Project</td>
</tr>
<tr>
<td>VTI</td>
<td>Swedish National Road and Transport Research Institute</td>
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<tr>
<td>4WD</td>
<td>Four Wheel Drive</td>
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Setting the Scene

Introduction

The terms of reference for this inquiry in the 54th Parliament began with the preamble:

The Victorian Government recognises that many older road users continue to drive and use Victoria’s roads safely for many years. However, changes associated with the ageing process may affect the safety of some older users of the road network.

As Victoria’s population ages it is important that the Government and the Parliament seek ways of maximising the continued safety and mobility of older road users.

This posed the first challenge – how does society balance the mobility needs of the older community with continued, if not increasing safety on our roads.

This debate was widespread in the community, as was evidenced by the divergent responses the Committee received in submissions, and heard at public hearings.

Who is an Older Person?

The other challenge the Committee had to address is the question of who is an older person. At what age is a person considered ‘old’? Again, the responses varied greatly.

The Committee found a range of interpretations in both the submissions and programs for older people. At the lower end of the scale, Victoria Police believe 50 years an appropriate definition for ‘older’. VicRoads and the Transport Accident Commission (TAC) both used 65 years and the Royal Automobile Club of Victoria (RACV) Ltd 60 years. Mr W. Frith, Manager, Research and Statistics at the Land Transport Safety Authority, New Zealand deemed 80 years as an appropriate definition as did some occupational therapists who regard older as meaning people in their eighties.
The Committee decided to consider the ageing process rather than a specific age, as proposed in the terms of reference on the previous page, where mention is made to ‘changes associated with the ageing process’.

As society expects people to work longer and be more active, researchers and policy-makers are attempting to replace the definition of an older person from an age group to the concept of a functioning age. The problem the Committee faced with this concept is how it should be measured, at what cost and with what investment of time and professional resources.²

The Committee noted that the Government formed a Ministerial Advisory Council of Senior Victorians to advise it on issues affecting senior Victorians, that is those 60 years and over. For consistency, the Committee chose 60 years as the minimum age for information about older road users, though most of the statistics were for 65 years and older.

**Aims of the Inquiry**

The Committee considers that the principal aim of the Inquiry is to improve road safety for all, while maximising the mobility of older road users.

Removing the driving licences of older drivers assessed as unsafe can be very distressful. Negative consequences such as decreased mobility, feelings of isolation and depression and potential higher safety risks on alternative modes of transport, have been reported. However, the safety of other road users must not be compromised.

At issue is community risk management and how best to achieve the lowest possible road trauma in Victoria. The challenge in implementing new measures, however, is to limit the adverse personal consequences on mobility and general well-being of the older person at minimal additional costs to the community.

Ultimately safety is the key issue.

**Reason for Conducting the Inquiry**

The ageing of the population is now a significant policy issue for government, both nationally and at a state level, with considerable implications for the workforce, health and social welfare systems. Consequently, the road safety and mobility implications are a growing concern.
Road Safety and Mobility

In December 1997 the Family and Community Development Committee of the Victorian Parliament tabled the report on the Inquiry into Planning for Positive Ageing. This report contained a number of recommendations relating to the mobility of older people, especially concerning public and community transport.\(^3\)

In May 2002, the Government’s approach to senior Victorians and an ageing population was outlined in a Ministerial Statement The Age To Be.\(^4\)

Following research into crashes involving older people by the then Federal Office of Road Safety in 1995 and 1996, the association of Australian and New Zealand road transport and traffic authorities – known as Austroads – and its member organisations, have increasingly been researching older road user issues.\(^5\)

The Victorian Government road safety strategy Arrive Alive includes older road users as one of the 17 challenges to be addressed over the five year period 2002 to 2007.\(^6\) The strategy builds upon internationally significant research and policy development of 1986 and throughout the 1990s by VicRoads and the Accident Research Centre, Monash University (MUARC).\(^7\)

### Conduct of the Inquiry

#### Discussion Paper

On 3 December 2001, the Committee published a Discussion Paper entitled Improving Safety for Older Road Users, and a brochure publicising the inquiry and inviting submissions. The brochure was distributed to more than 2,000 organisations associated with older citizens. In addition to providing background information on the terms of reference, the paper posed 71 questions and issues for consideration. The Discussion Paper was distributed to the key organisations and those who requested a copy.

#### Submissions and Hearings

This report is based on evidence received through written submissions, extensive public hearings, private briefings and site visits. This process for gathering evidence occurred over the course of two Parliaments and has consequently involved two Committees.

The Terms of Reference were advertised in the major daily metropolitan newspapers and one national paper in December 2001. The Committee also sought submissions from relevant Government departments, key stakeholders, health professionals and community groups. One hundred and eighty-three submissions were received in response to invitations and advertisements, see Appendix A.
A number of briefings, site visits and presentations were held in 2001 and throughout 2002. Between May and August 2002, formal public hearings were held to hear from organisations and individuals. The Committee also went to Brisbane in July 2002 to be briefed by experts.

Following the commencement of the 55th Parliament, the newly established Committee sought and obtained release of all evidence received under the previous Parliament. In addition, the Committee agreed to seek updated written submissions from individuals and organisations that had previously contributed to the Inquiry. Forty-nine submissions were received, including nine new ones and 40 amendments to their previous submission. See Appendix A.

Between April and June 2003 the Committee held ten briefings by key organisations and in July undertook a site visit to a retirement home. In June 2003 the Committee held hearings in Sydney with the relevant organisations from that state. Appendix B lists the witnesses who appeared before the Committee.

**Inspection Tour**

The terms of reference in the 54th Parliament requested the Committee report must reflect international knowledge and a study tour was undertaken in July 2001. Information was obtained from 63 representatives of police, driver licensing, road safety and academic authorities in the Netherlands, Sweden, the United Kingdom, United States of America and Canada. Discussions were also held with European and international organisations in Brussels and Paris. See Appendix B.

**Conference**

The Committee recognises that a formal public hearing process is not necessarily the best way of obtaining the viewpoints of members of the community. A two-day *Mobility & Safety of Older People Conference*, with international keynote speakers was conducted in Melbourne, 26–27 August 2002, in conjunction with the Australian College of Road Safety. A report on the *Transcript of Proceedings, Mobility & Safety of Older People Conference*, was published in October 2002.
Impact of an Ageing Population

In common with the rest of Australia and member countries of the Organisation for Economic Co-operation and Development (OECD), the population distribution of Victoria is ageing as a consequence of the:

- Ageing of the ‘baby boomers’, that is, people born between 1946 and 1964;
- Increased life expectancies;
- Decline in the birth rates since the 1960s.\(^9\)

The Australian Bureau of Statistics (ABS) has produced a number of projections for future population growth and age distributions based on various assumptions regarding natural population growth and net migration.\(^{10}\) Figure 1.1 shows the change in the estimated number of people aged 60 years and over and 80 years and over until 2031. While the numbers over 60 years almost double, the greatest percentage growth is in the 80 year and older group.

![Figure 1.1. Number of People Aged 60 Years and Over and 80 Years and Over](image)

Source: Department of Infrastructure, Submission to the Inquiry, June 2002, p. 4

The Committee was advised that the ageing population is expected to be increasingly located in the fringe suburbs of metropolitan Melbourne and throughout the rural areas of Victoria.\(^{11}\)

Household Composition and Living Arrangements

Changes in population numbers and their locations are factors in determining the future travel needs of older Victorians. A key determinant of travel behaviour is household composition and living arrangements. Nineteen ninety-six ABS Population Census information
about the living arrangements of older Victorians shows that, for those aged 85 years or more, around two-thirds were still living in private dwellings and about one third were living alone.\(^\text{12}\)

Continuation of current trends in low birth rates, high divorce/relationship separation rates, and the geographical dispersion of families could lead to much higher cases of future older Victorians with no local family support to enable them to live independently. Other forms of community support for the elderly will increasingly be needed.

Health and Fitness

Poorer health and disability increase with age. Health surveys conducted in 1995 and 1998, quoted in the VicRoads submission, showed:

- 21% of 65 years old and over Victorians require assistance with transport, rising to nearly 40% for those over 85 years, including seven per cent of those identified as not having a disability;
- 90% of persons over 65 years had suffered at least one illness and even higher proportions had taken health actions such as visiting a doctor, or taking medications during the preceding fortnight;\(^\text{13}\) and
- Nearly 100,000 Australians are restricted in their everyday activities by dementia or Alzheimer’s disease.\(^\text{14}\)

Travel Patterns of the Ageing Population

For all road users the major determinants of travel patterns are access to transport and travel purpose. Possession of a driver’s licence and access to a vehicle are key determinants of travel as a driver.\(^\text{15}\)

Driver Licensing Rates

The proportion of the older population with a driving licence continues to increase, with currently 75% of those over 65 years holding a licence.\(^\text{16}\) Numbers are expected to continue to increase, especially for women.

Based on the current high licensing rates for younger drivers it is estimated that licensing rates among those aged 65 years or more will increase from 84% for males in 1996, to 99% in 2031. For females the figures rise from 44% in 1996 to an estimated 94% in 2031.\(^\text{17}\)
Growth in Number of Trips

VicRoads, in their submission, quote travel patterns in Victoria from studies conducted. They identified a significant increase in the average number of trips by the elderly. In general, for Melbourne residents, the further the elderly live from the centre of the city, the more trips they make and the further they travel as a driver.  

Older females now travel a greater distance per day than in the past, though their average number of trips per day, as a driver, are still well below those of males. Average car driver trips by males 65 years and over range from about 1.5 per day in the inner metropolitan area to two in the outer metropolitan area. For women drivers of the same age the comparable figures are 1.3 and 1.2 trips per day.

Travel Purpose

In Victoria, trends and changes in travel patterns by various age and gender groups since 1993 can be obtained from the Victorian Activity and Travel Survey (VATS), though currently most data only relate to Melbourne. These surveys show that travel as a car passenger is an important transport mode for the elderly, especially females. This becomes more important as age increases.

Figure 1.2. Main Purposes of Car Passenger Trips for Ages 50 – 64 Years

Source: VicRoads, submission, Figure 1.9a, p. 12, based on VATS data 1994-96.
Figures 1.2, 1.3 and 1.4 provide an illustration of the main purposes of car passenger trips for the age groups 50-64 years, 65-79 years and 80 years and over. Shopping is the main purpose for all these groups, particularly for females. Social trips are also important for both sexes.21

Travel Mode and Time of Travel

Information on the mode, or type, of travel by older Victorians shows that there are differences throughout Victoria. Older rural residents are more likely to drive and less likely to use public transport, or walk or cycle, than older Melbourne residents.22

Older people also have quite different travel time patterns to other age groups. For example, while young males make about a quarter of their trips at night, males over 65 years make only about seven per cent of their trips at night.23
Car travel by older Victorians occurs typically on weekdays, in the morning and outside peak hours.

A report published in 2001 by an OECD Working Group, *Ageing and Transport: Mobility Needs and Safety Issues*, provides a synopsis of travel patterns across the OECD nations for societies that are ageing. The report states:

- Older people continue to have travel needs after retirement, although their needs may change;
- The car is expected to remain the dominant mode of transport because of the expected increase in the number of licensed older drivers, particularly women;
- Currently older people make fewer journeys, largely due to reductions in the number of work journeys. As age increases, the average length of journeys decreases. The number of journeys made for non-work activities remains almost constant to age 75 years and decreases thereafter. The average length of journeys also drops with age.24

### Future Generations of Older Road Users

Travel patterns of older road users may change when the generation who grew up with cars and licences from early teenage years become older. Many current older road users did not have access to motor vehicles at a young age and in some cases still do not have cars or licences. How travel patterns will change with a generation of lifetime automobile mobility is unknown.

The OECD report concluded that future cohorts of older people are likely to be healthier and more active than current ones. However the report did not specifically consider the long term health implications of the growing levels of obesity now common in many western societies.25 In any case, due to the increase in the absolute number of people in the older age groups the overall incidence of disability and other health difficulties is likely to increase in future decades. This has direct implications for mobility and safety.

The increasing number of older road users and the increasing number of people likely to be affected by medical conditions, has the potential to lead to an increase in road trauma in the future. While the next chapter will show that current older drivers do not represent a high proportion of the overall road toll, the future situation with a much larger number of older people is unknown.

It became obvious to the Committee when conducting its inquiry, that the composition of older road users will be vastly different from the older people a generation from now. Consequently, in formulating its
recommendations the Committee decided to deal separately – where possible – with the road safety and mobility needs of both current, and future groups of older road users.

### Cost of Crashes

Based on 1996 figures, the Bureau of Transport Economics (BTE) calculated the cost to the Australian community of a fatal injury at $1.5m and a serious injury at $325,000.26

On this basis VicRoads estimate that the average annual cost of road trauma to the Victorian community is in excess of $2.5b. With 18.6% of fatalities, and 6.6% of non-fatal injuries being road users over 65 years of age, VicRoads estimate the cost of road trauma at over $300 million, or 12% of total, per annum.27

A 1994 Older Road User Crashes report by MUARC used TAC claims data from the late 1980s showing average claim values for younger (17-64 years) and older (65 years and over) casualties.28 Older drivers had an average total claim cost roughly two-thirds of that of younger drivers, mainly because of fewer ‘loss of earnings’ claims.29 Drivers aged 65 and over comprised approximately five per cent of the total cost of trauma to all drivers. Older pedestrians represented approximately 14% of the total cost of pedestrian trauma.30

### Financial and Economic Considerations

The Committee observed that submissions and witnesses provided little information on the financial costs to individuals or government, or to the implications of the various proposals.

The lack of evidence meant the Committee was unable to determine the most economical approaches to improving the safety and mobility of older road users.

No benefit-cost calculations were available to guide the Committee in determining the most effective strategies for achieving safety and mobility goals.
Summary of Findings

- The Victorian population is ageing and the number of people in the older age groups will increase rapidly in future decades.
- The proportion of the older population with a driving licence will continue to increase, particularly for women.
- Older rural residents are more likely to drive and less likely to use public transport, cycle or walk than older Melbourne residents.
- Travel patterns of older people may change, as the generation who grew up with cars and licences from their teenage years becomes older.

Endnotes


11 VicRoads, Submission, pp. 6-9.
12 ibid., p. 9.
13 ibid., p. 10.
15 VicRoads, Submission, op. cit., p. 10.
16 VicRoads, Correspondence, 10 July 2003, Worksheet 3; and Australian Bureau of Statistics, Population by Age and Sex, Australian States and Territories, Catalogue no 3201.0, 27 March 2003.
17 VicRoads, Submission, op. cit., p. 10.
18 ibid.
19 ibid., p. 11.
20 ibid.
21 ibid., p. 12.
22 ibid., p. 13.
23 ibid., p. 17.
24 OECD, op. cit., pp. 34-35.
25 ibid., p. 25.
26 VicRoads, Submission, op. cit., p. 23.
27 ibid.
29 ibid., p. 70.
30 ibid., pp. 39, 57.
Road Crashes and Risks

Interpreting Crash Risk

In recent years the number of people who die annually from road crashes in Victoria has averaged 400. Each year about 6,500 people are seriously injured and approximately 17,000 suffer minor injuries, in an average of 17,500 reported casualty crashes.\(^1\)

Crash risk is the statistical probability of a crash, or crash outcome, relative to some measure of exposure to that risk. For example, road crash numbers are typically expressed relative to the size of a population group, the number of licence holders, per trip, or per distance travelled.

While population size is a reasonable basis for estimating pedestrian crash risk, the number of licensed drivers is a poor basis for calculating crash risk of older drivers. In Victoria, anecdotal evidence shows that a considerable number of older persons holding licences, either have not driven for a considerable period of time, or travel only very short distances.

A better risk exposure measure uses annual kilometres of travel, although even here there are problems in realistically comparing completely different modes or patterns of travel. A particular problem in interpreting the crash risk for older drivers is that they tend to have quite different travel patterns compared to younger drivers.

There are also different ways of considering travel risk. One is to look at the type of road, another to look at conditions of travel.

At the Mobility & Safety of Older People Conference, held in Melbourne in August 2002, Professor L. Hakamiès-Blomqvist, Director of Research at the Swedish National Road and Transport Research Institute, put the viewpoint that older drivers undertake a higher proportion of their driving on local streets and through intersections – which are a hazard to them – and much less travel on freeways, which are the safest class of roads to travel on. So in terms of road type, a higher proportion of their limited amount of travel is on the less safe types of road.\(^2\)
However, older drivers are less likely to spend time travelling in hazardous conditions, such as:

- At night, dawn or dusk;
- In wet or icy conditions;
- In peak traffic periods;
- On country roads, outside of towns;

As a result, a risk exposure measure based on an apparently neutral measure of vehicle kilometres, can give potentially misleading interpretations when travel patterns are quite different.

### Reported Crashes

Crash statistics in Victoria are based on crashes reported to police which involve casualties, that is, resulting in fatalities (where death occurs within 30 days), serious injury (where a person is admitted to hospital) or minor injury. In Victoria, a crash resulting only in property damage to vehicles is not required to be reported to police unless an owner is not present, such as a crash involving a parked car. This differs from most other states and the Committee considers it a flaw of the data gathered.

### Fatalities Excluded from Statistics

Those whom the Coroner determines died in a vehicle – prior to a crash – from natural causes, such as a heart attack or stroke, are excluded from Victorian road crash statistics. However crash statistics do include any other persons killed or injured in the subsequent crash.

Victoria Police reported that 19 drivers 50 years or over who became fatalities in 2001, were not included in the official road toll statistics because:

15 deaths were caused by heart attacks, there was 1 death due to brain haemorrhage, 1 death due to suicide, 1 death off road and 1 driver died outside the 30-day period.³

In 2002 eleven drivers were not included in the official road toll as six died of heart attacks and five crashes were defined as ‘off road’.⁴

In the context of the relatively small number of older driver fatalities, the exclusion of deaths resulting mainly from medical episodes, is significant, as each incident represents a potential serious hazard for other road users.
Crash Information

The Committee encountered problems obtaining appropriate up-to-date Victorian statistics. This is partly due to relevant crash data not being collected and partly due to the way the statistics are currently presented.

As an example, the Road Safety Committee’s Discussion Paper quoted statistics for the ten years, 1990 to 2000; VicRoads in their submission, used data from the financial years 1996/97 to 2000/01; the Royal Automobile Club of Victoria (RACV) Ltd. and the Transport Accident Commission (TAC) both presented data from 1996 to 2000 in their submissions; and the Victoria Police in their submission provided information for the calendar year 2001.

The Oldest Age Group Reported

The conclusions drawn from crash data depend very much on the definition of age groups. As an example, the TAC originally provided data for drivers 65 years and over as one group. However, following a request from the Committee, they provided statistics for drivers broken down into the age-groups, 65-74 and 75 years plus.
Figure 2.1a.  Driver Fatal Claims per 10,000 Licence Holders for Crashes Occurring in 2000

![Driver Fatal Claims per 10,000 Licence Holders for Crashes Occurring in 2000](image)

Figure 2.1b.  Driver Fatal Claims per 10,000 Licence Holders for Crashes Occurring in 2000 (65+ divided)

![Driver Fatal Claims per 10,000 Licence Holders for Crashes Occurring in 2000 (65+ divided)](image)

Source: TAC submission and correspondence of 19 June 2002.

Figure 2.1a shows driver fatality claims per 10,000 licence holders in each age group for crashes occurring in 2000. The large proportion of claims for the 75 years and over group, not obvious in the first diagram, become apparent when the 65 plus age group is divided into two sub-groups in Figure 2.1b.

Anglican Aged Care Services, in their submission recommended to the Committee, statistics for the 65 years and over age group need to be refined further into five-year categories.  

As the older population increases, the Committee considers it is vital that accurate data be collated, monitored and interpreted to determine best policies. It is time to consider the statistics by breaking them down into smaller age brackets, similar to those collected for novice drivers.

VicRoads, in their proposal to monitor the crash involvement of older drivers and pedestrians, also promote such a breakdown:
... particularly with regard to the 70-74, 75-79, 80-84, 85-89 and 90+ age groups to detect any emerging trends.6

The Committee concluded that there is a need for refined age-related road crash statistics.

Recommendation

1. That age-related road crash statistics be monitored and categorised by smaller sub-sets of age groups.

Fatalities by Age Group

In 2002 there were 397 fatalities of which 79, or nearly 20 per cent, were aged 60 years and over. As approximately 17% of the Victorian population is 60 years and over, older road users were slightly over-represented in the road fatalities on a population basis in that year.

When looking at a five year trend, however, those aged over 60 years comprised 23% of road fatalities.7

Figure 2.2 shows the annual average fatalities in Victoria, over five financial years by age group, derived from statistics provided by VicRoads. While the proportion and number of fatalities in the older age groups are not high, they become more significant when compared to the population of those age groups for pedestrians, or the distance travelled for drivers.8

Figure 2.2. Annual Average Road Fatalities by Age Group

Source: Derived from VicRoads, submission, Fig 2.1, p. 21. The numbers have been converted to an annual average value.
Fatalities by Road User Category

When examined by major road user type, the age distribution patterns differ. Figures 2.3, 2.4 and 2.5 are for drivers, passengers and pedestrians respectively.

**Figure 2.3.** Annual Average Driver Fatalities by Age Group  

![Graph showing annual average driver fatalities by age group for July 1996 to June 2001.](source: Derived from VicRoads Fig 2.7, p. 25.)

**Figure 2.4.** Annual Average Passenger Fatalities by Age Group  

![Graph showing annual average passenger fatalities by age group for July 1996 to June 2001.](source: Derived from VicRoads Fig 2.9, p. 26.)
Comparison of the three graphs shows that older people account for a disproportionate share of pedestrian casualties. Those aged 65 years and over represent approximately 35% of pedestrian fatalities.9

Pedestrians also represent a higher portion of road user fatalities in the oldest age groups, than in younger age groups.

Severity of Crashes

It is a characteristic of road crashes worldwide that older road users, relative to younger people, are more highly represented in fatalities and serious injuries than in minor injuries.

TAC claim records for crashes in 2002 show that those aged 65 years and over, account for 18% of fatal claims, 16% of claims involving at least one day in hospital and nine per cent of minor injury claims. The severity is worse for those aged 75 years and over, as shown in Table 2.1.

<table>
<thead>
<tr>
<th>Type of crash</th>
<th>Percent of Claim Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Group</td>
<td>0-25</td>
</tr>
<tr>
<td>Fatal</td>
<td>37%</td>
</tr>
<tr>
<td>Hospitalised &gt;1day</td>
<td>31%</td>
</tr>
<tr>
<td>Minor</td>
<td>38%</td>
</tr>
</tbody>
</table>

Source: TAC correspondence, 27 May 2003, Table 1.
Comparison of Fatalities and Serious Injuries

Table 2.2 provides a breakdown, over a five year period, of older road user fatalities and serious injuries for 60-74 year olds and 75 years and over groups. It shows that:

- Driver, passenger and particularly pedestrian fatalities are much higher in the older group. Pedestrians comprise 40% of the fatalities of those aged 75 years and over; and

- The number of serious injuries is lower for the older group, especially for drivers and passengers.

The RACV, in their submission, suggests the reason for lower serious injuries amongst the older road users:

… may be due to the heightened frailty of aged persons and their increased likelihood of being killed (rather than injured) given involvement in a crash.

The interpretation of increased frailty of older people is an important factor in understanding crash severity patterns.

Table 2.2. Average Annual Older Road User Fatalities & Serious Injuries by Age Group, 1996 to 2000

<table>
<thead>
<tr>
<th>Age Group</th>
<th>60-74</th>
<th>75+</th>
<th>60-74</th>
<th>75+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver</td>
<td>14</td>
<td>20</td>
<td>272</td>
<td>134</td>
</tr>
<tr>
<td>Passenger</td>
<td>8</td>
<td>12</td>
<td>115</td>
<td>63</td>
</tr>
<tr>
<td>Pedestrian</td>
<td>9</td>
<td>22</td>
<td>83</td>
<td>71</td>
</tr>
<tr>
<td>Motorcyclist</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Cyclist</td>
<td>1</td>
<td>1</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>55</td>
<td>490</td>
<td>272</td>
</tr>
</tbody>
</table>

Source: RACV submission Tables 1 & 2, pp. 15-16 converted to annual averages.

A recent Australian Transport Safety Bureau (ATSB) publication on motorcycle safety shows that motorcycle use by those aged over 40 years is increasing and that the number of older motorcycle fatalities is also increasing. In terms of risk of fatality the ATSB state:
There is a significant increase in fatality rates above the 55 to 59 year group. In terms of fatalities per 100 million kilometres travelled, motorcycle riders 60 to 64 years recorded a rate of 11.0 and motorcycle riders 65 years and over recorded a rate of 26.8. This increase in risk of the oldest motorcycle riders is likely to be due, at least in part, to an increase in their vulnerability to serious injury in the event of a crash.12

The Victoria Police also acknowledged a trend towards higher crash involvement of middle aged motorcyclists.13

### Where Do Crashes Occur?

Almost all the crash statistics provided in the submission by VicRoads were for the whole of Victoria. In order to understand where crashes were occurring, the Committee sought statistics from VicRoads separating major provincial cities from the Melbourne Statistical Division (MSD) and the rest of Victoria.14

### Drivers

Statistics for drivers aged 65 years and over for the period 1997 to 2001 showed:

- 39% of fatal crashes and 20% of serious injury crashes were on country roads;
- 14% of fatal crashes and 15% of serious injury crashes were in provincial cities and towns;
- A slightly higher proportion of fatal and serious injury crashes occurred in the MSD and provincial cities and towns, than for drivers aged less than 65 years;
- 47% of fatal crashes were in the MSD compared to 42% for younger drivers. For provincial cities and towns the numbers were 14% and 9% respectively. For serious injury crashes both age groups had 65% of their crashes in the MSD, but older drivers had 16% of their serious injury crashes in provincial cities and towns compared to 10% of younger drivers;15
- 64% of all casualty crashes occurred at intersections, compared with 54% for drivers aged less than 65 years. At 35%, there was a higher proportion of all casualty crashes at cross-intersections for drivers over 65 years, than for those younger than age 65 years, and to a lesser extent at T-intersections (27% to 24%);16 and
- A higher proportion of crashes with another vehicle (83%) than for drivers less than 65 years of age (69%).17
TAC data also shows that older drivers are more likely to be involved in multiple vehicle crashes and intersection crashes. The proportion of these types of crashes also increase with age, as shown in Table 2.3.

**Table 2.3. Percentage of Fatal and Hospitalised Claims for Drivers Involved in Multiple Vehicle and Intersection Crashes Occurring in 2002**

<table>
<thead>
<tr>
<th>Type of crash</th>
<th>Percent of Claim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age Group</td>
<td>16-25 26-54 55-64 65-74 75+</td>
</tr>
<tr>
<td>Multiple vehicle</td>
<td>43% 54% 66% 63% 72%</td>
</tr>
<tr>
<td>Intersection</td>
<td>14% 21% 29% 33% 43%</td>
</tr>
</tbody>
</table>

Source: TAC Correspondence, 27 May 2003, Table 2.

**Pedestrians**

Table 2.4 shows the casualty numbers and rates per 1,000 people for pedestrians in the 65-74 year and 75 year and over age groups in parts of the MSD and rural Victoria.

**Table 2.4. Annual Average Pedestrian Casualty Numbers and Rates, 1996 to 2000**

<table>
<thead>
<tr>
<th>Area</th>
<th>Number</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>65-74</td>
<td>75+</td>
</tr>
<tr>
<td></td>
<td>65-74</td>
<td>75+</td>
</tr>
<tr>
<td>Inner Melbourne</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>Middle Melbourne</td>
<td>48</td>
<td>60</td>
</tr>
<tr>
<td>Outer Melbourne</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>Fringes of Melbourne</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>17</td>
<td>26</td>
</tr>
</tbody>
</table>

Source: Derived from VicRoads, pp. 32-34.

As few rural pedestrian crashes occur outside of built-up areas, the relatively high rate of rural pedestrian casualty figures are likely to be dominated by crashes in provincial cities, towns and hamlets. The data suggests that the two main areas for concern for the safety of the older pedestrians are middle Melbourne suburbs and the built-up parts of rural Victoria.
When Do Crashes Occur?

Drivers

A report by the Accident Research Centre, Monash University (MUARC), *Older Road User Crashes*, in 1994 analysed Victorian casualty crashes occurring between 1990 and 1992. The report found that for drivers 65 years and over involved in crashes:

- 76% of crashes of all severities occurred on weekdays;
- 81% of crashes were between 9am and 6pm; 12% from 6pm until 6am, and seven per cent between 6am – 9am.\(^{19}\)

The RACV, in their submission, provided the most current information on older drivers involved in crashes. It noted:

> Exposure data collected by the Transport Research Centre (TRC) shows that drivers aged over 65 make most of their trips between 8am and 3pm (Harris, 1997). Recent Transport Accident Commission (TAC) data shows that only 10% of fatalities involving drivers 65 years and above occurred between 6pm-6am during 1996-2001.\(^{20}\)

Pedestrians

The MUARC report on *Older Road User Crashes*, 1994, found that pedestrian crashes occurred during the day:

- 30% between 9am and noon;
- 24% between noon and 3pm;
- 24% between 3pm and 6pm;
- 14% between 6pm and 6am; and
- 8% between 6am and 9am.\(^{21}\)

An ATSB analysis of older pedestrian fatalities which occurred in Australia between 1996 – 1999 and in 2001, noted that about one third of pedestrian fatalities aged 65 years or over occurred at night, dawn or dusk.\(^{22}\)

The ATSB also noted:

> This contrasts with the fact that the majority of travel by older pedestrians occurs during daylight hours.\(^{23}\)
Weather

The extent to which poor weather was a factor at the time of a crash is not well known. The ATSB report said rain, fog or other adverse weather conditions existed in 12% of fatal older Australian pedestrian crashes between 1996 – 1999.\(^{24}\)

The 1994 MUARC study found older drivers to be over-involved in casualty crashes on dry roads, relative to those aged less than 65 years.\(^{25}\)

The Need for Research on Travel Patterns

A number of submissions recommended research into older road user crashes.\(^{26}\) The most important need according to the RACV was:

… to gather comprehensive data about older road users travel exposure.\(^{27}\)

MUARC made a similar recommendation and the Organisation for Economic Co-operation and Development (OECD) working group on Ageing and Transport: Mobility Needs and Safety Issues, identified a need for better information on travel patterns.\(^{28}\)

The Committee’s Inquiry into Rural Road Safety and Infrastructure recommended that information on the travel patterns of rural residents and travel on the rural road network be gathered by VicRoads.\(^{29}\) The Government response only supported that recommendation ‘in part’.\(^{30}\)

The Committee was disappointed with this response. A focus on older road users is now necessary. As suggested during inquiry hearings, the continuation and expansion of the Victorian Activity and Travel Survey may be a suitable means of gathering such information.\(^{31}\)

Recommendation

2. That VicRoads gather comprehensive data on older road users travel patterns and associated crash risks in metropolitan, regional and rural areas of Victoria.
Why Do Crashes Occur?

In 1995 Elliott & Shanahan Research analysed, for the then Federal Office of Road Safety (FORS), the records of 71 Australia-wide crashes that occurred in 1992, involving the fatality of a driver or passenger, aged 65 years or older.\(^\text{32}\)

Drivers

Analysis showed the most common crashes occurred as a result of the older driver ignoring the traffic control signals or signs at an intersection. The second most common cause was the driver losing control of the vehicle and colliding with an oncoming vehicle or an object off to the side of the road.\(^\text{33}\)

Other reasons included: heart attacks, drivers making errors of judgment at intersections, and driver fatigue.

Pedestrians

The 1994 MUARC data showed that pedestrians aged 65 years and over were found to be slightly more likely to be involved in crashes at cross intersections and unsignalised intersections than their younger counterparts.\(^\text{34}\)

Who Was ‘at-Fault’ in Crashes?

The Committee also realised a lack of Victorian information on who was responsible for the crash. Information from the 1995 FORS report shows that older drivers are more likely to be ‘at-fault’ in fatal road crashes. The likelihood of an older driver being responsible for a crash increases with age, as do the number of cases involving two or more vehicles. This implies more ‘innocent’ crash victims are likely to be involved.\(^\text{35}\)

The Committee was surprised that Victorian agencies did not address the issue of crash responsibility in their submissions. When questioned on this topic, VicRoads stated:

VicRoads crash data does not attribute fault to persons involved in road crashes, and consequently no information on this can be provided.\(^\text{36}\)
Drivers

Two updated Victoria Police submissions did, however, provide information showing that in 2001 drivers aged 60 years and over caused 19 fatalities to other people, and in 2002 the figure was 22. The figures for the age and type of road user for these two years have been combined and are shown in Table 2.5. Most of the fatalities were passengers, though it is not stated whether they were in the offending driver’s car or in other vehicles.

In Sydney, the Committee heard from the Roads and Traffic Authority (RTA) who suggest that approximately 80% of the passenger fatalities were in the vehicle driven by the older driver.

Table 2.5. Road Users Killed by Age of Offending Driver, 1 January 2001 to 31 December 2002

<table>
<thead>
<tr>
<th>Road User</th>
<th>60-69</th>
<th>70-79</th>
<th>80 yrs +</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Passenger</td>
<td>11</td>
<td>11</td>
<td>7</td>
<td>29</td>
</tr>
<tr>
<td>Pedestrian</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Motorcyclist</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>14</td>
<td>8</td>
<td>41</td>
</tr>
</tbody>
</table>


The 1995 FORS report showed the analysis of road fatalities in Australia and noted the percentage of drivers responsible for a fatal crash. The report showed:

- The rate of driver responsibility for the crash was nearly 70% for those up to 19 years of age, falling to just over 40% in the 45 – 49 year age group, increasing steadily to 65% in the 75 – 79 year age group, then rising to 85% for those aged 80 years and over.

- Multiple vehicle crashes showed the most distinctive increase in responsibility with age, compared with single vehicle and pedestrian crashes. Forty per cent of drivers aged 45 – 49 were responsible for multiple vehicle fatal crashes in which they were involved, whereas drivers aged over 80 years were responsible for 85% of such crashes in which they were involved.

- Relatively few older drivers had an illegal blood alcohol content compared to younger drivers.
• The relative rate of responsibility for crashes of older drivers was much higher for night-time fatalities than for daytime. In the 80 – 85 year group, the older driver was 16 times more likely to be responsible for a night-time fatality than the 45 – 49 age group. For daytime fatalities they were eight times more likely to be responsible for the crash then the 45 – 49 age group.\textsuperscript{39}

The authors of the FORS report, Elliott & Shanahan, quote overseas studies that found:

Older drivers are also typically involved in accidents in which they fail to yield the right of way, make improper turns and disregard traffic signals.\textsuperscript{40}

Pedestrians

The ATSB recently concluded that the primary responsibility for older pedestrian fatalities was fully attributable to the pedestrian in 72\% of cases, and partly attributable to the pedestrian in 14\% of cases.\textsuperscript{41}

Need for Research on Crash Responsibility

Unlike fatal crashes, no statistics were available to the Committee on driver or pedestrian responsibility for crashes resulting in injuries or property damage. MUARC, in their submission, note that Victoria Police data is limited and fails to provide detailed information regarding the causes of crashes.\textsuperscript{42} One MUARC recommendation was for detailed in-depth studies of older driver crashes, to gain a better understanding of crash responsibility and events leading to crashes.\textsuperscript{43}

The Committee also noted the lack of crash responsibility data published in Victoria and considers this limits the understanding of the factors causing road crashes.

Recommendation

3. That government agencies investigate, record and publish, statistics on the responsibility of all types of crashes for all age groups.
Trends

Fluctuations in the road toll from year to year make determining trends difficult. Figure 2.6 shows the number of drivers aged 65 years and over, killed on Victorian roads over the past 14 years. From 1996 there appears to be an upward trend with major variation from year to year.

Figure 2.6. Driver Fatalities in Victoria, 65 Years and Over, 1989-2002

VicRoads examined the data for the period 1991 – 2000 for fatalities, serious injuries and total road casualties for road users aged 65 years and over. The most distinctive features were:

- A marginally statistically significant downward trend in older pedestrian fatalities – there was a 10% probability that the downward trend was due to chance;\(^4\) and

- A rise in serious driver injuries and the number of total driver casualties. Figures of annual serious injuries of drivers aged 65 years and over increased from 240 in 1991 to almost 350 in 2000. For all older driver casualties, the increase was from 720 to 1,100.\(^4\)

VicRoads explanation of the rise in driver casualties is that it may be due to more older drivers and higher driver licensing rates amongst this age group.\(^4\)
Why are Crashes so Severe on Older Road Users?

When a crash has occurred, a number of factors affect the severity of the crash impact for older road users. These include the frailty of older people, post-crash medical treatment, the type of crash and the road and traffic environment.

Fragility/Frailty

According to VicRoads the increased fragility/frailty associated with ageing is seen as a more significant contributor to risk of fatality or serious injury than impaired driving or walking ability, even though these factors also contribute to increased crash involvement.47

The Insurance Institute for Highway Safety in the United States state that the fragility of drivers aged 60 and older accounts for 60 to 90 per cent of their additional risk of dying.48

VicRoads and RACV, in their submissions mentioned the concept of a ‘fragility index’ to try to compare the outcomes of a particular crash on people of different ages.49 Figure 2.7 reproduces a fragility risk ratio bar chart for American drivers, included in the submission by the RACV.

Figure 2.7. American Driver Fragility Index by Age Group

MUARC, in their submission, state that at least half of the additional fatality risk of pedestrians aged 75 years or more can be attributed to frailty.50 Their submission also states that age-related differences in specific injury outcomes in crashes remain a largely unknown factor.51

Figure 2.8 shows a 1996 graph of involvement in serious injury crashes of drivers in Australia, relative to distance travelled and adjusted for older driver fragility (described in this table as vulnerability).
Even when frailty is taken into account, older drivers are still over-involved in crashes.\textsuperscript{52}

It should be noted that the travel exposure estimates for the older age groups used in Figure 2.8 are based on limited data and consequently the relationship is indicative rather than mathematically precise. The way of adjusting for fragility is also not clearly defined, however the Committee considers that the general trend is a useful guide.

Road and Traffic Environment

Older people tend to travel more in daytime and in off-peak travel conditions. Travelling in daytime is safer than travelling at night, dawn or dusk, however, off-peak travel in built-up areas holds certain hazards for older people, such as:

- Higher average vehicle speeds because of less traffic congestion; and

- Restricted sight distance due to more parked cars on arterial roads.

These influences can result in both more crashes and more severe consequences.
Interstate Comparisons

In 1986, Ms S. Torpey, Policy Analyst from the then Road Traffic Authority (now VicRoads) reported a comparison of older driver casualty crash rates across Australian jurisdictions, based on data from 1981 to 1983. This showed that the Victorian crash rates per head of population in that period were very similar to those in New South Wales, South Australia and Western Australia and lower than the crash rates in Queensland and Tasmania.

At that time Victoria had the lowest crash rate per number of licences issued, despite the lack of mandatory age-based health or licence assessments.

Torpey’s study is widely reported in international research literature and has often been quoted by those opposed to mandatory age-based measures. However it also has its critics. For example the Optometrists Association Australia (Victorian Division) Inc., in their submission, state:

… the Torpey analysis … is a unifactoral study that does not take into account other issues such as road conditions, types of trips and environmental factors.

A whole range of factors may affect inter-jurisdictional crash rate comparisons, including annual kilometres travelled by drivers. This 1986 study did not conclusively prove that older driver crash rate differences were solely due to older driver licensing practices.

Recently MUARC, on behalf of VicRoads, undertook two studies comparing interstate practices. While the studies compared crash results for drivers aged 65 years of age and over, in five yearly increments, VicRoads in their submission focused on the results from drivers aged 80 years and above for serious casualty data 1994 – 1998:

- For fatal crash involvement on a per-population basis, Victorian drivers were at least as well performed as drivers from all other States, with the exception of NSW. However the differences were generally not statistically significant.

- For fatal crash involvement rates on a per-licensing basis, Victorian drivers were consistently better performed than their counterparts in all other States. Again, the differences were generally not statistically significant.

- Victorian drivers aged 80 years and older had lower serious injury crash involvement rates per population than drivers from all other States, although these differences were generally not statistically significant.

- Victorian drivers aged 80 years and older had lower serious injury crash involvement rates per licensed driver than drivers from all other States. For all States except Tasmania, the differences were statistically significant.
For the more recent all casualty crash data for Victoria and New South Wales 1998-2000:

- on a per-population basis, NSW older drivers (over 80 years of age) have a lower overall crash involvement rate than Victorian drivers (and the difference is of borderline statistical significance);

- on a per-licensing basis, NSW older drivers have a higher overall crash involvement rate than Victorian drivers (and the difference is of high statistical significance).54

Two of the diagrams in the VicRoads submission, showing the results of the MUARC analyses, are reproduced in Figures 2.9 and 2.10.

Figure 2.9 shows the 1994 to 1998 fatal crash rates, on both a population and licence basis, for drivers aged 80 years and over in five states, relative to those for Victoria.

**Figure 2.9. Serious Injury Crash Rates for Older Drivers (80 years of age and older) in Other Australian States, Relative to Victoria, 1994 – 1998**

![Figure 2.9](image)


Figure 2.10 shows the all casualty driver crash rates, during 1998 and 2000, again on both a population and licence holding basis, for New South Wales relative to Victoria using two age criteria. VicRoads observe that the nine per cent lower crash rate on a population basis in New South Wales for the 80 years and over criteria was marginally significant.55
In interpreting these results VicRoads comment that some of the numbers involved in the analyses were small and therefore likely to be subject to chance fluctuations.

Comparisons based on per-population and per-licence rates may also be influenced by other underlying differences between the jurisdictions. There is anecdotal evidence to suggest that in Victoria, some older people retain their driving licences but rarely if ever drive, hence the ‘per-licence’ comparisons do not take different active-driver levels into account.\(^\text{56}\)

The Committee agrees with VicRoads, who state in their submission:

> Conclusions drawn from the current set of analyses would be strengthened by further research that develops a third level of comparison, based on the distances driven by older drivers in each jurisdiction. This would provide some measure of the extent of self-regulation, and its impact on exposure to crash risk.\(^\text{57}\)

Over time, various road safety benchmarks show Victoria to have much lower overall road crash rates than other jurisdictions, though in recent times this has diminished. In comparison with New South Wales, various measures of crash rates have shown Victoria to be 10% to 25% safer.\(^\text{58}\) Likely factors include a higher proportion of the state population living in an urbanised environment and a higher proportion of travel on freeways and other high standard roads.

The Committee is of the opinion though, that to be marginally safer than other states is not a very strong argument in support of maintaining the status quo in terms of older driver licensing arrangements.
The Committee concludes that it is unwise to compare Victoria with other jurisdictions until the true extent of driving by older Victorian licence holders can be determined, and then develop crash risk measures based on distance travelled by older drivers.

Recommendation

4. That VicRoads undertake research to improve the reliability of crash rate information by:
   - Determining the number of licence holders who drive by the various age groups; and
   - Developing crash risk measures based on the annual distances travelled by those groups.

Property Damage Only Crashes

In many circumstances, whether a crash results in a casualty or property damage only, can be a matter of chance. The difference between these two however, is that property damage crashes are more numerous than casualty crashes and can therefore provide more insight into the reasons why and where crashes occurred.

Although many property damage crashes are reported to police, they are not recorded in the VicRoads crash database. The Committee considers this is a significant deficiency in Victorian crash information.

The RACV provided information on comprehensive insurance claims made to their insurance company from 1994 to 1998. The data included casualty and property damage only crashes. Though not necessarily representative of all the crashes involving drivers in Victoria, the information does provide some useful insights into crash patterns. Among the relevant findings is that:

- Drivers aged 60 to 80 years, were involved in a higher proportion of property damage crashes than for casualty crashes; and
- Drivers aged 71 years or more were over-represented in intersection crashes.\(^{59}\)

The Committee does note, that in it’s response to the *Report of the Inquiry into Rural Road Safety and Infrastructure*, the Government announced a research project into the costs and benefits of using property damage crash data for potential blackspot analysis.\(^{60}\)

Other States collect data about a wider range of crash severities than Victoria. For example, New South Wales has adopted Australian Road Rule 287(3) which requires crashes to be reported if, among other things, one vehicle is towed away. The Committee estimates that adoption of this criteria would likely add data about 10,000 additional
crashes, approximately 60% more than the 17,500 casualty crashes currently reported. Victoria has a centralised tow truck allocation system for road crashes, therefore it would appear the agencies could collect the data with minimal change to the system. Furthermore, the Committee is aware that this data was collected in the past.

The Committee supports the reintroduction of reporting road crashes involving only property damage and the recording of this data in crash databases.

**Recommendation**

5. That in order to provide more insight into why and where crashes occur, crashes involving only property damage, in which a vehicle is towed away, be reported to Victoria Police and recorded in VicRoads crash databases.

**The Future Road Toll**

The impact of the future growth and ageing of the population, on the magnitude and composition of the future road toll, will be significant in developing strategies and allocating resources.

In 2000 American researchers published, *Projecting Fatalities in Crashes Involving Older Drivers, 2000-2025*, reporting a projection of the crash numbers for future generations of older drivers taking into account driving behaviour, population migration, personal wealth and health, infrastructure and technological impacts. 61

Projections using the American methodology, have recently been made for Australia by MUARC and are shown in Table 2.6. 62 These predict an overall three-fold increase in fatal crashes involving older drivers, without further road safety interventions. In 1995 there were 121 driver fatalities over 65 years in Australia and this is expected to increase to 341 in 2025, an overall increase of 281%. 63 The table shows projections of both male and female fatalities and the different composition of the main contributing factors for each gender – these contributing factors are assumed to apply equally to the American and Australian situations over the same 30 year period.
Table 2.6. Predicted Increase in Driver Fatalities Aged 65 Years and Over, Australia, 1995-2025

<table>
<thead>
<tr>
<th>Number of Fatalities</th>
<th>Contributing Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% ↑ nos.</td>
</tr>
<tr>
<td>Male</td>
<td>87</td>
</tr>
<tr>
<td>Female</td>
<td>34</td>
</tr>
<tr>
<td>Total</td>
<td>121</td>
</tr>
</tbody>
</table>


Based on the MUARC data, the Committee estimated that fatalities of drivers aged 65 years and over might increase from 28 per annum in the mid-1990s to approximately 80 per annum in 2025.

It should be noted that MUARC made no specific allowance for possible overall lower crash numbers, given an expected decrease in numbers of the other high risk groups – teenagers and young adults – nor for the impact of new and on-going road safety initiatives. Nor did MUARC use Australian data for the four different contributing factors for each gender.

In mid-2001 the Department of Environment, Transport and the Regions in the United Kingdom, published a detailed forecast of older driver casualties and crashes to 2025. Importantly, the mathematical modelling included factors to allow for the impact of on-going and future road safety initiatives.

Based on a continuation of current trends in demography, road crashes and the implementation of road safety measures, the projection for the year 2025 pointed to a slight reduction in the numbers killed or seriously injured, in the United Kingdom, for all those aged over 60 years. There were significant variations by age group, gender and type of road user.64

More detailed quantitative modelling of the number and consequences of future older driver crashes in Victoria, both fatal and non-fatal, along the lines of the UK approach, would better guide the choice of road safety initiatives. It would be prudent if projections were also made for passenger and pedestrian casualties.
Summary of Findings

- People aged 60 years and over make up about 17% of Victoria’s population, and approximately 20% of fatalities. Transport Accident Commission data shows 16% of hospitalisation claims and nine per cent of minor injury claims are for people over 65 years. Only some of this over-representation in the more serious road trauma is due to their frailty.

- In 85% of fatal crashes involving a driver 80 years or older, the driver was considered to be responsible. Australian data shows that, beyond middle age, driver responsibility increases with age.

- Older people account for a disproportionate share of pedestrian casualties, with those aged 65 years and over representing approximately 35% of pedestrian fatalities.

- The number of older drivers involved in casualty crashes has risen over the past ten years and to a greater extent than the rise in numbers of older Victorians or the numbers of older licence holders. Annual serious injuries of drivers aged 65 years and over increased from 240 in 1991, to almost 350 in 2000.

- Older drivers are involved in a higher proportion of intersection crashes, usually because they fail to give way. They are, however, less likely to be involved in risk-taking behaviour such as speeding, unsafe overtaking and drink-driving.

- Crash injuries involving older people are generally more severe than for younger people, not only due to their frailty, but also due to where and when they travel and the type or manner of crash.

- In the next 20-30 years a marked increase in older road user death and injury is likely because of the ageing of the population, an increase in the number of older people driving – particularly females – physical frailty of older people; increased travel per annum and per kilometre travelled, of the very oldest drivers.

- Improvements are needed in the way in which the data of older road user crashes are recorded and published, analyses of crash risks undertaken and information published about who was ‘at-fault’ for the crashes.
Recommendations

1. That age-related road crash statistics be monitored and categorised by smaller sub-sets of age groups.

2. That VicRoads gather comprehensive data on older road users travel patterns and associated crash risks in metropolitan, regional and rural areas of Victoria.

3. That government agencies investigate, record and publish, statistics on the responsibility of all types of crashes for all age groups.

4. That VicRoads undertake research to improve the reliability of crash rate information by:
   - Determining the number of licence holders who drive by the various age groups; and
   - Developing crash risk measures based on the annual distances travelled by those groups.

5. That in order to provide more insight into why and where crashes occur crashes involving only property damage, in which a vehicle is towed away, be reported to Victoria Police and recorded in VicRoads crash databases.

Endnotes


3 Victoria Police, Submission to the Inquiry, 2 August 2002, p. 3.

4 Victoria Police, Revised Submission to the Inquiry, 19 May 2003, p. 3.

5 Anglican Aged Care Services, Submission to the Inquiry, 7 March 2002, p. 2.

6 VicRoads, Submission to the Inquiry, April 2002, p. 70.


9 ibid., p. 21.
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10 RACV, Submission to the Inquiry, March 2002, p. 15.

11 ibid.


13 Victoria Police, op. cit., p. 6.

14 VicRoads, Correspondence, 29 August 2002.

15 ibid., pp.2-3.

16 ibid., p. 4.

17 Ibid., p.5.

18 VicRoads, Submission, op. cit., pp. 32-34.

19 Fildes, B, Corben, B, Kent, S, Oxley, J, Le, T.M and Ryan, P, Older Road User Crashes, op. cit., p. 54.

20 RACV, Submission, op. cit., p. 19.

21 Fildes, B, et al., Older Road User Crashes, op. cit., p. 68.

22 Australian Transport Safety Bureau (ATSB), Commonwealth Department of Transport and Regional Services, Road fatalities among older pedestrians, Monograph 13, Canberra, December 2002, p. 3.

23 ibid.

24 ibid., p. 4.


31 Dr J. Morris, Transport Research, RMIT University, Minutes of Evidence, 17 June 2002, pp. 88.


33 ibid., p. 53.

34 Fildes, B, et al., Older Road User Crashes op. cit., p. xi.
Road Safety for Older Road Users


37 Victoria Police, op. cit., pp. 4-5.

38 Mr A, Graham, Roads and Traffic Authority, NSW, Notes of Discussion, 24 June, p. 19.


40 ibid., p. 14.

41 ATSB, Commonwealth Department of Transport and Regional Development, *Road fatalities among older pedestrians*, op. cit., p. 2.

42 MUARC, Submission, op. cit., p. 10.

43 ibid., p. 13.

44 VicRoads, Submission, op. cit., p. 23.

45 ibid., pp.24-25.

46 ibid.

47 ibid., p. 34.

48 RACV, Submission, op. cit., p. 17.


50 MUARC, Submission, op. cit., p. 20.

51 ibid., p. 12.

52 ibid., p. 17; VicRoads, Submission, op. cit., p.35.

53 Optometrists Association Australia (Victorian Division), Submission to the Inquiry, February 2002, p. 21.

54 VicRoads, Submission, op. cit., p. 69.

55 ibid., p. 66.

56 ibid., p. 69.

57 ibid.

58 ATSB, Commonwealth Department of Transport and Regional Development, *International Road Safety Comparisons. The 2000 Report* shows Victoria has a 10% lower rate for fatalities per head of population, a 25% lower rate for fatalities per number of registered vehicles and a 27% lower rate for fatalities per kilometres travelled compared to NSW, pp. 8, 12, 16.


63 MUARC, Submission, op. cit., p. 5.

Health Issues for Older People

Ageing and Mobility

Submissions and evidence presented to the Committee highlighted mobility as being crucial for the well-being of older people. Social isolation can lead to increased health issues, in particular depression, so it is important that older people maintain as much mobility for as long as possible.

The challenge for the Committee is to determine what is safe mobility and how to minimise crash risk. Unfortunately when deliberating the issues, the Committee found little statistical evidence on which to base its analyses and decisions.

A report published by the Organisation for Economic Co-operation and Development (OECD) in 2001, *Ageing and Transport: Mobility Needs and Safety Issues*, notes that the mobility of older people may be progressively impaired by general physical changes experienced in the ageing process. Significant issues for road safety are the loss of agility, flexibility and endurance, reduced sight, cardio-respiratory capacity, postural mechanisms and deteriorating balance.¹

In the case of pedestrians, these factors lead to slower walking, shorter steps and precautions to maintain balance. Reduced neck flexibility can make it difficult for older people to move their head to look around before, or while, crossing the road to ensure that it is safe.²

Similar functional deficits can affect driving. In addition, older drivers need strength to control the steering wheel, press foot pedals, activate turn indicators and adjust other vehicle controls.

Pedestrians and Age-Related Changes

As mentioned, a substantial proportion of the over-involvement of older pedestrians in serious injury crashes is simply due to their increased fragility (frailty) and consequent vulnerability to injury.³
Common age-related declines for pedestrians include:

- Slower walking speeds;
- Longer times required to process information;
- Longer times spent interpreting uncertain or ambiguous situations;
- Slower decision-making;
- Inefficient and inappropriate scanning and visual search of the traffic environment; and
- Difficulties estimating vehicle distance and speed, especially at dusk and darkness.⁴

In summary, with regard to normal ageing, research shows that:

... the road-crossing task places overwhelming demands on attentional and cognitive resources of the oldest pedestrians. In a complex road environment with approaching traffic, it seems that reduced ability to attend to, integrate and process many different sources of information could reduce the ability to respond safely to approaching traffic.⁵

Almost all people take for granted their walking skills, yet as VicRoads state in their submission:

... safe road crossing requires adequate visual, auditory, perceptual and cognitive functioning to make a safe decision. Physical agility is also of obvious importance, particularly the ability to adjust walking pace, execute actions quickly when faced with traffic emergencies and to maintain postural stability. Good motor performance depends upon the ability to coordinate movements with changing visual inputs and when interacting with fast moving traffic.⁶

Driving and Age-Related Changes

In 1994, Dr M. Janke, a researcher with California Department of Motor Vehicles conducted a literature review and found that ‘normal ageing’ generally reduces or slows down sensation, perception, cognition, psychomotor response and physical functioning.⁷

In the report, Safety of Older Drivers: Strategy for Future Research and Action Initiatives, published in 1997, Professor B. Fildes, Professorial Fellow of the Accident Research Centre, Monash University (MUARC) suggests that most, if not all, older adults suffer some, usually minor, measure of disability in at least some of the following sub-areas:
• Visual acuity
• Contrast sensitivity
• Visual field loss
• Dark adaptation and glare recovery
• Auditory capacity
• Perceptual performance
• Motion perception
• Attention capacity
• Cognitive processing ability
• Decision time deterioration
• Loss of memory capacity
• Neuromuscular and strength loss
• Postural control and gait changes
• Reaction time.

Professor Fildes concluded that:

Of relevance to older drivers is how these diminished skills affect their driving abilities and here there is very little that seems to be widely accepted in the literature.

**Ageing and Crash Risks**

**Pedestrians**

MUARC in their submission, note that research into the issues of older pedestrians has often been overlooked. Similarly, VicRoads note that:

For older pedestrians, we can only speculate about the association between medical conditions and pedestrian crash involvement. While it is highly possible that all risk factors identified for older drivers are applicable to older pedestrians, these associations still need to be substantiated.

Dr J. Oxley, Research Fellow, MUARC, has found that the oldest and slowest walkers appear to experience difficulty adapting their judgment of a safe gap in the traffic to their slower walking ability. She and her colleagues have also identified links between physical agility, attentional and cognitive abilities and crash risk:
• Slower walkers made more ‘incorrect’ (or unsafe) crossing decisions than faster walkers did. This finding suggests that slower walkers experience difficulty in adjusting behaviour to suit changing abilities.13

• Participants who performed poorly on tests of visual search, attention and cognitive skill were more likely to make an ‘incorrect’ (or unsafe) crossing response.14

VicRoads notes that the issue of older pedestrians demands particular attention because of the high risks faced by older people when walking. Their submission quotes research by British consultant, Dr C. Mitchell, which shows that for older pedestrians in the United Kingdom, the risk of a fatality per journey is even greater than the fatality risk for older drivers.15 Data from New Zealand shows similar results:

The data show that for 80-plus year-olds, a walk of 1 km will incur, on average, 3 casualties per million such trips, but only 0.3 casualties if the same trips were driven (Frith, 2001).16

Drivers

MUARC research found that older drivers and pedestrians are over-represented in serious casualty crash statistics for the similar broad reasons:

• Increased body frailty and vulnerability to injury when a crash occurs;

• Decline in ability, considered as part of normal ageing, affecting walking, decision-making and visual abilities; and

• The onset of specific medical or health-related conditions which have severe functional implications for walking or driving.17

Both MUARC and VicRoads concur that the same factors used to explain older drivers’ crash risks, namely normal ageing and specific health conditions, are pertinent for pedestrians and other vulnerable road users such as cyclists and motorcyclists.18

Medical Conditions and Pedestrian Safety

VicRoads, in their submission, note that physical agility is of great importance when crossing the road and conditions that restrict agility can further increase crash risk. Arthritis is a common condition among older people and a leading cause of disability. It affects approximately one in every two people over 65 years in Australia.19 Dr M. Janke, reported in 1994 that arthritis restricts range of motion, particularly joint
motion, reduces physical endurance and strength, and causes pain and fatigue, all of which can act to increase crash risk.\textsuperscript{20}

Arthritis can also reduce walking speed and the ability to adjust walking pace to suit traffic conditions. It inhibits free head movement making it difficult for a person to centre their vision in the direction of traffic in order to detect the presence of a vehicle, its distance and speed.\textsuperscript{21}

However, MUARC states there is not enough evidence known about medical conditions and pedestrians:

There are various other conditions that have been associated with increased crash risk for older drivers, which can also affect the safety of older pedestrians. However, there is very little empirical evidence to clearly establish these links.

In most instances, the association between various conditions and pedestrian risk relies upon prima facie evidence. For example, given the important role vision plays in performing daily activities, detecting potential hazards, in maintaining balance and enabling ambulation, ocular conditions are likely to have a profound effect on an older person’s ability to walk safely in complex traffic situations. Likewise, dementia has been identified as a risk factor in driving. While it is likely that there are active older pedestrians with dementia and it is most likely that this condition would have some negative impact on their safety, there is no research that clearly associates dementia with increased pedestrian crash risk.\textsuperscript{22}

In addition, a large number of older people are taking medication that frequently affects their ability to walk safely. As pedestrians, this adds complications by potentially further slowing decision-making processes and crossing of the road.

**Medical Conditions and Driver Crash Risk**

In the 1997 MUARC report, *Safety of Older Drivers: Strategy for Future Research and Action Initiatives*, Professor Fildes compiled an extensive list of age-related medical conditions that threatened the continuation of safe driving. Only a few could be empirically linked to increased crash risk and invariably the association was only moderate. Table 3.1 lists the risk factors where:

- There is some evidence to support an association with crash involvement; and

- There is no, or conflicting evidence to support an association with crash involvement.
Table 3.1. Risk Factors Associated with Crash Involvement

<table>
<thead>
<tr>
<th>Conditions &amp; evidence of crash risk</th>
<th>Conditions &amp; conflicting evidence of crash risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dynamic visual acuity</td>
<td>• Static visual acuity</td>
</tr>
<tr>
<td>• Dementia</td>
<td>• Age-related eye diseases – cataract, macular degeneration, glaucoma and diabetic retinopathy</td>
</tr>
<tr>
<td>• Diabetes (hyperglycaemia)</td>
<td>• Cognitive processing generally</td>
</tr>
<tr>
<td></td>
<td>• Cardiovascular conditions</td>
</tr>
<tr>
<td></td>
<td>• Cerebrovascular conditions</td>
</tr>
<tr>
<td></td>
<td>• Arthritis</td>
</tr>
<tr>
<td></td>
<td>• Polypharmacy</td>
</tr>
</tbody>
</table>


In 1999, Safe Mobility for Older People: Notebook, published by the National Highway Traffic Safety Administration (NHTSA) in the United States, epidemiology research and driving or functional assessment tests were reviewed. From this, an extensive listing of medical conditions that have demonstrable crash risks was collated.

One of the key sources was research from the State of Utah, published in 1998, which looked at driver crash rates for eleven functional ability categories. This study is significant because it compares crash risk and functional ability within the same general driver population, enabling better comparison of the driving risks of the listed medical conditions. The study also sought to determine the levels at which risk increases or decreases.

The research looked at the relative crash risks, during a number of years in the mid-1990s, for:

• Drivers with a specified condition and fully licensed;

• Drivers with a specified condition and with a restricted licence; and

• Drivers without medical conditions, matched by age, sex and county of residence.
VicRoads in their submission, contain a table summarising the results of the Utah study, and conclude that:

Fully-licensed drivers with learning, memory or communication difficulties at a low level had 2.49 times the risk of being in a crash relative to healthy control drivers and 3.57 times the risk of being in a crash for which they were deemed responsible.27

The Committee ranked the eleven functional ability categories in order of the relative risk for all crashes for unrestricted drivers. ‘Motor Impairment’ was excluded as it was not deemed to be statistically significant and the ‘alcohol and drugs’ group was considered to be too broad for inclusion. The order is shown in Table 3.2. The table also includes the relative risk for ‘at-fault’ crashes, the ranking of which was very similar to the relative crash risk.

**Table 3.2. Relative Crash Risks from Utah Study 1992 – 1996**

<table>
<thead>
<tr>
<th>Functional ability Category</th>
<th>Relative Crash Risk</th>
<th>Relative risk for at-fault crashes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive disorders</td>
<td>2.49</td>
<td>3.57</td>
</tr>
<tr>
<td>Epilepsy</td>
<td>1.81</td>
<td>2.11</td>
</tr>
<tr>
<td>Neurologic</td>
<td>1.67</td>
<td>2.27</td>
</tr>
<tr>
<td>Muscularskeletal abnormality</td>
<td>1.66</td>
<td>1.92</td>
</tr>
<tr>
<td>Psychiatric</td>
<td>1.65</td>
<td>1.96</td>
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<tr>
<td>Visual acuity</td>
<td>1.49</td>
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<td>Diabetes, etc</td>
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<tr>
<td>Pulmonary</td>
<td>1.25</td>
<td>1.35</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>1.14</td>
<td>1.15</td>
</tr>
</tbody>
</table>

Source: Derived from Table 7, VicRoads submission, p. 122.

The relatively high probability of cognitive difficulties and crash risk and responsibility, compared to other functional abilities, is quite clear.
The 1999, *Safe Mobility for Older People: Notebook*, listed another set of medical conditions associated with an increased crash risk. The conditions with a statistically significant association included:

- Presence of cataracts
- Glaucoma
- Diabetes
- Foot abnormalities
- Falls
- Cardiac conditions
- Recurrent back pain
- Bursitis
- Renal disease
- Use of anti-depressant drugs.

VicRoads, in their submission, note the comprehensive review of past and current research undertaken by the Canadian gerontologist, Dr. B. Dobbs in 2001, to examine the effects various medical conditions may have on driving performance. She identified a number of medical conditions that could serve as ‘red flags’ to indicate that a person’s ability to drive safely may be compromised and should be further assessed. Appendix C provides a summary of the results.

Dr Dobbs found some medical conditions have a statistically significant greater crash risk, the highest being poor visual contrast sensitivity with a relative risk of 5.78 if both eyes were impaired.

The NHTSA *Safe Mobility for Older People: Notebook*, and the research by Dr Dobbs have substantially extended the number of conditions demonstrably associated with higher crash risk. While VicRoads interpret the magnitude of the relationships as often being ‘modest’, the evidence is cause for concern and warrants further investigation.

### Functional Abilities Required for Safe Mobility

VicRoads in their submission, state that Dr Janke’s 1994 research could not positively identify, by empirical evidence alone, medical conditions that affect driving.

Despite this, all the reviews point to three categories of functional abilities required for safe mobility:

1. Sensory – such as vision and hearing;
2. Cognitive – such as memory and being able to process information and make appropriate decisions; and
3. Physical – muscle strength and co-ordination, stamina, flexibility and susceptibility to sudden medical episodes such as heart attacks or strokes.
The OECD report, *Ageing and Transport: Mobility Needs and Safety Issues*, states:

The percentage of older people with varying levels of sensory, cognitive or motor disabilities, associated or not with a specific pathology, increases with age.34

### Sensory Abilities

#### Hearing

The OECD report further states:

Hearing impairment increases with age. This may cause difficulties in discriminating and localising the sound produced by approaching vehicle, especially in situations characterised by high background noise.35

#### Vision

Visual defects are very common in the general population. The Optometrists Association of Australia (Victorian Division) Inc., state in their submission:

Around 47 per cent of the population report sight disorders, many of whom need to wear glasses to see clearly (ABS 1996) and around two per cent suffer from visual impairment … defined as less than [legal] driving vision that is not corrected with spectacles.36

Vision defects also increase rapidly with age. A literature review by the Department of Transport, Local Government and the Regions (DTLR) in the United Kingdom showed, that for every decade after 25 years of age, people need twice the brightness at night to receive visual information:

… hence by age 75 some drivers may need 32 times the brightness they did at age 25. This information has important implications for illumination of signs and junctions in particular.37
The review identified two different types of changes in the ageing eye:

- The first, transmissive and accommodative power, beginning between the ages of 35 and 45. This affects distance vision, sensitivity to glare, binocular depth perception and colour sensitivity.

- The second concerns the retina and nervous system and begins between 55 and 65 years and affects the metabolism of the retina.\textsuperscript{38}

The Centre for Eye Research Australia (CERA) at the University of Melbourne, produced, in 2001, \textit{Eye Care for the Community}. Some of the key messages relevant to this inquiry are:

- Visual impairment and blindness increases three fold with each decade of age;

- The ageing of the population will lead to a doubling in the amount of eye disease in the next 20 years;

- Visual impairment (that is, less than legal driving vision) restricts social independence and impairs physical and mental health. This affects families and the community;

- Over 80\% of vision loss is caused by five conditions: refractive error (53\%); cataract (nine per cent); diabetes (three per cent); glaucoma (five per cent) and macular degeneration (13\%);

- By age ninety, one person in ten will develop glaucoma but half of those will not know they have it;

- By age ninety, two out of three will develop macular degeneration and as a result, one in four will suffer significant loss of vision; and

- Half of visual impairment is correctable and one quarter is preventable.\textsuperscript{39}

\textbf{Vision Impairment and Road Safety}

According to the report by the OECD on \textit{Ageing and Transport: Mobility Needs and Safety Issues}, the gradual decline in visual acuity (the ability to discriminate fine detail) can lead to problems in viewing oncoming vehicles, traffic signals and signs. With increasing age, peripheral vision may also decrease and restrict perception of the traffic environment.\textsuperscript{40}
A decline in depth perception with age may affect the ability to estimate the distance of approaching vehicles. The perception of vehicles motion, which depends on estimating distances travelled and speed of travel, may become less efficient.\textsuperscript{41}

This has serious ramifications when trying to select a safe gap to enter a stream of traffic, or cross an intersection.

Research literature provides a number of lists of visual abilities that are considered necessary to drive safely. One example compiled from a United Kingdom review is shown in Table 3.3.

**Table 3.3. Visual Abilities Needed for Driving**

<table>
<thead>
<tr>
<th>Static object abilities:</th>
<th>Moving object abilities:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual acuity</td>
<td>Visual localisation</td>
</tr>
<tr>
<td>Visual acuity in poor light and dark adaptation</td>
<td>Detection and tracking of moving objects</td>
</tr>
<tr>
<td>Glare</td>
<td>Speed and distance judgements</td>
</tr>
<tr>
<td>Contact sensitivity</td>
<td>Judgement of safe gaps</td>
</tr>
<tr>
<td>Colour vision</td>
<td></td>
</tr>
<tr>
<td>Peripheral vision</td>
<td></td>
</tr>
</tbody>
</table>


The list shows there is not a clear distinction between visual and cognitive abilities. When a person involved in a crash says they did not ‘see’ something happening, it could mean they had insufficient visual abilities to do so (a ‘blind’ spot in their visual field) or, it could be that their eyes were capable of seeing the object but their brain did not recognise the object as being potentially hazardous.

Dr Ball et al from the University of Alabama states:

*Driving is a highly visual task, and thus it might be expected that the higher incidence of visual problems and eye disease in the elderly is a primary cause of their driving difficulty.*\textsuperscript{42}
Professor Owsley, Professor of Ophthalmology, Psychology and Physiological Optics, School of Medicine, University of Alabama, USA, in her research into vision impairment and driving safety found that:

Drivers with certain eye conditions reduce their driving exposure and restrict their driving to the safest times, yet there is preliminary evidence that some eye conditions increase the risk of crashes. Visual acuity is only weakly related to crash involvement, whereas peripheral vision appears to play a more critical role. Colour vision deficiency by itself is not a threat to safe driving. Based on current literature, it is unclear whether other types of visual sensory impairment have a significant impact on driving safety and performance.43

Professor H. Taylor, Director CERA, provided the Committee with the results of an epidemiologic population-based study, conducted during 1991 – 1999, of visual impairment and eye disease known as the Melbourne Vision Improvement Project (VIP).

The study incorporated an extensive eye-related questionnaire and a standard eye specialist examination of about 3,200 people aged 40 years or older in the Melbourne metropolitan area. Five years later, those who could be contacted were re-examined, with current drivers asked about their accident record in the intervening years.44

Although the CERA research found there were insufficient numbers to show a statistically significant difference in self-reported crashes in those with poor vision – as measured by the current Victorian static visual acuity test for drivers – compared to those with adequate vision, they did however:

… estimate 85,000 Victorians over the age of 40 are driving with poor vision and our data would suggest that 80% of this poor vision is due to the failure to use the correct distance glasses. In addition approximately 7% of those driving with poor vision would have normal vision restored after cataract surgery.

The frequency of poor vision increases at an astounding rate so that one third of those over the age of 80 years who are driving have poor vision.45

The Committee is concerned that so many drivers may have less than the very basic vision standard required to obtain a licence, let alone drive, but is encouraged that 87% of the poor vision could be correctable with spectacles or cataract surgery.

The Melbourne research is supported by a study conducted in the Blue Mountains by the University of Sydney, New South Wales, which found a similar increase in visual impairment with each decade of life:
In the 70-79 age group visual impairment is approaching ten per cent and in the 80-89 year group visual impairment is close to thirty per cent of the population (Van Newkirk et al 2001).

To combat the various visual problems, CERA proposes:

**Refractive Error**
All Australians test their vision on a regular basis (every four to five years); have all elderly people vision tested as part of aged-care assessment, and improve access to subsidised spectacle programs;

**Cataracts**
Promote protective behaviour (for example, stop smoking and reduce ultra-violet exposure); detect cataracts with simple tests and operations;

**Diabetic Eye Disease**
Promote awareness and bi-yearly eye examinations;

**Glaucoma**
Promote awareness about family links and regular eye test for those with a family history and those over the age of 50; and

**Macular Degeneration**
Encourage cessation of smoking and confirm the strong genetic basis for this degeneration.

**Useful Field of View Test**

The idea that driving involves simultaneously processing information from the centre and the periphery of the visual field was the basis for ophthalmologists designing a Useful Field of View (UFOV) test. Deficits in the UFOV are reported as being one of the vision impairments with a statistically significant link to involvement in road crashes.

According to Dr A. Owens, Professor of Psychology, Franklin and Marshall College in the USA:

> One promising development is the Useful Field of View (UFOV) test which assesses the span and speed of visual attention by measuring one’s ability to recognise targets that are flashed briefly in the near periphery, within about 15 degrees of fixation.

Several studies, in particular, those of Professors Owsley, Ball and McGwinn, the School of Medicine, University of Alabama at Birmingham, USA, show UFOV narrows with age and is related to heightened crash risk in older drivers.
With adjustments for age, sex, race, chronic medical condition, mental status and days driven per week, Owsley and McGwin (1999) found drivers with a 40% or greater impairment in the UFOV, were 2.2 times more likely to be in a crash in the following 3 years.\textsuperscript{50}

A commercial version of the UFOV test has been developed by Professor Owsley and associates.

The Committee noted that the test is a promising development in identifying vision ability with crash risk.

The Committee considers that on the basis of:

- The extent of poor driver vision detected in the Melbourne Vision Improvement Project;
- Overseas research on the effect of various visual conditions on road crash rates; and
- The doubling of eye disease expected in Victoria in the next two decades due to population ageing,

that a greater understanding of these issues needs to be developed in Victoria.

VicRoads should undertake research into what visual impairments affect mobility and how the various levels affect crash risk.

**Recommendation**

6. That VicRoads undertake research to better understand the crash risks for older road users associated with various types and levels of visual impairment.

**Cognitive Abilities**

Attention, reaction time and information processing ability is of significance. The report by the OECD on *Ageing and Transport: Mobility Needs and Safety Issues*, notes:

Older people may search and scan for relevant stimuli less efficiently. Further, they may have greater difficulty sorting and separating relevant from irrelevant stimuli. A general slowing in processing information and selecting and executing responses may also occur. This involves significant differences in older people’s ability to simultaneously process multiple sources of information, as in complex traffic situations or heavy traffic. While younger adults assess all relevant aspects simultaneously, older people tend to process information sequentially.\textsuperscript{51}
Cognition and Road Safety

Cognition is a key, if not the most significant health–related issue in the safety of older road users. As stated by Professor Fildes and other experts, minor cognitive decline is part of the normal ageing process but dementia, medically diagnosed or not, has a much more serious impact.

Dementia

Dementia is fast becoming a major public health issue and is likely to be an even larger health issue in the 21st century.52

There are many different types of dementia. The most common are:

- Alzheimer’s disease;
- Vascular dementia – caused by ‘mini-strokes’;
- Pick’s disease and front lobe dementia;
- Parkinson’s disease;
- Alcohol related dementia;
- AIDS related dementia; and
- Huntington’s disease.53

Based on scientific studies, the Commonwealth Government states:

About 5 per cent of people over the age of 65 years and 20 per cent of people over the age of 80 years have some form of dementia. 54

Overseas surveys estimate that almost a quarter of those over 85 years suffer a form of dementia, while at the World Alzheimer’s Congress held in Washington in July 2000, it was suggested that the rate for people over 85 years might be as high as 50%.55

According to the Alzheimer Association of Victoria, in 2001 there were an estimated 41,000 Victorians over the age of 60 years living with moderate to severe dementia. This number is expected to increase to over 65,500 people by 2021, an increase of 61%.56

Dementia results in impaired cognition and the incidence and impact increase rapidly with age, especially in the more elderly. There are no known preventative measures or cures for dementia, although this is an active area of research with the potential for major advances.57
Road Safety for Older Road Users

**Dementia and Road Safety**

The Committee queried what impact this growing public health problem might have on road safety. The Royal Automobile Club of Victoria (RACV) Ltd stated:

> With the ageing population, better health and increased longevity, dementia type illnesses are likely to increase significantly.

> Because of the variability in functional abilities and the forgetfulness that is inherent with Alzheimer’s, people with this disease are prone to driving for longer than they are safe to do so (Taylor and Tripodes, 2001). They tend to underestimate driving dangers and overestimate their driving skills. (Fildes and Jarvis, 1994).

The cognitive impairments frequently associated with dementia which impact on driving include visuo-spatial skills, attention, judgement and memory. A number of studies have shown that people with dementia, who continue to drive, have more road crashes than other drivers. A literature review in 1997 by Associate Professor D. Carr of Washington University School of Medicine, St Louis USA, concluded that for people with dementia, the risk of a crash increases with the duration of the disease and also with the male gender.

According to the Alzheimer’s Association, studies such as those by Dr A. Dobbs (1997) and Dr R. Friedland (1997), report evidence that self-initiated driving cessation cannot be assured in people with dementia. Of concern, the Association also advised that:

> … resistance to the removal of driver status is sometimes exhibited by families and carers, as well as by the person with dementia.

**Detecting Cognitive Impairment**

The affect of undiagnosed minor cognitive impairments on road safety is currently unknown. In some cases, dementia can be undetected for years because of the slow rate of cognitive decline. But a diagnosis of dementia does not mean a person ought to stop driving immediately. As yet there is no scientific or professional agreement of the level of functional ability at which licence cancellation or restriction should occur.

Minor cognitive impairment may be a contributor to some crashes reported by, or to, police that are classified as being due to inattention, failure to see, or give right of way and possibly even crashes attributable to fatigue, speeding and alcohol/drug-related causes.

During a meeting with Dr K. Johansson, Chairman of the Karolinska Institute, Traffic Medicine Centre, Huddinge University Hospital in Sweden, the Committee was informed that dementia is the greatest
factor in older driver incapacity. Memory loss is the greatest indicator of the onset of dementia, however it can take up to 15 years to be fully diagnosable and this adds to the difficulties of diagnosis.\textsuperscript{64}

The medical profession has developed a number of techniques to assess the cause and extent of dementia. One common technique is the Mini-Mental State Examination (MMSE) which measures cognitive status and is a suite of simple questions and tasks which can be undertaken in a few minutes.

Unfortunately most of the medical tests are aimed at identifying the condition or disease and selecting appropriate treatments, rather than determining the impact on functional ability, in particular to driving.

The RACV in their submission, quote Fildes et al (2000) that:

Some recent research has indicated that screening drivers for cognitive impairment may be the most effective form of detecting drivers who may be a road safety risk.\textsuperscript{65}

The Committee concluded that there is a clear need to develop an improved understanding of the effect of various types and levels of cognitive impairment on road safety.

**Recommendation**

7. That VicRoads undertake research to better understand the effects on pedestrian and driving performance and crash risk of older people who have various types and levels of cognitive impairment.

**Physical Abilities**

As mentioned, impairment in physical abilities, sometimes described as motor skills such as agility and balance, can reduce an older person’s mobility. Physical impairments may also affect driver safety.

The NHTSA *Safe Mobility for Older People: Notebook* quotes studies showing increased driver crash risk with reductions in physical flexibility and the range of motion of arm, leg and neck. Tests conducted include: being able to walk quickly or tap a foot, raise one’s arms above the shoulders and rotate the neck to look over either shoulder.\textsuperscript{66}

A study by Marottoli et al (1994) in Connecticut, USA, found a walking speed test was most strongly associated with self-reported crashes, traffic convictions or being stopped by police.\textsuperscript{67} Almost twice as many slow walkers experienced such occurrences during the year after a test as had faster walkers. Also, drivers who walked an average of less than one street block per day had almost twice the number of adverse events
compared with those who walked further than one block. Both these measures were statistically significant.

Foot tap tests also showed an association with the adverse incidents, and may be a proxy measure for the ability to move a foot from the accelerator pedal to the brake pedal.\textsuperscript{68}

A Rural Health Study in Iowa, USA by Hu et al (1998) found an older female with difficulty extending her arms above shoulder height was more than twice as likely to be involved in a crash as another female with no such difficulty, if they each drove the same distance per year.\textsuperscript{69} Another study by Sims et al (1998) found ‘at-fault’ crash-involvement was significantly associated with poor arm movement.\textsuperscript{70}

In the 1994 Marottoli et al study, limited neck movement was associated with adverse driving incidents, adjusted for driving frequency.\textsuperscript{71} The NHTSA Safe Mobility for Older People: Notebook, found in their study, subjects who could not turn their heads and upper torso to view the time on a clock placed directly behind them were 1.38 times more likely to be involved in a crash than subjects who could perform this action.\textsuperscript{72}

### Illness and Older People

#### Degrees of impact

An illness affects people and their mobility to various degrees, even two people with the same mild disease may be effected differently.

Those with a mild form of dementia may be minimally disabled, while those with a severe form may be so disabled they are completely immobile.\textsuperscript{73}

The after-effects of strokes and the affect of arthritis are other common age-related illnesses that have widely varying effects on individuals.

Cerebrovascular conditions such as strokes or mini-strokes, can be a major source of neurological disfunctioning, often leading to permanent cognitive or physical disability. The degree of disruption to normal functioning appears to be dependent on the extent of neurological deficit and age.\textsuperscript{74}

In the case of arthritis, Professor Fildes, Professorial Fellow, MUARC, states that:

> Arthritis is a common condition among older people, estimated to affect more than 50% of those over 65 years and severely in 12% ... Those with arthritis are also more likely to have other disabilities than those without.\textsuperscript{75}
While diagnosis may be relatively easy, it is far more important, yet more difficult, to determine the associated functional deficiencies and the possible impacts on a patient’s safety on the road.

Multiple Health Conditions

A number of submissions noted that people with combinations of health conditions are likely to have an overall crash risk that is greater than the sum of the risks for the individual conditions. An investigation of combinations of medical conditions and the association with physical disability amongst older people, published in 1989 by the National Center for Health Statistics in the United States, was quoted by MUARC and VicRoads in their submissions to the Committee:

Approximately 70% of those aged 80 years and older reported co-morbid [multiple] conditions and a clear, graded increase was found in the proportion of those experiencing disability with an increasing number of conditions (i.e. those with more chronic conditions experienced greater disability).

The Alzheimer’s Association also noted:

Given that the majority of people who develop dementia are over 65 years, their driving may be further compromised by the presence of other diseases or health issues (e.g. vision deficits, medications, etc).

The Committee concludes that, with multiple health conditions increasing with age, and those affected likely to be at greater risk as drivers and pedestrians, medical fitness will become increasingly important for the rapidly expanding number of more elderly Victorians.

However, as mentioned at the Mobility & Safety of Older People Conference, held in Melbourne in August 2002, keynote speaker, Professor R. Marottoli, Associate Professor of Medicine, Yale University said:

What we know relatively little about, however, is how these conditions interact with one another. As is often the case, it is seldom that one condition is so severe that it affects capability; often it is several conditions of potentially lesser severity which, taken together, affect capability, but we do not know what their manifestations are necessarily and how they interact to affect capability, and then how those conditions interact with the medications that are used to treat them or with alcohol use.
Medications

The increased incidence of illness with age means older people are more likely to take medications, and quite often, multiple medications. Though most medications are beneficial in treating health conditions and lowering the road safety risks associated with the underlying conditions, some medications can affect patients’ safety when driving or walking. This is particularly so when starting new medications, new dosage levels, or changing medications. A common side-effect is sedation.

A recent report by the U.K. DTLR, Older Drivers: A Review, stated that:

- General practitioners and other prescribers are not always aware of whether their patients drive or not and often assume, erroneously, perhaps because of their age or sex, that they do not.

- There is reliable evidence that certain prescribed drugs do increase the risk for road traffic crashes, especially for elderly drivers. For example, minor tranquillisers have an excess risk factor of 4.9 and major tranquillisers have an excess risk factor of 6.3 in the general population. These measurements would be greater in an elderly driver population due to changes in metabolism of such drugs combined with other existing limitations in driving ability.

- Polypharmacy is more common in older people and combinations of drugs need to be considered. In general, alcohol is a serious exacerbator in older people.

- Although the details of the effect of different drugs is a vast area, there are often available equivalent drugs which do not have the side effects on cognition (and driving) that others do.

Dr J. Gowan, Manager, Training and Development, Victorian Branch of the Pharmaceutical Society of Australia, stated in evidence to the Committee, that a number of improvements had been implemented by the industry to minimise the adverse effects of medications in relation to road safety. These included improved labelling and training pharmacists to advise patients about their medications.

Dr Gowan advised that:

I believe that pharmacy is now refocusing on the provision of information for the consumer rather than purely a supply of a product. The initiative of the home medication review, where we get paid $140 per review, is one instance of that. This is the first time that we have actually been paid for a cognitive service rather than being paid for a product.
Variability of Health and the Effects of Medications

The effect of medications on older people may last longer and be more variable than for younger patients. Depending on the medical condition and the extent of medication use, a person may be capable of travel on some days while unable to undertake similar travel on other days.

Similarly, an older person may fail a driving assessment one day and pass a similar assessment the next day, or vice-versa, because of the effects of health and medication variability.

The Committee therefore notes that health and medication variability has important implications for some forms of medical and driving assessment.

Interaction of Medications and Alcohol

The possible impairing effects of some medications on some patients, and the impact of small amounts of alcohol – below the current legal blood alcohol levels – may contribute to the already reduced sensory, cognitive and physical abilities of some older drivers. In 1996 the Committee, in the Inquiry into the Effects of Drugs (Other than Alcohol) on Road Safety in Victoria recommended:

That specific attention be given to research into the effects of combinations of drugs, including alcohol, on driver performance and their involvement in road crashes.

The Government supported this recommendation and the Committee is aware that drug and alcohol involvement in road crashes is being monitored. However the Committee is unaware of Victorian research into the effects on driver performance. In light of the general ageing of Victoria’s population, the Committee is of the view that the effects of combinations of medications, and of medications and low levels of alcohol consumption, on the driving performance of older people now needs to be researched.
Recommendation

8. That VicRoads undertake research to better understand the effects various types and levels of:

- Specific medical conditions;
- Multiple conditions;
- Medications; and
- Multiple medications and medications together with low levels of alcohol,

have on an older person’s walking and driving abilities.

Health Conditions and Future Generations

Further research could provide some insights into the relationship between health conditions in the older community and the incidence of road crashes and their outcomes. However, would projections based on these relationships provide a valid basis for taking particular road safety actions now?

Health, Mobility and Crash Survival

Information from the United States and Europe suggest that future cohorts of older people are likely to be healthier and more active than is currently the case.\(^85\)

The Ageing and Transport: Mobility Needs and Safety Issues, report by the OECD states that:

... at present, most men and women can expect to maintain an active, largely disability-free life up to their mid-to late 70s. For men, the onset of more severe disability is liable to occur at the end of their 70s and for women, in their early 80s.\(^86\)

Life expectancy is continuing to increase in OECD countries. The report notes that it is critical to determine whether future cohorts’ longer life span are accompanied by commensurate increases in good health, or whether longevity will merely increase the number of years of disabled living. While the data to support the extension of disability-free life are still emerging, the evidence is promising, showing a decline in the annual disability rate for older Americans. European data also shows an increase in the amount of time older people can expect to live without disability.\(^87\)

VicRoads note that these findings, in combination with advances in acute medical care, may mean that in the future older people may be
more mobile and also physically better able to survive if involved in a crash. Therefore, mobility and safety issues for future cohorts may be less significant, on a per population basis, than for the current generation.

Crash Risks

Similarly, there are suggestions the crash risks of the current elderly are lower than earlier cohorts of the same age and that such trends may persist in the future.

Professor L. Hakamies-Blomqvist, Director of Research, Swedish National Road and Transport Institute, at the Mobility & Safety of Older People Conference, in Melbourne stated there is some evidence to support the dominance of intersection crashes starts at a later age in cohorts born later.

There are major research difficulties in separating cohort effects from changes in driver demographics, vehicle fleet usage characteristics and a continually changing road infrastructure. The intersection effect referred to, could just be a reflection that, due to roadwork programs, intersections are now relatively safer places, compared to other locations, than in earlier times.

The overall message for older driver safety is mixed. VicRoads states:

On the one hand, the emerging cohorts are expected to be healthier and lead longer disability-free lives than their predecessors. On the other hand, demographic factors mean that there will be an increase in the absolute number of disabled – and hence at-risk – older drivers into the foreseeable future.

The Committee cautions that expectations of an improvement in the general health of older Victorians may not necessarily translate into lower road crash risks.

Research Needs

The relationship between medical and health conditions, medications, functional impairment and crash risk is not clear but warrants further investigation.

As has been demonstrated over the past ten years or so, additional research may increase the number of medical conditions known to be associated with increased crash risk and further refine the accuracy of those risks. However what is more important is identifying the level at which a condition adversely affects the functional abilities necessary for an individual to drive safely.
VicRoads, in their submission quote Dr M. Janke’s conclusion that:

… the main thrust of effort in testing for driving safety-related competencies in the elderly should be identification of critical visual and cognitive defects.91

This view is also supported by Professor Owsley, Professor of Ophthalmology, Psychology and Physiological Optics, School of Medicine, University of Alabama, USA, who informed the Committee that vision and visual attention cognitive problems were the most important problems for older drivers.92

While determining the levels at which all functional disabilities affect crash risk is the long term objective, the current priority should be on determining the levels at which deterioration in visual and cognitive abilities affect driving safely. Declines in these abilities have been clearly shown to increase driver crash risk. Significantly, the proportion of older people with declining vision and cognition increases very rapidly with age.

MUARC, in their submission, recommend to the Committee that research is required to determine which health and medical factors have functional consequences that affect driving and walking and whether these consequences necessarily lead to increased crash risk.93

Is it possible for an individual to compensate for functional impairment when driving. The RACV stated that:

Research to develop measures to effectively assess health related problems that affect a person’s ability to drive is needed.94

In addition to the previous recommendations focusing on vision and cognitive impairments and crash risk, the Committee considers there is a need for complementary research on the driving performance and crash risk of older people having specific medical conditions, multiple medical conditions, taking medications and taking medications and alcohol.
Summary of Findings

- Drivers and other older road users with poor vision, cognitive difficulties and some other physical and mental impairment have a higher risk of being involved and responsible for a collision. These risks can increase markedly as health deteriorates.

- The incidence and severity of health impairments increases with age, sometimes quite markedly. For example, visual impairment and blindness increase three fold with each decade of age. The incidence of various forms of dementia increases dramatically in later years, rising to approximately 25% at 85 years, with some recent expert estimates as high as 50%.

- The two main functional areas on which to concentrate research and road safety countermeasures are visual and cognitive abilities. The effects on the walking and driving performance of older people having multiple conditions, medications, multiple medications and medications with low levels of alcohol also require further research.

Recommendations

6. That VicRoads undertake research to better understand the crash risks for older road users associated with various types and levels of visual impairment.

7. That VicRoads undertake research to better understand the effects on pedestrian and driving performance and crash risk of older people who have various types and levels of cognitive impairment.

8. That VicRoads undertake research to better understand the effects various types and levels of:
   - Specific medical conditions;
   - Multiple conditions;
   - Medications; and
   - Multiple medications and medications together with low levels of alcohol,

   have on an older person’s walking and driving abilities.
Endnotes


2 ibid.

3 VicRoads, Submission to the Inquiry, April 2002, p. 43.

4 ibid., p. 45.


6 VicRoads, Submission, op. cit., p. 45.

7 ibid., p. 37.


9 ibid.

10 MUARC, Submission, op. cit., p. 20.

11 VicRoads, Submission, op. cit., p. 46.

12 MUARC, Submission, op. cit., p. 20.

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14 VicRoads, Submission, op. cit., p. 44.

15 ibid., pp. 42-43.

16 ibid., p. 43.

17 MUARC, Submission, op. cit., p. 20.

18 VicRoads, Submission, op. cit. p. 43.

19 ibid., p. 45.

20 ibid.

21 ibid., pp. 45-46.

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27 ibid., pp. 39, 122.

28 Staplin, L, et al., op cit., section 1A1(m).


30 ibid., p. 40.

31 ibid., p. 118.

32 ibid., p. 41.

33 ibid., p. 39.

34 OECD, Ageing and Transport: Mobility Needs and Safety Issues, op. cit., p. 52.

35 ibid.

36 Optometrists Association Australia (Victorian Division), Submission to the Inquiry, 28 February 2001, p. 7.


38 ibid., p. 15.

39 Centre for Eye Research Australia (CERA), University of Melbourne, Eye Care for the Community, Melbourne, September 2001, pp. 7-15.

40 OECD, Ageing and Transport: Mobility Needs and Safety Issues, op. cit., p. 52.

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44 CERA, Submission to the Inquiry, 21 March 2001, p. 3.

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Chapter 3 – Health Issues for Older People


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81 Dr J. Gowan, Pharmaceutical Society of Australia, Minutes of Evidence, 5 August 2002, pp. 126-127.

82 ibid., p. 129.

83 ibid., p. 126.


85 VicRoads, Submission, op. cit., p. 37.


87 ibid., p. 24.

88 VicRoads, Submission, op. cit., p. 37.


90 VicRoads, Submission, op. cit., pp. 41-42.

91 ibid., p. 39.


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94 RACV, Submission, op. cit., p. 23.
Health Assessments

Current Victorian Practices

The *Road Safety Act 1986* and the *Road Safety (Drivers) Regulations 1999* contain provisions related to medical fitness to drive in Victoria. Section 17 of the Act sets out the purposes of licensing, which include:

(a) to ensure that people who drive motor vehicles on highways are competent drivers, and

(b) to ensure that drivers are aware of safe driving practices and road law; and

(c) to ensure that people who are, or who become, unsuited to drive are not permitted to drive on highways.

Regulation 225 requires licence holders to notify VicRoads of any permanent or long-term injury or illnesses that may impair their ability to drive safely. Regulation 226 describes the types of test that may be required and the qualifications of persons who may conduct them.\(^1\)

At present Victorians only need to answer two simple health questions when applying for a learner permit or probationary licence, and never thereafter, though they are told when renewing their licence, that they have a legal obligation to report a medical condition.

The national medical standards for licensing and clinical management guidelines for drivers, are now contained in *Assessing Fitness to Drive for Commercial and Private Vehicle Drivers*, published by Austroads in September 2003. These guidelines combine previously separate medical guidelines for car and commercial vehicle drivers and is available to all medical practitioners and health professionals. Work is currently underway to develop an accredited on-line tutorial program about the new guidelines for general practitioners.\(^2\)

VicRoads has a process to review a driver’s medical fitness to drive. Drivers who come to the attention of VicRoads may be required to undertake an on-road driving test with a specialist VicRoads licence tester or, a specially trained occupational therapist.
Of the 3.28 million Victorian licence holders, fewer than one in 2,000 (.05%) are tested each year. There are approximately 12,840 new cases and 19,000 existing cases reviewed annually. Those aged over 65 years comprise 12.8% of the total driver population, but account for 80% of those tested.

**Notification Process**

For any form of review to be conducted, VicRoads needs to be notified of the potential risk of a driver. The notification process has several arms. Drivers can self-report to VicRoads or be reported by police, doctors or other health professionals, family or by members of the public.

**Self-Reporting**

Although licence holders are told to report any medical condition that may affect their driving, each year about 2,000 existing drivers report they have developed a medical condition and even fewer notifications are received at licence renewals.

This indicates self-reporting is largely ineffective, despite the legal requirements.

**Health Professionals**

There is no legal obligation on doctors to report patients to VicRoads, although any person who does so is immune from civil or criminal action. Doctors and other health professionals, do however, have a duty of care to ensure that unsafe drivers do not place themselves and the community at an unacceptable risk. The *Assessing Fitness to Drive for Commercial and Private Vehicle Drivers* handbook for health professionals discusses the potential conflict between public interest and patient confidentiality. According to VicRoads, around 2,000 unsolicited reports are received each year from doctors and other health professionals.

An issue of concern raised by Ms N. Gardner, in an individual submission, was that some health professionals weren’t aware whether their clients drove. Health professionals should at least find out and note the answer in their patient records.

**Police**

The Victoria Police report approximately 1,500 drivers each year for assessment, using a standard form that describes the nature of the concern and the source of the report. Reports may result from a crash, police observation of poor driving or complaints from the public.
Members of the Public

Any member of the public may report a person’s poor driving but usually reports come from family members. VicRoads state there are fewer than 500 a year reported by these sources.¹¹

Medical Assessment

When an unsafe driver is reported to VicRoads, the driver is asked to provide a medical report from a doctor, eye or other appropriate specialist.¹² The outcomes of the initial medical assessment can lead to licence withdrawal, a conditional licence, an on-road driving assessment or a requirement for on-going review. If the report shows the person meets the criteria and there is no other reason for concern, no further action is taken.

If the doctor’s recommendations are unclear, or appear to be contrary to the guidelines, then further specialist advice may be sought by VicRoads from the Victorian Institute of Forensic Medicine (VIFM).

Drivers who suffer from progressive degenerative diseases are reviewed at intervals recommended by either the national medical guidelines or their treating specialist; usually between one and five years. The reviews may require a report from the person’s doctor confirming their on-going fitness. In more complex cases specialist reports or driving assessments may be needed.¹³

On-Road Testing

VicRoads

An on-road test with a VicRoads licence tester is conducted where a driver’s apparent inability is not caused by cognitive, psychological or other medical problems. The first such test is free of charge.

VicRoads in their submission note:

There were 766 VicRoads tests conducted in the financial year 2000/2001. Of these 439 were as the result of reports from the police, 191 from doctors, 79 family or friends, 49 other sources and 8 occupational therapists. Fifty-nine percent of those tested retained their licence, some with restrictions.¹⁴

The driving test is different from the standard novice test and is conducted from the driver’s home. Before the test begins the tester discusses with the driver what their mobility needs are and the routes on which they usually travel. A short test of road law knowledge is done followed by a driving assessment on routes normally used by the driver.¹⁵
**Occupational Therapists**

Occupational therapists with specialist training and authorised by VicRoads conduct tests to evaluate a driver’s physical or cognitive abilities to drive. An assessment by an occupational therapist is always conducted where there is any doubt about a person’s cognitive functioning. The assessments can also be conducted as part of a rehabilitation program for people of any age who have been hospitalised following a stroke or other illness. VicRoads may request an assessment based on advice from a general practitioner or the VIFM.\(^{16}\)

An assessment, which includes road law as well as physical, visual, sensory and thinking abilities is conducted before the on-road test. This can take up to two hours. If the results are satisfactory an on-road test is conducted in a dual control car with a driving instructor present in the front passenger seat, and the occupational therapist in the rear seat. Some 3,300 occupational therapy tests are conducted each year.\(^{17}\)

**Appeal Mechanisms**

If a person is found to be medically unfit or fails their driving assessment their licence may be suspended indefinitely, or cancelled. If this occurs a person may apply to VicRoads to have the decision reviewed. The Manager, Registration and Licensing Policy, has the authority to conduct reviews. There were 70 internal reviews conducted in 2000, of which 55 decisions were affirmed, six revoked and nine amended.\(^{18}\)

The Magistrates’ Court is another avenue of appeal, but this is rare with only five or six completed each year. According to VicRoads only 2 appeals have been upheld since 1998.\(^{19}\)

**Concerns about the Process**

A number of submissions made comments about the current medical review process. Concerns raised by the Royal Automobile Club of Victoria (RACV) Ltd, on behalf of their members, include the:

- Length of time it takes for reviews to be completed; in some instances many months;
- Communication problems with the driver. In many cases the driver has not fully understood the process, causing stress;
- Cost of re-assessments, sometimes several hundred dollars, borne by the driver, can cause financial hardship;
- Unexpectedly low number of referrals from health professionals and concerns that some police officers reported older people too frequently;
Flaws in the process of determining whether a driver undergoes a detailed assessment by an occupational therapist or whether an on-road test with a VicRoads licence tester is sufficient. Inaccuracies can occur, especially if the driver has some cognitive impairment which may be difficult to detect in a standard medical consultation; and

Insufficient support systems to help people who have their licence cancelled to adjust to life without a car.

Other concerns raised in submissions and at hearings were of the limited availability of occupational therapists, especially in outer suburban Melbourne and rural Victoria, and the substantial difference in cost between occupational therapists' assessments and the free VicRoads driving test.

Ms Di Stefano, Lecturer, School of Occupational Therapy, La Trobe University told of long waiting periods and the almost non-existent service in rural areas from the 50 or so driver-trained occupational therapists in Victoria. Almost all such therapists work part time on driving assessments, most just a half day per week. According to lecturer Ms M. Di Stefano, the average waiting period is between six weeks and three months, during which time they cannot drive. She said:

> We have had extreme cases where, in one hospital facility, people have had to wait seven months to get an assessment.

Ms R. Lovell, Lecturer, School of Occupational Therapy, La Trobe University said that there were often shortages in Gippsland and the western region. Also:

> … there is someone in Swan Hill now but for a while there was nothing from Bendigo to Mildura. People had to travel huge distances if they had to be assessed.

The Council on the Ageing (COTA) Victoria believed that the:

> … cost of re-assessment is a major disincentive to ‘doing the right thing’.

There are discrepancies even within the public health system. A patient at one centre may only have to pay $60 whereas at another centre they may pay $160 for an assessment. Private therapists typically charge $65 per hour plus travelling time. COTA sought subsidies from government for older drivers facing occupational therapist assessment.

The Peter James Centre, an eastern metropolitan geriatric assessment clinic, recommended to the Committee that VicRoads and/or the
Transport Accident Commission (TAC) fund driving assessment services at specialist aged care centres and the cost to clients be fully or partially compensated by the Government.\textsuperscript{29}

The RACV noted that many of their members concerns could be addressed by relatively simple improvements to the current arrangements, including increasing the awareness among older people of specific health issues that could affect driving.\textsuperscript{30} Older migrant drivers, who may have difficulties understanding English, presents an issue to government that also needs to be addressed.

The School of Occupational Therapy at La Trobe University also proposed an evaluation and public education campaign of the existing medical review requirements.\textsuperscript{31}

The Committee is concerned with the Victorian requirement that all on-road tests, under the medical review process, are conducted in a driving instructor’s vehicle, to allow the driving instructor access to dual controls.

In Sydney, the Committee heard that no such requirements apply in New South Wales, in fact the Roads and Traffic Authority (RTA) encourage people to use their own vehicles.\textsuperscript{32} The Committee is of the view that allowing drivers to use their own vehicles would remove a layer of anxiety, if they are not comfortable using a driving instructor’s vehicle.

The Committee agrees with the need for an evaluation of the medical review process as it relates to older drivers.

**Alternative Medical Review Processes**

The Organisation for Economic Co-operation and Development (OECD) report, *The Ageing and Transport: Mobility Needs and Safety Issues* released 2001, described options to ensure medically unfit drivers are brought to the licensing authority’s attention.\textsuperscript{33} These are the Californian model, the Maryland model and the Australasian (Austroads) model, the latter evolving from the two American models. The Committee notes that all three models are similar to the current Victorian system in that only drivers suspected of some level of functional impairment are assessed.

**Californian Model**

The Californian model derives from two pilot studies conducted between 1993 and 1997 by the California Department of Motor Vehicles to identify the driving performance of people with age-related impairments, especially cognitive decline. It is a three-tiered method of measurement and essentially comprises:
• Brief and inexpensive screening tests to identify drivers requiring more extensive assessment;

• Some computer screen-based tests to attempt to identify those drivers who would clearly pass or fail an on-road test; and

• An on-road driving test specifically developed for impaired drivers.34

The introduction of a tiered approach to assessment, rather than assessing everyone in the same way is the prime feature of the Californian model.35 The OECD report states that:

… driver testing can be most effectively and equitably conducted by targeting those older drivers who pose discernable risks to others.36

In 2001, preparations were underway in California for a field trial at five licensing offices which will collect data from drivers of all ages to determine the feasibility of the model.37 The trials are likely to include vision screening for contrast sensitivity and use of a checklist by licensing staff to observe possible signs of driver impairment.

Maryland Model

The Maryland model, developed by a multidisciplinary group of professionals, targets those drivers considered to be at risk of unsafe driving, irrespective of age. Those drivers referred for assessment have to complete a medical health questionnaire and have their medical provider send a detailed report to the Medical Advisory Board of the Motor Vehicle Administration. Like the current Victorian model, a referral may come from family, friend, concerned citizen, or professional groups.

In addition, drivers undertake eleven gross impairment screening tests (GRIMPS) which assess physical, visual and cognitive functions. A Medical Advisory Board physician reviews the results and may require an additional interview to make a final judgment of fitness to drive.38

According to the OECD report, the Maryland model only assesses drivers suspected of being substantially functionally impaired.39

Austroads Model

In 1998 Austroads commenced work on developing a model licensing re-assessment procedure, drawing on the California and Maryland work. They commissioned the Accident Research Centre, Monash University (MUARC) to undertake the research. The report prepared by MUARC stated that the most effective method of detecting and removing impaired drivers from the roads was to adopt the 'referral' process where unsafe drivers are reported to licensing authorities by various sources,
followed by an evaluation to determine the extent of assessment required of each driver.40

The Austroads model is presented in Figure 4.1. MUARC in their submission, state the key elements of the model are:

- Older driver testing is based on functional ability rather than chronological age;
- Development of a network of community reference sources;
- Use of a three-tiered assessment procedure, incorporating valid referral tools, screening tests and in-depth assessment tools;
- Use of a case manager to assist older people through the process; and
- Use of re-training and rehabilitation procedures and the expansion of the licensing agency’s role to include advising drivers about alternative transport options if they need to stop driving.41

The RACV, VicRoads, MUARC and COTA all support the model and advocate a trial in Victoria. While not opposing such a trial, the Committee has concerns about the effectiveness and financial viability of the proposed model. Issues include:

- The identification process appears to be the weakest link in the proposed Austroads model. The referred model is very similar to the current reporting system in Victoria. The Committee has been shown no evidence that the current referral process is effective.
- A feature of the model is the introduction of case managers. The Committee is concerned whether VicRoads could ensure such services were available throughout the state. The RTA in New South Wales expressed concern about the potential cost and the difficulties of servicing remote locations.42
- The health assessment tools are still at the experimental stage and their technical and cost effectiveness have yet to be established.

Recommendation

9. That VicRoads trial the Austroads model licensing procedure in Victoria and, if successful, adopt the model.
Figure 4.1. Austroads Model Licence Assessment Process

VicRoads Submission to Parliamentary Road Safety Committee, April

Source: VicRoads, Figure 3.1, p. 51
Some jurisdictions require specified medical professions to report to licensing agencies patients they consider are medically unfit to drive. This may be instead of, or in addition to, age-based medical examinations.

Interstate

South Australia and the Northern Territory are the only Australian jurisdictions where health professionals have a legal duty to report to licensing authorities, drivers medically unfit to drive.43

The South Australian Department of Transport, Urban Planning and the Arts (DTUPA) state in their submission:

... although the legislation imposes a duty to report, some medical practitioners feel that this creates an ethical dilemma for them.44

They also said that the licensing agency, Transport SA, is reviewing the relevant section of the Motor Vehicles Act and will, in conjunction with key stakeholders, be developing a number of options for consideration on the topic of mandatory reporting.

Overseas

In Canada, mandatory reporting occurs in about half the provinces. As part of the Older Driver Improvement Program introduced in 1996, Ontario introduced a requirement for health professionals to report to the licensing agency once they have formed the opinion that the patient’s medical condition may make the operation of a motor vehicle dangerous.45

A similar situation applies in Oregon and in some other American jurisdictions and European countries.

Should Health Professionals be Required to Report Unfit Drivers

General Practitioners (GPs) and other health professionals play an important role in helping determine whether an older person should continue to drive. Evidence presented to the Committee shows that health workers, especially GPs, need to be better educated about the impact of ageing on driving.
The Optometrists Association Australia (Victorian Division) Inc., reflected the views of other professional associations when they advised the Committee that their role in relation to older patients should be to:

... reinforce the position of the optometrists as the professional assisting the patient to achieve good eye care and safe road use, rather than cast the health professional as an agent of the licensing authority.46

RACV in their submission stated:

Most health professionals tend not to raise issues of driver licensing or driving cessation with their patients. The medical community does not have the information and knowledge to assess drivers nor the delineation of responsibility needed to address the issue of fitness to drive and driving cessation.47

Results of a survey of GPs in the New South Wales Central Coast, in late 2001, indicate 75% of GPs were worried or anxious about cancelling an older person’s driver’s licence, 41% felt confident to make appropriate medical driver assessments and assess driving competency, but only 29% routinely asked older patients about their driving habits and medical fitness to drive. Results showed doctors in general did not feel this was a routine part of medical practice.48

GPs are also fearful of being placed in an adversarial position with long term patients.49 As a consequence, Staff Specialist in Geriatric Medicine at Central Coast Health in New South Wales, Dr P. Lipski, informed the Committee that:

GPs on the Central Coast say they want a separate body set up to assess driving performance.50

While a similar study has not been undertaken in Victoria, anecdotally the Committee is aware that health professionals here have a similar view. This is of concern to the Committee. It must be re-inforced to health professionals that it is not their role or function to revoke a person’s driver licence. Health professionals only raise concerns of a patient’s ability to drive, with the patient, or if necessary, to VicRoads. It is then VicRoads’ responsibility to take action and review that driver.
Professional Association’s Views

The Committee received a number of comments on what role health professionals should take.

The Royal Australasian College of Surgeons, Victorian Road Trauma Committee expressed the following views with regards to mandatory reporting:

Medical practitioners would have to be absolved by legislation of any recourse that the driver may have if this were to be introduced. The drivers should also have a right of appeal with an established review process.  

This position was supported by the Australian Medical Association (Victoria) Ltd (AMA), who advised the Committee that:

AMA Victoria is opposed to any legislation that would require medical practitioners to report drivers who may be a risk because of medical impairment. We believe that such a provision would discourage older patients from seeking routine treatment from their usual doctor, which amongst other consequences may make any impairment worse. Whilst the patient remains under supervised care the doctor can closely monitor the driver and can counsel the patient about their responsibilities as a driver or has the option of making a voluntary report.

The Optometrists Association Australia (Victorian Division) Inc., also opposed mandatory reporting and suggested that:

Optometrists should be assisted in the task of advising patients to surrender their licence with clear, concise and easy to read resources on:

- Visual standards for driving;
- Patients’ obligations to self report;
- Practitioners’ indemnity from civil action for reporting patients who are unfit to drive;
- VicRoads processes for notification;
- Options for conditional licences;
- Strategies for safer road use;
- Available assistance, including other professional services that may assist the patient and options for decreased reliance on driving.
Further opposition to mandatory reporting requirements by medical practitioners, was heard from Victoria Police, who suggest that the present legislative framework provides strong support for driver self-reporting and protection for the ‘informers’ against litigation arising from the disclosure.\(^{54}\)

According to the RACV making it compulsory for all health professionals to report potentially unsafe drivers to VicRoads would only be effective if health professionals had a sound knowledge of all issues related to driver safety, and also were willing to do this. The RACV also noted that, if drivers require medical certificates as a basis for re-licensing, the issue of legal liability of health professionals issuing the certificates is raised.\(^{55}\) While encouraging health professionals to report drivers suspected of being unfit to drive, the RACV recommended to the Committee, that this should not be mandatory.\(^{56}\)

The Committee does not support the introduction of mandatory reporting by health professionals of unsafe drivers in Victoria, but encourages the professions to adhere to public safety ethical principles. It was made clear to the Committee that health professionals need further education to improve their understanding of older driver issues. This should be provided to them. Drivers and health professionals also need to be informed about the distinct roles of health professionals and the licensing agency.

### Enhanced Primary Care Assessment

The 1999-2000 Federal Budget introduced, as part of an *Enhanced Primary Care Medicare Services* program, an entitlement for older Australians to a Commonwealth Government funded assessment of health and well being. This applies to persons 75 years and over; or 55 years and over if of Aboriginal or Torres Strait Islander descent. The entitlement is regardless of whether the person is in good health or not. The assessment is intended to inform a person’s GP about risk factors and hazards that may require further health management.\(^{57}\)

In addition to the assessment, which might be undertaken in the person’s own home, there are meetings, called ‘case conferences’, between the GP and at least two other health or community care providers, for example, a pharmacist, physiotherapist, dietitian. An action plan is then developed to better co-ordinate care.\(^{58}\)

The assessments provide an appropriate opportunity to consider all aspects of a patient’s safety and arguably could be expanded to include their driving and pedestrian needs. Dr R. Bouvier, Community Safety Consultant, Royal Australian College of General Practitioners, told the Committee that the annual health examination could be structured to enable doctors to ask a few driving related questions.\(^{59}\) The Brotherhood of St Laurence also suggested driving-related tests be included in the Enhanced Primary Care initiative.\(^{60}\)
The Committee considers that the annual health assessment provides a useful forum for a person to regularly discuss fitness to drive or walk, with their health professionals. The scheme covers a significant proportion of older people most likely to have health-related difficulties with mobility. The Committee questions however, whether information about the scheme has been widely disseminated throughout the community and would urge active promotion by the Federal Government.

Recommendation

10. That the Minister for Transport request the Federal Minister for Health and Aged Care to include questions relating to driving and walking into the Commonwealth Government funded annual health assessment now available for older Australians. That those who qualify be made aware of this service.

Future Programs

Improved Referral and Assessment Methods

Several submissions including COTA, noted further work was required to improve current screening procedures to reliably identify ‘at-risk’ drivers.61

The Committee however, found a number of products and research programs which may improve identifying and assessing impaired drivers in the future. They are briefly described below.

DriveABLE

During the course of the overseas study tour, the Committee met in Edmonton with Dr A. Dobbs, President of the DriveABLE Institute of Research on Driving. Dr Dobbs is an advocate of evaluation testing and has developed a product which is a cognitive impairment test for drivers, orientated to assessing driver functional abilities rather than the reasons for the impairment.62

The product does not purport to identify safe drivers, only those no longer safe to drive. To develop his product, Dr Dobbs compared safe to unsafe drivers to determine appropriate criteria. The DriveABLE assessment has two parts, a competence screen and, if necessary an on-road evaluation.

During the screening process, a trained professional guides the driver through a number of computer-based tests assessing mental and motor skills relevant to driving. According to the Institute, the tests are comprehensive and not complicated; the driver responds by touching a screen or pressing a button.63
If questions of competence remain, an on-road assessment is conducted. This is different from regular on-road tests. The competency test has been developed to reveal errors made by drivers who are unsafe because of medical conditions. The on-road test, of about 40 minutes duration on a set course, is taken in a dual control vehicle. The assessment records all driving errors, focusing on errors usually only made by known cognitive-impaired drivers, disregarding the types of errors made by normal safe drivers.

Following initial research, DriveABLE began as a trial product in 1996 and is now in use in a number of locations in North America. The cost to be assessed is approximately $AUD220. According to documentation provided to the Committee, two major studies conducted by Dr A. Dobbs, each of around 500 people, have verified the process.

**CogState**

Another possible future approach has been developed by a Melbourne biotechnology company. CogState is a computer-based cognitive performance test comprising a number of tasks specifically designed to measure speed and accuracy in about 18 minutes. The founders have backgrounds in neurology, neuropsychology and psychiatry, have brain research experience and links to Melbourne, La Trobe and Harvard Universities.

CogState uses an essentially non-language ‘playing card’ approach, with each element addressing a different aspect of thinking, memory, attention and speed. While essentially for short-time frame monitoring, such as deciding whether to resume play during a sporting event, it is applicable to use during rehabilitation from medical emergency situations, such as a stroke or a brain injury.

An important difference of this technique is that it is benchmarked to individuals. The product records the individual’s best base score to benchmark future performances rather than make comparisons with the broad average performances of supposedly-comparable groups. Results can also benchmark the effect of various levels of alcohol, or other drugs and medications.

At a public hearing, one of the developers, Associate Professor P. Maruff, described the results of a group of mildly cognitively impaired drivers, hypothesized as having the early stages of Alzheimer’s disease, whose performance on the memory component of the test was about equivalent to a .07 blood alcohol level. In later correspondence Chief Executive Dr P. Bick made the point that while Victoria rigorously enforces a blood alcohol limit of .05, it ignores the fact that as people age, their performance, as measured by the CogState test, may indicate an inability to control a motor vehicle akin to a blood alcohol level above the legal limit.
CogState in their submission, recommended to the Committee that a pilot program of an annual CogState screening test for people over the age of 65 years be undertaken. Further, that impaired performance standards be developed and legislative thresholds determined, comparable to those for illegal levels of alcohol. Medical examinations were also recommended as part of the process.

The product shows promise and may have a role in the longer term.

Other Means of Assessment

At the Mobility & Safety of Older People Conference, Dr J. Charlton, Senior Research Fellow at MUARC, described a number of tools currently being evaluated for use by GPs and licensing agencies.

She suggested that initial assessment tools, to identify drivers requiring further attention in a surgery need to be quick (five to ten minutes), have some validity with driving and be acceptable to GPs and drivers. Examples include:

- GRIMPS (Gross Impairment Scale), a non-computerised test developed in Maryland by Dr L. Staplin and colleagues and incorporating rapid pace walk, foot tapping, arm reach and head/neck rotation, memory, visual perception, visual scanning, and attention and visual acuity;
- OPS scale (Orientation and memory, Praxis and attention, Social interaction), an observational tool developed in the Netherlands;
- Self-reported assessment of fitness to drive;
- Cognitive function testing (overlapping pentagons, months backward test); and

These tools were tested on over 200 drivers aged 79 years and over about to go for, or had recently completed, a mandatory on-road licence test in Wellington, New Zealand. Almost all the participants found the assessment procedure satisfactory. Dr Charlton said there was still much to be done to pare down the cluster of subtests, to come up with something that may be used in a GP’s surgery, to identify drivers needing further assessment.
The second stage screening techniques being trialled, for use primarily by licensing agencies or occupational therapists, are:

- GRIMPS;
- DriveABLE;
- CALTEST, a computer based assessment, comprising components of the California Test; and
- EDS (Elemental Driving Simulator) developed by Gianutsos and colleagues at Life Sciences Associates, New York, which involves a tracking task performed on a computerised driving simulator.73

According to Dr Charlton, at this stage CALTEST and DriveABLE appear to be the most promising.74 Both tests include a sub-test designed to assess useful field of view (UFOV) – measuring perceptual-response time, visual search and selective attention – all shown to be associated with the risk of crashing.75

The Committee reached the conclusion that while the DriveABLE approach appears to have merit, it has yet to be independently evaluated and there is insufficient evidence that it is economically worthwhile or necessarily the best product. CogState is geared towards medical diagnosis and treatment/rehabilitation, but the method of delivery and the ability for individuals to access and practice on the internet at any time are attractive features from a road safety viewpoint.

While CogState appears to be valid in terms of neurological diagnosis, there is no proof it can detect differences between drivers who are likely to have crashes and those who won’t. DriveABLE claims to be able to make this important distinction.

CogState, or some of the tools being examined by MUARC, might in the future be of value as part of the annual Federally-funded case consultation for all people over 75 years. This would have road safety and general health benefits for both older drivers and non-drivers.

There is a demonstrated and urgent need for objective tests to assist health professionals to ensure drivers with cognitive difficulties are fairly and equitably treated.

The Committee support the investigation of improved referral and assessment techniques for possible future use in examining drivers who may be suffering cognitive impairments.

Recommendation

11. That VicRoads develop cognitive screening and assessment tools for driver licensing purposes.
Summary of Findings

- There were community concerns about the current VicRoads driver medical review process, including timeliness, cost to drivers and limited availability of specially-qualified occupational therapists.

- A national licence re-assessment procedure for older and disabled drivers is currently being developed by MUARC for Austroads. The model does not include age-based re-licensing tests but is essentially the current VicRoads medical review process, with improved methods to refer potentially unsafe drivers to VicRoads, better driver assessment tools and a more client-friendly process. A feasibility trial in Victoria should be undertaken in Victoria.

- The introduction in Victoria of mandatory reporting by health professionals, of medically unfit drivers, is not supported, but the professions should be encouraged to adhere to ethical issues.

- Health professionals need further education to assist in discussing road safety concerns with clients. The role of health professionals is to conduct medical examinations and provide a report to be forwarded, by the driver, to the licensing agency. This process needs to be clarified for both drivers and health professionals.

- The Commonwealth Government funded health assessment for those people 75 years and over, provides a forum to regularly discuss fitness to drive or walk, with their health professionals. The scheme covers a significant proportion of older people most likely to have health-related difficulties with mobility. The Committee questions however, whether information about the scheme has been widely disseminated throughout the community and would urge active promotion by the Federal Government.

- Better cognitive screening and assessment tools need to be developed for driver licensing purposes.

- A number of cognitive recognition tests have been developed overseas and experiments conducted in driver licensing situations. There is also a Melbourne-developed screen-based product which could possibly assist general practitioners in patient referrals to VicRoads or be of use within a licensing agency to test driver cognitive ability in the future.
Recommendations

9. That VicRoads trial the Austroads model licensing procedure in Victoria and, if successful, adopt the model.

10. That the Minister for Transport request the Federal Minister for Health and Aged Care to include questions relating to driving and walking into the Commonwealth Government funded annual health assessment now available for older Australians. That those who qualify be made aware of this service.

11. That VicRoads develop cognitive screening and assessment tools for driver licensing purposes.

Endnotes

1 VicRoads, Submission to the Inquiry, April, 2002, p. 48.
3 VicRoads, Submission, op. cit., p. 53.
4 ibid., p. 54.
5 ibid., pp. 52-53.
6 ibid., p. 52.
8 VicRoads, Submission, op. cit., p. 53.
10 VicRoads, Submission, op. cit., p. 53.
11 ibid.
12 The forms used are available on the VicRoads' website, go to the 'Forms and Handbooks' menu option, http://www.vicroads.vic.gov.au.
13 VicRoads, Submission,op. cit., p. 54.
14 ibid., p. 55.
15 ibid., p. 54.
16 ibid., p. 55.
17 ibid.
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Age-based Assessments

**Victorian Licensing Practices**

Fundamental and perplexing questions facing the Committee were those to do with whether age-based mandatory medical and/or eyesight assessments and/or on-road driving tests for older drivers should be introduced in Victoria, and if so at what age, at what intervals and in what form.

A person can obtain a licence at age 18 in Victoria. Currently they must undergo a drive test, knowledge test and a basic vision assessment. There are no mandatory age-based medical, vision or on-road driving tests of drivers after they gain that licence.

A licence is normally renewed every 10 years, although a three year option is available.

**Australian and New Zealand Licensing Practices**

Unlike Victoria, vision assessment and medical reports are required for older drivers, in each state and territory and New Zealand for older drivers. In addition, annual mandatory on-road driving tests from age 85 years are required prior to licence renewal in New South Wales and Tasmania.

In May 1999 New Zealand changed its on-road older driver licensing regime, deferring the start of the on-road test from 76 to 80 years and only testing every two years from 80 years of age, rather than annually.\(^1\) The test format was also updated to specifically assess the key risk areas for older drivers – testing for failing to give way, difficulties in negotiating intersections and incorrect or no signalling.\(^2\) In March 2003, the New Zealand Minister for Transport said he was considering removing age-based testing, without further explanation.\(^3\)

Table 5.1 shows the licensing procedures for older car drivers currently required elsewhere in Australia and New Zealand. In some instances the vision assessment is part of the medical report. More stringent procedures apply for drivers of commercial vehicles.\(^4\) Procedures for motorcyclists sometimes vary from those for car drivers.
As stated, the most stringent age-based assessments occur in Tasmania and New South Wales where annual medical assessments commence at 75 and 80 years respectively, followed by annual on-road driving tests for all drivers aged 85 years or more. New Zealand conducts on-road tests at 80 years and subsequently every two years. The other jurisdictions rely predominantly on medical assessments, with on-going road testing occurring only in special circumstances.\(^5\)

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Vision test</th>
<th>Medical report</th>
<th>Road test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victoria</td>
<td>When reported</td>
<td>When reported</td>
<td>When reported</td>
</tr>
<tr>
<td>New South Wales</td>
<td>Annually from 80 years</td>
<td>Annually from 80 years</td>
<td>Annually from 85 years</td>
</tr>
<tr>
<td>South Australia</td>
<td>Annually from 70 years</td>
<td>Annually from 70 years</td>
<td>When recommended by medical report</td>
</tr>
<tr>
<td>Queensland</td>
<td>If requested</td>
<td>Every 5 years from age 75</td>
<td>When recommended by medical report</td>
</tr>
<tr>
<td>Western Australia</td>
<td>75, 78, 80 onwards annually</td>
<td>75, 78, 80 onwards annually</td>
<td>When doubts raised by medical report; convictions</td>
</tr>
<tr>
<td>Tasmania</td>
<td>Annually from 75 years</td>
<td>Annually from 75 years</td>
<td>Annually from 85 years</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>At each renewal</td>
<td>When reported</td>
<td>When reported</td>
</tr>
<tr>
<td>Australian Capital Territory</td>
<td>Annually from 75 years</td>
<td>Annually from 75 years</td>
<td>When recommended from medical report</td>
</tr>
<tr>
<td>New Zealand</td>
<td>At renewal for all drivers</td>
<td>75, 80 and then biannually</td>
<td>80 years then biannually</td>
</tr>
</tbody>
</table>

Source: Derived from MUARC submission, p. 24, updated for recent change in Queensland.
Overseas Licensing Practices

As a general rule vision-based screening methods are more common in America while medical certification is common in Canada and Europe.

Europe

Licensing practices in Europe vary widely, but most have some age-based driver assessments or changes in licence duration.

There are no age-based renewal procedures in Belgium, France, Germany and Sweden, and hence no medical or other requirements. At the other extreme, annual renewal occurs in Ireland, regardless of age, with a certificate of medical fitness required from age 70.

In other countries there is usually an age at which shorter duration licences are issued. This age ranges from 45 years in Finland with a medical review and 50 years in Italy, to 70 years in the United Kingdom, The Netherlands and Portugal.6

United States

Ten American States plus the District of Columbia have special licensing practices for older drivers.7

In a survey of all 50 USA states released in 1998, neuro-psychologists Dr R. Fields and Dr G. Valtinson found that Illinois had the most stringent standards, with empirically based graduated licensing for both younger and older drivers.8 In Illinois, vision screening is mandatory at all renewals, every four years. Except for those who have no traffic convictions, everyone must take a written test every eight years. From 75 years, all Illinois drivers must do an on-road test for licence renewal.9

Pennsylvania has ‘random’ medical examinations and other requirements for selected drivers 45 years and over.10

In 1990, five American jurisdictions required mandatory periodic age-based road tests, this has now reduced to two:11

- Illinois tests at ages 75, 79, then every two years beginning at 81 and every year beginning at 87; and

- New Hampshire tests every four years, beginning at age 75.12

Until December 1998 Indiana also had mandatory driving tests. Following a legal finding that the licensing agency did not have authority to apply age-based testing, a review recommended that Indiana cease road tests.13
Dr Fields and Dr Valtinson observed a trend towards longer renewal periods and reduced testing procedures for older drivers, based on financial concerns for the licensing agency rather than safety.¹⁴

A study published in November 2002 by Dr D. Grabowski and Dr M. Morrisey, from Department of Health Care Organisation and Policy, University Transportation Center Alabama, looked at the effect of American state road laws and requirements on those 65 years and over. The study of fatal crash rates in 48 American states over the period 1985 – 2000 found that more stringent licence renewal provisions for older drivers may have been effective. In particular the study found:

… suggestive evidence that vision and road tests for 65 to 74 year olds, road tests and in-person renewals (where road tests or vision tests were not required) for those aged 75 to 84 and in-person renewals for those aged 85 years and older were associated with fewer driver fatalities in their respective age cohorts.¹⁵

The authors qualified the findings saying that the results may over or under estimate the true impacts because the study was not able to control all differences between states. However the available evidence does suggest that the re-licensing policies for older drivers, does save lives.

Canada

Seven out of 13 Canadian jurisdictions require obligatory age-based medical assessments. Five require medical assessments at ages 75, 80 and every two years thereafter, Yukon Territory examines at 70, 80 and then annually and in British Columbia a medical assessment is required at age 80 and every two years thereafter.¹⁶

In terms of a multi-faceted approach, one of the most comprehensive programs is in Ontario. Until October 1996, Ontario required all drivers 80 years and over to take an annual vision screening, knowledge and road test. Following growing complaints from older drivers that the process was discriminatory and burdensome, the mandatory on-road test was abandoned and a program introduced consisting of vision screening, knowledge testing, driver record review and classroom instruction. The assessments are now conducted two yearly rather than annually.¹⁷

Once drivers pass the vision screening and knowledge tests they must attend a group education session. Prior to beginning the session, the records of all participants are reviewed by group counsellors who have been trained to both deliver the course and review driving records. The counsellors decide if any attendees should undergo an on-road test.

Preliminary evaluations of the Ontario package suggest a reduction in older driver crashes.¹⁸ However, it is not clear which elements of the Ontario package might be responsible for the apparently beneficial road safety effect. There was also no measure of whether older drivers may
have reduced their travel exposure, changed driving behaviour, or stopped driving altogether as a result of the program.

**Age-based Mandatory Medical Assessment**

The *Road Safety Strategy 2000-2005 Discussion Paper* released by VicRoads in mid-2000 canvassed the idea of optional three year restricted licences for drivers aged 75 to 85 years without medical certificates, or full licences with a certificate stating they were fit to drive:

> It is also suggested that drivers aged 85 and over be required to provide a medical certificate to obtain renewal of a full or restricted licence.\(^{19}\)

Neither the idea of an optional medical certificate to retain full driving privileges, nor the proposal for medical certificates for all drivers over 85 years of age became part of the subsequent Road Safety Strategy 2002-2007 *Arrive Alive*.\(^{20}\) It is unclear why the proposal was not included in the strategy.

The older driver crash rate comparisons undertaken by the Accident Research Centre, Monash University (MUARC) for VicRoads – described in Chapter 2 – showed that New South Wales casualty crash rates for 1998-2000 for drivers 80 years and over, were nine per cent lower than for Victoria, on a population basis.\(^{21}\)

The Committee notes that the New South Wales older driver licensing conditions, initiated at 80 years, may well have beneficial effects on older driver trauma for this elderly age group.

Although this is marginally significant, it is not possible to determine whether this reduction is due to the annual medical and vision assessment requirements that commence at 80 years of age in New South Wales, the on-road tests from 85 years, or the resulting lower proportion of the older population that hold a licence, relative to Victoria, where there are no such restrictions.

**Community Views**

The Committee received many submissions both supporting and opposing mandatory age-based medical certificates. The submission by the Royal Automobile Club of Victoria (RACV) Ltd, presented both pros and cons for medical certificates at licence renewal:

> It also ensures that the assessment is health related, which may be more acceptable to older people than other forms of retesting. However, the issue of whether introducing such a measure would reduce road trauma among this age group needs to be considered, as do a range of other practical issues.\(^{22}\)
In opposing the systematic use of medical certificates as a licence renewal requirement the RACV also stated:

Another area of concern relates to the conclusions some drivers will draw from medical certificates in relation to their fitness to drive. If a person receives a medical certificate that allows them to maintain their drivers licence until the next renewal period – either 3 or 10 years, then they may conclude that they are safe to drive for that entire period. This may not necessarily be the case.23

The Victoria Police in their submission, strongly supported regular assessments for cognitive function, particularly for older drivers, and proposed to the Committee that drivers should be assessed on the:

- Capacity to process information normally encountered when driving;
- Physical ability to turn their head sideways and be able to do ‘over the shoulder’ checks; and
- Capacity to react correctly and in sufficient time, in an emergency situation.24

Victoria Police recommended to the Committee that a medical profile be established using age, among other agreed indicators, to ensure that drivers who are considered at risk are tested periodically. Licence renewal should be subject to a satisfactory assessment or medical certificate.25 The Victoria Police also suggested in their submission:

… that a medically based schedule be established which sets out the expected normal deterioration of function in those capacities considered essential in maintaining safe and effective control of a motor vehicle.26

The Australian Medical Association (Victoria) Ltd (AMA) in their submission quoted the Committee’s Discussion Paper to support their view that there is currently insufficient evidence to establish whether a routine test for medical competency is warranted.27

At a public hearing, Dr R. Bouvier, Community Safety Consultant, Royal Australian College of General Practitioners, told the Committee that:

We cannot assess fitness to drive in the consulting room.28
He was also critical of the Austroads, *Assessing Fitness to Drive* medical guidelines publication and their focus on medical conditions, arguing that:

> Just because you have a diagnosis of a disease does not mean that your driving is impaired.  

However, the AMA in their submission, suggested that if a medical test was introduced, consideration should be given to having such an examination attract a Medicare rebate. This would require the Federal Health Minister to remove the current prevention of a rebate for a test to obtain a licence.

The Road Safety Benefits of Age-based Medical Assessments

There is no clear connection between age-based medical examinations of older drivers and lower road crash risk. Mr R. Burns, Senior Counsel from the Ministry of Transportation, Ontario, Canada stated there is a lack of evidence showing a specific age at which driving performance alters from safe to unsafe. This makes the task of choosing an initial age, and subsequent ages for medical certificates essentially arbitrary.

The older driver crash-rate comparisons of Australian states described earlier, show it is not possible to isolate the effects of medical certificates from other components of older driver licensing. Only two studies have come to the attention of the Committee on the effect of age-based medical certificates on road safety.

**Israeli Research**

An early study in Israel by Zaidel and Hocherman published in 1987, cited in the RACV submission, found that medical assessments had no positive effect on road trauma. The authors recommended that targeting specific groups of impaired drivers, rather than those over a certain age, would be most likely to have safety benefits.

**Comparison of Finland with Sweden**

Professor L. Hakamies-Blomqvist, Director of Research, Swedish National Road and Transport Institute and colleagues, compared the safety outcomes of older driver re-testing regimes in Finland and Sweden using 1990 data. Finland requires all drivers over the age of 70 years to have a medical assessment with a general practitioner before they can renew their licence. Sweden has no such requirement. According to Professor Hakamies-Blomqvist at the *Mobility & Safety of Older People Conference*, in Melbourne in August 2002, the study found that the medical testing procedure in Finland produced no safety benefits. The results showed:
No drivers had their licences removed on the basis of the medical report;

5% of drivers aged over 70 did not reapply for their licence – these were predominantly female drivers who drove very few kilometres;

Some older drivers visited more than one health professional, and all eventually obtained a certificate to say they were safe; and

The knowledge of doctors in Finland in determining fitness to drive was limited, although they often displayed restrictive attitudes towards driving by the elderly. The above points suggest that the medical assessment process applied in Finland in 1990 may have been poorly implemented and hence unlikely to produce safety benefits. The authors of the study were also critical of the lack of centralised registering by the Finnish police authorities which resulted in a lack of numerical information on the outcomes of the medical examination process. It is possible that the Finnish doctors may not have been focused on medical factors likely to affect safe driving. They may have been inadequately trained for the task or appropriate guidelines and assessment tools may not have been available. In commenting on the study VicRoads stated that:

While the Finnish program could not be shown to reduce crash levels compared to Sweden, it was found that Finland had a higher older pedestrian fatality rate.

Professor Hakamies-Blomqvist said that what seemed to be happening with the Finnish medical assessment was that it took away a lot of safe drivers and put them in a traffic mode, that is, as a pedestrian, where they were much more likely to get killed and injured.

Medical Assessment and Crash Risk

During the public hearings, the Committee was advised by the AMA that doctors are trained to identify and treat ailments. They are not trained to identify how that ailment may affect driving abilities.

A small study by Dr. K. Johansson, Chairman of the Karolinska Institute, Traffic Medicine Centre, Huddinge University Hospital in Sweden, and colleagues, conducted in 1993-94 compared 37 drivers older than 65 years, whose licences had been temporarily suspended following crashes or traffic offences, with drivers with similar characteristics who had not been suspended. Intensive medical examinations lasting one and a half days were conducted on both groups of drivers. The authors concluded that:
A standard medical examination of an older patient, which is compulsory in many countries, is not sufficient to identify those with increased crash risk. Furthermore, the Organisation for Economic Co-operation and Development (OECD) report on Ageing and Transport: Mobility Needs and Safety Issues, states that:

Mandatory medical assessment of all drivers of a certain age to detect those who are unfit to drive is neither cost-efficient nor beneficial. Although medical assessment seldom provides sufficient grounds for an absolute assessment of driving ability, it does play a role when there are genuine reasons to question older drivers’ functional capabilities.

VicRoads only has information about the medical condition of approximately 40,000, or 1.5% of Victorian drivers. Dr M. Odell, a specialist medical advisor at the Victorian Institute of Forensic Medicine (VIFM), stated at the Mobility & Safety of Older People Conference:

... so you can imagine that perhaps the other 98.5 per cent are totally fit, but I somehow doubt that.

A study by the VIFM of older driver fatalities and medical conditions in 1996 and 1997 strongly suggests that the number of drivers at risk of a crash, due to a medical condition, is likely to be very much higher than the Medical Review statistics from VicRoads indicate. How much higher and what affect that has in terms of safety on our roads was unable to be determined.

The Committee considered that the lack of knowledge about the medical fitness to drive in Victoria was a hindrance to obtaining the true picture on medical issues and driving.

Advantages and Disadvantages of Age-based Mandatory Medical Assessment

Advantages of mandatory age-based medical assessments are:

- To assist in identifying drivers who may not be fit to drive;
- All drivers of a defined age group are assessed;
- Some illnesses and diseases may be discovered and treated earlier, with general community health benefits; and
It will provide a better picture of the medical fitness of that portion of the overall driving population.

Disadvantages include:

- Medical checks may not be sufficiently predictive of current or future medical fitness to drive, and involvement in crashes;
- Some persons may prematurely decide not to renew their licence, with adverse consequences for their mobility;
- Higher administrative costs to the licensing agency to process the many thousands of additional certificates each year; and
- Some older drivers may conclude that if they obtain a certificate they are fit to drive until the next examination.

Many submissions supported mandatory age-based medical certificates, however not one provided significant evidence that such a measure would improve the safety of all road users. Ages to conduct assessments were offered without any supporting evidence.

However, it is of concern to the Committee that, as shown previously in Figure 2.8, older driver serious injury crash rates per distance travelled, increases considerably for those aged 80 years and over. The number of drivers in this age group is also increasing. The Committee consider that measures need to be taken now to ensure adequate medical assessment processes are available in the future.

The current arrangements assume that all drivers know and voluntarily disclose to VicRoads any medical conditions likely to affect their safe driving. The Committee does not believe this always occurs, especially in the older portion of the population most prone to medical conditions. Introduction of a requirement for a medical assessment to be conducted for drivers 80 years and older would target those most likely to be affected by medical conditions, while minimising the number of people needing to be assessed.

As more comprehensive data is collated about medical conditions of the Victorian driving population, the commencement age and frequency of medical assessments may need to be reviewed.

The type and content of assessment should be determined by VicRoads, in conjunction with the appropriate organisations, and should focus on medical conditions that affect the driving safety of this age group, as distinct from the type of regular medical certification conducted for younger age groups, such as drivers of commercial vehicles.
Chapter 5 – Age-based Assessments

Recommendation

12. That VicRoads, in conjunction with relevant organisations, develop and implement a standard medical assessment to determine fitness to drive for those aged 80 years and over who wish to renew their licence.

Age-based Mandatory Eyesight Assessment

As discussed in Chapter 3 the Centre for Eye Research (CERA) at the University of Melbourne estimates 85,000 Victorians are driving with less than the level of eyesight required by law. The frequency of poor vision increases rapidly with age, with one-third of drivers over 80 years failing the current standard.44

In every other Australasian jurisdiction, vision assessment is compulsory for older drivers prior to re-licensing. This is usually done by a GP as part of the medical certificate process.

The standard Victorian eyesight assessment conducted in a licensing agency office is a static acuity test, involving reading rows of letters in a well-lit indoor office environment. The criteria is 6/12, meaning that a vision impaired person is defined as one who cannot read at 6 metres, what a normal sighted person can read at 12 metres. Research has been unable to precisely define a ‘safe static acuity’ criterion, but 6/12 is widely used for driving.

The main problem with static acuity is that, while it might be easy to assess, it is not the most critical ability with regards to driving. Mr M. Hull, Consultant, stated at the Mobility & Safety of Older People Conference, in Melbourne:

Controlling a car in traffic requires picking out a small number of hazardous objects from amongst a clutter of irrelevant objects often in poor, or variable light.45

However, Professor C. Owsley, Professor of Ophthalmology, Psychology and Physiological Optics, School of Medicine, University of Alabama, USA, told the Committee she believes there are social reasons for retaining the acuity assessment as it acts as an indicator for people to see an ophthalmologist.46
The Optometrists Association Australia (Victoria Division) Inc., were in favour of age-based mandatory assessments and recommended to the Committee:

- Licence renewal should occur every three years from age 70 then annually from age 80; and

- All persons applying for renewal should be required to produce a certificate from an optometrist, or a medical practitioner, not more than 12 months old stating that their vision meets current requirements for driving.47

In a presentation to the Committee in June 2003, Professor H. Taylor, Director of CERA, supported eyesight assessments for drivers over 70 years of age, at two to five year intervals. He also noted that visual ability falls gradually and people often do not notice the decline. He suggested there was a need to raise awareness of visual decline, and eyesight assessment for people over the age of 50.48

A number of organisations and individual submissions also proposed eyesight assessments for all drivers, or drivers over various ages.49

The Road Safety Benefits of Age-based Eyesight Assessments

In a comprehensive study Dr D. Levy, et al used multivariate regression equations and 1985-1989 fatality data to assess the safety benefits associated with different older driver licensing requirements across all 50 American states. Older was defined as 70 years, the age at which many state renewal policies for older drivers commence.50

Unlike other studies they estimated older driver fatality rates per capita using a regression model which included demographic and licensing renewal policy variables. They took into account many other variables which might affect comparisons of crash involvement rates between states, including: annual distance travelled; speed variation and, urban/rural driving mix.51

The study found that mandatory vision screening every four years for older drivers resulted in a fatal crash involvement rate 7.9% lower than states without such requirements. Screening every two years would reduce the older driver fatal collision involvement rate by 14.7%.52

Dr Levy et al, in an article in the Journal of the American Medical Association, October 1995 noted the study had limitations:

Our data do not provide an indication of which driver, if any, was at fault in the crash. … some of the reduction … may be attributable to a reduction in senior licensure, rather than from removing more dangerous drivers from the road.53
While noting that there is insufficient evidence of road safety benefits for age-based mandatory eyesight assessment, the Committee is concerned about evidence from CERA regarding sub-standard vision of the Victorian driving population. Periodic eyesight assessment for all drivers would have public health benefits.

**Improved Eyesight Assessments**

At the *Mobility & Safety of Older People Conference*, Mr. Hull, in relation to whether eyesight assessments should be compulsory for drivers, stated that if the only eyesight screening undertaken at a licensing agency is reading an eye chart, the road safety benefit may not justify the cost. He also said:

> If we can test for peripheral vision as well as for visual acuity, and maybe also for the mental processing that goes on behind what the eye sees, there may be some road safety benefit.

The New Zealand driver licensing agency, the Land Transport Safety Authority, recently introduced eyesight assessments for all new or renewed licences using a Titmus Vision Scanner that assesses static visual acuity and low-contrast static acuity as well as a rough test of peripheral fields. Licence holders who fail these relatively simple assessments are required to consult an eye specialist for a more thorough examination and possible vision correction before re-licensing.

Mr. Hull states that the New Zealand method is better and more objective than the current visual acuity screening commonly used in Australia.

Other overseas jurisdictions are also introducing improved eyesight assessment methods. In Oregon, USA in 2000 an Older Driver Advisory Committee, after an extensive public inquiry, included amongst its recommendations the addition of Useful Field of View (UFOV) assessment as part of the standard visual screening for all drivers renewing their licences from 50 years of age. Adding the UFOV assessment would increase the likelihood of identifying drivers who demonstrate difficulty with speed, selective attention or divided attention. Failure of this assessment would lead to more thorough investigation of the reasons for the visual attention difficulty.
Advantages and Disadvantages of Age-based Mandatory Eyesight Assessment

Advantages of mandatory eyesight assessment are:

- All drivers are assessed;
- Some eye illnesses and diseases may be discovered and treated earlier, with general community health benefits; and
- It will provide authorities with knowledge of the visual ability of that portion of the overall driving population.

Disadvantages include:

- Eyesight assessments, especially simple static visual acuity tests, may not be sufficiently predictive of current or future visual fitness to drive; and
- Inconvenience to an individual, especially those living in remote areas, away from licensing agencies or optometrists.

The Committee believes the current static visual acuity assessment is inadequate and a review of the screening methods should commence to enable more effective assessment. As mentioned earlier the UFOV assessment shows promise for identifying drivers with potentially higher crash risk.

The Committee therefore considers that VicRoads should comprehensively review eyesight standards and assessment methods in order to better identify drivers with visual impairments who may be at greater risk of being involved in a crash.

Also, the broader public health benefits, not to mention road safety, would far outweigh the inconvenience to drivers and cost to society, to undergo an eyesight assessment prior to licence renewal.

How this is best achieved, whether at VicRoads licensing offices, at an optometrist’s office, or by some other method needs to be investigated, though the Committee’s preference would be the optometrist.

Recommendations

13. That driver eyesight standards and assessment methods in Victoria be comprehensively reviewed and an assessment be developed and implemented to replace the current acuity test.

14. That eyesight assessments be required prior to renewing a licence.
Age-based Mandatory On-Road Testing

The Committee received numerous submissions both supporting and opposing mandatory age-based on-road driver testing. Those supporting on-road driving tests included the Life Planning Foundation, the Ulysses Club for older motorcyclists (for drivers and riders over 40 years) and individuals. Those opposing driving tests were VicRoads, the RACV, MUARC and the Council on the Ageing (COTA).

MUARC, in their submission stated:

Supporters of the practice of periodic mandatory licence re-testing for older drivers argue that people in their later years wishing to retain a licence need to demonstrate they are fit and capable of driving without risk to other motorists. Those who oppose age-based, periodic licence re-tests, base their claims on cost-effectiveness, discrimination, equity issues, the inability of licence tests to discriminate those at risk, and the adequacy of self-regulation.

In Sydney in June 2003, the Committee held discussions with staff from the Roads and Traffic Authority (RTA), New South Wales. As mentioned, a driving test is required annually from 85 years at the RTA’s expense. With the population rapidly ageing, concerns were raised of the spiralling numbers of tests, which had already increased from 10,000 tests four years ago, to 19,000 in 2002. The current cost to the New South Wales government for on-road testing of older drivers is $3.8 million and rising.

The Road Safety Benefits of Age-based Driving Tests

The Committee could find no studies specifically addressing the road safety effects of on-road testing of older drivers. The studies which do exist either assess mandatory age-based licensing practices as a whole, or look at other elements such as medical certificates, vision screening or re-licensing intervals.

Comparisons of American States

Some researchers have attempted to compare the older driver crash rates in American jurisdictions with different older driver licensing practices. Ontario Ministry of Transportation official Mr A. Haroun in 2000, quoted two such studies by American researchers Lange and McKnight (1996) and Dr Levy and colleagues (1994).

Lange and McKnight compared Illinois and Indiana, where age-based vision screening and driving skills exists, with Ohio and Michigan where they don’t. The relative crash involvement ratio was seven per cent lower in the states with age-based testing. The authors concluded that it was unclear whether age-based road tests actually succeeded in
removing unsafe drivers from the road, or merely induced drivers to reduce their exposure.\(^6^3\)

The 1994 report by Levy, et al, estimated older American driver fatality rates per capita using a regression model which included demographic and licensing renewal policy variables.

The study found that the incremental gain from adding either a knowledge test or driving road test every four years, was a reduction in the crash rate of an additional four per cent. Furthermore, the study suggested that safety benefits could be improved by lowering the renewal term to two years. Therefore:

\[
\text{If either a knowledge or road test requirement were added to the vision test, the incremental gain would be an additional 11.1 per cent reduction.}^{6^4}
\]

According to Mr Haroun, the findings of Levy et al suggest the most empirically defensible age-based renewal policy would consist of a two-year renewal cycle along with the combined use of both age-based vision screening and a knowledge test.\(^6^5\) However, as stated in the previous section, Levy concedes the study had limitations.\(^6^6\)

The National Highway Traffic Safety Administration Safe Mobility for Older People: Notebook, includes an investigation by Rock (1998) into the effect of revisions made to the Illinois licence renewal process. He found that eliminating the on-road test for those aged 69-74 years had no adverse effect on road crashes. In addition, shortening the renewal from four to two years for drivers aged 81-86 did not appear to have any benefit.\(^6^7\) Whether these findings would apply to other age groups is unknown.

The authors of the Safe Mobility for Older People: Notebook, Dr L. Staplin et al, comment that in relation to on-road testing:

\[
\text{A road-test requirement for all renewals over a certain age does not appear to add any additional information about a driver's ability to safely carry out the driving task.}^{6^8}
\]

They also state that tests may best be reserved for those drivers reported to the licensing agency for poor driving performance, or by doctors for specific medical disorders, or involved in traffic offences or crashes between licence renewals.\(^6^9\)

The Committee agrees with this viewpoint. It is also mindful of the particularly stressful nature of on-road tests for older drivers, and the potentially adverse effects on mobility of premature voluntary licence cessation.
Road Knowledge Tests

RoadSafe Wimmera, in their submission, proposed road law knowledge tests for older drivers. Road knowledge tests, not associated with an on-road driving test, are used in California and Louisiana, USA and Ontario in Canada as a component of age-based licence renewal assessment.

Testing Regimes as a Predictor of Crashes

The report by the OECD states that older driver licensing procedures based on medical assessments, and/or driving-related tests are aimed predominantly at detecting drivers who are unable to drive safely. To be effective, a procedure must have two qualities:

- Be able to detect a driver who is sufficiently impaired to pose an unacceptable risk to the public (called sensitivity in the technical literature); and
- Not mistakenly identify safe drivers (specificity).

The report stated that:

It has been impossible to obtain sensitivity and specificity measurements for any of the known older-driver testing programmes. In all likelihood, such measurements have not been made.

In terms of whether current on-road driver tests are effective in determining which drivers are likely to crash in the future, the RACV quote a 2001 report by the United States Insurance Institute for Highway Safety that concluded:

... despite decades of research, no screening tests for driving abilities have been developed to accurately identify the people who will crash without falsely identifying other drivers who won't.

An on-road test forms part of all driver review processes where other forms of assessment, such as driver health, have proven inconclusive. It is also usually the benchmark against which alternative techniques, such as computer-based screening, are assessed.

Recent evidence from New Zealand shows poor driving test performance by drivers over 80 years of age is a predictor of subsequent crash involvement. Approximately 75% of older drivers pass the on-road test on their first attempt which rises to 90% on the second attempt. Those that had to repeat the test increased the likelihood of a reported crash by 14%. The authors suggest that the new on-road test
does identify older driver behaviours or limitations, that are related to crashes.\textsuperscript{74}

A New Zealand Government Review in August 2001 concluded that on-road testing:

\begin{quote}
... appears to be the most direct and valid method for assessing potential driver difficulties in a systematic and standardised manner.\textsuperscript{75}
\end{quote}

It is unclear what the current ‘best practice’ is with regard to the on-road testing of older drivers. While there are national medical guidelines for the assessment of fitness to drive, there currently appear no national standards for the on-road testing of older drivers, or even drivers in general.

**Advantages and Disadvantages of Age-based Mandatory On-Road Testing**

The advantages of mandatory age-based on-road testing include:

- It is a valid assessment of a drivers real capability, performed in and around, the driver’s usual routes; and

- All drivers in a defined age group are tested.

Disadvantages include:

- The test can be quite stressful for some older drivers;

- Some may decide not to renew their licence rather than sit the test, with adverse consequences for their mobility and possible implications for spouses and other family members;

- Tests are expensive for the testing agency and time consuming for the drivers; and

- On-road tests may not be sufficiently predictive of the future crash history of individual drivers.

The Committee agree with the Staplin viewpoint that on-road tests are best reserved for those drivers reported to the licensing agency for poor driving performance, or are involved in traffic convictions or crashes between licence renewals, or reported by doctors for specific medical disorders. It is also mindful of the particularly stressful nature of on-road tests for older drivers, and the potentially adverse effects on mobility of premature voluntary licence cessation.
The Committee concludes that there is insufficient evidence of the road safety benefits of mandatory age-based on-road and road knowledge testing of older drivers to justify their introduction in Victoria.

**Recommendation**

15. That mandatory age-based on-road driver testing or road knowledge testing not be introduced in Victoria at this time.

**Volunteer Drivers**

A number of submissions raised concerns about the appropriateness of the people who volunteer to drive cars and small buses to transport older and disabled people. Often the drivers are as old as their passengers and their driving skills and medical condition are unknown to the organisations that operate the vehicles.

Ms J. Meehan, Mildura Driver Occupational Therapist and committee member of SunAssist, the largest volunteer driver scheme outside Melbourne, believes there are legitimate safety concerns for ageing volunteer drivers. She believes what is needed is:

… a standard non-threatening entry test imposed Victoria-wide on all volunteer drivers with a bi-annual re-assessment if they are still driving.76

Some organisations now require an assessment of their volunteer drivers, but they are very ad-hoc and in some cases conducted by non-professionals.

Ms A. Berndt, Clinical Director, Driver Assessment Rehabilitation Service, University of South Australia, in her submission, proposes older volunteer drivers should have to obtain a certificate of competency from a driving instructor.77

The Committee considers there is a need for a driver accreditation approach because of the legal liability insurance requirement for organisations using volunteer drivers. VicRoads should take a lead to develop a suitable standardised assessment process and establish a quality assurance regime for the assessment of volunteer drivers.
### Summary of Findings

- All Australasian jurisdictions except Victoria have some form of age-based health assessment, using a wide variety of methods and at different ages. Interstate comparisons of older driver crash rates have attempted to determine the effect of these practices. However, interpretations of the results vary and the studies do not enable the Committee to determine which, if any, of these practices are successful, and have a beneficial road safety impact.

- Practices also vary overseas, many jurisdictions use a combination of methods, again at different ages. Medical certificates are common in Europe and Canada while vision screening is more common in America.

- Current arrangements in Victoria assume that all drivers know and voluntarily disclose to VicRoads any medical conditions likely to affect their safe driving. The Committee does not believe this always occurs, especially in the older portion of the driving population, most prone to medical conditions. Introduction of mandatory age-based medical certificates for licence renewal for drivers aged 80 years and over would target those most likely to be affected by medical conditions which affect driving, while minimising the number of people requiring certificates.

- The current driver eyesight screening fails to take account peripheral vision, congenital vision defects and other eye diseases. Improved vision assessment methods and standards need to be developed and implemented for licence renewal.

- There is insufficient evidence of the road safety benefits of mandatory age-based on-road testing and road knowledge testing of older drivers, to justify their introduction in Victoria.
Chapter 5 – Age-based Assessments

Recommendations

12. That VicRoads, in conjunction with relevant organisations, develop and implement a standard medical assessment to determine fitness to drive for those aged 80 years and over who wish to renew their licence.

13. That driver eyesight standards and assessment methods in Victoria be comprehensively reviewed and an assessment be developed and implemented to replace the current acuity test.

14. That eyesight assessments be required prior to renewing a licence.

15. That mandatory age-based on-road driver testing or road knowledge testing not be introduced in Victoria at this time.

Endnotes


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Chapter 5 – Age-based Assessments

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59 Life Planning Foundation, Submission to the Inquiry, 5 February 2002, p. 5; the Ulysses Club, Submission to the Inquiry, 3 March 2002, p.3; Mr T. Maslin, Submission to the Inquiry, 22 January 2002, p. 2; and Mrs A. Fraser, Submission to the Inquiry, 28 February 2002, p.2.

60 MUARC, Submission to the Inquiry, March 2002, p. 23.


63 ibid.

64 ibid., p. 9.

65 ibid.

66 ibid., p. 8.

67 Staplin, L, et al., op. cit., section 1c1(a)iv.

68 ibid.

69 ibid.

70 RoadSafe Wimmera, Submission to the Inquiry, 27 February 2002, p. 2.

71 OECD, op. cit., p. 81.

72 ibid.

73 RACV, Submission, op. cit., p. 7.


76 Ms J. Meehan, Submission to the Inquiry, 4 March 2002, p. 2.

77 Ms A. Berndt, Submission to the Inquiry, 2 April 2002, p. 11.
Licensing Issues

Self Regulation by Drivers

One school of thought is that older people adequately compensate for declining abilities or health conditions. For a driving licence holder this has been termed ‘self regulation’. It has been argued that if most drivers adequately self-regulate then there is less need for licensing authorities to require testing. The Committee questions the capability of drivers to make such decisions rationally.

In relation to driving competence and crashes, Californian Researcher, Department of Motor Vehicles, Dr M. Janke states:

The weight of the evidence with regard to driving competence or skill appears to indicate that the most likely state of affairs is a reduction in elders’ driving skills resulting from various declines that come with age. However, this reduction in skill does not necessarily translate into a higher crash rate over any given period of time for elderly drivers as a group, because of the group’s characteristic compensatory behaviours and voluntary limitations of their driving.1

VicRoads subsequently noted that:

The effectiveness of self-regulation inferred by Janke’s comment is considered to be of critical importance to those older drivers experiencing the “normal” consequences of ageing. If effective self-regulation is widespread, most older drivers do not represent a significant road safety problem.2

The Accident Research Centre, Monash University (MUARC) in their submission state:

It is postulated that for the most part, older drivers compensate for these changes by driving less, avoiding driving at night, in bad weather, in heavy traffic or in difficult or high risk situations, and travelling only in familiar areas and at lower speeds.3
The Royal Automobile Club of Victoria (RACV) Ltd agree that many older drivers are very good at self-regulation, but that others may need to be encouraged to self-regulate.\(^4\)

VicRoads, in their submission, list factors identified by MUARC that could influence, both positively and negatively, the adoption of self-regulatory strategies and behaviours, including:

- Awareness of the impact of declining performance and health on driving skills;
- Perceptions of a loss of independence;
- Influence from others (for example, family, friends);
- Lifestyle choice; and
- The accessibility of and willingness to use public or alternative transport.\(^5\)

The Committee noted reductions in travel may not be due to a conscious decision to reduce travel risk, but simply that there is less need to travel. Lack of travel at night, or in poor weather, may also be more comfort-related than an attempt to reduce the risk of a road crash. Safety concerns about travelling at night may also be more about security, rather than concerns about safety while travelling.

MUARC, in their submission state:

... there are large gaps in our knowledge about the incidence and process of self-regulation in this country and about the effectiveness of self-regulatory practices in reducing crashes. It is possible that there is a sub-set of this group that may be unable to self-regulate their driving adequately and is therefore at a higher risk of crash involvement.\(^6\)

A subsequent, unpublished report by MUARC, described a recent random telephone survey of 656 Victorian drivers aged 55 years and older.\(^7\) The results showed that about half of the 25% who avoided night travel and driving at night in wet conditions, did so because of vision problems. Avoidance of busy traffic and a reduction in driving were associated with arthritis. Lower confidence and crash involvement were also associated with driving avoidance. However, not all drivers were adopting appropriate self-regulatory practices:

Indeed, only one-half of those participants with lower confidence ratings, who arguably should avoid these driving situations, reported self-regulating.\(^8\)
Overall, there was little evidence self-regulation was an effective means of reducing crash risk in those who rated themselves as moderately or not at all confident drivers. Of concern, the researchers also reported:

Interestingly, crashes were more prevalent amongst those who self-regulated by avoiding potentially risky driving situations.\(^9\)

As mentioned earlier the extent of self-regulation by people with various levels of dementia and mild cognitive impairment is unknown.

The Committee conclude that while self-regulation may be valid for most older drivers, it is not a satisfactory fail-safe strategy and cannot alone be relied upon to keep incapable older drivers from being a safety hazard. Intervention by licensing agencies will be necessary to ensure safety for all road users.

### Duration of Licences

Many submissions proposed a shorter licence duration as a driver ages, with a number of people expressing concern that drivers in their late eighties or nineties were being offered 10 year licences without any form of assessment.

The licence duration in Victoria was increased from three years to ten years in the 1980s for economic reasons. In other Australian jurisdictions the length of a licence is usually either five or ten years. In New Zealand licences are now renewed for five years on the driver’s 75\(^{th}\) birthday and every two years from their 80\(^{th}\) birthday.\(^{10}\)

The Road Safety (Drivers) Regulations 1999 do not specify the duration of a driver’s licence. Under Regulation 208 a licence expires on the day that is recorded by VicRoads. Therefore, these periods could be altered without a change to the regulations.\(^{11}\)

Licence renewal notices currently quote the ten year licence fee, however drivers are advised they may have a three year licence on request. About 25 per cent of licence renewals are currently for three year periods.\(^{12}\)

Following a request from the Committee, VicRoads provided information on the number of licence holders at each age over 60 years, and the licence duration requested. Twelve per cent of those aged 60 years chose a three year licence, increasing to 17% for those aged 80 years old and over.\(^{13}\) This implies that drivers younger than 60 years of age are predominantly choosing shorter duration licence periods.
Shortening the Licence Period

There was very strong community support for shorter duration licences for older drivers. This would provide more frequent opportunities for drivers to consider whether they could, should or need to continue to drive.

There is a wide range of renewal periods in Europe beyond a determined age; three years in the United Kingdom from age 70; four years in Denmark from age 70, then every three years from 71, every two years from the ages of 72 – 79 and then every year from 80; five years in The Netherlands; and ten years in Italy until age 50, then five year renewals until age 70, then three yearly. In many countries the licence periods reduce further at a more advanced age, down to every two years or annually.

VicRoads recommended to the Committee that licences be renewed at 10 yearly intervals until drivers reach 75 years. The Chief Executive of VicRoads, Mr. D. Anderson said that, because of the higher casualty rate of older drivers:

… it would be prudent to issue licences for only a three-year period beyond the age of 75 years, instead of continuing to issue 10 year licences beyond any age.

He later added that with three yearly renewals the latest road safety information could be provided to drivers. Approximately 165,000 Victorian licence holders are over 75 years.

In recommending to the Committee the introduction of a shorter licence period, the RACV in their submission noted:

Changes to the length of licensing period has some road safety related benefits in that it will ensure that all drivers have a more current form of driving identification with them and it may also act as a trigger for some drivers to question their fitness to drive before renewing their licence.

The RACV also provided results of a 1997 survey of their members, which showed that half prefer the 10 year licence period. Older drivers were slightly less likely than other age groups to support the 10-year licence (40%), although it was still the most popular choice.

The RACV suggest that benefits of a shorter licence period may outweigh the slight inconvenience caused to drivers of renewing every three or five years rather than every ten.

On the basis of the proportion of older drivers with poor visual acuity increasing with age, the Optometrists Association Australia (Victorian Division) Inc., proposed that licence duration be reduced from ten years
to three years at 70 years of age and reduced further to annually from 80 years of age.\textsuperscript{22}

The Country Women's Association (CWA) proposed five year licences between 55 and 70 years and two year licences thereafter.\textsuperscript{23}

The Committee recommends shorter licence durations, supplemented by education to encourage safer driving practices and that licence duration should be reduced further for the very oldest drivers. This is because of their much higher incidence of functional impairment and the increased incidence of crashes in which older drivers are deemed ‘at-fault’.

**Transition Arrangements**

One difficulty with providing a shorter licence period for older drivers is the transitional arrangements. For example, if five yearly licences were introduced at 65 years of age, a driver facing licence renewal at age 64 years would still be offered a ten year licence up to 74 years. Measures to overcome this situation include to:

- Adopt the shorter licence duration at an earlier age;
- Move to a birthday renewal date arrangement, as in the United Kingdom and New Zealand, with Victorian drivers aged 55-64 years having licences that expire on their 65th birthday; or
- Adopt a phased arrangement, such as in Denmark.

The Committee proposes adoption of five yearly licences beyond the age of 65 with a phased in arrangement. Licences being renewed in, say, the driver’s 56\textsuperscript{th} year would be for nine years, in their 57\textsuperscript{th} year for eight years, and so on. This would provide both a suitable transition from the current ten year licence, and an earlier opportunity for older drivers to start to think about modifying travel patterns and driving practice to improve their travel ease and safety.

Because of the increased incidence of impairment, especially in vision and cognition, and the rapid increase in driver casualty risk and the ‘at-fault’ crashes in the case of the very older driver, there is a sound case for licence duration to be reduced further for the oldest age-group.

The Committee believes that 80 years would be an appropriate age to move to an even shorter licence period. Those overseas jurisdictions which have a much shorter period for the oldest age group have adopted two yearly licences.
Recommendation

16. That VicRoads introduce a five year licence period, phased in by 65 years of age and the licence period be further reduced to two years from 80 years of age.

Health Questionnaires

In Victoria applicants are asked two questions regarding health status when first applying in writing for a learners permit or driving licence:

Do you suffer or have you ever suffered from an eyesight or hearing defect, dizziness, blackouts, epilepsy, diabetes, psychiatric or mental illness, any medical condition or other disability which may affect your driving?

Are you taking drugs or prescribed medication?24

If they answer yes they are asked to provide further information on the application form. VicRoads may ask for the applicant to undergo a medical examination by their doctor.

In December 1999, the Road Safety (Drivers) Regulations placed the onus on the individual to report to VicRoads any permanent or long term injury or illness that may impair their ability to drive safely.25

The Committee believes few drivers are aware of this new responsibility, and even if they do the penalty for non-compliance is only one penalty unit, currently $100.

In the United Kingdom a more extensive questionnaire is completed at licence renewal.26 In the Netherlands the Committee was provided with a personal declaration form which lists 10 questions and is completed before a licence is issued by the licensing authority at renewal.27

The RACV propose that the licence renewal process could include some mechanisms for highlighting the need for all drivers to be physically fit to drive. They recommended to the Committee that a health questionnaire ought to be completed by all drivers before renewal.28

The RACV also noted that the national medical guidelines for heavy commercial vehicle licences contain a pro-forma questionnaire for drivers to complete as the first part of the mandatory examination by a medical practitioner. The RACV propose that such a questionnaire could be used for car drivers. Individuals recording a medical condition on the questionnaire would then be treated as any other driver who reports a medical condition to VicRoads, and may be required to undergo a medical assessment and possibly a driving test.29
The RACV note that completing the questionnaire would increase motorists’ awareness of the importance of being ‘fit to drive’ and may also create an opportunity for drivers to discuss their fitness to drive with health professionals, family and others.30

The Committee considered that, although there was no evidence that requiring drivers, of any age, to answer a health questionnaire would reduce road crashes, it was a means of bringing to drivers’ attention their legal responsibility and the significance of medical conditions and safe driving. This questionnaire should be available in other languages.

Recommendation

17. That all drivers be required to complete a health questionnaire when renewing their licence. This questionnaire should be available in other languages.

Other Strategies

Philosophical Approach to Driver Assessment

While not currently investigating the broader issue of driver licensing and training, the Committee observes that it may be timely to consider a philosophical change, from a ‘get it once, lifetime’ driver certification to a quality management lifelong learning approach, involving continual education and adaptation of driving to changing circumstances and road law.

In such an approach there might be random assessments of medical fitness, road knowledge and on-road ability as occurs currently with alcohol testing, speeding, and vehicle roadworthiness. As mentioned, the State of Pennsylvania, USA has a random driver assessment, whereby drivers over the age of 45 years, predominantly concentrating on the oldest age groups, are selected each month for re-testing at licence renewal.31

Road Crash and Traffic Conviction Histories

Another method of identifying drivers who may be at-risk with medical conditions, could be a system of identifying those with a history of crashes and/or traffic convictions.

Crash History

Traffic crash history is a possible basis for identifying drivers for licence re-assessment. A submission from a private individual, Mr R. Munro, proposed driving tests for older drivers involved in crashes.32

Two Canadian provinces use records of past crashes reported to authorities as a means of identifying potentially unsafe older drivers. In
Ontario a crash report indicating that a driver aged over 70 years was ‘at-fault’, triggers action by the licensing authority. In 2000, almost 5,000 drivers were required to complete a re-examination of vision, knowledge and road test, due to a conviction of a crash-related offence. Prince Edward Island uses two crash criteria for drivers aged over 80 years; two crashes within 12 months or three in 24 months.

In Illinois, a crash recorded on a driving record requires the driver to undertake a written test and/or a road exam.

**Traffic Convictions and Demerit Points**

Past research has demonstrated that there is a strong connection between a driver having a history of traffic convictions and their involvement in collisions. For example, during the *Inquiry into the Demerits Points Scheme* in 1994, the Committee learned that drivers with higher numbers of offences are three to six times more likely to be involved in crashes, although the numerical rates differed widely between the studies. That Inquiry also concluded that those Victorian drivers who had accumulated 12 or more demerit points, within a three year period, would have about five times the crash involvement of those without demerit points.

The above research did not specifically focus on the age of the repeated traffic offenders, and it could be argued that drivers with high numbers of demerit points might be predominantly ‘risk takers’, rather than drivers with a history of poor driving.

Researchers from New Zealand Land Transport Safety Authority (LTSA) Mr M. Keall, Scientist and Mr W. Frith, Manager, Research and Statistics, recently found that older New Zealand traffic offenders had almost seven times the likelihood of a recent crash than non-offenders, although this might partly be due to those with demerit points having higher travel exposure.

Two Canadian provinces, British Columbia and Ontario, make use of demerit point records to detect potentially unsafe older drivers. In Ontario, serious offenders may be interviewed, road tested or have their licence suspended or cancelled. Any traffic offence by an older driver in which points are lost within the previous two years results in a road test.

California Department of Motor Vehicles researchers Mr M. Gebers and Mr R. Peck found an interaction between age and prior driving record when crashes and traffic conviction records were closely examined. In a paper in 1992 they suggested a modified demerit point system be adopted for older drivers:
One reason for the lower action threshold may be the much lower driving exposure of older drivers. The authors stated an advantage of such a system is it could also detect drivers with mental and physical problems who could be referred for further investigation.

The Committee concludes that VicRoads should use its crash, conviction and demerit point records to identify potentially unsafe drivers for investigation.

Recommendation

18. That VicRoads use crash records, traffic conviction records and demerit point scores to identify and assess licence holders who may no longer be safe to drive.

Restricted Licences

VicRoads is able to issue licences to drivers that restrict driving where the driver may be unsafe. These restrictions are usually determined on the basis of medical advice from general practitioners, occupational therapists, optometrists or other health professionals.

The current licence or permit restriction codes are:

- **A** Automatic transmission
- **B** Synchromesh transmission (heavy vehicles only)
- **E** 260cc motor cycle engine size restriction and no pillion passenger allowed
- **G** Glasses or corrective lenses must be worn
- **I** Ignition lock device (for repeat drunk drivers)
- **P** Passenger restriction
- **V** Driver aids or vehicle modifications
- **X** Any condition or restriction VicRoads has advised the person of, in writing
- **Z** Zero blood alcohol limit.

Examples of conditions imposed under code X are shown in Table 6.1.
Table 6.1. Examples of Conditions Imposed Under Code X

<table>
<thead>
<tr>
<th>Examples of problems/conditions</th>
<th>Restrictions /conditions</th>
</tr>
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<tbody>
<tr>
<td>Night vision problems</td>
<td>Daylight hours only</td>
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<tr>
<td>Fatigue problems</td>
<td>Duration</td>
</tr>
<tr>
<td>To reduce complexity</td>
<td>Location</td>
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<tr>
<td>Reduced attention</td>
<td>Off-peak only</td>
</tr>
<tr>
<td>Distractibility</td>
<td>Number of Passengers</td>
</tr>
<tr>
<td>Fatigue associated with some conditions (eg multiple sclerosis)</td>
<td>Specified Temperatures</td>
</tr>
</tbody>
</table>


VicRoads provided the Committee with June 2003 statistics on the number of older licence holders with licence conditions. At 65 years about five per cent of drivers have licences with conditions, increasing to about 14% for drivers aged 85 years. The most frequent conditions across all ages relate to wearing corrective lenses or spectacles when driving.44

The RACV state the issuing of restricted licences is generally well received by older drivers as long as drivers’ assessment is based on sound medical advice.45

Further:

Most drivers regard restricted licences as being preferable to ceasing driving completely, especially in areas of limited public transport services such as rural areas.46

The RACV recommended to the Committee that restricted licences:

... should be issued to drivers who are regarded to be safe to drive in some situations but not in others. The licence conditions placed on drivers must be based on sound medical advice after the individual driver has been assessed and their mobility needs taken into account.47

A number of other submissions were supportive of the greater use of licence conditions.48
The Effectiveness of Licence Restrictions

No statistical evidence was available to the Committee to show that restricting licences in Australasia is effective in improving road safety for drivers or other road users and there is only limited overseas information.

Evidence from crash records from 1992-1996 in the State of Utah, USA shows that drivers with restricted driving licences, due to some medical conditions, have a lower crash rate than unrestricted drivers with the same condition.\textsuperscript{49} In Utah licence applicants must complete a general health questionnaire. Those reporting a medical condition are placed into one of 12 categories. The higher levels of severity in each category have various sets of restrictions, including speed, area, time of day and passenger requirements.\textsuperscript{50} At the American Association of Motor Vehicle Administrators, Motor Vehicle and Traffic Law Institute Conference, Canada 2002, Ontario Ministry of Transportation senior counsel Mr R. Burns, quotes the preliminary results of Diller et al (1999) as showing that:

Unrestricted drivers with learning and memory disorders had at-fault collision risk 3.63 times higher than restricted drivers with the same condition.\textsuperscript{51}

However Burns also quotes a study of drivers with vision conditions in North Carolina that looked at crash involvement during 1997 to 1999. The study found that drivers aged 65 years or more with vision restrictions as a licence condition (that is, no night travel and/or travel only on lower speed roads) had a crash rate 41\% higher than drivers without vision restrictions, or only a corrective lenses restriction.\textsuperscript{52} While on face value this evidence does not support the case for restricted licences, Burns says that it is not known if the crash rate would have been even higher had licences not be restricted.\textsuperscript{53}

Another study, by researchers Salzberg and Moffat in 1998, looked at the Washington State Department of Licensing’s Special Examination Program, a process broadly similar to the VicRoads’ Medical Review process. According to a summary of the research in the National Highway Traffic Safety Authority (NHTSA) \textit{Safe Mobility for Older People: Notebook}, positive outcomes are shown for drivers with restricted licences who had diabetic retinopathy, cataracts, cardiovascular conditions and diabetes, but licensing restrictions did not lower the crash risk of drivers with macular degeneration. Also, for those with neurological, psychiatric, or stroke/cerebral vascular conditions, the reductions in crash risk still left these drivers at three to four times greater risk when compared to control group drivers.\textsuperscript{54}

The Committee concludes that the overseas studies show that licence restrictions may have some road safety benefit, but this depends on the particular functional ability which the restriction attempts to address, and
the details of the restriction imposed. Some restrictions may have been inappropriate for the condition, or ignored by the driver. While research is continuing overseas it is too early to know the road safety benefits of licence restrictions, or the type of restriction most effective for a particular medical condition.

Knowledge of Availability of Conditions

The RACV, in their submission stated:

RACV member research conducted in 1995 found that many older people were not aware of the option of having restricted licences. These older people, and quite possibly some health professionals, may have been under the incorrect impression that the only option available was either a full, unrestricted licence, or no licence at all.

Health professionals should be made aware of the availability of restricted licences and the procedures involved in changing a person's licence status with VicRoads. Older drivers should also be made aware of this option and be encouraged to discuss their physical fitness to drive with their health professionals.55

The Committee agrees that both older drivers and health professionals should be made aware that conditional licences exist.

An Automatic Restricted Licence Proposal

The concept of automatic three year licences with no night driving or travel during peak hours in urban areas, for drivers aged 75 – 85 years, was proposed in the Road Safety Strategy for Victoria 2001-2005 Discussion Paper of mid-2000. Obtaining a full licence would require a medical certificate stating fitness to drive.56

A Blanket Night Curfew

The RACV in their submission, state that many older drivers do not like driving at night and, as a result, many avoid it. A 1997 Member Survey confirmed they rarely drive at night, if at all.57

While visual deterioration can impair sight at night more so for some older drivers, the RACV note that a night curfew on drivers over the age of 75 would not cause any reduction in the road toll.58 TAC crash statistics for 2001 show, of 39 drivers over the age of 65 killed only two of these fatalities occurred between the hours of 6pm and 6am.59

RACV reported on a 1993 MUARC report that also found that drivers over the age of 65 were less likely to be involved in night-time crashes than other drivers.60 The RACV therefore state that licensing conditions to prohibit night driving seems to be unwise, given the extremely low crash involvement of older drivers in night-time crashes.61
A Blanket Peak Hour Ban

Available evidence indicates that the distance older drivers travel declines with age.\textsuperscript{62} The 1997 RACV survey showed that older drivers drive fewer kilometres, drive for fewer hours, go on fewer long distance trips and are more likely to drive on familiar routes than their younger counterparts.\textsuperscript{63} The RACV also notes that:

To date, no research has been conducted to indicate whether older drivers are safer if they drive at peak or off-peak times. Of course, driving during off-peak times means there is less traffic and possibly less chance of having a crash.\textsuperscript{64}

A review of overseas literature by Californian researcher Dr M. Janke concludes that most older drivers avoid driving at peak times, if they can, due to the inconvenience and anxiety caused by the increased congestion.\textsuperscript{65}

The RACV view is that a blanket restriction on travelling at peak times would cause difficulties for older people if they need to get to medical or other appointments that require them to travel in peak times.\textsuperscript{66}

To conclude, the Committee considers that blanket restrictions are unlikely to produce road safety benefits and would inhibit the mobility of many older people. Licence conditions relating to night and peak hour travel should be related to individual circumstances, on the basis of specialist professional advice.

Enforcement

The Committee was unable to find any firm evidence on the compliance of drivers to licence restrictions.

Victoria Police support restricted licences only in certain circumstances. Curfews are one such circumstance. The Victoria Police submission of August 2002 stated that:

Any licence condition applied to a curfew would need to clearly specify times for the commencement and completion of any curfew.\textsuperscript{67}

However, then Assistant Commissioner R. Shuey told the Committee at a Public Hearing in August 2002, that curfews would be difficult to enforce and that one of the issues was police being able to identify whether people were driving within the curfew limits.\textsuperscript{68} A clear mark would be needed on the vehicle.
Public Identification of Conditional Licence Holders

In a revised submission in May 2003, Victoria Police stated that restricted licences are unenforceable and an alternative process of clearly identifying drivers with these restrictions should be considered, for example:

... display of “O” plates similar to probationary licensed drivers having to display “P” plates.69

Currently Learner and Provisional licence holders are required to display L or P plates on the front and rear of their vehicles to warn other road users that they are either learning to drive, or are relatively inexperienced drivers.

Some submissions suggested that older drivers be either encouraged or required to display plates to warn other road users that they may be more cautious, react slower or otherwise drive differently to other motorists.70 When asked about the notion that a restricted driver be identified in the same way as novice drivers are, Dr K. Ogden, General Manager Public Policy, RACV replied:

We would have a problem with that. While I can see that is a well-intentioned suggestion, in fact it makes that person a potential target of intimidation, or road rage, as it is sometimes called. There needs to be a balance between making the person a target and actually identifying them as having a special need. That needs to be carefully thought through.71

When asked whether he would categorically not support the introduction of an O or S type identification, Dr Ogden replied:

I do not know that I would go so far as saying we would not categorically contemplate it. I am saying that before we go that far we would need to see some evidence that it would not have an unexpected negative effect.72

The Committee agree with the RACV about concerns to do with intimidation of older drivers and do not support mandatory use of identification plates or symbols for some, or all holders of conditional licences.
Graduated De-Licensing

A number of submissions suggested the gradual introduction of restrictions for older drivers, analogous to graduated licensing for novice drivers, commonly termed ‘Graduated De-Licensing’ in international literature.

In Victoria, novice drivers have restrictions on blood alcohol level and the power of the vehicles they can drive. In some jurisdictions there are additional restrictions on probationary drivers, including maximum travelling speeds and prohibitions on travelling late at night and carrying passengers.

The Committee considered a number of other possible classes of restriction may warrant further research and investigation. Drawing analogies from the novice driver licensing regime, there is scope for consideration of a wider range of conditions for older drivers. These might include:

- Local areas, routes and types of road;
- Accompanying persons;
- Blood alcohol level; and
- Type of vehicle.

In recent years the New Zealand Ministry of Transport has been expanding the use of conditional licences for older drivers. One proposal under consideration is to allow drivers 80 years and over to select whether they want a full or restricted licence before attempting their biannual on-road test. The two tests would be different. At present, older drivers are considered for a restricted licence only if they fail the on-road test. If the results are successful in New Zealand, it is worth consideration for use in Victoria.

Local Areas, Routes and Types of Road

Restricting some drivers to only travel in local areas, sometimes called ‘locality licences’, was supported in many submissions. However, the Committee could find no evidence for restrictions made to the number of kilometres allowed to travel from the registered address of the driver, or particular routes, or categories of road. There appeared to be no clear guidelines on the conditions which should apply for drivers with particular functional limitations. In any case older driver crashes predominantly occur close to home.

There may however be justification for banning travel on certain types of roads such as high-speed urban freeways or highways. There is clear evidence from overseas that older drivers have a relatively high rate of
difficulty with high-speed traffic merging onto freeways; changing lanes when on the freeway and safely negotiating exits. Even though freeways are the safest road facility for travellers in general (in terms of casualties per distance travelled) they are not as safe for some older drivers.\textsuperscript{74}

Another restriction might be to ban driving in certain areas, such as the Melbourne central business district, or beyond a township environment.

One of the major difficulties faced by drivers with visual and cognitive impairments is safely negotiating intersections and turning across oncoming traffic into driveways or car-parks. Prohibitions by area or road type do not adequately address these difficulties.

The Roads and Traffic Authority (RTA), New South Wales informed the Committee during a meeting in Sydney in June 2003 that they issued restricted licences based on kilometres from the driver’s home.

\begin{center}
1, 2, 3, 4, 5 kilometres; then they go in 5-kilometre increments up to 50 kilometres … 10-kilometre increments up to 100 kilometres; and then we have a 120-kilometre radius and a 150-kilometre radius.\textsuperscript{75}
\end{center}

Concerns were raised about the logic of the system. A driver living in inner Sydney would probably not get very far in five kilometres. The larger kilometre radius was for those drivers who lived a long way from country towns but the Committee questioned whether they were able to cope with driving such long distances.

Ms A. Berndt, Clinical Director, Driver Assessment Service, University of South Australia, advised that inappropriate licence restrictions, such as travelling only within a five kilometre radius, shows a lack of knowledge of the effects of some older driver health issues. While she was supportive of restricted licences, she stated in her submission that even very short journeys can be tiring for older drivers and some Multiple Sclerosis or dementia sufferers have used up their physical and cognitive reserves just getting out of their front door.\textsuperscript{76}

Another approach to this type of restriction for the very borderline impaired driver would be a route-based system, where the condition would be expressed in terms of authorised roads. This has precedents with permit schemes for over-dimensional vehicles (large cranes, etc) and the system of authorised routes for B-Double vehicles in Victoria. Routes could be tailored to the particular needs and capabilities of individual drivers, such as travelling to the local shops, medical facilities, or community welfare centres.
Accompanying Persons

There could be value in requiring some older drivers to be accompanied by a companion, especially if the passenger was a current or former driver. The companion adds an additional set of eyes and ears, and can seek assistance if the driver has a sudden medical incident. New Zealand LTSA scientist Mr M. Keall and Mr W. Frith, Manager Research and Statistics, state that, based on recent New Zealand crash analysis and other studies:

… older drivers may be safer if they can rely on another driver to share driving duties.77

There are situations, however, where crashes could be caused by wrong instructions from the companion, who might also be aged and with their own health difficulties.

One of the licence restriction options in Utah is the driver be accompanied by a licensed driver.78 Some overseas road safety experts have also considered the ‘co-pilot’ concept.79 Maybe an instructional course for ‘co-pilots’ could be developed. While not an optimal solution, requiring an accompanying person is probably a preferable alternative than being isolated in remote rural locations.

Blood Alcohol Level

Probationary drivers, drivers of buses, taxis and trucks are all required to have a zero blood alcohol level when driving.

As discussed previously, the Committee support the current alcohol limit of .05 for experienced, non-professional drivers. However it does have concerns about the safety of those drivers with medical conditions, having visual and cognitive difficulties and/or taking medications, which can produce adverse effects if even quite small amounts of alcohol are consumed.

At present the Committee considers there is insufficient evidence to justify a zero-blood alcohol limit for all drivers with restricted licences. There is a case for making it a possible licensing condition for some drivers with particular medical conditions, especially those on medications which could have impairing effects if any alcohol is consumed.
Type of Vehicle

A Victorian with a car licence is permitted to drive a wide variety of light passenger vehicles, including mini-buses of up to 12 seats. Some large four wheel drive vehicles and mini-buses also have quite different handling characteristics to small sedan cars.

Probationary drivers in Victoria are not permitted to drive high powered vehicles. The Committee is unaware of any jurisdictions where older drivers holding restricted licences are not permitted to drive a particular type of vehicle, a model of car or a group of specified passenger vehicles. The only limitations on the vehicle used appear to be automatic transmission, power steering or individual-specific vehicle modifications, such as steering or pedal adaptions, as a result of a disability. VicRoads statistics show automatic transmission was one of the most prevalent licence condition for older drivers, but that conditions relating to specific modifications were relatively rare.  

Vehicle type for older drivers is an area for some more creative licence conditions, such as requiring automatic transmission, power steering, power brakes and automatic daylight driving lights. While the safety benefits of each of these items may be small, the cumulative effects may be enough to compensate for impairments in driving ability which would be considered too risky in another vehicle. The possible additional cost to the driver would need to be considered, but modifications or specifications may be preferable to the alternative of not having a licence.

Categories of Restriction

The use of standardised functional ability levels and associated restrictions enabled Utah to undertake the comprehensive comparison of medical conditions, crash rates and the effect of restricted licences described earlier in the report. At the time of the study drivers with no, or low levels of, impaired functional ability had no restrictions. Those on:

- Level 6 – had a speed restriction placed on their licences;
- Level 7 – speed and area limitations;
- Level 8 – speed, area and time of day restrictions;
- Level 9 – must be accompanied by a licensed driver and may have speed, area and/or time restrictions as recommended by a health professional.

They also had two higher levels of impairment associated with special driving limitations based on professional advice.

Given the paucity of data on the effectiveness of licence restrictions, there would be value in conducting similar research in Victoria. The
number of possible licence conditions is considerable. To enable a person to continue driving, enhance enforcement and facilitate research, there may be value in developing a series of standard restrictions, which could be aggregated to address an individual’s medical situation, or applied progressively as a driver’s health deteriorated. Appropriate codes could be recorded in the VicRoads driver licence database to enable comparison of groups of drivers with particular licence conditions with crash and traffic offence records.

The Committee supports the concept of restricted licences with conditions appropriate to the capabilities of individual drivers. The graduated de-licensing concept should be further explored and a wider range of licence condition codes investigated.

**Recommendation**

19. That a wider range of driving licence condition codes be investigated by VicRoads.

**Need for Investigation**

The Committee is concerned with the lack of Victorian evidence about the effectiveness of restricted licences in reducing road safety risk. Overseas research, predominantly in Utah, gives differing results for particular categories of functional impairment. In addition there is no evidence of the effectiveness of the off-road and on-road methods used to assess those suspected of impaired driving, due to medical conditions.

Before encouraging the greater use of restricted licences the Committee proposes that VicRoads investigate the effectiveness of the existing restricted licence regime in Victoria, and associated assessment methods and processes, in reducing older driver crash risk.

**Recommendation**

20. That VicRoads investigate the effectiveness of licence restrictions, and associated assessment methods and processes, in reducing driver crash risk.

**Driver Education and Training**

Voluntary education programs exist in Victoria, conducted by various groups including, VicRoads, the RACV and the Hawthorn Community Education Project.

**Education Sessions Available in Victoria**

Over a number of years the Hawthorn Community Education Project has developed a course called *Wiser Driver* which is presented in four weekly two hour sessions. Between 10 – 15 people attend each course.
**Wiser Driver** is designed as a refresher course for older drivers to refresh their road knowledge, discuss important issues about driving and consider their future transport options. The four sessions cover the following areas:

- The ageing population, licensing and driver testing;
- Traffic rules;
- Roadworthiness, including driving skills, night driving, fatigue; and
- Maintaining your driver’s licence and strategies for the future, including upgrading skills, road rules, the importance of staying fit and healthy, being a safe pedestrian, travel habits, costs of running a car, assessing driving skills, planning for the future, and alternatives to driving.

At the *Mobility & Safety of Older People Conference*, in Melbourne, Ms J. Elsworth, the course co-ordinator in describing the course said:

> … the major strength of the program … is that older people have helped to design the style and the format for themselves and their peers.

**Wiser Driver** is now available, by a licensing agreement, to other organisations. A 2001-2002 evaluation conducted for the Australian Transport Safety Bureau, based on ‘before and after’ attitudinal responses and self-assessment of 148 participants, found that:

> … the Wiser Drive Course has the capacity to positively influence driving behaviour for an absolute minimum of 35-45% of course participants, with the potential evident from survey data to influence up to 80% of course participants.

**SafeDrive** an education program for older drivers, organised by VicRoads in collaboration with local government, aims to provide information about safe driving practices, assessing driving skills, medical conditions and healthy living. Local general practitioners, pharmacists, optometrists and police officers are also invited to present various segments. Approximately 800 people participated in 2001-2002.

VicRoads also individually tailors presentations to diverse groups of older drivers. Fourteen presentations were made to over 1,000 participants in 2001.

The RACV delivers *Years Ahead*, previously known as *Streets Ahead*, which aims to increase awareness of key road safety information and resources. The 60 minute sessions are given to groups such as senior citizens clubs, Probus Clubs, church groups and retirement villages and includes a video on *Your Driving Future*. Since launched in March 1997,
over 30,000 people have participated. Currently 130 metropolitan and 130 rural presentations are held annually. A biannual newsletter is distributed to people who have attended. The RACV state that:

The newsletter is an excellent communication channel with older people and allows for a discussion of topics that time constraints during the program do not permit.

The RACV has evaluated the *Years Ahead* program and found that it has a positive impact on the views and attitudes of older drivers. However, measures of self-reported confidence levels and driving exposure were not found to increase as a result of the program.

Saferoads is a consortium comprising VicRoads, RACV, Municipal Association of Victoria (MAV), the local government professional’s organisation (LGPro), Victorian municipalities and local Community Road Safety organisations. Their new *Keeping Older Drivers Safe and Mobile* program incorporates an educational element for delivery to local groups of older citizens aged 65 years and over.

Development of the program and its piloting in East Gippsland Shire were described by Ms K. Nelson, Manager, Development Services, East Gippsland Shire, at the *Mobility & Safety of Older People Conference*. The resources include a video and a CD containing sample media releases and fact sheets on road safety, vehicle safety, health and licensing issues which can be tailored to local requirements. Other municipalities are beginning to use the program.

In Sydney in June 2003 the Australian Driver Trainers Association informed the Committee about a course for older drivers held over three days that they conduct through municipalities in New South Wales. The course includes vision screening and driving tests as well as interactive educational sessions. It includes a practical session with a comprehensive vehicle ergonomic assessment for each participant and an extended period of on-road driving assessment which addresses the impact of fatigue and concentration on driver performance.

### Older Driver Handbooks

VicRoads has produced a free 68 page *The Victorian Older Drivers’ Handbook* available from VicRoads offices, by mail or from their internet site. It is also available through the RACV and local government offices. The handbook covers topics such as:

- A self-assessment of health and driving capabilities, in the form of 34 questions. This may also be completed by an accompanying passenger;
- Information on medical conditions, medicines, safe driving practices and good health and driving; and
• A small section on legal obligations, the Medical Review Process and a brief description of the Review Driving Test and Occupational Therapy Driver Assessment.

Brochures and Other Information

VicRoads has produced brochures on medical conditions often suffered by older drivers including, *Glaucoma and Driving, Driving and Diabetes, Driving and Epilepsy* as well as other issues such as, *Improving wheelchair visibility and safety*.

Other resources available, include the Alzheimer’s Association of Australia *About you … Driving and Dementia* help sheet, and a smaller sheet for those caring for a driver with dementia.96

VicRoads, RACV, TAC, Saferoads and the Alzheimer’s Association provide older road user safety information on their internet sites.97 Magazine articles are also a useful communication medium. The RACV journal *Royalauto* occasionally features articles on the subject.98

While supporting all these education sessions and publications, the Committee questions whether they reach their target audience.

Effectiveness of Current Victorian Programs

Based on the evidence provided, the Committee considers it is unclear what proportion of older people are aware of current programs, the messages they convey and whether they are appropriate for all older age groups. The products and services appear to reach only a small segment of the overall market. As an example, only 40,000 copies of *The Victorian Older Drivers’ Handbook* have been distributed by VicRoads, yet there are approximately 650,000 licensed drivers in Victoria over the age of 60 years.99

Little quantitative evidence was available on the effectiveness of both current distribution of information methods and their subject matter. However information from the recent *Wiser Driver* evaluation showed:

• Little awareness by course participants of the legal obligation, under the Road Safety (Drivers) Regulations 1999, for drivers to report to VicRoads any disability or medical condition that may affect driving; and

• The perception that there are limited effective mechanisms for on-going driver education throughout the licence holding period.100
Availability

The above material is available at VicRoads offices and RACV shops and usually distributed at group discussions, but no pro-active mail-outs have occurred. In New South Wales the RTA send their *Older Drivers Handbook* to licence holders at 70 years of age.\(^{101}\)

RoadSafe Barwon is the only group in Victoria who appear to have done the ‘sums’ about program coverage. They estimate that presentations to a minimum 200 service clubs and church groups could possibly reach half the target audience of some 20,000 people in their area.\(^{102}\)

Age Sub-groups

Should all older age sub-groups be given the same messages or the same relative emphases of messages? Currently it is not clear which age group is being targeted. *The Victorian Older Drivers’ Handbook* makes no mention of age. The *Saferoads* program frequently mentions 65 years and over and the VicRoads pedestrian brochure addresses people 60 years of age. The Western Australian handbook uses the term ‘senior’, and quotes risks for drivers aged 60 and over.

The age of the people shown in photos can give a message to potential readers as to whether it applies to those younger or much older than themselves. The Western Australian photos show people much younger than the Victorian publications. Photographic images need to be appropriately selected.

As an example of different needs, people at retirement stage, usually in their mid-sixties, might need more information about vehicle purchase, residential relocation and public transport services. Those in their eighties might need more information on eyesight and medical conditions and alternative transport services.

The Committee is aware that *The Victorian Older Drivers’ Handbook* is currently being updated and will include a section on the responsibilities of drivers. However, it would be desirable for the handbook to be expanded further to include planning for driving cessation, mobility options and alternative modes of transport. It is also important that this material be disseminated to as many older people as possible. The Committee therefore recommends that it be sent out with a person’s licence renewal from 60 years of age.

Information in Other Languages

Currently there are very limited resources for older road users in languages other than English. The learner permit and licensing handbooks are produced in 15 languages to assist people whose first language is not English. Therefore, people with those same languages will also need access to *The Victorian Older Drivers’ Handbook*. At the very least, the Committee believes this document should be made
available in the most popular languages. Education services should be conducted in languages other than English and sessions tailored to community and senior citizen groups.

Recommendations

21. That VicRoads expand the information provided in *The Victorian Older Drivers’ Handbook* and distribute it with licence renewal forms to those drivers 60 years and over. This handbook should also be translated into other languages.

22. That VicRoads develop education and publicity strategies to address older road user safety issues for drivers, health professionals, families, friends and caregivers. To ensure the success of these strategies targets be set on how to reach the correct audience and the programs be evaluated.

Resources Interstate and Overseas

**Interstate**

MUARC has developed a *Retiring from Driving Handbook* on behalf of the Council on the Ageing (COTA) in the Australian Capital Territory and the ACT Department of Urban Services. The RACV suggested to the Committee that a similar document be developed for Victorian drivers and their families, including topics such as: the risk of driving as a person ages, recognising signs of ageing and changing ability, and planning ahead, as currently there is very little information available.¹⁰³

The Committee do not see the need for yet another handbook but agree the information is vital for older drivers. This information should be incorporated into the current VicRoads *Victorian Older Drivers’ Handbook*.

**Overseas**

The Department of Transport in the United Kingdom has produced a free 12 page handbook titled *Drive On! Advice for Older Drivers*, which includes sections on skills refreshment, the law, eyesight implications and driving cessation. The section on stopping driving notes there is no legal cut off age for driving, the onus being on the individual driver in deciding when the time is right to stop driving.¹⁰⁴

During the course of the overseas study tour, the Committee heard of three particularly enlightening programs:
BROEM

BROEM, which translates into ‘comprehensive deliberations on elderly and mobility’, is a program in the Netherlands for older drivers. The program is run co-operatively by a traffic safety organisation, a motorist organisation and the association of garage proprietors. The main aim of the program is to support and improve the driving proficiency of drivers over the age of 50. Since 1991 approximately 7,000 people voluntarily attend each year, serviced by 1,200 instructors.

The course consists of three one-hour sessions of theory, medical information and driving. The theory covers traffic regulation, road law and driving behaviour. An optometrist and an audiologist check the participant’s eyes and ears, and reaction time are tested on a simulator. A driving instructor takes the person for a half hour drive, providing feedback as to their vehicle handling and driving ability in traffic.\textsuperscript{105}

MAVIS

The Mobility Advice Vehicles Information Service (MAVIS) located in Crowthorne, Berkshire, United Kingdom provides advice, information and assessment for disabled and elderly drivers and passengers, and administers and monitors Government funding of mobility centres. It has a particular emphasis on vehicle adaptation and vehicle choice to enable people to continue, rather than stop, driving.\textsuperscript{106} MAVIS is administered by the Department for the Environment, Transport and the Regions and a number of independent mobility centres operate throughout the United Kingdom.\textsuperscript{107}

SAGE

Gloucestershire County Council has a *Safer Drivers with Age* (SAGE) assessment program conducted in the driver’s local area. All assessments are initially conducted following a referral from a physician or family member. Only four per cent are for older drivers. The program involves vision screening and medication assessment by a nurse, driving ability and hazard awareness testing conducted by a driving instructor, in a person’s own car.

The cost in 2001 to the driver was approximately $AUD50. Those who pass qualify for approximately $AUD24 discount on insurance from a sponsoring insurance company. Any driver who fails the SAGE test is given a disabled subsidy for free public transport in Gloucestershire. SAGE has 18 assessors for a population of 500,000. There is a three year recall for assessments.\textsuperscript{108}

Other Programs

Other programs brought to the attention of the Committee include a May 2003 American Association of Motor Vehicle Administrators (AAMVA) campaign. Entitled *GrandDriver*, it includes a website
www.granddriver.info with links to driver refresher courses, driver rehabilitation specialists, alternative transport options, resources for families and fact sheets and brochures about older drivers.

The campaign is part of an effort to help older drivers maintain their mobility and stay in the community as active, vital citizens for as long as possible. It is being pilot-tested in the Maryland, Virginia and Washington DC areas before going national.\textsuperscript{109}

There are a number of other internet information resources in America specially for older drivers provided by organisations such as the American Automobile Association Foundation for Traffic Safety (www.Seniordrivers.com) and the American Association of Retired Persons (www.aarp.org/drive/).\textsuperscript{110}

**Education Sessions as Part of Licence Conditions**

As mentioned, Ontario drivers seeking licence renewal after 80 years of age must attend an educational session every two years. The session lasts about 90 minutes and 10-15 people attend each course. The curriculum was developed specifically for older adults and offers information on age-related mental and physical impairments that may affect driving performance and how older drivers may compensate for them. The session is supplemented by other components that assist to identify problem drivers.

Older drivers have reportedly been extremely supportive of the new program. A full-scale three year evaluation of the changes made in the Ontario package is underway. Preliminary results, to the end of 1997, revealed a much greater decline in the fatal crash involvement rate, per number of licensed drivers, for those over 80 years old, than for control groups of 55-59 and 65-69 year old drivers.

Several submissions proposed similar mandatory education processes, while others opposed such concepts.\textsuperscript{111} The RTA of New South Wales commented that the cost to the community and licence holders to attend educational sessions must be measured against any road safety benefits.\textsuperscript{112}

In California, drivers can obtain automotive insurance premium reductions if they attend a classroom educational session as part of the voluntary Mature Driver Improvement (MDI) program. Dr M. Janke of the Department of Motor Vehicles in California, quotes results from a comparison of the crash and traffic offence rates of course graduates over the period 1988 to 1992, with those comparable drivers who did not attend the course. The investigation found that the MDI group had lower traffic offence rates, but:
… the observed frequencies of total and fatal/injury collisions did not yield a reliable and significant reduction in risk for course graduates.\textsuperscript{113}

A number of possible explanations were considered, one being graduates gained knowledge and confidence which enabled them to reduce their number of offences, but at the same time increased the amount of driving and exposure to challenging driving situations, which could possibly lead to greater crash risk. The only way to confirm this hypothesis however, would be to collect data on the amount of driving done by both MDI graduates and the control group.\textsuperscript{114}

In a number of jurisdictions, including Victoria, older drivers observed driving poorly and who come to VicRoads attention, who fail a road test, are advised to undertake refresher training from a driving instructor before considering being re-tested. Some submissions proposed all older drivers be encouraged to voluntarily take refresher lessons or be assessed by a driving instructor.

Drifting Instruction and Voluntary Assessment

Keeping up driver skills and confidence through regular driving becomes increasingly important in a driver’s latter years.

The RACV offers a one-hour driving assessment with an instructor, which includes a written report providing a guide to improving particular areas of driving. Corrective tuition and an update on driving laws are also available from the RACV and other commercial driving schools.\textsuperscript{115}

At the Mobility & Safety of Older People Conference, Mr C. Cotterill VicRoads’ Road Safety Officer for the Barwon Community Road Safety Council (RoadSafe Barwon), described a local community-based program for mature-aged drivers in Geelong and the Surf Coast Shire. The organisation offers refresher lessons with licensed driving instructors in dual control vehicles and provides $10 vouchers towards the $30 refresher lesson. Over six years more than 200 vouchers have been issued, however this is only one per cent of the target audience.\textsuperscript{116}

The Committee recognises that with some older couples, the driving is predominantly undertaken by the male. Women should be encouraged to maintain their driving skills in case their husband should have to give up driving through ill health. Refresher lessons with a driving instructor are a good way of keeping up skills and confidence, but sharing the driving time should also be encouraged. This subject should be included in The Victorian Older Drivers’ Handbook.
Future Education Programs

In their submission and presentations to the Committee, the RACV advised new programs were needed for improving older pedestrian behaviour, encouraging discussion with health professionals, retiring from driving and mobility planning and to encourage self-regulation. They stated that funds should be allocated for an evaluation of program outcomes.\(^{117}\)

VicRoads made a broad recommendation to the Committee about further developing programs to assist older drivers to remain driving as long as they are capable.\(^ {118}\)

The Committee concludes that there is a need for VicRoads to develop education and publicity strategies on how to target markets appropriately, assess the effectiveness of programs and strategies and the accountability for delivery of such programs.

Some concepts that may be suitable for adoption in Victoria are:

- A program combining medical and visual assessments conducted by health professionals, for driver safety, such as nurses or pharmacists, combined with voluntary driving assessments with some educational content. This might also include basic vehicle safety and comfort assessment by a driving instructor, such as seat adjustments and advice on additional/larger mirrors.

- Information, advice and possibly assessment services provided by a body along the lines of MAVIS. Some states, such as South Australia, have Independent Living Centres which provide advice on a range of everyday living issues. Advice on mobility/transport options, driving, mobility scooters, etc may just be part of a wider range of services available.

- Information packs and group presentations for family and friends concerned about an older persons driving or needing to be aware of what to do if that person’s driving deteriorates in the future. Families and caregivers of those with a diagnosis of early dementia would be an obvious target group. The Alzheimer’s Association already has some useful materials.

The Committee believe the concept of educational sessions needs further investigation for more solid evidence of their benefits before recommending them as part of the licence renewal process.

**Recommendation**

23. That VicRoads investigate the value of educational sessions as part of the licence renewal requirements for older drivers.
Summary of Findings

- Research is being undertaken into the extent to which various groups of older road users are successful in compensating for declining functional abilities which affect their safety. However the extent of self-regulation of driving by people with various levels of dementia and mild cognitive impairment is unknown.

- Shorter licence durations are needed for older drivers. This would provide an opportunity for educational information, encouraging safe driving practices, to be distributed more frequently.

- Self-reported health questionnaires at licence issue and renewal should be introduced as a means of better alerting drivers with medical conditions that this may affect their ability to drive safely and informing drivers of their legal obligations.

- VicRoads should use its crash, traffic conviction and demerit point records to identify and investigate potentially unsafe older drivers.

- As the population ages there will a need for conditional licences, within the context of a comprehensive and well publicised graduated de-licensing framework.

- A wider range of licence condition codes should be investigated.

- The effectiveness of restricted licences in reducing driver crash risk in Victoria is unknown and needs to be investigated by VicRoads.

- Older drivers, health professionals, families friends and caregivers need education on older road user safety issues. The Victorian Older Drivers’ Handbook needs to be mailed out, along with licence renewals to drivers over the age of 60. The Handbook should be translated into other languages.

- Ontario requires those 80 years and over, prior to licence renewal to attend a short group education session. While there is insufficient evidence to support its introduction in Victoria, the concept is worth exploring further.
Recommendations

16. That VicRoads introduce a five year licence period, phased in by 65 years of age and the licence period be further reduced to two years from 80 years of age.

17. That all drivers be required to complete a health questionnaire when renewing their licence. This questionnaire should be available in other languages.

18. That VicRoads use crash records, traffic conviction records and demerit point scores to identify and assess licence holders who may no longer be safe to drive.

19. That a wider range of driving licence condition codes be investigated by VicRoads.

20. That VicRoads investigate the effectiveness of licence restrictions, and associated assessment methods and processes, in reducing driver crash risk.

21. That VicRoads expand the information provided in The Victorian Older Drivers’ Handbook and distribute it with licence renewal forms to those drivers 60 years and over. This handbook should also be translated into other languages.

22. That VicRoads develop education and publicity strategies to address older road user safety issues for drivers, health professionals, families, friends and caregivers. To ensure the success of these strategies targets be set on how to reach the correct audience and the programs be evaluated.

23. That VicRoads investigate the value of educational sessions as part of the licence renewal requirements for older drivers.

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Mobility Options

What is Meant by Mobility Options

Mobility can be defined as the ability to physically move from one place to another. While taken for granted by the vast majority of younger people, many older Victorians have to adapt to changing physical and cognitive capabilities which can make getting around increasingly difficult.

A key challenge is in finding the right safety balance between measures that maintain or increase mobility for older people, and those that restrict their mobility options.

The Committee noted the discussion paper *Safe Mobility, for All, for Life* by Queensland Transport, which comments:

> In every community, remote and rural or urban, when the private motor vehicle and non-private transport in all its forms are taken together and viewed as a ‘total’ passenger transport system, there are gaps. Those people who fall through these gaps find it difficult to meet their basic needs and to lead a reasonable quality of life. They suffer this disadvantage because of those gaps and other barriers to their personal access and mobility. This is a problem that will only get worse in the face of a rapidly growing and ageing population if the status quo prevails.¹

Mobility options for older people, both as drivers and pedestrians should therefore, not only be about maintaining existing levels of mobility, but also about improving travel options, levels of service and safety. Such improvements will mean older people will be better placed to continue to make an important contribution to society.

In a paper presented at the Australian Road Research Board/Road Engineering Association of Asia and Australasia (ARRB/REAAA) conference in Cairns in May 2003, Ms A. Harris, Chief Behavioural Scientist, Royal Automobile Club of Victoria (RACV) Ltd stated:

> Key policy issues related to mobility are whether Australians have a right to some form of lifelong mobility, how much mobility are groups or individuals entitled to, who should provide
it and who should pay for it. What level of investment in mobility and transport for older people is required to alleviate some of the resultant costs of health care and road trauma. What is the optimum level of spending on transport and mobility services for older people who are not able to drive themselves?²

### Current Mobility Options

A presentation by Ms Harris, at the *Mobility & Safety of Older People Conference*, in Melbourne in August 2002, showed results of a survey conducted in 2002, in which 125 retired drivers, who were both city and country people (and RACV members), were surveyed. Of these 85 said they ‘got around’ by receiving lifts from family and friends, while 82 used taxis, 46 buses, 22 trains, 20 community transport, 19 electric scooters and 10 used trams.³

In addition, 38% reported having difficulty using buses, 26% reported they had problems using trains, 26% had difficulty walking, 8% reported difficulties with taking lifts from others and in using taxis, five per cent had problems using trams, while two per cent indicated problems with the use of electric scooters and two per cent using community transport.⁴

The RACV also state that the results showed older drivers often have little or no knowledge of the transport options available in their area, and that most people have always relied on the car for their transport.⁵

### Pedestrian Mobility

**Walking**

Walking is recognised as both a form of exercise to remain healthy and socially active and a means of mobility. It is an activity that has a degree of risk. Pedestrians account for approximately 20% of Victoria’s road toll.⁶ The Committee is concerned about the high incidence of older pedestrian fatalities and injuries, and considers the recommendations presented in this report will go some way to reducing the crash risk and severity.

The Organisation for Economic Co-operation and Development (OECD) report on *Ageing and Transport: Mobility Needs and Safety Issues*, 2001, produced a table based on a Norwegian travel survey of 1097 females and 991 males, conducted in 1997 – 1998. The survey showed problems related to walking and, to a lesser extent, public transport, increased with age. The following table highlights the results of the survey. While climatic differences and lifestyle habits may differ between Norway and Victoria, the figures are indicative of both age-related trends and gender differences.
Table 7.1. Problems Related to the Use of Transport Modes by Different Age Groups, Norway, 1997-1998

<table>
<thead>
<tr>
<th>Age</th>
<th>Walking (%)</th>
<th>Public Transport (%)</th>
<th>Car (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
<td>Men</td>
</tr>
<tr>
<td>57-63</td>
<td>9</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>64-70</td>
<td>11</td>
<td>28</td>
<td>6</td>
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<tr>
<td>71-77</td>
<td>16</td>
<td>33</td>
<td>7</td>
</tr>
<tr>
<td>78+</td>
<td>32</td>
<td>47</td>
<td>10</td>
</tr>
</tbody>
</table>


At the Mobility & Safety of Older People Conference, Mr I. Kett, Executive Director of the Victorian Council on Fitness and General Health Inc, VICFIT, outlined key points of the draft State Walking Action Plan.

Mr Kett commented that:

... looking at the research that we are finding now that the cities in the world that are performing best on a whole range of different measures tend to be the ones that are creating environments that are suitable for walking. The ones that seem to be doing the worst are the ones that are dominated by motor vehicles and taking away the face-to-face interaction from people.  

He also made the point that:

... the more we take people away from the streets and from that social interaction, the more we create communities that are isolated and insecure.

Programs Aimed to Assist with Pedestrian Safety and Mobility

The OECD report highlighted that:

The quality of footpath and pedestrian-crossing surfaces and the avoidance of abrupt changes in level and steep inclines are particularly important for increasing the confidence of older pedestrians and facilitating their mobility.

Between 1985 and 1989, VicRoads carried out an investigation into the causes of pedestrian crashes and found older pedestrian crashes are generally associated with routine local activities, so the most effective intervention for improving older pedestrian safety are those that target
local conditions.\textsuperscript{10} In 1990 VicRoads developed a Pedestrian Safety Strategy with implementation being carried out by Local Pedestrian Advocates.

A number of pedestrian safety programs are currently operating in Victoria. These are outlined below:

**Walk With Care**

The aim of the program, introduced in 1990, is to reduce the incidence and severity of crashes involving older pedestrians. The program includes consultation with local government and community representatives.

The program was trialled in 1992, in seven municipalities with high incidences of older pedestrian crashes. It was later extended to other municipalities and since July 1990, 50 municipalities have implemented *Walk With Care* programs involving 520 community groups at a total cost (as at April 2002) of $4,883,000.\textsuperscript{11}

Engineering treatments implemented include audio tactile devices, kerb extensions, pedestrian refuges and fencing, pedestrian operated signals, pram crossings, pedestrian signage, and footpath repairs.

A series of one hour interactive discussions of 20 people or less are held, covering issues such as planning for walking, choosing a safe place to cross, and crossing the road correctly.\textsuperscript{12}

**WalkSafe**

This program, based on crash data to identify high risk locations, groups and behaviours within the community, was developed by VicRoads to reduce the incidence and severity of pedestrian crashes in urban areas. It involves a combination of engineering treatments, education, enforcement, and promotions/publicity. Two large scale programs have been implemented in the Cities of Stonnington and Port Phillip. In the latter municipality, information was provided in Russian and Hebrew and through ethnic radio and a local community television network, something the Committee commends and encourages.\textsuperscript{13}

**Safer Routes to Shops**

This program has been developed in conjunction with VicRoads and local government to focus on areas in and around strip shopping centres with a history of pedestrian crashes. It incorporates a range of consultative mechanisms to identify impediments to safe and convenient travel to shops and proposes ways in which local government, local business and aged care agencies can make shopping easier for older pedestrians. It is currently being trialled in the City of Glen Eira.\textsuperscript{14}
Responsible Serving and Consumption of Alcohol

This program conducted in partnership with the police, local government, liquor licensees and Liquor Licensing Victoria, targets pedestrians and pedestrian casualties in the vicinity of licensed premises. To date it has tended to target young adults, but as older people may also be represented among intoxicated pedestrian casualties, the program could be adapted to their situation. The program has been piloted in Stonnington and subsequently implemented in Port Phillip. It has yet to be evaluated.\(^{15}\)

To conclude, VicRoads are currently reviewing the delivery of pedestrian programs and recommended to the Committee that pedestrian programs be re-assessed in association with local government, and in consultation with older persons’ representative groups.\(^{16}\) The Committee support such a review to determine the value of the programs and the best manner to expand effective programs.

Pedestrian Mobility Devices

Motorised scooters, sometimes known as gophers, are designed as a mobility aid for people who have difficulty walking. The Committee heard evidence showing scooters are increasingly popular transport alternatives for older people and that a number of devices are starting to come onto the market that are being seen as an alternative to the motor vehicle, and not just an aid for those who cannot walk very far.

Safety concerns have been raised about the use of the devices, especially when ridden on-road. There have also been concerns about the hazard the devices pose to other pedestrians. In addition, issues such as their visibility in traffic, braking controls, and stability when cornering or crossing kerbs and channels have been raised.

The *Road Safety Act 1986* excludes motorised wheelchairs from being classed as a motor vehicle when used for the sole purpose of conveying injured or disabled people.\(^{17}\) In order to be classed as a pedestrian mobility device they must not exceed 10km/h on level ground.\(^{18}\) A submission from the Department of Transport, Urban Planning and the Arts, South Australia, did however note that many available mobility devices are capable of exceeding that speed.\(^{19}\)

The RACV, in their submission stated that, with the increasing popularity of electric scooters as a mobility option for older road users, the following issues need to be urgently addressed:

- Who is permitted or encouraged to use scooters?
- What, if any, safety equipment (such as helmets) should be worn?
What, if any, road environments should they be prohibited from?

What role does local government have to provide safe footpaths for scooter users, while also restricting their use in areas where they could harm other people or where there is not suitable infrastructure?²⁰

In their submission, the RACV quote research conducted in Western Australia for the Ministerial Review Committee on Electric Wheelchairs and Scooters, reported by Missikos and James in 1997, who concluded that:

- A design standard for the safe performance of these devices should be introduced;
- Legislation relating to scooters should be clarified and that electric wheelchairs and scooters be registered;
- Guidelines for infrastructure providers are needed; and
- A code of practice outlining the rights and responsibilities of people using the devices should be developed and publicised.²¹

Scooter Design

At the 2002 Road Safety Research, Policing and Education Conference, held in Adelaide, Ms M. Dolling, Occupational Therapist at the Driver Assessment Rehabilitation Service, University of South Australia advised:

The motorised scooter is now an impressive looking machine, with the design of controls and accessories to a degree pushing the boundaries, promoting the impression that it is less of a wheelchair and more of a vehicle, in an image-driven market.²²

Controls are not the same as for a motor vehicle, which can pose a problem for some ex-drivers in an emergency situation. To automatically activate the brake the rider needs to quickly release their finger/thumb grip on the throttle control lever. According to Ms Dolling:

In past learned experience the natural reaction is to apply the brake.

To engage the brake on the scooter, the opposite to natural reactions must occur.²³

In terms of visibility the Maroondah Pensioner’s Association Branch advocated flashing warning lights in daytime; RoadSafe Mildura proposed use of a flag; and RoadSafe Central Victoria said the devices should meet bicycle lighting and reflectivity standards.²⁴
VicRoads, in their submission makes no mention of design standards for scooters. The RACV noted that, though vehicle registration regulations do not apply to such devices, VicRoads should take some responsibility for the safety and well-being of the people who use scooters.\textsuperscript{25}

The RACV recommended to the Committee that the Transport Minister should make recommendations to the Australian Transport Council that a design standard for the safety and performance of scooters be developed applying to all scooters sold in Australia.\textsuperscript{26}

The Committee agrees that safety standards should be developed for scooters.

**Scooter Usage**

Ms R. Lovell, Lecturer at the School of Occupational Therapy at La Trobe University, said that a number of older people aren’t able to use the devices safely, but there is nothing occupational therapists or other health professionals can do to stop them.\textsuperscript{27}

In addition to recommending a code of practice for scooter suppliers, the School of Occupational Therapy, La Trobe University in their submission, recommended to the Committee that:

- It should be compulsory for prospective users to undertake competency testing and training prior to acquisition;
- Review processes should be put in place for the monitoring of people with a deteriorating physical and cognitive condition; and
- Consideration should be given to setting up a system to both register and regulate the standards of such devices.\textsuperscript{28}

In Sydney, the Committee heard from Mr J. Brown, Policy Advisor, National Roads and Motorists Association (NRMA) Ltd who commented that:

> We have to look at the [scooter] users, their knowledge and their capabilities and at who suggested they should have one of these devices in the first place, because they are a mobility aid, they are not a person’s total mobility.\textsuperscript{29}

The RACV recommended to the Committee that, in order to ensure the safe use of scooters:

- VicRoads should investigate potential changes to legislation to regulate the use of mobility scooters; and
- Department of Victorian Communities should develop guidelines and advice for local government about safe infrastructure for scooters.\textsuperscript{30}
The Peter James Centre, an aged care and rehabilitation organisation in Melbourne, also recommended to the Committee that potential users be required to licence and register the scooters.\textsuperscript{31}

**Scooter Insurance**

Another issue is public liability and vehicle damage insurance. In New South Wales, legal protection on road and road–related areas such as footpaths is provided free by the Nominal Defendant Scheme of the Motor Accident Authority (MAA). However this form of surrogate third party insurance only covers claims resulting from crashes on public roads within that state.\textsuperscript{32} Similar schemes exist in South Australia and the Northern Territory, but not in Victoria.\textsuperscript{33}

Personal injury claims resulting from incidents in parks, shopping malls and within buildings are not covered.\textsuperscript{34}

The Committee considers the devices should be regulated and that third party insurance aspects of their use be investigated.

**Education and Awareness**

During the *Mobility & Safety of Older People Conference*, the NRMA’s Mr J. Brown stated if there is no footpath on which to travel, the only place scooters can go is on the road, and this starts getting into ambiguous areas of safety, rights and responsibilities.\textsuperscript{35} The RACV recommended to the Committee that VicRoads, in conjunction with other government departments, health professional associations, disability groups, and older person groups, should develop a code of practice outlining the rights and responsibilities of scooter users.\textsuperscript{36}

The NRMA-ACT Road Safety Trust funded the Australian Capital Territory Council on the Ageing (COTA) to undertake research and develop a training package for users of mobility devices. The result was the ACT Education Training Package *Safe Scooter* Project, which includes a facilitator’s handbook, PowerPoint slide presentation, users’ guide and a video.\textsuperscript{37} A *Scooter Safe* training resource was produced, with a workshop covering the following five modules:

- Rights and responsibilities of motorised scooter users;
- Safe motorised scooter driving practices;
- Australian Road Rules;
- Maintenance of motorised scooters; and a
- Practical session.\textsuperscript{38}
Extensive work co-ordinated by the Main Roads Department in Western Australia several years ago examined registration and licensing issues that led to publications to assist both user and suppliers.\textsuperscript{39}

The Committee is concerned that no government agency is taking a lead and determining whether or not scooters should be regulated, licensed or registered. Before these devices proliferate in the community, the Committee recommends an investigation similar to that in Western Australia to develop safety standards for these devices, examine registration, user licensing and insurance issues and the development of appropriate guidelines and publicity material.

**Recommendation**

24. That VicRoads, in relation to motorised mobility devices:

- Develop safety standards;
- Regulate their use on public roadways and pathways;
- Investigate third party insurance aspects of their use; and
- Conduct an awareness campaign focussing on the rights and responsibilities of users, for both the user and the public.

**Other Pedestrian Movement Devices**

In addition to motorised scooters an additional form of pedestrian movement device has recently appeared on footpaths in the United States. This is the Electric Personal Assistance Mobility Device (EPAMD), a self-balancing, two-wheeled non-tandem device that can turn-in-place, transport one person and travel at a maximum speed of 20 km/h. The first of these devices, the Segway, has been on public sale since early 2003 at a price of approximately $AUD7,500.

With the ability to emulate human balance, the device uses the same space as a pedestrian and can go wherever a person can walk. The device will allow people at home and at work to go farther, move quicker, and increase the amount they can carry.\textsuperscript{40} Following trials on university campuses, industrial sites and elsewhere the device is now mass-marketed via the internet and dealer networks.

However, with a top speed of 20 km/h such devices have the potential to greatly increase the range of activities available to users. A potential disadvantage is the increased range of vehicles, operating within road reserves, especially the vulnerable area of footpaths.

Forty American states have passed laws regulating their use in terms of both equipment requirements and the authorisation of local and state
authorities to adopt ordinances with respect to their time, place and manner of use. Equipment requirements in California for example, include front, rear and side reflectors, a system that enables a rider to bring the device to a controlled stop, lamps for night-time visibility and a sound emitting device.\textsuperscript{41}

VicRoads and local government need to consider the safety implications of their possible use in Victoria, particularly the potential hazard for older pedestrians.

\textbf{Cycling}

The Committee received little evidence in relation to cycling as a mobility option for older people.

As unprotected or vulnerable road users, cyclists (and especially older cyclists) are likely to fare poorly in a crash with a motor vehicle. While the number of cyclists fatally injured in Victoria is small compared to other modes of unprotected transport (motorcyclists and pedestrians), this may be more a reflection of the low levels of cycling rather than a good safety record.

In Victoria there has been considerable Government-initiated encouragement of cycling as a healthy, environmentally friendly mode of travel, yet the Committee noted no-one proposed modifying bicycles or power-assisted bicycles to make them easier for older riders to use. Similarly almost nothing was said about development of motorcycles or motor scooters for older users.

The OECD report on \textit{Ageing and Transport: Mobility Needs and Safety Issues}, 2001, states that cycles are used for a considerable amount of travel in European countries, such as Belgium, Denmark, Germany, Sweden and the Netherlands.\textsuperscript{42} In these countries power-assisted bicycles and mopeds are common. Only one submission provided information on motorised cycles. Mr. R. Hirsch, an advocate for disabled people, described a number of motorised cycles, including one electric tricycle, and mentioned the availability of a conversion kit to enable a small electric motor to be fitted to a standard 700mm (26 inch) bicycle.\textsuperscript{43}

Cycling by older Victorians has potential health benefits, as it provides good all-round exercise.\textsuperscript{44} There may be opportunities to adapt two and three wheeled pedal cycles to better suit the needs of older riders, to overcome possible difficulties with lack of balance and rider fatigue.\textsuperscript{45} Such innovations should be encouraged.
Motorcycling

As with cycling, the Committee received few submissions relating to older people and motorcycling. The incidence of motorcycle fatalities has increased, most notably for people over the age of 30 years who have taken up motorcycling for the first time, or are returning to riding after a long absence.

Crash risk is increased due to unfriendly aspects of the road design, such as tram tracks and painted lane markings that become slippery when wet.

In a recent report by the Accident Research Centre, Monash University (MUARC), which involved survey research and an analysis of crash data, it was noted that for those over 30 years, the frequency of riding decreased with age and that only 41% of people over the age of 60 who held a motorcycle licence, were riders.46

The report suggests a range of measures that may help reduce the crash rate for older motorcyclists, including: reducing the total distance motorcyclists travelled, promotion of refresher courses, educating car drivers about motorcyclists and promoting speed reductions.47

Alternative Transport

Australia wide, it is estimated that about 70% of older people’s trips are made as drivers or passengers in private cars.48 The OECD reported that, before older people stop driving they usually reduce the extent of driving and limit their driving to local journeys in familiar areas under easy driving conditions.49 According to the RACV, the decision to stop driving is made easier if adequate alternative transport is available.50

This conclusion is consistent with results of focus group testing conducted by the RACV. Older people in rural areas reported they would continue to drive, even if medical advice was that they should not, if there were no transport alternatives.51

There are two main types of alternative transport:

1. Informal arrangements, where a person receives a ride free of charge – usually by a partner, family, friends; or

2. Formal arrangements, where a person pays for a service – either through fees or a donation.

The RACV stated that the availability of family members as a means of alternative transport will diminish in the future, especially in rural areas. The proportion of older people living in rural areas is increasing, while the numbers of younger people in rural areas is decreasing with a
corresponding decrease in the numbers of family members living close by.\textsuperscript{52}

The Office of Senior Victorians, on behalf of the Department of Human Services, informed the Committee in their submission, that:

Alternative means of transport will most likely be successful if they are promoted as a better alternative to driving – not simply as the only option once you are no longer able to drive.\textsuperscript{53}

On this issue, Ms A. Harris, Chief Behavioural Scientist, RACV, stated in a recent paper that:

If there are inadequate mobility options available, many older people may choose to continue to drive, albeit with some self-regulation, even if they are not safe to do so.\textsuperscript{54}

In 2001 the American Automobile Association Foundation for Traffic Safety, and the Beverley Foundation (an organisation that engages in research and education in ageing) compiled a detailed index of 236 informal senior transportation programs. The Beverley Foundation identified what they regarded as the 11 best schemes and subsequently prepared a publication describing model informal transportation programs which local communities might like to adopt.\textsuperscript{55}

The Committee will focus on three examples of services that operate in the United States which help to maintain mobility, through ‘dial-a-ride’ services:

- The Independent Transportation Network (ITN);
- The Good As Gold program; and
- Little Brothers – Friends of the Elderly.

**Independent Transportation Network**

The Independent Transportation Network (ITN) is an American non-profit transportation service, established in Portland Maine, for seniors and people with visual impairments developed through research funded by the Federal Transit Administration (FTA), American Association of Retired Persons (AARP) and the Transportation Research Board (TRB). ITN is a model of consumer-orientated community-based senior transport in the comfort and convenience of a private car. It incorporates the efficiency of group transport through shared rides and advance planning.

Established by Mrs K. Freund, Director of ITN, transport in private vehicles is provided to about 1,000 people by both paid and volunteer
drivers 24 hours a day, seven days a week. Some volunteers drive as infrequently as once a month, others as often as several days a week.

To use the service a person becomes a member of the organisation and opens an account to pay for their rides, which are based on time or distance travelled. There are discounts for advance bookings and shared rides. Members travel costs can be subsidised in several innovative ways. For example, family members can purchase service vouchers, elderly people can donate their cars to the service for a specified amount of service vouchers and private firms, patronised by older people, can subsidise trips.

Speaking as the keynote speaker at the Saferoads 2002 Conference in Melbourne in July 2002, Mrs Freund, stated that the entrepreneurial community-based service:

Feels like “family and friends” but with independence.

A number of other American communities are about to commence similar schemes under the auspices of ITNAmerica, established with FTA support to make the scheme available across the USA and other counties.

Good-As-Gold Program

This is a door-to-door, shared ride taxi service for citizens aged 65 and over operating in Michigan USA. Started in 1985, the program is funded mainly through local taxes, fare revenue, and state funds. The three criteria for its success are the availability of long term funding, a reliable taxi company and a compact service area of approximately 23 square miles.

Little Brothers – Friends of the Elderly

This is a national, non-profit organisation with offices in seven USA cities and eight counties. The agency provides transportation for the elderly to medical appointments, shops and social activities. Services are provided during normal business hours on weekdays and occasionally on weekends.

Unfortunately alternative transport schemes for older people do not exist in Victoria. There is a need for social entrepreneurs to be encouraged to develop car and taxi-based alternative transport schemes for older people in Victorian communities.

The TAC in their submission, proposed that in order to facilitate alternatives to driving:
... the TAC is willing to partner interested agencies in a pilot program within a suitable municipality that seeks to develop a pool of capable older drivers to transport less capable older people on specific local type trips.61

The Committee supports the TAC offer to partner a pilot scheme and believes the Department of Infrastructure (DOI) could provide assistance. The Committee suggests the role of state agencies should be to facilitate the establishment of incorporated associations to operate services, investigate any insurance and legal impediments and assist with the installation of trip booking, accounting and other administrative systems.

After establishment, the services could be funded by users and local communities, though there may be a role for the state or charities to subsidise some or all of the trips for particular individuals who would not otherwise be able to travel.

**Recommendation**

25. That the Department of Infrastructure undertake a partnership with the Transport Accident Commission to develop and pilot an alternative local transport service for older Victorians.

**Taxi Services**

Mr J. Stevenson, then Manager, Public Transport, VicRoads, stated at the *Mobility & Safety of Older People Conference*, that taxis could be a transport option.62 However, with little share-ride taxi development occurring, the cost of hiring a taxi on an exclusive basis is prohibitive for many older people.63

The Victorian Taxi Directorate administers the Multi-Purpose Taxi Program (MPTP), which provides a 50% discount on the cost of a taxi fare up to a maximum discount of $25 per trip. Seventy-four per cent of the total membership of the 180,000 people on the MPTP is aged over 70 years, 83% being over the age of 50 years.64

Eligibility is strictly based on an applicant’s medical disability. In the 12 months to March 2002, approximately 75-80% of applications met the criteria for inclusion.65

The Victorian Taxi Directorate, in their submission, stated that current annual subsidy expenditure for the MPTP is in excess of $36m.66

In 1997 the Victorian Parliamentary Family and Community Development Committee, in their report on the *Inquiry into Planning for Positive Ageing* stated:
Many older Victorians want to see the extension to this [MPTP] to those aged over 70 years who live alone, with the criteria for eligibility needing to be more flexible.67

The Inquiry recommended:

That, after consultation with a health professional, those older Victorians experiencing a temporary physical disability that prevents them from using public transport be issued with a temporary taxi concession card for the duration of the disability.68

This has not occurred.

The Victorian Taxi and Tow Truck Directorate in their submission, considered possible changes to the regulatory environment so as to allow taxis, under specific conditions, to operate as community transport vehicles – especially in areas where taxis are under-utilised. The Directorate informed the Committee that:

… the taxi industry has strong concerns about the commercial impact of “community transport” and could be expected to view an expansion of community transport or other alternative schemes as a threat to the viability of rural taxi operations.69

MUARC, in their submission suggested to the Committee, that a subsidised taxi system, more readily available, would provide a real alternative to those unable to drive and that the subsidy system needs to be reviewed to ascertain the true extent of both current and future demand.70

Ms Harris, at the Australian Road Research Board/Road Engineering Association of Asia and Australasia (ARRB/REAAA) Conference, in Cairns May 2003, stated that taxis are the only formal type of transport that can provide a door-to-door service, consequently:

Greater promotion and utilisation of taxi services, as well as ensuring that taxi services are integrated with other forms of transport, especially community transport, will be vitally important in the future.71

Flexible fare charging does exist elsewhere in Australia, including multiple hire taxis or jitneys. Two ‘best practice’ examples noted by Ms Toepfer, Manager Transport Services and Development, Shellharbour City Council, New South Wales, at the Mobility and Safety Conference in Melbourne 2002, was the maxi taxi services at Mackay Taxi Holdings and the Brisbane City Council’s cabs service.72
When in Sydney the Committee heard from Mr K. Ryan, Director, Rural and Regional Strategy, Department of Infrastructure, Planning and Natural Resources about a senior’s taxi club which had been trialled in two western New South Wales towns. For a nominal amount the people could join the club and on one day of the week, a quiet day for taxis, they could go anywhere within the area of the 60 km/h town speed limit for a capped price of $4 in one town and $6 in the larger town.73

The concept of a maximum fare was highly attractive to senior taxi-club participants living on a fixed income, while taxis were earning some money instead of sitting idle at a rank. There were also flow-on effects with town businesses offering special deals and lunches for seniors on Tuesday.74

The Committee is eager to see such schemes encouraged in Victoria.

Public Transport

In his presentation to the Mobility & Safety of Older People Conference, Mr J. Stevenson reported that 78% of Melbourne’s households are within 400 metres of a bus, tram or train service.75 However, for many people public transport services, especially in outlying suburbs or country areas, may be either non existent or infrequent, and there may be no weekend or evening services. Added to this, route designs may be long and circuitous and connections between services may mean long waiting times.76

University of Queensland survey results indicate that barriers to using public transport included health-related problems, fear of falling, ‘nerves’, anxiety and cognitive impairment.77 On this aspect, COTA Victoria, advised the Committee that there are a number of contributing factors that have led to a lack of public transport options for older people, including:

- Very limited extension of public transport routes over the past 50 years, combined with an expansion of the metropolitan area far beyond the reach of an adequate public transport system.
- Erosion of public transport services for regional and rural Victoria.
- Encouragement of older people (supported by their preference) to live in their own home for as long as possible.
- Non-existence of a community transport policy for metropolitan and rural Victoria.78
In their report on *Ageing and Transport: Mobility Needs and Safety Issues*, the OECD noted that:

As more people continue to drive well into old age, those residing in outlying areas may have fewer public transport services and mobility alternatives available when driving is no longer possible. Furthermore, more resources and a larger share of countries’ gross domestic product will be needed to provide retirement pensions and health care, leaving fewer funds to meet the mobility needs of older people who do not or cannot drive.\(^79\)

Further, in Sydney in June 2003, the Committee held discussions with Ms C. Mason, Manager, Community Transport, Transport NSW, who informed the Committee:

… a lot of older women are far more reliant on transport, whether it is public transport or other forms of transport. They may not have ever been able to drive, or their partners have become sick and they no longer have access to a car. That tends to dominate.\(^80\)

At the *Mobility & Safety of Older People Conference*, Ms J. Thompson, Policy Officer, COTA Victoria, noted that for many people, retiring leads to downsizing their house and moving further away from the city, which then means moving to areas where there is less public transport available and fewer family, friends and social connections.\(^81\)

A survey conducted by the RACV showed that older people are unwilling to use public transport, especially while they were still driving.\(^82\)

On this point, VicRoads recommended to the Committee that older drivers be encouraged to use public transport before they can no longer drive safely, such as through the provision of day trips with concession fares and the promotion of group activities using public transport.\(^83\)

On the issue of policy co-ordination, Ms A. Harris, in a paper at the ARRB/REAAA Conference in Cairns in May 2003, stated that:

Some areas of government have implemented policies that have also impacted on the transport needs of older people. The closure and downgrading of many rural and regional hospitals and health services has had a profound impact on the transport needs of older people living in rural Victoria. It appears that the mobility and transport impact of these policies were not considered when they were developed. As a result, the transport sector has had to make provisions for the results of policies made by other government sectors.\(^84\)

Consequently, she recommended that more emphasis be placed on adequate and suitable transport for older people, which could include:

- All areas of government, especially health and housing, to address the mobility implications of their policies;
- Greater education and information provision; and
• Greater support/assistance for local government and other community transport providers.85

Also at the Mobility & Safety of Older People Conference, Ms Y. Toepfer, Manager Transport Services & Development, Shellharbour City Council, New South Wales, commented that a system of ‘adaptive transport’, based on the individual mobility needs of passengers involves the following characteristics: flexible routes and services, demand responsive, fast and direct, on time and easily understood information, comfortable and safe, convenient, fewer transfers and speedy connections.86

She stated however:

There are a number of reasons why public transport providers lag behind the wants and needs of the populations they serve. These include the cost and time required for capital restructure; a lack of innovation at a political level in Australia where the value in shifting from road expenditure to transport expenditure has yet to be recognised; government regulations that serve to stifle innovation and competition; restrictive public transport contract conditions; and fixed track thinking on the part of planners.87

Ms Toepfer commented that, flexible route services are becoming increasingly common and dial-a-bus and ring-a-ride schemes are operating through community transport or other non-profit providers, on a booking system.88

At a public hearing in June 2002, Mr R. Kinnear, Director, Public Transport Planning, DOI, informed the Committee that:

... a major exercise is being done at the moment called Busplan that is reviewing all the bus services across metropolitan Melbourne with the aim of developing and expanding those services progressively over time. Within the 2002 State budget $44 million was allocated for new bus services almost entirely in outer suburban Melbourne and regional and rural Victoria.89

DOI has the responsibility to ensure public transport services meet the transport needs of not just the general public, but to plan for future generations of Victorians. In the case of older drivers there is a need to provide incentives, support and encouragement to use and become familiar with public and alternative transport before they cease driving.

Recommendation

26. That the Department of Infrastructure provide older drivers with realistic incentives, support and encouragement to use public and alternative transport before they are in a position of no longer being safe to drive.
Community Transport

Community transport can be defined as a system that meets the community or local needs of people who are socially, geographically, economically or physically disadvantaged, including frail older people and people with disabilities. It involves transport services provided primarily by non-government, community based organisations in circumstances where conventional public transport services are either not available or appropriate.

In the presentation by Ms Toepfer to the Mobility & Safety of Older People Conference, she suggested:

... Community Transport services are increasingly required to work more as welfare organisations under the Home and Community Care Program, working one-to-one with passengers, restricting their capacity to provide quality services for greater numbers of people needing assistance.

The Committee investigated the community transport schemes operating in Victoria and elsewhere in Australia.

Victoria

The Committee was informed by officers at the Department of Human Services (DHS) that, in association with the DOI, DHS had established a support program to facilitate ‘flexible community transport initiatives’. The program is titled Transport Connections and initially targets rural and regional areas of Victoria and the Melbourne Metropolitan fringe. The Government has allocated $700,000 for 2003/04, which will involve a series of grants to support community based transport programs.

Five municipalities are undertaking the program – Bass Coast, Gannawarra, Golden Plains, Macedon Ranges and Wellington shire councils. Other programs are being undertaken by the following organisations:

- Northern Care and Share Inc. in the fringe City of Hume;
- Upper Hume Community Health Service, linking the Mount Beauty and Kiewa Valley communities to Albury-Wodonga in north-eastern Victoria;
- Western District Health Service servicing Casterton and Port Fairy, Western Victoria; and
- Wimmera Volunteers Inc. servicing the rural areas of the Rural City of Horsham and the shires of West Wimmera, Hindmarsh, and Yarriambiack, again in western Victoria.
A number of community transport schemes already operate in Victoria, however these are mainly unco-ordinated services at a local level, and fail to meet the needs of an increasingly ageing population, especially in remote and rural areas. A number of reports have been produced on community transport provision in regional Victoria. The main themes evident in the reports is a lack of communication, co-ordination and funding at both the local and central government level, and that no government agency is prepared to take responsibility for community transport provision or its co-ordination.

In response to a question on the effectiveness of community transport services, the Committee was informed by Mr J. Collins, Executive Director, Strategic Planning, DOI, that:

The only piece of work I am aware of and I stress ‘that I am aware of’, so I cannot guarantee it is the only piece of work being done – is the Latrobe Valley access and mobility study that is looking at opportunities to get better results by looking in a holistic way at public transport and community transport services. Since the Department of Human Services is responsible for those general community transport services, I suspect you would need to ask it [sic] those questions.

During the public hearing in June 2002, the then Chairman of the Committee, the Hon A. Brideson MLC, asked the DOI officials who was responsible for community transport. DOI representatives responded that it was really a health matter and again referred to the Latrobe study:

We hope the Latrobe Valley access and mobility study will give us some useful insights into that.

The Department stated they would brief the Committee on the results of the Latrobe study once the report was released and that:

In the Latrobe example everything is being looked at, including the relationship between taxi services and community and public transport services.

All municipalities have community transport services, but whether they meet the needs of people in the community is questionable.

In response to a question on community transport programs that operate in Victoria and the Home and Community Care (HACC) program, Mr D. Savige, Senior Project Officer, Victorian Rural Human Services Strategy, DHS commented that:
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... there is no funding program for community transport; many funding programs have transport included as an element, but in terms of general funding support for community transport, there is no funding program. Currently the art for community transport agencies is to cobble together their service from the many and various sources that exist.99

During the Mobility & Safety of Older People Conference, Mr P. Hibbert, Transport Co-ordinator for SCOPE (formerly the Spastic Society of Victoria), commented that:

At this point of time we have a major problem with community transport at a government level, because it does not exist. It really does not exist officially with our government. We have a Department of Human Services that will fund you for vehicles but will not fund you for transport. It does not acknowledge that transport is its responsibility, although there has been a little shift in its attitude over the past 6 to 12 months. We have a Department of Infrastructure, which is the regulatory authority for transport, saying straight out that community transport does not fit into its responsibilities so it is not part of its system, yet between them the two departments acknowledge that we should have an integrated transport system.100

Issues concerning the lack of departmental co-ordination were raised as far back as 1997, with the Victorian Parliament Family and Community Development Committee, Inquiry into Planning for Positive Ageing. They found:

... there is a real role for the Victorian Government (Departments of Infrastructure and Human Services) and Local Government to consider partnerships in the provision of community transport. In addition, the potential of a coordinated community transport system linked into the public transport system operating within each region (metropolitan and rural) needs to be investigated.101

Some five years after this report was tabled, Ms J. Hollingsworth, Senior Communications Officer, Office of Public Transport, DOI, informed the Committee there was still no co-ordinated approach to community transport and that it didn’t fit well within DOI, mainly because it didn’t involve fare-paying passengers.102

There is some evidence of increasing cooperation. In February 2002 DOI and DHS jointly prepared two draft documents, Overview of Rural Regional Responses to Community Transport – Working Draft for Comment and Overview of Metropolitan Regional Responses to Community Transport – Working Draft for Comment, February 2002, which provided an overview of rural and urban responses to community transport in Victoria.103

As an example of this program, the City of Knox, in association with Environment Victoria, has developed a program to assist older people with their mobility needs, while COTA, in conjunction with the Victorian
State government and City of Wyndham, has developed a training package for volunteers who drive older people in their communities.\textsuperscript{104}

To further improve the provision of community transport in Victoria, the School of Occupational Therapy, La Trobe University, in their submission, stated:

Creative, community based alternative transportation systems need to be explored to meet the transportation needs of older and/or functionally impaired individuals who can neither drive nor access public transport.\textsuperscript{105}

New South Wales

Transport NSW prepared a report in May 2002 that reviewed the regulatory framework for community and courtesy transport services. It recommended community transport services be recognised as a form of public transport under the \textit{Passenger Transport Act} and, as such, be subject to regulation, the extent of which would depend on whether the service operates either as a ‘for profit’ or ‘not for profit’ enterprise.\textsuperscript{106}

Transport NSW accredits operators of community transport vehicles, that is, vehicles that seat more than 8 people.

Three community transport programs operate in New South Wales:\textsuperscript{107}

- Home and Community Care (HACC). This joint Federal and State program provides community care services to frail older and younger people with disabilities and their carers. This program is nationally based, with the costs shared between the Commonwealth (60\%) and State (40\%) governments;

- Community Transport Program (CTP). This State program aims to address transport inadequacies or shortcomings locally by encouraging more efficient use of transport resources; and

- Area Assistance Scheme (AAS). This State program facilities and supports community development and the provision of integrated services in regions undergoing rapid urban growth or change.

During 2000-2001, a total of $13.34m was allocated to more than 134 organisations under HACC, CTP and AAS.

Ms T. Umasaran from Transport NSW advised the Committee that as at 25 September 2002, 31 of the 134 organisations that undertook community transport services in New South Wales were local government agencies.\textsuperscript{108}

Mr M. Flynn, Senior Policy Officer, Government and Strategic Relations section at the Department of Ageing, Disability and Home Care (DADHC) said that, in 2001/02, community transport accounted for
approximately 1.1 million trips involving 96,000 clients. However, he cautioned that this figure needs to be qualified, on the basis that only 71% of services (as at June 2002) were accurately reporting usage. Mr Flynn also advised that public transport usage (in contrast to community transport) in New South Wales accounted for approximately 2 million trips per day.\textsuperscript{109}

Ms C. Mason, Manager, Community Transport, Transport NSW commented that, while all community transport operators are advised that they must prioritise ‘demand’, a lack of funding, vehicles and drivers, meant they tended not to advertise their services for fear of unrealistically raising community expectations.\textsuperscript{110} Ms Mason subsequently informed the Committee that 35 out of 134 local councils in New South Wales run community transport programs, the majority being rural councils.\textsuperscript{111}

Mr Flynn noted a number of issues that need to be addressed, including:\textsuperscript{112}

- What is the best way to bring private bus services into the community transport sector?
- What can be done to better utilise drivers?
- Is there an appropriate model for the use of volunteer drivers and what are the benefits and costs of volunteer versus paid drivers?
- Should crash history and character checks be undertaken on volunteer drivers?

One popular model the DADHC considers has some merit is the multiple occupancy transport service, which involves older people making an advance booking for a service (similar to a shuttle service). They are then collected from, and returned to, their homes at an agreed time.

The Transport Development Officer of the New South Wales Central Coast Community Council, Mr J. Roberts, commented on the efficacy of community transport at a local level.\textsuperscript{113} He noted that:

- There is an increasing gap between high consumer demand and supply of drivers and vehicles. As a result, the Council has been identifying ways to expand the community transport scheme. One proposal has been to enter into arrangements with private organisations and clubs with an interest in the welfare of older people. The Council considers that the best arrangements will be those involving vehicles leased during off-peak times from (for example) rest homes, Legacy and RSL clubs.
A ‘hub and spoke’ style bus brokerage scheme, where express bus services on main routes are fed by local community transport providers, is also being considered as an option to better target community transport to those most in need.

The existing Commonwealth-State Government scheme (HACC) and the two State Government programs (CTP and AAS), while offering a co-ordinated approach, are not meeting the high level of demand. New, innovative methods are required if community transport is to meet the needs of an increasingly ageing population.

The Committee considers the community transport system operating in New South Wales is more comprehensive than in Victoria and further investigation should be undertaken by the Victorian Government into it’s operation, and whether aspects of the New South Wales system should be adopted in Victoria.

Queensland

Queensland Transport, in their discussion paper Safe Mobility, for All, for Life, propose that in the short term community transport should continue performing its:

... core role of providing fully assisted and accessible public transport services to those unable to use any other form of non-private transport.114

However, the discussion paper proposes a long-term ‘whole of community’ framework that involves additional funding to expand the supply and range of non-private transport services.115

In November 1994 the Queensland Parliament enacted the Passenger Operations (Passenger Transport) Act, which recognised emerging forms of passenger transport such as courtesy and community transport, as service categories under the regulatory regime for public transport.116

An advantage of the Queensland regime, over Victoria and New South Wales, is that community transport operators are able to charge user fees rather than having to rely on donations. That in itself has been responsible for growth in a range of innovative services.117

One scheme being examined by Queensland Transport is for the funding of ‘transport development’ workers, located outside of government, whose role is to support communities in a region to initiate or co-ordinate community transport schemes. The work involves finding sources of government funding and negotiating with bus and taxi operators.118
South Australia

In 1998 Sciens Consulting, on behalf of the Women’s Advisory Council, Office for the Status of Women, published a guide on setting up a rural community passenger network, which they defined as:

... an organised group of people in a regional area who work to co-ordinate and deliver transport services to people who are transport disadvantage*.119

The guide notes that the function of community passenger networks is to promote a broad range of transport options for people outside the metropolitan area, enabling people to be involved in their community and make the best use of existing resources. The following categories of transport providers are specified.120

• Existing taxi and bus services;
• Community buses;
• Local agencies and organisations with fleet vehicles that can be ‘loaned’; and
• Local people willing to use their own vehicles to help people meet their transport needs.

The guide is designed to be used by local councils. One good example of the guide’s practical application is the Barossa Council’s Community Transport scheme, developed to assist the older, frail and younger disabled residents who don’t have easy access to transport. Volunteers are required to keep the scheme operating.121

The Victoria Police submission also made mention of a private initiative in South Australia called the ‘Murray Valley Community Transport Scheme’. Drivers are volunteers and clients are required to make a booking and travel with a carer. The Scheme is funded by donations only, and all vehicles are supplied by volunteers.122

The Way Forward in Victoria

A number of the programs described above are worth considering for Victoria. There is a debate between DHS and DOI as to who should accept ownership and the delivery of such programs. The Committee is of the view that DOI, as the main provider of transport and infrastructure in Victoria, should take the lead and develop such strategies.

The Committee concedes that effective, long term planning for older people’s mobility needs is seriously lacking. To address this problem, greater levels of planning is required, by individual older people themselves, their representative organisations, and all levels of
government. This is particularly so for those parts of rural Victoria without any public transport or taxi services.

**Recommendation**

27. That the Department of Infrastructure develop a long term strategy and statewide action plans to meet the mobility needs of older Victorians. These should include:

- Public transport, community transport and alternative transport services, including possible use of taxis;
- Supporting local communities to ensure that older people have access to transport, wherever they live in Victoria; and
- Provide information on the services available for older travellers.

**Summary of Findings**

- VicRoads and local government need to consider the safety implications of the possible use of pedestrian mobility devices in Victoria, particularly the potential hazard for older pedestrians.

- Some other Australian and overseas jurisdictions have transport schemes and information services which could provide suitable models for use in Victoria.

- A membership-based alternative transport scheme originating in Portland, Maine in the United States provides individualised car-based service to members and is one idea that should be further examined for possible piloting in Victoria.

- Older drivers need to be encouraged to become familiar with public transport and other alternative means of travel before they cease driving.

- A number of local community transport schemes attempt to meet the mobility needs of older Victorians, including those who have ceased driving. However, they lack co-ordination and a long term commitment and strategy. There is a need for such a strategy and action plan to be developed and implemented.

- The Department of Infrastructure needs to take responsibility for developing a long term strategy and action plans for public, community and alternative transport services, including taxis.
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Recommendations

24. That VicRoads, in relation to motorised mobility devices:
   - Develop safety standards;
   - Regulate their use on public roadways and pathways;
   - Investigate third party insurance aspects of their use; and
   - Conduct an awareness campaign focussing on the rights and responsibilities of users, for both the user and the public.

25. That the Department of Infrastructure undertake a partnership with the Transport Accident Commission to develop and pilot an alternative local transport service for older Victorians.

26. That the Department of Infrastructure provide older drivers with realistic incentives, support and encouragement to use public and alternative transport before they are in a position of no longer being safe to drive.

27. That the Department of Infrastructure develop a long term strategy and statewide action plans to meet the mobility needs of older Victorians. These should include:
   - Public transport, community transport and alternative transport services, including possible use of taxis;
   - Supporting local communities to ensure that older people have access to transport, wherever they live in Victoria; and
   - Provide information on the services available for older travellers.
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Managing the Transition

Introduction

Due to differences in generational expectations and social influences, levels of vehicle use in the next 20-30 years is likely to be higher amongst people, especially women.

Strategies to assist the current cohort of older drivers making the transition to non-drivers may not be appropriate for future generations of older people. As such, governments will need to address mobility expectations not just for the current generation of older people, but for those people now in their 40s and 50s.

Ms E. Villeneuve, Founder and Director of the Driving Decisions for Seniors program in the USA State of Oregon, commented that:

So much of the misery of getting old is about status. Losing your licence is about status.¹

How to effectively manage the transition from driver to non-driver is a key planning challenge for health professionals, government and non-government agencies alike.

In a recent report for the United Kingdom Department of Transport, Associate Professor D. O’Neill, Department of Medical Gerontology, Adelaide and Meath Hospital, Dublin, noted that the greatest ‘threats’ to older people are:

- Reduced mobility (that is, withdrawal from driving, inadequate public transport systems, and hostile traffic environments); and
- An increase in their vulnerability to serious injury and death when exposed to the traffic environment.²

Professor O’Neill states that:

Driving is a skill of huge practical and psychological importance to many older people.³
It is not surprising therefore, that older people who need to stop driving are faced with a number of difficult decisions. The Royal Automobile Club of Victoria Ltd (RACV) in their submission identified the transition process, and the difficulties drivers faced in making the appropriate decisions, including:

- Obtaining advice and assistance from health professionals;
- Making their own decision to stop driving or coping with the de-licensing process administered by VicRoads;
- Adjusting psychologically to their status as a non-driver;
- Coping with the administrative issue of selling a car and finding other forms of identification in the absence of a driver’s licence; and
- Learning about alternative transport options and how to maintain the same social contacts and activity levels they had as a driver.4

What is Involved in the Transition from Driver to Non-Driver?

Survey results from a University of Queensland study published in 2002 identified that, for older people, there is a considerable reliance on the motor vehicle as the mode of transport, while there was little evidence of planning and support in making the decision to stop driving, with some people considering it too difficult to even contemplate.5

Planning for the Change

Results of focus group testing for the Administration on Aging, reported on the USA-based on-line resource SeniorCitizens.Com reported a similar finding, with:

… a nearly universal lack of planning – by those now elderly or those of us who hope to be older one day – concerning travel options once driving is no longer viable.6

This point is re-inforced in a study undertaken by University of Michigan researchers and presented at the 9th International Association for Travel Behaviour Conference in Queensland in July 2000. The study concluded that little has been done to develop a comprehensive framework that might lead to a model of driving reduction and cessation.7

The results of the survey, involving 1,053 respondents, indicated that drivers who anticipated problems were more likely to have thought about arranging for rides and hiring someone to drive them, than those who did not anticipate any driving difficulties.8 Consistent with the
Queensland research findings two years later, there was evidence older drivers do little to plan for the time that they are unable to drive.\(^9\)

The authors of the Queensland study reported that, while the decision to give up driving is a major one, the actual process of stopping driving, either voluntarily or involuntarily, is not well documented.\(^10\) They suggest the extent to which older people are aware of their declining functional abilities, may assist in adjustment to their driving patterns, although this may not be the case for those with cognitive disorders, who may not be aware of their level of cognitive decline.\(^11\)

Interestingly, carers of older drivers also expressed reluctance to address the issue with the drivers, as some feared negative impacts on their own lifestyle.\(^12\) However, not surprisingly, the availability of close family support and feasible transport alternatives was viewed as easing transition planning.\(^13\)

For those that had ceased driving, the survey noted that, a majority of former drivers (irrespective of their level of cognitive ability), reported the decision to stop driving was their own, although sometimes the decision followed advice from health professionals and family.\(^14\) Other factors that were identified in the survey results as leading to driving cessation and licence surrender included, failing to pass the on-road test, the costs involved in maintaining a motor vehicle, family pressure, nervousness and fear of a crash.\(^15\)

The authors recommended the need for resources to assist older people, their carers and health professionals, to plan for the transition from driver to non-driver, and better manage alternative transport options.\(^16\)

The RACV listed in their submission, resources that need to be improved to assist older people in planning for such a transition:

- Provision of information on the risks of continued driving;
- Information and promotion of the availability of transport options;
- Planning for the future mobility needs of the older driver, so that mobility, independence, and activity levels are maintained; and
- Programs or information highlighting some of the dangers associated with being an older pedestrian, and information and strategies encouraging safe pedestrian practices.\(^17\)
Support for the Driver and their Families

At the 2002 Road Safety Research, Policing and Education Conference, held in Adelaide, Ms A. Harris, Chief Behavioural Scientist, RACV, stated support for the retiring driver, to cope with and adjust to the transition, could involve:

- Programs to encourage drivers to raise the issue of their fitness to drive with health professionals;
- Education and information about alternative transport options and how to maintain the same social contacts and activity levels they once had as a driver;
- Programs to urge older people to consider and plan for their mobility needs as they grow older; and
- Programs that offer one-to-one support for those needing help in dealing with the emotional issues associated with stopping driving.18

Ms Harris also suggested that support for families could include:

- Information to help families dealing with issues associated with an older family member limiting or stopping driving;
- Information about what services, such as transport, home help and other local support is available for older non-drivers; and
- Workplace policies that permit family members the flexibility of providing trips or other support to elderly family members during work hours.19

Focus testing reported by SeniorCitizens.Com identified that people who were best able to adjust to the transition from driver to non-driver were those people who had one or more of the following attributes:

- Partners who drive;
- Live with their children or have children in the area;
- Have sufficient financial resources to purchase transportation services;
- Are involved with a religious institution;
- Live in communities with viable non-driving transport options;
- Are physically able to use public transport; and
• Have reduced their activities and expectations to fit their present circumstances.  

To better understand what happens to a person who has stopped driving, in 2002 the RACV commissioned Open Mind Research to conduct a small scale study involving a total of 125 interviews with recently retired Victorian drivers. People that reported having a more positive transition tended to be those that:

• Have a greater acceptance of ageing;
• Don’t view driving as integral to their identity;
• Are still engaged in the community; and
• Have some alternative transport.

The research indicated that those people who reported having greater difficulty in adjusting to being a non-driver were those who:

• Relied on driving to get to social activities and who placed a high value on independence;
• Stopped due to medical reasons, although they believed their driving was okay;
• Reacted negatively to having to stop driving and often experienced anger or depression; and
• Had poor social networks and few resources to help them cope.  

These results are consistent with research into the linkages between driving cessation and a loss of mobility, self esteem, personal health and well being. Similarly, at the Australian Road Research Board/Road Engineering Association of Asia and Australasia (ARRB/REAAA) conference in Cairns in May 2003, Ms Harris discussed research studies which identified that many older people who stop driving due to poor health have to cope with loneliness and isolation, exacerbated if there is no family living nearby, with symptoms of depression especially where alternative transport is not available.  

The RACV recommended to the Committee that the Victorian Government ought to fund the development of a comprehensive support program for older people who make the transition from driver to non-driver. The program should be delivered in local communities and coordinated by local government.  

At the Road Safety Research, Policing and Education Conference, in Adelaide, November 2002, Mr P. Lumb, from the School of Social Work and Social Policy, University of South Australia suggested that a ‘mobility’ licence could be introduced for people over 70 years. This
would entitle people to benefits such as subsidised air, tram, bus or train fares, an annual taxi distance allowance and discounts on the purchase of small electric scooters.\textsuperscript{26}

VicRoads, in their submission, recommended to the Committee that:

A cross-Government steering group be convened to identify potential roles, responsibilities and resource implications for the various Government departments and agencies to support drivers facing the transition from driver to non-driver, due to licence withdrawal or surrender; and that a report on suitable processes and programs to meet these needs including options for alternative mobility be provided to the Government.\textsuperscript{27}

The Committee endorses the need for an 'whole of Government' approach and that DOI, which has transport responsibilities, should take the lead.

The Effect on Health and Driving Cessation

Submissions identified general practitioners (GPs) and other health professionals require more information in helping people make the difficult transition to non-driver.\textsuperscript{28} The RACV state that, as a result of this lack of expertise and a lack of time with older patients to work through the difficult process of making the decision:

It may be more appropriate for a health professional to access a referral source to local programs designed to assist older people with the transition.\textsuperscript{29}

The results of the Open Mind Research survey, presented by Ms Harris, are consistent with international research findings which indicate older people stop driving due to medical reasons.\textsuperscript{30} The advice of health professionals usually plays a more significant role in this decision (more so than the advice of family members).\textsuperscript{31}

Professor O’Neill, believes that medical practitioners should be deliberating on fitness to drive with a view to correcting any physical or functional problems, enabling the older driver to be more comfortable, secure and safe in their driving.\textsuperscript{32}

Professor O’Neill proposes a wide range of interventions to prolong the driving life of older drivers with impairments which include: access to a full interdisciplinary team; a good working relationship with a specialist driving assessment centre; and the availability of car adaptation services.\textsuperscript{33} When driving is no longer possible however, it is important to explore alternatives with the patient.\textsuperscript{34}
The ideal situation, he believes, is to provide a system of ‘paratransit’: affordable, tailored and individual transportation. While various models already exist, he acknowledges that funding remains a significant problem.

He is also concerned that there are several societal prejudices that go against this approach and cites as an example the literature on health and driving which is phrased in negative terms, emphasising the selection of those who should not drive, rather than enabling those who are affected by illness to drive through remediation.

Professor O’Neill also noted that:

The emphasis of many government manuals on fitness to drive, as well as much of the scientific literature, is on who should not drive, stressing the safety of other people preceding the right of the patient to drive: in effect, conferring a policing role on physicians. From a clinical and ethical viewpoint, this poses a dilemma, and a policing mentality may have a negative impact on attitudes to older drivers. It may also deter patients from attending their physicians if they fear that disclosure of illness may result in limitation of driving.35

Information Provided to Health Professionals

Health professionals have a role in assisting and assessing older drivers. These include GPs, medical specialists, optometrists, psychologists, physiotherapists and occupational therapists.36

SafeDrive Medical is a 2-3 hour discussion session for groups of GPs and other health professionals covering older driver safety issues and the Austroads Assessing Fitness to Drive guidelines. Developed by the National Ageing Research Institute (NARI) at the University of Melbourne with funding from VicRoads, the program has been run since the late 1990s with sponsorship by the Transport Accident Commission (TAC) and a number of others. The session is run after working hours, facilitated by peer educators (geriatricians), is free to participants and provides Continuing Medical Education (CME) credits.37 Other states have expressed interest in running the program.38

Evaluation of the SafeDrive Medical program shows that it is useful in raising awareness in the participants.39

Dr P. Darzins, then Senior Lecturer Geriatric Medicine, NARI, told the Committee that, while the sessions had reached more than 500 participants in the first three years:

... general practitioners make up the minority of the audience. The majority is made up of occupational therapists and aged care assessment team workers. I think they get to the general practitioners that way.40
Ten seminars were delivered in 2002 and 15 planned for 2003. There are about 11,000 members of the Royal Australian College of General Practitioners in Victoria, so coverage of GPs is probably no more than two per cent.\textsuperscript{41}

The inadequacy of older road user safety information included in undergraduate and post graduate medical courses received some mention in a submission and at hearings.\textsuperscript{42} The RACV recommended to the Committee:

\begin{quote}
The Department of Human Service, in consultation with academic institutions training health professionals, should ensure that adequate levels of education about fitness to drive is included in the curriculum of all health professional training courses.\textsuperscript{43}
\end{quote}

They also recommended that VicRoads should develop programs to encourage current health professionals to discuss fitness to drive with their patients and clients.\textsuperscript{44}

The Royal Australasian College of Surgeons also supported education for both the medical and general communities.\textsuperscript{45}

**Professional Association’s Views**

The Committee received a number of comments on what role health professionals should take. In particular, the Pharmaceutical Society of Australia (Victorian Branch) recommended to the Committee, that health professionals should be educated and that rational prescribing guidelines be developed, which would help minimise driving impairment, on prescribed drugs and the potential effects on driving.\textsuperscript{46}

Similarly, the Australian Association of Occupational Therapists Victoria Inc., recommended to the Committee, that a specific education package be developed for health professionals in dealing with, identifying and educating older ‘at risk’ drivers.\textsuperscript{47}

The Optometrists Association Australia (Victorian Division) Inc., noted there is a need for an easy to read brochure that lists the services (including advice on driving safely) that health practitioners can pass on to clients. The Association advised the Committee, given appropriate support, that it would be prepared to develop such a resource.\textsuperscript{48}

Ms Di Stefano, Lecturer, School of Occupational Therapy, La Trobe University, told the Committee at a Public Hearing in 2002 that:

\begin{quote}
We believe there needs to be more work done on providing guidelines for general practitioners, and generally for educating health professionals.\textsuperscript{49}
\end{quote}
She also suggested that *Assessing Fitness to Drive* be disseminated to a broader range of health professionals, such as pharmacists, and on a periodic basis.

In support of this approach, the RACV recommended to the Committee, that VicRoads and the Department of Human Services develop information and training programs for health professionals on how to assist patients make the transition from driver to non-driver.\(^50\)

The Committee notes the recent release of new guidelines for *Assessing Fitness to Drive for Commercial and Private Drivers* by Austroads.\(^51\) This provides an appropriate opportunity for a much needed major publicity campaign to reach a wider group of health professionals.

**Health and Driving**

The Optometrists Association in their submission, suggested that VicRoads should consider conducting training courses for optometrists on licensing processes, which would assist optometrists to provide advice to older patients who may no longer be fit to drive.\(^52\) The Association also recommended to the Committee that *The Victorian Older Drivers’ Handbook* be made widely available to all optometrists, to distribute to all patients who are drivers over the age of 65 years.\(^53\)

The Optometrists Association also suggested that all health care providers and other organisations that interact with older people, such as clubs, councils and libraries, should have access to information on professional services and transport options for older people making the transition to non-drivers and to be generally safer road users.\(^54\)

The Committee believes the role of health professionals in relation to older drivers making the transition to non-drivers, needs to be clarified. Discussion should be promoted by key Government transport and health agencies, in cooperation with non governmental agencies and industry representative groups, to produce clear and comprehensive guidelines.

The Committee is of the view that DOI should take the lead role in planning and co-ordinating services to manage the transition from driver to non-driver.

**Recommendation**

28. That a whole-of-government approach be taken, in consultation with relevant organisations and community groups, to develop policy to assist Victorian drivers with the transition from driving to non-driving.
Summary of Findings

- Making the transition from driver to non-driver can be a major life event, but one few older Victorians currently consider or plan for in advance.

- A range of resources and services are needed to help older drivers, their family, health professionals and community care and advice organisations assist in the transition.

- A comprehensive action plan is needed to co-ordinate the activities of health services, government and other agencies on the transition.

Recommendation

28. That a whole-of-government approach be taken, in consultation with relevant organisations and community groups, to develop policy to assist Victorian drivers with the transition from driving to non-driving.

Endnotes


3 ibid.


7 Kostyniuk, L, Shope, J and Molnar, L, ‘Driving Reduction/Cessation Among Older Drivers: Toward a Behavioural Framework’, University of Michigan, Transportation Research Institute, 9th International Association for Travel Behaviour Conference, Gold Coast, Queensland, July 2000, p. 2.

8 ibid., pp. 5, 14.

9 ibid., p.13.

11 ibid.

12 ibid., p. 22.

13 ibid.

14 ibid.

15 ibid.

16 ibid., 19.

17 RACV, Submission, op. cit., p. 48.


19 ibid.

20 SeniorCitizens.Com, Mature Older Senior Drivers: Mobility Changes for Elders who Reduce or Cease Driving.

21 Harris, A. op. cit., p.1.

22 ibid., p. 8.

23 ibid., p. 10-11.


25 RACV, Submission, op. cit., p. 51.


27 VicRoads, Submission, op. cit., p. 106.

28 RACV, Submission, op. cit., p. 51; Optometrists Association of Australia (Victorian Division), Submission to the Inquiry, February 2002, p. 19.

29 ibid., p. 50.

30 Harris, A, op. cit., p. 2.

31 ibid.

32 O’Neill, D, op. cit., p. 113.

33 ibid., p. 120.

34 ibid., p. 121.

35 ibid., p. 115.

36 Austroads, Assessing Fitness to Drive, 2nd edition, Sydney 2001, p. 3.
37 Dr P. Darzins, National Ageing Research Institute, Minutes of Evidence, 17 June 2002, p. 53; National Ageing Research Institute, Safe Drive Medical 2002 brochure, 2002; VicRoads Submission, p. 82.

38 ibid., p. 56.

39 ibid., pp. 53-54.

40 ibid., p. 53.

41 VicRoads, Submission to the Inquiry, March 2002, op. cit., p. 82; Dr Bouvier, Australian College of General Practitioners, Minutes of Evidence, 5 August 2002, p. 107.

42 Dr P. Darzins, op. cit., p. 50-51; RACV, Submission, op. cit., pp.38-39; Ms G. Simpson, Dr R. Bouvier, Minutes of Evidence, 5 August 2002, p. 106.

43 RACV, Submission, op. cit., p. 7.

44 ibid.

45 Royal Australasian College of Surgeons, Victorian Road Trauma Committee, Submission to the Inquiry, 8 March 2002, p. 4.

46 Pharmaceutical Society of Australia (Victorian Branch), Submission to the Inquiry, 8 March 2002, p. 10.


48 Optometrists Association Australia (Victorian Division), Submission op. cit., p. 16-17.

49 Ms M. Di Stefano, School of Occupational Therapy, La Trobe University, Minutes of Evidence, 6 August 2002, p. 173.

50 RACV, Submission, op. cit., p. 50.


52 Optometrists Association Australia (Victorian Division), op. cit., p. 15.

53 ibid., p. 16.

54 ibid.
Safer Vehicles

Motorist Knowledge of Vehicle Safety Issues

The Accident Research Centre of Monash University (MUARC) state in their submission, that vehicle safety improvements since the 1960s have effectively halved the risk of suffering serious injury in a crash. Examples include seatbelts, airbags, crash-absorbing design and internal padding. There is currently a school of thought that says driver fatalities could fall by a further 40-50% if all drivers drove the safest vehicle in their class.

The Royal Automobile Club of Victoria (RACV) Ltd, in their submission, state it is common for older people to drive older, smaller and lighter vehicles and be less familiar and have less knowledge about vehicles safety features than younger people.

Older vehicles, especially the cheaper models, are less likely to have the most advanced safety equipment. With an average age of eleven years the Victorian fleet is one of the oldest in Australia and the developed world. A higher vehicle age, together with fewer safety features than in American or European models, means older occupants in Victorian vehicles are more likely to be injured than those in other comparable countries.

The safety of older people involved in a crash would be improved if they were occupants of newer vehicles.

In 1997 the RACV commissioned the market research company ANOP to conduct a survey of motorists’ awareness and attitudes of a range of vehicle issues. The results identified the perceptions held by older motorists concerning vehicle safety in comparison with other age groups:

- When asked ‘What aspects or features of a car help to make it safe in a crash?’ only 51 per cent of drivers aged over 55 years believed that specific ‘safety features’ were important. This compared with a figure of over 75 per cent for drivers aged 18-33 years.
• Similarly, only nine per cent of the over 55 year old age group identified impact absorption (such as crumple zone) as making a car safe in a crash, compared with nearly 20 per cent of 18-24 year olds.\(^{638}\)

The RACV conclude that the survey suggests people over 55 years are less familiar and have less knowledge about vehicle safety features than younger age groups.\(^{639}\)

Recently MUARC was commissioned by the RACV to conduct qualitative focus group research on vehicle safety and purchasing issues with over 200 drivers aged over 55 years.\(^{640}\) The responses revealed a preference for near-new or recent model vehicles when considering replacing their current vehicle. Features reportedly important to participants were generally those that improved the comfort or ease of driving, with only a minority nominating safety features such as airbags and Automatic Braking System brakes.\(^{641}\)

When asked to nominate which of five factors were most important when purchasing a vehicle, the greatest proportion of participants (40%) rated the handling of the vehicle as the single most important factor. Vehicle safety was reported as the most important factor by approximately 30%, while approximately 20% indicated that fuel economy would mainly influence their decisions. Vehicle appearance and make or model were of importance to fewer than 10% of participants. Vehicle size and cruise control were more likely to be nominated as positive safety features by country participants than metropolitan participants.\(^{642}\)

The RACV said that older people need to be educated about the benefits of current vehicle design, and safety features and encouraged to purchase vehicles with features that will help keep them safe on the road.\(^{643}\)

**Safety Features for Older Vehicle Occupants**

Vehicle safety features can be broadly divided into the following two areas:

• Passive features, which minimise occupant injuries in a crash; and

• Active features, which help drivers avoid a crash in the first place.

Ease of use is also a factor that impacts on older user mobility.
Passive Safety

Passive safety is of particular importance for older occupants of motor vehicles, given they are more susceptible as a group to bone fractures, soft tissues damage and other crash injuries as a result of increased physical frailty.\(^{644}\)

Vehicle Age and Design

The RACV, state in their submission:

A common misconception among motorists is that older cars are stronger and more solid than new cars. While this may be true in a lot of cases, strength itself is not what protects an occupant from injury in a collision.\(^{645}\)

It is the ‘crumple zones’ of modern vehicles that minimise the effects of a crash on occupants.\(^{646}\) A well-designed car body will absorb the crash force with a minimum of intrusion into the passenger cabin.\(^{647}\)

Further, the RACV state:

New cars tend to provide significantly better protection to their occupants than older cars. This is because vehicle safety has progressed significantly over the last 20 years.\(^{648}\)

Government regulations, through the Australian Design Rules (ADR) have raised the minimum standards for occupant protection.\(^{649}\) Examples include energy absorbing steering columns, head restraints, inertial reel seatbelts in front seats, and minimum-height adjustable head restraints.\(^{650}\)

The most significant recent rules introduced were in July 1995 for ADR 69 which specifies standards for frontal impact occupant protection and ADR 72, introduced in January 1997 which deals with increased side door strength. The former resulted in most manufacturers installing airbags for the front seat occupants, while the latter has encouraged installation of intrusion bars to strengthen side doors to reduce injuries in side-impact crashes.

Side Impact Protection

RACV in their submission, quote MUARC research that shows older drivers are over-represented in side-impact collisions resulting in a casualty, either as a result of failing to give way to other vehicles, or due to their susceptibility to injury in this type of crash.\(^{651}\)

Figure 9.1, provided in the submission by Holden Ltd, shows the age of drivers involved in frontal and side impact crashes. This clearly demonstrates that younger drivers are predominantly involved in frontal
crashes. The involvement rate in side impact crashes increases from around 35 years of age till around 80 years old, with quite a steep increase between 75 and 80 years.

Figure 9.1. Percentage of Drivers Involved in Frontal and Side Impact Crashes by Age

[Graph showing percentage of drivers involved in frontal and side impact crashes by age.]

Holden, in their submission, also provided a diagram showing the relative risk of injury from different types of crashes. Compared to an impact with the front of a vehicle an impact on the right hand side had 10 times the risk of injury, a left hand side impact five times the risk and an impact to the rear of the vehicle 0.1 times the risk.\(^6\)

For this reason, the RACV say that selecting a car with good side impact protection is important for older motorists.\(^6\) Side impact protection is much harder to achieve than frontal protection because there is only the width of the door to protect the occupant. The Australian New Car Assessment Program (ANCAP) has been performing side impact tests on vehicles since 1999. As a result of changes to design regulations, modern vehicles are more likely to be built with improved side impact protection.\(^6\)

**Vehicle Aggressivity and Size**

A simple definition of ‘aggressivity’ is that it measures the damage to one vehicle and injury to its occupants, to the damage it causes to another vehicle.\(^6\) MUARC believe vehicle geometry is a significant factor and large recreation vehicles with high bonnets such as four wheel drives (4WDs) have a particularly high aggressivity rating. MUARC also state this is an issue that affects older occupants, more than most other age groups, and pedestrians are at a particularly high risk of injury when hit by these types of vehicles.\(^6\)

According to VicRoads the effect of vehicle mass on crashworthiness in frontal crashes has been well documented and claims, as a very broad
rule, the larger the car the better the occupant injury outcome.\textsuperscript{657} VicRoads quotes a report on \textit{Ageing and Transport: Mobility Needs and Safety Issues}, by the Organisation for Economic Co-operation and Development (OECD) as stating that this can be attributed to two main factors:

- The impact force (and hence the stress on the occupant) is more moderate to an occupant of a larger car when it strikes another of lesser weight.
- A larger car is better able to absorb the impact energy in its structure than a smaller one. Less energy being transmitted to the occupants translates to a lower risk of serious or life-threatening injury.\textsuperscript{658}

What has perhaps not been appreciated by the public is the extent of the effect on occupant fatalities when cars of differing weights collide. At the \textit{Mobility & Safety of Older People Conference}, held in Melbourne in August 2002 Dr L. Sparke, Manager of Advanced Engineering, Holden showed a diagram demonstrating the vastly disproportionate impact of vehicle size inequality on driver fatalities in comparable types of collisions. This showed that if the larger car is 50\% heavier than the lighter car then drivers of the lighter car are five times more likely to be killed than drivers of the heavier car.\textsuperscript{659}

The evidence provided by the RACV shows the most vulnerable age group, those aged 75 and over, are the most likely to own an older car: 62\% drive cars ten years or older and 18\% had cars that were 20 years old. Similarly, they are the most likely to drive small and medium size cars, which the RACV regard as less safe than large or luxury vehicles.\textsuperscript{660}

VicRoads in their submission, quote a MUARC finding that older drivers are likely to receive maximum protection from modern, large vehicles. However, given the relationship between vehicle mass and aggressivity, while this strategy may benefit those older drivers able to handle larger vehicles, it may also result in increased injuries to others, especially occupants of older, lighter vehicles involved in multi-vehicle collisions.\textsuperscript{661}

The Committee supports ANCAP and other research to identify and reduce vehicle aggressivity through improved vehicle design.

\textbf{Seatbelts}

Since their introduction in 1969, seatbelts have played a major role in improving occupant safety and are regarded as arguably the most important road safety initiative in Australia.\textsuperscript{662} VicRoads, in their submission quote MUARC researchers, who estimate that properly installed and fitted seatbelts reduce the risk of injury by around 50 per cent in the event of a crash.\textsuperscript{663}
Despite very high general compliance in using seatbelts, 20% of all vehicle fatalities are unrestrained. For older occupants the rate is approximately 10%. Queensland fatal crash statistics also confirm that older occupants, 60 years and over, are half as likely to be not wearing restraints as younger occupants.

At the Mobility & Safety of Older People Conference, Professor Fildes, Professorial Fellow, MUARC, showed a diagram of the tolerance to injury from the force imposed by a seat belt for three age groups. Those aged 65 years and over had only a quarter of the ability to withstand the restraining force of the belt relative to the youngest group reported (16-35 years).

This is one reason why fractures to the chest area are far more common among older occupants in crashes. They can, in some circumstances, also contribute to the incidence of chest injury for a frail elderly occupant, although such injuries are almost certainly less severe than those of an unbelted occupant. It is not known if the non-use of seatbelts by some older vehicle occupants is due to possible concerns about seatbelt inflicted injuries.

The Committee observed that given their frailty, the disturbing lack of use of seatbelts by a significant number of older vehicle occupants in fatal crashes, casts doubt over the supposedly safer behaviours of older people often quoted by devotees of driver self-regulation. All Victorian vehicle occupants, especially the frail older drivers, are therefore likely to benefit from further strategies to improve restraint use, including information in The Victorian Older Drivers’ Handbook.

In addition to encouraging use of seatbelts, improvements to seat belt mechanisms, airbags and other supplementary restraint systems may be of particular value in reducing the crash outcomes for older people. Restraint system improvements currently being introduced into some new vehicles include:

- Seat belt load limiters used in conjunction with an airbag. These unreel gradually to reduce the maximum force exerted by the belt on the driver or passenger’s chest area;

- An adjustable seat belt upper anchorage which allows the occupant to ensure the belt sits comfortably across the shoulder rather than below it, or across the neck, where it is far less effective and potentially more dangerous in the case of a crash; and

- Seat belt webbing grabbers which prevent belt lengthening during a collision and thereby minimising the chance of the occupant’s head striking the vehicle’s interior, particularly on non-airbag equipped cars.
Looking further ahead, a number of innovations are occurring such as seatbelts which are fully integrated into the seat to provide an optimum belt layout for all shapes and sizes. Other countermeasures being considered by researchers include ‘airbelts’, which inflate on impact to offer added protection by spreading the belt load on the occupant’s chest.\textsuperscript{668}

While better seatbelts will improve occupant safety in the longer term, the Committee considers that the immediate focus should be on encouraging all older occupants to wear correctly fitted seatbelts, through both education and enforcement.

**Recommendation**

29. That a publicity campaign, supported by enforcement, be developed to encourage older vehicle occupants to correctly wear seatbelts.

**Airbags**

The RACV, in their submission, state that a study in 1997 by market research company ANOP, found that airbags are one of the lesser-trusted safety features on vehicles, many people believing they cause more injuries than they prevent. RACV state that older people often tend to be the most suspicious of this type of technology. Most of the stigma surrounding them originates from the experience in the USA, where airbags are larger and inflate more aggressively due to low seat belt usage.\textsuperscript{669}

Serious injuries are extremely rare with Australian airbags. The RACV state that:

Thus far, there have been no recorded fatalities in Australia involving motorists where the airbag was cited as the cause of death.

In fact, in a frontal collision, airbags are highly effective in minimising the risk of brain injury, as well as chest, facial and neck injuries (Morris, Brown, Fildes, Corben, Langford and Hull, 1998). In a side collision, depending on the particular airbag design, they can minimise the risk of abdominal, chest, neck and/or head injuries.\textsuperscript{670}

The RACV conclude that both front and side airbags are of particular importance for older motorists.\textsuperscript{671} The organisation advocates that driver airbags be made mandatory on all new passenger vehicles. It states that due to the lower occupancy rates in front passenger seats, the cost-effectiveness of introducing a similar rule for this position is less clear and likely to be lower than for the driver. Nevertheless, RACV encourages motorists to purchase vehicles with both driver and passenger airbags, where possible.\textsuperscript{672}
According to the RACV, properly restrained rear seat passengers typically fare much better than front seat passengers in frontal crashes. Side airbags are potentially as effective for front as for rear seat passengers, however there is no proof they are as effective as frontal airbags. The RACV supports the use of side airbags that provide both head and chest protection.673

The Federated Chamber of Automotive Industries (FCAI) opposes mandatory installation of side airbags. The chamber points out that neither the Economic Commission for Europe (ECE) or American regulations currently mandate installation of side impact airbags. The FCAI submission states that side-impact protection can be provided by way of side intrusion beams in doors, or a more substantial B pillar between the front and rear doors.674 While this is true, side airbags are increasingly being chosen by purchasers of new cars.

A number of airbag innovations are underway, including an inflatable side curtain that protects the head by covering the whole side of the car in a crash. The curtain also stays inflated, thereby being of benefit in both rollover and side impact collisions. Airbags to cushion the legs and feet are also under development.675

The RACV in their submission conclude that, while airbags are of substantial overall benefit to all motorists, in some cases they have the potential to cause minor injuries due to the speed with which they inflate. For this reason, the development of dual stage airbags, which inflate less aggressively in lower severity collisions, may be of added benefit to older motorists.676

Because of their vulnerability, particularly to chest injuries, the Committee considers that older vehicle owners should be encouraged to consider buying vehicles with airbags when upgrading their cars.

**Smart Restraint Systems**

Development of ‘smart restraint systems’ may be able to both reduce the risk of incidental injuries and improve the efficiency of seatbelts and airbags. Such systems use sensors to detect the presence of seat occupants, determine their weight and whether they are wearing a seat belt. Airbag deployment is then tailored to better protect a seat occupant in the event of a crash.677 It has been estimated by MUARC researchers that smart restraints can reduce serious injuries by as much as a further 20 per cent.678 The technology is likely to appear in luxury model cars within a few years.
Head Restraints

Head rests sit atop the seat and prevent the occupant's head from moving backwards in the event of a rear-end collision. The RACV in their submission, state that the most common injuries in car crashes is whiplash, often occurring in even minor rear end crashes. The Insurance Institute of Highway Safety (IIHS) estimates that neck strains and sprains account for between 30 to 40 per cent of all American car insurance claims. While the IIHS believes a significant proportion of these are suspected to be fraudulent, they nevertheless represent a very significant problem. The main causes of whiplash are said to be poorly adjusted and poorly designed head restraints.

In his address at the Mobility & Safety of Older People Conference, Professor Fieldes said that properly designed and adjusted head restraints would be particularly useful for older vehicle occupants. Improved restraints are now becoming available, including 'active' restraints which move forward during the early stages of a collision to fill the gap between the back of the head and the front of the restraint.

To encourage their use in new vehicles the Committee considers that active head restraints deserve more prominence in safety literature for new car purchasers.

Active Safety

Active safety refers to features which help drivers avoid a collision. Some features include electric mirror adjusters, adjustable steering column, clear easy-to-read instrumentation and easy to operate dashboard controls. Vision and visibility features are particularly important for older drivers.

Mirrors

Vehicles should be designed with good visibility in all directions for the driver. Older drivers lack the flexibility of their younger counterparts when it comes to checking blind spots, over their shoulders. Auxiliary rear vision mirrors can assist older drivers who have difficulty moving their head or shoulders or are driving vehicles with large pillars, creating blind spots and making rear or side vision more difficult. There already exists a number of inexpensive products, including some that simply attach to existing interior rear vision mirrors, which can improve visibility.

Tinted Glass

Holden, in their submission, stated that tinted glass causes an unnecessary hazard by obscuring 25% of clarity. Identifying approaching vehicles at intersections, and judgment of speed and distance when light levels are low, becomes more difficult for older people.
Holden note:

At age 50, 10 times the light intensity is typically required to see what can be seen at age 20. Losing 25% of visibility by tinting glass creates an unnecessary hazard, to the driver, to occupants of other cars, and particularly to pedestrians.684

It also makes it harder for drivers to be able to make eye contact with one another.

**Daytime Running Lamps**

Another way to increase the visibility of a vehicle is through the use of Daytime Running Lamps (DRLs), which are either full or near-full intensity headlights or parking lights. According to the submission by Holden Ltd, their parent company General Motors introduced automatic DRLs in North America in 1997. Four years of data has demonstrated to Holden that they are extremely effective in reducing crash involvement, with a:

- 12% reduction of pedestrian crashes during daylight hours;
- 13% reduction in daytime frontal crashes; and
- 7% reduction in all crashes at dawn or dusk.685

According to Holden Ltd, a study by National Highway Transport Safety Administration (NHTSA) published in June 2000, in the United States, showed that DRLs may reduce daytime fatal pedestrian incidences by almost 30%. Evaluations of their effectiveness for the entire Finland and Sweden vehicle fleets during the 1970s, were also said to support DRLs.686

Dr Sparke Manager of Advanced Engineering, Holden stated that:

Driving with lights on during daylight hours will reduce pedestrian crashes, completely preventing a significant number of injuries. Most importantly, it is a safety strategy that could be introduced immediately, using a public campaign to promote the use of parking lamps during daylight driving.687

If automatic daylight running lights are not available on a vehicle it is good safety practice to use parking lights during the day and headlights as soon as daylight reduces, as well as during rain and fog.

The Committee supports this investigation, but all the issues need to be considered, including possible glare and irritation to oncoming drivers.

Further the Committee considers the benefits of frontal airbags and active head restraints, and the importance of side impact protection
features, should feature more prominently in the safety messages given to older drivers and passengers.

Recommendation

30. That VicRoads investigate all the issues associated with the possible safety benefits of daytime running lights.

Encouraging Older People to Purchase Safer Vehicles

The RACV published an eight page brochure *Making the Right Choice – Vehicles Safety Advice for Seniors* in July 2002. The association says that additional information about vehicle safety features and safe car selection will also be included in their safety awareness program, *Years Ahead – Road Safety for Seniors*.688

Both the RACV and VicRoads recommended to the Committee that the Government implement programs to better inform older Victorians about vehicle safety, including how to select the safest cars.689 The RACV also recommended to the Committee that VicRoads continue to contribute funds to ANCAP, which crash tests popular new model cars to ascertain their safety, and support an extension of the program (or another program) to specifically assess the safety performance of vehicles in protecting older occupants.690

The ANCAP program, funded by the State and Federal Governments and Australian motoring clubs, crash tests new vehicles and publishes the results to enable potential purchasers to make an informed decision based on safety. The testing is more stringent than those conducted to ensure compliance with ADRs. ANCAP tests consist of frontal impact, side impact and pedestrian injury compatibility tests.691

According to VicRoads and the RACV the results of ANCAP testing show a correlation with real world crash outcomes shown in the *Used Car Safety Rating* publications, which are based on extensive analysis of many years of real crash data.692 ANCAP brochures advise motorists to choose a vehicle that scores at least three stars out of a top score of five; advice particularly important for older motorists.693 The Transport Accident Commission (TAC) have an internet site (www.howsafeisyourcar.com.au) which provides safety ratings information from ANCAP and the Used Car Safety Ratings (UCSR) data.

To conclude, the Committee endorses the need for improved education for older people when purchasing cars and for the development of crash rating information focusing on the specific needs of older road users (such as pedestrian aggressivity and side impact protection). However the Committee is concerned about the cost involved for older drivers to purchase new and safer cars. Information on the safety performance of older cars, provided in the *Used Car Safety Rating* brochures, also needs to be promoted to older people considering buying a car.
Recommendation

31. That older people be encouraged through campaigns to purchase safer vehicles by:

- Agencies producing and distributing brochures on safer vehicles that include information on side impact protection, seatbelts, airbags and head restraints; and

- Encouraging ANCAP to develop publications focusing on the specific safety needs of older road users.

Future Generation of Vehicles

Motor vehicle manufacturers need to be encouraged by governments to produce vehicles that are safer and easier for older people to use.

Improving Vehicle Safety

While advising older people about the safety performance of existing vehicles is necessary in the short term, it is far more important that manufacturers design vehicles to provide greater protection for older people. The RACV proposes governments can:

- Lobby for mandatory fitment of ‘core-type’ safety features on all new vehicles through the Australian Design Rules; and

- Work towards an acceptable compromise between industry and road users, with regards to vehicle front-end protection for vulnerable road users.694

Ease of Use

Vehicle design can influence the comfort and ease of use for older people. Older drivers often complain that they have to bend down too far in order to reach the seat and find it difficult to exit the car for the same reason. Older people can be assisted by manufacturers installing appropriately located handholds and supports, seat adjustment controls, power and electrically operated devices and adjusters and, if appropriate, provision of special adaptive equipment.695 Similar equipment is already in use for drivers and passengers with some specific physical disabilities.

When asked at the public hearing, in June 2002, whether Holden had given any thought to manufacturing a vehicle specifically with an older market in mind, Dr L. Sparke, Manager of Advanced Engineering, stated that the current vehicle had been designed:
... in recognition that 50 per cent of our customers are female and more fragile, and that the average age of our customers is 45.696

The Committee is of the view however, that vehicle manufacturers are not acknowledging this growing market. In the future there will be a market for vehicles designed specifically for ease of use by older people. Features might include swivel seats, simplified control panels and a return to simpler instrumentation. Governments should encourage Australian car manufacturers to offer such options in their vehicles.

Vehicle design regulations are a Federal Government responsibility, therefore the State Government should request Federal action and support.

Recommendation

32. That the Minister for Transport request the Federal Government to encourage Australian vehicle manufacturers to consider producing cars with safety and ease of use options for older people, such as simplified controls and instrumentation and swivel seats.

Safer Vehicle Fronts for Pedestrians

In 1999 the Road Safety Committee Inquiry into the Incidence and Prevention of Pedestrian Accidents showed that 84% of Australian pedestrians were struck by the front of the vehicle and in 94% of cases the pedestrian was thrown over or to the side of the vehicle.697

The shape of the front of a vehicle and the vehicle speed at the moment of impact, greatly influence the extent to which the pedestrian is struck by the bumper bar, the front of the engine hood, the bonnet, windscreen, front roof pillars and roadway. Two thirds of pedestrian fatalities are from head injuries, with crash tests in Europe showing that under-bonnet structures and engine parts are a critical factor in the severity of head injuries.698

Pedestrians are extremely vulnerable in a crash and will always be more severely affected. Older pedestrians are particularly at risk due to their frailty, relative lack of mobility and in some cases impaired sight and hearing.

Creating safer vehicle fronts is a crucial factor in improving pedestrian safety.
Regulating Vehicle Design

The ECE of the United Nations, are in the process of developing a standard method to rate the safety of the front of vehicles in crashes with pedestrians. Once an international standard has been developed VicRoads state it will be considered for adoption in Australia as a Design Rule.699

The FCAI in their submission, state vehicle design regulations aimed at the protection of pedestrians do not exist anywhere in the world. They are opposed to a unique Australian ADR for such a purpose. The Federation says Australia is committed to harmonisation with ECE regulations.700

The RACV proposes that Australian vehicle standard regulators should examine the feasibility of pursuing a similar approach to the ECE, who are working on introducing a voluntary agreement with manufacturers to introduce, by 2005, front ends on all cars that are safer for pedestrians if a crash occurs.701

The RACV asserts 4WDs and vans need such a standard to improve their particularly hazardous front ends.702 The Committee notes the growing number of 4WDs on suburban roads, their impact on road safety, and supports the RACV view that 4WDs and vans should also satisfy frontal safety requirements for pedestrians.703

Dr Sparke of Holden cautioned about the proposed redesign of the front of passenger cars and the associated pedestrian dummy crash test procedures. He is of the view that:

- The impact velocity range from minor injuries to fatal injuries is so narrow that the design changes will provide some impact in the range but either side of it there will be no beneficial result.

- The proposed procedures comprise three separate tests dealing with the bumper bar (affecting lower leg injuries), the leading edge of the engine hood (leg and pelvis injuries) and the bonnet (head injuries). Because of the very serious long term consequences of brain injuries, vehicle redesign which reduces the risk of leg and hip injury by 10 per cent but increases head velocity by 10 per cent would be a disastrous outcome.704

The science of redesigning the front of passenger cars to reduce road trauma is in its infancy and its effectiveness is currently only assessed in a particular set of simulated crashes. While modifying the fronts of vehicles as a means of minimising pedestrian trauma in a crash is undoubtedly technically difficult, governments should continue to put pressure on vehicle manufacturers to address this important safety issue.
New Car Assessment Programs

Despite lack of government standards, pedestrian-impact standards developed in Europe are currently being used in the European (NCAP) and Australian New Car Assessment Programs (ANCAP). Test results have been publicised for approximately five years in Europe and for more than a year in Australia. It has been estimated that if all new vehicles in Europe met the rating of ‘Good’ in the NCAP tests, the pedestrian road toll could be reduced by 20% within three years.705

The Committee is concerned that in the latest Australian ANCAP crash tests for large Australian-model cars – Commodore, Falcon, Magna, Camry and Avalon – achieved only average performance for pedestrian protection.706

At the Mobility & Safety of Older People Conference, in Melbourne in August 2002, Dr Sparke cautioned that one of the unfortunate outcomes of such testing is it encourages vehicles to be designed to achieve the survival of young males, in one severe type of simulated crash. This encourages the use of stiffer restraint systems:

... and as a consequence older people in moderate speed crashes are going to be at increased risk of injury.707

Despite the technical difficulties and safety trade-offs, governments should continue to encourage vehicle manufacturers to improve the safety outcomes for occupants as well as other people involved in crashes.

Bullbars

Bullbars are fitted to approximately ten per cent of all passenger cars in Australia. In the event of a collision they are capable of being particularly harmful to pedestrians, especially older people. They are also a very serious hazard to vehicle occupants in side-impact crashes, a common crash type for older drivers.

Research on fatal crashes by the Australian Transport Safety Bureau (ATSB) published in 2000 shows that 90 people die annually in Australia from impact with the front of a vehicle equipped with a bullbar. Of these, 30 were pedestrians, 10 bicyclists and motorcyclists and 50 occupants of side impacted vehicles. In all likelihood these figures are underestimated because of incomplete identification of bullbars in the crash records.708

The Committee received many submissions on the issue of bullbars.709

Currently there is no national standard addressing bullbar design, though such a development is being considered.710 Bullbars are
regulated through individual state roadworthy requirements. The ATSB study found there was no conclusive basis for opposing the use of newer-style bullbars.\textsuperscript{711} These are typically smaller, use lighter materials, are connected to the vehicle differently and are compatible with air-bag deployment mechanisms.

The FCAI notes that properly designed bullbars provide real safety benefits to vehicle occupants if the vehicle collides with an animal, but inappropriately designed or fitted bullbars could interfere with the vehicle’s occupant protection systems and may invalidate compliance with occupant protection regulations.\textsuperscript{712} According to the Chamber:

\begin{quote}
The challenge is to provide compatible bullbars that are fit for purpose (i.e. protect the vehicle in the event of an animal strike) but are not aggressive to pedestrians and cyclists.\textsuperscript{713}
\end{quote}

In their submission the RACV state that in a majority of driving environments, bullbars cannot be shown to conclusively provide safety benefits to either vehicle occupants or other road users.\textsuperscript{714}

Further, they state:

\begin{quote}
While many argue their benefits while driving in rural areas, particularly off-road, it is generally agreed by vehicle safety experts that they possess little or no benefits for city driving. However, due to the difficulties of separating city and country driving, any ban on bull bars in the city is impractical and near impossible to regulate.\textsuperscript{715}
\end{quote}

However, the Ministerial Advisory Committee of Senior Victorians stated bullbars should be illegal, except for approved versions used in defined rural areas.\textsuperscript{716}

In a paper accompanying the Holden submission, Dr Sparke noted:

\begin{quote}
Bull Bars are a fashion accessory the community cannot afford, and banning their use in urban areas would remove a serious hazard to pedestrians and to other vehicle occupants.\textsuperscript{717}
\end{quote}

The Committee is concerned about the issue of aggressivity of vehicle design and its severe safety impact on older pedestrians and on older vehicle occupants. The Committee therefore proposes a publicity campaign to warn of the dangers of bullbars to other road users. Though the Committee recognises it may be difficult to implement, VicRoads should also investigate a permit scheme for the use of bullbars on vehicles registered in the Melbourne metropolitan area.
Recommendations

33. That a publicity campaign be conducted on the unnecessary fitment of bullbars and the appropriateness of fitting them on vehicles used solely in urban areas.

34. That VicRoads investigate a permit scheme for the use of bullbars on motor vehicles registered in the Melbourne metropolitan area.

Safer Public Transport Vehicles

Buses and Trams

Travel by bus is by far the safest form of motor vehicle travel. According to the submission from the Bus Association, a report released in 2001 by the ATSB on *Australian Bus Safety*, show the fatality rate for a passenger in a car is eight times higher than for bus passengers, and for injuries the rate of hospitalisation is 14 times higher.\(^7^{18}\)

Mr Kinnear, Director, Public Transport Planning, Department of Infrastructure (DOI), at a public hearing in June 2002, informed the Committee that the *Commonwealth Disability Discrimination Act 1992*, stipulates building and public transport access standards for people with disabilities are to be implemented over the long term.\(^7^{19}\) DOI, in their submission, advised that more than 450 low-floor buses were already in service as of mid-2002, with an additional 100 being added each year. Ninety-six low floor trams will also be operating by 2004.\(^7^{20}\)

The Bus Association of Victoria in their submission, stated that Victoria is leading Australia in the roll-out of accessible buses.\(^7^{21}\) The association also said that it was very conscious of the need to cater for the mobility requirements of older road users:

> Our vehicle fleet is one of the most visible examples of the changes already occurring in transport systems from this stimulus and we see the ageing of the population as a real opportunity for market growth in bus services.\(^7^{22}\)

One individual, V. Simpson, in their submission mentioned that some public transport vehicles were hard for older passengers to access.\(^7^{23}\) Claims were made that they also had safety deficiencies, commonly resulting in passengers falling over when trams or buses were moving or braking. Ms A. Gleeson, an individual in her submission, commented about a new model tram introduced by Yarra Trams in Melbourne. She stated that:
• Overhead hand-rails were needed in the front section of the tram for passengers to hang on to;

• People had fallen from the raised seat platform in the tram;

• The tram doors close on people who are slow in alighting;

• People had difficulty in finding/reaching the buzzer used to alert the driver that they wished to leave at the next tram stop; and

• Some new trams do not have the elderly/disability sticker giving older passengers priority over some of the front seats.\textsuperscript{724}

Dr. J. Hearn, a member of the Ministerial Advisory Council of the Ageing of senior Victorians, echoed these concerns in a public hearing.\textsuperscript{725}

The Committee concluded that modifications to the Victorian bus fleet to improve the accessibility for older patrons are well underway, but further improvements are needed for tram users. Of concern particularly are the latest model trams, which might have been expected to be more suitable for older passengers, but in fact appear to be less suitable for older passengers than the trams they are replacing.

Taxis

The report on \textit{Ageing and Transport: Mobility Needs and Safety Issues}, published in 2001 by the OECD describes two accessible or adapted taxi designs, including a large Swedish mini-van called ‘Taxi Rider’ which has a number of innovative features addressing the needs of wheelchair and other older or disabled users.\textsuperscript{726} The report also proposes taxis be designed to cater for older users using swivel seats and enabling wheelchair access.\textsuperscript{727} A number of specially adapted Melbourne taxis already have the latter capability, however the Committee observes that the service to older and disabled passengers could be improved.

The Committee also noted the submission from the Taxi and Tow Truck Directorate of the Department of Infrastructure made no mention of the suitability of taxi vehicles and services for older taxi users. In the long term a greater proportion of taxi customers are likely to be elderly and a higher proportion will require travel in more appropriately adapted vehicles. The Directorate should be monitoring taxi design, and ensuring the future Victorian taxi fleet is appropriately modified.
A number of innovations are occurring in small vehicle design which have implications, both positive and negative, for older road users.

The OECD report notes that one vehicle type is a public buggy – small electric vehicles currently used at large transport transfer points, for example ferrying passengers between airport terminals or circulating through large shopping or pedestrian areas. These vehicles are typically converted electric golf carts or small industrial vehicles.728

Buggy-based vehicles, both individually driven and for public passenger transportation, are likely to have an increasing role in transporting older people in specialised situations, some off-road and some on-road. Their use, however, may be hazardous for pedestrians.

Scootercars

A version of a buggy vehicle is the Scootercar. Originally introduced in The Netherlands it is now available in the USA, Denmark, Germany and Portugal. The vehicle has a polyester body with three wheels, two seats, a large luggage area, a 49 cc two stroke engine and a top speed of 45 km/h. The manufacturer claims this modern looking vehicle offers the comfort, ease and safety of a car for little more than the cost of a moped – the technology on which the vehicle is predominantly based.

As a result of the new European Union legislation, anyone over 16 years can drive this vehicle without a helmet or car driving licence. The primary use currently are fun trips for young adults in holiday areas and for the delivery of fast foods in towns. Other suggested uses include product promotions and trade exhibitions.729

At this early stage of development the vehicles have not been marketed to an older clientele or used as public or community transport vehicles, however the Committee sees a possible future role for such vehicles, or variants, in transporting older people in some local situations, probably 'off-road.' They might be self-driven or hired with a driver.

As with gophers, these buggy-type transport devices need careful consideration for their safety consequences, particularly for older pedestrians.

Growing Diversity of the Vehicle Fleet

One of the emerging trends on Australian roads is the growing size and diversity of the motor vehicle fleet. This has recently been recognised in the 2003 and 2004 Action Plan of the National Road Safety Strategy.730 The Committee notes with concern the adverse safety implications of this trend, recently raised publicly by Dr. I. Johnston, Director of MUARC.731
In addition to a size and incompatibility problem on roadways, expanding use of motorised mobility devices, buggy-like vehicles and yet to be developed variants, have the potential to create considerable safety problems on footpaths and shared pathways, in shopping malls and transportation terminuses.

While use of the devices may be of benefit to some older people, the fast movement of the devices in a congested pedestrian environment potentially poses a threat to the safety of other citizens, particularly the elderly. The Committee considers this situation will need to be carefully monitored and managed if the growing safety problem of vehicle size and performance diversity on roads is not to be exacerbated by incompatibility problems on footpaths, shared pathways and in pedestrian areas.

**Future Vehicle Technologies**

There are a number of currently available and emerging vehicle developments which have the potential to substantially improve the safety of older road users.\(^{732}\)

These are commonly referred to as Intelligent Transport Systems (ITS) and include systems that electronically control various driving functions or provide information to assist the driver.

Some systems, such as in-vehicle navigation, are already in use in Australia, while others are still at the concept stage. Compared with many earlier technological developments, progress in developing ITS systems has been extremely rapid and most of the currently envisaged devices will be available for use by even the earliest of the ‘baby-boomer’ generation, who are now in their late 50’s.

Several technologies could assist older drivers to avoid crashes. Professor Fildes, Professorial Fellow, MUARC, lists devices expected to improve safety for older road users as improved sensing systems; intelligent cruise control; enhanced visual image; route guidance systems; Intelematic speed control; and an emergency call unit.\(^{733}\) The submission by the RACV gives additional details about a number of prospective support systems for the older driver, especially those which warn of impending hazardous situations.\(^{734}\)

Of the systems currently becoming available in luxury models overseas, visual enhancement systems are the most likely to have the greatest benefit for older drivers. The systems use ultrasound or ultraviolet light to detect road conditions at night or in adverse weather conditions. The enhanced view is then usually projected onto the windscreen.\(^{735}\) The systems have the potential to free many older drivers from night-time ‘curfews’, either self-imposed or required by licensing authorities.
More research is needed before the potential value of particular ITS systems for older drivers can be determined. The Committee agrees with the concerns raised by the RACV that in-vehicle navigation assistance systems may result in less attention to driving conditions and become a distraction to the driving task.  

Research has already shown that some older drivers are unable to use these systems as efficiently as their younger counterparts, with older drivers looking more frequently and for longer periods at in-vehicle displays than younger drivers. The RACV, in their submission state:

> While ITS applications have the potential to be of great benefit to older road users, there is a great danger these technologies could have severe detrimental effects on the older driver. In particular, certain mental, physiological and psycho-motor deficiencies that occur due to ageing will create significant handicaps for older drivers and reduce their traffic safety, if their needs are not considered in the development of the technologies (Stamatiadis, 1994).

There is also the danger that older drivers may over-rely on particular systems to assist them to drive for longer than they should. It is critical that systems are tailored to the specific safety needs of older road users, and that human factor knowledge and principles are incorporated into the design, deployment and evaluation of these systems.  

The Australian Association of Occupational Therapists Victoria Inc. submission stated however, that audible and visual alarms and in-vehicle navigation systems would be beneficial, and that while ITS will add to complexity, once older people have adapted to the technology it could assist them to remain on the road longer. Similar comments were made by the School of Occupational Therapy, La Trobe University in their submission.

**The Safecar Project**

TAC, the Ford Motor Company of Australia and MUARC are undertaking the Safecar project, which aims to demonstrate and evaluate some of the latest available in-vehicle safety technologies.

Whilst each technology is currently being assessed independently, the SafeCar project is the first time a number of ITS systems have been combined in a vehicle. On-road trials in 15 specially-instrumented fleet vehicles are currently underway. It has been estimated that the technologies, in combination, have the potential to reduce road trauma by at least 30 per cent.

One of the first aims of the project include examining the acceptability of the various systems to drivers. While not specifically targeting older
drivers, this Victorian project does include elements which could be beneficial to the safety and mobility of older people. The Committee is supportive of its aims.

**Acceptability of ITS and Training of Older Road Users**

Product acceptability and effective training are essential if older road users are to purchase and gain benefit from ITS applications. The limited information available about the acceptance by older drivers of various ITS applications, concludes that learning performance and aptitude for learning decline with age, particularly when the information presented increases in complexity, or when the speed of presentation is beyond the control of the subject. For example, the RACV in their submission, state:

> If older drivers are to benefit from the introduction of ITS applications, then some attention should be paid to the method by which the use of those systems is taught to them.

Safecar researchers Regan et al, consider that the next cohort of older drivers, those currently in their 50’s and 60’s, will have had much more experience with technology and be less hesitant to use systems than the current cohort of older drivers. Other researchers have expressed a similar viewpoint.

The Committee concludes that some emerging ITS technologies may be able to assist older drivers, however, research with large numbers of older people of various capabilities are needed before this can be clearly determined.

**Summary of Findings**

- Older occupant safety can be improved by increasing the usage rate of seatbelts, better seat belt systems, greater use of airbags, improved head restraints, use of more modern passenger cars and improved vehicle compatibility.

- The safety benefits and issues related to the improved vehicle visibility with daytime running lamps need investigating.

- Older drivers need to be better informed about what constitutes vehicle safety.

- Australian vehicle manufacturers should be developing cars with options that meet the specific needs of older drivers and passengers.
• Reduction in harm to pedestrians struck by vehicles may be possible through the better design of the fronts of passenger vehicles.

• Bullbars represent an increased hazard to other road users. Their fitment on vehicles used predominantly in the metropolitan area is not justified.

• There is potential for innovative changes to motor vehicles, taxis and newly emerging transport conveyances to improve the future mobility and safety of older people, mindful of all the challenges to vehicles size and safety they pose.

• New technology is promising but any benefits to future older road users have yet to be clearly demonstrated.
Recommendations

29. That a publicity campaign, supported by enforcement, be developed to encourage older vehicle occupants to correctly wear seatbelts.

30. That VicRoads investigate all the issues associated with the possible safety benefits of daytime running lights.

31. That older people be encouraged through campaigns to purchase safer vehicles by:
   - Agencies producing and distributing brochures on safer vehicles that include information on side impact protection, seatbelts, airbags and head restraints; and
   - Encouraging ANCAP to develop publications focusing on the specific safety needs of older road users.

32. That the Minister for Transport request the Federal Government to encourage Australian vehicle manufacturers to consider producing cars with safety and ease of use options for older people, such as simplified controls and instrumentation and swivel seats.

33. That a publicity campaign be conducted on the unnecessary fitment of bullbars and the appropriateness of fitting them on vehicles used solely in urban areas.

34. That VicRoads investigate a permit scheme for the use of bullbars on motor vehicles registered in the Melbourne metropolitan area.

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Safer Roads

Conflicting Demands

At the *Mobility & Safety of Older People Conference* in Melbourne in August 2002, Mr. J. Langford, Manager, Road Safety Research, Department of Infrastructure, Environment and Resources, Tasmania said that there will always be some road users who pose an unacceptable risk, but with improved infrastructure strategies the risks and errors made by these high risk drivers could be lessened. He also said that it is unlikely that single features lead directly to many crashes; and more likely that a combination of features lead directly to crashes—particularly in a threatening, complex environment.¹

The Accident Research Centre, Monash University (MUARC) in their submission state:

The task of driving is becoming a greater challenge for all motorists and this challenge increases exponentially with age.²

Difficulties Reported by Older Drivers

Older drivers have reported numerous difficulties interacting with the road environment. A report by Fildes et al in 1994 found that:

… older Australian drivers and pedestrians complain about the lack of consideration given to their special needs in road signing, lighting conditions, merging lanes, pedestrian crossings and pavement surfaces.³

A 1992 American survey, quoted in the VicRoads submission, identified six issues: reading street signs; driving across an intersection; finding the beginning of a right-turn lane (in Australia); making a right-turn at an intersection (in Australia); following pavement markings; and responding to traffic signals.⁴
Factors Discovered from Crash Investigations

VicRoads in their submission, provided a summary of American crash patterns:

Older drivers tend to be involved in crashes occurring at below average speeds and in complex traffic situations when altering direction or entering traffic flow – particularly when attempting right angle left turns (equivalent to right turns in Australia), reversing and parking. It is likely that they are more frequently responsible for their accidents due to errors in perception, judgment, decision-making and reaction time. Older drivers were also found to be over-represented in crashes involving failure to yield, improper turning, disregarding traffic signals and red-light running.5

Complex intersections are difficult worldwide, for older drivers to navigate.6 Following an investigation of older driver crash patterns at 62 ‘blackspot’ sites in four jurisdictions in Australia and New Zealand, researchers for Austroads concluded that the single, most significant finding was that:

... crash-involved older drivers were unable to select safe gaps in conflicting traffic when making decisions at intersections.7

One of the conclusions from the blackspot investigations was that changes to road design standards and traffic signal practices, could reduce crashes where choosing safe gaps in the traffic stream is critical.8

Identifying Road Elements in Need of Modification

Road and traffic engineers need to be cognisant of older driver behavioural traits in order to understand why road elements might need to be modified to assist older drivers.

In 1999 Austroads commissioned MUARC to examine the applicability to Australasian roads of 90 recommendations identified by the United States, Federal Highways Administration (FHWA) Older Driver Highway Design Handbook published in 1998. The process involved:

1. A review of national and international literature dealing with problems confronting older drivers from current design specifications;

2. A review of the FHWA Handbook and its recommendations;

3. A discussion by an expert committee on the applicability of the American recommendations to Australasian conditions and
creation of a list of recommendations as a guide to possible future changes; and

4. A series of older driver blackspot crash site investigations by a multi-disciplinary research team.

The subsequent Austroads Older Driver Road Design Manual contains about 50 recommendations, categorised by the four broad traffic environments found by FHWA to be difficult for older drivers, namely: intersections; freeway interchanges; roadway curvature and passing zones; and highway construction zones.9 MUARC state that the Austroads manual:

... is not intended to replace existing road design guidelines and that these recommendations do not constitute a new standard of required practice. Rather, the manual is designed to provide practitioners with practical recommendations.

... when and where to apply recommendations remain at the discretion of the practitioner.10

MUARC suggest the recommendations might be applied where there is a history of older driver crashes or a high concentration of older residents.11 Training workshops are underway to promote the recommendations to ensure they receive maximum use by Australasian road designers.12

The Committee questions whether the Austroads older driver recommendations will be effectively translated into road design practice if not included in official road design standards and guidelines.

**Specific Measures to Improve Older Driver Safety**

The Committee heard suggestions on how specific infrastructure measures might improve older driver safety. Examples include:

- Dedicated right turn traffic lanes and traffic signals to reduce the safe gap selection problem;
- Raised channelisation to more clearly define vehicles paths and prevent wrong choice of traffic lane;
- Improved sign luminance to make signs easier to see;
- Better signing and markings at ‘give way’ or ‘stop’ sign locations;
- Longer sight distances at intersections, curves and the crests of hills;13
- Longer perception/reaction time assumptions used in road designs;
• Legibility of signs including size and fonts of letters;

• Delineation, guideposts, painted edge-lining;

• Construction zones, where changes to conditions might not be adequately conveyed to older drivers; and

• Roundabouts.  

From the evidence presented, the Committee selected five infrastructure actions which it considers likely to have the most significant safety benefits for older road users and where attention should be prioritised.

These were:

• Right turns at signalised intersections;

• Lower speed limits at hazardous intersections;

• Road and street signs;

• Perception/reaction times; and

• Road safety audits and safety reviews.

Right Turns at Signalised Intersections

The 1994 report by Fildes et al, Older Road User Crashes, showed that 66% of older Victorian driver casualty crashes occurred at intersections, 16% of which occurred where there were traffic signals. Older drivers were also found to be over-involved in crashes when turning right against opposing traffic, compared to younger drivers.  

The RACV recommended to the Committee that fully-controlled right turns at signalised intersections be installed. At present the standard traffic signalised treatment is a stop-go signal, with exclusive turn arrows being added if certain circumstances, such as crash history, warrant. At the public hearing the Committee held in May 2002, Dr K. Ogden General Manager, Public Policy of the Royal Automobile Club of Victoria (RACV) Ltd stated the default ought to be:

... a fully controlled right turn and there would have to be good reasons for not putting that in.  

However the RACV, in their submission, did note that:

Full right turn control often comes at the expense of reduced intersection capacity and this needs to be balanced against the incremental safety gain it may provide.
VicRoads are less supportive, suggesting fully-controlled signalised intersections be investigated. They note controlled right turns reduce the green time available to through vehicles and so may not be feasible at congested intersections.\(^{19}\)

The above situation is one example where the provision of increased safety to right turn movements adversely impacts the travel times of other motorists and pedestrians. Despite these potentially adverse effects on traffic flow, the Committee support the more widespread use of exclusive right turn arrow traffic signals at intersections.

**Lower Speed Limits at Hazardous Intersections**

Intersections are the most dangerous part of the road system for older drivers. A particular hazard is on heavily trafficked highways where drivers of all ages entering from a minor road have to choose safe gaps in approaching high-speed traffic. Older drivers may experience particular difficulties making wise choices and safely undertaking the turn. To add to the complexity, sometimes such intersections are located on curves, which makes it difficult to see oncoming traffic.

The Committee notes that VicRoads has undertaken a number of safety treatments at hazardous unsignalised rural intersections using both flashing yellow warning lights and a 10km/h lower speed limit in the immediate vicinity of the site. An example is the McDonalds Track intersection on the South Gippsland Highway north-west of Lang Lang township. The Committee sees a greater role for lower speed limits in the vicinity of particularly hazardous unsignalised intersections, where traffic signals would not be economically justified or might be counter-productive in terms of road safety.

At the *Mobility & Safety of Older People Conference*, Mr B. Corben Senior Research Fellow of MUARC, supported reduced speeds. He said that even at signalised intersections:

> … a large proportion of road trauma happens in signalised intersections, especially at high speed rates of 70 or 80 km/h or when somebody has failed to comply with the red signal resulting in high speed, high angle of impact and therefore a consequence of severe injury. So all of that trauma potential can be reduced quite markedly at those sorts of intersections if a lower speed limit is applied.\(^{20}\)

The Committee support lower speed limits at hazardous intersections.
Road Signs

Submissions received by the Committee raised a number of concerns about road signs such as:

- Signs needing to be bigger and brighter;\(^{21}\)
- Excessive or redundant signage should be removed;\(^{22}\)
- Drivers with mild dementia may be distracted by extraneous information, from road signs or billboards;\(^{23}\) and
- Often signs are put in the wrong place, obstructed by trees or overgrown vegetation.\(^{24}\)

Mr D. Anderson, Chief Executive, VicRoads said:

... for whatever reason we sometimes put signs in the wrong places – for example, they can get shielded by trees.\(^{25}\)

Concerns were also expressed about variation in the placement, size, colour of letters, and background colour of street name signs. There is a need for a standardised approach to street name signage throughout Victoria.

The Committee supports the introduction of larger and more visible letters and symbols on road signs. Growth of vegetation, affecting sign visibility also needs constant attention by VicRoads and local government.

Perception/Reaction Times

Current national road design applies a 2.5 second perception-reaction time when designing roads. Studies of driver reaction to stimuli have shown this to be the average reaction time, however the variance of the distribution is very high. The RACV state that it is generally accepted that reaction time is longer in older road users and increases with the complexity of the driving task. One overseas study found that perception/reaction time in older groups is about two seconds longer than in younger groups.\(^{26}\) Accordingly the RACV recommended to the Committee that:

Austroads should review the use of a 2.5 second perception-reaction time in road design, particularly at locations where the driving task is complex such as intersections.\(^{27}\)

The Committee support the use of this more conservative design parameter. It should apply not only to new construction, but also existing roads, especially at intersections. A modification may be to prohibit, or
prevent with additional infrastructure, a right turn at intersections where vision is obscured by the crest of a steep hill or a sharp curve.

Road Safety Audits and Safety Reviews

The purpose of a road safety audit is to examine a new project, by an independent expert, for a project’s crash potential and safety performance. VicRoads states:

The Austroads Road Safety Audit guide should be consulted when planning, designing and implementing road safety features and actions, and when considering those that particularly aid older road users.

The RACV, in their submission, note that a road safety audit at the design stage, has demonstrable benefits in improving safety. In their submission, they recommend to the Committee, that an audit be a compulsory practice on all projects where public funds are used.

According to VicRoads, the revised 2002 Austroads publication Road Safety Audit, recognises age-related decline in visual functions and the inability to negotiate complex on-road tasks. The publication recommends the use of fully-controlled right turns; adequate placement, size, maintenance and repetition of signs; and improved traffic engineering in high pedestrian areas, to help address these issues.

While in-depth safety audits of new projects are desirable they typically cover only one to two per cent of the total road network per annum. Many of the operational difficulties faced by older drivers are primarily due to system-wide ‘maintenance’ short-comings, such as overgrown vegetation obscuring signs, damaged or illegible signs, faded line pavement line-marking. Quality assured maintenance processes and safety reviews of existing roads are therefore needed on a regular basis, concentrating on sign and road delineation clarity and other issues particularly relevant to older road users.

Focusing on Key Safety Actions

There are many other road design and operational actions necessary to improve the safety for older road users, however the Committee agree priority ought to be given to the above five selected actions.
Recommendation

35. That the safety for older drivers, their passengers and other road users be improved through road design and operation improvements, by:

- Providing more fully-controlled right turns at signalised intersections;
- Further use of lower speed limits at hazardous intersections;
- Larger and more visible letters on road signs and standardised letters and colours for street names;
- Allowing for slower driver reaction times; and
- Conducting safety reviews of existing roads on a regular basis with particular emphasis on older road user needs.

The Road Design Process

New roads are designed for the expected travel demand at some future time or ‘design year’, typically 30 years ahead. There are extensive sets of standards and guidelines which assist road designers to create consistent and safe roadways.

One task of designers is to estimate what will be the number and performance characteristics of the vehicles travelling in the ‘design’ year. Assumptions about driver characteristics are also part of that process. An important consideration is the time it takes a driver to react when a hazard is observed on the road ahead. Another is the size of the gaps in traffic drivers need before they will enter or cross a road.

A driving population predominantly of people with slower reaction times and more conservative traffic gap selection characteristics, has slightly different infrastructure needs from those of a younger population. As the Victorian population ages there may be an increasing mismatch between road user capabilities and an infrastructure, designed and constructed in earlier times for a principally younger clientele.

The Future Traffic Environment

It is important to look at the context for travel in coming decades, especially for the Melbourne metropolitan and outer urban area where population growth pressures will be greatest.

Traffic congestion, the speed at which drivers choose to travel and the ability of the centrally co-ordinated signals system, which controls traffic
flows, are key factors that will determine the traffic environment facing future older Victorians.

Traffic Congestion to Increase

Increasing traffic congestion and associated driving stress was not mentioned in submissions and yet the federal Bureau of Transport Economics forecast a substantial increase in traffic volume in coming decades, especially for freight vehicles. The annual road congestion cost in Melbourne is forecast to treble from $2.7b in 1995 to $8b by 2015.33

Traffic volumes are continuing to increase on many metropolitan arterial roads. Even the concept of un-congested daylight ‘off peak’ hours is no longer relevant on some busy roads. Increased traffic congestion has serious long-term implications for the mobility of older people, a factor, so far, insufficiently recognised by government agencies and the wider community.

Speed Differences May Increase

As mentioned, Dr I. Johnston, Director, MUARC, has expressed concern about vehicle size diversity and its adverse safety effects on occupants of smaller vehicles in crashes.34 A similar concern may be warranted about a potential growing disparity in the speed distribution of the future vehicle fleet, primarily resulting from differences in the travel speed preferences of drivers, rather than the inherent speed capabilities of the vehicles they are driving.

If current trends continue, the future scenario will be a fast-paced, globally-competitive, just-in-time transport industry and associated workforce operating 24 hours a day seven days a week.35 In contrast, travelling on the same road network, will be the ever-increasing number of older people for whom journey speed and time reliability is of much lesser importance.

Research conducted thirty to forty years ago showed a relationship between divergence from mean (average) travelling speed and increased crash risk. Higher speeds resulted in greatly increased crash risks, but lower than mean speeds also increased crash risk, though to a lesser extent.36

The Committee acknowledges that this research is dated, and modern day traffic speed distributions may well be less dispersed than in earlier times. However, if there is a growing disparity in vehicle speeds due to the changing proportions and different speed desires of older and younger drivers, there may be an unanticipated increase in traffic hazards. Such a disparity also has important implications for smooth and efficient traffic flow.
The Co-ordinated Traffic Signal System

Traffic signals in Melbourne and Geelong are co-ordinated by a control system that synchronises signals to produce a ‘green light wave’ through successive intersections. This system functions well because it effectively assembles a number of vehicles at a red traffic signal and dispatches them as a group, commonly called a ‘platoon’. This then produces downstream gaps in the traffic stream after the platoon has passed enabling pedestrians to cross the road, vehicles to cross the road at minor intersections or vehicles to make right turns into side streets or property driveways.

Pedestrian crossings on arterial roads are controlled by traffic signals – rather than zebra crossings that interrupt the traffic flow – to preserve the movement of platoons of vehicles.

For those travelling along a major road and those wishing to cross or enter that road between signalised intersections, the safest and most efficient traffic flow is achieved with good platoon discipline. If some drivers travel too fast and others too slow the platoon disperses, thereby lessening the ‘gaps’ in the traffic stream and potentially leading to more hazardous situations, especially for older drivers and pedestrians. Encouraging groups of drivers to travel together at a common speed is thus beneficial for both safety and traffic efficiency in areas covered by co-ordinated traffic signals. Comments by Transport SA support changing the culture of driving from an individual approach to a co-operative one to ensure efficient traffic flow and fewer crashes. This concept deserves consideration.

Worsening traffic congestion, a potentially greater diversity of travel speeds and the availability of safe gaps in the traffic stream are factors likely to have a major impact on the safety of older road users in built-up areas. Road agencies need to be alert to the challenges posed by a continually changing traffic environment.

Strategic Approaches

At the Mobility & Safety of Older People Conference, Mr. J. Langford suggested that improving the road system for older users can be achieved on a number of levels:

- At a strategic level by road safety policies such as Sweden’s Vision Zero and the Netherlands’ Sustainable Safety approaches;
- At an intermediate level by national and state blackspot programs; and
- At a specific level by responses to particular incidents (for example fatal crash sites) or issues (such as older drivers; older pedestrians).
Sweden’s Vision Zero

The Vision Zero concept was first developed by Professor C. Tingvall and his colleagues at the Swedish National Road Administration (SNRA).\(^3^9\) According to MUARC it places absolute emphasis on the value of human life and suffering. Accepting that people make mistakes, the SNRA:

… argued for the need to radically change the current traffic system to achieve a zero road toll. They see the present road transport system as a global public health problem, claiming that compared to other man/machine systems, traffic systems around the world are underdeveloped.\(^4^0\)

While the ultimate aim is zero road fatalities, the approach accepts errors will be made and collisions will occur, so the strategy is to minimise the consequences of crashes.\(^4^1\) The Swedish Parliament has formally adopted Vision Zero as its road safety approach. Some other European governments have also adopted elements of the approach.

MUARC, in their submission describe a number of these policies adopted in the city of Trollättan, near Göteborg on the west coast of Sweden. Here many of the principles are being applied and evaluated. Examples include:

- Extensive use of barriers to divide undivided roads to reduce head-on collisions, and barriers on the sides of roads to minimise the effects of run-off-the-road crashes;
- Reduced speed limits to reduce impact energy in collisions;
- Extensive use of roundabouts to minimise crashes and their outcomes; and
- Local street design to enhance the safety of pedestrians and other vulnerable road users and change the priority from vehicles to public transport and pedestrians.\(^4^2\)

MUARC state that:

The use of Vision Zero thinking and solutions especially in relation to vulnerable road users will become critical in addressing the problems associated with an ageing society.\(^4^3\)
and recommended to the Committee that:

Some of the road and engineering strategies coming from the Vision Zero philosophy could be examined to examine how they may be applied in heavy pedestrian areas to enhance the safety of older people.44

The potential role of Vision Zero in achieving the national road safety strategy targets for 2010 was the topic of a paper by Professor Fildes, Professorial Fellow, MUARC, at a national road safety conference in Melbourne in November 2001. He said that the implications of Vision Zero are profound and represent an enormous challenge to the designers of the road transport system. The benefits to society however, far outweigh the challenges.45

For several years the Australian Automobile Association has also publicly advocated a role for the Vision Zero approach in Australia.46

The Committee is supportive of the general philosophy of Vision Zero and noted it wasn’t acknowledged in submissions by key road safety agencies. It also commends Stonnington Council for its innovation in adopting a road safety strategy based on the Vision Zero concept.47

Netherlands Sustainable Safety Approach

In the Netherlands in 2001, the then Committee heard from representatives of the national Institute for Road Safety Research, known as SWOV. They discussed the concept of Sustainable Safe Road Transport Systems (SSRTS), a policy developed in the 1990s and currently being implemented across the country.

The main aim of SSRTS is to provide a functional, homogenous and predictable road network so that the public will instantly recognise the required behaviour for each and every road. There are three categories of road, each designed according to its function:

- Freeways and major highways to cater for major traffic flows;
- Other arterial roads to provide a traffic distribution function within a district; and
- Residential and local streets to provide access to properties.

From the vulnerable road user perspective, it means that certain vehicles would not enter roads that have an access function and, if they did, the vulnerable road user would have priority.48

The Committee was told that research was being conducted to:
• Investigate the extent to which a sustainable safe traffic environment fits the strengths and weaknesses of older road users; and

• Which Intelligent Transport Systems (ITS) can contribute positively towards the harmony between traffic environment and elderly road users.49

Future Victorian Road Safety Strategies

In the Road Safety Committee report *Walking Safely*, 1999, the Committee recommended the development of urban design guidelines using, among other approaches, the philosophies found in the Dutch and Swedish sustainable road safety principles.50 While this was supported by the Government and the need for urban design guidelines accepted, the Committee notes their principles and safety concepts do not appear in Victoria’s road safety strategy *Arrive Alive*.51

The Committee considers further road safety gains could be achieved in Victoria by adopting some of the strategies used in Sweden and the Netherlands, or an amalgam. Long term issues such as the safety of older road users require a longer term program than the five year *Arrive Alive* action plan.

The Committee therefore propose that the Government conduct an inquiry into long term strategic road safety issues to determine whether some significant policy framework shifts might be desirable to guide medium term road safety action plans. Such an inquiry should consider the philosophical approaches and policy development processes adopted, or under consideration, in comparable interstate and overseas jurisdictions. The respective roles of various organisations and coordination mechanisms might also be considered, together with the road safety strategy development process. The Road Safety Committee would welcome the opportunity to conduct such an inquiry.

**Recommendation**

36. That the Government conduct an inquiry into the most appropriate way of developing long term road safety strategies, such as the Vision Zero and Sustainable Safety concepts.

**Land Use Planning**

Land use planning for an ageing Victorian population is an important long-term mobility and safety issue and yet it does not appear high on the agenda of land use planning organisations.52

In June 2002 representatives of the Department of Infrastructure (DOI) provided the Committee with an overview of the issues and how they
were being addressed. This included a briefing on a blueprint for the future of metropolitan Melbourne as it grows by an estimated one million people over the next three decades. *Melbourne 2030 – Planning for Sustainable Growth* was released as a draft in October 2002.

Despite the large future growth of the older age groups being well documented by the Australian Bureau of Statistics and others, *Melbourne 2030* makes no mention of this ageing population and its implications for land use planning and transport services. The document did however note that:

> The design of many newer subdivisions locates neighbourhood facilities such as local shopping centres and community facilities beyond convenient walking distance.

The only initiative in *Melbourne 2030* relevant to older people was to implement a walking action plan that includes provision for footpath-bound vehicles such as wheelchairs, prams and scooters.

As people age they generally change their travel patterns to reduce the distance necessary to access services. The submission by VicRoads states that good land use planning minimises the need for pedestrians to cross roads and provides space for pedestrian facilities, such as medians, refuges, footpaths or other pedestrian facilities. The volume, type, location and behaviour of traffic are also influenced by roadside development. VicRoads also consider land use planning proposals should be audited for factors that affect the safety of older road users as well as all road users.

### Arterial Road Layout and Sub-divisional Design

Arterial road layout can impact on the level of road safety. A well designed system will limit road access to signalised intersections, or prevent hazardous turns via medians or other means.

Some past residential sub-divisional designs have created circuitous road patterns and cul-de-sacs, to overcome the problems of traffic attempting to travel through residential areas to bypass congestion on arterial roads. While such designs have been successful in achieving this environment and safety objective, they have made walking and public transport routes much longer, thereby disregarding the mobility needs of residents. The elderly are particularly effected.

DOI said new sub-divisional design guidelines will be developed which support walking and public transport.

Planners also need to focus on the safety of entrances and exits from retirement villages and new residential estates to high speed arterial roads, where older drivers can have particular difficulties adapting to the sudden change in speed environment.
Local Shopping Services

For older people even walking a few hundred metres can be a major difficulty. There is a need to ensure essential day-to-day services and amenities can be accessed easily. The return of the traditional corner milk-bar/general store is unlikely, but planning schemes may need to allow the sale of some goods from properties in residential zones.

In their submission, the RACV recommended to the Committee that the Government ensure, through planning provisions, that the neighbourhood structure provide for services catering for older people to be located within local communities.60

Mrs Ash, in an individual submission, supported the need for municipalities to ensure, when approving plans for new developments, such as retirement villages, that people do not have to use their cars to buy necessities or walk great distances.61

Shopping Environments and Transport Interchanges

Shopping environments need to better cater for older people. Examples include ramps as well as stairs, room for people with walking frames or mobility scooters, resting areas, protection from adverse weather, good lighting and a sense of security. Also needed are drop-off and pick-up areas for frail older people and in some centres mobility device battery charging facilities.62

Similarly transport interchanges need to be designed for a growing clientele of older travellers, with distances required to walk between modes as short as possible.

One program being implemented across Victoria, by the Department of Sustainability and the Environment, is Pride of Place, an urban design program to improve the safety and amenity of public places, especially for pedestrians.63 Seventy per cent of the $9m spent on 161 projects in the first three years of the program was in rural and regional Victoria, with examples including $40,000 for a strategic transport plan for Warragul and $100,000 for streetscape improvements in Kyabram.64

Guidelines for Developers

During the course of the Rural Road Safety and Infrastructure Inquiry, the Committee heard of the development of a draft Roads Safety and Land User Guide entitled Safer Urban Environments.65 While not specifically aimed at older road users the Guide adequately covers many of the road safety aspects they face.
Recommendation

37. That land use planning by the Department of Sustainability and the Environment and all municipalities take greater account of the needs of an ageing population by such measures as:

- Improving arterial road layout and residential subdivisional design;
- Encouraging services and amenities to be provided closer to where older residents live, including those in retirement villages; and
- Making it easier for older people to shop and change modes of transport.

Summary of Findings

- Current road design practices rarely take into account the specific needs of older road users. As the number and proportion of such users increases in coming years the road system needs to be adapted to their needs.
- Regular quality assured maintenance and road safety audits and reviews are needed. Examples include ensuring easily-readable signs and pavement markings.
- While many of the planning changes necessary to improve the safety and mobility of future older road users have been identified in research literature, it has not been translated into policy by Victorian organisations.
- Strategic road safety policy approaches such as Sweden’s Vision Zero and The Netherlands’ Sustainable Safe Road Transport Systems deserve further consideration in Victoria.
- While a large number of changes to road design practices have been identified, which would potentially improve the safety of older road users, a focus on selected key actions especially at intersections, may be the best approach.
Recommendations

35. That the safety for older drivers, their passengers and other road users be improved through road design and operation improvements, by:
   
   - Providing more fully-controlled right turns at signalised intersections;
   
   - Further use of lower speed limits at hazardous intersections;
   
   - Larger and more visible letters on road signs and standardised letters and colours for street names;
   
   - Allowing for slower driver reaction times; and
   
   - Conducting safety reviews of existing roads on a regular basis with particular emphasis on older road user needs.

36. That the Government conduct an inquiry into the most appropriate way of developing long term road safety strategies, such as the Vision Zero and Sustainable Safety concepts.

37. That land use planning by the Department of Sustainability and the Environment and all municipalities take greater account of the needs of an ageing population by such measures as:
   
   - Improving arterial road layout and residential sub-divisional design;
   
   - Encouraging services and amenities to be provided closer to where older residents live, including those in retirement villages; and
   
   - Making it easier for older people to shop and change modes of transport.

Endnotes


2 Accident Research Centre, Monash University (MUARC), Submission to the Inquiry, March 2002, p. 50.


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6 ibid.

7 ibid., p. 96; and Mr J. Langford, 'Infrastructure', op. cit., pp. 119.

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30 RACV, Submission, op. cit., p. 79.

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37 Department of Transport, Urban Planning and the Arts, South Australia, Submission to the Inquiry, April 2002, p. 31.


39 MUARC, Submission, op. cit., p. 61.

40 ibid.

41 ibid., p. 62.

42 ibid., p. 63.

43 ibid., p. 65.

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52 The OECD Report devotes an entire chapter to the subject, the Discussion Paper posed four questions (Q. 68-71), pp. 43-45.


56 ibid., pp. 158-159.

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59 Mr G. Anson, op. cit., p. 45.

60 RACV, Submission, op. cit., p. 88.

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62 Mr D. Isted, Submission to the Inquiry, 1 March 2002, pp. 4-6.


Safer Pedestrian and Cycling Facilities

Introduction

As discussed earlier in the report, older pedestrians are one of the highest risk road user groups.¹

Pedestrian safety was comprehensively covered in the 1999 Road Safety Committee report of the Inquiry into the Incidence and Prevention of Pedestrian Accidents, however no recommendations specifically addressing older pedestrian issues were included.²

While few submissions addressed infrastructure requirements for cyclists, measures to assist older pedestrians would also benefit older cyclists.

Many of the physical and cognitive difficulties faced by older drivers also apply to pedestrians, such as arthritic problems that make it difficult to walk, or look over their shoulder, poor eyesight, or an inability to detect the speed of oncoming traffic. To compound the health problems, pedestrians encounter infrastructure difficulties such as narrow footpaths, high kerbs, uneven road and footpath surfaces and short crossing times at signalized pedestrian crossings or intersections.³

Research suggests that older pedestrians may have different visual search patterns to younger pedestrians and tend to spend a greater amount of time looking down in order to better place their feet to avoid falls.⁴ Improving the quality of footpaths and road-crossing surfaces is therefore an important aid to pedestrian safety and mobility.

In looking at the various initiatives to assist older pedestrian safety the Committee specifically focused on the general speed environment of the road system, facilities to enable pedestrians to cross roads and roundabouts.
Lowering the General Speed Environment

The Transport Accident Commission (TAC) state in their submission:

One of the most effective ways of reducing pedestrian trauma across all age groups is to reduce vehicles travel speeds at locations that pedestrians frequent.\(^5\)

The benefits are twofold: fewer collisions are likely to occur; and the impact speed and injury outcomes will be less severe. To illustrate the point, TAC refer to the results of research by the Road Accident Research Unit at the University of Adelaide findings that a 5km/h reduction in average travel speeds in built-up areas will reduce pedestrian fatalities by about 30%.\(^6\)

On 22 January 2001 the default urban speed limit in Victoria was reduced from 60 km/h to 50 km/h.\(^7\) A subsequent study by the Accident Research Centre, Monash University (MUARC) has shown that crashes have reduced in local residential streets, with pedestrians being the main beneficiaries:

Statistically significant estimated crash reductions in 50 km/h zones, relative to changes observed in similar crash groups in all other speed zones, were:

- 12% reduction in all casualty crashes;
- 40% reduction in death and serious injury for pedestrian involved crashes; and
- 19% reduction in all casualty crashes involving younger drivers.\(^8\)

Travel speed surveys show reductions in the mean speed and indicate 85 per cent of vehicles now travel between two and three km/h slower.

Speed Limits on Arterial Roads

While the local street speed limit reduction has been beneficial, most pedestrian casualties occur on arterial roads. The emphasis should now be on lowering speeds on sections of arterial roads in built-up areas which have a history of pedestrian casualties or, are clearly hazardous for pedestrians. While increased enforcement and some engineering measures can assist in moderating vehicle speeds, a lowering of speed limits is a quick, cheap and effective measure.

In the *Rural Road Safety and Infrastructure Inquiry* in early 2002 this Committee recommended:
That, if requested by the local municipality, VicRoads should reduce speed limits on Main Roads in areas of pedestrian activity in rural townships.9

The Government Response supported the recommendation in part and said that VicRoads would review their policy in conjunction with local government and Victoria Police.10 The Committee is unaware whether this is occurring. Requests by local government to alter speed limits on arterial roads to better protect older pedestrians, should be given priority.

The Committee is aware VicRoads has now commenced two pilot programs of:

- Time-variable 40 km/h speed limits in 14 Melbourne shopping centres; and
- 50 km/h signed speed limits in 60 rural and outer metropolitan town centres.11

In New South Wales, lower speed limits on arterial roads in country towns are becoming more common, with town-wide speed limits of 50 km/h in sizable towns like Parkes, Forbes and Armidale. These limits even apply to the National Highways and exist from the outskirts of the town, not just in the main shopping street. In many cases the lower limits have been accompanied by street modifications and beautifications to emphasise a slower speed environment.

The Committee supports a reduction in vehicle speeds on arterial roads where a history of pedestrian crashes exists, or a safety review reveals a likely hazard. This may involve variable or permanent lower speed zones, the latter preferably, accompanied by streetscape modifications to emphasise a lower speed environment.

The Committee did however note the possibility for confusion, especially for older drivers, if there are numerous changes of speed limit along a road. Changes should be clearly signed, preferably with repeater signs.

Local Residential Speed Zones

As discussed the default speed limit reduction to 50 km/h in built-up areas in Victoria has been effective, but there are still some residential, commercial and industrial areas where this limit is still too high. This applies particularly to older areas of the inner suburbs of Melbourne where:

- Road reservations between property boundaries are narrow (often only 10 metres wide);
Many buildings are built right up to property boundaries thereby severely restricting sight distance at intersections; and

Parked cars obscure pedestrians about to cross the road.

A way of solving the dangers is through local residential speed zones which typically have 40 km/h speed limits, with appropriate signage erected on the zone boundaries. Sometimes road humps have also been used.

MUARC, in their submission, note that pedestrian-priority residential areas have been introduced in many countries. However there appears to be a resistance to their widespread use in Victoria. The Committee considers there is scope for more zone-based speed limits in appropriate areas, especially where there is a high proportion of older pedestrians.

Strip Shopping Streets and other Highly Pedestrianised Locations

The lowering of speed limits in strip shopping streets featured prominently in submissions and at hearings. The City of Darebin Integrated Travel Plan included a reduction in speed limits in High Street, Preston. The Royal Australasian College of Surgeons proposes 40 km/h speed zones for areas of high pedestrian activity. The Ministerial Advisory Council of Senior Victorians suggests a 30 km/h limit in areas of high pedestrian activity.

VicRoads stated in their submission, that in areas such as shopping centres with high numbers of pedestrians, parking and trams, it is generally not possible to travel at high speeds. However, a certain times, when there is a break in the traffic or in off-peak periods, it is possible to travel faster. VicRoads suggest that speed limits could be reduced in such areas to 40 or 50 km/h or less, either permanently or on a part-time basis using electronic variable speed signs.

The TAC recommended to the Committee that speed limits along main roads at shopping centres, should be reduced from 60 km/h to at least 50 km/h. It added that it may be appropriate to apply engineering measures such as ‘gateways’ and pavement treatments to signify to the passing motorist that pedestrian activity is high and that speeds should be reduced.

Victoria Police were more cautious, questioning the use of variable speed limits in areas of high pedestrian traffic, preferring to wait for the results of the evaluation of their use in school precincts.

MUARC in their submission, point out that environmental beautification has also contributed to pedestrian safety overseas, with innovative designs of footpaths and landscaped gardens. However, this practice is not common in Victoria.
The Committee supports the introduction of either permanent or variable lower speed zones in strip shopping streets and locations with a high concentration of older pedestrians.

Traffic calming measures, such as narrowing roads, kerb extensions and widening footpaths should also be used to create a safer and more welcoming environment for pedestrians.

**Recommendation**

38. That in order to reduce older pedestrian fatalities and injuries, the general road speed environment in built-up areas be lowered by:

- Reducing vehicle speeds on those arterial roads where there has been a history of pedestrian crashes or the environment has been identified as hazardous to pedestrians;
- Increasing the use of lower residential area speed zones in the more densely developed areas;
- Introducing lower permanent or variable speed zones in strip shopping streets and locations with a high concentration of older pedestrians; and
- Implementing traffic calming measures in areas of high pedestrian activity.

**Crossing the Road**

The analysis by MUARC of crashes between 1990 and 1992 showed older pedestrian casualty crashes in Victoria were equally divided between those at intersections and those mid-block, that is between intersections.\(^{19}\)

More recent Australian data of older pedestrian fatalities for the years 1996 to 1999 shows however, that:

- 75% of fatalities occur mid-block; and
- 20% of fatalities occurred when crossing roads at signalised intersections, or at signalised or unsignalised pedestrian crossings.\(^{20}\)

There are therefore different intersection/mid-block patterns for these two types of pedestrian crashes.
Upgrading Traffic Signal Technology

Two types of signalised pedestrian crossings are being trialled in Victoria:

- Pelican (PEdestrian Liight CONtrol) crossings – which are a combination of a zebra crossing and a pedestrian operated signal; and

- Puffin (Pedestrian User Friendly INtelligent) crossings – which use infra-red and microwave detectors to lengthen or shorten the pedestrian ‘green’ time depending on how quickly the pedestrian crosses the road. Detectors can also be used to detect the presence of a pedestrian waiting at the kerbside, as well as cancelling the green time if the pedestrian changes their mind about crossing at the lights. Different types and configurations of detector are being trialled.

The Royal Automobile Club of Victoria (RACV) Ltd consider that, for Puffin crossings:

Drivers benefit through reduced delays, while pedestrians benefit by having as much time as they need to cross the road while always being protected by a red light facing motorists.

VicRoads support the wider use of Puffin treatments where there are higher concentrations of pedestrians, particularly older pedestrians.

Victoria Police take the view that further research must be undertaken before Puffin signals could be justified. The MS Society support Puffin signals but don’t believe Pelican signals are as beneficial for people with multiple sclerosis. The RACV recommended to the Committee that:

VicRoads should undertake further improvements to the operation of Pelican and Puffin crossings, evaluate their effectiveness, and implement if they are found to be cost effective.

The Committee supports improving existing pedestrian signals by adding Puffin technology where appropriate.

Modifying Existing Pedestrian Crossings

Measures that can improve the usability and safety of existing zebra or signalised pedestrian crossings include modifying the crossing itself or the associated signs and signals. The Road Safety Committee’s Discussion Paper and submissions received suggest lower speed limits in the vicinity of pedestrian crossings identical to those near school crossings.
In a number of municipalities the surface of some pedestrian crossings and intersection crosswalks have been painted yellow to improve visibility for motorists.\textsuperscript{28} This has sometimes been supplemented by barriers to encourage people to use the crossing.

The RACV recommended to the Committee that traffic signal modifications such as:

- The re-introduction of the green ‘walk’ phase and extending the ‘walk’ times at intersections;
- Audible signals to assist vision impaired pedestrians; and
- Adopting a standard walking speed of 1.0 metres/second, rather than the existing 1.2 m/sec.\textsuperscript{29}

VicRoads state that, while extending green times for pedestrians would give slower pedestrians more time to cross, it would reduce the green time for motorists. Signal times need to be reviewed on a site-by-site basis to identify where pedestrian times could be extended without causing unacceptable vehicle delays.\textsuperscript{30}

According to VicRoads, an Austroads study has found that reduced signal cycle times during off-peak periods improved pedestrian compliance by reducing the time between low-risk crossing periods, and reduced high-risk crossings by up to 30%.\textsuperscript{31}

The Committee support modifying existing pedestrian crossings by painting surfaces, installing barriers, adjusting signal times and enhancing signal features.

**Pedestrian Refuges and Painted Median Strips**

Pedestrian crashes most often occur on undivided secondary arterial roads.\textsuperscript{32} Such roads are typically wide enough for two traffic lanes in each direction, but are often effectively one lane in each direction due to parked cars.

It can be a complex task for older pedestrians to select safe gaps in two directions, as well as coping with possibly reduced sight distance due to parked cars. The introduction of a continuous central median strip or isolated pedestrian refuges (traffic islands) can reduce the distance to be crossed and let pedestrians concentrate on crossing one direction of traffic at a time.

Where raised medians are not possible, such as where there are tram lines, a number of Melbourne municipalities involved in the new WalkSafe program have used painted medians between the inner tram lines, supplemented by ‘cats-eye’ pavement reflectors. The painted medians keep traffic away from the centre of the road, providing pedestrians with a better view and allowing them to better stage their
crossing. VicRoads note that research has shown that drivers slow down at the painted treatments.\textsuperscript{33}

The RACV recommended to the Committee that the VicRoads guidelines for pedestrian refuges be reviewed to ensure refuges are provided where needed.\textsuperscript{34} The Committee supports increasing the number of pedestrian refuges and painted median strip treatments.

Another issue the Committee identified are left turn slip lanes which pedestrians need to cross at some intersections to access the buttons to activate traffic lights to cross the main road. At the very minimum zebra crossings are needed to give older pedestrians assurance of priority over left-turning vehicles.

**Kerb Extensions**

Kerb extensions are another means of narrowing a road to reduce the distance a pedestrian has to cross. They can also prevent illegal parking which may obscure pedestrians from the view of approaching motorists. The extensions may be placed at pedestrian crossings or where pedestrians typically cross a road, such as at an intersection.

**Recommendation**

39. That in order to improve the safety for older pedestrians crossing a road, VicRoads and Local Government:

- Upgrade pedestrian traffic signals using Puffin technology, where required;
- Modify existing pedestrian crossings and their signal settings; and
- Provide more pedestrian refuges, painted median strips and kerb extensions.

**Roundabouts**

When the Australian Road Rules were introduced in Victoria in 1999 the rules about priority at roundabouts were revised. Pedestrians no longer had legal right of way over turning motorists.

Objecting to this rule, Vision Australia Foundation, advocated pedestrians be given priority in all situations, that is, at both intersections and roundabouts.\textsuperscript{35} The Committee notes this issue is one of the national road rules worth re-consideration, especially in the context of the possible confusion of older road users.\textsuperscript{36} This rule may cause confusion especially with older pedestrians because it is in direct contrast to the general ‘give way’ rule.
VicRoads also recognise that roundabouts can be hard for any pedestrian to negotiate, because it is often difficult to recognise whether a vehicle is going to exit at the road they wish to cross, or at another leg of the roundabout.\textsuperscript{37}

To add to the possible confusion, some municipalities have installed traffic islands to assist right turning vehicles at local street intersections. Though to some road users they might appear to be roundabouts, they are not. Such practices need to be reviewed and if the treatment is retained then distinctive signage should be installed.

Victoria Police state there is a significant risk of collision between pedestrians and vehicles the closer pedestrian crossings are to roundabouts. They state that the pedestrian crossing relocation strategy, implemented some years ago, has reduced the risk of pedestrians being struck. However, this has been at the expense of making pedestrians walk away from the most direct route across roadways to a crossing some distance, typically 20 to 30 metres from the roundabout.\textsuperscript{38}

The RACV, in their submission, recommended to the Committee that the needs of pedestrians should be accommodated at roundabouts and that existing roundabouts, with a history of pedestrian crashes, be fitted with refuges or other appropriate crossing treatments.\textsuperscript{39}

The Committee supports providing a safer environment for pedestrians needing to cross roads at, or near, roundabouts. VicRoads should investigate how this might best be done.

**Recommendation**

40. That VicRoads review the safety needs of older pedestrians wanting to cross at, or near, roundabouts.

**Cycling Infrastructure**

A submission from Mr M. Yeates, Convenor of Bicycle Federation of Australia, Cyclist Urban Speed Limit Task Force, commented on the dominance of the motor vehicle and that, with road infrastructure being designed for motorists, cyclists' safety is threatened.\textsuperscript{40} In addition, the lack of cycling infrastructure such as dedicated bicycle lanes, may result in less people opting to cycle than would otherwise be the case if the infrastructure was comprehensive and developed.

For instance, the Organisation for Economic Co-operation and Development (OECD) in their report, *Aging and Transport: Mobility Needs and Safety Issues*, quote a Danish study that found crash risk of cyclists was reduced by 25-60\% on rural roads with separated bicycle lanes.\textsuperscript{41} Cycle lanes however, tend to cross roads at various points and this interaction with vehicles puts them at increased risk of a crash.\textsuperscript{42}
Transport South Australia stated in their submission, that one strategy to improve cycle safety is through the provision of a bicycle lane between the through and left turn lanes and also noted that:

In both Europe and North America, investigations into bicycle lane installations have shown that where a contrasting coloured surface compared to the motorised vehicle lanes is used in bicycle lanes, there has been a reduction in crash rates for cyclists.43

The OECD report recommended that research be conducted to identify the infrastructure changes that are required to better protect cyclists without impairing the mobility of other road users.44

### Suitable Paths for All

Older pedestrians, cyclists and users of mobility devices all have different needs for paths and ramps. Sometimes they can best be provided separately, but in other cases shared facilities are necessary.

The Committee met with Mr I. Napier, Secretary of the Pedestrian Council of Australia in Sydney, who spoke about the advantages and disadvantages of shared pedestrian and cycling facilities and of the growing diversity of users of paths, ranging from pedestrians, electric wheelchairs and mobility scooters, to cyclists.

He told the Committee of a new form of pedestrian mobility aid recently introduced on American footpaths which can potentially travel at three, four or five times walking speed. Such devices, and future variations, will add to the diversity of users of paths. New paths may be needed for mobility scooters and these new faster mobility devices.45

There is a growing network of off-road paths and on-road bicycle lanes in Victoria. However, one concern with the introduction of these bicycle lanes on roads, is the variety of painted lines and road markings that may confuse motorists as to their obligation to give way to cyclists. The Committee is unaware of any education campaign to inform the driving public.

Vision Australia also recommended to the Committee that motorised scooters be legally allowed to use dedicated bicycle paths and lanes. This issue deserves further attention.46

On-going maintenance is essential to ensure paths and ramps are adequate. Not to be overlooked is the difficulty blind or severely visually impaired pedestrians have when trying to determine they are at the edge of a roadway. A concrete lip at the edge of the road or the installation of hazard tactile tiles is essential for white cane users.47 At such locations the need for smooth gently sloping surfaces for wheelchair users, and the need of the visually impaired to detect a
change in walking environments can conflict. Municipalities need to give close attention to such situations.

Recommendation

41. That municipalities take greater account of the needs of an ageing population by providing suitable paths and ramps for pedestrians, cyclists and users of motorised mobility aids.

Summary of Findings

- A range of infrastructure improvements may improve the safety of older pedestrians. A reduction in general traffic speeds, upgrading technology, adjusting traffic signal settings and improving the visibility of crosswalks are just a few examples.
- Improved paths and ramps for pedestrians, cyclists and users of an ever-growing diversity of pedestrian mobility devices, are needed.

Recommendations

38. That in order to reduce older pedestrian fatalities and injuries, the general road speed environment in built-up areas be lowered by:

- Reducing vehicle speeds on those arterial roads where there has been a history of pedestrian crashes or the environment has been identified as hazardous to pedestrians;
- Increasing the use of lower residential area speed zones in the more densely developed areas;
- Introducing lower permanent or variable speed zones in strip shopping streets and locations with a high concentration of older pedestrians; and
- Implementing traffic calming measures in areas of high pedestrian activity.
39. That in order to improve the safety for older pedestrians crossing a road, VicRoads and Local Government:

- Upgrade pedestrian traffic signals using Puffin technology, where required;
- Modify existing pedestrian crossings and their signal settings; and
- Provide more pedestrian refuges, painted median strips and kerb extensions.

40. That VicRoads review the safety needs of older pedestrians wanting to cross at, or near, roundabouts.

41. That municipalities take greater account of the needs of an ageing population by providing suitable paths and ramps for pedestrians, cyclists and users of motorised mobility aids.

Endnotes

1 VicRoads, Submission to the Inquiry, April 2002, p. 72.


4 Royal Automobile Club of Victoria (RACV), Submission to the Inquiry, March 2002, p. 83.

5 Transport Accident Commission (TAC), Submission to the Inquiry, April 2002, p. 10.

6 ibid.


8 Newstead S, Hoareau E, and Cameron, M, Evaluation of 50 km/h speed limits in Victoria - Summary of interim analysis of all crashes and crashes involving pedestrians, MUARC, March 2002.

9 Parliament of Victoria, Road Safety Committee, Inquiry into Rural Road Safety and Infrastructure, March 2002, p. 84.


12 Accident Research Centre, Monash University, (MUARC), Submission to the Inquiry, March 2002 p. 52.
13 City of Darebin, Submission to the Inquiry, 5 March 2002, p. 2; Royal Australasian College of Surgeons, Submission to the Inquiry, 8 March 2002, p. 2.


16 TAC, Submission, op. cit., p. 10.


18 MUARC, Submission, op. cit., p. 52.


20 Australian Transport Safety Bureau (ATSB), Commonwealth Department of Transport and Regional Development, Older Pedestrians, Monogram 13, December 2002, pp. 3-4.


22 RACV, Submission, op. cit., p. 84.

23 VicRoads, Submission, op. cit., p. 98.

24 Victoria Police, op. cit., p. 7.


26 RACV, Submission, op. cit., p. 84.


28 VicRoads, Submission, op. cit., p. 77.

29 RACV, Submission, op. cit., p. 85.

30 VicRoads, Submission, op. cit., p. 98.

31 ibid.

32 RACV, Submission, op. cit., p. 86.

33 VicRoads, Submission, op. cit., p. 76.

34 RACV, Submission, op. cit., p. 86.


37 VicRoads, Submission, op. cit., p. 99.

38 Victoria Police, op. cit., p. 9.

39 RACV, Submission, op. cit., p. 87.


42 ibid.


44 OECD, op. cit., p. 62.


47 ibid., p. 6.
Appendix A

List of Submissions

Government
Department of Human Services
Department of Infrastructure
Department for Transport, Urban Planning and the Arts, South Australia
Federal Minister for Ageing
Minister Assisting the Minister for Planning and Infrastructure, WA
Minister for Health, Western Australia
Minister for Health and Community Services, Northern Territory
Minister for Health and Human Services, Tasmania
Minister for Housing & Senior Victorians
Minister for Transport and Infrastructure, Northern Territory
Minister for Transport, Minister for Roads; New South Wales
Ministerial Advisory Council of Senior Victorians
Roads and Traffic Authority, New South Wales
State Coroner, Victoria
Transport Accident Commission
Transport SA
VicRoads
Victoria Police
Victorian Health Promotion Foundation (VicHealth)
Victorian Taxi & Tow Truck Directorates

Local Government
Borough of Queenscliffe
City of Boroondara
City of Darebin
City of Greater Dandenong
City of Greater Geelong
City of Wodonga
Horsham Rural City Council
Knox City Council
Manningham City Council
Maroondah City Council
Shire of Yarra Ranges
West Wimmera Shire Council
Yarriambiack Shire Council

Non Government
Accident Research Centre, Monash University
Alzheimer’s Association Victoria
Anglican Aged Care Services Group
Association of Motoring Clubs Inc.
Australian Association of Occupational Therapists, Victoria Inc.
Australian Driver Trainers Association
Australian Medical Association (Victoria) Ltd. and Medical Society of Victoria Inc.
Australian Motorcycle Council Inc.
Australian Retired Persons’ Association Inc., Advocacy Committee
Australian Retired Persons’ Association, Bendigo Branch
Benalla U3A
Bicycle Federation of Australia, Cyclists Urban Speedlimit Taskforce
Brotherhood of St Laurence
Bus Association Victoria
Castlemaine Senior Citizens Club Inc.
Centre for Eye Research Australia Ltd, University of Melbourne
CogState Ltd
Council on the Ageing, Victoria
Donvale Rehabilitation Hospital
Drysdale Senior Citizens Club
Echuca Community for the Aged
Elmore Senior Citizens Centre
Federal Chamber of Automotive Industries
Hawthorn Community Education Centre
Holden Ltd.
Injury Research Centre, University of Western Australia
Kaniva and District Senior Citizens’ Centre
Kooweerup Senior Citizens Inc.
Law Institute Victoria
Life Planning Foundation of Australia Inc.
Lions Club of Nhill
Manningham Centre
Maroondah Residents & Ratepayers Association
MS Society of Victoria
National Ageing Research Institute, University of Melbourne
National Council of Women of Victoria Inc
Older Persons Action Centre Inc.
Optometrists Association Australia (Victorian Division) Inc.
Park Hall Village Residents
Peppertree Hill Retirement Village
Peter James Centre, Eastern Health Service
Pharmaceutical Society of Australia (Victoria Branch) Ltd
Probus Association of Victoria
Professional Driver Trainers Association of Victoria Inc.
RoadSafe Barwon
RoadSafe Central Victoria
RoadSafe Mildura
RoadSafe Wimmera
Rosebud Retirement Village
Royal Australasian College of Surgeons, Victorian Road Trauma Committee
Royal Automobile Club of Victoria (RACV) Ltd
School of Occupational Therapy, La Trobe University
Stawell Senior Citizens
The Combined Pensioners and Superannuants Association of Victoria, Maroondah Branch
The Country Women’s Association of Victoria Inc.
Transport Research Centre, RMIT University
Ulysses Club
Vision Australia Foundation
Warrawee Seniors’ Club Inc., Inverloch
Women’s Electoral Lobby, Victoria
Wimmera Older Adults Recreation Network
Xenon Technologies Pty Ltd
## Individuals

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<thead>
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<th>Name</th>
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<td>Noble Park</td>
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<td>Dr R. Bouvier</td>
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<td>Mrs A. Burton</td>
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<td>Mr R. Carnaby</td>
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<td>Mr P. Clark</td>
<td>Warrandyte</td>
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<td>The Patch</td>
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<td>Mr R. Dean MLA, Member for Berwick</td>
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<td>Dr C. Drummond and Dr D. Bradt</td>
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<tr>
<td>Mrs E. Pullman</td>
<td>Cheltenham</td>
</tr>
<tr>
<td>Mrs C. M. T. Rawson</td>
<td>Tullamarine</td>
</tr>
<tr>
<td>Dr J. M. Reid</td>
<td>East St Kilda</td>
</tr>
<tr>
<td>Mr D. P. Reynolds</td>
<td>Hampton</td>
</tr>
<tr>
<td>J. E. Sander</td>
<td>Glen Waverley</td>
</tr>
<tr>
<td>Mrs J. C. Sands</td>
<td>Burwood</td>
</tr>
<tr>
<td>Mr J. Shaw</td>
<td>Heidelberg</td>
</tr>
<tr>
<td>Mr A. Shell</td>
<td>Rosebud West</td>
</tr>
<tr>
<td>Mr V. J. Simpson</td>
<td>Macleod</td>
</tr>
<tr>
<td>Mr G. T. Smith</td>
<td>Derrinallum</td>
</tr>
<tr>
<td>Mr H. Stevens</td>
<td>Canterbury</td>
</tr>
<tr>
<td>Mr E. W. Stormont</td>
<td>Frankston</td>
</tr>
<tr>
<td>Ms S. Strain</td>
<td>Richmond</td>
</tr>
<tr>
<td>Ms K. Thomas</td>
<td>Ivanhoe</td>
</tr>
<tr>
<td>Mr K. Tuohy</td>
<td>Carnegie</td>
</tr>
<tr>
<td>Name</td>
<td>Town /Suburb</td>
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<tr>
<td>Mr J. Voyage</td>
<td>Melbourne</td>
</tr>
<tr>
<td>Mr R. Weston</td>
<td>Lilydale</td>
</tr>
<tr>
<td>Dr M. R. Wigan</td>
<td>Melbourne</td>
</tr>
<tr>
<td>Mr W. Wiggins</td>
<td>Sale</td>
</tr>
<tr>
<td>W. L. Wilkins</td>
<td>Ivanhoe</td>
</tr>
<tr>
<td>P. G. &amp; R. Worssam</td>
<td>Mont Albert</td>
</tr>
</tbody>
</table>
Appendix B

List of Witnesses

Public Hearings
54th Parliament

Melbourne 20 May 2002

Mr David Anderson  Chief Executive
Mr Eric Howard  General Manager, Road Safety
Mr Bruce Chipperfield  Acting Manager, Registration and Licensing Policy
Dr Jeff Potter  Manager, Research and Driving Impairment
VicRoads

Mr Greg Tweedly  Acting Chief Executive Officer
Mr David Healy  General Manager, Road Safety
Transport Accident Commission

Dr Ken Ogden  General Manager, Public Policy
Ms Anne Harris  Chief Behavioural Scientist
Ms Robyn Seymour  Road User Programs Officer
Royal Automobile Club of Victoria (RACV) Ltd

Melbourne 17 June 2002

Mr John Collins  Executive Director
Department of Infrastructure

Dr Peter Darzins  Senior Lecturer, Geriatric Medicine
Dr Paul Andrews  Business Manager
National Ageing Research Institute

Ms J. Wood  Chairperson
Dr June Hearn  Council Member
Mr Rob McNabb  Council Member
Ministerial Advisory Council of Senior Victorians

Mr Nick Tolhurst  Senior Project Officer
Office of Senior Victorians, Department of Human Services

Dr Laurie Sparke  Manager Advanced Engineering
Holden Ltd.

Dr Jenny Morris  Director
Transport Research Centre, RMIT University
Melbourne 5 & 6 August 2002

Mr Peter Jamvold
Group Manager
Southern Division
Insurance Council of Australia

Mr Ray Shuey
Assistant Commissioner
Mr Peter Keogh
Superintendent
Traffic & Operations Support Department
Victoria Police

Ms Christine Simpson
State Coordinator
Dr Ric Bouvier
Community Safety Consultant
Royal Australian College of General Practitioners

Professor Hugh Taylor
Managing Director
Associate Professor
Head of Eye Health Promotion
Jill Keeffe
Centre for Eye Research Australia Ltd

Dr Jenny Gowan
Victorian Branch
Pharmaceutical Society of Australia

Dr John Reid
Cognitive Neuroscientist
Mr A. Batty
Business Development Manager
Dr P. Bick
Chief Executive Officer Elect
Professor Paul Maruff
Science Team Leader
Associate Professor
David Darby
Chief Scientific Officer
Cogstate Ltd

Dr Peter Lynch
Clinical Director
Ms Ann Leembruggen
Chief Occupational Therapist
Aged Care and Rehabilitation, Peter James Centre

Ms Marilyn Di Stefano
Lecturer
Ms Robin Lovell
Lecturer
School of Occupational Therapy
La Trobe University

Mr Frank McDermott
Associate Professor
Mr G.D. Grossbard
Deputy Chairman
Royal Australasian College of Surgeons
Briefings and Inspections  
54th Parliament  

Melbourne 18 June 2001

Mr Eric Howard  General Manager, Road Safety  
Dr Jeff Potter  Road Safety Department  
Mr Geoff Shanks  General Manager, Registration and Licensing  
VicRoads

Melbourne 3 September 2001

Ms Philippa Angley  Alzheimer’s Association Victoria

Melbourne 10 September 2001

Dr Ian Johnston  Director  
Dr Judith Charlton  Senior Research Fellow  
Mr Bruce Corben  Senior Research Fellow  
Accident Research Centre, Monash University

Monash University 17 September 2001

Dr Ian Johnston  Director  
Professor Thomas Triggs  Deputy Director  
Dr Judith Charlton  Senior Research Fellow  
Accident Research Centre Monash University  
Professor Brian Fildes,  Chair of Road Safety  
Royal Automobile of Club of Victoria (RACV) Ltd

Melbourne 24 September 2001

Ms Vivienne. McCutcheon  President  
Ms Jill Thompson  Policy Officer, Policy Officer  
Victorian Council on the Ageing

Melbourne 8 October, 2001

Dr Morris Odell  Forensic Physician  
Victorian Institute of Forensic Medicine
Road Safety for Older Road Users

TAC Offices 3 December 2001

Mr Stephen Grant  Managing Director and CEO
Mr David Healy  General Manager, Road Safety
Mr Paul Tierney  Major Projects Officer

Transport Accident Commission

Melbourne 23 September, 2002

Mr Graeme Johnstone  Victorian State Coroner

Overseas Briefings
54th Parliament

Rotterdam, Netherlands 9 July 2001

Dr Joop Kray  Programme Manager Road Safety
Dr Willem P. Vlakveld  Senior Consultant, Traffic Safety Section
Mr Willem Vermeulen  Senior Research Officer
Dr Ragnhild Davidse  Researcher, Behaviour, Decision Making & Analysis

Ministry of Transport, Public Works & Water Management

Professor J. A. Rothengatter  Experimental & Work Psychology
University of Groningen

Dr Ruud A. Bredewoud  Head, Department of Medical Affairs
Centraal Bureau, Rijvaardigheidsbewijzen (CBR)

Mr Rien Fluit  Traffic Advisor
Mid-Holland Police, Operational Division Ondersteuning

Stockholm, Sweden, 9 July 2001

Mr Per Henriksson  Researcher, Traffic & Road User Behaviour
Mr Satu Heikkinen  Research Assistant

Swedish National Road & Transport Research Institute (VTI)

Stockholm, Sweden, 10 July 2001

Dr Kurt Johansson  Chairman
Karolinska Institute, Traffic Medicine Center, Huddinge University Hospital

Brussels, Belgium 11 July 2001

Ms Jeanne Breen  Executive Director
European Transport Safety Council (ETSC)
Mr Dimitrios Theologitis  Head of Unit, Road Safety, Technical Standards & Technology
Mr John Berry  Principal Administrator
European Commission, Directorate-General for Energy & Transport
Mr Mark Watts , MP  Member European Parliament, Co-Chair ETSC

Paris, France 13 July 2001
Mr Wolfgang Hübner  Head, Transport Division
Dr Anthony Ockwell  Transport Division
Directorate for Science, Technology & Industry
Ms Martine Micozzi  Administrator
Ms Veronique Feypell  Principal Assistant, Routes et de Transport Routiers (RTR) Programme
Ms Caroline Abettan  Assistant, RTR Programme
Ms Emma Walker  Student Intern, RTR Programme
Organisation for Economic Co-Operation and Development

Mrs Martine-Sophie Fouvez  Principal Administrator
Ms Mary Crass  Administrator, Environmental & Urban Issues
European Conference of Ministers of Transport

London, UK 17 July 2001
Ms Ann Frye  Head, Mobility & Inclusion Unit
Mr Richard Jones  Head, Licensing, Roadworthiness & Insurance
Dr Paul Jackson  Research Manager – Driver Impairment, Road Safety
Department of the Environment, Transport & Regions
Dr Christopher Mitchell  Transport Scientist & Engineer

London, UK 18 July 2001
Mr Robert Gifford  Executive Director
Ms Clare Maltby  Policy & Campaigns Officer
Parliamentary Advisory Council for Transport

Viscount Jan Simon  Member of Parliament
House of Lords

Mr David Kidney, MP  Member of Parliament
House of Commons
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr Rolf Lamsdale</td>
<td>Business Manager</td>
<td>Mobility Advice &amp; Vehicle Information Service – MAVIS</td>
</tr>
<tr>
<td>Mr Brian Ellison</td>
<td>Senior Driving Advisor</td>
<td>Mobility Advice &amp; Vehicle Information Service – MAVIS</td>
</tr>
<tr>
<td>Mr Ben Plowden</td>
<td>Director</td>
<td>The Pedestrian Association</td>
</tr>
<tr>
<td>Mr Garry Handley</td>
<td>Road Safety Team Leader</td>
<td>Gloucestershire County Council</td>
</tr>
<tr>
<td>Mrs Gwyneth Dunwoody</td>
<td>MP, Chair</td>
<td>Environment, Transport and Regional Affairs Committee</td>
</tr>
<tr>
<td>Mr Richard Cooke</td>
<td>Clerk of the Transport Committee</td>
<td>Environment, Transport and Regional Affairs Committee</td>
</tr>
<tr>
<td>Ms Patricia P. Pine</td>
<td>Director</td>
<td>New York State Office of Aging</td>
</tr>
<tr>
<td>Mr Neal E. Lane</td>
<td>Executive Deputy Director</td>
<td>New York State Office of Aging</td>
</tr>
<tr>
<td>Mr Philip R. LePore</td>
<td>Co-ordinator, Older Driver Program</td>
<td>New York State Office of Aging</td>
</tr>
<tr>
<td>Mr Nick Rogone</td>
<td>Director, Program Development &amp; Implementation</td>
<td>Governor's Traffic Safety Committee, New York State</td>
</tr>
<tr>
<td>Mr Frank DeMarinis</td>
<td>DeputyDirector, Local Program Operations</td>
<td>Governor's Traffic Safety Committee, New York State</td>
</tr>
<tr>
<td>Mr Marcus Harazin</td>
<td>Acting Deputy Director, Policy &amp; Program Development Division</td>
<td>Governor's Traffic Safety Committee, New York State</td>
</tr>
<tr>
<td>Mr Robert Dingman</td>
<td>Assistant Commissioner</td>
<td>New York State Department of Motor Vehicles</td>
</tr>
<tr>
<td>Ms Sandy Foster</td>
<td>Program Manager</td>
<td>New York State Department of Motor Vehicles</td>
</tr>
<tr>
<td>Ms Jennifer D. Hogan</td>
<td>Community Liaison</td>
<td>New York State Department of Motor Vehicles</td>
</tr>
</tbody>
</table>
Appendices

Washington, USA 25 July 2001

Dr John Eberhard Manager, Older Driver Research Program
Mr Douglas B. Gurin Social Science Research Analyst
Ms Laurie Flaherty, RN, MS Office of Communication & Outreach
Dr Esther Wagner Research Psychologist
Dr David L. Smith, P.E. Senior Mechanical Engineer, IVI Light Director
Dr M. Joseph Moyer Engineering Research Psychologist
Research, Development & Technology – Safety
National Highway Traffic Safety Administration

(NHTSA)

Mr Kenneth S. Opiela Highway Research Engineer
Safety Research and Development (HRDS)
Federal Highway Administration

Ottawa, Canada 27 July 2001

Professor Cynthia Owsley Ophthalmologist
The University of Alabama at Birmingham,
School of Medicine

Mr Paul Boase Chief, Road Users
Dr Y. Ian Noy Chief, Ergonomics Division
Ms Deborah Collard Research Officer
Road Safety & Motor Vehicle Regulation
Transport Canada

Dr Herb M. Simpson President & Chief Executive Officer
Traffic Injury Research Foundation

Edmonton, Canada 30 July 2001

Dr Allen Dobbs Developer & President
Mr Donald W. Little Chief Executive Officer
Mr David Treece Manager, Financial Operations
Ms Barb Carstensen, R.N. General Manager
DriveABLE

Dr Bonnie M. Dobbs Assistant Professor – Faculty of Rehabilitation
Psychology
University of Alberta

Mr Gregg A. Hook Chair, Transportation Safety
Director, Driver Records
Mr M. Fuhr Secretary, Transportation Safety Board
Alberta Transportation
Interstate Briefings and Inspections
54th Parliament

Brisbane 18 July 2002

Mr Barry Watson
Associate Professor
Richard Tay
Dr Will Murray
Centre for Accident Research & Road Safety
(CARRSQ) Queensland University of Technology

Mr David Denmark
Transport Planning Management Consultant

Brisbane 19 July 2002

Mr John Lee
Brisbane City Council

Superintendent Grant Pitman
Mr Peter Kolesnik
Queensland Police

Mr Don Bletchly
Director, Transit Development
Ms Peter Irvine
Manager, Scheduled Services
Mr Col Robinson
Director, Public Transport
Mr Peter Pramberg
Manager, Marketing and Public Education
Mr Martin Thomsett
Acting Director, Public Transport Strategy and Planning, Public Transport

Mr David Ball
Director, Strategy, Land Transport and Safety
Mr Geoff Meers
Group Manager (Road Safety Policy & Advanced Technology) Land Transport and Safety
Ms Julie Holt
Manager (Communication Strategy) Land Transport & Safety
Queensland Transport

Briefings and Inspections
55th Parliament

Melbourne 28 April 2003

Mr David Anderson
Chief Executive
Mr Eric Howard
General Manager Road Safety
Dr Jeff Potter
Manager Vulnerable Road Users
VicRoads

Melbourne 12 May 2003

Mr Ray Kinnear
Director, Public Transport Planning
Department of Infrastructure
Melbourne 19 May 2003

Mr Stephen Grant  
Mr David Healy  
Mr Ray Shuey  
Mr Peter Keogh

CEO and Managing Director  
General Manager Road Safety  
Assistant Commissioner  
Superintendent

Transport Accident Commission  
Victoria Police

Melbourne 2 June 2003

Mr Peter Matwijiw  
Ms Monica Pfeffer  
Mr Douglas Savige  
Professor Ken Ogden  
Ms Anne Harris  
Ms Robyn Seymour  
Ms Lynette Moore  
Ms Marilyn Di Stefano  
Professor Hugh Taylor

Office of Senior Victorians  
Policy Consultant, Aged Care  
Senior Project Officer  
General Manager, Public Policy  
Chief Behavioural Scientist  
Road Users Programs Officer  
Executive Director  
Lecturer  
Managing Director

Victoria Police  
Department of Human Services  
Victorian Rural Human Services Strategy  
Royal Automobile Club of Victoria (RACV) Ltd  
Alzheimer’s Association  
School of Occupational Therapy  
La Trobe University  
The Centre for Eye Research Ltd.

Melbourne 16 June 2003

Dr Ian Johnston  
Professor Brian Fildes  
Dr Judith Charlton

Director  
Professororial Fellow  
Senior Research Fellow

Accident Research Centre, Monash University

Frankston 28 July 2003

Mr Stuart Shaw

General Manager  
Baxter Retirement Village
Road Safety for Older Road Users

**Sydney 24 & 25th June 2003**

Professor Hal Kendig  
Dean of Health Sciences  
Faculty of Health Sciences  
University of Sydney

Mrs Neryla Jolly  
Head of School of Applied Vision Sciences

Mr Michael Veysey  
Acting General Manager  
Road Safety Strategy

Ms Rosemary Rouse  
Manager, Road User Safety

Mr Andy Graham  
Trends Analyst  
Road Safety Strategy

Mr Duncan McRae  
Driver Development  
Driver & Vehicle Strategy  
Roads and Traffic Authority, New South Wales

Mr John Brown  
Policy Advisor  
Mobility Safety Department  
National Road and Motorists’ Association (NRMA) Ltd

Dr Peter Lipski  
Geriatric Medicine  
Central Coast Area Health Service, New South Wales

Mr Jeff McDougall  
President

Mr Allan Porter  
Executive Director

Ms Shona Blanchette  
Director  
Australian Driver Trainers Association

Mr T. Townson  
Acting Director  
Metropolitan Strategic Planning

Mr Ken Ryan  
Director, Rural and Regional Strategy  
Department of Infrastructure, Planning and Natural Resources, New South Wales

Ms Caroline Mason  
Manager, Community Transport, Policy and Funding  
Ministry of Transport, NSW

Mr Ian Napier  
Secretary  
Pedestrian Council of Australia
## Medical Conditions that may serve as ‘Red Flags’ Regarding Driving Safety (Dobbs, 2001)

<table>
<thead>
<tr>
<th>General Condition</th>
<th>Details</th>
<th>Evidence Relating to Driving</th>
<th>Crash Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual Impairments / Illnesses</td>
<td>Low vision (20/200 to 20/50)</td>
<td>The crash rates of restricted / unrestricted drivers with visual impairments were compared with controls. Research details relating to acuity not provided.</td>
<td>RR = 2.38* (without restrictions) RR = 1.31* (with restrictions) Dynamic visual acuity said to be a more reliable predictor of crashes than static visual acuity.</td>
</tr>
<tr>
<td>Cataracts</td>
<td>Compared past 5 year crash history of older drivers with / without cataracts with controls.</td>
<td>RR = 2.2*</td>
<td>RR (one eye impaired) = 2.70* RR (two eyes impaired) = 5.78*</td>
</tr>
<tr>
<td>Colour Vision Defects</td>
<td>Compared crash risk / driving ability of red, green colour-blind drivers with controls. Questionnaire to individuals with congenital colour blindness.</td>
<td>Red colour blind twice as many rear-end crashes. Those with colour vision defects reported general difficulty when driving.</td>
<td>Unknown</td>
</tr>
<tr>
<td>Contrast Sensitivity</td>
<td>Compared those with cataracts pre-surgery and impaired contrast sensitivity with controls.</td>
<td>RR (one eye impaired) = 2.70* RR (two eyes impaired) = 5.78*</td>
<td>Unknown</td>
</tr>
<tr>
<td>Diabetic Retinopathy</td>
<td>Proliferative diabetic retinopathy can result in reductions in the visual field. Panretinal photocoagulation said to reduce the risk of severe visual loss.</td>
<td>Field loss in both eyes had double the crash and conviction rates (per person per 160,000km).</td>
<td>Unknown</td>
</tr>
<tr>
<td>Glaucoma and field loss</td>
<td>Compared peripheral field loss and crash rates in individuals with glaucoma and controls.</td>
<td>Field loss in both eyes had double the crash and conviction rates (per person per 160,000km).</td>
<td>Unknown</td>
</tr>
<tr>
<td>General Condition</td>
<td>Details</td>
<td>Evidence Relating to Driving</td>
<td>Crash Risk</td>
</tr>
<tr>
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</tr>
<tr>
<td>Monocular Vision</td>
<td>Compared crash rates of individuals with monocular vision with controls (research from the 1970s and early 1980s).</td>
<td></td>
<td>Those with monocular vision have nearly double the number of crashes and have more reckless driving violations.</td>
</tr>
<tr>
<td>Macular Degeneration</td>
<td>Compared self-report and official records of those with macular dystrophies (MD) and controls.</td>
<td></td>
<td>No difference in crash rates except those with MD who don’t restrict driving to night time are more likely to be involved in night time crashes.</td>
</tr>
<tr>
<td>Hearing</td>
<td>Hearing impairment</td>
<td>Compared crash rates of those with hearing impairment with controls.</td>
<td>Equivocal results.</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>Coronary Heart / Artery Disease</td>
<td>Considered injury to others as a result of 'sudden death at the wheel'.</td>
<td>Early research suggested little risk to other drivers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>More recent studies suggest there may be a slight increase in risk to others.</td>
</tr>
<tr>
<td></td>
<td>Disturbances of Cardiac Rhythm</td>
<td>No direct crash research. Used an equation to estimate risk of harm to other road users.</td>
<td>Unknown.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Estimated annual risk of harm to other road users to be 1 in 45,000.</td>
</tr>
<tr>
<td></td>
<td>Congestive Heart Failure</td>
<td>No direct crash research. Considered associated cognitive impairment and inferred impact on safe driving ability.</td>
<td>Unknown.</td>
</tr>
<tr>
<td>Abnormal Blood Pressure</td>
<td></td>
<td></td>
<td>Unknown.</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>Transient Ischaemic Attacks</td>
<td>No direct crash research. Considered associated cognitive impairment and inferred impact on safe driving ability.</td>
<td>Unknown.</td>
</tr>
<tr>
<td>General Condition</td>
<td>Details</td>
<td>Evidence Relating to Driving</td>
<td>Crash Risk</td>
</tr>
<tr>
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</tr>
<tr>
<td>Cerebrovascular Accident (CVA) (Stroke)</td>
<td>No direct crash research. Considered acute neurological events. Considered chronic neurological impairment versus controls (not CVA’s alone) Post CVA.</td>
<td>Unknown. Very low risk. RR (unrestricted drivers) = 4.21* RR (restricted drivers) = 2.18* RR = 0.8*</td>
<td></td>
</tr>
<tr>
<td>Peripheral Vascular Diseases</td>
<td>Peripheral Vascular Diseases</td>
<td>No direct crash research.</td>
<td>Unknown.</td>
</tr>
<tr>
<td>Diseases of the Nervous System</td>
<td>Seizures</td>
<td>Compared the crash rates of those with epilepsy to that of controls (however methodological problems with these studies).</td>
<td>An increased risk from 1.5-1.95 times that of controls.</td>
</tr>
<tr>
<td></td>
<td>Sleep Apnoea</td>
<td>Compared crash rates (over varying periods) of those with sleep apnoea and controls (however methodological problems with these studies).</td>
<td>An increased risk of crashing from 2-7 times that of controls.</td>
</tr>
<tr>
<td>Respiratory Diseases</td>
<td>Asthma</td>
<td>No direct crash research.</td>
<td>Unknown.</td>
</tr>
<tr>
<td></td>
<td>Chronic Obstructive Pulmonary</td>
<td>No direct crash research. Considered associated cognitive impairment and inferred impact on safe driving ability.</td>
<td>Unknown. Unknown. Unknown.</td>
</tr>
<tr>
<td></td>
<td>Other Pulmonary Conditions (not specified)</td>
<td>The crash rates of restricted / unrestricted drivers with pulmonary conditions were compared with controls.</td>
<td>RR = 1.96* (without restrictions) RR = 0.85 ns (with restrictions)</td>
</tr>
<tr>
<td>Metabolic Diseases</td>
<td>Diabetes Mellitus</td>
<td>Compared crash rates of drivers with diabetes and controls (however methodological problems with these studies).</td>
<td>Equivocal results.</td>
</tr>
<tr>
<td>General Condition</td>
<td>Details</td>
<td>Evidence Relating to Driving</td>
<td>Crash Risk</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Thyroid Disease</td>
<td></td>
<td>No direct crash research.</td>
<td>Unknown.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Considered associated cognitive impairment and inferred impact on safe driving ability.</td>
<td>Unknown.</td>
</tr>
<tr>
<td>Renal Disease</td>
<td>Chronic Renal Failure</td>
<td>No direct crash research.</td>
<td>Unknown.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Considered associated cognitive impairment and inferred impact on safe driving ability.</td>
<td>Unknown.</td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>Musculoskeletal Disabilities</td>
<td>The crash rates of restricted / unrestricted drivers with musculoskeletal abnormalities were compared with controls.</td>
<td>RR = 4.02 (without restrictions) RR = 3.07 (with restrictions) RR = 2.2 (3 or more abnormalities) RR = 2.8 (impaired knee flexion)</td>
</tr>
<tr>
<td>Disabilities</td>
<td></td>
<td>Examined the crash rate of individuals with foot abnormalities (based on self-report).</td>
<td></td>
</tr>
<tr>
<td>Psychiatric Disease</td>
<td>Psychiatric or Emotional Conditions</td>
<td>Compared the crash risk of individuals with a psychiatric disorder with controls (however methodological problems with these studies).</td>
<td>May have higher crash risk. RR = 1.74 (without restrictions) RR = 2.42 (with restrictions)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The crash rates of restricted / unrestricted drivers with psychiatric or emotional conditions were compared with controls.</td>
<td></td>
</tr>
<tr>
<td>Medication / Drugs</td>
<td>Anti-depressants</td>
<td>Compared crash rates of older drivers using tricyclic antidepressants with controls.</td>
<td>An increased risk of crashing of 2.2-2.3 times.</td>
</tr>
<tr>
<td></td>
<td>Anti-histamines</td>
<td>Compared crash rates of drivers using older anti-histamines with controls.</td>
<td>Possible increase in crash rates.</td>
</tr>
<tr>
<td></td>
<td>Benzodiazepines</td>
<td>Compared crash rates of drivers using benzodiazepines with controls.</td>
<td>Crash rates up to 2.4 times more (when considering higher doses and higher half-life compounds).</td>
</tr>
</tbody>
</table>

RR = relative risk  
* = the relative risk is statistically significant  
ns = not significant
Bibliography


Association for the Advancement of Automotive Medicine/NHTSA, *Determining Medical Fitness to Drive, Guidelines for Physicians*, AAAM/NHTSA Consensus Meeting Guidelines, 2000.


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Foldstein, M, Foldstein, S and McHugh, P, *Mini-Mental State Examination*, Psychological Assessment Resources Inc, Florida, USA.


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