Older road users
The role of government and the professions

AA Foundation for Road Safety Research

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Proceedings of a one-day conference held at The Royal Society of Arts London, 19 November 1993

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The AA Foundation for Road Safety Research

The AA Foundation for Road Safety Research was formed by The Automobile Association in December 1986 as part of its continuing efforts in the road safety field and as a major contribution to European Road Safety Year.

Registered as a charity, the objectives of the Foundation are:

> To carry out, or procure, research into all factors affecting the safe use of public roads;
>
> To promote and encourage the safe use of public roads by all classes of road users through the circulation of advice, information and knowledge gained from research; and
>
> To conceive, develop and implement programmes and courses of action designed to improve road safety, these to include the carrying out of any projects or programmes intended to educate young children or others in the safe use of public roads.

Control of the Foundation is vested in a Council of Management under the chairmanship of Sir Peter Baldwin. Day to day activity is the responsibility of the Foundation Management Committee under the chairmanship of Kenneth Faircloth.

SPONSORS

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Biographies

Sir Peter Baldwin KCB MA FCIT (Hon) FIHT CBIM
Chairman, AA Foundation for Road Safety Research

After graduating from Corpus Christi College, Oxford, and service in the Foreign Office, he entered the Home Civil Service, serving for 20 years in the Treasury and two years in the Cabinet Office. In 1976, he moved from the position of Deputy Secretary in the Treasury to be Permanent Secretary at the Department of Transport until 1982. He then served as Chairman of one of the 14 Regional Authorities of the NHS in England from 1983 to 1991, including two years as Chairman of the 14 chairmen. From 1986 to 1993 he chaired the Disabled Persons Transport Advisory Committee. He is involved in the management of several charitable organisations, notably the Royal Association for Disability and Rehabilitation and the Charities Aid Foundation. He became a member of the AA Committee in 1983 and has served as Vice-Chairman since 1991.

David Bayliss OBE FEng
Director of Planning, London Transport

After graduating from the University of Manchester Institute of Science and Technology and the University of Manchester, he worked for Manchester City Council on transport and town planning matters. He later moved to London where he worked on urban transport issues for the Greater London Council before joining London Transport in 1984. As Director of Planning, he is responsible for overall transportation, corporate planning and associated research and studies. David Bayliss has acted as advisor to a wide range of international organisations including the World Bank, OECD, WHO, United Nations Environment Programme (UNEP) and the European Conference of Ministers of Transport.

James S Bevan MB BChir MRCGP DRCOG
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After graduating from Trinity College, Cambridge, he worked in several London hospitals before becoming Medical Officer at Westminster School. He is a Senior Partner in private general practice, Medical Consultant to the London College of Music and Medical Advisor to several large companies. He has acted as a Consultant to WHO and is currently Chairman of the Foundation of Nursing Studies and Secretary of the Ethics Committee, Humana-Wellington Hospital. Dr Bevan is the author of various books and articles on medical matters aimed at the lay public which have been translated into several languages including Japanese.

Philip H Bly BSc PhD FInstP MCIT
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After graduating from the University of Durham, he became an Assistant Professor of Physics at Simon Fraser University in British Columbia teaching and researching into magnetic thin films. On his return to Britain in 1971, he joined the Road Research Laboratory where he undertook research on issues such as public transport, transport policy, demand prediction, land use and accessibility. He was appointed Head of Vehicles Group at TRRL in 1987 with responsibility for vehicle safety, the environmental aspects of road traffic and the mobility of elderly and disabled people.

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After graduating from the University of Cambridge, he worked at the Universities of Birmingham, London and Sussex as a transport economist and statistician before joining the Department of the Environment. From there, he went to School of Advanced Urban Studies at the University of Bristol before moving to the Flinders University of South Australia. He took up his present position in 1991.

Kenneth Faircloth OBE BSc (Econ) FIMI
Deputy Director General, The Automobile Association

After graduating from the London School of Economics and National Service, he worked for Esso for some years before joining the AA in 1965. In 1986 he was promoted to Managing Director and was appointed to his present position in 1989. He is a Council Member of the AA Foundation for Road Safety Research. Mr Faircloth is a Freeman of the City of London and a member of the Worshipful Company of Coachmakers and Coach Harness Makers. Amongst other appointments, he is Chairman of the Public Affairs Committee of the British Road Federation.

The Rt Hon Roger Freeman MP
Minister of State for Public Transport

After graduating from Balliol College, Oxford, he qualified as a Fellow of the Institute of Chartered Accountants and was Treasurer of the Bow Group from 1967 to 1968. In 1979 he contested Don Valley and has been Member of Parliament for Kettering since June 1983. From 1983-1985 he was a member of the House of Commons Treasury and Civil Service Select Committee. In May 1986, he was appointed Parliamentary Under Secretary of State for the Armed Forces. In December 1988 he joined the Department of Health as the Parliamentary Under Secretary of State. In May 1990, he was promoted to Minister of State and joined the Department of Transport as Minister for Public Transport.

Lady Sally Greengross OBE
Director, Age Concern England
Secretary General Eurolink Age

After graduating from the London School of Economics, she spent some years as a lecturer and researcher. She joined Age Concern in 1977 and became its Director in 1987. As Secretary General of Eurolink Age – a EC-wide organisation – Lady Greengross liaises with politicians, administrators and older people's organisations at National, European and International levels. Among other appointments, she is Vice President for Europe of the International Federation on Ageing and a member of the UN Network on Ageing. She also works closely with WHO on many issues, including the establishement of an International Exchange on Ageing, the Law and Ethics (EAGLE).

Peter G Headicar BA MSc(Eng) MSc(Soc Sc) MRTPI MCIT
Reader in Transport Planning, Oxford Brookes University

After graduating from the University of Newcastle upon Tyne he took higher degrees at the universities of London and Bristol and worked with local authorities and consultants in London and West Yorkshire, eventually becoming Policy Planning Manager with West Yorkshire Passenger Transport Executive. He lectured and published throughout his professional career before joining the School of Planning at Oxford Brookes University in 1989. His research interests include the strategic interactions between transport, land use and the environment as well as individual travel behaviour, accessibility and travel needs.

Michael J Kendrick CEng MICE FIHT
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He worked in several local authorities, latterly Nottinghamshire County Council, before moving to Northamptonshire as Principal Assistant County Surveyor (Design and Construction). In 1984, he was appointed County Surveyor. Michael Kendrick is Vice President of the County Surveyor's Society and the Institution of Highways and Transportation. He is also an advisor to the Association of County Councils on issues relating to transport and the environment. He took up his present post in 1987.

Sir Donald Maitland GCMG OBE
Chairman, Health Education Authority

After graduating from Edinburgh University and war service, he joined the Foreign (later Diplomatic) Service and served in various posts in the Foreign Office and the Middle East. He later became Chief Press Secretary to the Prime Minister, UK Permanent Representative to the UN in New York before moving to a similar post to the EC in Brussels. He became Chairman of the Health Education Authority (HEA) in 1989. He is a past Member of the Commonwealth War Graves Commission and a past Deputy Chairman of the Independent Broadcasting Authority. Currently, Sir Donald is Chairman of Governors of the Charlemagne Institute, Edinburgh, the Bath Institute for Rheumatic Diseases and President of the Federal Trust for Education and Research.

Barbara E Sabey ISO BSc FInstP FIHT
Technical Advisor, AA Foundation for Road Safety Research

After graduating from the University of London, she joined the Road Research Laboratory. In 1972 she was appointed as Head of Accident Investigation and in 1980 as Head of Road Safety. She has worldwide experience in road safety research including advising Monash University Accident Research Centre in Australia and Traffic Authorities in both Australia and New Zealand. She is a trustee of the Child Accident Prevention Trust (CAPT), and a member of the Medical Commission on Accident Prevention (MCAP) Transport Committee. She was the Chairman of the AA/MCAP Joint Working Party on Older Drivers.

Foreword

The Rt Hon Roger Freeman MP
Minister of State for Public Transport

The number of older people is increasing and they represent a significant proportion of the population of this country. Older people are now more active and mobile than ever before, but inevitably they may find that their sight, hearing and judgement are not quite as sharp as when they were younger. It will therefore be more important than ever in the years ahead to take account of the older road user. We must take action now on measures, for example in adapting road design for older drivers, which will need to serve us well into the next century. By then the number of drivers, particularly women, aged over 60 will have increased considerably. But we should not forget older people who do not have a car or simply prefer to walk; half of the pedestrians killed on our roads are over 60 years of age and we must find ways of reducing casualties amongst this group.

There is much that the Government can do and is doing, but the safety of older people on our roads, as elsewhere, is the responsibility of us all. Local authorities, the police, motoring organisations, insurance companies, doctors and opticians all need to be involved. The wide range of topics addressed by the speakers at this conference illustrates the many factors and issues which we need to consider.

It is fitting that this conference should be organised by the AA Foundation for Road Safety Research since it was their earlier conference in 1989 which really first drew attention to the problems faced by older road users. I have been greatly encouraged by the progress that has been made since then, but there is still much to be done. It is therefore appropriate, as the European Year of Older People and Solidarity Between Generations comes to an end, that we should meet together to take stock of the situation.

AA Foundation research programme and its application

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Technical Advisor
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Abstract

The work of the AA Foundation for Road Safety Research has encompassed several studies of older road users. Particular attention has been paid to older drivers, the starting point for which was a comprehensive survey of their needs for mobility, problems they encounter, concerns about their driving ability, and attitudes towards modifying or giving up driving. As a result of consultation and discussion of research findings from this and other studies, recommendations have been put forward through a joint working group of the Medical Commission on Accident Prevention and the Automobile Association for ***Helping the Older Driver****. These recommendations relate to road and vehicle design and use, and advice on changing driving habits and planning for giving up driving. Some unresolved problems have also been identified. More recently, problems perceived by older pedestrians have been the subject of study, building on existing knowledge to detail specific risk situations and how to ease the conflicts between pedestrians and traffic. The AA Foundation's forward research programme is committed to advancing the understanding of how and why older people are injured in the road environment, and seeking ways of helping them to travel more safely consistent with maintaining mobility.*

1 Development of research and its application

The objectives of the AA Foundation for Road Safety Research, founded in 1986, are threefold:

i To carry out, or procure, research into all factors affecting the safe use of public roads;

ii To promote and encourage the safe use of public roads by all classes of users through the circulation of advice, information and knowledge gained from research;

iii To conceive, develop and implement programmes and courses of action designed to improve road safety; these to include the carrying out of projects or programmes intended to educate children or others in the safe use of public roads.

Sabey, B E *AA Foundation research programme and its application* In Clayton, A B Proceedings of a conference on *Older road users – the role of government and the professions*, AA Foundation for Road Safety Research, Basingstoke.

Thus the Foundation strategy is to encourage research of the highest academic standard, but also to ensure that practical applications are realised.

The programme of research which has been initiated has placed most emphasis on behavioural issues related to accident circumstances. The individual studies, summarised in the AA Foundation brochure (1993), have covered road users of a range of ages using different modes of transport under different environmental conditions. Problems of older road users have been addressed as part or whole of several studies. In completed work particular attention has been directed to older drivers, but more recently concerns for older pedestrians are being addressed.

2 Older drivers

The programme of work on older drivers started with a research survey in 1987/88 to explore the use of the car by older drivers, and to identify their problems. At the outset the question arose as to who is the "older driver". Capabilities decline with age and performance deteriorates, but the changes are gradual and vary widely from individual to individual. The decision was made to start considering potential driving problems from the age of 55 years to provide a baseline, at an age when little if any deterioration has set in, against which progressive decline and its effects can be assessed.

In line with the objectives of the Foundation the survey was followed by a Conference to discuss this and other relevant research and their implications with organisations who have an interest in concerns of older people. At the same time, a joint Working Group was formed of the Medical Commission on Accident Prevention (MCAP) and the Automobile Association (AA) to develop recommendations for action in terms of road and vehicle design, and behavioural and medical issues. The outcome was a detailed report published by the MCAP/AA (1990), which has been widely disseminated.

2.1 Survey of motoring and the older driver

A detailed questionnaire was completed by nearly 1000 drivers aged 55 years and over. Along with information on current driving habits, the importance of having a car and problems experienced, participants were asked to make an assessment of their own driving ability and any changes in it or their actual driving behaviour since 50 years of age. Their attitudes to giving up driving were explored, and they were also asked on what issues they might seek advice and from whom they would expect to receive it.

The findings were reported in detail by the AA Foundation (1988), together with an indication for areas of further action which developed from the survey. In the analysis of the survey responses, comparisons were made between three groups of ages: 55 to 64, 65 to 74, and 75 plus. The

differences between these groups were particularly significant in indicating the growing problems drivers face as they get older. A few of the issues are highlighted here.

Table 1 – Changes in approach to driving compared with when 50 years old

Sample size	Total (951) %	Age 55–64 (570) %	65–74 (272) %	75+ (109) %
Leave more distance from vehicle in front	49	43	56	60
More cautious	44	39	49	57
Avoid rush-hour/heavy traffic	38	29	50	50
Avoid night driving	30	21	42	46
Avoid long trips	28	20	38	50
More frequent breaks	28	26	30	28
Drive slower	25	20	28	46
Avoid motorways	18	12	25	33
Reduce driving	12	6	18	31
Avoid busy junctions	12	8	16	21
Use other transport mode whenever possible	5	3	6	12
Other	2	2	2	–
No changes	19	25	12	3

For all respondents cars were considered of great importance and necessary for maintenance of lifestyle. The nature of the use for social or leisure activity and for personal business was much the same for all age groups: although, not surprisingly, those over 64 used the car less for travelling to work, it was only for the 75 plus age group that the mileage driven was reduced.

The speed at which drivers drove in relation to other traffic, the extent to which they admitted exceeding speed limits, and the frequency of overtaking decreased with age. Some drivers reported difficulties in reading traffic signs, and rather more mentioned glare as a problem: there was however little difference in the level of reporting between the age groups. Few drivers expressed concern about negotiating junctions, a finding which has serious implications in the light of the known fact that the involvement of drivers in accidents at junctions increases with age.

The most significant differences between the age groups lay in their reported changes in driving behaviour since the age of 50 years, and the influences on their driving habits. With increasing age (see Table 1), greater proportions of drivers leave more distance from the vehicle in front; drive more slowly and are more cautious; avoid heavy traffic, night driving and long trips, motorways and busy junctions. Yet all age groups reported very little worsening of their driving ability since the age of 50, apparently believing the changes in their driving behaviour compensate for any decline in performance.

Table 2 – Who should make the decision about giving up driving?

	Total (996)
Driver him/herself	80%
Doctor	71%
DVLA/Motor Vehicle Licensing Centre	11%

In terms of fitness to drive, older drivers increasingly tire more easily with age, find driving more stressful, admit slower reactions, are less good at absorbing information and less confident as drivers. Arthritis and difficulty in turning the head to look back were the most prevalent physical problems experienced.

A crucial part of the questionnaire related to why experienced drivers give up driving, the factors involved, and who should make the decision about giving up. Agreement was strongest that deterioration in health, doctor's advice, and inability to afford to run a car were the main reasons for giving up driving. The main factors which should determine when to give up driving were driver's health and accident record: on the other hand the need for mobility was an important consideration. Age was not considered a good basis for giving up, and this view was more strongly held the older the driver.

Overwhelmingly drivers felt that they themselves should make the decision to give up driving (see Table 2), with a strong expectation of input from the doctor who is expected to be a source of advice on driving capability.

Other findings from the research and the implications for action were taken into account in the work of the MCAP/AA Working Group reported in Section 2.3.

2.2 Conference on motoring and the older driver

The Conference held in 1989 brought together many researchers and road safety practitioners to disseminate research findings and to discuss the problems of older drivers. Implications for the police, driving instructors, and motor industry were discussed. Medical considerations and consumers' views were put forward. Although no proceedings of the Conference were published, the contributions provided an important input to the work of the MCAP/AA Working Group.

2.3 MCAP/AA Working group

The terms of reference of the Working Group were "to make recommendations for early action by Government and others to guide, consult, and inform older drivers on their driving capabilities and limitations; the action they and others should contemplate, and any further research that may be required".

In its deliberations, the Group took note of available evidence identifying the problem, and existing information on the circumstances in which older drivers have accidents, attitudes of older drivers to driving, relevant psychological and physiological changes with ageing, and poor health. It

was particularly mindful of the conflict between mobility and safety which the older driver sooner or later has to face. Coming to terms first with modifying driving behaviour and pattern of driving, and later deciding to give up driving can make such a major impact on an older person's way of life. It is an essential need to maintain mobility, and to enable people to drive in comfort for as long as possible consistent with safety.

2.4 Recommendations for action

The outcome of the Working Group's review and its recommendations are reported in *Helping the Older Driver* published by the MCAP/AA (1990).

Ways of making travel safer and more amenable for older drivers were identified in the light of knowledge existing at the time of the review, through action in the fields of the vehicle, the road and the driver.

There are many features on modern cars that can make driving much easier for the older driver. It was recommended that vehicle and equipment designers should give more attention to the needs of older drivers, and that suppliers should advise older people on suitable design features and accessories.

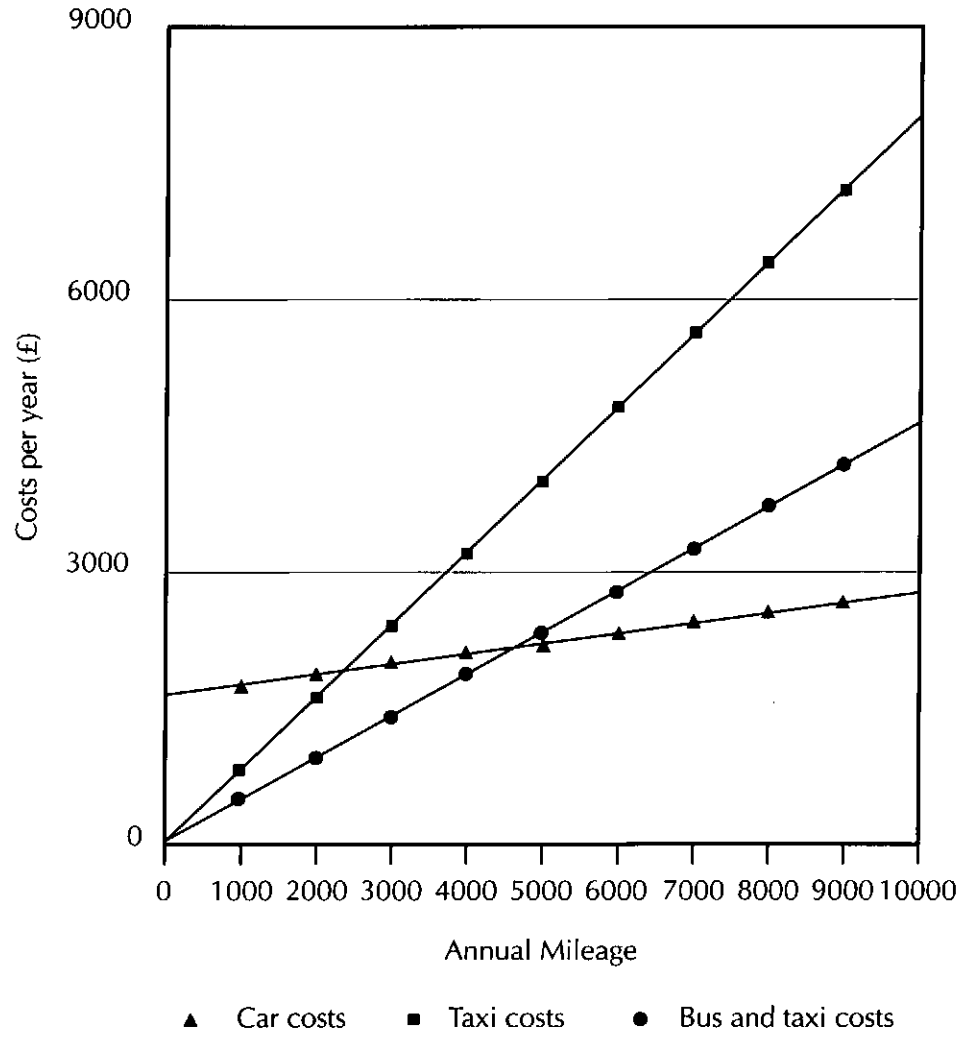
Highway design can also help older people drive more safely. More account of the special needs of older drivers should be taken in highway planning, particularly in the design of junctions, easing perceptual and visual problems, control of speed, and provision of roadside facilities.

For the driver, the essential requirement is to provide advice firstly on how to plan for changes in patterns of driving and life style to accommodate declining abilities, and ultimately on how to prepare for giving up driving altogether.

The advice on changing driving habits needs to include: an awareness that abilities will decline with age; recognition of causes of increasing tension or stress; choice of car for ease and comfort of driving; choice of special equipment, either for the car or for the driver (no thick framed glasses) to give good all round visibility; choice of suitable routes and travel times; how to avoid fatigue; side effects of medication, and effects of alcohol.

Giving up driving is a much more sensitive and traumatic issue. Planning ahead from the time of considering retirement is advisable. Older drivers should assess the extent of their dependence on their car in relation to their future lifestyle, and whether there are alternative forms of transport. One consideration that has been largely overlooked is the use of taxis. Where a car is being maintained for only low mileage use, taxis may present a cheaper mode of transport. Figure 1 shows that for mileages up to 2500 per year it is cheaper not to own a car but to use a taxi. Apart from the financial benefits there are other advantages such as removing stress induced by parking and maintenance problems. For distances up to 5000 miles per year use of combination of bus and taxi is financially preferable.

Figure 1 – A comparison of the costs of car use and various transport options (based on 1989 costs)



In planning for the future shared driving between partners in a household also has benefits. It reduces the anxiety of having to drive, and reduces fatigue on longer journeys. The major benefit if both partners regularly drive, they maintain their confidence, so that if one partner has to give up driving the other can continue to maintain the lifestyle. Although an increasing number of older women hold driving licences there is still a tendency for husbands to dominate in actual driving.

2.5 Dissemination and application of findings

The application of recommendations relating to vehicle aids and highway design and use clearly fall within the remit of responsibilities of vehicle engineers and highway engineers and planners. Dissemination of the results of the MCAP/AA Working Group was effected through the established channels of communication.

A much more intractable task is how to make appropriate advice available to the drivers themselves. Both operational and institutional difficulties exist.

Much advice is available on how driving habits should be modified. The problem is how to put it together and how to disseminate it. This requires considerable effort, and needs to be shared between a variety of agencies. Motoring organisations and advanced schools of driving have a role to ensure that drivers receive some exposure to advice through structured distribution. However, more selective involvement aimed specifically at older drivers is more appropriate to the Driver Vehicle and Licensing Agency, insurance companies, and especially the health carers, doctors and opticians who have regular contact with the older person.

Advice on giving up driving raises much greater difficulties. The variability in the performance of older persons means that it would be inequitable to prescribe in law the age at which driving must cease. The AA Foundation survey of older motorists demonstrated emphatically that any move to more stringent statutory procedures than the present "after 70" procedure would attract immense resistance. On the other hand development of voluntary arrangements, supported by advice and guidance from doctors would be largely acceptable. Indeed there was an expectation that the doctor should be the major source of advice, though the final decision on giving up driving should rest with the individual. Whether the input should be from the family doctor or another, independent, doctor remains unresolved.

Aware of the important role of the doctor in helping older drivers, the AA has taken the initiative of distributing a summary of the MCAP/AA report to GPs through the Family Health Services Authorities (FHSA) in England and Wales, the Health Boards in Scotland, and the Health and Social Services Boards in Northern Ireland. Nearly 10,000 copies have been circulated, of which about half went to individual doctors and half to group practices.

Undoubtedly further initiatives to help the older driver through health education and primary health care are anticipated as part of *The Health of the Nation* strategy.

2.6 Outstanding issues

The MCAP/AA review identified a number of areas where further understanding of the problems facing older drivers and how they might be helped was required.

i Study of specific behavioural problems encountered by older drivers, especially at junctions;

ii Re-analysis of existing statistical studies to clarify the changes in road travel which older drivers make;

iii Study of the reasons, circumstances and implications of giving up driving to help in providing appropriate advice to those needing to consider such a decision;

iv Examination of the effects of traffic environment and experience on older driver behaviour, since the older drivers of the future will have gained their experience in today's heavy traffic.

Some of these issues are already being taken up in new research projects, or are under consideration.

3 Older pedestrians

As the AA Foundation programme of work progressed, the need to promote more research on pedestrian accidents became apparent. Following a comprehensive study of accidents to young pedestrians by Lawson (1990), a study of road users' perceptions of risk and attitudes to safety by Carthy *et al.* (1993) specifically included pedestrians, covering all age groups. Two current research studies are exploring pedestrian exposure to risk, also covering all age groups, and defining the problems of the older pedestrian.

Current guidance setting out the principles of defensive walking have been developed by The British Institute of Traffic Education Research (1990), under contract to TRRL, to help older pedestrians look out for themselves more effectively. To build on this it is desirable to detail more evidence on specific situations in which risk is substantially increased by the combined effects of pedestrian behaviour, location in the road environment and manoeuvres made by traffic.

In the study by Carthy *et al.* some 133 road users (23 aged 65 plus) took part in road crossings at 7 sites. They were asked to rate each location in terms of risk; to assess what attributes of the road, traffic, vehicle and pedestrian behaviour had affected their rating; and their views on possible ways of improving road safety for pedestrians. Similar assessments of risk and perception from the pedestrians perspective were made by 473 road users (100 aged 65 plus) using video presentations of road crossing sites. The results suggested that amount and speed of traffic were perceived as most threatening by pedestrians, but there was interestingly a difference in perception of risk between responses from those who held driving licences and those who did not. The former were better able to assess risk at the roadside, but as drivers made little allowance for pedestrian activity. This approach is now to be developed further in a new study which will address specifically the problems of older pedestrians of 65 years and over, and seek ways of alleviating them.

Lack of evidence on pedestrian activity and movement has hindered progress on development of the understanding of levels of accident risk to pedestrians and the influencing factors. Conventionally pedestrian casualty rates have been related to head of population. But this takes no account of the amount of walking undertaken, nor under what circumstances. The only comprehensive study of pedestrian activity in Britain which could be used for establishing meaningful casualty rates was conducted by Todd and Walker (1975). This showed that evaluating casualty rates against different measures of pedestrian activity such as distance walked, time spent walking and numbers of roads crossed showed different patterns of risk for different ages and sexes of pedestrians. In the case of the older pedestrians these measures of exposure indicated even greater increases in risk over the younger adults than were apparent from the rates per head of population.

The current study being undertaken by the University of London Centre for Transport Studies and Steer Davies Gleave aims to fill this gap in knowledge. It comprises a detailed assessment of pedestrian activity and movement covering a wide range of housing types, road layouts and shopping areas in Northampton, selected as representative of Britain's towns and cities. Together with pedestrian casualty data the information

collected in the survey will advance the understanding of how and why pedestrians are exposed to risk in the road environment. Nearly 1000 people have taken part in the study, of which about one tenth are 65 years plus.

4 Commentary

In recent years there has been a growing awareness of the road safety concerns of older road users. The Department of Transport (1991) policy document *The Older Road User* highlighted the needs for action to reduce casualties amongst older pedestrians and drivers. A follow up Conference (British Institute of Traffic Education Research, 1991), when the main issues were presented and discussed, was designed to encourage increased awareness and action amongst all agencies involved with the welfare and safety of older people. It is timely that in the European Year of Older People and Solidarity between Generations, the present Conference emphasising the independence, mobility and safety of older road users should look further at the role of government and the professions.

The AA Foundation for Road Safety Research sponsorship of the Conference and its forward research programme demonstrate its commitment to advancing the understanding of how and why older people are injured on the roads, and seeking ways of helping them to travel more safely consistent with maintaining mobility.

The Automobile Association itself is committed to ensuring that the messages from the Foundation research are widely disseminated, and through its Public Policy Group promotes appropriate action to apply measures to help older road users.

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Growing older, wish to travel

An overview of the demography and the travel needs of the older road user

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Abstract

Demographic trends illustrate the extent to which, as healthcare has improved and longevity increased, the proportion of elderly people in the population has increased, especially those over 70. At the same time, more and more elderly people are drivers, and our patterns of living, travel, and land-use have all served to increase the need for individual mobility. It has become more difficult to meet the dispersed needs by public transport, and the incentive to continue to drive a car is greater. Although older drivers tend to travel less, they have a higher accident rate, and a markedly higher injury rate. Eyesight, hearing, physical strength and agility, mental acuity and reaction time all tend to deteriorate with age, causing particular problems to elderly drivers in increasingly complex and congested traffic. Moreover, when accidents happen, elderly people are more fragile and less able to stand the forces of the impact, so their injuries tend to be more serious. Because the proportion of elderly people is growing, we need to place a greater emphasis on building vehicles to suit them better, and designing road and traffic systems which take account of their difficulties.

1 Introduction

There has been much discussion lately about the growing number of older people in the population, and about the difficulties our social security systems may have in coping with this trend. Much of the concern in this context centres on the provision of pensions and medical care, and these are obviously important determinants of the quality of life.

But it is not sufficient to be adequately fed and housed, nor even to maintain good health. Like everyone else, older people need to take a full part in the many social activities which are an important aspect of the quality of life. To the extent that those activities are not available in the home (and, even where they are, most people wish to have frequent contact with other people), it is necessary to be mobile. For some people, poor health makes this difficult. But even for the fit, travel is often not easy.

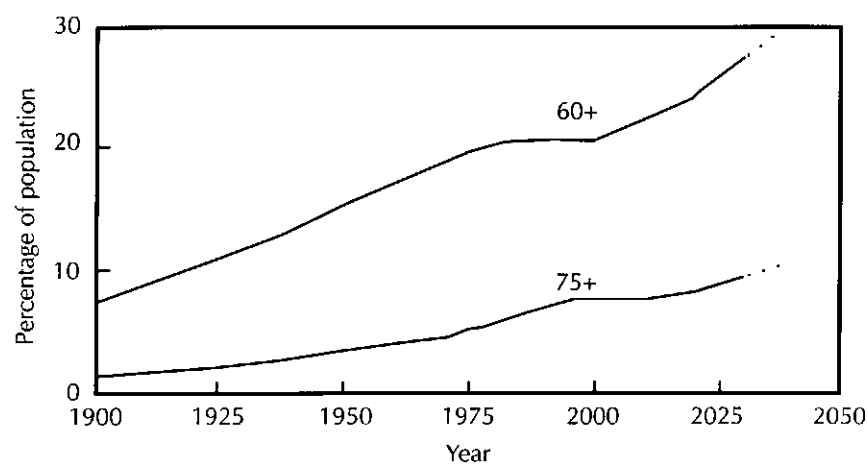
Bly, P H (1993) *Growing older, wish to travel* In Clayton, A B (Ed) Proceedings of a conference on *Older road users – the role of government and the professions*, AA Foundation for Road Safety Research, Basingstoke.

It is not a question of society "coping" with this sector of the population as a problem. Taken as a whole, older road users have some identifiable needs which are not adequately met, and which merit greater consideration. Conferences such as this can play a valuable role in describing what those needs are, and in suggesting how they might be met. This is a large and important section of the population, and the priority assigned to finding and applying the solutions should be already high. It will grow higher still, as the numbers of the elderly grow.

2 Demography

Figure 1 puts the present concerns about growth in the older population into historical context (Central Statistical Office, 1992). For convenience, the ages used to delineate the "elderly" are 60 and 75. Sixty can hardly be described as elderly, of course, and it is important to recognize that, with longevity increasing not merely because of medical intervention but also due to a generally higher standard of health, the increasing proportion of older people does not represent the same proportionate increase in people disabled or incapacitated by age. But 60 is the pensionable age for women, and for many men, and as such provides a useful yardstick.

Figure 1 – Increase in the older age groups as a proportion of total population

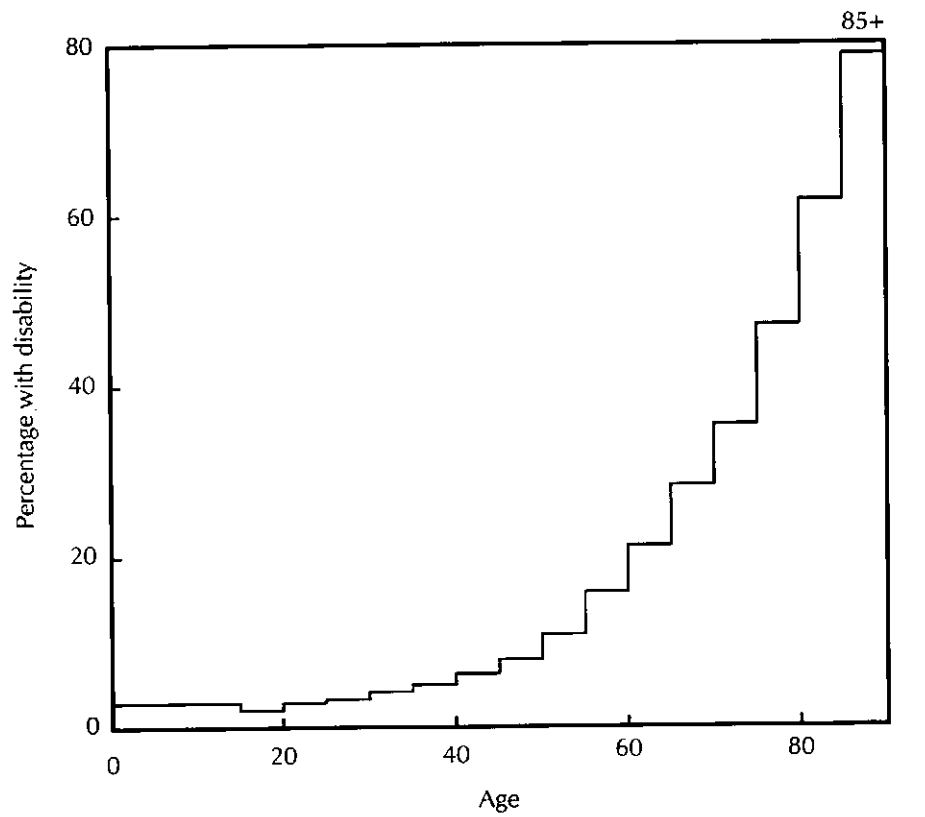


We are currently in the middle of a rather unusual pause in the historic upward trend, as people born during the low birth rates of the depression and second world war reach retirement age. Those born during the post-war baby boom reach 60 at the turn of the century, however, and growth thereafter is faster than in the 50's and 60's. By the year 2025 the proportion of the population over 60 will be three times as high as it was in 1900, and 50% greater than in 1960.

The growth in the numbers of people of 75 or more is even more marked, with a sixfold increase over the period. The same temporary pause in growth as for the 60 year olds, and for the same reasons, occupies the first decade of next century. In terms of identifying that part of the population which is likely to have substantial physical difficulties in travelling, 75 is a much more relevant measure, since as Figure 2 shows (Martin *et al.*, 1988) disability (as defined by OPCS – it includes relatively minor deficiencies)

increases very rapidly with age beyond 60, affecting almost half of peop in the 75 to 80 age group, and over threequarters above 85.

Figure 2 – Increasing disability with age



3 The need to travel

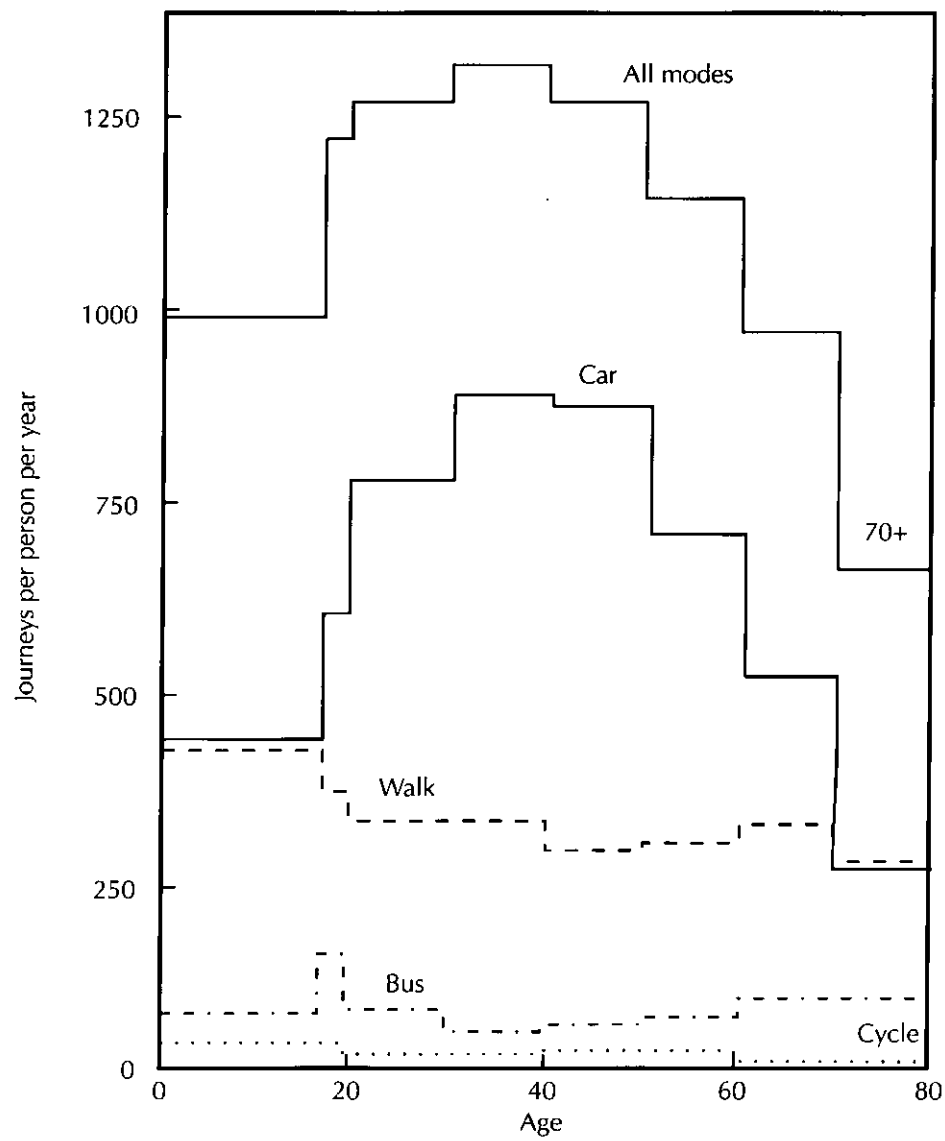
Naturally, older people are less likely to be in employment than those below 60, and there is therefore less travel to and from work. They are also less affluent, on average, than economically active people, and this also is likely to reduce their travel, either because they are less able to afford the activities to which other people travel, or the travel itself is too expensive. In addition, it is more likely that they will have physical disabilities which make travel, and some of the activities to which they might otherwise travel, more difficult.

For all these reasons, older people travel less than younger people, as Figure 3 shows (National Travel Survey, 1993). Of course, the number of trips made does not necessarily indicate the amount of travel older people might like to make if travel were easier or cheaper, or they were fitter, but without the necessity of travelling to work every day some reduction in travel is to be expected.

The most obvious aspect of Figure 3 is the much smaller use of car by older people. Indeed, people over 70 make rather less use of cars than do children, who only have access as passengers. People who do not have access to a car tend to make more trips by other modes, and certainly bus use is higher amongst both young and old than in the middle age ranges where car use is high. Walking also increases slightly in the 60 to 70 age

bracket, but it declines above 70, as the reduced ability to walk is a more important factor than the lack of car as an alternative mode.

Figure 3 – Use of different modes by age (National Travel Survey)

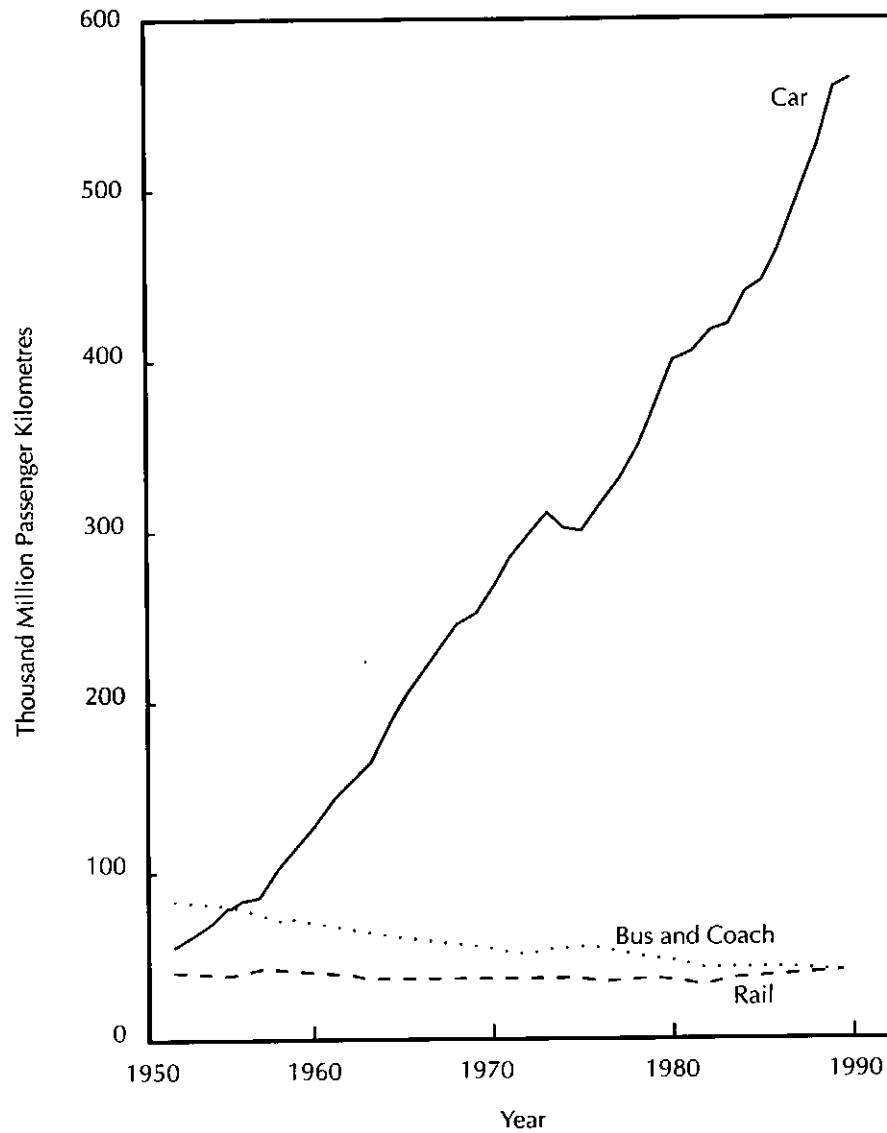


The private car is by far the dominant mode of transport generally. Its use is still increasing rapidly, not merely because car ownership is growing but also because people are travelling further. At the same time, fewer people are using public transport, which faces a growing difficulty in servicing the more dispersed journey pattern. The trends in the modes are shown in Figure 4.

The rapid growth in car travel represents not just the strong preference for this quicker and more flexible mode, but also the extent to which the whole of our society has become geared to the car. Mechanised transport has had a profound effect on where people live, work and pursue their various activities. In the first half of this century, trams and buses encouraged the lower density development of suburban homes, but

focussed activities into town centres and local sub-centres because public transport is best suited to this type of radial travel.

Figure 4 – Trends in travel



The car does not have these constraints. Indeed, the congestion generated by too much private traffic accessing the central urban areas has positively encouraged the development of new industrial and office estates, hypermarkets and leisure centres in out-of-town locations. For those with a car, these new patterns of activity can be very convenient (though they may cause serious environmental problems), but for those without private transport they are often very difficult to reach. And it is not simply that these new developments are inaccessible to many elderly people. Concentration of shopping and leisure activities into large out-of-town developments has reduced demand for the small local provider, so that the village shop and the town cinema have disappeared, and there are now fewer alternatives close at hand.

At the same time, use of public transport continues to decline so that, overall, services will tend to become spread more thinly and fares will rise. It is particularly difficult to serve the new peripheral developments effectively. Consequently, alternative means of transport are becoming progressively less satisfactory, since for most people distances to these developments are too great to walk or cycle easily. One further factor is the greater dispersal of families, so that grown-up children are likely to live further from parents than was the case a couple of decades ago. Thus the need for car travel is increasing, and there is greater pressure on older people to own a car if their finances permit.

4 Access to a car

Car ownership is relatively low among the older population, and in part this is an obvious consequence of lower income levels amongst retired people. But this is not the whole story. Younger people have grown up into a car-dominated culture, and are eager to acquire one as soon as they can possibly afford it. Many older people were not brought up in car-owning households, have never regarded the car as something they should aspire to, and may well consider driving as something beyond their interests or capabilities. They have never learnt to drive and do not wish to, even if their incomes might stretch to it.

This is illustrated in Figure 5, which shows licence holding as a function of age, for both men and women (National Travel Surveys, 1975 to 1991). There are a number of points worth making here:

1) almost 90% of men in the age range 30 to 60 hold a full driving licence;

2) licence holding is much lower among women, but follows much the same pattern with age;

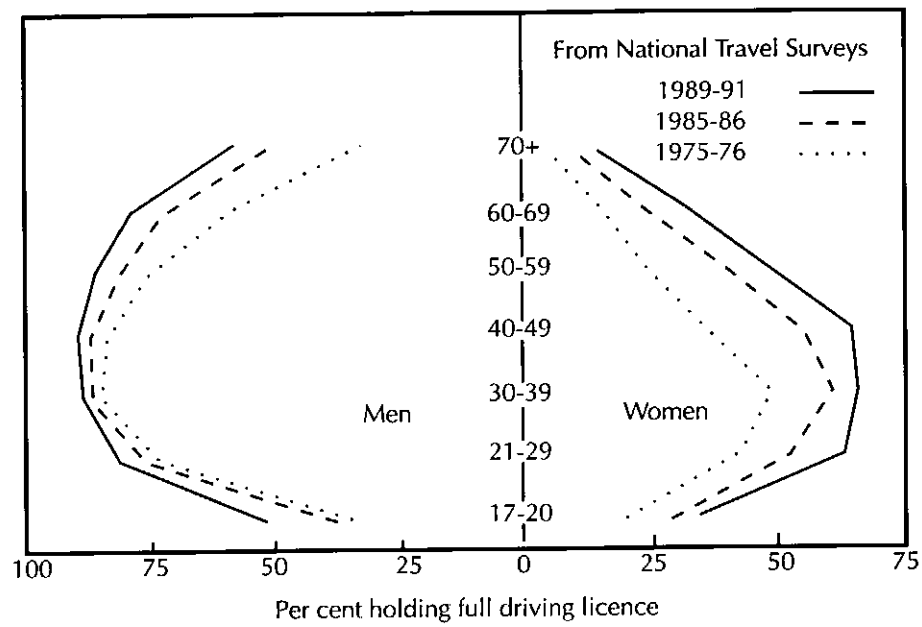
3) licence holding increases very rapidly with age above the minimum age of 17, as young people learn to drive as early as possible;

4) licence holding falls sharply with age in the older age groups, especially for women, where above 50 less than half of women can drive;

5) across the three National Travel Surveys, from 1975 to 1991, the increase in licence holding has been much greater for women than for men, and is growing most rapidly in the older age groups.

There is nothing surprising about all this. It simply means that the "driving habit" is at different stages of development as between men and women, and between young and old. It is not that the old have given up their driving licences, they have never had them. They will catch up rapidly however, not so much by the existing elderly gaining licences, but by present licence holders growing into the older age groups. Women of all ages are also catching up with the men, in this case for the most part by acquiring licences.

Figure 5 – Driving licence holding by sex and age

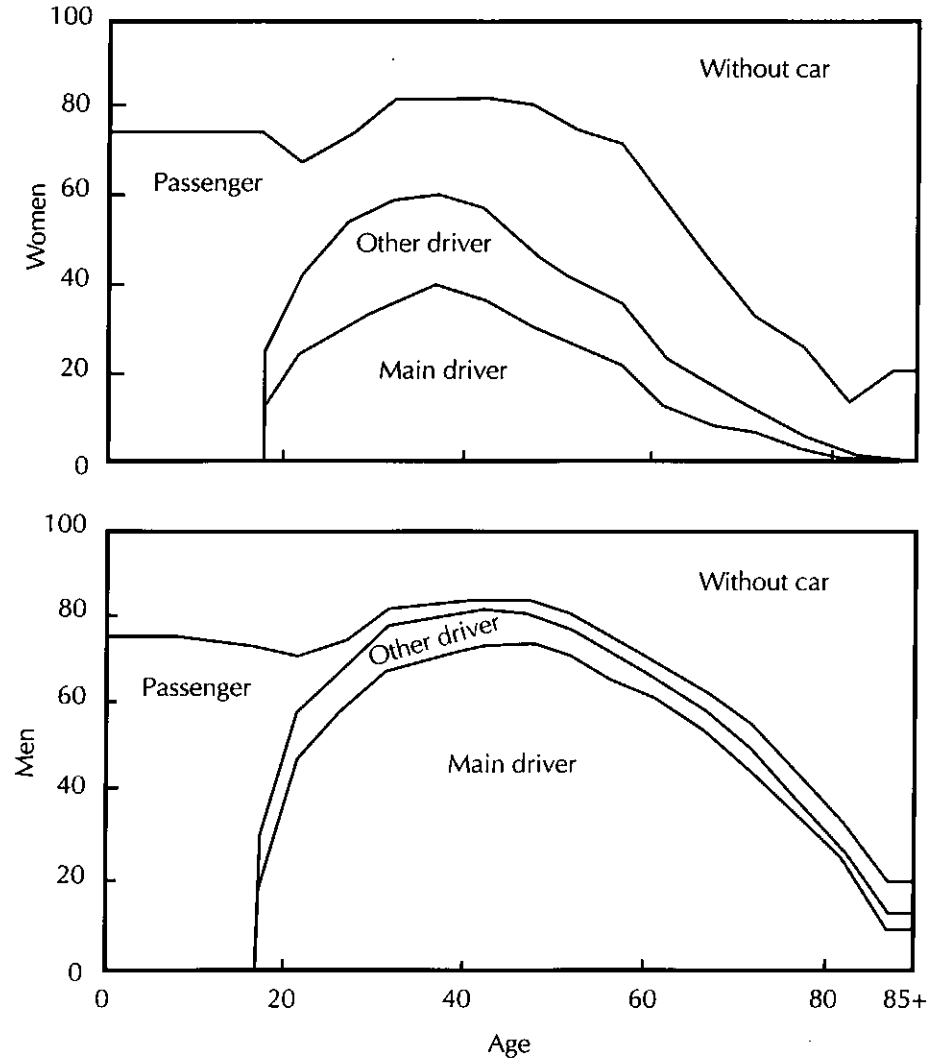


Thus the "car culture" will spread into the older groups as the population ages. The new elderly will be more likely to be able to drive, and to be used to having a car available. Of course, some may have to give up the car because they can no longer afford it, and others through ill-health, but after a lifetime accustomed to the car they will do this reluctantly and will try to hang onto the car as long as possible.

Access to a car shows much the same pattern as licence holding (Figure 6, after Oxley (1991), based on the 1985/6 National Travel Survey). In the middle age ranges, the majority of men have access to a car as the main driver, whereas this is much less true of women, who are more likely than men to have access either as "other driver" (ie not the main driver of the vehicle) or as a passenger. This merely reflects the reality that the family car is often considered to belong to the man rather than the woman of the household, and that many women in car owning households cannot drive though, as noted above, this is changing rapidly.

Most children have access to a car as passenger (for some trips), so that most of the population have some sort of access to a car across most of the age range – except amongst the elderly. For people over 70, most do not have access to a car, and above 80 only a tiny minority drive. In the highest age groups ill-health and loss of physical acuity will inevitably reduce the numbers of people able to drive, but nevertheless the driving habit will continue to spread up through the age range and the numbers of people wishing to drive, able to own a car, and determined to retain one as long as possible, can be expected to grow rapidly.

Figure 6 – Car access by sex and age (National Travel Survey, 1985/6)



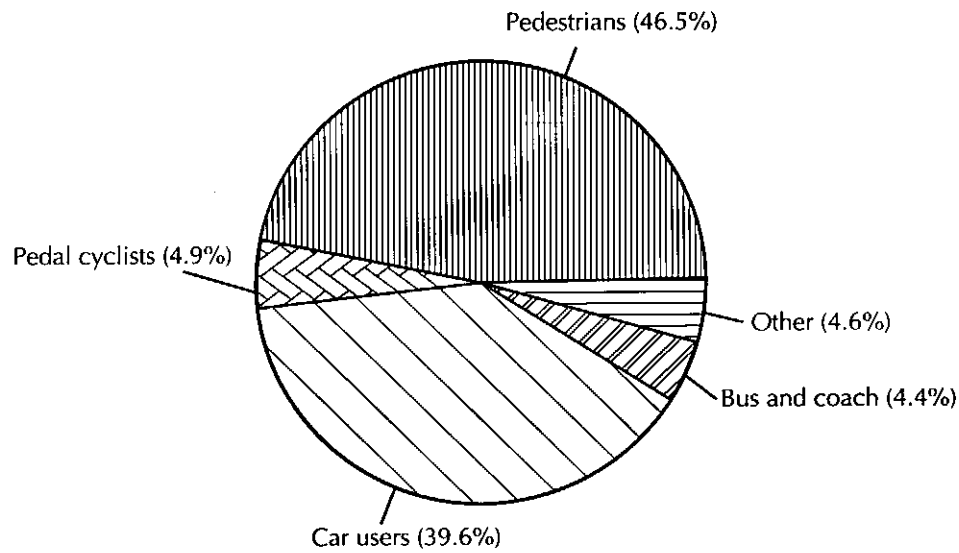
5 Road safety

If, then, our society places a premium on owning a car, because only the car offers the flexibility required to get to the most attractive, but very dispersed, destinations, there will be considerable pressure for people to continue driving beyond the point at which they feel able to drive safely. This raises concerns about the safety implications of the expected growth of car ownership amongst the elderly.

Overall, road casualty rates amongst older people are relatively low: at 287 casualties per head of population of age 60 or more, this compares well with rates of 694 for ages 16 to 59, and 398 for children up to 15 (Department of Transport, 1992). But the rate is declining more slowly than for the lower age groups. Figure 7 gives the breakdown by travel mode of people of 60 or more killed or seriously injured in road traffic accidents (Department of Transport, 1992). Almost half of the casualties are pedestrians, and only 40% are car occupants. Indeed, as noted previously, 60 is relatively young, and this concentration on pedestrian injuries is even more marked in the older age groups: for people of 75 or

over, 58% of killed or seriously injured casualties are pedestrians, and only 31% are car occupants. The likelihood of a pedestrian accident is highest in the youngest and oldest age groups (for people over 70, the rate is three times as high as for people between 30 and 50 – Department of Transport, 1992). Children tend to be involved because they are too nimble, running onto the road unexpectedly and without regard to traffic. The elderly are often involved because they are not nimble enough, taking too long to respond and get out of the way of an errant vehicle.

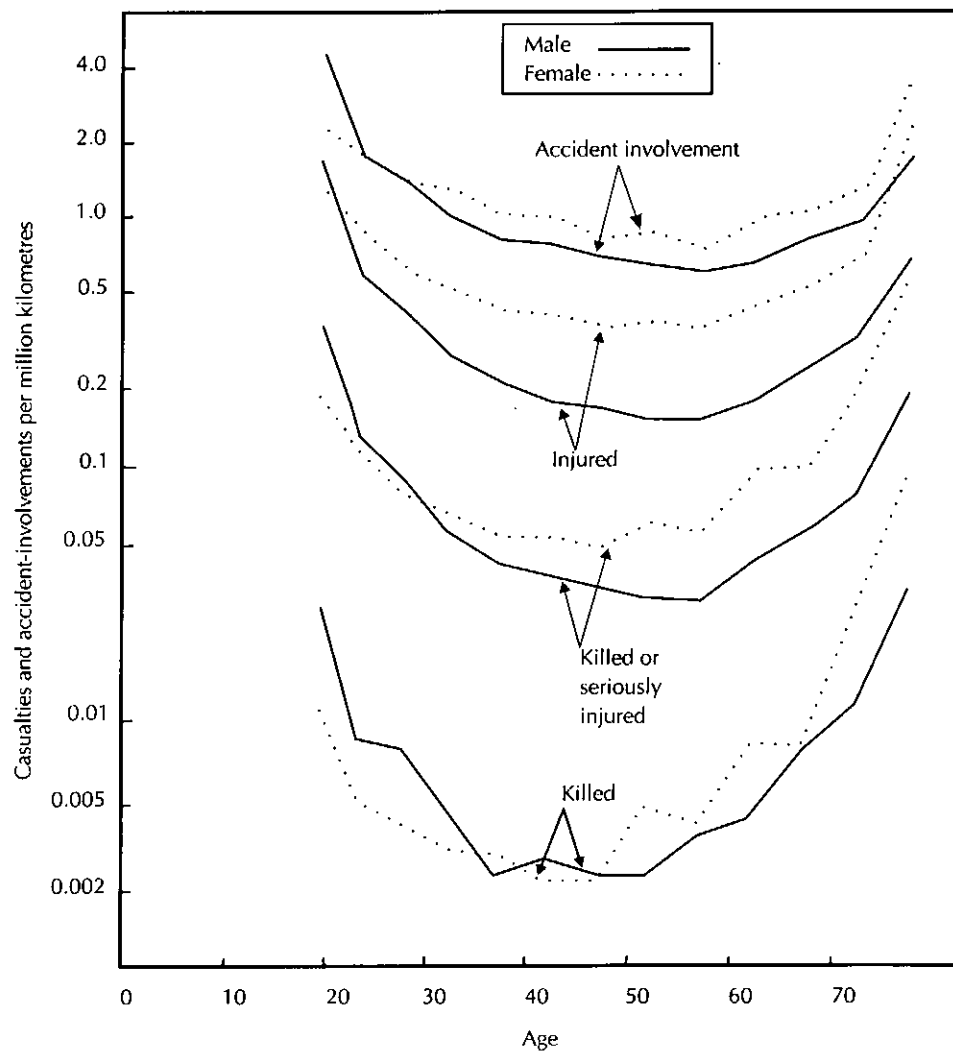
Figure 7 – Proportion of road users 60+ killed and seriously injured by mode



Car occupant casualties are a smaller group than pedestrians, but they are still rather larger than might be expected from the limited access to cars noted in the section above. The matter is examined further in Figure 8, which plots accident involvement and injuries against age (Broughton, 1990). This is a rather complicated diagram, but it makes some important points. The vertical scale measures accidents and casualties in relation to total distance travelled by each age group, so the fact that the older age groups do less mileage in cars than the younger groups is taken into account in these comparisons.

Figure 8 shows, for men and women separately, how the likelihood of an accident, or of each of three levels of injury, vary with age. The three levels of injury are **fatal injuries**, in the bottom curves, **serious plus fatal** in the second pair of curves from the bottom (serious injuries are typically those injuries which require hospitalisation), and **all injuries**, slight, serious and fatal, in the second pair of curves from the top. The vertical scale is logarithmic, so that there are very many more accidents (top curves) than fatalities (bottom curves), even though the two sets are relatively close to one another in the diagram. Roughly speaking, there are ten to twenty times as many serious injuries as deaths, five to ten times as many slight injuries (which include cuts and bruises) as serious injuries, and five times as many accidents as there are injuries.

Figure 8 – Car driver casualty and accident-involvement rates, 1986



In each case, the curve shown has a "U" shape, because both accidents and injuries are more likely amongst the younger age groups, and among the older age groups, than among the middle age groups. However, as far as accidents (top curves) are concerned, the left hand side of the "U" is higher than the right, showing that the younger age groups are more likely to have an accident than the older ones. Although drivers over 75 are more likely (by a factor of two or so) to have an accident than people in the age range 30 to 70, the likelihood is still much less than in the age group 17 to 25.

Turning now to the bottom curves, for fatal accidents, it can be seen that the right hand side of the "U" is higher than the left. That is to say, the older drivers are more likely to be killed in an accident than are the younger ones. This has, of course, nothing to do with older drivers having higher speed accidents. It is the younger age groups which tend to be involved in high speed accidents, and that is why they are even more likely to be killed, relative to the middle age groups, than they are to have an accident. On the whole, older drivers are likely to be travelling more slowly than the middle groups. They are more likely to be killed, however, simply because they are physically more fragile and injuries heal less well.

The same is true of the likelihood of serious injury, and this enhanced risk is especially noticeable amongst women.

In summary, then, Figure 8 shows that older drivers are more likely to be involved in an accident than drivers in the middle age groups, per mile travelled, but their risk is smaller than for the youngest age groups. They are much more likely to be killed or seriously injured in an accident, however, because they are physically less able to withstand the trauma.

6 The needs of the older road user

In discussing the needs of older road users it is useful to identify the problems which are more frequent in this age group than in others, but there will of course be many people who are unaffected by those problems. Equally, solutions to the problems common to older road users will also help some people in younger age groups.

The main problems for the older road user stem from the same two factors which cause difficulties in many other aspects of life. These are the general deterioration in health and lack of physical robustness, and their generally lower levels of affluence. Improvements in health care and medical treatments will mean that people at a given age will be more physically able than they were in the past, but the overall increase in life expectancy will provide greater numbers of people at higher ages where the physical problems are more severe. Apart from specific disabilities, there is inevitably some general deterioration in eyesight, hearing, physical strength and agility, mental acuity and reaction times which makes driving more difficult for some older people, especially in increasingly complex and congested traffic systems.

The continuing trend to more dispersed travel and land-use patterns will increase the need for car access to many destinations, and will make the alternative modes less satisfactory. To this extent, the travel problems of the elderly may become more difficult. Against this, growing affluence, insofar as the elderly will share in it, will make travel more affordable, and will increase access to a car or taxi. Nevertheless, there will inevitably be many older people who cannot afford a car or taxi, and others who cannot drive through disabilities of one sort or another.

It is possible that, in the longer-term future, some restraint may be put on car use in order to address environmental and congestion problems. It would be many decades before land use were markedly affected, however, and in the meantime any curbs on car use would compound the travel problems of older people, unless there were also big improvements in public transport.

It is not the purpose of this paper to discuss possible solutions in any detail. Other papers at this conference will build on the general overview given here. But it is clear that part of the solutions lie in vehicle design. Vehicles today, whether cars or public transport, tend to be designed with the average person in mind. Older people can find it difficult to cope with layouts which are negotiated with ease by younger people.

Buses can be designed so that access to both the vehicle and the seat is much more easily managed by those with the minor disabilities which become common with age. Low-floor buses can greatly ease access for both elderly and disabled people (and for mothers with young children and people with shopping), but this requires a wholly new design. Yet even within the shell of a traditional high-floor double decker there is much which can be done to ease access, by adapting the dimensions of steps and seats, by providing handgrips, and by using colour to make the steps and rails readily visible (Mitchell, 1989). The Disabled Persons Transport Advisory Committee (DIPTAC, 1988, about to be updated) has produced a valuable set of guidelines and specifications to improve bus design in these respects, and these are being widely adopted.

The design of many cars is also not well-suited to elderly people with restricted physical movement and limited strength. Automatic gears and power-assisted steering can help greatly with the driving itself, but door dimensions and seat layout often make getting in and out more difficult than necessary (Institute for Consumer Ergonomics, 1985). Advice is available to elderly and disabled people on choosing a model of car which minimises these difficulties (Department of Transport, 1985), but there is plenty of scope for manufacturers to consider the ergonomics of older people and produce designs which are better suited to them. The industry has argued in the past that there is not a sufficiently large market to make this worthwhile, but as noted above this is a rapidly growing market, and would seem to deserve at least as much attention as those for sports cars or off-road vehicles. For people with more serious disabilities, special adaptation of the vehicle controls can allow someone to drive who could not possibly control a normal vehicle, and here again useful guidelines have been developed (DOT/TRL/IMechE, 1990) to ensure that the modifications are made effectively and safely. The incidence of strokes in particular increases with age, but car adaptations and retraining can enable many sufferers to continue driving (Simms, 1991).

There will inevitably remain a large proportion of elderly people who will not have a car available, and they are likely to find it increasingly difficult to get to their desired destinations, as dispersal continues and activities tend to be located in larger facilities on the edges of towns, and public transport becomes less convenient. These problems can only be addressed by providing some form of transport specially tailored to the particular needs of elderly people, or by bringing the facilities to the people in the form of mobile shops or delivery services, or by trying to make the relocation of older people into suitable housing placed conveniently close to the necessary facilities much easier than it is at the moment.

Older pedestrians have a particularly high risk of accidents, and as the Department of Transport's helpful booklet on *The Older Road User* makes clear (Department of Transport, 1991) this is being addressed by the development of a safer traffic environment, in traffic calming and control schemes which will improve safety for all age groups, by the development of more intelligent pedestrian crossings which can allow for the slower progress of older people (Davies,1993), and by the provision of safety advice. Indeed, making older people aware of the dangers can be effective, for there is evidence already that they try to avoid risks by driving less at night-time or in congested or poor weather conditions (Brown and Schultz, 1991).

Rapid advances in electronic information systems may eventually assist the older driver by giving automatic warning of dangers and automating some aspects of the driving task (Wootton, 1993), though substantial help from this quarter is still some way off. Another consideration is the design of vehicles to protect occupants in accidents. The stiffness of seat belts and foam padding is selected to reduce the forces applied to the body during the rapid decelerations generated during collisions. This is inevitably a compromise, since protection designed to absorb energy in high-speed collisions may be too stiff to prevent less serious injuries in minor collisions. Similarly, protection stiff enough to minimise injury to a younger person may be too stiff to achieve the maximum reduction in injuries to an older person (Mackay, 1988). It is not practicable yet to provide protection of different stiffnesses to suit different ages, but this may become possible eventually, especially with active safety devices such as seatbelt pretensioners or airbags. Even in designs for the average person, however, the overall optimum design for safety should change as the average age of car occupants increases.

7 Summary

The numbers of older people will grow fairly rapidly after the turn of the century. Although people are becoming fitter at any given age, the numbers of people with some degree of physical infirmity will inevitably increase.

Car use in this age group will also increase rapidly, as the people who age into it will already be used to having a car available and will be reluctant to give it up despite reduced income and the onset of poorer health.

The current trends in land-use patterns will make it increasingly difficult to get to the desired destinations by other modes.

The design and layout of both cars and public transport could be made more convenient for older people to use.

Accident rates are higher amongst older drivers than average, but not so high as amongst drivers in the teens and early twenties.

Although elderly drivers find difficulty in coping with some driving conditions, they reduce their accident risk by avoiding driving at night and in congested or poor weather conditions.

Older car users have a higher risk of death and serious injury even than the youngest drivers, because they are physically less able to survive the forces involved in accidents, and may need different qualities of collision protection.

Older pedestrians have a particularly high risk of injury in road traffic accidents, and need special consideration in the design of protection from traffic.

In considering both the provision of transport, and their safety, the needs of older road users are often distinctly different from those of younger people. As older road users increase in number, they should be able to command a greater attention to these problems. Other papers in this conference will suggest what the solutions might be. To ensure that the solutions are applied, however, will require commitment and resources from all those with a responsibility for transport.

Acknowledgements

This paper was prepared within the programme of the Transport Research Laboratory, and has Crown Copyright. The views expressed are those of the author, and not necessarily those of TRL or the Department of Transport.

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Transport accidents and other accidents

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Abstract

This paper examines information on accidents generally, transport accidents, and road accidents. There were about 14,000 accidental fatalities per year in Great Britain between 1982 and 1991, of which 38% were in road accidents, 36% were in the home, and 26% were elsewhere. Transport modes other than road account for just over 2% of accidental fatalities. Accidental fatalities per head fell by about 2% per year during the decade. Transport in general, including even the relatively safe modes, has relatively high risks per hour compared with other everyday activities, such as being at home or at work. Therefore concern about transport safety seems justified. The safest modes per hour for passengers are bus and rail, but there are many more fatalities to non-occupants than occupants involving these modes. The unprotected road users – pedestrians, cyclists, and two-wheeled motor vehicle users – have the highest risks per hour. The risk per year of having a fatal accident of any kind is about three times greater for people over 65 than for the population as a whole. The main reason for this is that the risk of a fatal accident in the home, particularly due to a fall, rises sharply with age. The risk of having a fatal road accident is also higher for people over 65 than for the population as a whole, though more modestly so. The main reason why road fatalities per head rise with age is not that older people have a higher frequency of road accidents, but that the consequences of road injuries are more serious. It has been estimated that the same physical insult is about three times more likely to be fatal to a person aged 70 as to a person aged 20.

1 Introduction

This paper examines information on accidents generally, transport accidents, and road accidents. Section 2 considers fatal accidents and fatal accident rates of all kinds, but does not consider the effects of age. Section 3 considers the main classes of fatal accidents by age group: these are on the road, in the home, and others. Section 4 considers road accidents by age group, and considers non-fatal as well as fatal casualties.

2 Numbers and rates of accidents

We begin by looking at the numbers and rates of accidents of various kinds. For all except road accidents in this paper, fatalities are used as a measure of the relative importance of different kinds of accidents, because

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information on fatalities is generally available on a fairly consistent basis.

However, accidents also cause injury, damage, disruption, emergency service costs and administrative costs, and these obviously should be accounted for. The proportion of losses due to fatalities varies with the type of accident. For reported road accidents in Britain, fatalities account for 30% of the total annual cost on current values. For certain kinds of industrial and public transport accidents, the losses due to disruption and property damage may be much higher than for typical road accidents. This implies that fatalities alone may underestimate the relative importance of public transport accidents.

Table 1 – Average number of accidental deaths per year 1982–1991: Great Britain

Place	Average number per year
At home	5,050
At work	470
Transport	
Road	5,290
Rail	230
Air	50
Shipping	50
Other	2,890
All accidental deaths	14,030

Sources: Central Statistical Office (annual)
Department of Transport (annual)
Health and Safety Commission (annual)
Health and Safety Executive (annual)
Office of Population Censuses and Surveys (annual)

Table 1 shows that there were about 14,000 accidental deaths per year in Great Britain in the last decade. These represent 2.2% of all deaths, and 13% of all life-years lost under 65, because those who die in accidents are on average relatively young (Department of Health, 1991). Suicides are excluded.

Of the 14,000 fatalities per year, there were about 5,000 each in the home and on the road, and 500 at work. Rail had about 230 fatalities per year, of which about 80 were to passengers, staff and other people who were lawfully on railway property, and 150 were to "trespassers", who were unlawfully on railway property. Air and merchant shipping each had about 50 deaths per year on average, though these figures can be influenced by a single disaster. The definitions of what deaths are included vary somewhat between the transport modes, but it is clear that the number of accidental deaths per year on each of the non-road modes is a small fraction of that on the roads.

Figure 1 – Accidental deaths per head: Great Britain: 1982–1991

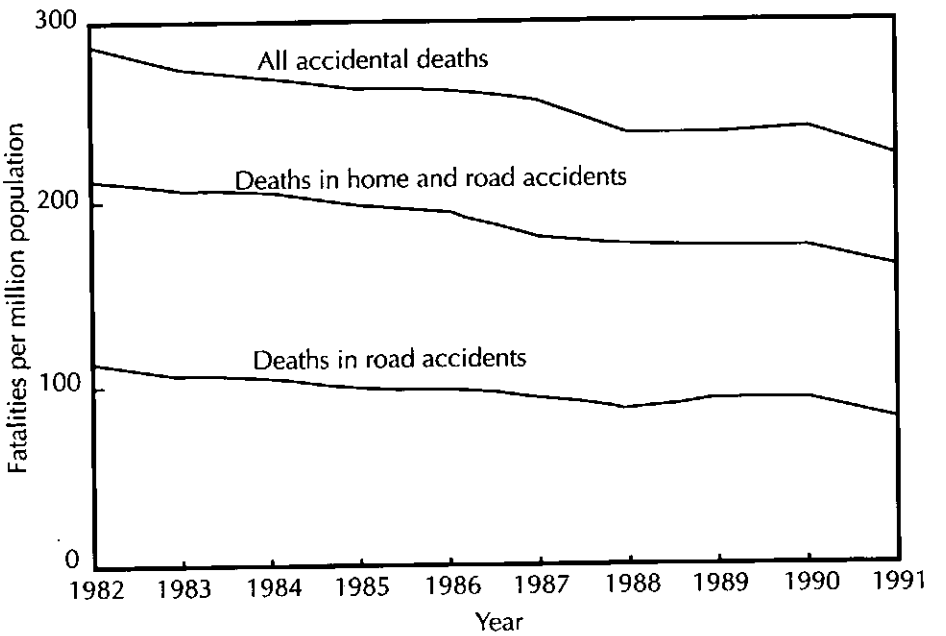


Figure 1 shows the trends in accidental fatalities per head in the major groups. Fatalities per head in each main category – on the road, in the home, and other – each fell by about 2% per year.

Part of the reason why there are far more fatalities on the roads than on the non-road modes of transport is that the roads are used much more, so there is greater exposure to risk. It is useful therefore to express the numbers of fatalities as rates of some kind, and to consider the numbers of fatalities both per unit distance of travel and per unit of time spent travelling. The latter permits comparison not only between the transport modes but also between transport and other activities.

Collings (1990) has recently provided fatality rates per passenger-kilometre, passenger-hour, and passenger-journey for travel by the main transport modes. It is sensible to use these, even though the periods covered do not coincide exactly with those in Table 1.

Table 2 presents his fatality rates per 100 million passenger-hours and passenger-kilometres, with the modes ordered by their fatality rates per hour. Table 2 also presents accidental fatality rates per 100 million hours of work by employees, overall and in a selection of occupations, and fatality rates per 100 million hours at home. In the industrial risk literature, the rate per 100 million hours is sometimes called the fatal accident rate (FAR) (Kletz, 1992). Hambly (1992, Appendix A) gives an interesting table of FARs of other activities.

Table 2 shows that, when exposure is allowed for, the difference between public transport and the private road modes is reduced. Nevertheless, public transport is still relatively safe for passengers, including bus and coach travel. So is car travel. However, the unprotected road users – pedestrians and two-wheeled vehicle users – have the highest fatality rates, and two-wheeled motor vehicle users are in a class by themselves.

The vulnerability of pedestrians means that some door-to-door journeys by public transport may be riskier than the same journeys by car, in spite of the relatively low risk on public transport, because people may be exposed to relatively high risk while walking to and waiting for public transport.

Table 2 – Accidental fatality rates for transport and other activities

	Fatalities per 100M passenger-hours	Fatalities per 100M passenger-km
Passenger travel by:		
Bus or coach	1.4	0.06
Rail	6.0	0.1
Car	12.4	0.4
Water	16.0	0.8
Air	20.0	0.04
Foot	27.0	7.0
Pedal cycle	64.0	4.6
Two-wheel motor vehicle	342.0	11.4
Employment		
All work	0.9	
Banking and finance	0.17	
Chemical industry	1.1	
Construction work	4.9	
All railway work	5.6	
Extraction of ores	13.0	
Being at home:		
All ages	2.6	
People under 65	1.0	
People 65 and over	11.5	

Sources:
Passenger transport: Collings (1990):
Air, rail, water: 1979–88;
Bus or coach: 1984–88;
Other road: 1988.
Employment: calculated by the author for 1986–1991 from data in Health and Safety Executive (1992), assuming a 2,000 hour working year;
Home: calculated by the author for 1982–1991 from data in Office of Population Censuses and Surveys (annual), assuming an average of 3,500 non-sleeping hours at home per person per year.

Another point about buses and trains is that, although their fatality rates for passengers are low, they are involved in many more deaths to non-passengers than passengers. For buses there are about eight times as many non-passenger as passenger fatalities, and for railways there are about 4.5 times as many. In the case of buses the other fatalities occur among other road users and are counted in the relevant groups. For trains the other fatalities are mostly among track workers, users of level crossings, and – most of all – trespassers.

Table 2 also shows that travel generally is relatively risky compared with other everyday activities, such as work and being at home. For most occupations, being at work is less risky than being at home, and both are much less risky than travelling, especially as a pedestrian or two wheeled vehicle user.

3 Accidents by age group

Table 3 and Figure 2 show that the numbers and types of accidental deaths per head per year vary greatly with age. People over 65 have the highest accidental death rate (762 accidental deaths per million population per year), and 15–24 year old group the second highest (247 per million population per year). For the oldest age group, the majority of accidental deaths occur in the home; for the 15–24 year old group, the majority of accidental deaths occur on the road. The over 65 group have somewhat fewer road deaths per head than the 15–24 year old group, but more than the other age groups.

Table 3 – Accidental deaths per year per million population by age group: Great Britain 1982–1991

Age group	On the road	In the home	Other accidental	All accidental deaths	All deaths
0–14	42	24	17	83	881
15–24	185	26	35	247	560
25–64	77	41	49	167	4,312
65 and over	155	404	204	762	59,204
All ages	100	91	65	255	11,535

Sources: *Road Accidents Great Britain*, Department of Transport (annual); *Mortality Statistics*, Office of Population Censuses and Surveys (annual).

If accidental deaths are considered as a proportion of all deaths, the age pattern looks very different, as is shown in Figure 3. For the over-65 group, accidental deaths are a small proportion of all deaths, and road deaths are a small proportion of accidental deaths. For this group, road deaths are thus only 0.26% of all deaths. On the other hand, for the 15–24 age group, accidental deaths are a substantial proportion of all deaths, and road deaths are the dominant component in accidental deaths. For this age group, road deaths are 33% of all deaths.

Figure 2 – Accidental deaths per head: Great Britain: 1982–1991

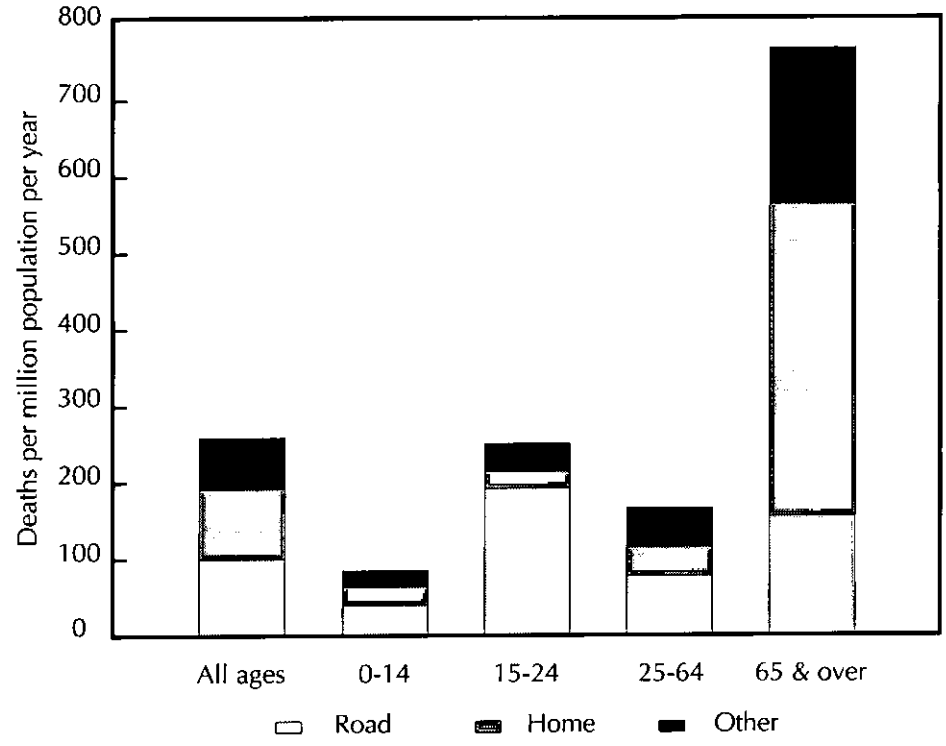
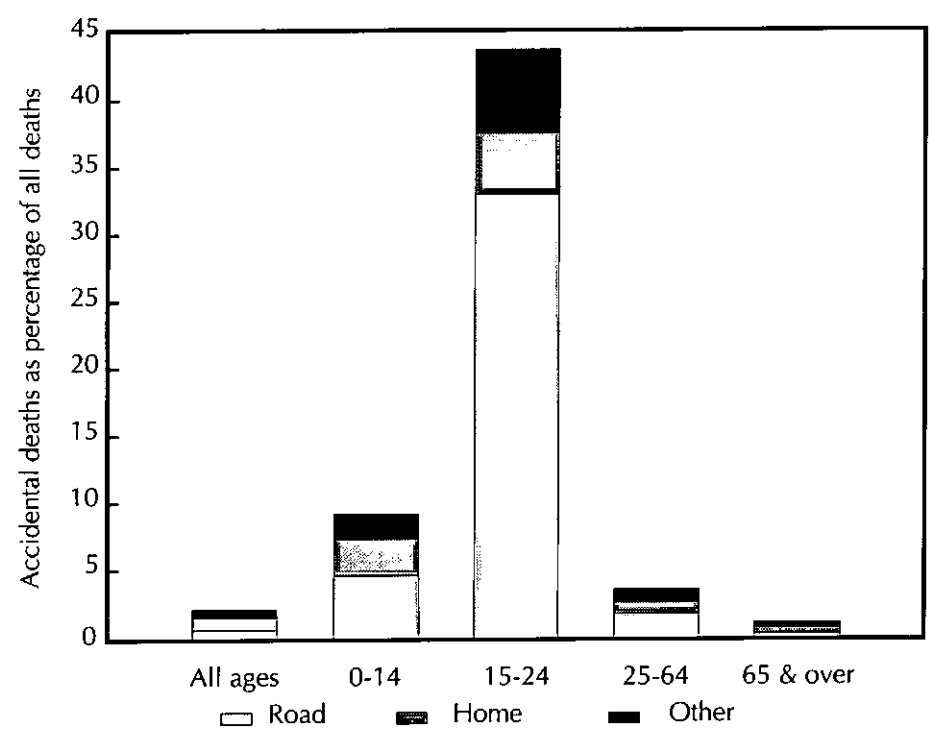


Figure 3 – Accidental deaths as a proportion of all deaths: Great Britain: 1982–1991



4 Road fatalities and casualties by age

Figure 4 shows the pattern of road fatalities per head per year through the age ranges for 1989–1991; Figure 5 shows the corresponding pattern for all road casualties. The patterns are very different for the older age groups. There is a sharp rise in the number of fatalities per head as age increases for the older groups, as was also shown in Figure 2.

Figure 4 – Road fatalities per head: Great Britain 1989–1991

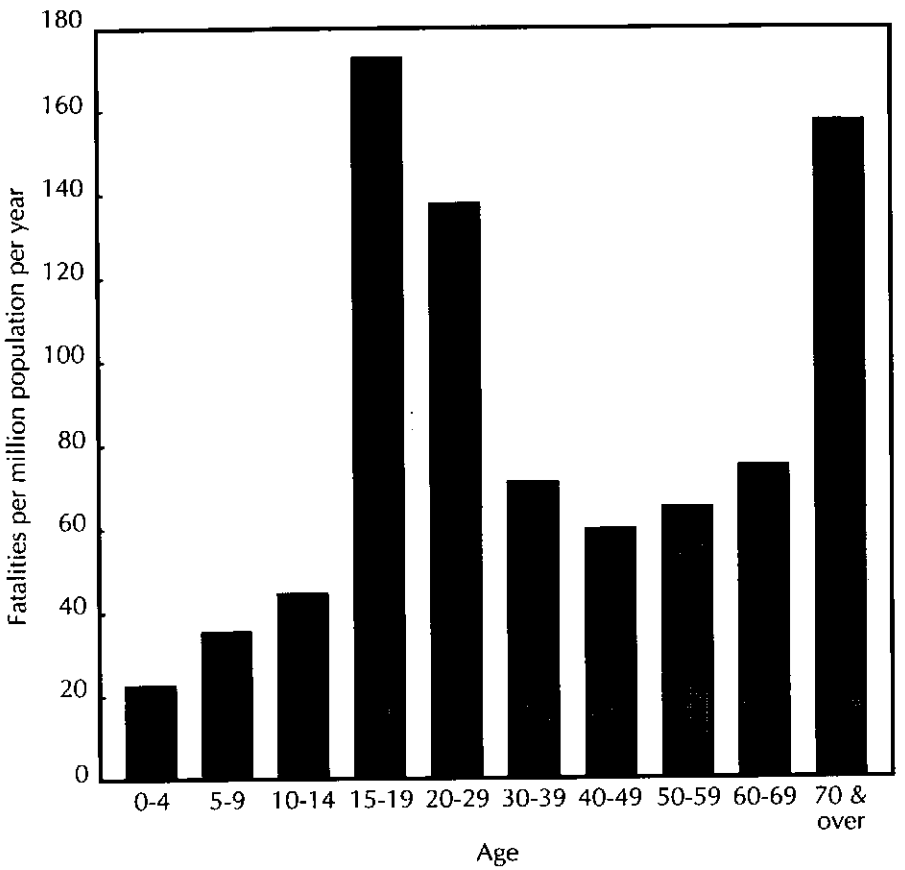
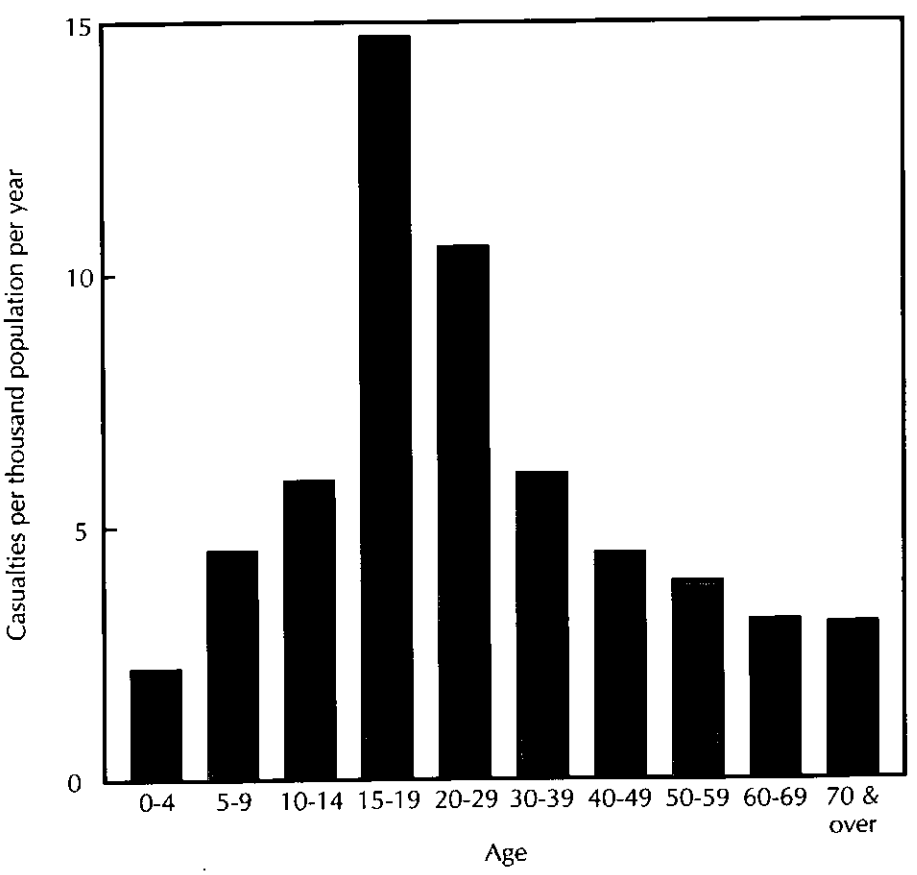


Figure 5 – Road casualties per head: Great Britain 1989–1991



However, there is no similar rise in the total numbers of casualties per head in the older groups, which remain relatively low. Therefore the older groups do not appear to have especially high accident frequencies but the consequences of accidents are relatively severe for them. The proportion of casualties that are fatal thus rises sharply with age.

Figure 6 shows the proportions of casualties that are fatal for the main age groups and classes of road users. The figure shows that for each age group the proportion of pedestrian casualties that are fatal is higher than the proportion of car occupants in the same age group, presumably because pedestrians are more vulnerable. However, for both pedestrians and car occupants, the proportion of casualties that are fatal rises sharply with age. The ratio reaches almost 10% for pedestrians over 70, compared with an average of 3% for all pedestrians.

Figure 6 – Proportion of road injuries that are fatal: Great Britain 1989–1991

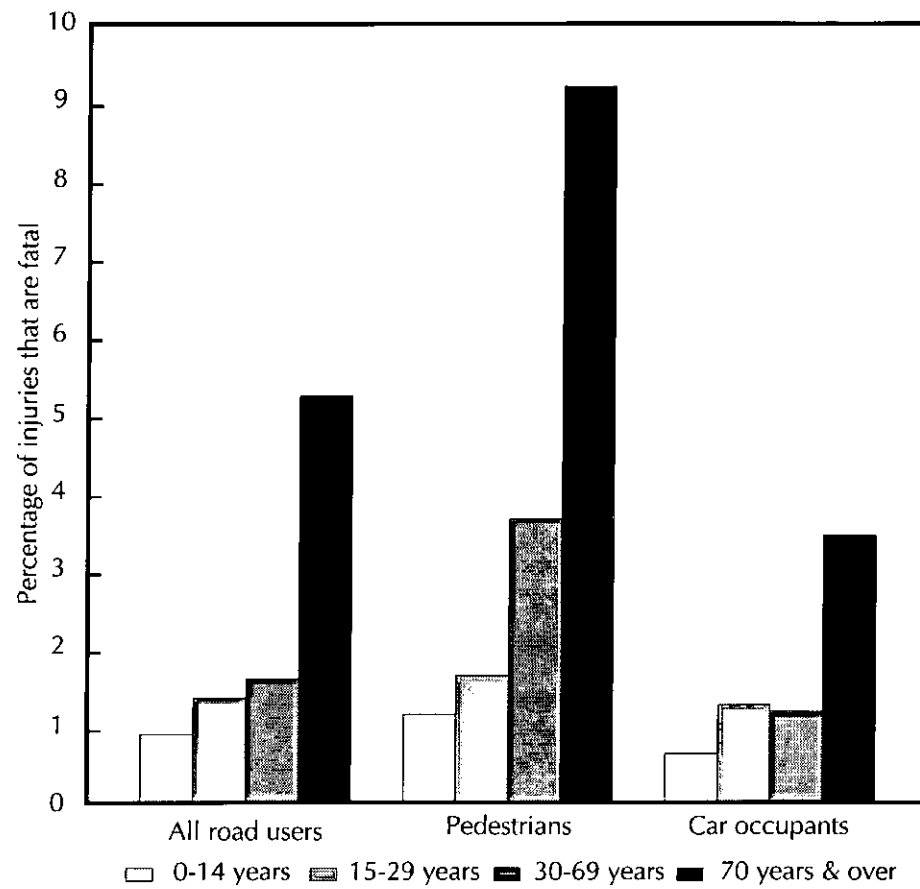


Figure 7 and Table 4 show the number of fatalities per head in each age group among the main types of road users. Of the fatalities in the over-70 age group 65% are to pedestrians, 30% are car occupants, and 5% are other types of road user. The corresponding figures for all age groups are 36% pedestrians, 46% car occupants, and 22% others.

Figure 7 – Road fatalities per head: Great Britain 1989–1991

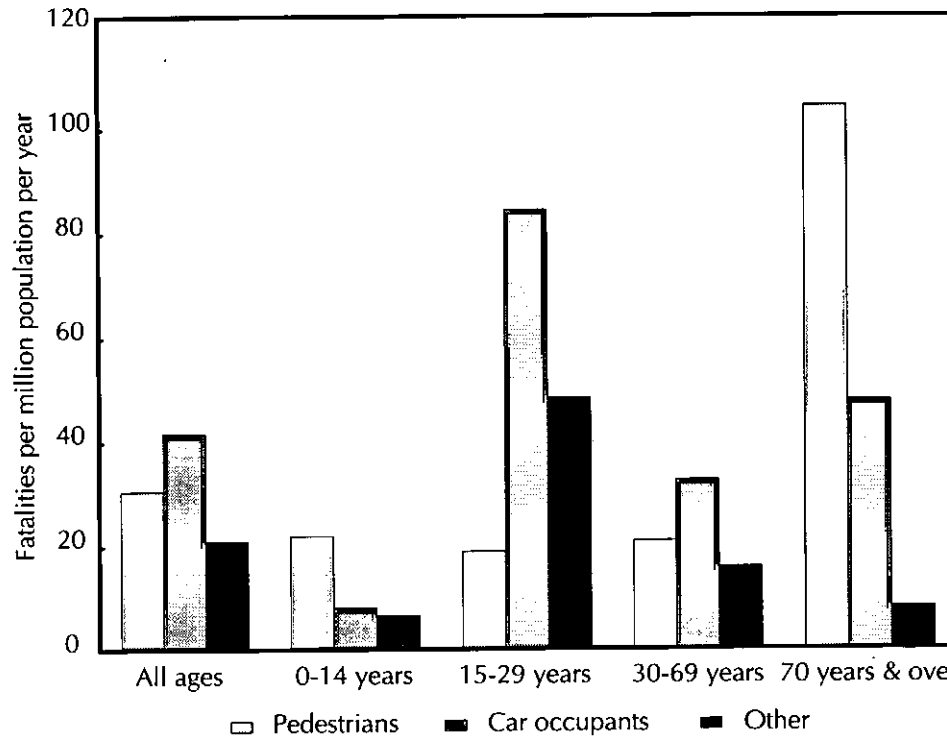


Table 4 – Road fatalities per year per million population by age group: Great Britain 1989–1991

Age group	Pedestrian	Car occupant	Other	All fatalities
0–14	21	7	6	34
15–29	18	83	47	148
30–69	20	32	15	67
70 and over	102	47	8	157
All ages	29	41	20	89

Source: *Road Accidents Great Britain* (Department of Transport, annual).

Table 5 – Road casualties per year per million population by age group: Great Britain 1989–1991

Age group	Pedestrian	Car occupant	Other	All fatalities
0–14	1,968	1,199	878	4,045
15–29	1,146	7,026	3,496	11,668
30–69	563	2,812	1,047	4,422
70 and over	1,115	1,382	526	3,023
All ages	1,040	3,342	1,542	5,924

Source: *Road Accidents Great Britain* (Department of Transport, annual).

Figure 8 – Road casualties per head: Great Britain 1989–1991

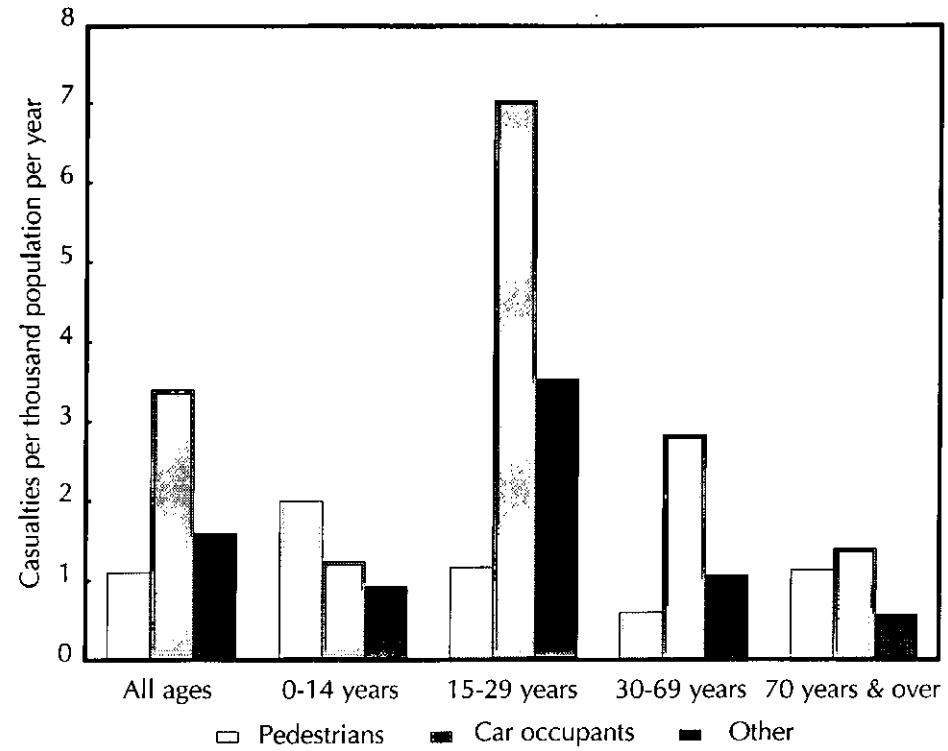


Figure 8 and Table 5 show corresponding data for all casualties. The all-casualty pattern for the over-70 age group is quite different from the fatality-only pattern: 37% are pedestrians; 46% are car occupants; and 17% are other road users. The number of pedestrian casualties per head among people over 70 is higher than in the middle age ranges, but lower than for children.

Table 6 – Pedestrian casualties per year per million population by age group: Great Britain 1989–1991

Age group	Crossing road		Not crossing road	All
	At crossing	Elsewhere		
0–14	126	1,676	166	1,968
15–29	108	784	254	1,146
30–69	63	377	143	582
70 and over	121	867	127	1,115
All ages	93	776	172	1,040

Source: *Road Accidents Great Britain* (Department of Transport, annual).

Table 6 shows the number of pedestrian casualties per head by location. For all age groups, a large majority of casualties occur while the pedestrian is crossing the road at places other than at a pedestrian crossing. The location pattern for pedestrians over 70 is broadly in line with that for all pedestrians.

5 Conclusions

The risk per year of having a fatal accident of any kind is about three times greater for people over 65 than for the population as a whole. The main reason for this is that the risk of a fatal accident in the home, particularly due to a fall, rises sharply with age. The risk of having a fatal road accident is also higher for people over 65 than for the population as a whole, though more modestly so. On the other hand, the proportion of all fatalities that are due to accidents is much smaller for people over 65 than for other age groups.

No information is given in this paper on the age distribution of fatalities on transport modes other than road, but since the numbers are small, they are unlikely to have a great effect on the risks in any particular age group.

About 65% of road fatalities among people over 70 are to pedestrians, and 30% are to car occupants. The risk per year of accidental death as a pedestrian is about three times greater in this age group than in the population as a whole. On the other hand, the risk of injury as a pedestrian is about the same for people over 70 as in the population as a whole. The implication is that the frequency of pedestrian accidents is similar for people over 70 as for the average of people under 70, but the consequences are much more serious. The locations of pedestrian casualties are broadly similar for people over 70 as for the average of people under 70.

The proportion of car occupant injuries that are fatal is also much higher for people over 70 than people under 70. Evans (1991, p42) has estimated from US road accident data that the same physical insult is about three times more likely to kill a person aged 70 as a person aged 20. The data in this paper are consistent with this, and this increasing fatality risk is the most important single aspect of accidents to older road users in our data. The high home fatality rate among older people may arise partly for similar reasons.

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The role of town and country planning

Planning for choice and mobility

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Abstract

The issues raised in planning for choice and mobility amongst older persons can be seen as a more extreme version of those confronting Society at large. An increasing proportion of old people have both the wish and the capability to exploit the freedoms obtainable from personal use of a car. However, not only is it not practicable to provide fully for this wish but the consequences would be particularly damaging to old people themselves (because of the hazards of a car-dominated environment and the deteriorating accessibility which is created for those who do not have the use of a car). The prospective adverse consequences are of a scale which cannot be mitigated by simply tweaking established practices – for example, through improved design or special development or transport initiatives – important though these may be as short-term palliatives. To ensure independence and mobility for all it is necessary to adopt an over-arching planning strategy which makes it practicable to travel freely without resort to car use. Furthermore it is necessary for non-car travel to become more commonplace amongst those who do own a car – of all ages – in order to create the social environment in which choice and mobility for old people can become a practical reality. The paper builds on recent Government Planning Guidance to identify the components of such a strategy.

1 Introduction

The invitation to me, as a representative of the planning profession, to present a paper at this conference is perhaps a little surprising. Glad though I am to accept, I cannot believe it escaped the organisers' notice that town planners have very little directly to do with roads or road users! But clearly they are more perceptive. People only use roads because they are trying to get from A to B and it is town planners who seek to influence what goes on at all the As and Bs. Hence their decisions are a major factor in determining the volume and pattern of movement on roads, or to put it another way just how far and where people have to travel to in order to meet their requirements. In my view this issue of **accessibility** is at the

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heart of town planners' contribution to enabling people to lead full and independent lives and will be the focus of my paper.

I thought it would be helpful however to begin by identifying the opportunities and constraints surrounding planning action generally and then consider this in relation to the issues of mobility and accessibility in particular. I then go on to consider the distinctive characteristics and needs of older people and what sort of planning response might be appropriate to meet them. Finally I return to the issue of practicability to consider the prospects for achieving the sorts of action seen as desirable.

2 What can planners influence?

My remarks are made in the context of planners working for a local planning authority, ie that section of the profession which is involved in regulating proposals initiated by private developers. The distinction is important because planning authorities make their decisions in relation to some conception of the public interest – which hopefully includes the mobility of older people. By contrast planners acting on behalf of developers or landowners will naturally only have the interest of their clients in sight and these will frequently **not** include the needs of older people. Reconciling the conflict between public and private interests is at the heart of the statutory planning system and personal mobility is but one of many issues at stake.

In their role as regulator planning authorities have jurisdiction over two main matters:

i) the use of land, ie the type of activity (residential, retail, industrial etc) and intensity appropriate to different parts of an area, and

ii) the design and layout of buildings, including provision for access and parking, and for movement within the site and between adjacent sites – especially important in relation to larger developments.

Planning control is only invoked where a substantial change is proposed in either or both of these – typically when a site is being developed or redeveloped or when buildings are being physically altered or converted to a different purpose.

This implies three very important limitations on the scope for planning influence;

i) It only exists where **change** is being contemplated. Even over a period as long as a decade the bulk of sites, their use and development, remains unchanged. Any consequential impacts from this existing development – on mobility or anything else – therefore constitute a legacy over which planners in the present day can exert no influence.

ii) Planners act mainly in a **responsive** mode. However desirable a particular type of development may be from the public viewpoint, planning authorities have no means of ensuring that it takes place if the relevant landowner or developer do not wish it. Much planning activity in fact consists not simply of regulation but of negotiation between the parties to try and ensure that certain elements sought by the authority (eg a proportion of social housing) are included in return for the benefit of planning permission.

iii) Many changes which take place in the use of buildings, and which are the subject of public concern, fall outside the **scope of planning control**. No permission is required to cease the use of a building so that a valued local facility may be closed without reference to the public interest at all. Equally a particular use may be changed but within a general permitted category – for example the change of a shop from food store to video rental, or in the types of case accepted for treatment at a local hospital or clinic – which may fundamentally affect the lives of people previously dependent on it.

Another very important constraint is that the "public interest" which can be invoked has to be within the limits of what the Government deems to be relevant to the use and development of land. The public interest in related matters – for example the effect on personal mobility other than that resulting from the proposal on the site itself – is not allowable as a material consideration.

3 The relationship of planning to mobility and accessibility

Personal mobility is the ease of moving about. It is a function of the quality of the various transport systems, subject to any factors which limit individuals' ability to make use of them – principally their physical mobility, car availability, income and domestic commitments.

Compared with professions working directly on the management or improvement of transport systems, planners' influence on mobility itself is somewhat minor and cannot address the contributory personal factors at all. It is significant however in three respects:

i) in determining arrangements for access, movement and vehicle storage associated with individual developments (including in some cases deliberate **restriction** of provision as part of an authority's overall transport policy),

ii) in ensuring that the type and intensity of development, and the resulting traffic generation, does not exceed the capacity of the highway network in the vicinity, (ie avoiding worsening mobility through traffic congestion), and

What can we, in the medical profession, do to help?

Our advice is likely to be listened to, provided it is reasonable and does not conflict too much with the patient's self interest.

I would like my profession to become more aware of its responsibilities to the older driver and suggest:

More definite advice about driving. Often, this is easily given, particularly when the doctor has been seen in a new car. An automatic gearbox is a help, provided the driver has made the change from manual when young enough, and good, all-round vision, even if extra mirrors are added, will help those who are stiffening with age.

Sharing the driving. When going on long journeys, take frequent breaks to avoid fatigue and change drivers regularly. The tendency is for the man to drive most of the time but, as he is likely to be older, he may have to give up driving before his wife. She will thus, be less skilled, more anxious about driving, and out of practice, when the time comes for her to take over all the driving.

Discussion about changing skills – and the ways of using the car at the best times for safe driving. Advice about avoiding tension and the fact that it is possible to learn how to relax. People should even be prepared to cancel a journey if the conditions are not suitable. For example, the glare of headlights on a wet night may cause undue distress. Advice about deteriorating health – which may, ultimately, prevent driving. These changes are often mental as well as physical. Dementia is just as much a problem as arthritis.

Early advice will give the driver time to change a lifestyle that may be dependent on the car. If, however, the problem is some form of disablement, requiring modifications to the car, then the appropriate skilled advice can be obtained. It is here that the Mobility Advice and Vehicle Information Service (MAVIS) can be very helpful. They give skilled advice on how to adapt cars for the disabled and on those that are most suitable for the older driver.

In some parts of the United States, there are various courses to help the older driver, by finding out the problems of which the individual may be unaware. This gives a chance to change habits. An additional incentive to change is that some insurance companies will give reduced premiums to those who have been involved in these courses.

Recently, SAGA Holidays have started to organise similar driving courses for the elderly, who feel that their driving skills need to be improved. Perhaps our insurance industry will now follow their American colleagues and offer lower premiums to these drivers.

Medical advice is most important, as the doctor must, and I emphasise must, view his patient as a whole. He should consider what are the effects of disease, such as heart problems and arthritis, on driving skills. What harmful effects of prescribed drugs may occur? Will sleeping pills still have a sedative effect the next day? I fear that too few doctors give firm, clear advice about the side effects of drugs, or remember that these may affect

- because of illness, disability or death of a partner there can be an increase in the number of activities a person has to carry out, but also a reduction – often dramatic – in the time, money or car availability for them

- there is an increased need for medical journeys and for supportive social contact at times of personal stress, particularly important in the context of the policy shift towards "Care in the Community".

These two main differences relating to retirement and mobility impairment – important though they are – should not obscure the fact that in many other respects older people exhibit the same characteristics as other age groups, including the variety that is to be found **within** any one group. Indeed the fact that someone is old, of itself, is much less important than whether they live in town or country, are rich or poor, fit or disabled, with or without a car, have local family and friends etc. An old person in any one of these categories will have travel habits and needs more like their younger counterparts than the generality of their peers.

Over time, with growing affluence, car ownership and licence holding, a greater proportion of people (young and old) are moving to more spacious surroundings and/or adopting a more travel-intensive, car orientated way of life. As a result, built-up areas are expanding and population densities are falling. The historic pattern of "freestanding" towns and villages is being replaced by broader groupings of towns and dormitory settlements which are functionally linked as urban regions. The greater mobility now available to the majority of people enables retail and other services to operate more efficiently from fewer, larger outlets – often in purpose-built premises located outside traditional town and suburban centres so that provision can be made for easy access by car. The whole centrifugal process is made possible by large-scale investment in the highway network, particularly in motorways and other major inter-urban roads.

Meanwhile for those people without the use of a car accessibility is deteriorating as local facilities disappear and major new ones are located further afield at places which are more difficult to get to. Public transport services are tending to be reduced or become more expensive, and conditions for walking or cycling more difficult and unpleasant in an increasingly car-dominated environment.

Looking solely at older people the conflicts that are generated by this process and the polarisation of opportunities **within** this age group are even more profound. Those with the option of car use are likely to be **more** car orientated than their younger counterparts because of their distinctive mix of journey purposes and because of their greater resistance to walking and using public transport. Those without the option of car use are even **more** disadvantaged than similar, younger people because they are physically less able to make use of non-car alternatives and are more sensitive to the hazards of public places, including the adverse effects of traffic.

To plan for the mobility characteristics and accessibility needs of "older people" therefore raises essentially the same issues and conflicts as amongst the population at large, but more starkly. The more that planners respond to the demands arising from people exercising choice and

mobility through the use of their cars, the worse become the conditions and opportunities of the remainder. Of course the picture is not quite as clear-cut as this but the underlying trends are very firmly established and, some would say, rooted in the logic of economic progress.

5 The planning response

The effects of motorisation on land use patterns and the growing disparity in opportunities have been taking place over many decades and look set to continue for many yet. The problems that are posed are not new. Town planning should be able to make a significant impact over these timescales. Has it? Will it?

Probably the most distinctive and persistent feature of British town planning policies has been to retain a pattern of physically distinct, relatively compact settlements – a policy of "urban containment". The principal motives for this have been to protect settlement identities, to preserve the countryside and to prevent urban sprawl. The success of this policy – which draws on the strengths of the British planning system to limit undesirable outcomes rather than promote desirable ones – means that the potentially adverse consequences for accessibility of full-blown motorisation have been greatly reduced.

Urban areas are still sufficiently dense that many everyday facilities remain within walking or cycling distance. Frequent bus services – to and from the town centre at least – can be operated without subsidy. Although car users may choose to live in one place and travel to a range of others for different purposes it is still possible for non car users to fulfil most of their requirements within their home town. The loss of facilities, and resulting accessibility problems, is of course already a problem in rural areas and some smaller towns. Over time the threshold settlement size is rising in which the "choice" for people without cars is either to accept the difficulties of travelling to the required facility elsewhere or to curtail or abandon that part of their life altogether.

For the growing number of car users however the benefits of urban containment are more mixed. It does mean that for town dwellers the distances which **have** to be travelled are normally quite short. But public unwillingness (from about the mid 1970s) to invest in, and accept the environmental consequences of, the infrastructure necessary to accommodate mass car ownership has meant a successive deterioration in traffic and environmental conditions. The dilemma facing most local authorities is that to protect or improve conditions by management measures instead involves placing parking and other restrictions upon motorists. Typically such restrictions are seen as threatening the prosperity of businesses within the older centres and prompting the diversion of trade and investment to other towns or peripheral locations where conditions for motorists are more favourable.

There is no prospect of an early resolution to this dilemma, not least because Central Government (probably regardless of political persuasion) seems unable to take a sufficiently strategic view. There is also no

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generally, a strong case for a shift in transport policy to include measures to selectively restrain road traffic. Schemes have recently been proposed for Cambridge and Richmond upon Thames and there is a government study into congestion charging in London. The technical feasibility and economic needs are now reaching a point where direct charges for the use of congested roads should be introduced in the UK in the next few years.

4.5 Passenger information

The ready availability of buses depends on potential users knowing where and when services run. This means good signage on vehicles, clear and legible timetables kept up to date and easy access to information on changes to routes and timings of services. With the faster pace of service changes following bus deregulation and the disruptive effects of traffic congestion real time information is of increasing importance, even for many regular users with well established travel patterns. Modern technology now means that real time information systems at bus stops are feasible.

London Transport has already introduced the first *Countdown* real time passenger information system on Route 18 and a further stage is planned for introduction along the Uxbridge Road later this year. This system provides dot matrix signs at bus stops, rather like those on the London Underground, which identifies the next few buses approaching the stop and how long before they are expected to arrive. The early results of studies indicate that passengers value this facility very highly and it is quite conceivable that such systems could be commercially worthwhile along busier routes.

5 Conclusions

Despite falling usage generally and the increasing car orientation of older people buses will continue to be an important form of local transport especially for those who do not have the physical ability or economic means to drive. Indeed because the bus market is, to some extent, a "deprived market" it is especially important that it is nurtured and made fit for the needs of those groups most dependent on it as often they will have no real alternative to the bus. The economic deregulation and privatisation of buses in the UK outside London has reduced the cost base and increased the volume of service. This should have led to greater use and increased satisfaction with buses but the reverse seems to have occurred. In London where competition has operated within a regulated framework costs have come down more slowly but appear to be likely to fall by as much as outside and service quality and ridership have held up rather better.

This suggests that because buses are often a "no choice" or second choice mode and lower income groups are well represented amongst bus passengers it appears that the straight operation of market forces may be leading to an economic equilibrium with service levels lower than those which existed in the former regulated regime. If this is the case then older people may well be less well served by buses than they have been in the

investment decisions businesses and developers will continue to respond to these changing markets, not to the wishes of planners. (Only very large increases in the cost of motoring might reverse established trends and this seems politically untenable). The fact that many public services, notably health and education, are being reorganised on commercial lines means that they too will increasingly follow market logic. It is worth reiterating that planners are powerless to control the closure or "rationalisation" of facilities and cannot pursue development policies which do not ultimately enjoy the support of markets.

2 Even if transport policies were altered to give greater emphasis to urban public transport the sorts of scheme which would show greatest benefit (under current rules of evaluation) would be those which succeeded in attracting large numbers of car users and/or people travelling in work time – typically rail-based services to or from city centres. Whilst benefiting non car users who happen to travel in those corridors such schemes are largely irrelevant to the mass of older people whose journey needs tend to be shorter (ie more local and suburban in character) and served by bus. The needs of older people with disabilities would also not figure significantly in public transport schemes aimed at reducing car travel.

It is possible to conceive of overcoming these two obstacles simultaneously by introducing a charge to be levied upon developers which was geared to securing both environmental and social objectives. This would follow the principle already established that a developer is responsible for making acceptable the physical consequences of his actions, for example in making highway improvements in the vicinity of a site to cater for consequential increases in traffic. The idea of extending this to environmental consequences seems to have been accepted, in theory at least – the "polluter pays" principle – (Department of the Environment, 1990). I am taking the logic one step further and applying it to accessibility issues which have both environmental and social significance.

I am suggesting that in the case of larger developments developers should be required to ensure the provision of public transport services sufficient to achieve specified levels of accessibility for non car users. In situations where these levels did not already exist and could not be provided commercially this would imply payment to the local authority responsible for arranging socially necessary transport services. In the case of smaller developments a system of standardised payments might be made into a general fund for public transport support instead. The accessibility standards would have to be set and applied nationally (though varying by type of area) to avoid individual planning authorities "bidding down" in their competitive efforts to secure developers' investment. Over time, as sites came to be developed, the proportion of each urban area over which this system applied would increase and the revenues increase likewise.

The merit of this suggestion is not just that it progressively guarantees standards of accessibility without provoking calls on public funds but that – in the spirit of the Government's planning guidance – it reinforces land use policies for development to be concentrated in places which are naturally suited to public transport provision. The incentive would be for

developers to seek locations which offered the specified standards of accessibility already or which could be raised to these levels at minimum cost. In conjunction with policies of demand-management applied to motorists it would facilitate the option of public transport use by people **with** a car available, thereby helping to improve traffic conditions for the majority who continued to travel by car.

In sum therefore I would argue that such a strategy offers the unusual prospect of choice and mobility for all.

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The role of highway engineering

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Abstract

There is little doubt that the changes in population structure within the UK will result during the next 40 years in increasing numbers of older people. The extent to which this trend will impact upon road safety policy specifically is, however, less clear, particularly in the period up to 2010. The paper first attempts to set the perceived problems within the broader framework of social, environmental and economic policy, particularly the emerging consensus on sustainable transport policy. It then discusses the extent to which the aims of road safety policy for the older road user might accord with or conflict with these broader policy considerations. Information is included summarising the position within Northamptonshire concerning reported accidents to older road users and comparisons are drawn with other national studies to determine their relative exposure to risk. A survey of current practice is referred to in the paper and the results of this should be available for presentation and discussion at the Conference in order to assist in developing policy and programmes at the local level. In conclusion the paper returns to the theme of the balance between specific programmes for the area of activity and the broader concepts of sustainable transport development in an attempt to determine the most cost-effective approach.

1 Introduction

The brief for the preparation of this paper indicated that it should emphasise the prescription and application of policy rather than simply repeat the findings of previous research and also that it should concentrate on what needs to be done over the next twenty to thirty years in the UK. It is not difficult to address the first of these criteria since relevant research is relatively limited but the second presents more problems since the road safety dimension cannot be addressed in isolation from broader issues of social, environmental and economic policy. Failure to address the broader agenda might, on the one hand, lead to the promotion of financially unattainable and perhaps environmentally unacceptable scenarios and on the other might leave unexplored possibly beneficial areas of policy interaction.

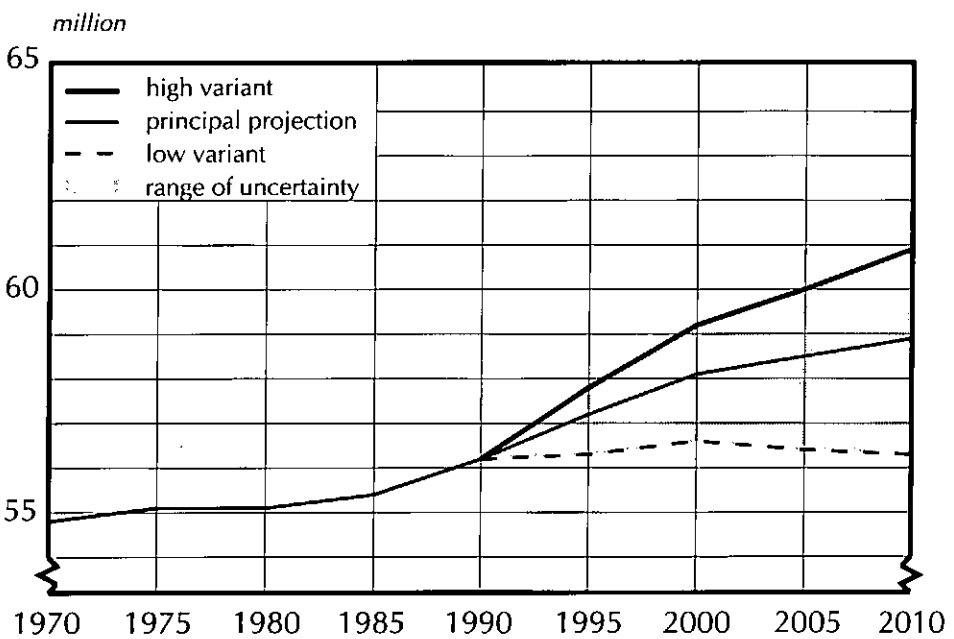
Although this paper will therefore address the specific problems associated with the older driver, it will seek to place these within the broader context of social, environmental and, in particular, emerging transport policy.

Kendrick, M J *The role of highway engineering* In Clayton, A B (Ed) Proceedings of a conference on *Older road users – the role of government and the professions,* AA Foundation for Road Safety Research, Basingstoke.

2 Population structure and distribution

As the whole basis of the increased attention being paid to the requirements of the older driver derives from perceived trends in population structure and distribution it is clearly important that these trends are well understood, together with the level of confidence which can be ascribed to them. Although population forecasts are more reliable than many planning indicators, they are based on a number of assumptions concerning mortality, fertility and migration, so that variations in any of these assumptions will affect the outcome. The Office of Population, Censuses and Surveys (OPCS) therefore prepares, in addition to the principal projection of the most likely outcome, a number of variant projections based upon higher and lower assumptions of the component elements to provide a range within which future population changes may be expected to fall. The range to the year 2010 is indicated in Figure 1 below.

Figure 1 – Total population: United Kingdom



Source: *Office of Population Censuses and Surveys*

Between 1990 and 2010 the total population of the United Kingdom is forecast to increase by 2.6 million (4.5%); however the range of uncertainty spreads from an increase of 4.7 million to no increase at all.

The main conclusions of population forecasts up to the year 2010 are:-

a) Probable total increase in population of 2.6 million (4.6%);

b) Faster increase than for the previous 20 year period;

c) No further fall in the number of teenagers;

d) Fall of 2.4 million in young and adults (20–35);

e) Higher average age in the working population;

f) Little change in the numbers aged 65–79;

g) Increase of 600,000 in the over-80s.

The last two conclusions are of particular importance as although the older population is increasing, this increase at least until the year 2010 is likely to be concentrated in the over-80 age group which on previous experience are more inclined to considerably reduce or terminate their driving. It is also worth noting that the period from 1970 to 1990 saw an increase of 1.1 million (20%) in the 65–79 age group and an increase of 0.9 million (73%) in the over-80 age group with no apparently adverse consequences for accident and casualty statistics.

Although these conclusions would seem to suggest that there is an opportunity to develop a measured and considered response to the perceived problem, it is important not to be too complacent for a number of reasons:-

a) Forecasts for the following 20 years up until 2031 suggest that numbers of potential older drivers will increase;

b) Purchasing trends and lifestyle expectations of older people may vary significantly between cohorts with implications for transport usage;

c) Health costs increase vary considerably with age as indicated in Figure 2 and the implications of this, combined with other related pensions and social costs, may inhibit the ability of Government to respond to other important policy areas.

3 Indicators and influences

Remaining for a while with the broader policy agenda there are a number of other indicators and influences which can be used for forecasting the future of life within the UK, including:

a) Economic forecasts including projection of consumer spending;

b) Attitude surveys to assess whether the aspiration of today becomes the actuality of tomorrow;

c) Social example whereby the life style and attitudes of the better-off groups in society can indicate the norm for the future;

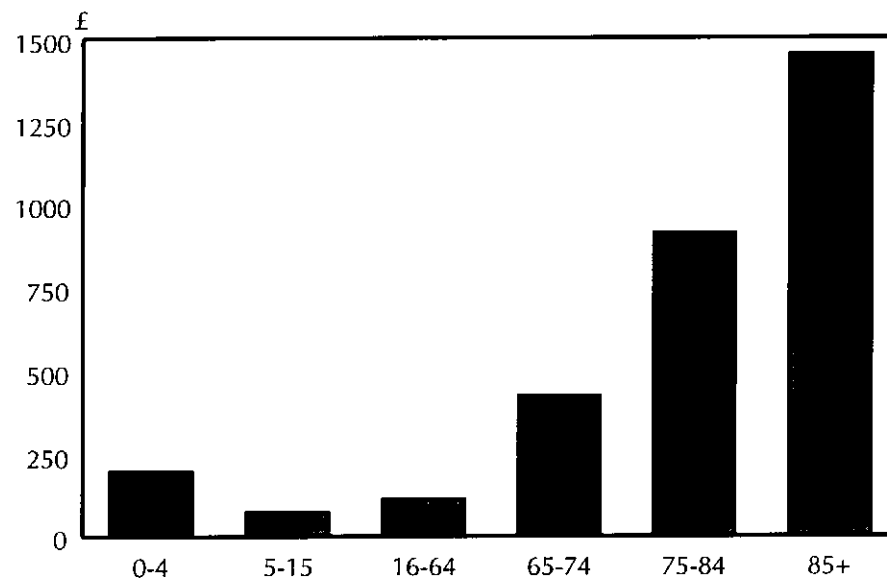
d) International example which is particularly relevant in environmental and transport issues;

e) Government policy direction itself can act as a direct influence on other trends and aspirations;

f) Policies can interact with each other, for example environmental legislation could influence the balance between personal and collective mobility thus benefiting the road safety position.

Figure 2 – Health costs by age group

Expenditure per head on hospital and community health services by age group in 1986-87



Source: *Treasury and Department of Health*

People's health care gets more expensive as they get older. People over 65 cost the Health Service more than 13 times as much as people aged 5-64 – and the number of people over 85 will be 50% greater in 2010.

One way of illustrating the interaction between these indicators and influences is to develop three hypothetical scenarios summarised by Northcott (1991).

a) Market-oriented scenario with lower income tax, reduced Government spending and supply side changes to improve the efficiency of the market and raise labour productivity;

b) Interventionist approach with higher income tax, higher Government spending on social services, and expansion of research, development and training to improve productivity;

c) Environment-oriented scenario with major investment to improve environmental quality, carbon tax increasing to a high level of total taxation with off-setting cuts in VAT.

The reason for developing this particular theme is that with each scenario the opportunities for addressing lower order social problems such as road

safety for the older driver are different. For example, the environment-oriented scenario, with the likelihood of much higher charges for water and energy but lower prices for health, education and informal recreation, will bring major shifts in demand and greater opportunity to address the road safety problems at marginal expenditure levels. More emphasis on the individual rather than the social wage as implied by the market oriented approach may require a different strategy.

4 Transport policy

Recent years have seen a developing consensus, at least within professional circles, towards the concept of a sustainable transport policy and in 1991 the Association of County Councils published a report *Towards a Sustainable Transport Policy* to encourage this process. The concept has also been gaining ground following the United Nations Conference on Environment and Development in Rio de Janeiro in 1992 following which each Government has to produce a National Report to the UN Commission.

The measures which might need to be addressed within the context of a sustainable transport policy summarised in the ACC document include, *inter alia*:

a) Pricing road and parking space;

b) Discouraging single occupancy of cars;

c) Improving the attractiveness of public transport;

d) Modifying vehicle design;

e) Improving information;

f) Encouraging energy efficient transport modes – including cycling and walking.

Each of these strategic elements have implications, mainly positive but occasionally negative for the specific issues affecting older drivers and it may be, therefore, that the greatest gains will be made by working with the grain of sustainable transport policy rather than independently.

Similarly the Government White Paper *The Health of the Nation* published in 1992 identified accidents as one of five key themes to be targeted, together with others relevant to an increasingly older population. Again policy convergence would seem to be the best way forward.

The development of sustainable transport policy will alter the balance progressively between the three main policy areas – safety, capacity and environment, and will also result in the redefinition of certain previously held concepts. For example accessibility will almost certainly replace mobility as an end in itself. The following transport policy developments will almost certainly be particularly advantageous to the older people.

a) Increased importance for public transport and improved access;

b) Increased emphasis on accessibility rather than mobility;

c) New planning policy guidance PPG13 promoting closer integration of land use and transport policy;

d) Focus on speed reduction through traffic calming and other means;

e) Focus on vulnerable road users generally for road safety policy.

Similarly certain policy areas may be disadvantageous, for example:

a) Motorway tolling may cause diversion back onto other roads more likely to be used by older people;

b) Moves towards multi-modal travel such as park and ride, although in some respects helpful, may not avoid the need to drive part of the way.

5 Risk exposure

Some indication of the scale of the problem for older road users can be gained by analysing the figures for Northamptonshire. Based on the 1991 OPCS figures there were 110,000 people aged 60 and over, and 58,000 aged 70 and over, out of a total population of 578,800.

During 1991, 3,321 people were injured on the County's roads in reported traffic accidents providing a casualty rate of 5.74 per 1,000 population. For casualties aged 60 and over the rate was 2.95 and for 70 and over the rate was 2.31. First impressions are that older people are roughly half as likely to be injured in traffic accidents as the population as a whole.

For pedestrians the figures suggest that both the over 60s (0.72 per 1,000) and the over 70s (0.71 per 1,000) have the same likelihood of injury as the population as a whole (0.73 per 1,000). Those most at risk are the 5–9 year olds (2.26 per 1,000).

These figures of course take no account of the relative exposure to risk, since relatively fewer older people use the roads with the same frequency as younger people and Broughton (1987) has undertaken a more detailed national analysis to assess this. His analysis showed that for males the over 74 age group had the second highest record (69 casualties per 100 million vehicle miles) following the 17–20 age group (170 casualties per million vehicle miles) and twice the all ages average (31 casualties per million vehicle miles).

6 Practical approaches

The Working Group of the Medical Commission on Accident Prevention and The Automobile Association published *Helping the Older Driver* in 1990 and outlined a number of general areas for attention relating to

vehicle design, highway design and driver education. So far however there are few practical examples of schemes or programmes specifically tailored to address the needs of older road users. A survey is presently being undertaken and the results of this will be presented at this Conference.

Design adjustments which would seem to assist older road users include:

a) Reduced complexity of junction layouts;

b) Alteration to sightlines and visibility distances;

c) Alignment of side roads at junctions;

d) Segregated right turning lanes;

e) Phasing of traffic signals;

f) Signing and lighting quality and maintenance;

g) Increased use of advance warning signs;

h) Rest and refreshment facilities.

It is significant that each of the above areas for improvement, although of particular relevance to older drivers, will also have benefits for the wider driving community and it may well be that overall what is required is a continuing emphasis towards road safety generally coupled with the pursuance of a sustainable transport policy.

7 Conclusions

Although there is emerging evidence of increasing numbers of older road users during the period up to 2031, the extent to which this is likely to present road safety problems requiring specifically directed policy approaches is much less clear, particularly bearing in mind the experience of the last 20 years. Even if the emergence of a problem is accepted as proven, it may well be that the development of sustainable transport policy coupled with continuing emphasis on conventional road safety engineering will provide the most effective returns. This is undoubtedly an area where the usual requests for more research are certainly justified.

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The role of health education

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Abstract

This country's health record compares unfavourably with continental Europe and North America. Our death rate from coronary heart disease is one of the highest in the industrialised world. Nor are we as physically fit as we should be. Awareness of the causes of illness and premature death is relatively high. A majority of those who smoke want to give up. A high proportion of the population want to improve their health through exercise. Health education offers people the knowledge, skills and confidence to lead healthier lives. It calls for changes in habits, behaviour and lifestyle. The promotion of good health and the prevention of disease can contribute to reductions in the National Health Service (NHS) costs and hospital waiting times. The White Paper "The Health of the Nation", published in July 1992 provides for a better balance to be struck between health promotion and the prevention of disease on the one hand and care on the other. Responsibility for achieving improvements in five key areas – coronary heart disease and strokes, cancers, mental illness, accidents, HIV/AIDS and sexual health – rests not only with Government and the NHS, but also with statutory and other authorities, the voluntary sector, industry, commerce, the media and individual citizens. Our lives would be more enjoyable if we followed a simple five-point code – do not smoke; drink sensibly; follow a balanced diet; take plenty of physical exercise; and learn to manage stress.

1 Introduction

The AA Foundation for Road Safety Research is to be commended for its initiative in organising this conference. As an older road user myself, I applaud the Foundation's concern for the independence, mobility and safety of that ever growing section of our population – the over-65's – who use the roads.

The list of presentations to this conference points to the fact that the chosen theme raises a wide range of policy issues. How are the independence, mobility and safety of older road users to be assured and, once assured, maintained? What obstacles have to be overcome? And how? Who is to assume responsibility for action?

Various elements are involved: the nature of our roads, road building policy, the type and purpose of vehicles, the division of responsibility between central and local government, the role of statutory and voluntary organisations, the obligations of vehicle manufacturers, the provisions of

Maitland, D *The role of health education* In Clayton, A B (Ed) Proceedings of a conference on *Older road users – the role of government and the professions*, AA Foundation for Road Safety Research, Basingstoke.

the law and the degree to which it is observed and enforced, the behaviour or road users whether in vehicles or on foot and, most important, older road users themselves.

2 The Government's approach

Use of the road is so much a part of our culture as well as our economic and social life that it is no surprise that much thought has already been given to many of these issues. In 1987 the Government set a target for reducing casualties on the roads by one-third by the year 2000 (Department of Transport, 1991). Four priority areas were identified for special attention – the road, the vehicle, the driver and a category of citizen described as "the vulnerable road user". In June 1991 the Department of Transport addressed the needs of one such vulnerable group – the older road user. The Department set out a number of measures which, when set alongside longer-term policies such as the road-building programme, motorway lighting and the drinking and driving publicity campaign, could reduce the number of casualties among older people on our roads.

The White Paper *The Health of the Nation* published in July 1992 included accidents in its list of five key areas in which substantial improvement in health can be achieved. In this major policy document the Secretary of State for Health restated the Government's commitment to reduce the death rate for accidents among people aged 65 and over. She set the target of a reduction of at least 33% by the year 2005 – from 56.7 per 100,000 population in 1990 to no more than 38 per 100,000 (Department of Health, 1992). This target relates, of course, to all accidents. Falls cause 56% of fatal accidents among the over-65's, transport accidents cause 22% and the remaining 22% have other causes (Office of Population Censuses and Surveys 1992a). As the White Paper pointed out: "Few accidents are due purely to chance". While older people are more active and mobile than they ever were, their faculties are less acute. Many are disabled; only one person in fifty will not escape some form of rheumatic complaint in their lifetime (Bath Institute of Rheumatic Diseases, 1988-89). Older people are more vulnerable and have special needs.

3 Health promotion and the prevention of disease

The contribution health education can make to assuring the independence, mobility and safety of the older road user is an integral part of national and local programmes to promote the health and well-being of the elderly. The chances of living longer have improved markedly in recent years. The expectation of life after birth is assumed to rise to 76 for a male and 81 for a female by the year 2010. In 1951 the respective life expectancies were 66 and 71 (Office of Health Economics, 1992).

Added to the obvious benefits of alleviating ill-health and reducing premature death and disability among older people are the economic benefits to the nation. Although only 5% of the elderly population are in hospital or residential care at any given time, a third of the resources of the National Health Service (NHS) are devoted to the over 75s, who

occupy half of the NHS beds (Health Education Authority, 1991a). The importance of ensuring that older people continue to lead active and healthy lives in the community for as long as possible is self-evident.

The objective of the work of the Health Education Authority (HEA) is to prevent disease and to promote healthy living and thereby to bring about improvements in health and reduced the demand for health care services. For the past several years we have been committed to the promotion of good health in old age and all our relevant programmes have been addressing the needs of the older people. Our most recent initiative is a review of the effectiveness of education programmes in the community aimed at reducing the incidence of coronary heart disease and accidents in the over-65 age group. This review will form part of the NHS's country-wide research and development strategy.

4 The concerns of older people

Older people derive information from a wide variety of sources and those planning to address specific guidance to older road users should exploit these. Doctors' surgeries are an obvious example. Surveys indicate that television and, to a lesser extent, radio offer the best ways of conveying health messages to older people – and especially those who live in rural and isolated communities – not merely through advertisements, which are expensive, but through a range of programmes and especially "soaps". Publications of various types can also be used – leaflets, posters, video cassettes, audio tapes and community newspapers. Other outlets can prove effective – post offices, supermarket checkouts, local libraries, Citizens Advice Bureaux and sports centres. And other organisations can assist – the social services, local authorities, community health workers and voluntary organisations.

One of the most serious barriers to effective health promotion among older people is the negative attitude of the public, the media and some health professionals towards old age. Generally speaking, ageing is seen as a period of inevitable decline. This barrier can be surmounted in several ways. For example, older people can be increasingly involved in the planning and development of policy. Attitudes in the community can be improved by raising public awareness of the nature and extent of the problems of the elderly. Older people themselves can be encouraged to adopt a more positive approach to remaining healthy, to raise their expectations, to shed their fatalism and appreciate the benefits of changing their behaviour. Overcoming the difficulties inherent in conveying health education messages to older people is not easy. The learning process deteriorates with age and older people must be allowed time to absorb health messages and act upon them.

The elderly are inclined, as the saying goes, to be set in their ways. Those in middle age on the other hand are the most likely to be influenced by health education programmes. The elderly – those 65 and over – will be least affected by such initiatives. In the HEA we accept that this is part of human nature and, for this reason, we have taken the view that we have to start early and aim our guidance for better health in old age specifically at

people aged 40–45. This can be done by raising personal awareness in the first instance and then increasing knowledge and understanding in such a way as to encourage a change in attitude and behaviour before patterns have become set.

5 The HEA's strategy

The HEA's current strategy, which was endorsed by the Secretary of State at the end of 1992, takes full account of the designation in *The Health of the Nation* of the five key areas where substantial improvements are called for – coronary heart disease and strokes, cancers, mental illness, HIV/AIDS and sexual health and accidents (Health Education Authority, 1993). Our programmes over the past six years have been directed at the main causes of preventable illness and premature death and we have had the needs of older people in mind.

One of our main preoccupations has been, and still is of course, coronary heart disease. Most of those who die from coronary heart disease are elderly. Regular physical activity can dramatically increase the ability of older people to retain their independence. Older women can benefit from cancer screening programmes.

Smoking is the cause of the majority of preventable deaths in the United Kingdom. One fifth of all deaths from coronary heart disease are attributable to smoking, as are over 81% of the deaths from lung cancer (Health Education Authority, 1991b). The death rate from chronic bronchitis is six times greater for smokers than for non-smokers (Royal College of Physicians, 1983). The proportion of people who smoke cigarettes is falling steadily. Among men over 60 the drop has been especially steep, but such an impressive reduction has not been matched by women (Office of Population Censuses and Surveys, 1992b).

In 1990, 14% of men and 5% of women over the age of 65 were drinking over sensible drinking limits. There have been significant changes in consumption in this age group over the past few years (Office of Population Censuses and Surveys, 1992b).

Older people are at greater risk of malnutrition than other groups of the population. Their nutrition needs are high. Above all, they need a balanced diet. But their appetites may be small – owing to decline in taste and smell, absence of social companionship, or immobility. Those who live alone and are dependent on pensions are the most likely to be receiving less energy than they need from their diet.

Total loss of teeth, which occurs frequently with old age, is another cause of malnutrition. Over 80% of people over 75 have lost their natural teeth (Office of Population Censuses and Surveys, 1991). It will take time for this situation to improve so the demand for replacement dentures is likely to remain high for some time to come. The fact that education and training about oral hygiene are now introduced at an early age should ensure that a higher proportion of older people still have their teeth in their later years.

These are examples of the challenges the HEA faces. Health education is not so much a science as an art and practice. And experience has persuaded us that it pays to simplify our messages. In some instances we have to offer specific guidance, for example about ways of reducing the risk of accidents. But, for the rest, we believe that our fellow citizens, young and old, would lead more enjoyable and rewarding lives if they thought it in their interest to follow a simple five-point code for healthy living: do not smoke; drink enjoyably and sensibly; follow a balanced diet; take plenty of physical exercise; and learn to manage stress.

6 The essence of health education

In this country those charged with the task of educating the public in ways of preventing disease and adopting a healthier lifestyle face an uphill task. Although our health today is better than ever, our health record compares unfavourably with our neighbours in continental Europe. Our death rate from coronary heart disease, for example, is one of the highest in the industrialised world (World Health Organization, 1992). The Allied Dunbar *National Fitness Survey*, published in 1991, showed that one in three men and two out of three women cannot continue walking at a reasonable pace up a 1 in 20 gradient without becoming breathless, or having to slow down or stop. Forty-eight percent of men and 40% of women are overweight. Eight percent of men and 13% of women are obese (Health Education Authority and Sports Council, 1992). A substantial percentage of deaths caused by fire, drowning, homicide, suicide and traffic accidents are attributable to smoking or alcohol misuse, or both (Royal College of Physicians, 1987).

Should these statistics suggest a population ignorant about or indifferent to health, this would be misleading. In April 1987 the HEA began to test public knowledge about and attitudes towards coronary heart disease. Our research over the past six years has shown that heart disease is perceived – correctly – as the biggest killer in England. More important, 87% of the population believe that the risk of Coronary Heart Disease can be reduced. This figure represents an increase in awareness of 79% over a five year period, mainly among the C2, D and E social groups. Moreover, ways of reducing the risk are more widely acknowledged and motivation to make simple changes in lifestyle is encouragingly high (Health Education Authority, 1991c). The HEA's Health and Lifestyle Survey carried out in 1992 showed that 65% of adult regular smokers wanted to give up (Health Education Authority, 1992) and in another separate lifestyle survey (Health Education Authority, 1989), 83% wanted to improve their health by taking more exercise.

No adequate information is available to enable us to compare these findings with perceptions and attitudes in similar societies. But enough is known to persuade us that the benefits to be gained through health education directed at people with reasonably high levels of knowledge and, in addition, a desire to change their behaviour are enormous.

As a form of shorthand, health education is a convenient term. But it is often misunderstood and sometimes misrepresented. Health education is

more than occasional AIDS or anti-smoking advertisements on television or radio, press photographs of celebrities sitting self-consciously on exercise bicycles, or cheerful kiddies holding balloons aloft at health fairs. This type of promotional and mass media activity is only one of many approaches. Education about better health aims not only to enable the general public to acquire the knowledge and skills, motivation and confidence to lead healthier lives. It is also concerned with assisting those who come into contact with the public to communicate sensitively and effectively; with helping those who take important decisions in large organisations to introduced practical health policies; and with contributing to a climate of opinion which supports the adoption of measures, including legislation, to protect or enhance public health.

These objectives can often be best achieved by forming what are known as 'healthy alliances' – groupings of organisations and individuals with a common interest in confronting one or more public health problems. *The Health of the Nation* strategy specifically encourages healthy alliances to reduce accidents.

7 Conclusion

This may sound straightforward. The reality, however, is different. Those who work in the fields of prevention of disease and the promotion of good health do not have an easy ride. Health education calls for change – change in attitudes, in habits, in behaviour, in lifestyle; change in those aspects of our daily life over which we can exercise control and which affect our well-being. Making such changes is not easy, even when some of our national strengths and weaknesses – our tolerance, our suspicion of authority and our attachment to the rights of the individual on the one hand and, on the other, our reluctance to face unpleasant facts and our tendency to confuse licence with liberty. In a sophisticated society such as ours individuals have the right to behave as they wish, provided of course, that, in doing to, they do not infringe the rights of others. Evidence that this right is widely exercised is there for all to see. But individuals have another right – the right to be informed about the risks of certain types of behaviour so that they may make informed choices. This is as true for the older road user as for all our fellow citizens. And, if they exercise this right and draw the appropriate conclusions, they will have a better chance of assuring their independence, their mobility and their safety.

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The role of the doctor

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Abstract

The paper opens with a brief review of some of the normal physiological changes that occur as a person ages. The older driver is considered from the viewpoint of the doctor and the help that the medical profession can provide. Maintaining the health and skills of the driver are the responsibilities of the doctor. In particular, doctors can provide more definite advice about driving, create a greater awareness of the effects of prescribed drugs, and recommend vision and, if indicated, hearing tests. When the time comes to consider stopping driving, the doctor has a responsibility to advise the patient. In cases of uncertainty, doctors can obtain confidential advice from the medical department at DVLA. The paper concludes with a look into the future and offers some suggestions as to how to prevent the problems of ageing occurring too young.

1 Introduction

I am here today as a general practitioner. The fact that I am also a senior medical consultant to The Automobile Association has little to do with my everyday contact with patients of all ages. Very few of them know of my association with the AA. However, it is through this association that I have had an increasing interest in the older road user, both as a driver and as a pedestrian. In both, ageing is a reality and, in both, there is an increasing likelihood of some form of disability.

2 Ageing as a reality

Apart from the effects of disease, it is worth, if only briefly, to mention some of the normal physiological effects of ageing on all of us. This has, as I am sure you are aware, little to do with the date of your birth.

Ageing is accompanied by:

1 Diminishing vision – a brighter light is needed to see objects that could previously be seen quite easily. This can cause problems with night driving and the ability to read traffic signs. It is accompanied by increasing long sightedness, so that spectacles are often required for reading.

2 Impairment of hearing – this is mainly in the upper tones and is most obvious in the difficulty in hearing a telephone ring.

Bevan, J *The role of the doctor* In Clayton, A B (Ed) Proceedings of a conference on *Older road users – the role of government and the professions,* AA Foundation for Road Safety Research, Basingstoke.

3 There is a gradual stiffening of the joints – so the range of movement is less, particularly in the larger joints such as the hip and the knee.

4 A slowing of physical reaction time – an older person who starts to fall, perhaps from a stumble, is unable to react fast enough to prevent the fall, even though fully aware of what is happening. In a report on the older driver (Medical Commission on Accident Prevention/The Automobile Association, 1990), it was found that 12% of 65-year-olds and 25% of those aged 75 and over complained of neck stiffness. Ten percent of 65-year-olds also complained of rheumatism and problems with hearing. This gives some idea of how common these minor complaints are in the elderly.

5 A slowing of the mental reaction time – so the brain cannot correlate all the information that is presented to it at the same time. In older drivers, this can be seen in the increased accident rate of those who want to turn right across the flow of traffic. This is often accompanied by deteriorating memory.

6 A more rapid onset of fatigue – which will exacerbate the two previous effects of ageing.

7 A reduced tolerance to the effects of alcohol.

8 Finally, there is a greater vulnerability to the sedative and other effects of many drugs, both those that are prescribed and those obtained over the counter.

Although we are here today to discuss the older road user, it is the older driver who is the main focus of our interest.

3 The older driver

Inevitably, I have to look at the older driver from my position as a doctor. The car is an essential part of many people's lives and it is important that all of us should take a positive attitude towards the older driver. The family doctor is, in many ways, in the best position of all to help. Most older people have a driving licence and advice from their own doctor may help towards longer and safer driving, provided health is maintained. However, there is a marked increase in the accident rate of those over the age of 70. This is mainly due to driver error.

The Medical Commission on Accident Prevention and The Automobile Association have published an excellent booklet entitled *Helping the Older Driver*. As our population is living longer and, fairly soon, 20% will be of retirement age, it is essential to keep them safely on the road.

The design of the car and the construction of the road are not the doctor's responsibility. Maintaining the health and the skills of the driver are.

What can we, in the medical profession, do to help?

Our advice is likely to be listened to, provided it is reasonable and does not conflict too much with the patient's self interest.

I would like my profession to become more aware of its responsibilities to the older driver and suggest:

More definite advice about driving. Often, this is easily given, particularly when the doctor has been seen in a new car. An automatic gearbox is a help, provided the driver has made the change from manual when young enough, and good, all-round vision, even if extra mirrors are added, will help those who are stiffening with age.

Sharing the driving. When going on long journeys, take frequent breaks to avoid fatigue and change drivers regularly. The tendency is for the man to drive most of the time but, as he is likely to be older, he may have to give up driving before his wife. She will thus, be less skilled, more anxious about driving, and out of practice, when the time comes for her to take over all the driving.

Discussion about changing skills – and the ways of using the car at the best times for safe driving. Advice about avoiding tension and the fact that it is possible to learn how to relax. People should even be prepared to cancel a journey if the conditions are not suitable. For example, the glare of headlights on a wet night may cause undue distress. Advice about deteriorating health – which may, ultimately, prevent driving. These changes are often mental as well as physical. Dementia is just as much a problem as arthritis.

Early advice will give the driver time to change a lifestyle that may be dependent on the car. If, however, the problem is some form of disablement, requiring modifications to the car, then the appropriate skilled advice can be obtained. It is here that the Mobility Advice and Vehicle Information Service (MAVIS) can be very helpful. They give skilled advice on how to adapt cars for the disabled and on those that are most suitable for the older driver.

In some parts of the United States, there are various courses to help the older driver, by finding out the problems of which the individual may be unaware. This gives a chance to change habits. An additional incentive to change is that some insurance companies will give reduced premiums to those who have been involved in these courses.

Recently, SAGA Holidays have started to organise similar driving courses for the elderly, who feel that their driving skills need to be improved. Perhaps our insurance industry will now follow their American colleagues and offer lower premiums to these drivers.

Medical advice is most important, as the doctor must, and I emphasise must, view his patient as a whole. He should consider what are the effects of disease, such as heart problems and arthritis, on driving skills. What harmful effects of prescribed drugs may occur? Will sleeping pills still have a sedative effect the next day? I fear that too few doctors give firm, clear advice about the side effects of drugs, or remember that these may affect

driving, as well as other skilled work involving moving machinery. These adverse effects will be made worse by even small amounts of alcohol.

The doctor should be aware of the adverse pharmacological effects of prescribed drugs. If in doubt, he can refer to the British National Formulary (BNF). It makes it clear which drugs may cause problems. It also has a short section on prescribing for the elderly. All general practitioners are also sent the Monthly Index of Medical Specialities (MIMS). It also carries warnings about the effects of the drugs that may cause problems with driving.

I realise that I paint a grim picture, so would like to balance it by reminding you that many drugs have no adverse effects. Many produce an improvement in skills, such as those for arthritis, which give quicker, painless movement – and those for heart problems, that reduce fatigue and increase the sense of well-being.

Doctors are helped by the chemists, as the Royal Pharmaceutical Society ensures that all drugs, both prescribed and those bought over the counter, are labelled with warnings, if they may cause sedation, or inter-react with alcohol. Unfortunately, labels are small and may not be read by the patient. Thus, the legal responsibility to warn the patient still remains with the doctor.

I would like to see something more striking on drug containers. Last year, I was at an international conference organised by La Prévention Routière on Drugs and Driving. Although most of the other speakers were concerned about the so-called social drugs – marijuana, cocaine and the like – I confined my talk to the effects of pharmaceutical drugs. I suggested that we should all follow the Dutch and Scandinavians, in putting red triangles on bottles containing drugs that may cause sedation.

All drivers understand that a red triangle is warning sign of a hazard; in this case, a warning of sedation.

The doctor can recommend vision and, if indicated, hearing tests. These, particularly when combined with a self-rating questionnaire, have been shown to modify and improve driving. The optician has an essential place in advising the older driver to have regular eye tests.

There comes a moment when someone should consider stopping driving altogether. Sometimes this is easy and obvious. Often it requires gentle advice from the doctor, who should be aware of the responsibility to do so. All licence holders have a personal responsibility to inform the Driving and Vehicle Licensing Agency (DVLA), if there has been a change in health that may affect driving. The family doctor must remind the patient of this. Indeed, it is wise if the doctor writes in the patient's notes that he has done so.

Sometimes, there is uncertainty. Uncertainty in the doctor's mind what to advise. The DVLA medical department is well aware of this and will willingly give confidential advice on the phone. At this stage, there is no need to give the patient's name.

However, very rarely, it may be necessary to inform the DVLA of a person

who has become a real hazard to other road users. In this situation anyone, including a doctor, can ring the DVLA and give the person's name in confidence. The DVLA may then ask the licence holder to undergo a physical examination by one of its appointed specialists. An example of this kind of problem is that of the physically fit individual who has a dementing illness, such as Alzheimer's disease.

I think that, for many doctors, the only time they think about this problem is when one of their older patients asks to be examined for renewal of a car insurance policy and their fitness to drive. This is a moment of potential professional difficulty. The doctor's prime responsibility is to the patient but, in this position, a conflict of interest can arise. He is representing the insurance company's interest and not the patient's.

The British Medical Association rightly points out that the patient's own doctor is the best person to give an opinion on health and capabilities, but makes it clear that this ethical problem should be pointed out by the doctor to the patient. I feel very strongly, as does the Assurance Medical Society representing the companies' own doctors, that an independent doctor should do these examinations.

It removes any possible ethical conflict. It also means the older driver will not feel resentful towards the family doctor, if told that he or she is no longer fit to drive.

4 Conclusions

All of us here today can reasonably expect to be driving in the year 2000. Some of you can look forward to another 20 or 30 years of safely keeping your licences. The older road user can expect radical improvements in car design and safety, with considerable improvements in road engineering. The driver, I fear, remains the same basic human being.

I can only speak for my profession. The engineering aspects of medicine, the new joints, heart pacemakers and so on, may well improve. The pharmaceutical industry will invent new and safer drugs, to prevent the development of disease. However, the effects of ageing remain the same.

Is there anything that doctors can do to help the community? I believe that there is. We need to advise our middle-aged patients about the future now. Health education, to increase the awareness of the benefits of regular exercise and stopping obesity, with its damaging effects on over-strained joints, are just two of the things that will maintain good health in older people.

This can be highlighted by the medical profession's encouragement for the use of the red triangle on bottles containing drugs and by more consistent warnings from the doctor of the sedative effect of drugs.

Reference

Medical Commission on Accident Prevention/The Automobile Association (1990) *Helping the older driver* Report of an MCAP/AA Working Group. London and Basingstoke.

The role of the bus planner

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1 Introduction

Buses are the most ubiquitous and used form of public transport in the UK. For every rail passenger there are 3½ bus and coach passengers and for every domestic air passenger there are over 200. Outside London the difference in the relative use of bus and rail is even more marked with the ratio being 16:1 and outside the larger cities the use of rail, other than for the occasional long distance journey, is quite a rare experience for most people. Data on taxi and private hire car use are poor but it appears that only a tenth as many journeys are made by the 135,000 or so of these vehicles, as are made by bus.

The use of buses is not spread evenly throughout the population and many fit, better off, car owners outside the large cities rarely travel by bus. On the other hand there are large numbers of people, many of them elderly, who by dint of economic circumstances, physical ability or inability to drive depend on public transport – usually buses – and/or the kindness of car driving friends or relations to get beyond their immediate locale.

Buses are therefore not just the dominant means of public transport in the UK but are particularly important for a number of less mobile groups amongst which are older people. Planning for a reasonable level of mobility for these groups is consequently a crucial task for responsible transport planners. This paper looks at how well present bus provision and policies are meeting the needs of older people and what can be done to make things better.

2 Bus travel and older people

From Table 1 it can clearly be seen that young people use public transport more. This is mainly because teenagers have less access to cars. In the economically active years bus use drops especially for men who have higher labour participation rates. This reduction is also because of cultural factors which mean that, all other things being equal, men use cars more than women. As economic activity reduces (assuming retirement at 60 years of age for women and 65 for men) we see a return to bus use with the proportion of frequent users stepping up by almost a half. Table 1 also shows that as age increases above 75 bus use tails off. This is probably for a combination of reasons but primarily reducing physical mobility.

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Table 1 – Frequency of local bus use by age and sex (Department of Transport, 1989)

Age Group	<30	30-59	60-64	65+
Males		%		
Frequent	23	11	13	20
Moderate	26	14	18	22
Rare	51	75	69	58
Females			**60-75**	**75+**
Frequent	34	20	29	18
Moderate	29	28	32	28

This phenomenon is illustrated in Table 2. From this it can be seen that ownership of driving licences has been changing with historic time as well as through the life cycle of the population. Between the mid seventies and 1988/90 ownership increased in all categories but most amongst women and the older groups. This confirms the common sense understanding that people today are more likely to learn to drive than they were in the past and that women are catching up with men in this area. Thus the proportion of older women (60+) with licences has more than doubled over this period whilst the proportion of men in the 20–49 age range with driving licences has only increased by about 5%.

Table 2 – Ownership (%) of driving licences by age and sex (Department of Transport, 1992)

Age Range	Male		Female	
	1975/76	1988/89	1975/76	1988/90
17–19	31	41	17	28
20–29	75	79	42	60
30–39	85	86	48	68
40–49	82	90	38	64
50–59	75	86	26	49
60–69	59	77	15	30

There is no reason to suppose that this phenomenon will not continue and older people, especially women will be more likely to have driving licences in future than has been the case hitherto. Even today the car is the main form of motorised transport for older people and this will probably be even more the case in future unless policy measures limiting car use on a large scale are introduced. It must also be recognised that the growth in car use has been associated with a process of suburbanisation and dispersal of facilities such as shops, health care and social amenities. Also more families are dispersed so family help is less available than in the past. These phenomena make the use of public transport and "self family help" to contribute to meeting older people's mobility needs less effective as present trends continue.

Older people make fewer journeys than average: between 8 and 9 a week compared with around 19 for people between 16 and 59 years of age. Moreover their travel habits differ. Fewer journeys are made for work or during the peak and journey lengths are shorter. While people over sixty average a little under 60 miles a week, men in the middle age ranges average over 160 and women about 100 miles.

Whilst a significant proportion of older people will continue to rely on buses for their motorised transport the increase in the number of fitter older people using cars seems likely to continue to grow. With more suburbanisation and dilution of this basic element of bus demand, normal market mechanisms will be less able to serve the public transport needs of older people in future years.

3 Recent trends in the bus industry

There has been a long term decline in the UK bus industry since the development of mass car ownership in the 1950s. This has been exemplified by declining ridership, deteriorating finances and worsening operating conditions caused by the increased number of vehicles on the roads. Attempts have been made by central and local government along with the industry itself to reverse, or at least slow down, this trend but with limited success. From a peak ridership of 16½ bn journeys by bus and coach in 1950 traffic fell to just over 8½ bn journeys in 1970 and to about 4½ bn today. Two major attempts at the national level have been made during this period to put the bus industry on a better footing. The 1968 Transport Act set up the National Bus Companies and the Passenger Transport Authorities and Executives and provided for public transport grants. Later New Bus Grant and Transport Supplementary Grant were introduced. Traffic continued to fall to the mid 1980s when there appeared to be a brief respite. The 1985 Transport Act was aimed at improving the fortunes of the industry by introducing deregulation outside London and, as this was a watershed in the provision of bus services, it is worth looking at trends since then.

Table 3 illustrates some of the main trends on a national basis. There have been differences between various parts of the country and in London bus services have remained regulated whilst being progressively tendered. Costs have fallen substantially but so has ridership and fares revenue. However the quantity of bus service has increased. This has not been uniform with additional service being focused on the busiest routes and periods. Vehicle age has increased; a trend started earlier with the termination of New Bus Grant. Moreover margins in the industry are such that it is unable to renew buses fast enough to prevent continued ageing.

From the older person's point of view the picture is a mixed one. The adverse features include older vehicles which tend to be less accessible and comfortable, and a real increase in fares for those who pay them. Whilst overall service volume has increased, off-peak services have not and poorer information means that, on aggregate, service quality has probably deteriorated for most older people. The increase in the real value of concessionary fares payments appears positive on the face of it but, on closer examination, a different picture emerges as the benefits have been diluted by growth in the number of pensioners and extension of schemes in some areas to include children. Also over the past two years the sums spent have fallen in real terms as a result of local government budgetary pressures.

Table 3 – Recent trends in the bus industry (all prices at 1991/92 levels)

Feature	1985/86	1991//92	% Change
Bus kilometres	2,077M	2,487M	+20
Passenger journeys	5,641M	4,669M	–17
Bus fares	100	113	+13
Cost per bus kilometre	140p	95p	–32
Cost per passenger journey	53p	51p	–4
Fares	£1,918M	£1,699M	–11%
Revenue support	£698M	£377M	–46%
Concessions	£393M	£410M	+4%
Minibuses	14%	29%	+101

Over the last five years the number of free schemes has reduced and flat charges, where applied, have in a number of cases been increased substantially. On the other hand the number of areas without any form of concession has reduced. There remains nevertheless considerable disparity between the most and least generous, ranging from free travel at one extreme to no concession at the other. Future budgetary pressures seem likely to reduce the value of the more generous scheme rather than eliminating schemes altogether although growing car ownership amongst elderly people is causing some local authorities to consider whether reduced fares for conventional public transport is the most cost effective way of improving the accessibility of older people.

The increased use of minibuses has been generally beneficial for older people although some of the early designs were not particularly accessible. The friendlier atmosphere, ability to sustain services that would otherwise become uneconomic and the ability to get into residential and other areas too difficult for large buses has been a bonus. More recent designs, especially of midi-buses, are better than the early "van type" models and can be almost as easy to use as a well designed large bus. Low floored buses are now being used in continental Europe and are to be tried in the UK later this year. Whilst these will improve accessibility for the mobility impaired, including many older people, as yet the cost effectiveness needed for them to become common-place in today's situation has yet to be demonstrated.

Recent trends in the UK bus industry do not, on balance, auger particularly well for older people. Older vehicles, poorer service quality and a trend towards less generous concessionary fares schemes cannot be welcome. In addition increased congestion on the roads, poorer passenger information and more complex ticketing lead to the conclusion that this situation is going to get worse unless something is done about it.

4 General improvements needed

Buses, as the origin of their name clearly indicates, are an omnibus facility: essentially comprehensive in the service they give. They serve a wide variety of users with overlapping needs. Therefore, fortunately, much of what needs to be done to improve bus services for older people is also needed for most of the other user groups; if not always for exactly for the same reason.

Buses should provide a reasonably comfortable, reliable, ubiquitous means of local assisted transport, accessible to most people and at charges affordable by those groups who rely on them most.

4.1 Vehicle design and operation

About 20% of bus journeys are made by people above retirement age and more than 40% of these have suffered from some physical difficulty which impairs their mobility. The design of the buses and the way they are operated can materially affect their convenience to the significant numbers of older (and other mobility impaired) people. There have been several codes of practice prepared on the design of buses to improve their accessibility in this country and overseas. Some of these require kneeling/low floor buses to virtually eliminate the particularly troublesome problem of boarding and alighting. Such arrangements can be expensive and may make travel less convenient for able bodied passengers. The recommendations of the Disabled Passengers Transport Advisory Committee (DIPTAC) on bus design are a carefully considered and well balanced set of proposals which strike a sound balance between the needs of people with mobility impairments, the interests of other passengers and the need for reasonable economy.

These recommendations cover clear signing, manageable step heights, adequate handrails, numbers of steps, floor slopes, door sizes, gangway widths, seating arrangements, location of bell pushes, internal signs and luggage space. None of these features are extravagant and collectively add little to the initial cost of a new bus. However, as has been shown above, replacement rates are low presently and, unless these change, it will be many years before some unsuitable buses currently operating are scrapped. The cost of converting existing vehicles to incorporate DIPTAC features varies according to the vehicle design but some features, such as sleeving handrails, cost very little whilst others, such as changing the step configuration can be more expensive. However the full incorporation of DIPTAC features will usually cost less than five thousand pounds. Given that a bus will normally carry over a million journeys in its lifetime spread over all journeys this cost amounts to less than half a penny per journey. This is less than 1% of the average fare and it is quite conceivable that the improved accessibility that these features provide could generate additional income of that order. The DIPTAC recommendation that all buses should have these features by 1997 seems reasonable in this light

but, on present trends, this seems unlikely to be achieved.

It is also recommended by DIPTAC that buses are driven so as to allow sufficient time for mobility impaired passengers to leave and take their seats while the bus is stationary. To do this adds about one minute per hour of running time and needs to be provided for in the design of the schedule. In a very competitive environment however there are pressures to minimise running times to save costs and to drive to maximise the number of passengers. However in areas where there are large numbers of less mobile people it may be that operators will pay attention to their needs to promote company loyalty. Also the increased use of more complex cash fare payments means that some buses sit longer at stops which has the indirect effect of giving more time for people to get to and from their seats. Consequently it is not clear whether this aspect of bus operation has got better or worse for older people in recent years.

4.2 Passenger infrastructure design and operation

All too often the bus accessibility problem is seen as one of vehicle design whereas, on many bus journeys, more time is spent off the vehicle than on it. The ease of the necessary walk to and from the stop will be affected by the proximity of the stop to passengers' origins and destinations and the quality of the pedestrian environment through which passengers pass. Traffic planners and highway authorities must ensure that bus stops are conveniently located, easy to see and well illuminated. Also the general walking environment should be designed and maintained to facilitate use by people with walking difficulties.

The public transport planner's role covers the provision and maintenance of bus stops, shelters, stations and interchanges. Again there are several codes for the design of these facilities which relate to shelter, lighting, seating and supports, protection from vehicles, gradients, surface characteristics, signing, information provision and facilities such as telephones, luggage storage and refreshments at stations and interchanges. At bus stations and busy interchanges there should be a staff presence to assist passengers and guard against vandalism to which public facilities of this kind are unfortunately prone. Moreover they should be kept clean, well lit and in a good state of repair to ensure a welcoming and reassuring image.

An important ancillary aspect of bus services is the method of payment. Most buses today are one person operated and this means that the passenger has to pay either the driver or a machine on entry. For older people alighting can be a problem and having to address the problem of payment at much the same time can make a difficult operation even worse. Where "payment" is simply flashing a pass then this problem is minimised. A convenient way of carrying out this kind of transaction is by using contact-less electronic smartcards. These can operate as "free" passes, stored fare or stored ride cards with concessions incorporated in the on-card tariff structure and/or the reader operation.

A demonstration of this technology has already been carried out in London and a full scale trial of Bus Electronic Smartcard Ticketing (BEST) is underway in the Harrow area. All that passengers have to do is to touch a card reader with their card (which can be kept in its wallet or a purse

or bag) and pass when the green light shows a valid transaction has taken place. If the card is used as a Stored Value Ticket (SVT) then the passenger has to push a button for the appropriate fare before touching the reader. This technology has considerable attractions for operators as it allocates revenue accurately and swiftly and allows the possibility of different operators using different fares without creating any inconvenience to passengers.

4.3 Service planning

To be attractive bus services should be both dense and frequent. Moreover stops should be sufficiently frequent that only a short distance is required to reach one once on the route, yet not so frequent that the journey once on the bus is unacceptably slow. These considerations go for all bus users but older people are more likely to accept slower journeys if they involve less walking. All these considerations must be set in the context of what is reasonably economic.

There are three approaches to service planning. The first is purely commercial and seeks to provide a service pattern which is the most profitable. Generally this will lead to a concentration of services on a fairly sparse network on which vehicle loadings are higher. Where there is "on the road competition" this will increase the tendency to "hunt" for denser traffic. This regime will leave the quieter routes and times poorly served and tend to act against the interests of older people who rely heavily on these types of services. The second approach involves a combination of commercial and non-commercial services. In deregulated Britain this is provided with the gaps in the commercial network being filled by local authority procured "socially necessary" services. This is something of an artificial distinction as many services which are provided as part of the commercial network are also socially necessary.

In London a planning procedure which blends commercial and social factors is used and this has proved successful in helping to increase London's share of the national bus market from 20% to 25% over recent years. These deal with the comprehensiveness, frequency, simplicity and operability of the network. The main service planning parameters are:

- in residential areas routes should be within 400m of most homes;
- in central London, and on main suburban routes services should generally run every 10 mins during the day and every 12 mins at other times;
- on low density routes a minimum frequency of two buses per hour should apply;
- the use of midi-buses should be considered when big bus frequencies fall below five per hour;
- routes should usually run between the same terminal pairs throughout the week;
- last buses should not leave busy centres before midnight and 2300 hrs in quieter suburban areas;

- running times should allow reliable operations in the prevailing traffic conditions;
- on low frequency routes timetables should be easily remembered;
- generally changes to services should have a social benefit/cost ratio of at least 1.5:1.

Whilst these criteria have been developed to suit London's particular circumstances, and a set of criteria for, say, a small country town would be different in some respects, they illustrate the kind of considerations that are involved in designing a satisfactory bus network.

4.4 Service reliability

Unreliability of bus operations can arise from poor mechanical equipment, poor management and staff and difficult traffic conditions. Over recent years the introduction of competition in the industry has sharpened performance and poor reliability for mechanical, management and staffing reasons has generally reduced. However growing traffic congestion has meant that "on the road" reliability has suffered, especially in the busy urban areas. In order to counteract this trend special priorities on busy roads, where there are significant flows of buses, are needed as well as more general measures to contain urban traffic congestion.

Bus priorities include physical measures such as bus lanes, bus only turns and bus only streets but increasingly electronic technology can be used to help buses in traffic. These include area traffic control schemes which give due weight to the additional number of passengers that buses carry and special priorities at traffic lights to buses with electronic tags. In London, for example, bus lanes are worth about £20m a year to passengers and operators at today's prices. If they were complied with fully this figure could double. With the expansion of conventional priorities and the implementation of new systems like real time area traffic control with bus priorities the benefits could be increased to around £100m a year.

Outside London there are less bus lanes than within: only 200 or so. This amounts to less than ½% of the length of urban bus routes. In the more enlightened cities overseas up to 5% of bus routes have some form of priority and it would not be unrealistic to aim for a minimum target in the UK's urban areas of 1% (a 150% increase). Along with other forms of bus priority additional benefits of at least £50m a year to passengers and operators outside London are possible.

Britain's urban roads are some of the most congested in the world and their layout is such that for most of their route buses will have to run as part of the general traffic stream. As urban traffic congestion grows, as it seems set to do in the absence of positive measures involving traffic restraint, bus services will deteriorate further. In London traffic congestion is estimated to cost bus passengers £140m and operators £120m a year. Even if the cost of congestion to bus operations in the rest of the country is no more than in London the national total would be £½ bn pa. Whilst it would be unrealistic to think that traffic congestion could be eliminated completely the costs of congestion to the wider economy are huge and growing. There is therefore, in the interests of bus users and traffic

generally, a strong case for a shift in transport policy to include measures to selectively restrain road traffic. Schemes have recently been proposed for Cambridge and Richmond upon Thames and there is a government study into congestion charging in London. The technical feasibility and economic needs are now reaching a point where direct charges for the use of congested roads should be introduced in the UK in the next few years.

4.5 Passenger information

The ready availability of buses depends on potential users knowing where and when services run. This means good signage on vehicles, clear and legible timetables kept up to date and easy access to information on changes to routes and timings of services. With the faster pace of service changes following bus deregulation and the disruptive effects of traffic congestion real time information is of increasing importance, even for many regular users with well established travel patterns. Modern technology now means that real time information systems at bus stops are feasible.

London Transport has already introduced the first *Countdown* real time passenger information system on Route 18 and a further stage is planned for introduction along the Uxbridge Road later this year. This system provides dot matrix signs at bus stops, rather like those on the London Underground, which identifies the next few buses approaching the stop and how long before they are expected to arrive. The early results of studies indicate that passengers value this facility very highly and it is quite conceivable that such systems could be commercially worthwhile along busier routes.

5 Conclusions

Despite falling usage generally and the increasing car orientation of older people buses will continue to be an important form of local transport especially for those who do not have the physical ability or economic means to drive. Indeed because the bus market is, to some extent, a "deprived market" it is especially important that it is nurtured and made fit for the needs of those groups most dependent on it as often they will have no real alternative to the bus. The economic deregulation and privatisation of buses in the UK outside London has reduced the cost base and increased the volume of service. This should have led to greater use and increased satisfaction with buses but the reverse seems to have occurred. In London where competition has operated within a regulated framework costs have come down more slowly but appear to be likely to fall by as much as outside and service quality and ridership have held up rather better.

This suggests that because buses are often a "no choice" or second choice mode and lower income groups are well represented amongst bus passengers it appears that the straight operation of market forces may be leading to an economic equilibrium with service levels lower than those which existed in the former regulated regime. If this is the case then older people may well be less well served by buses than they have been in the

past. There are however a number of actions that planners and policy makers can do to improve the lot of the bus passenger in general and the older bus passenger in particular.

The age of buses has been increasing for over a decade and continues so to do. This trend needs reversing. Whilst this is a serious situation it also provides an opportunity. The need to introduce an accelerated fleet replacement programme also provides the opportunity to re-equip the parc to significantly improved standards of accessibility. The rejuvenation of the bus fleet will require investment of around £300m a year through the 1990s. This is a tall order for an industry with a turnover of £3½ bn and profits of under 5% which is presently investing under £100m a year in new vehicles. Government financial support for the local bus industry has reduced by about £300m a year (at current prices) since the mid eighties and there is an *a priori* case for the reintroduction of a new bus grant linked to more accessible vehicles. If this were to be 25% of the cost for buses over ten years old it would cost significantly less than £100m a year and give the process of replacement a major boost. In order to ensure that accessibility standards continue to rise there is a strong case for the national Public Service Vehicle Construction and Use Regulations requiring DIPTAC features to be provided.

The provision of passenger infrastructure is now a local authority rather than an operator responsibility. Standards vary and some municipalities and Passenger Transport Executives provide good facilities. Just as British Rail, London Transport are set standards for their services and facilities by the Government and there is no reason why bus passengers should not enjoy the same attention. This would require bus passengers charters for infrastructure in each local authority area with an obligation to meet national guidelines drawn up by the Government on the advice of the industry and passengers' representatives.

The question of service planning is a contentious one. The Government is strongly committed to the present regime without economic regulation yet, judged by ridership and the results of attitudinal research, many passengers feel themselves to be worse off as a result. If no significant changes are to be made in this area it is important that local authorities take particular care in their procurement role to achieve a level and pattern of service which meets the needs of less mobile and older people. The Chartered Institute of Transport in a recent report on the bus industry has advocated the introduction of "quality contracts" between local authorities and operators in their areas. If these prove practicable they could provide an opportunity for the needs of older people to be given explicit recognition in the planning and operation of bus services at a local level.

Good quality bus services can only be provided where they are not subject to the debilitating effects of traffic congestion. With growing traffic densities especially in urban areas this means that more bus priorities are needed to ease buses through traffic "hot spots". A target of 1% of urban bus route lengths with bus lanes is suggested as something that we should be aiming for nationally and electronic priorities should increasingly be employed. In the longer run in the interests of buses and traffic generally, restraint on car use at the busiest times in the more congested towns and cities will be necessary.

Good passenger information is needed both on the routeing, timetables, interchange, etc as well as on the state of the service at the time that it is needed in areas which are subject to service irregularity, disruption or frequent changes. Electronic communications and data processing (telematics) can now make this possible. This technology can also greatly simplify payment for bus travel through the use of contact-less smartcards. Both these applications have been demonstrated and should gradually become part of the public transport scene in the next few years.

The present concessionary fare arrangements for retired people show such variety as to raise serious questions about efficiency and fairness. Whilst local variations are not necessarily a bad thing there appears to be a need for national guidelines within which local authorities should determine arrangements for their areas.

There is still much that the planner and policy maker can do to make buses more useful and attractive to older users. This requires a clear understanding of the needs of older users and a determination to meet them. Whilst the new era of greater freedom and private enterprise has some advantages for older users, on balance the results do not, so far, look promising. A new partnership therefore is needed between the public and private sectors to reap the benefits of competition whilst ensuring that the critical social role of buses, in all its subtle and complex dimensions, is secured on behalf of older travellers and the many others for whom good bus services are a vital ingredient of a full and satisfying life.

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Older people, their independence and mobility

Lady Sally Greengross OBE
Director Age Concern England

Abstract

Mobility is a key factor in determining independence for older people. A major challenge at the end of the 20th century is to make this a priority and recognise the fact that older people are no longer a small minority but an increasingly large proportion of the population. Many have mobility difficulties in an environment which does not fully take their needs into account as, contrary to popular perception, these needs tend to increase with age, especially as more people now live alone. Those who plan and design our wider environment need to take these factors into account. Lack of transport is a major barrier to a full life and can prevent enjoyment of health in the broad terms defined by the World Health Organisation. The transport environment itself may be the real handicap affecting many older people whether they are drivers, pedestrians or cyclists.

The Government has made the reduction of accidents an immediate priority area for attention. The cumulative effects they have on older people need to be seriously addressed.

Recommendations for action are discussed which would help in many situations. In the case of drivers, especially the fast increasing number of older women drivers, who find their cars indispensable, strategic ways forward, which avoid negative stereotyping and concentrate on educational campaigns, safety features and design, are highlighted. These would give this growing sector of the consumer market better opportunities to enjoy travel and leisure.

Facilitating mobility is also about equity and social justice and is of the utmost importance in meeting the often urgent social need for mobility experienced by our older population.

1 The context

It is most appropriate during this special year, the European Year of Older People and Solidarity Between Generations, to focus on independence and mobility in later life. The latter may well be the key to independence for many, if not most, older people, when for the first time in human history we can all expect to enjoy 20-25 years of active healthy life after our full time employment ceases.

Greengross, S *Older people, their independence and mobility* In Clayton, A B (Ed) Proceedings of a conference on *Older road users – the role of government and the professions,* AA Foundation for Road Safety Research, Basingstoke.

Today, nearly three quarters of all women and over half the men in our population will survive to over 75. Across the European Community at present there are 60 million people over pension age and 100 million over 50.

With more attention now placed on health promotion and the prevention of disease it may well be that the numbers of active older people will exceed current forecasts which indicate that the 65-74 age group in this country will rise by 21% by the year 2021.

My own organisation, Age Concern, provides one example of a health promotion initiative concentrating on later life. We are just embarking on a major programme called "Ageing Well" which is being piloted in the UK and will hopefully spread across the European Community. Some pilot projects will involve older people as "senior health mentors" giving encouragement, training, information and advice about keeping fit and well to groups of other older people. Interestingly, one of the programmes has accident prevention as its primary objective.

Today's 10½ million people over pension age include 7 million women, nearly half of whom live alone, either without family contacts or at some distance from them, giving us clear signals about how needs and patterns of personal mobility are changing and will be further transformed in future – a future too near for their implications to be ignored by those who are responsible for planning and designing our environment, particularly our road networks, constructing public and private transport systems and designing cars.

Mobility needs, in fact, often increase with age, particularly with so many older people, especially women, living alone. The quality of their lives and their relationships with family members and others can be very dependent on getting around, visiting, shopping independently or helping others in the community. The other side of the coin is that mobility through adequate transport is essential if other people are to be able to visit them.

One such assumption, which is harmful, particularly to many disabled older people, is that mobility needs lessen with age. The mobility component of the disability living allowance is based on the age a particular disability is acquired and people only qualify if they become disabled before the age of 65. This bears no relationship to the needs of that person resulting from the acquired disability.

2 Barriers to a full life

While the level of independence we all wish to retain is theoretically feasible for the majority of older people, it does not, unfortunately, always materialise. To begin with, prejudices involving stereotypes of older people are deeply rooted in our society, including the view that all older people are slow to learn, rigid, unable to cope with new technology and gradually withdrawing from an active life. Research has conclusively demonstrated that such views are erroneous. With appropriate teaching

and training older people tend to be better at retaining information, though often slower at initially learning, needing to build on knowledge already acquired during a lifetime of assimilating information in a variety of formal and informal ways. When opportunities for a full life are accessible, appropriate and attractive to them, they take them up eagerly.

Prejudice also leads to direct discrimination or "ageism" based solely on age. It is obvious that people of 50 and 60 are not necessarily similar to people of 80 or 90 – also that among individual 60 year olds there is as much difference, both in speed of thought processes, IQ levels or adaptability, as among 15 or 20 year olds. Yet we consistently make assumptions which lump people together within an age cohort as if they are all the same.

The enormous contribution of older people to society is not always recognised. My own organisation, Age Concern, depends on approximately 250,000 volunteers, working across the UK at a local level, performing a huge variety of tasks. The majority of them are over 60 and without them the Age Concern movement would come to a standstill, but it is by no means unique and many other voluntary organisations could also not survive without the enormous contribution made by the older generation. To do their job involves the freedom offered by affordable and suitable transport.

While the likelihood of acquiring some disability increases with age, handicaps caused by the environment should be minimised and should not be barriers to a full and healthy life. Health in its broadest terms and as interpreted by the World Health Organisation means having a sense of wellbeing and participating fully in the social life of the community.

While the need for personal mobility increases with age, accessible means to that mobility also become more important and barriers which a younger person might find easy to overcome may be seen as insurmountable as one gets older.

To retain independence in later life, often after suffering the loss of one's partner, requires an enormous amount of commitment and energy – in fact, can mean creating a new social life, making new friends and taking up new interests and activities. This often hits people who may at the same time have to cope with minor but debilitating physical disabilities.

Such conditions need to be compensated for through access to an environment geared to people of all ages, but in reality our built environment is designed for the young.

Shopping precincts with "cobbled type" paving and necessitating long walks to get shopping to a bus or car; inadequate numbers of public lavatories, especially for women, inadequate street lighting to allay fears of attack, let alone see properly if one ventures out at night; cash machines situated in "unsafe" positions and poor maintenance of pavements and dangerously sited pavement furniture, all militate against older people's interests.

Yet to design our built environment to suit the growing elderly population would not be catering for a small minority. It has been estimated (OPCS

1988) that 6.2 million adults have a degree of disability along a continuum ranging from slight to severe. According to the Disabled Persons Transport Advisory Committee, 4.2 million people (7.6% of the population) experience great difficulty in using public transport and it has been estimated that at off peak time the majority of bus passengers have mobility difficulties (Disabled Persons Transport Advisory Committee, 1992).

Making our environment "user friendly" today also means making it "older user friendly" which will be of benefit to everyone, for example, young mothers, who do not always have an easy time on public transport. The saving in health care costs as a result, not only from the reduction of accidents but in helping housebound, clinically depressed and isolated elderly people, would be considerable, more than justifying, I firmly believe, the necessary expenditure involved.

To create such an environment, those responsible for its design or who deal with older people as customers or consumers need to understand what it is like to cope with the needs of everyday life for many elderly people.

Simulation exercises and other forms of specialist training are essential for this. Age Concern's own training programme, *Through Other Eyes* originating in Canada, can transform the level of service available in shops, on public transport, in banks and many other places frequented by older people, by giving people the actual experience of coping with handicaps. As a result of participating in the courses, radical changes have occurred in floor layout and coverings, the use of mirrored surfaces, visibility and legibility of signs, labelling of goods and methods of taking cash, etc.

Accessibility, if it is to lead to real mobility, must be continuous. Managing heavy luggage on stairs which have to be negotiated in Tube stations directly linked to Heathrow Airport can be difficult if not impossible; transporting cycles on some trains or keeping one's balance while finding the right money on a moving bus, are barriers which can easily defeat the objective of the service for many potential consumers. Prepurchasing of tickets would not only speed up one-man operated buses but help older and partially disabled passengers immeasurably.

It is perhaps largely as consumers, with increasing access to occupational pensions and savings, which enable them to make trips and take holidays, that older people are beginning to have a degree of power commensurate with their voting power, which is now beginning to be recognised by politicians at all levels.

3 Accidents

The Government's Health of the Nation initiative has made the reduction of accidents one of its priority areas for immediate action. This is of immense importance to older people as older pedestrians are at a higher risk of injury than other adults and more likely to be killed or severely injured. Almost half pedestrian fatalities occur in people over 60.

An OECD report in 1986 pointed out that although with advancing age the effects of any given condition might be quite minor, the "cumulative handicap" can be quite significant. It is also known that older people require longer stays in hospital than younger adults and the cost of their care is very much higher.

Older cyclists tend to be keen and enthusiastic and see this inexpensive form of exercise as a reasonable risk and good in terms of health promotion. However, Mills (1989) suggested that there may be serious underreporting of cycling accidents and Christian (undated) found that a third of reported fatal accidents involved cyclists of 60 and over. A recent conference (British Institute of Traffic Education Research, 1991) supported active campaigning to reduce accidents, directed at the general population but accessible to key groups.

To ensure that messages get to those who most need to hear them, older people themselves should be an important training resource and source of information as senior mentors along the lines of our health promotion initiative.

4 Older drivers

When considering older drivers, we need to consider two separate though overlapping groups of people.

Firstly, there are today's 10 million drivers of over 55, mostly male – people used to an environment, including the design of cars suited more to younger drivers than to them and rather passively still accepting this as a "given fact".

Secondly, there is the group of adults, many now approaching the "Third Age". There will be at least 17 million older drivers in 2031, people used to driving in heavy traffic conditions, who, especially if female, cannot contemplate being without a car. Public transport networks are less than adequate and increasingly fail to meet the needs of older people. These people are more articulate about what they want and need.

The importance of the older consumer can be seen from the example quoted by a representative of a major advertising agency recently. He pointed out that a Volkswagen/Audi group survey found that people over 50 buy 36% of Golf and 47% of Polo cars. A recent NOP poll produced figures demonstrating that over-55's outspend the young on food, gardening, DIY goods and holidays. Holidays these days very often depend on the car. An American organisation, Age Wave, has also estimated that 80% of all UK wealth is owned by people over the age of 55 and 60% of UK savings accounts are held by people in that age bracket.

It is not, therefore, only socially desirable but sound economic sense to continue the process, now well under way, to manufacture cars which cater for this important consumer market.

A recent AA Public Policy department research report on women and cars (The Automobile Association, 1993) confirmed that women drivers of today already see their car as the key to an independent and emancipated life. Those who are older, however, are not as confident as men and tend to be worried about night driving and travelling by motorway.

Many manufacturers are already focusing on safety features, but cheaper car phone systems and more secure car parks are among measures that would be helpful to women drivers, as would correct information about safety and situations of real risk. Increasing numbers of women in the work force and familiarity with driving long distances will undoubtedly lead to a very rapid rise in the numbers of female drivers in the near future, especially as the AA research showed that they tend to consider public transport more expensive than their car and far less convenient.

Increasingly, carers also see the car as vital to their crucial role in community care. For them and for all older people, the fact that many essential services, such as health care, are now centralised far from home, and the trend towards out of town and supermarket shopping for which older people show the same preference as younger adults, make a car an increasingly important factor in maintaining the quality of their lives.

The AA's own research on the needs of disabled travellers (The Automobile Association, 1991) found that 90% of disabled people use their cars for mobility and a third drive themselves. But if we include non-registered disabled people's needs, many of whom are elderly, the numbers involved would be much greater.

The Department of Transport's policy document (1991) on *The Older Road User* demonstrated clearly that older people, like all other road users, prefer to travel by car but they do tend to use local roads and make short journeys. The greatest increase in licence holders between 1965 and 1985 was among older age groups.

5 Accidents on the road

To help older pedestrians, who are very vulnerable to accidents, the new detectors on Pelican crossings with audible signals will be very valuable. Older drivers tend to have a lower casualty rate than younger adults but as their numbers increase, so will the accident toll. The AA Foundation for Road Safety Research's (1988) study on *Motoring and the Older Driver* demonstrated that, with age, car use declines to 30-40% of that by younger adults, although frequent slow trips, which are characteristic of older drivers' use of their car, remain very important to them.

They tend to avoid rush hour congestion and high risk situations which partly compensate for any decline in judgement and slower reactions.

They are also less likely to skid, cut corners or drive on the wrong side of the road than young people.

Traffic calming initiatives, severely enforced speed limits, more easily readable and visible traffic signs using new materials, are all helpful to older drivers, and indeed to pedestrians, as are refresher courses, together with regular fitness and eyesight tests. The effects of alcohol and medication vary with age and need to be taken into account.

The Automobile Association, in collaboration with the Medical Commission on Accident Prevention, recommended better all round vision and general car safety features, which are, in any case, now important as marketing features (Medical Commission on Accident Prevention/The Automobile Association, 1990). They also drew attention to the importance of current EC legislation on safety which has already been incorporated by many manufacturers.

They point to the need for co-operation between government, the insurance industry, health authorities, voluntary organisations and the motoring bodies.

To ensure that future action to improve driving is to be acceptable to older drivers, the focus for assessing differing competence needs to be a disability rather than age.

Crude classification reinforcing stereotypes is misleading and will lead to further age discrimination. One grossly unfair example of this is the government's plan to introduce a £6 fee for the renewal of a licence at three-year intervals after the age of 70. If this is necessary it should also apply at other ages where the ability to drive well is what counts.

There should be more campaigns like the *Devon 60+ Campaign* (Gimber 1991) where self-assessment measures of driving skills and well directed information and leaflets encouraging post-assessment advice on improving driving skills are available. One helpful sign is that aerobic exercise appears to help in reducing any decline in driving ability and in compensating for loss of driving skills associated with age.

An important task for us all is to encourage safe, convenient and affordable mobility for all older people. With a more strategic approach this would be possible and the rewards for them and the wider society would be immeasurable. It is time for us to stop looking at older people as a liability and fully recognise their importance as consumers and customers and to the society in which we must have a place.

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Summary of papers

Sir Peter Baldwin KCB MA FCIT (Hon) FIHT CBIM
Chairman, AA Foundation for Road Safety Research

At the close of an immensely interesting conference and the stimulating discussions resulting from presentations of a very high standard, it is important to reflect on why we are all here today. No one likes to admit that the onset of old age is going to change one's quality of life. However, it is better to be well prepared for the changes in lifestyle, including those affecting the safety, mobility and independence of the road user, which are inevitable with the passage of time.

We have heard from a number of speakers today that the most significant changes to the age profile of the nation will occur after the year 2010. It is therefore pertinent that the AA Foundation for Road Safety Research should hold this conference at a time when careful planning and a degree of vision by all the many disciplines, professions and organisations, including government, can help meet the challenges which lie ahead.

The anticipated large increase in the elderly population of the United Kingdom, as a proportion of the total, many of whom are currently confident, middle aged car users, is not an unexpected development – there is no excuse why the changes should not be adequately catered for by central and local government, relevant agencies and by the individuals themselves. But the challenge has to be accepted and the dangers from procrastination exposed. This was accepted by the Minister of State in his keynote address and confirmed in the foreword to this document. Maintaining mobility and good health are high ideals and government alone cannot be expected to ensure our hopes and desires are achieved – but they can give a lead and I hope this conference will have helped in focusing on proposals from which the maximum benefit can be gained.

Although the AA Foundation for Road Safety Research was founded as recently as 1986 it has undertaken considerable work related to older road users as highlighted by Barbara Sabey in her "setting the scene" presentation. We wish and intend to continue in this field and to anticipate the outcome of the growing awareness amongst politicians that the welfare of the elderly road user is not an issue which is the sole responsibility of a single government department. Doctors and others in the medical profession can also influence the transport patterns and mobility requirements of the elderly.

Philip Bly provided considerable insight into the changing mobility patterns which are emerging and the reasons why vehicle manufacturers need to take account of the special requirements of the elderly who will constitute a significant proportion of their market in the years ahead – and one which is expected to have a substantial disposable income.

The comparisons relating to accident statistics provided by Andrew Evans emphasized the serious consequences of road accidents for the elderly, especially pedestrians. This also links in with car design and the need for road engineers and planners to take account of the problems facing the elderly road user.

In his forthright exposition of an over-arching planning strategy to provide mobility without recourse to car use, Peter Headicar ensured that a policy of

unhindered mobility by car should not be accepted as inevitable. By proposing that accessibility should be considered as important as mobility, he struck a chord with comments from other presenters. Accessibility takes on great significance for those in retirement who suffer from mobility impairment. There is a clear need to ensure that the absence of accessibility is minimized but increasingly the country is faced with demands arising from the exercise of choice and mobility through car use which worsen the conditions and opportunities for those without access to a vehicle. Some of his recommendations will be considered controversial, perhaps unpopular, but unless we are content with the current situation there is a case that radical alternative policies should be given an opportunity to prove themselves.

As part of his day to day responsibilities Michael Kendrick has to contribute towards the mobility and safety of older road users in Northamptonshire. The concept of a sustainable transport policy, which he promoted, and its relevance to the government's White Paper "The Health of the Nation" underlined the advantages to be gained from policy convergence between government departments. He stressed that neither mobility nor accessibility can be appreciated without maintenance of good health, a theme taken up by the following speaker.

Sir Donald Maitland set out the economic benefits to the nation of a healthy elderly population and how the Health Education Authority promotes improvements in health and thereby a reduction in demand for health care services. Again the specific role of the doctor was considered to be of especial importance, a theme built upon by James Bevan, who was particularly keen for his profession to be more aware of its responsibilities to the older driver, through advice and discussion. More explicit warnings on bottles containing drugs that may cause sedation was a specific recommendation which already has widespread support in the Netherlands and Scandinavia.

As a provider of public transport David Bayliss outlined recent trends in the industry such as older vehicles and poorer service quality – which were unwelcome as well as improvements which could encourage use in the future – vehicle design, better on-route information, more welcoming infrastructure and more new buses. A strong plea was made for a new partnership between the public and private sectors to reap the benefits of competition whilst ensuring the social role of buses is recognised as a vital ingredient of a full and satisfying life to many elderly people.

Maintenance of mobility into old age and, with it, personal independence was a theme running through Lady Greengross' presentation. A vigorous promotion of the elderly was given; increasingly we read of the advantages of experience over youth in so many facets of life, yet for the most part our built environment is designed for the young. Making it "user friendly" for the elderly has positive repercussions for young mothers – for instance on public transport – and numerous improvements were proposed in this area as well as car design and health promotion.

I believe that the presentations we have heard today provide a useful catalyst in the form of recommendations and warnings to enable appropriate decisions to be taken to cater for the needs and desires of all types of elderly road user. I trust that this conference, by commemorating European Year of Older People and Solidarity between Generations, will be recalled as the event which laid down definitive recommendations to legislators, professions and practitioners so as to contribute to a better deal for all older road users.

Tables and figures

The role of highway engineering

The role of the bus planner

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