Towards a safe urban speed limit

Report of the Cyclists Urban Speed Limit Taskforce

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executive summary

This review of Australian and overseas literature, research and experience shows that current urban speed limits are far too high to allow safe use of urban areas by cyclists and pedestrians as well as motorists, a fact that is now well known to many road researchers and traffic and urban planning authorities.

Most of the deaths and serious injuries to cyclists, pedestrians and motorists occur on the larger, non-local roads. Reducing the speed limit only in 'residential' streets and not across whole urban areas will therefore only address the small minority of fatalities and severe injuries.

The Australian Road Rules review initially included reducing the General Urban Speed Limit. The current urban speed limit of 60km/h is amongst the highest urban speed limits in the world. Against these well known facts, recent press announcements by various authorities have tended to emphasise reduced speed limits only in 'residential' streets and some authorities are promoting or actually raising speed limits on the most dangerous roads for pedestrians and cyclists ... as well as other road users.

Confirming what many cyclists and pedestrians have suspected, urban planning, traffic and road authorities have not taken and do not take into account the needs of pedestrians and cyclists in determining urban traffic needs.

Proposals to reduce speed limits only in selected residential streets are definitely not a review of the 60km/h general urban speed limit. They are simply an extension of the current process of determining the speed of traffic by assessing the growing dominance of increasing density and speed of traffic based on the 85th percentile approach which allows speed limits to be set according to traffic needs only. Increasing speed and increasing volumes of traffic would continue to lead to increased speed limits and reduced safety and amenity for cyclists and pedestrians of all ages.

Therefore, while current policies and strategies purport to support cycling and walking, continued support for road projects and public transport without inclusion of cycling continue to make cycling less safe and less convenient.

Commitment to cycling and walking can be assessed by the extent to which they have been included and excluded in recent government transport and planning strategies and projects.

Federal and state governments and the federal Department of Transport through a strong commitment to the National Bicycle Strategy and cycling promotion must ensure that processes exist which will ensure that cyclist and pedestrian needs are included in all research, policy and implementation for road and street environments.

Current and new infrastructure can only provide accessible and equitable routes for cyclists and pedestrians if it can be safely, equitably and economically used by the various vulnerable road users. As has been argued by the leading integrated urban traffic planners in the world, cyclists and pedestrians do not cause the majority of crashes with serious or fatal consequences and accordingly, the following are summary recommendations.

1 Proposed changes to road conditions and in particular speed limits must be subject to safety audit processes which include mandatory facility planning for cyclist and pedestrian safety. The audits should be carried out jointly by community based groups and road and urban planning authorities so that all road and development planning decisions include local interests, in particular the safe and convenient use of urban areas by cyclists and pedestrians.

2 All local area traffic planning must include rather than exclude major arterial and non-local type roads and streets so that road hierarchy based planning does not continue to allow and encourage continuing development of major arterial roads through vital urban centres as a response to continuing growth in traffic demand. This will be achieved by ensuring that environmental and amenity issues are considered exhaustively in all urban traffic planning and management proposals.

3 Reverse the current car based standard planning hierarchy by prioritising the modes such that all urban and regional transport needs are determined and addressed in priority commencing with walking then cycling then public transport then freight then private transport in order to encourage safe local trips and preserve local and regional amenity. Adoption and committed implementation of such a strategy would be a major step in moving towards Australian government obligations to reduce greenhouse gas.

4 From evidence and experience in both Australia and overseas, speed limits in urban areas are excessive by up to 30km/h across all urban areas. Several Australian road authorities already produce ‘road safety’ brochures and campaigns confirming this fact.

Therefore, if the safety of pedestrians and cyclists as well as motorists is to be addressed equitably and economically, it is essential that:-

1 the current general urban speed limit of 60km/h be reduced to 30km/h in residential and other “people oriented” urban areas, and,

2 higher speed limits only be allowed on urban roads where higher speeds have been found to be safe, equitable and convenient for cyclists and pedestrians by an audit process as previously described or where the audit process confirms that adequate and frequent facilities allow separation.

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overview of project

The Bicycle Federation of Australia (BFA) is a national body, which through member organisations in each state and the ACT, works to improve the cycling environment. The members of BFA recognise that safety is a prime issue for all road users ... not only cyclists.

As part of a federal government initiative to develop consistent national road rules, speed limits have been under review. Over a similar period, urban speed limits have also been considered in several national urban design reviews seeking to protect and maintain amenity in urban areas. Compared with overseas best practice and Australian needs, these reviews have effectively ignored the interests of cyclists and pedestrians. Urban areas in Australia remain dangerous for cycling and walking.

The National Bicycle Strategy (Department of Transport and Communications, 1993) was welcomed at its launch in 1993 although no substantial ongoing Commonwealth government support was committed. By the end of 1994, the BFA President noted that the Commonwealth government had effectively withdrawn from implementation of the National Bicycle Strategy. By referring the National Bicycle Strategy to the Australian Transport Council, the Commonwealth government was able to avoid committed support for the Strategy.

The National Bicycle Strategy remains a very important policy initiative. It is much more than "fine words printed on glossy paper" (Cyclist, December 1994-January 1995). It confirms the imperative to plan for and provide safe cycling conditions and facilities in a broad healthy urban environmental context. Most importantly, the National Bicycle Strategy provides a basis for assessing and reviewing ongoing commitment to safe cycling and the extent of implementation of the Strategy.

In particular, the objectives of the National Bicycle Strategy (p5) are to:

: integrate cycling into the transport system as a legitimate mode of personal mobility;

: encourage more safe cycling in the community; and

: significantly reduce the rate of bicycle related crashes and the severity of injury to cyclists.

Given the likely relationships between these objectives and the review of urban speed limits, the BFA National Conference held in February 1996 determined to undertake a review of current traffic and transport research and experience from the cyclists perspective in order to demonstrate the benefits of integrating safe cycling conditions as a component of improving the safety of all road users.

The Cyclists Urban Speedlimit project has sought to identify relevant integrated objectives which can be assessed against specific broad-ranging criteria including feasibility, cost-effectiveness, health, safety, environmental and other social factors supported by and in support of the broad aims of the National Bicycle Strategy.

Inclusion of such factors emphasises the extent that cycling is not objectively considered. In particular, the needs of cyclists and pedestrians have not been met by current reviews of the urban speed limit by the majority of government and other research bodies.

Much of the European experience of slow speed, mixed traffic planning has not been considered or has been dismissed. Where research which could be relevant has been carried out, limited or narrow research questions have ensured that broader, more integrated possibilities and beneficial outcomes have not been addressed or have been excluded.

Previous road safety and engineering solutions no longer meet the needs of equity and accessibility for all members of the community. Vulnerable road users are bearing the brunt of these failures by being forced to adopt other means of access and/or through provision of facilities which remove rights of access and replace them with inferior, sometimes dangerous, solutions. Generally, these solutions are based on the premise that high speed traffic is essential. However, high speed traffic is considered so dangerous that vulnerable road users are explicitly and implicitly excluded from use of the road and street network.

Several recently implemented schemes in Australia and overseas have shown that the 'old' solutions are no longer 'state of the art'. Broader assessment including environmental, health and amenity impacts has shown that such solutions cannot meet relevant criteria when community-wide interests are valued as essential. Those whose former and current role was to implement the 'old' solutions are now being pressured to at least consider the new alternatives, whilst often resisting change despite new policies. Many if not most of those charged with implementing cycling initiatives and the urban speed review are in exactly this position.

This report confirms that policy initiatives to date are little more than 'fine words printed on glossy paper'. Cycling conditions cannot be improved while some of the most feared road features cannot be changed. Similarly, effective off-road facilities cannot be provided unless the inevitable road crossings and on-road links are also provided at high levels of safety and convenience for all the proposed users.

The principal reason given for not implementing useful and safer cycling facilities is that they must be designed to allow for current high speeds of urban traffic. With increasing recognition of the costs of pedestrian and cyclist fatalities and serious injuries and of the cost of alternative facilities, urban speed must be reduced. Lowering the urban speed limit is essential. Safety of cyclists and pedestrians should determine the limit.

acknowledgements

Many people and organisations provided assistance to this project. In particular, each of the member groups of the Bicycle Federation of Australia has contributed substantially. However, because in many cases, the issues are similar, those contributions which best suited the project have been selected and appear in the report.

There are very few revolutionary or new ideas. This is particularly true of the topics addressed by this report. Therefore the report draws on existing practice and existing literature rather than endeavouring to produce new solutions. Cyclists from many parts of Australia submitted so many ideas and pieces of information which emerged in discussions, articles, submissions or which emerged in newspaper articles that individual acknowledgements cannot be made.

However, special mention must be made of the speed limit debate in South Australia. Not only is the debate much more spirited than elsewhere in Australia, it has been most informative. Members of the Bicycle Institute of South Australia (BISA) provided a wealth of information, critique and experience to this report and to the debate in South Australia. Hopefully, they will be rewarded.

A just reward would be a decision by Australia's Transport Ministers that cyclist and pedestrian safety together with acceptance of public health and environmental imperatives includes a substantial commitment to new transport policies, in particular the National Bicycle Strategy, and that a safe general urban speed limit of 30km/h is therefore essential for pedestrians and cyclists.

The safety and health of the tens of thousands of Australians who are killed, injured or effected by road crashes and road health effects each year are more important than the political challenges of accepting the need to promote a change in behaviour of similar magnitude to others successfully implemented in road safety and public health.

The assistance of many authorities is also acknowledged with gratitude because in many cases, it is clear that potentially, this report would be critical of current research and policy. To the extent that the report has been critical, many of the criticisms are illustrative of the causes of the many concerns expressed by environmental, urban and transport planners and critics in regard to current policy and implementation.

In particular, many of the criticisms are of implementation rather than of policy or issue identification, indicative of the principal problem of implementing new or better ideas without the committed support of researchers and authorities in government by experienced advocates, the knowledgable consumers. Therefore, commitment to research and implementation which includes the interests of cyclists and pedestrians as the consumers (rather than the researchers and managers) see them, remains essential.

introduction

"It's a hundred years since the first recorded road fatality. Bridget Driscoll was knocked down and killed by a demonstration car at a fair in London on August 17, 1896. A witness said: 'The car was coming at a great rate; as fast as a bicycle.' The coroner at her inquest said he hoped such a tragedy would never happen again. The Queensland road toll this year is 208" (The Courier-Mail, August 19, 1996).

It is both interesting and informative to reflect upon this article. We are eternally optimistic about the future. Like the coroner, we rely on hope rather than intuition, experience and knowledge.

From a cyclists perspective, little comfort can be drawn from this report. While the report implies that no cyclists had been killed, it could also confirm that cycling and cyclists were not included in road research and records 100 years ago! The magical appeal of the car had already taken hold to the extent that pedestrians and cyclists were no longer to be protected from the impacts of the car. The car was to dominate the next century of urban transport and planning.

However, such domination was not unexpected. In 1907, the car was described as 'a luxury that is apt to degenerate into a nuisance' by U.K Prime Minister Asquith when commenting on proposals to introduce a car tax (Elsworth, 1991, 5).

The 'luxury' aspect of the car remains with us today promoted through use, advertising and urban and transport planning which made and still make car use seem essential. The car does provide a very suitable solution to many needs although many of these are perceived needs; the outcome of car dependency and the planning which has created it.

However, alternative solutions to these needs are not and have not been considered. One of the solutions, cycling, has almost been replaced by the car and subsequently, car dependency. The 'luxury' of the car and its 'nuisance' to others without cars have been the prime reasons for its dominance. Pedestrians and cyclists have been and remain its victims.

Planning and road authorities have been and remain the proponents of car dependency. By failing to provide for other solutions, they provide improved facilities and conditions for cars, buses and trucks based on increasingly prevalent use thus ensuring an increasing demand. Paradoxically, by failing to curtail the 'nuisance' of cars, these authorities have allowed pedestrians and cyclists as well as car drivers and their passengers to become the victims of the car, a role that continues currently in Australia. As Ian Roberts noted recently, "... the very people to whom we should be able to turn for support, Road Safety professionals, offer us the least succour" (Australian Cyclist, August 1995).

Understanding of the role of transport, road and urban planning in current decision making processes is therefore crucial. Review of research in urban, traffic and transport planning demonstrates an almost complete lack of evidence of concern for and solutions to pedestrian and cyclist needs. Whilst road and car studies are integrated and demonstrate extensive benefits from more roads and more cars, pedestrian and cyclist studies are undertaken in isolation, preventing integration and inevitably confirming problems with implementation and lack of benefits.

In particular, the relationship between the peak body groups undertaking 'research' and the various governments, the ‘roads’ departments and the various ‘road lobby’ groups is informative. While seemingly independent research bodies, Austroads, the national association of road transport and traffic authorities in Australia (Austroads, 1993) and ARRB, the Australian Road Research Board Ltd, are essentially government bodies, governed and funded by federal and state road authorities whose principal interests have been and continue to be the promotion and use of the national road system. Austroads essential purposes include support for "identification of world best practice in the management of Australia's roads" (Austroads, 1993).

Austroads mission is:

to pursue the effective management and safe use of the nation's roads:

- as part of the Australian transport system
- by the development and promotion of national best practices, and,

to provide professional advice and support to ministerial councils and national bodies (Austroads, 1993).

No independent groups exist to assess these purposes and missions in order to ensure that the 'nuisance' elements of transport and car dependency are as well researched and publicised as the 'luxury' elements of car use. Review of submissions and reports seeking to address the 'nuisance' elements of car use demonstrates that car dependency has become an almost permanent unquestioned fact whilst the 'nuisance' elements are seen as problematical, likely to threaten car dependency, usually involve alternative use of road and street space and therefore are best referred to the road and town planning experts for their 'professional advice'.

These processes suggest that pedestrians and cyclists should not expect much support from transport and traffic management systems and decision makers. Cyclists and pedestrians are the 'nuisance', not cars.

Review of submissions and reports from cycling advocacy groups has shown relatively consistently that it is these groups which are aware of the 'nuisance' issues and of the many potential solutions. The independence and apparent lack of responsibility of road authorities allows informed but alternative solutions (e.g. BFA, 1996) to be ignored and accordingly has led to pedestrians and cyclists continuing to be viewed as if they are a 'nuisance' to cars on the roads.

If cyclists and pedestrians have become the 'nuisance' rather than the cars, the processes and research which have led to this situation are important issues if these processes are to be slowed or reversed.

Majority, democratic or market-led arguments are commonly but erroneously used to justify providing facilities and funding. Transport and urban planning authorities are no different when seeking road funding.

However, when future problems are potentially predictable, experts have a particularly important role. 'Planning' predicts and therefore determines future outcomes. It cannot change current problems. Planning is a long term strategy which should involve both current and future outcomes.

Inclusion of well informed long term predictions is essential to 'planning'. Inevitably, exclusion or marginalisation of such predictions is an indicator of possible short term benefits which may ignore long term negative outcomes. Thus it is essential that 'planning' processes, reviews and research include well informed long term views and predictions.

Clearly, many if not most such issues and predictions will not necessarily be those held by the 'majority'. Therefore rather than excluding such issues in response to majority, democratic or market-led arguments, inclusion of such issues by issue-raising, informative and educative strategies and 'debate' is essential. Enlistment of those agencies known to have experience or expertise in these 'other' issues is therefore an essential prerequisite to effective long term 'planning'.

Enlistment of diverse well informed public and advocacy agencies, the extent of public accessibility to expertise and knowledge and the opportunity for a lengthy well informed public 'debate' are strong indicators as to whether 'planning' outcomes and strategies are committed political processes or simply uncommitted gestures.

This report is a response to current 'debate' about urban speed limits. Deciding urban speed limits does not involve simple trade-offs. It is a complex problem effecting many interest groups. To date, speed limits have been considered from a very simplistic perspective by a very narrow group of 'experts' who appear not to have been well informed about 'other' issues and have continued to rely on excluding expertise and experience from advocates for the 'other' relevant interests.

For example, media reports of local authority statements by senior Brisbane City Councillors promoting '50km/h on non-major roads' and '65km/h on major roads' (Westside News, 24July1996) are of particular concern. Continued BCC support for the notion that 40km/h or less cannot be implemented to replace 60km/h because 'a 40km/h limit or less should only be used where physical traffic calming devices have been implemented or in well defined local areas' does nothing to 'clarify' (South-West News, 11September1996) the real issues of perceived and real dangers to cyclists and pedestrians in urban areas and particularly, on major and 'non-major' roads.

Therefore, this report seeks to provide a stimulating source of information to assist those advocating for a safe and healthy urban environment and to assist those who will make the decisions. Where the report is critical of current practices and processes, it is recognised these are often the expected roles of those currently involved. However, by including rather than excluding 'others' in the process, the 'unexpected' may well be achieved.

the cyclists perspective

There are of course many kinds of cyclists. In practice, it is relatively easy to describe many more than are, for example, listed in the current Australian design guide (Austroads, 1993). The needs of cyclists are in fact universal and ubiquitous.

Accordingly, the cyclists perspective is quite distinct from that of the motorist. It may be viewed through the eyes of the young or old, the partially sighted or those with various disabilities, the extremely fit or the occasional cyclist, the environmentalist or the scientist, the physical worker or the student. The list is almost endless. It is an equitable list which would include anyone whose needs can be accommodated by human powered vehicles. These are usually but not limited to a bicycle and often are quite different to standard bicycles, e.g. a wheelchair.

The cyclist may be cycling quickly, slowly, enjoyably or simply to get somewhere else. The choice may be based on financial, security, fitness, physical or geographical criteria or any combination of these. The cycling experience may be purposeful or aimless, for recreation, sport or commitment to environmental causes. Cycling may save time and money. It may combine convenience, economy, fitness and commitment. There may be no other option.

With such a range of attributes, it appears paradoxical that cycling is not encouraged to the maximum. It is socially equitable, environmentally friendly, healthy, sustainable, economical. Cycling certainly is a suitable means for moving from place to place in urban and rural areas, allowing greater distances to be covered more easily by more people.

Although cycling is more efficient than walking, cycling and walking are essentially mutually supportive rather than in conflict. The conditions and facilities which encourage cycling and walking are so similar that good conditions for one encourage the other. Good conditions for cycling and walking encourage those with various physical and other disabilities (Engwicht, 1992, 82). While suitable conditions to a large extent existed in most urban areas, they are continually being modified, reducing the amenity for these groups while increasing the benefits for car users.

Meeting the needs of pedestrians, cyclists and those with disabilities without reducing their amenity provides an effective tool for analysis and assessment of structural and regulatory changes to urban areas. Currently, such needs are not considered. As in Europe, acceptance of the rights of such groups (Tolley, 1993,xvi) is essential. Promotion of the 'cyclists perspective' is imperative, not just for cyclists but for those with disabilities and for pedestrians and public transport users.

safe and healthy transport

Given that the broad interests of pedestrians and the access disabled are reflected in the cyclists perspective, transport systems which are safe and healthy for these groups are essential. Therefore, transport systems can no longer be considered only from the specific needs of specific dominant groups as they are at the moment.

If any group such as cyclists and pedestrians, is considered as special or different to the rest of the transport system as cyclists on roads are treated in the Guide to Engineering Practice (Austroads, 1993), their interests can be marginalised. The need to fully integrate the cycling perspective is lost and replaced with "discretion and judgement" (Austroads, 1993,foreword). The imperative to provide safe and healthy transport has been replaced by discretion and judgement which does not reflect the cyclists perspective.

Many groups of users can be excluded by exercise of discretion and judgement if unchallenged or unable to be challenged by other views. It is "inappropriate" for young children to cycle on busy roads "because of their inability to judge traffic speeds and situations" (Austroads, 1993, 1). Elderly drivers are advised to "avoid heavy traffic times". Elderly pedestrians are advised to "avoid peak traffic times" and to "allow plenty of time to cross the road" (Queensland Transport, undated).

Contrary to the apparent meaning of such seemingly sensible advice, this is not advice about "greater safety on the roads" and "tips to help you to continue using our roads safely" (Queensland Transport, undated). This is advice not to use the roads because they are no longer safe.

The young and the elderly as well as those with disabilities suffer from special difficulties in coping with the roads (e.g. McLean, 1995). These are not small groups in the population. The greying population is rapidly growing. For these large population groups, the roads have become so dangerous that equitable access to urban facilities and services is effectively prevented.

Without the cyclists perspective, experts produce their solutions to the problems as they see them. Provision of barrier fences to prevent the problems of pedestrians and cyclists crossing roads is seen as solving the problem of the need to cross roads. Rather than provide safe roads, helmet wearing by cyclists is promoted which does nothing to improve the safety of the cyclist and may even increase risks of crashes. Helmets can only reduce crash impacts during and after a crash (Hillman, 1993).

An equitable healthy and safe transport perspective requires the reasons for the danger (which are often but not always the cause of the risk or danger) be addressed or removed, rather than reducing the amenity of the likely victims.

aims and goals of the 30km/h urban speed limit project

Cycling advocates presumably seek improved conditions for cycling. While pragmatic and political opportunities are recognised as components of the processes of change, assessment of 'improvements' must be well informed, not only by local or regional needs but by experience and recognition of new ideas and changing conditions. The fundamental aim of improving cycling conditions remains fundamental through such processes. While difficult and often seemingly counter-productive, advocacy for best practice is therefore essential.

Current considerations of a suitable urban speed limit demonstrate this dilemma. As this report seeks to illustrate, the needs of cyclists as represented by the cyclists perspective, appear to provide a very pragmatic basis for deciding a suitable urban speed limit, not only based on the needs of the broadest range of cyclists and pedestrians but also the needs of most of the many other users of the transport networks.

Such an outcome must be well informed and address the diverse needs in such a manner that the outcome appears inevitable without adopting a biased position. The outcome must seem sensible to those who currently exercise "discretion and judgement" (Austroads, 1993,foreword).

The two concepts - 'safe and healthy transport' and 'the cyclists perspective' as previously outlined in this report have been adopted.

In addition, the 'universality' of cycling and pedestrian needs has been adopted. Accordingly, the cyclists perspective is considered as an international or global perspective which has been met in many parts of the world, thus allowing worlds best practice as a standard and a goal rather than being constrained by Australian best practice.

Worlds best practice will suggest solutions the adoption of which may seem radical or impossible. However, it is obviously inappropriate to accept or endorse Australian practice if it is inconvenient, inequitable, flawed or dangerous when assessed in comparison with worlds best practice or operational examples and solutions which are advocated or practiced by recognised authorities outside Australia.

Some facilities previously sought by or provided for cyclists are not conducive to safe, convenient and healthy cycling. They may well prove to have been counter-productive to the longer term outcomes identified by this report. Paradoxically, but not surprisingly, some issues advocated in Australia for many years have been adopted elsewhere and represent what is now regarded as best practice. Identifying the reasons such practices are not adopted in Australia is an important goal of this report in addition to providing evidence for adopting 30km/h as the urban speed limit.

research, process and evidence

This report has comprised a major but not exhaustive search of the literature, not only pertaining to cycling but to issues which involve transport and urban planning, environmental assessment, integrated planning and decision making. In addition, issues and submissions from BFA members were sought and have provided a wider ranging view of many of the issues which potentially should inform the final decisions being made about the new urban speed limit.

Much of the literature fails to address the real risks to and safety of cyclists and pedestrians. Often, it appears that cyclists and pedestrians are not so much ignored or excluded, they are simply not included. Whether this is by design or not, is impossible to determine without extensive access to briefings to consultants and departments within government. Where cyclists and pedestrians are considered (e.g. Austroads, 1993), it is usually in isolation such that the implications of integration, inclusion or exclusion are not considered from a perspective of equity and a commitment to improving cycling and walking conditions.

The current perception of cycling in transport and urban planning is well illustrated by the images of young children on bicycles on the covers of recent major transport planning documents (Queensland Government, 1996; Austroads 1995) rather than, for example, commuter cyclists.

Therefore, much of the research and literature suggests that two seemingly conflicting points of view exist. Firstly, cyclists and pedestrians are recognised as vulnerable. They are described as 'vulnerable road users'. However, whenever vulnerable users are considered to be what can only be described as excessively vulnerable, various constraints, barriers and prohibitions are implemented to protect the vulnerable users by preventing them being as exposed while at the same time, substantially reducing their amenity and convenience. Much, if not most, Australian technical and research literature displays these characteristics.

Secondly, much of the advocacy literature and the technical literature which confirms the vulnerability of cyclists and pedestrians supports the seemingly obvious need for solutions which substantially benefit the vulnerable road users. However, the solutions are problematic for those who currently exercise "discretion and judgement" (Austroads, 1993, foreword). The onus of responsibility has effectively been shifted from those who cause the problems ... to those who have become the victims.

By adopting the cyclist perspective and the safe and healthy transport aim, equity considerations clearly demonstrate the effectiveness of the biased processes by which "discretion and judgement" (Austroads, 1993, foreword) are exercised. Therefore, many of the issues raised in this report might appear biased in favour of the vulnerable road users ... precisely because the current system is so biased against them. Similarly, much of the evidence raised in the report will also appear biased. This report is not about biased research. It addresses the specific issues of safe and healthy transport, equity and responsibility.

current status of the urban speed limit

The general urban speed limit is the normal standard speed limit expected in towns and cities with no visible speed limit signs. Where necessary, higher and lower speeds can be implemented but must be indicated with extensive and repetitive signage. The present general urban speed limit is 60km/h.

As road rules are regulated by state governments, they vary from state to state. The urban speed limit is currently 60km/h in all states. As a part of the development of standard national road rules, the urban speed limit is being reconsidered. There appears to be little research into the various approaches that could be taken in determining the appropriate criteria for deciding the urban speed limit (RACQ, 1995, 22).

The 1974 decision to convert from 35mph to 60km/h rather than 50km/h may 'have been an unfortunate choice which has led Australia in the opposite direction to international trends' (RTA,undated, 15). Overseas experience has confirmed that 50km/h was too high (NRW,undated; enfb,undated). Now, after taking the wrong direction 22 years ago, road authorities are suggesting the adoption of 50km/h without adequate research based on extensive trials and overseas experience.

In confirmation of the continuing reluctance to consider and trial adoption of overseas experience, the Chairman of the NSW Parliamentary Staysafe Committee was advised by European experts that 'a 50km/h suburban limit already being trialled on Sydney's lower north shore was ... too fast' (The Telegraph, 14 July 1996).

Recent government announcements confirm that adoption of '50km/h on all urban streets' is being considered by South Australia (The Advertiser, August 3, 1996) and '50km/h limit in residential streets' is being considered in Queensland (The 1996 Queensland Road Safety Action Plan). Brisbane City Council has sought approval of the Queensland Government to implement '50km/h on residential streets and non-major roads and 65km/h on major roads' (Westside News, July 24, 1996).

There is little evidence as to why the various authorities, contrary to earlier reviews supporting 30 and 40km/h (MTFTC, 1995, 16), are now seeking 50km/h rather than lower and safer speed limits. 'A reduction in traffic speed would cause a bottleneck' is one reason given for avoiding implementing 40km/h on roads that are 'too busy for a 40km/h zone' (Westside News, July 29, 1992). Current and previous announcements suggest that 50km/h is being sought only as a token or compromise reduction to respond to residents requests, most of which appear to favour 40km/h, possibly based on the known outcomes of intensively engineered local area traffic calmed precincts. The 'luxury' of traffic apparently remains dominant over the 'nuisance' caused by traffic.

Current international trends which 'encourage the use of 30km/h or lower speed limits' are also well known and presumably understood by road authorities. Adoption of 30km/h or 40km/h is usually suggested with the condition that these can only be applied 'in residential areas where appropriate layouts could be achieved, together with more general use of traffic calming in built-up areas' despite road authorities being aware that 'Australia has a high urban speed limit' which at 60km/h appears to be amongst the highest, if not the highest urban speed limit in the world (RTA,undated, 15).

This is a very incomplete picture. Many authorities in Europe have extensive experience in implementation and outcomes of very large 30km/h zones. Some areas have whole of city 30km/h general speed limits (e.g. Sammer, 1994). Most, but not all, of the European examples are cities and towns 'designed' well before the rise of the automobile. They have been adapted to suit the changing needs for mobility and accessibility. Current Australian reluctance to consider a general urban speed limit lower than 50km/h confirms the extent to which Australian cities and towns have been adapted and designed for car convenience and not for pedestrians and cyclists.

Current debate about the urban speed limit in Australia reflects the continued preference for the perceived need for ‘speed limits to appear reasonable to drivers’ (McLean, 1995, 9). Adoption of an urban speed limit based on current experience in Europe seeks to place the quality of urban living, the safety and health of those who live in urban areas above the 'luxury' of car travel through such areas. However, very recently, road authorities (e.g. RTA,undated, 15) and the Chairman of the NSW Staysafe Committee (The Telegraph, 14 July 1996) have recognised that Australian urban traffic practice may be substantially in contrast to overseas practices if safety, amenity and convenience of the occupants of urban areas are considered.

Despite opting for a trade-off between the speed limit on residential streets and primary distributors, the Ministerial Task Force on Traffic Calming 'strongly recommends against ... zoning of local distributors at 50km/h' (MTFTC, 1995, 16). The excessive influence of engineering (MTFTC, 1995,iii) may explain why the urban speed limit debate has been moved from a default limit to 50km/h only in residential streets.

However, since groups such as the RTA and the NSW Staysafe Committee are now aware that Australian urban speed limits are so much higher than is desirable and are now also aware of the disadvantages of not lowering the urban speed limit, it is reasonable to expect that their views will support and be supported by the views of cyclists and pedestrians and that the general urban speed limit will be determined with these views included rather than treating only 'residential streets'.

redefining the current problem

All urban areas should have a safe 'urban speed limit'. The proposition that urban speed limits should provide or encourage unsafe conditions for cyclists and pedestrians using streets and roads in urban areas would appear to be both unreasonable and unrealistic.

One of several current difficulties with determining a safe urban speed limit is that there is insufficient and inadequate research to demonstrate the effect which the current speed limit is having on pedestrians and cyclists thus allowing the status quo, i.e. 60km/h to continue to be viewed as apparently safe despite indications to the contrary. These indications include not only the European experience but preferences and risk avoidance behaviour currently existing in Australia.

The effects of legal speed limits include both crash outcomes and perceived risks. The relationship between speed and crash risk is not very clear (e.g. Fildes and Lee, 1993; Cyclist, February 1996, 30). However, the relationship between speed and crash severity is 'considerably more convincing' (e.g. Fildes and Lee, 1993, 10) as it is based almost directly on basic laws of physics.

The relationship between speed and the severity of occupant injuries, although complicated by the kinds of vehicles involved and the type of accident, is also clear. In a given type of accident, the risk of the vehicle occupants being seriously injured increases disproportionally with the speed of impact. TRL research indicates that ... at 30mph (50km/h), the risk of serious injury is three times that at 20mph (30km/h) and at 40mph (70km/h), ... five times (Department of Transport, 1992, 6). Travelling through urban areas at 40mph (70km/h) is five times more likely to result in serious injury in a crash than travelling at 20mph (30km/h). Crashes are also far more likely to occur as vehicle speeds increase (Department of Transport, 1992, 4).

Crash severity as an outcome of excessive speed is convincing because crashes are the obvious outcome of exceeding the safe risk. The Queensland Transport campaign brochure "Do you drive too fast for the unexpected?" emphasises excessive speed as being dangerous under various conditions, many of which are 'expected' rather than 'unexpected'.

Intuitively, crash outcomes for vulnerable road users in conflict with heavy road vehicles are likely to be much worse than those for heavy motor vehicles. Wherever possible, the risk of such crashes is avoided. Parents now drive their children rather than encouraging them to cycle or walk to school ... primarily because they perceive the roads as being too dangerous. Pedestrians and cyclists avoid busy or dangerous routes by taking alternative routes or using alternative modes of transport.

Perceptions of danger or risk are effects of high speed limits. They are emphasised by the use of 40km/h or lower speed limits around school precincts for example. These areas feel safer yet there is surprisingly little research into their actual benefit. There have been some studies into the effect on reducing speeds (e.g. Fildes and Lee, 1993, 33) but few if any into the benefits or actual safety improvements of reduced speed.

Similarly, because minor crashes are not required to be reported to police but are significant deterrents to pedestrians and cyclists, most research carried out is very flawed, in particular when the research is used to substantiate current practices. As most cyclists and pedestrians will recognise, many minor crashes occur but are not reported. Significant numbers of near-misses also occur. These also are not reported and are effectively unreportable.

Many urban speed related crashes appear not to be reported as speed related simply because the urban speed limit is 60km/h i.e. it is too high. As stated in the Queensland Transport campaign brochure "Do you drive too fast for the unexpected?", 'speeding is not merely exceeding the speed limit. Many crash victims have admitted driving too fast for the conditions, even though they were not over the speed limit'.

It is not difficult, therefore, to comprehend the legal problem facing traffic police reporting a vehicle involved in a crash for travelling at an excessive speed but below the speed limit. Such instances are more likely to be treated for example, as undue care rather than speed related. Therefore, 'crash' and traffic reports tend not to show 60km/h as too high and 60km/h appears a safe urban speed ignoring the effect of 60km/h impacts on the safety of cyclists, pedestrians and motorists.

The combination of these factors confirms that current reporting and therefore research is significantly flawed, in particular against the interests of cyclists and pedestrians because of their natural tendency to avoid, where possible, exposure to excessive danger. In this way, the inequities in current road and urban planning are not explicit. Reliance only on current research of current practice ensures the threats to cyclists and benefits from adopting more equitable solutions cannot be shown.

Australian road research is currently defined by those who control the transport system, from the national level down by Austroads or ARRB. Accordingly, by effectively ensuring that only demonstrably necessary research is carried out and by determining the criteria both for the research and for the outcome, only an increasing fatality or serious injury outcome will generate committed research into the conditions which would encourage a return to cycling and walking as safer and more convenient modes than motorised traffic.

However, those interested in improving urban amenity by providing more equitable choice need not accept the current situation where their interests are marginalised. On the contrary, their views may well represent those of much larger groups with similar or supportive interests who have not been and are not recognised for similar reasons.

The interests of pedestrians are well supported by the more defined needs of cyclists advocacy groups. Mutually supportive research and action will draw attention to the larger interests of the much larger group. For example, in the Netherlands in the early 1980's, the '*50 is too much*' campaign committee was formed from the pressure groups 'Stop the child murder', ENFB, the Dutch Bicycle Association and VBV, The Association for Protection of Pedestrians (enfb,undated). Groupings such as the Safer Streets Coalition and the Zebra Group in South Australia, confirm the similarity of interest in Australia.

The broader base of support provided by such groupings is essential to successfully redressing the imbalance in current research caused by the 'success' of the 'road lobby' (Alarm UK,undated). The continued absence of both the recently formed Pedestrian Council of Australia (Staysafe, 1996, 72) and the Bicycle Federation of Australia from groups such as those addressing speed management and road safety at state and federal levels of government is a potent measure of the real concern and recognition of these interest groups by motoring and road interests.

The PCA and the BFA in effect represent different sectors of the non-motorised road user groups, the 'cyclists perspective', in the same way that motorised road user groups are currently represented by freight transport, bus transport, motorcyclists and motorists organisations on existing groups such as the National Road Safety Strategy Implementation Taskforce (FORS, 1996, 1). However, roads are unlikely to be safe for cyclists and pedestrians while their interests are represented by those who seem unable to represent or are opposed to them (BISA, correspondence to Office of Road Safety, South Australia, 23 September1996).

other places and examples

Most readily available research of cycling promotion and implementation through deliberate policy is either from or strongly influenced by practice in the Netherlands. It is relatively common to assume from this that particular criteria have led to this outcome.
However, selected criteria often demonstrate selectivity which reflects predetermined perspectives or prejudices. For example, 'the extent to which people will cycle in Brisbane' was considered by Brisbane City Council to 'always be constrained by the city's climate and topography. It is also increasingly difficult for people to comfortably, securely and safely cycle on Brisbane's roads' (BCC, 1994, 54).

By comparison, the Dutch experience exemplifies the best approach to promotion of cycling as a high priority.

The Netherlands is very threatened by rapidly increasing use of cars. The Dutch experience provides many years of deliberate practice in the provision of cycling friendly facilities designed to ensure that cycling retains a central position in the traffic and transport system as an excellent alternative to the car (e.g. Welleman in CROW, 1993, 9).

While the popular image of the Netherlands is that of a cycling paradise, the same flat conditions make other forms of transport engineering relatively just as, if not more, appealing. The crucial aspect of the Dutch approach has been the apparent success in transferring and adapting their fundamental concepts of reducing the negative effects of increasing car use, restricting car mobility, improving quality of life and at the same time giving new incentives to economic development.

Cycling is viewed as a means to these ends, not as a goal in itself. Integrated, safe and healthy traffic which includes cyclists has resulted in less casualties among cyclists and passenger car occupants despite increased car traffic and increased bicycle usage in the period 1980-90. Cycling fatalities in 1991 were 24% less than in 1986 and those requiring hospital treatment were reduced by 16% (CROW, 1993, 12-14).

These outcomes were sought and achieved by:

> reducing the number of encounters between cyclists and fast motorised traffic, i.e. s*eparation;*
>
> *reducing speed* differences between cyclists and motorised traffic in places where separation is either impossible or undesirable;
>
> and, more generally, aiming to:
> -*simplify situations* where encounters between road users take place;
> -*educate* to better equip road users for their tasks; and
> -restrict the seriousness of the outcome of possible serious accidents.
> (CROW, 1993, 17)

In the context of a report into speed limits, these three 'simple rules' are essential rather than alternatives or mutually exclusive.

Separation, the first of the three 'simple rules' requires that the cyclists and fast traffic cannot mix due to the provision of separate 'tracks' with fly-overs and tunnels wherever crossings would otherwise be required. As the situation is similar for pedestrians, adequate facilities can provide for both if equitable access is provided. In practice, equitable access for cyclists and in particular pedestrians can rarely be provided due to cost and physical space restrictions. Inevitably, provisions for motorists increase the benefits for them whilst reducing the benefits or providing complete barriers for pedestrians and cyclists. As this is not an equitable solution, this is the principal reason separated bicycle facilities are opposed in Australia, in Europe (e.g. Godefrooij in CROW, 1993, 138) and the USA (e.g. Forester, 1994).

There are many opportunities for separation. Examples include facilities successfully implemented along freeways and arterial roads where adequate equitable crossings are provided such that crossings are safe and involve no time delays or distance penalties for cyclists and pedestrians (e.g. CROW, 1994, 189, 192). Other examples include contra-flow lanes in one way streets and links in major bicycle routes (CROW, 1993, 139).

In practice, ‘separation’ facilities cannot provide a general solution due to excessive cost and space requirements. Reducing speed, the second of the 'simple rules', is the only option available if traffic volume and intensity are to be maintained and cyclists and pedestrians are to be treated equitably.

A road which is safe for a small number of cyclists is safe for a large number of cyclists. Danger to cyclists is not caused by the number of cyclists on a section of road. Consideration of the road profile, motor vehicle volume and speed indicate the type and degree of separation required while the volume of bicycles will determine the urgency of a cycling facility and its dimensions (CROW, 1994, 77-82). A graphic method of assessing the amount of separation with various combinations of motor vehicle speed and volume (CROW, 1993, 140; CROW, 1994, 80-81) is shown at Appendix 1.

With speeds below 30km/h, overtaking manoeuvres present little danger to cyclists even at relatively high volumes of 10000 private car equivalents (pce) per 24 hours. However, for speeds between 30 and 60km/h, separation is likely to be required where the *design* speed is 60km/h and the traffic volume exceeds 3000 pce for 24 hours. As volumes increase from 2000 towards 10000 pce for 24 hours, and actual speeds *exceed* 30km/h, the speed and volume of traffic make a cycle-lane 'not justifiable' (CROW, 1994, 81-82). As these combinations are very common in Australian cities and towns, bicycle lanes are inherently unsafe here.

Following this research and experience, recent research in India has shown the natural tendency for mixed mode traffic to mix at speeds of up to 30km/h and to optimise capacity by separating at speeds above that (Tiwari,G et al, 1995). Most cyclists will be familiar with the 'pleasure' of cycling in lower speed traffic - the relative luxury of congestion.

The third of the three 'simple rules' is more generally applicable to all road users. Road and traffic design should seek to *simplify situations* where encounters between road users take place, *educate* to better equip road users for their tasks and restrict the seriousness of the outcome of possible serious accidents (CROW, 1993, 17). The issue of excessive speed and its effect on the safety of all road users has a major role in each of these three goals. Further in this report, specific review of road safety education and of particular road elements will further emphasise the integrated nature of these three goals.

Many and extensive traffic calming projects which were carried out throughout Europe commencing in the 1960's have provided evidence that the needs of cyclists and pedestrians can be met with combinations of traffic calming and very low speed limits which are safe for cyclists and pedestrians, an approach which has been noted by the Roads and Traffic Authority of NSW (RTA,undated, 15).

Bicycle and pedestrian friendly cities and towns can be created by utilising existing traffic facilities to encourage these modes (McClintock, 1992, 178-179) across not only local traffic areas but whole towns and cities (Sammer, 1994) if safe and convenient routes and road crossings are provided.

Recent trends and experiences in traffic calming and low speed zoning have been reviewed extensively (e.g. Hass-Klau and Bocker, 1992; TEST, 1989). The most important issue in urban areas remains the extent to which the perceived problems and threats which currently discourage cycling and walking, have been or can be reduced, in particular by means which are the most beneficial and least detrimental for the largest number of people (Brindle, 1984) by including cyclists and pedestrians.

Evidence supporting the implementation of low speed limits with minimal traffic calming construction costs and maximum benefits comes from places such as Nordrhein-Westfalen in Germany (Newman and Kenworthy, 1992, 40; NRW,undated) and Graz in Austria (Sammer, 1994) which have successfully researched, trialed, adopted and monitored implementation with specific interest in cyclists and pedestrians in addition to other road users and interests. Similar outcomes have been achieved in the major speed reduction trial held in Unley in Adelaide where achievement of substantial speed reductions by 40km/h speed zoning was the committed goal of the local authority (Unley CC, 1996).

Despite improvements obtained by reducing urban speed limits and by local area traffic schemes, further gains were considered feasible with increased positive outcomes expected. Following the adoption of a 50km/h speed limit in Graz, a two year trial of 50km/h on "priority roads" and 30km/h on all other roads resulted in even further benefits - a 12% reduction of accidents with injury, 24% reduction in serious injury, 17% reduction in pedestrian injury and a 14% reduction in injury to car users. Despite only a 4% reduction in cyclist injuries, 83% of cyclists strongly supported the reduced speed limit. General acceptance has been so high that in July 1994, the scheme was made permanent (Sammer, 1994).

The adoption of a general urban speed limit of 30km/h has been shown to provide a safe urban environmental amenity if 50km/h is used as an absolute maximum speed limit and then only on a limited number of 'priority roads' in urban areas other than urban freeways. Evidence such as the Graz experience strongly supports the theoretical position that reductions in speed limits are beneficial and lead to equity and safety, not just for vulnerable road users but for all road users as well as all residents and visitors to urban localities.

an Australian need

The needs of cyclists and pedestrians are no different in Australia to the needs of overseas cyclists and pedestrians. The traffic engineering principles which recognise the inherent safety of vehicles travelling at similar speeds are well known including the often proposed need to take 'action against slow drivers'. Taking action against the slower moving vehicles and traffic is not equitable due to the demographic and other characteristics of road users. The research basis for these principles and proposals is very contentious (e.g. Fildes and Lee, 1993, 7, 8-9).

Current Australian research reports continue to suggest the need for more research in Australia (pp x-xi) to clarify such issues before deciding on the cause-effect relationships which might occur here. This is an extremely conservative argument which appears only to benefit the researchers by requiring more research and benefit the current road managers by avoiding what they view as difficult decisions. The alternative option of accepting overseas experience and research could be taken. By implementing substantially reduced speed limits, outcomes could be promoted and tested with a high probability of success given the beneficial outcomes achieved elsewhere. The researchers and the traffic managers would still have a major continuing role in monitoring and managing the different traffic flows and conditions (e.g. UnleyCC, 1996).

As most cyclists and pedestrians are fully aware, most cities and towns in Australia are quite suitable for cycling and walking when the perceived traffic danger is minimal, that is, when cycling with little or no traffic or in congested conditions. The use of roads by pedestrians and cyclists does not cause many serious crashes unless with motor vehicles. However, motor vehicles inherently lack the ability to react to the 'unexpected' actions of others whether they be motorists, pedestrians or cyclists. This effect is exacerbated by increasing speed as is shown by traffic authorities such as the Roads and Traffic Authority of NSW (e.g. RTA, 1995, 2) and Queensland Transport in the campaign brochure "Do you drive too fast for the unexpected?".

Clearly, cyclists and pedestrians in urban areas in Australia are in conflict with the way motorists are currently entitled to operate their vehicles and in particular, the speed at which motor vehicles are entitled to travel. Nobody argues publicly that reducing speed on urban roads will not improve safety. It seems therefore that safety, in particular that of cyclists and pedestrians, is not a sufficiently significant issue.

Road and traffic authorities are aware of both the needs and the conflicts (Travelsafe, 1993, 27) but have chosen not to address them in a manner supportive of cyclists and pedestrians despite unsupported claims to the contrary (BISA correspondence to Office of Road Safety, South Australia, 23.9.1996). Road authorities include motoring organisations but exclude cyclist groups from advisory committees (FORS, 1996, 1; QT, correspondence, 14.8.1995). As Ian Roberts recently observed, "the very people to whom we should be able to turn for support, Road Safety professionals, offer us the least succour" (Australian Cyclist, August 1995).

Road safety and road and traffic engineering in Australia addresses two main streams of issues. Firstly, the safety of traffic is addressed to maximise the safety of motorised traffic. Secondly, the safety of pedestrians and cyclists is addressed to maximise their safety. By utilising separation rather than integration, the 'safety' of both groups is perceived to be improved. The inherent inequity of separation of the vulnerable road users is never explicit. Separation seems sensible.

Road safety therefore can be viewed as an education strategy to ensure motorists and non-motorists view separation as normal. People educated in such a manner are most likely to regard integration as very dangerous even when it need not and has been shown not to be. The major means of demonstrating and testing new ideas when in apparent conflict with current practice is experience.

However, road authorities have shown little willingness to conduct substantial well researched trials, preferring instead to rely on research into current trends from which predictions have been extrapolated. By reliance on such research methods as the 85th percentile speed limit adjustment, vehicle speed limits have been seen to be accurate and if not, speed limits have been increased, a view supported by motoring organisations. The RACQ Traffic and Safety Manager confirms that 'we are after *realistic* speed limits which people will adhere to' (RACQ, 1995, 22,italics added).

Concern expressed by cyclists about increasing and excessive speeds in urban areas is not a recent occurrence however. The Bicycle Federation of Australia has advocated a 40km/h 'default' speed limit since 1979 (Parker, 1995, 64) and the then Bicycle Institute of Victoria advocated 25mph (40km/h) in residential areas in 1977 noting that at that time both the USA and China had 25mph (40km/h) limits in urban areas (BIV, 1977).

A major Australian review of town planning and road safety literature and practice confirms that the needs of cyclists and pedestrians were being considered and debated in the 1970's including the need 'to concentrate more on the practical problems of catering for cyclists within existing street networks' (Brindle, 1984, 6-7). Brindle very clearly identifies and demonstrates the strong but overly-simplistic tendency to rely on separation rather than integration which has led to planning attempts to segregate traffic into hierarchies and to segregate uses to try to avoid conflicts (pp5-8). However, segregation based on hierarchies cannot ever be relied upon because Transport Ministers and local authorities are 'not in a position to give guarantees about future transport planning' (e.g. spokesman for Queensland Transport Minister in Westside News, 25 September, 1996, p3).

In discussing the concepts of segregated networks and local area planning (pp42-50), Brindle correctly identifies the 'ubiquity of pedestrians and cyclists' (p42) and the excessive cost implications of segregated networks considered in the Geelong Bikeplan (p43) in order to provide an equitable route density for cyclists. However, by separating rather than integrating the roles of traffic engineering and urban planning (p43), cyclists needs are seldom if ever, adequately addressed.

By drawing upon the cost: benefit of such facilities for cyclists only and by failing to accept the dangers of separate bikeways (p43) as argued by Forester, Brindle makes conclusions which ignore most of the major concerns of cyclists and the major causes of cyclist crashes, preferring instead to promote segregated cycle routes, greatly improved conspicuity and cyclist protection (helmets), adequate vehicle-cyclist clearance and road surface improvements.

As Brindle notes (pp43-44), *much of the discussion on cyclists applies to pedestrian facilities. Most urban main roads in Australia, of course, already have "segregated" pedestrian facilities - the parallel sidewalk or foot-path. The problems that arise at crossing points are the subject of traffic engineering rather than urban planning, except where (as in the case of independent bike paths) the pedestrian movement is accommodated on a special network of paths segregated not only horizontally but, at crossing points, either vertically or in time from traffic routes. Almost certainly, Canberra's comparatively low pedestrian casualty rate (which arises largely from its very low percentage of casualties on the higher-order roads) results from its control over abutting access and the location of pedestrian-generating activities away from major traffic routes.*

Brindle concludes that it 'is the way traffic behaves within the locality (that) is all-important. In particular, slow-moving vehicles present little threat, no matter what form the design of the locality takes', strongly indicating that local safety is 'affected more by the management of mixed traffic areas than by traffic segregation' (p50).

However, in his conclusions, Brindle does not address the requirements of safe mixed traffic environments, noting that 'the dilemma presented by cycle planning is that it may generate greater cycle usage' (p54) while failing to note that this same dilemma of town planning has promoted and continues to 'generate' car usage. Probably quite typically for the era, at no point in his review does Brindle view the mixed traffic outcome in detail, preferring the idea of segregation over the impracticality. Both pedestrians and cyclists are thereby consigned to the car dominated outcomes prevalent today. This paradoxical position of traffic and urban planners remains unresolved with pedestrians and cyclists of concern in the planning rhetoric.

However, the reality is that cyclists and pedestrians needs can rarely be fulfilled by segregation (MTFTC, 1995, 29). Therefore, as they will inevitably choose to cross at grade and therefore conflict with free flowing traffic in preference to substantial ramps or time delays (Brisbane City Council Workshop, ‘Grade Separated Crossings’, 31 May 1996), their needs will remain unfulfilled unless the dominance of traffic is reduced.

Brindle's review is an important document in establishing many of the issues which are still viewed as difficult problems in Australia today. In his introduction, Brindle cites Tripp as stating that 'any town so planned that its citizens are killed and injured in vast numbers is obviously an ill-planned town' (p1). In practice, from a cycling or walking perspective, the perceived risk of death or injury is perhaps even more important as an issue and criteria for judging 'an ill-planned town'.

road safety, ill health and trauma reduction

The best evidence of the perceived safety of urban areas in Australia comes from anecdotal evidence. Few if any detailed studies have been carried out. Comparing the number of bicycles currently at primary schools with the number in the late 1950's when the suburbs were in their growth stage shows that virtually no students currently cycle to school whereas long lines of racked bicycles were common in the 1950's and 1960's. As it is relatively uncommon for roads to have changed, it is as Brindle has suggested 'the way traffic behaves within the locality (that) is all-important' (Brindle, 1984, 50).

The reluctance of current parents to allow, let alone encourage, their primary school children to walk or cycle to school is a measure of the perceived safety of the trip including not only road crossings but also the social dangers encouraged by the lack of other people walking and cycling. Paradoxically, parents who decide to drive their children to school because it is too dangerous, increase the danger for those walking or cycling or having no other option.

Reinforcing anecdotal Australian evidence, the extent of this paradox has been demonstrated in Britain where up to 90% of children own a bicycle yet as few as 1% cycle to school principally due to fear of injury (Cleary and Hillman, 1992, 225). To counter such perceived and real dangers and concerns, specific strategies have been successfully implemented in Sweden and the Netherlands (Preston, 1993, 60-62) with much reduced severity and up to 85% reduction in crashes in Denmark (Nielsen, 1993, 264) by provision of very extensive safe routes to schools.

As many habits are formed in childhood, the extent of the shift from independent means of transport such as walking and cycling in the 1950's to the later almost complete reliance on cars now requires policy intervention such as extensive safe routes to schools if complete car reliance is to be avoided. This is not only an issue of independence, however. It is also an indicator of future lifestyle and health (CTC, 1993, 26). Recent studies have suggested 'that there is a strong correlation between childhood and adult activity levels. Inactive children and adolescents grow into sedentary adults' (Roberts et al, 1995, 12). Reflecting trends in Australia, primary schoolchildren in Britain are not sufficiently active to maintain a reasonable level of fitness (BMA, 1992, 20).

The integration of physical activity into other lifestyle activities presents opportunities for improving health both for children and for adults and in particular, for the least fit. Regular moderate activity such as walking and cycling has a 'preventative maintenance' effect which may be its most vital function; more valuable than exercise prescribed as a remedy to cure a disease (Roberts et al, 1995, 14).

Integration of exercise activity into a daily routine such as walking and cycling to school or to work or public transport rather than using a car provides not only health benefits for the participants but importantly, reduces real and perceived danger to others. Therefore, protection and provision of urban localities which encourage extensive cycling and walking rather than deterring them is a strong indicator of a town or city seeking to promote public health and amenity and avoid the description of 'ill-planned'.

The extent that people of all ages choose to cycle or walk in preference to using a car is therefore, in the absence of economic imperatives, a strong indicator of perceived safety of these modes and therefore is a strong indicator of the amenity and environment of the locality. Arguably, a city or town where many people choose to cycle or walk is therefore likely to be healthier and safer than those where walking and cycling are perceived as dangerous or risky.

Perceptions that a locality or town is safe for walking and cycling are likely to be substantially correct in fact because the perception is likely to be based on experience. The numbers of cyclists and pedestrians are an indicator to others that cycling and walking are perceived as sufficiently safe. Urban and traffic planners have failed to grasp this significance. They have failed to recognise that reducing car dependency requires provision of conditions that are firstly perceived and then found to be safe thus encouraging people to choose to walk or cycle. Noting that 'it is also increasingly difficult for people to comfortably, securely and safely cycle on Brisbane's roads' (BCC, 1994, 54) only confirms that maintaining the perceived safety of cycling and the provision of improved conditions and facilities for cyclists and pedestrians have not been priorities of the largest and most powerful local authority in Australia.

Evidence of perceived danger to cyclists and pedestrians is also provided by crash data and outcomes (FORS, 1996b;1996c). However, as the majority of road fatalities in Australia are motor vehicle occupants, road safety strategies reflect a priority towards making motorists safer (Roberts et al, 1995, 39). Improvements to car safety in front-on crashes have produced cars that are now so safe in front end crashes that statistically, cars are becoming dangerous in right angle crashes. Because the emphasis has been on improving vehicle safety in crashes, it appears that there may have been no obvious reduction in crash numbers, only in rate and severity of crashes. There appear to be many more crashes with less fatalities but with many more severely injured survivors including cyclists and pedestrians.

With 'safer' cars, speed and speed limits in Britain increased from 2mph in towns and 4mph elsewhere until 1896, 14mph in towns until 1903, 20mph until 1930 when speed limits for cars were abolished. In 1934, a general 30mph speed limit in built-up areas was implemented (Department of Transport, 1992, 7). In 1974, Australia chose 60km/h.

For pedestrians and cyclists, the implications of increased vehicular speed have until recently, been ignored. As cars have become 'safer', and car occupants therefore relatively less represented in fatalities and serious injuries, cyclists and pedestrians are perceived to have become relatively more frequent serious casualties and fatalities, a perception which more likely represents a measure of risk and therefore fear of cycling and walking, rather than the reality.

This effect has been exacerbated by the need for cyclists and pedestrians on arterial, sub-arterial and connector roads to mix with increasingly larger volumes of higher speed traffic due to the complete absence of realistic facilities or alternatives such as public transport which carries bicycles.

Inevitably therefore, Australian experience with crash outcomes demonstrates the need for lower speed environments or high quality segregated routes (e.g. Dolinis et al al, 1995) as predicted by the Dutch speed and volume design guidelines (CROW, 1994, 81-82).

Due to the relatively small numbers of fatalities and serious injuries suffered by cyclists and pedestrians as separate groups, cost: benefit studies inevitably find separate facilities for them to be uneconomic. The other alternative, reducing speed, has seldom if ever been addressed as it is the promise of speed and convenience (Department of Transport, 1992, 10) which gives the car its convenience over other modes of transport. To reduce speed is to ruin the dream. So, while cyclists and pedestrians are over represented in casualty statistics, the small number of casualties has lead to inaction, only in very small part due to the difficulty of research with small numbers.

The real issues of pedestrian safety and vehicle speed have been raised in detail for the first time in a recent major Adelaide study (FORS, 1994) which correlates with the known characteristics of cars and their speed. As for cars (Department of Transport, 1992, 56), the effects on pedestrians (and cyclists) have been shown to be disproportionately related to vehicle speed. Following investigations of 176 fatal pedestrian collisions in the Adelaide urban area, a 75% reduction in fatalities was predicted for a 20km/h reduction in travelling speed in areas which are presently 60km/h speed limit areas. More than 85% of the 176 fatal pedestrian collisions occurred on non-local roads. Reductions in speed on local roads would produce only a very small reduction in fatalities because fatalities simply do not occur there in sufficient numbers (FORS, 1994,x). Only 6 serious and 21 minor injuries and no fatalities were reported for cyclists in 40/50km/h areas in Victoria in the period 1988-94 (BV, 1995, 21).

Recently developed computer mapping provides the opportunity to make predictions from the FORS study and compare them with reported cyclist and pedestrian collisions. As can be predicted by the findings of the FORS report and by assessment using the Netherlands practice (CROW, 1994, 81-82), a large proportion of reported collisions and unreported collisions and ‘near-misses’ involving cyclists or pedestrians in Brisbane occur in non-local streets including high volume 60km/h streets in the CBD and major urban shopping and commercial centres. If improved road safety and reduced ill health and road trauma are to be achieved, reduction of urban speeds to a safe level for cyclists and pedestrians is essential on non-local streets and roads, that is, on all urban streets and roads.

health promotion and road safety campaigns

Road safety is an excellent example of the opportunities to be gained by effective inter-sectoral action as advocated by the discussion paper, "Promoting Health in Australia" (NHMRC, 1995). Any industry or activity which regular kills at least 2000 people per annum might reasonably be expected to take whatever steps are necessary to substantially eliminate an annual cost estimated to be approximately $6 billion in Australia.

The road industry currently does not explicitly pay its share of the cost of road trauma. It has recently been estimated that road trauma in Queensland costs around $1 billion per annum, which if added to the current cost of driving would add approximately $1000 to the registration cost of each of the estimated 1 million drivers in Queensland. Similar estimates confirm that in other places, 'motor vehicles impose a far greater cost upon society than the tax their drivers pay' (CTC, 1993, 32). By externalising the costs of trauma, the road industry is able to argue economic efficiency outcomes which ignore the $6 billion per annum. Allocating the cost of road trauma to the costs of road authorities to be met by road income might ensure that a more realistic and equitable commitment to road safety campaigns emerged.

Inter-sectoral action by transport and health sectors is essential to address the mounting social costs of excessive motorised traffic which increasingly excludes the healthy and safe modes, cycling and walking. Despite apparent concerns that improved cycling facilities would increase cycling ((Brindle, 1984, 54), significant improvements in total road safety including motorists as well as cyclists and pedestrians have been achieved by substantial commitments to improved cycling facilities and safe urban environments in many parts of Europe in particular in Austria, Denmark and the Netherlands (CTC, 1993, 47-8; Sammer, 1994).

Excessive speed has been identified as the direct cause of trauma. Reductions in speed show clearly that all road users benefit from reduced risk of crashing and if in a crash, reduced trauma. Accordingly, rather than continue to seek incremental improvements to safety during and after a crash (e.g. air-bags, cyclists helmets etc), proven crash reduction strategies based on reduced speed in urban areas are now essential and inevitable based on European experience but only if vulnerable road users interests are to be considered important.

The outcomes of the 40km/h trial (UnleyCC, 1996) show that Australian drivers are similar to overseas drivers. Quite reasonably, an extensive period is required to gain confidence and acceptance of dramatically different conditions to those which they have been accustomed. Like other public health campaigns (e.g. smoking, skin cancer) and road safety campaigns (e.g. seat belts, bicycle helmets, driving under the influence), excessive speed in urban areas can and must be substantially reduced. It is 'likely to take a decade of public education' (MTFTC, 1995, 16).

experience and driver education

Current road safety, urban planning and traffic and transport planning and policies reflect the total dominance of car transport - the 'windscreen perspective'. This is not surprising because the experience of those advising and deciding on such matters is similarly dominated (Roberts et al, 1995, 51-53). If policies and decisions are to improve conditions for cyclists and pedestrians, experience and expertise from those fields is essential to avoid reports and plans which 'seem to be written from the perspective that cycling is dispensable and deterrents ... appropriate' (p52).

Ignoring findings 'that the most significant attribute that affected motorist attitudes to cyclists was their own cycling experience' (Walker in Roberts et al, 1995, 52), the experience of cyclists and pedestrians is not regarded as 'expert' by decision makers in transport authorities. Accordingly, while 'it is understood that most community-based organisations support the introduction of lower speed limits in residential areas ... it is not practical to involve the many special-interest groups which have a valid interest in the speed management issues directly in the development of speed management policy' (Queensland Transport, correspondence, 14.8.95).

Experience of safe quality cycling in alternative traffic conditions can be gained in a number of ways including compulsory bicycle riding in urban traffic as part of the process of learning to drive (McClintock, 1992, 87-89).

However, programmes such as Queensland Transport's "BikeEd" suggest that quiet streets which 'avoid dense or high-speed traffic' (p95) be used for cycling education implying that such areas are sufficiently safe for cyclists. The programme completely fails to address the causes, need for and 'criteria of a bad street' (p73).

Large area trials and safe routes to schools provide other opportunities for experience for cyclists and pedestrians and for motorists. As has been demonstrated during the energy crisis in the 1970's and since, reduced car use (Roberts et al, 1995, 53) and reduced speed limits (e.g. Fildes and Lee, 1993, 11-20, 21) have led to reduced crashes and less severity of trauma. Increases in speed limits have increased crashes and severity (p16) in the absence of road engineering improvements which in urban areas are increasingly being viewed as inappropriate.

From the "windscreen perspective", it can easily be demonstrated that freeways are "the safest of road types" (Select Committee on Road Safety, 1994, 22). However, from the perspective of the cyclist, pedestrian and occupant of an urban locality, safety in urban streets and roads can only be achieved equitably by reduced urban speeds. Increased experience and education of drivers can only be achieved in such areas.

In Australia at present, there are few areas where the necessary speed restrictions have been accompanied by appropriate education and encouragement campaigns including where necessary, enforcement.

Therefore there are few areas where research can be tested and education in mixed traffic conditions implemented and assessed. Accordingly, the 40km/h trial (Unley CC, 1996) provides a rare, if not the only test of desirable urban street use.

However, there are a considerable number of areas (e.g. in Brisbane) where 40km/h and 50km/h speed zones have been implemented with little or no additional promotion and without the integration of pedestrian and bicycle routes and safe routes to school. These areas demonstrate that considerable speed reductions do occur due primarily to reduced speed limits contradicting the popular view promoted by traffic engineering research (e.g. Moses and Reily, 1985) and politicians (e.g. South-West News, 11September, 1996). The extent of speed reduction will also reflect other influences and in particular, up to a 'decade of driver education' (MTFTC, 1995, 16).

In particular, speed reductions that have occurred in such areas provide evidence of a substantially safer environment for pedestrians and cyclists. This is due only to the reduced speed of vehicles. The gap between the posted speed and actual speeds remains a function of education, road environment and the expectation of conflict with other road users (Department of Transport, 1992, 18) as promoted by Queensland Transport's campaign, "Do you drive too fast for the unexpected?"

In 30 or 40km/h areas, encouragement of cycling and walking conditions and where desirable or necessary, provision of cycling and walking facilities will encourage additional use by cyclists and pedestrians, reinforcing the need for motorists to travel at the posted speed to reduce possible conflict with the expected 'unexpected'.

These approaches are far better integrated and far more economical than the current almost exclusive reliance on extensive traffic calming devices (e.g. UnleyCC, 1996), a reliance which has been developed by traffic engineers (MTFTC, 1995,iii) because it is argued that there are no other options currently available to local authorities, a proposition that has been heavily criticised (e.g. see MTFTC, 1995, 23).

Urban areas which are sufficiently safe for children to again walk and cycle throughout Australian suburbs are therefore an essential goal and arguably, mutually supportive of any campaigns urging slower speed or promoting cycling and public transport. A generation of children who have grown up in suburbs which are safe and friendly for cycling and walking and have up to 10 to 12 years experience in urban cycling and walking are more likely to comprehend the behaviour of cyclists (McKay in McClintock, 1992, 89) and pedestrians.

In urban areas where cycling and walking might be expected, cyclists and pedestrian behaviour is only likely to be perceived as ‘unexpected’ by motorists (and planners) who have grown up in suburbs where planners have provided high speed road hierarchies which 'create traffic sewers and recognise almost no other values or rights other than the free and unobstructed movement of motorised vehicles' (Kenworthy in MTFTC, 1995, 14). Thus marketing and demonstration of social, health and safety benefits provides positive rather than 'gloom and doom' messages (CROW, 1993, 238).

environment and urban design

Environmental factors influenced countries such as the Netherlands and Germany to introduce and implement strong government policies to reduce already occurring, serious environmental impacts as well as those which were becoming predictable. Factors included the oil crisis of the 1970's, air pollution and acid rain, increasing noise, waste of land and capital resources, increasing recognition of health and trauma costs; all substantially driven by a rapidly increasing demand for car use. These factors also influence and impact on Australian cities and towns (Austroads, 1995, 4) although there is no evidence that they are being sufficiently seriously considered to prioritise cycling and walking.

The car dependant use of Australian urban areas can be as easily modified as has been the case in European cities which have decided to address rather than ignore these issues. Amongst the most successful examples are Groningen in the north of the Netherlands and Basel in Switzerland. Rather than continue conversion of traditional urban areas into car dependant areas, both cities chose enlightened improvements to public transport, cycling and walking instead of road improvements. The imperative need to provide effective alternatives using the limited funds available was selected to avoid wasting funds on provision and impact costs and amelioration of further road construction when other modes would provide a better level of service and better long term environmental and economic outcomes.

Both Basel and Groningen now have limited expenditure on new roads and parking other than at the perimeter, choosing instead to continue to improve non-car mobility and access. Not surprisingly, both cities have a majority of trips by other than car and have retained their character as people places. Both cities are featured as enlightened examples of European integrated transit and environmental urban planning, a major promotional and economic benefit (e.g. Ministry of Transport, Public Works and Water Management, 1995; Baudepartment Kanton Basel-Stadt, 1995).

These and many other examples demonstrate the importance of integrating transit and urban design rather than separating them into two conflicting areas of expertise as has occurred in Australia (Brindle, 1984, 43-44). Avoidance and reduction of noise and air pollution are essential to provision of healthy urban environments yet noise and air pollution are the primary products of current urban planning in Australia.

Reduced passenger vehicle travel, speed reduction, modal shifts to less polluting transit, smoother driving and changed urban form are all strategies of the first major Australian study of uncosted transport externalities. These strategies are essential to reduce congestion so existing roads can be utilised optimally with minimum environmental impact (EPAV, 1994). Provision of improved transit by public transport, cycling and walking rather than by more cars is essential and provides a strong assessment measure of transport and urban planning goals if any reduction in rates of increases in pollution are to be achieved. All the above strategies are addressed by reducing speed limits in urban areas (e.g. Newman and Kenworthy, 1992, 40).

speed limit or speed reduction

The role of speed limits as legal regulations is problematic. Speed limits are one of the few apparently well defined legal requirements where continued breach of the law is acknowledged by researchers (see Fildes and Lee, 1993, 24-25), the law makers, the enforcers and supposedly, the community. Accordingly, by accepting that the speed limit is not in fact the actual limit above which infringers will be prosecuted, the speed limit is relegated to being an indicator of the speed at which prosecution is likely, in Australia apparently some 10km/h or more above the limit.

This confusion is furthered by advisory speed signs which seek to advise 'safe' speeds, usually considerably less than the legal speed limit although the speed limit purports to represent a trade-off between the mobility and safety of motor traffic (Fildes and Lee, 1993, 21). In research reports, there is little if any evidence that other than motorists interests such as their mobility and safety, have been taken into account in setting the urban speed limit in Australia (e.g. pp21-36). This situation remains unchanged. Where reduced speed zonings have been considered necessary as around schools, implementation remains subject to through traffic not being substantially impeded (Westside News, 29 July 1992).

The number of necessary advisory and local area speed zones has increased substantially such that it now appears the advisory or zoned speeds are the appropriate 'general' speeds. The credibility of the need for 'safer' lower urban speeds will be substantially enhanced by adopting that speed rather than maintaining the much higher general urban speed limit. Thus very confusing and non-credible situations such as low speed advisory signs followed by speed limit signs indicating a higher speed limit on the approach to an 'unsafe' bend can be avoided.

Rational elimination of advisory speed signs and low speed zones would lead to the adoption of a general urban speed limit based on the critical minimum advisory speed as dictated by various criteria such as schools, cyclist clearance, pedestrian crossing areas, bus stops, sharp corners and hidden intersections. Exceedances of the much lower speed limit in 'safe' areas where a higher speed might be justified could still be tolerated as now unless excessive speeds caused nuisance or crashes.

Advisory speed signs would therefore be eliminated along with the confusion of different approaches in each state and even within states as around schools. Visual and cost concerns about excessive signage would also be eliminated. With this approach the ‘critical’ speed limit is clear and breaches involving property damage or trauma could be better assessed and prosecuted. Drivers would have a clear obligation to obey the posted speed limit and the need to defend their case for exceeding it, in particular if involved in a crash. The speed limit would then perform an advisory, absolute maximum and *prima facie* role (Fildes and Lee, 1993, 23). Involvement of speed as a cause of crashes would also be much more accurately reflected in crash reports.

The Queensland Transport campaign brochure, "Do you drive too fast for the unexpected?", provides the reasons why the urban speed limit should be lowered. A car travelling at 60km/h takes at least 34m to stop. It is still travelling at 60km/h (in the reaction time) when a car travelling at 30km/h has stopped in a distance of 12m. At 65km/h vehicle travelling speeds, most child (and elderly) pedestrians in a crash situation will be killed yet at 30km/h only 1 out of 20 of them would be killed. Many of the others will not even be hit because the vehicle could stop or take avoiding action. Similar effects apply to cyclists hit by vehicles. Failing to lower the urban speed limit to a safe limit for cyclists and pedestrians continues to support the current transport and traffic engineering perspective that cyclists and pedestrians are 'unexpected'.

Of course, cyclists and pedestrians are not unexpected. Their needs tend to be ignored in current traffic planning and research (e.g. see Fildes and Lee, 1993, 21-25). By addressing only the credibility of the speed limit from the motorists perspective, the interests of all others can continue to be ignored, creating the 'traffic sewers' which recognise 'almost no other values or rights other than the free and unobstructed movement of motorised vehicles' (Kenworthy in MTFTC, 1995, 14). This effect is strongly embedded in current policy and research. Only a non-windscreen perspective seems able to question it.

Current moves to implement 50km/h in residential streets and to increase speeds on some non-local streets and roads must therefore be critically reviewed before implementation (MTFTC, 1995, 16-7). In promoting 50km/h, there is no evidence as to whether 'excessive' speed in urban areas would still be a risk factor, why 50km/h and why 50km/h only on local or 'residential' streets have been chosen or upon what research the decision has been based to support these decisions. Certainly it appears that cyclists and pedestrians interests are still not demonstrably significant to road designers and town planners (Plowden and Hillman, 1996).

The *Childhood Pedestrian Injury Study* in Perth (Curtin University 1994), despite finding that injury risk by traffic volume was increased by the speed of the traffic (p.5), did not include traffic speed in the four factors that "contribute to a child's risk of pedestrian injury" (p.4). General speed reduction was seemingly not regarded as an option. Despite the apparent success of speed zones in improving safety of children and presumably cyclists and motorists around schools but not at other times and nearby places (FORS, 1996b), children or their carers (p2, 4) and other pedestrians continue to be blamed for causing their own death (FORS, 1996c, 2) without acceptable reasons for doing so being demonstrated while seemingly, earlier studies (FORS, 1994; Corben and Diamantopoulou, 1996) are ignored.

The relative safety of school zones, for example, appears to confirm that all urban areas should have a safe urban speed limit which provides safe conditions for cyclists and pedestrians (MTFTC, 1995, 16-7) to use the streets and roads in all urban areas, not just some special 'zones'. However, many urban speed related crashes appear to remain unreported as speed related ... because the urban speed limit is 60km/h. It is not difficult to comprehend the legal problem facing traffic police reporting a vehicle involved in a crash for travelling too fast ... but below the speed limit.

Based on such reports, it is not surprising 'most pedestrians were killed in urban areas, away from intersections and while crossing the road where there were no marked crossings. Most (69%) of the pedestrians were considered to be responsible for these crashes. The pedestrians killed included children who did not look before crossing, young alcohol affected adults and the largest group (40%) comprised older persons who generally made misjudgements. Pedestrians, like cyclists, had a high incidence of death due to head injuries; 19% died instantly and half died in hospital. Many had lower extremity injuries. The drivers involved in these crashes tended to be younger, *but not speeding* or driving under the influence of alcohol' (Attewell and Dowse, 1992, 1 in Cairns and Antill, 1996, 4, italics added). Because such crashes are more likely to be treated as undue care rather than speed related, crash and traffic reports continue to show 60km/h as not too high for the safety of cyclists and pedestrians. Therefore only the cyclist or pedestrian could be the cause.

In reports such as that above, the definition of 'speeding' allows the driver to escape culpability for 'driving too fast for the unexpected' by, for example, failing to see the pedestrian or cyclist and by blaming the victim. By selectively focussing on normal behaviour and learning and degenerative processes, the young and the aged pedestrians, cyclists and motorists can all be viewed as at risk. However, if being a young, access handicapped or aged pedestrian or cyclist is a normal, 'expected' and essential activity of urban areas, excusing drivers for driving too fast for the 'expected' (e.g. McLean, 1995, 9) is grossly inequitable and biased.

The recent "Pedestrian Safety Report" (NRTAC, 1995) appears similarly flawed. 'There is no direct evidence that increased arterial road speed limits have led to increased pedestrian fatalities' (p18). As with the use of bicycle helmets, increased (Hillman, 1993) or reduced 'fatalities' may result from less people undertaking the activity (Hillman in McLean, 1995, 9), a likely occurrence when both traffic speed and density are increasing (Curtin University, 1994, 5). It is also probable that there may be more unreported crashes and injuries but less fatalities. Changes in exposure are therefore essential to such findings (e.g. Dolinis et al, 1995, 7).

The findings of several cited research projects both in Australia (e.g. FORS, 1994) and overseas have confirmed that speed on all urban roads and streets is a substantial factor in urban pedestrian (motorist and cyclist) trauma and that both crash frequency and severity have been reduced by reductions in general urban speed limits. However, authorative bodies have tended to confuse rather than clarify research findings and ensuing debate by, for example, supporting 'the reduction of the *general urban speed limit* on *non-arterial* roads as an effective measure for reducing the level of pedestrian trauma on our roads' (NRTAC, 1995, 19,italics added) and uncritically adopting supportive findings (e.g. NRTC, 1995, 41) rather than addressing the more substantive issue of high speed traffic on non-local and arterial roads (FORS, 1994, 42).

As up to 85% of fatal pedestrian crashes occur on urban non-local roads, lowering speed limits in local streets shows little effect on fatal pedestrian crashes (p42) and similarly, for cyclists who also inevitably, have to cross or use non-local roads (Forester, 1994).

traffic engineering, transport and urban design

The difficulty facing traffic and transport engineering and urban planning is allocating appropriate values to activities which have become both normal and threatening. To provide a suitable alternative to car travel for example, pedestrians and cyclists must be either expensively separated or safely integrated into traffic (CROW, 1993). Inevitably, these alternatives will have significant negative impacts on the current, almost totally dominant mode of transport. A completely new approach to using the existing urban transport networks is therefore essential (Yeates, 1995) if Australia is to achieve what has already been successfully achieved and demonstrated in many other places by provision of increasingly safer conditions and facilities for cycling and walking (Parker, 1995) rather than for increasing numbers of cars.

As motorists, as part of the whole urban population, benefit from reductions in noise, trauma and crashes and from improvements in air quality, new systems for assessing speed limits might be expected to include such issues. However, recent Australian developments in speed assessment appear not to include these issues as primary determinants primarily because, as in the case of VLIMITS, they are devised by road authorities for setting speed limits (e.g. see Fildes and Lee, 1993, 30-32). Their operation continues to require qualitative inputs which include 'almost no other values or rights other than the free and unobstructed movement of motorised vehicles' (Kenworthy in MTFTC, 1995, 14). It is the relative weighting of the qualitative inputs such as determining that a much higher number of cyclists and pedestrian conflict points is both inevitable and a desirable outcome of the ubiquity of these modes in urban areas, which will determine the extent that systems such as VLIMITS represent the interests of motorised user groups to the continued detriment of non-motorised users.

An alternative approach involves assessment from a safety perspective (e.g. Austroads, 1994). By use of safety audits requiring safe conditions for potential pedestrians and cyclists, urban roads which are safe for higher speed traffic and provide special facilities (e.g. bike lanes or paths with frequent safe road crossings) can be very easily determined (pp42-43, 59, 62) and designed appropriately if the process ensures adequate public input from the vulnerable road user perspective (MTFTC, 1995, 18-9). All other roads would remain at the new safe general urban speed limit for mixed traffic with high levels of cyclist and pedestrian safety and amenity. Therefore all roads and streets would be much safer for all users than at present. However, road authorities and motorists organisations are likely to resist such changes, fearing that decisions 'could be taken out of the hands of traffic engineers by politicians and *interest groups*' (RACQ, 1995, 22, italics added).

However, the outcomes of substantially reduced urban speed limits are well known and well researched. As in the Netherlands, the criteria for incompatibility are "the speed and intensity of the motor traffic ... The danger on the road is not caused by cyclists, but by cars". With 85% of traffic speed less than 30 km/h, all modes of transport can be mixed (CROW, 1993, 139). Experience from 30 and 40km/h zones in Australia confirms that speed limits of 50km/h are inappropriate if cyclists and pedestrians are to be safe (MTFTC, 1995, 14-17).

bike lanes

Bike lanes, lanes for bicycles on roads, have been promoted in Australia for many years (e.g. BIV, 1977). Technical standards described in current Australian guidelines (Austroads, 1993) are not mandatory standards nor are there mandatory criteria for the provision of these facilities. Generally, in Australia, it appears installations of bike lanes have been refused because there has been inadequate road reserve despite installation of bike lanes in other countries with similar or less wide road reserves.

For example, the Brisbane Bikeways Plan of 1983 did not contain any bike lanes because 'the likely roads are considered too narrow for bike-lanes as well as other traffic, alternative routes can be provided along lowly trafficked streets and there is concern amongst some Council officers that cycle lanes provide a false sense of security for cyclists and other road users' (Queensland Bike Plan Conference, 1984, 7.4)

Current engineering for cyclists (CROW, 1994) indicates that generally roads are too narrow only when 'other traffic' is prioritised in terms of traffic speed or volume. Prioritising 'other traffic' remains common practice in both implementation and research as two examples illustrate.

The Unley 40km/h trial has created substantial reductions in the speed of traffic. With a 40km/h speed limit, some of the best streets in the trial zone (Unley, 1996) with in excess of 2000 vehicles per day (p71) and 85th percentile speeds in excess of 50km/h (p73) are at or approaching a combination of speed and volume of traffic which requires specific bicycle consideration (CROW, 1994, 80). Although it substantially achieved its goals, analysis of this trial of Australian best practice produced conditions where separation of cyclists from traffic is still 'desirable' (p81) due to speed and volume. Despite likely major improvements in perceived and actual safety of cyclists (and pedestrians), there would seem to be few if any 'alternative routes ... along lowly trafficked streets' in Australian urban areas which are useful continuous cycling routes and meet Netherlands practice guidelines unless the speed in those streets is substantially below that achieved by a 40km/h speed limit, that is, unless European limits of 30km/h (or less) in such areas are applied.

In Australia, it appears that so little is known of the real requirements for urban cycling and walking safety that authoritative bodies continue to promote extremely dangerous suggestions seemingly in contradiction of the well documented experience of the Netherlands (e.g. CROW, 1993;1994). One example is the notion that there are 'safety concerns' with bicycle lanes or sealed shoulders on roadways 'once the posted speed limit of the road exceeds 80km/h' (Queensland Government, 1996, 66) where such a facility should never be considered due to the speed (CROW, 1994, 80-1). Another example recommends the provision of 'cycle lanes or adjoining cycle roads' on 'all future primary and district distributors' (MTFTC, 1995, 29) rather than excluding cycle lanes when the speed limit recommended on district distributors is '60km/h or above' and on primary distributors 'should generally be *raised* from 60km/h to 70km/h' (p16) again contrary to best safety practice for cyclists (CROW, 1994, 80-1).

Reviews of bike lanes on arterial roads in Adelaide have demonstrated the need to ensure that facilities comply with world rather than Australian best practice. While viewed as an improvement in one review (Bike South, 1995, 129) and as problematic by another (Taylor et al, 1995), neither review addressed the substantive conflicts inevitable with cyclists in very high volumes (20000 per day) of high speed (greater than 60km/h) arterial road traffic. Arguably, these lanes should not have been installed in such conditions (CROW, 1993; Forester, 1994). Therefore, the lanes under review may best be viewed as surprisingly 'safe' but only for relatively small and minority cyclist interest groups such as seasoned commuters or cycling athletes rather than for children on the way to school or elderly or other cyclists in search of a pleasant, safe and convenient recreation ride.

pedestrian and cyclist crossings

Road crossings and intersections are generically identical in safety, purpose and utility. Completely separated crossings while desirable are effectively unachievable if convenience, safety, cost and equity issues are maintained for the vulnerable road user groups. As conflicts are inevitable at both segregated and unsegregated intersections and crossings, equity provides an assessment of the relative priorities determined by current traffic engineering and urban planning.

The old form of pedestrian crossing, the 'zebra', is being progressively removed in many parts of Australia. Because crossings are viewed as dangerous, they are being replaced with median refuges (MTFTC, 1995, 31; Travelsafe, 1993, 24-29; Moses, 1989) often at different locations. However, in areas of high pedestrian activity, up to 75% of pedestrian/vehicle crashes do not occur at crossings (Corben and Diamantopoulou, 1996, 17). Removal of zebra crossings has removed all 'rights' of crossing roads from pedestrians and cyclists who are now required to wait until there is a 'safe' gap in the traffic, a concept which is increasingly illusory (FORS, 1994). This approach to pedestrian 'safety' appears to have developed in Western Australia for four-lane roads (Moses, 1978) and been inappropriately adopted for other uses.

Crossing removal is now frequently adopted in preference to reducing traffic speeds where pedestrians are deemed to be at risk using zebra crossings. No generic strategies have been adopted to improve equity for and reduce perceived risk to pedestrians and cyclists on non-local roads and similar areas where road crossings remain essential, other than very infrequent pedestrian controlled crossings, overpasses and underpasses. Pedestrian and cyclist safety requires frequent and safe crossings of urban 'main roads' which can be provided by recognising their needs (FORS, 1993; Corben and Diamantopoulou, 1996, 43-6).

The convenience of off-road cycling facilities is severely reduced by crossing and intersection requirements which provide little or no priority for cyclists and pedestrians. This is one of the strongest arguments in favour of integrated mixed traffic in urban areas (e.g. Forester, 1994; CROW, 1993; CROW, 1994) given the apparent impossibility of providing safe and convenient crossings in current Australian urban traffic design.

If the Netherlands cycling expertise (CROW, 1993) is applied equitably with cost and convenience for all modes of transit and transport, the current high speed rather than the increasing volume of urban traffic in Australia emerges as the principal cause of problems in crossing the road as demonstrated in Adelaide (FORS, 1994). Unlike the increasing volume of traffic, required speed is relatively easily varied.

Speed zones around some schools demonstrate that although small speed zones are relatively safe, areas beyond the speed zone remain very dangerous and again, the fault of the pedestrian (FORS, 1996c, 1, 2). Accordingly, universal reduction of urban speeds to a safe speed on all urban roads based on not driving too fast for the 'unexpected' is essential if equitable mobility and access is to be retained for the full range of cyclists and pedestrians in urban areas, given that all other generic approaches are too expensive or too intrusive. Combinations of speed deterrents with perceived needs to cross roads can provide functional integrated solutions, for example, by use of raised platform crossings rather than speed humps despite motorists concerns (MTFTC, 1995, 21-22) to improve non-motorised user safety and convenience.

roundabouts

It is recognised 'that roundabouts can be particularly dangerous for pedestrians and cyclists'. They are 'accepted as a safe traffic control measure for motor vehicles, (but) roundabouts can be hazardous for cyclists'. Rather than address the safety problem, Travelsafe requires cyclists to 'recognise the dangers and ride to avoid those dangers, not to confront them' (Travelsafe, 1993, 26). There is perhaps no clearer example of the problem of the extent of car domination in Australia than this finding which further legitimises the car dominance of current traffic engineering whilst ostensibly, endeavouring to improve safety.

Roundabouts are generally regarded as the most feared junction type. The accident rate for cyclists is some 14-16 times greater for cyclists than for cars and is 2-3 times greater than for cyclists at traffic lights (CTC, 1991, 1). Given that accident rates at intersections are 2-3 times higher than in mid-block areas (e.g. Taylor et al, 1995, 11), it is reasonable that cyclists fear roundabouts as a particularly dangerous facility.

The fear of roundabouts and the perceived need to avoid them also applies to pedestrians (CTC, 1991, 14), a view often confirmed by significant detours required by fencing, barricades or inadequate sighting distance into the adjoining arm of the intersection to check for cars turning left (in Australia). However, concern about roundabouts is not only from non-motorists. Some motorists avoid them due to the aggressive, confusing and complex manoeuvres needed to traverse them (p14; RACQ, 1995, 5).

Travelsafe (1993, 26) noted that the design of safer facilities should be utilised at construction, an issue raised in recent discussion about lane marking two lane roundabouts (e.g. RACQ, 1996, 20). Despite examples in overseas and Australian guidelines, road authorities continue to ignore the needs of cyclists and pedestrians at all roundabouts (BNSW, 1994, 23) and are proceeding with major changes to the standard markings for multi-lane roundabouts, using "multi-lane roundabouts made easier" (Queensland Transport, brochure) to promote the changes. Increased danger and threats to cyclists and pedestrians which are obvious and inevitable outcomes of the new improved design have been ignored.

Roundabouts essentially create an intersection for each arm rather than a single intersection. While negotiating the roundabout, drivers and cyclists must watch each entry, the vehicles in front and the chosen exit point. At entry, traffic in front must be watched as well as that to the right in the roundabout. Small vehicles are inevitably less likely to be noticed. Accordingly, both cyclists and motorcyclists are grossly over-represented in crash involvement (e.g. CTC, 1991, 9). Small roundabouts are 50% more dangerous than standard sized facilities (p9), an outcome which is exacerbated by high approach speeds to and through the roundabouts and substantially reduced in low speed or traffic calmed environments.

public transport and multi-modes

The need for safe convenient routes for cyclists and pedestrians in urban areas is well recognised as an important adjunct to increased use of both cycling and public transport. Cycling and walking remain essential for local trips including to public transport if unnecessary local car trips are to be reduced. Walking (and cycling) are often even more important in larger cities yet are frequently neglected in favour of accommodating increases in motorised traffic (Vuchic, 1981, 81-83; CROW, 1994, 101-120)

Both cycling and public transport are very efficient 'people movers' in confined corridors with limited space for parking and with high levels of convenience if routes are available close to points of departure and arrival. Combinations of public transport and cycling therefore can overcome route deficiencies and excessive distances to and from points on designated public transport routes. The weakest link in public transport is always ready accessibility to the public transport service (CROW, 1994, 103).

This requirement is easily addressed by improved cycling conditions which allow access distances to public transport stops to be doubled from 400m to 800-1000m by cycling at only twice the pace of walking, increasing the catchment by over 4 times, and thus providing a substantial potential growth in the market for public transport.

The conditions for cycling to fulfil this role are those of cycling in urban areas generally and accordingly, are not a specific cost to public transport or cycling but a general cost of providing transport options to encourage use of non-car modes rather than cars. The costs to public transport providers include provision for secure storage of bicycles at stops and provision for carrying bicycles on public transport to provide access at both ends of trips (CROW, 1994, 111-120).

In addition, sharing corridors for cycling and public transport can provide local, CBD and regional trip options in the one narrow corridor. Provision of safe urban cycling conditions to cover all urban areas requires that most local bus routes follow routes which are also logical routes for cyclists. Local buses regularly stop and therefore have low average speeds often considerably lower than both cyclists and cars. Accordingly, use of lanes for both buses and cyclists (McClintock, 1992, 184-185) provides a rationale for low speed kerbside transit lanes in many urban areas with road space for more than two lanes.

Increasing congestion and reduced urban speed limits constrain the top speed achievable by buses in such streets and roads. Safety and convenience of both passengers and other road users is enhanced by a lower bus speed and in particular, the role of enforcing lower traffic speeds is an important benefit for both young and elderly bus passengers who are exposed to high risks when alighting or crossing roads adjacent to bus stops. Noise and pollution effects of buses can be substantially reduced by limiting buses in the kerbside transit lanes to a maximum speed which is safe for cyclists and beneficial for bus passengers, pedestrians and occupants of nearby buildings as well as cyclists. Capacity to continue to provide efficient non-car transit is preserved and current service is improved.

roads and streets

In urban areas, streets and lanes were traditionally provided for local access and service needs. With use of the motor car for local trips, the convenience, range and lack of effort and apparent cost have encouraged much longer 'local' trips leading to daily commuting and short duration business trips with travel times up to and over 2 hours each way, that is 'local trips' of distances over 150-200km in each direction. The 'local' has been totally distorted, not only by the convenience and speed of travel, but by the effect that providing for such long local trips has had on others travelling locally by traditional short trip means such as a half hour walk to school or a one hour commuter cycle trip to work or university.

Traffic and urban planning has continued to facilitate the convenience and efficiency of car travel by effectively providing 'right of way' over pedestrians and cyclists and by providing higher speed limits which ensure the dominance. Hierarchies (e.g. Brindle, 1984) are now supported by slogans such as 'roads for movement' and 'streets for living' (BCC, 1994, 56-58) and by other supposedly authoritative bodies (MTFTC, 1995, 6, 12) yet hierarchies do not protect 'streets' which can 'become' through routes or are planned for movement i.e. 'become' roads.

Similarly, parking is part of ‘street’ use. It only becomes a ‘road’ problem when excess parking occurs, usually because deficiencies in alternative access modes ensure public transport and cycling are too inconvenient or slow compared with car transport, often the case at hospitals and universities. Parking is only a problem for 'roads' when parking is viewed as congesting traffic rather than providing short term easy access for visitors and freight. Rather than improve conditions for non-car modes, parking removal provides greater capacity for more traffic by expanding the peak hours to 'ease Brisbane City traffic congestion and to speed the flow of public transport' (''Evening traffic clearway hours extended'', City News, 29August1996) and speed the flow of cars rather than utilising the kerbside lanes for the adjoining properties and activities. As with road hierarchies, removal of kerbside parking primarily benefits car commuters to the detriment of the locality by increasing capacity and reducing congestion unless all additional lane capacity is used only for buses and cyclists.

Provision of all hours parking, bus stops and freight loading zones along arterial routes assists commercial developments by constraining through traffic. Ensuing congestion provides an essential incentive for cycling, bus and train use which, without traffic congestion, cannot provide efficient trips compared with cars. Accordingly, while European cities have been increasing non-car mode competitiveness by increasing public transport and cycling efficiency, Australian cities have been improving car competitiveness and constraining cycling and public transport on roads. Safe, healthy, sustainable cities have few if any 'roads', recognising that 'living' urban 'streets' extend across all urban areas except, and increasingly including, freeways.

residential streets ... urban centres and central business districts?

By addressing the 'proposed introduction of 50km/h local road speed limits on residential streets', the New South Wales Joint Standing Committee upon Road Safety, the Staysafe Committee, hopefully inadvertently, appears to be undertaking a very limited inquiry. The inquiry is not necessarily limited only to 50km/h or to 'residential' streets but can include issues of urban road safety and urban speed limits. Following recent overseas advice (The Telegraph, 14July1996), the selection of 50km/h and the restriction of its application to residential streets may be reviewed by the Staysafe Committee based on overseas experience which has confirmed 50km/h is excessive in all urban areas if safety of cyclists and pedestrians and if environmental and amenity impacts are an issue in urban areas, not just some selected residential streets.

There has been very little public debate except in Western Australia (MTFTC, 1994;1995) and South Australia. By demonstrating a practical and economic alternative to the previously seemingly entrenched view in Australia that speed reductions as envisaged by 40km/h limits were (and still are) only 'allowable' in LATM with physical speed reducing devices such as speed humps, the Unley trial exposed the extent of current 'expertise'. Review of the development of the urban speed management process suggests that it is the process that has been managed. Rather than any evidence of a commitment to reducing urban speed limits to a safe and workable limit, much of the research is strongly reliant on current and previous 'expertise' which has effectively been substantially discredited by the Unley trial and by other existing 40km/h areas without or with limited LATM devices.

Rather than replace 60km/h by 30 or 40km/h (e.g. MTFTC, 1995, 16-17), Australian road authorities seem to have predetermined 50km/h only in local or residential streets thereby giving an impression of a substantial change without further discrediting their expertise by adoption of a 50km/h speed limit adopted in other comparable countries years ago. For example, by approving selected parts of the "The 1996 Queensland Road Safety Action Plan" (Queensland Transport, correspondence, 23August1996) which was released early in 1996 by the Queensland Government, a '50km/h limit in residential streets' appears to have been 'approved' in Queensland without debate or consultation about the many other urban speed limit issues.

By constraining debate and relying only on road authorities and current traffic engineering and urban planning practice (e.g. RACQ, 1995, 22), the issues of safety and amenity in other urban areas such as shopping precincts and business centres including the CBDs (Corben and Diamantopoulou, 1996, 39-42, 43-46, 50) have been completely removed from consideration by other than traffic engineers (MTFTC, 1995,iii). It is clear from this and other studies (e.g. FORS, 1994) that it is these areas rather than residential streets which need reduced speeds. However, in recommendations for improving the safety of cyclists and pedestrians in the City of Sydney, a recent report (Staysafe, 1996) did not include speed reduction as a possible strategy to improve safety and amenity for all users of the city including motorists (FORS, 1994, 43-4) although this issue perhaps should be urgently revisited as part of its current inquiry into residential street speed limits.

Australian trials

Recent Australian trials of reduced speed limits have tended to continue the tradition identified previously (Brindle, 1984) of relying on hierarchies and treating or trialing small areas. As shown in more recent studies (e.g. FORS, 1990) and in particular, by the Unley trial (UnleyCC, 1996), trials of small areas may or may not be successful. By allowing only small area trials, only the validity of local area speed zones can be tested.

Small areas are simply inappropriate for testing reductions in the general urban speed limit which is a city wide requirement. Thus the continued choice of trials in small areas (the Unley trial is similar in size to Central Park in New York) is a means of ensuring that reducing the appropriate speed for the general urban speed limit remains problematic and seemingly unlikely to be changed to a speed which is adopted on the basis of the knowledge gained by citywide implementation overseas.

However, the Chairman of the NSW Staysafe Committee has recently been advised by European experts that 50km/h is too fast (The Telegraph, 14July1996). He has clearly become aware of the benefits of much slower urban speeds and hopefully the Staysafe Committee will critically review the nature and extent of the research which led to the implementation of a 50km/h limit for the North Sydney trial when clearly, the limit should have been 40km/h based on the success of Unley or 30km/h based on the success of implemented European limits as in Graz (Sammer, 1994). Rather than endorsing 50km/h, some submissions to the Committee seek a 30 or 40km/h general urban speed limit (Bicycle New South Wales, 1996) and 'particular regard' to the safety of vulnerable road users (Kidsafe, 1996, 2), both of which are supported by overseas research.

Given the reluctance of road authorities and motorists organisations (RACQ, 1995, 22) to allow cyclist advocacy groups to participate in decision making in projects such as the Austroads Urban Speed Management Project and the equivalent project in Queensland Transport (correspondence, 14August1995; 23August1996) it is clear that the processes and trials are very closely controlled by traffic engineering interests (MTFTC, 1995,iii) by the exclusion of participation and monitoring by interests including cyclists. These interests are excluded by road authorities because current road planning will be challenged by cycling and walking safety needs. That traffic engineers could lose their control of such issues also concerns some motorists organisations (RACQ, 1995, 22) although the onus is clearly on these groups to provide a safe environment (Main Roads Department, 1990, 142).

The Unley trial shows strong evidence of the benefit of low cost, area wide strategies which if adopted over a citywide area would most likely be successful based on overseas experience. However, that proposition and the real value of the Unley trial is rendered problematic by the controlling road authority and motorists organisations interests, even in the face of substantial research, trials and implementation both here and overseas.

As the Mayor of Unley has stated: 'I am concerned that the compromise notion of a national 50km/h limit seems to be gaining popularity in political circles, and is likely to be pushed at the National Conference of Transport Ministers later this year. **50 is a meaningless figure useful only for its political acceptability. We have shown conclusively that 40km/h is the way to go**.' (UnleyCC, 29 August 1996, original emphasis).

Rather than a national 50km/h general urban speed limit which was proposed previously (RACQ, 1995, 22; NRTC, 1995b, 14)), traffic authorities now appear to be arguing for only an extension of the existing hierarchy of speed limits (e.g. MTFTC, 1995, 15-16). Extending the existing hierarchy will necessitate an extremely complex array of decisions and signage if only residential streets (NRTC, 1995, 41) are to have reduced speed limits (pp40-46; RACQ, 1995, 22) in addition to local area traffic speed zones and school and other special speed zones.

local area traffic schemes

As previously noted, local area schemes and hierarchical traffic planning are simply a means of designing traffic provision to ensure that current traffic retains its dominance in urban and traffic planning. By determining main roads as boundaries of local area traffic schemes, road authorities continue to expand road capacity based on satisfying increased demand and using congestion to demonstrate the need for more roads.

Main roads are now being recognised as inappropriate, dangerous edges which constrain walking and cycling and therefore easy and safe access to public transport but as the Adelaide pedestrian fatality study (FORS, 1994) has shown, not only main roads are dangerous. Most roads are dangerous; increasingly so with more vehicles and higher speeds, even when relatively small numbers of vehicles are driving too fast (Curtin University, 1994; Corben and Diamantopoulou, 1996, 41-42). Stopping distances at speeds above 40km/h are 'insufficient for situations where pedestrians (might) unexpectedly step onto the road' (Main Roads Department, 1990, 10). Accordingly, major improvements in urban road safety can only come from reductions in speed on all roads unless other alternative routes are provided along and, frequently, across them to preserve convenience, safety and amenity for pedestrians and cyclists.

By using main roads as boundaries for trials, trials of reduced speed zones have been effectively constrained to comparisons with 'old' forms of LATM, those 'that slow vehicles' (Main Roads Department, 1990, 10). Despite achieving speed reductions, even the Unley trial includes ‘roads’ which require special cycling (and pedestrian) treatments if best practice guidelines (CROW, 1994) are applied. The North Sydney trial includes some main roads but utilises 50km/h as the speed limit. Thus almost all streets with more than 2000-3000 vehicles per day require special 'separation' treatment for safe walking and cycling due to excessive 85th percentile speed. Thus the entire scheme remains potentially dangerous due to insufficient stopping distances.

The RTA in conjunction with several local authorities has however, also been assessing speed reduction models in urban commercial centre trials on major roads in Sydney although not in the context of area-wide reduced speed zones. By designing to reduce traffic speed and improve pedestrian crossing safety and convenience but not specifically designing for cyclists, these trials have demonstrated that reduced speed conditions can improve cycling conditions as an inherent outcome, in particular, if lane widths are not constricted for other reasons such as improving pedestrian safety at the expense of cyclists safety.

The Campsie urban centre in Beamish Street demonstrates a low speed urban reconstruction with more than 200 buses per day through the main shopping street which carried some 16000 vehicles per day and now provides enhanced pedestrian crossing facilities using wide platform pedestrian crossings designed for the latest RTA buses (CanterburyCC, 1994;RTA, 1992). The Hurstville Boulevard project converted an arterial main road through the town centre into a pedestrian and transport interchange with limited car access (HurstvilleCC, 1996). These projects exemplify conditions easily attainable in most Australian urban centres (e.g. MTFTC, 1995, 3).

integrated solutions or segregation

Reference to much of the current road safety literature about excessive speed confirms the unavoidable outcomes of excessive speed. The faster the vehicle, the more difficult reacting to or avoiding the 'unexpected' becomes. In its simplest form, current consideration of the desirability of change to the existing General Urban Speed Limit of 60km/h reflects among many factors, the desirability of continuing almost total reliance on the needs and interests of motorists and to a lesser extent the needs of freight transport to determine the amenity and environment of urban areas in Australia.

There is ample evidence to demonstrate that inclusion of safe walking and cycling conditions on Australian roads and streets is currently not accepted by many road authorities (MTFTC, 1995, 28-29), primarily because of concern for the possible impacts on cyclists of the very high speed vehicles which would share the roads with increasingly larger numbers of cyclists. World best practice as developed in the Netherlands confirms this perspective. As reducing the volume of motorised traffic can only be achieved by a shift to other modes, speed reduction is the only means available to ensure that cyclists and pedestrians are regarded equitably in integrated transport and transit design.

Alternatively, separated and physically segregated facilities are often promoted and envisaged as a 'solution' for cyclists and pedestrians. While segregated facilities have an essential role, they simply cannot provide for the ubiquity of cycling and walking in urban areas. There is insufficient space. Where there is space, it is often more highly valued for other uses. Provision of adequate facilities is expensive and if relecting trip desire lines, replicates existing road and street facilities. Separated facilities cannot be provided at all desired crossing points, inevitably leading to major reductions in safety and convenience at traffic crossings due to the priority given to motorised traffic. Accordingly, while there will always be a place for some facilities of this type, there is simply no possibility of providing adequate permeability in urban areas without using the existing street and road networks e.g. Geelong Bike Plan (BIV, 1977).

European experience where cycling has continued to be valued shows that cycling and walking can substantially replace local car traffic, leading to up to 80% of trips under 2.5km being undertaken by walking or cycling as in Amsterdam for example (Ministry of Transport, Public Works and Water Management, 1995, 55). This has not occurred because of climate or because people always cycled but because cycling is valued. Very many Australians in urban and country areas also cycled. However, in Australia, car traffic was, and remains, more valued to the 'experts' than walking, cycling and public transport.

Problems of dangerous urban traffic can only be addressed by reducing expectations of high speed traffic priority and converting all existing urban areas into safe areas for the ubiquitous cyclist and pedestrian (Corben and Diamantopoulou, 1996, 41-42) as demonstrated in Europe (Ministry of Transport, Public Works and Water Management, 1995) if cyclist and pedestrian convenience, safety and amenity in urban areas is to be provided.

multi-modal and integrated solutions

Because Australian roads and streets are regarded as being so dangerous for pedestrians and cyclists that pedestrian crossings are removed and bicycle lanes on roads are regarded as problematic due to lack of space or questionable safety, any change to the cause of this perceived danger is likely to be difficult. By addressing possible future outcomes rather than current problems, the possibilities appear to reflect both a solution to the current 'problems' and a preferred outcome. Accordingly, it is the preferred outcomes and not the currently perceived problems which should, and can, strongly inform the urban speed limit review ... if the outcomes are able to be reviewed and implemented.

Reference to current Australian and overseas literature confirms that environmental conditions can be improved while providing high levels of safe transport in urban areas by providing much better walking, cycling and public transport conditions. This can only be achieved with currently available funds. Therefore rather than spending funds on more and faster roads which annually cause up to $6 billion in trauma and crash costs, a much larger proportion of existing funds can easily be allocated to higher capacity non-motorised and public transport modes which are inherently much safer and much cheaper than the dominant motorised modes.

Not surprisingly, this intention is expressed in most recent transport and planning rhetoric. "TravelSmart" (BCC,undated), the "Integrated Regional Transport Plan for South East Queensland" (Queensland Government, 1996), "The Way Ahead: Metropolitan Transport Directions for Western Australia" and the "Metropolitan Transport Strategy" (Department of Transport, Western Australia, 1995) are some examples.

However, a priority emphasis on cycling and walking is essential, if the rhetoric is to be successfully implemented (CROW, 1993). In Australia, quality implemented examples are currently very rare. Recent rail projects such as the new northern suburbs line in Perth and the Brisbane to Gold Coast rail project in South East Queensland demonstrate both the desirability and convenience of implementing preferred outcomes and their practicality now. However, potentially, both projects are very vulnerable to capacity improvements to roads and highways in the same corridors. As well as increasing car convenience rather than allowing congestion to encourage modal shift, improved capacity roads always substantially impact on walking and cycling safety and convenience.

Thus it is the extent that walking and cycling conditions have priority over local and regional car traffic improvements that determines the relative accessibility and competitiveness of public transport. This has occurred in Australia in the past and will continue despite the rhetoric.

benefits for pedestrians, cyclists ... and motorists

The public profile and advocacy of motorists organisations in Australia appears to be strongly biased towards achieving ideal requirements for motorists (RACQ, 1995, 22). While this is quite normal and reasonable for advocacy based organisations, inferring that these organisations represent the interests of all road users is clearly unacceptable unless their expertise is recognised by those who they purport to represent. However, while most government road authorities accept the expertise of motoring organisations, similar access and representation is not provided to cycling and in particular, pedestrian interests.

Exclusion of 'other' road user groups (p22) from expert advisory groups reinforces car dominance. The motorists 'windscreen' perspective not only remains dominant but cannot be challenged if motoring organisations are legitimated as 'organisations with responsibility for the implementation of specified Speed Management actions' while cycling interests can be excluded by limiting 'the composition of the(se) groups to organisations which are responsible for developing and administering policies and actions which will reduce the incidence and severity of speed-related crashes" (Queensland Transport, correspondence, 14 August 1995).

Taking only the motorists perspective is particularly dangerous for the vulnerable road users. For example, it is the difference in marginal speed which makes the difference between being able to respond safely to the unexpected. Accordingly, while it may seem appropriate to motorists that considerable tolerances above the posted speed limit are necessary before offences are prosecuted (RACQ, 1993, 11), the "Do you drive too fast for the unexpected?" brochure and much other research (e.g. FORS, 1994) makes it clear that, from the vulnerable road user perspective, all tolerances should be included by motorists in determining the speed at which vehicles are driven (FORS, 1994, 43). The 10% higher speed tolerance allowed to drivers (RACQ, 1993, 10) is a fatal margin for cyclists and pedestrians in all urban areas (FORS, 1994).

The potential for such criticism can be reduced along with the incidence and severity of speed-related crashes by resolving the needs of urban traffic with all interested parties as the often unreported urban low-speed crashes involve increasing proportions of cyclists and pedestrians in urban areas as cars become safer in low speed crashes.

However, some motoring organisations are aware that the increasing problems on roads can be reduced by encouraging favourable conditions for other modes. They recognise and promote "Cycling Motorists" (AA, 1993) as a suitable alternative to the car for some journeys, recognising that reduction of unnecessary trips by promoting suitable alternatives is in the interests of their members and the general public. By encouraging safe equitable cycling conditions, motoring organisations can work with other expert groups to best achieve common goals including urban safety.

current research

Currently, very little Australian research is forward thinking in orientation. In practice, most road research appears to be pragmatic, addressing current problems and seeking solutions to those problems. There is little evidence of long term predictions. There is little research into preferred outcomes as an alternative to predicted outcomes if current preferences for car based travel continue to be further inculcated into normal patterns of existance in urban areas (e.g. Newman and Kenworthy, 1992, 1-7).

Overseas experience including the west coast of the USA and Japan suggests that continuing to build more freeway type motoring facilities is fruitless, although it took earthquakes to show that other modes could be more efficient and, in practical terms, similarly convenient if sufficient facilities or opportunities exist or were provided. In Europe, alternatives to car transport have been supported to combat the effects of pollution and noise and to maintain the quality of urban living in the villages, towns and major cities (e.g. Alarm UK, undated).

In particular, Japan has recognised the utility of combining cycling with train transport as station spacing is very suitable for cycling but too large for walking in whole-of-catchment terms. Countries as diverse culturally as Japan and the Netherlands have long recognised and funded the benefits of cycling and public transport (Parker, 1995b, 35).

Demand already exists in Australia. It is severely constrained by lack of adequate facilities and in particular by lack of research, usually because those making funds available and those viewed as road 'experts', lack a future oriented perspective and in particular, adequate experience and commitment to the benefits of alternatives. In Australia, there simply is insufficient experience, practice, research and opportunity.

Much recognised 'expertise' is open to criticism because it very strongly reflects the bias of the 'windscreen' perspective without appearing to comprehend the bias of the cyclist or pedestrian perspective. While containing much significant material, Moses presents his report on his major overseas study tour, noting that 'Western Australia leads the(se) countries (visited) in a number of areas including the replacement of zebra marked pedestrian crossings with concrete islands, the use of small street name signs in advance at intersections on identified traffic routes and the wearing of helmets by young cyclists' (Moses, 1988).

Recent research (e.g. FORS, 1994; Corben and Diamantopoulou, 1996) confirms the vulnerability of pedestrians and cyclists (Main Roads Department, 1990, 139) recognised since the 1970's but rarely addressed by road authorities. With the perceived needs of road traffic so dominant and those needs so dominantly represented by road authorities, current research supporting 30 or 40km/h urban speed limits (MTFTC, 1995, 16) appears likely to again be disregarded along with the needs of cyclists and pedestrians as has occurred previously.

While not explicitly promoting the need for a substantial reduction in the general urban speed limit, road authorities are aware of the generality of excessive urban speed. 'Many drivers fail to appreciate when a speed limit lower than the limit is required. A lower speed may be necessary because of road conditions (a sharp bend or narrowing of the road), traffic conditions (parking activity near shops, the presence of cyclists or young or elderly pedestrians), or environmental conditions (adverse weather, inadequate street lighting)' (MTFTC, 1994, 12). However, the need to lower the speed limit generally is not chosen for implementation despite campaigns such as '*Hit at 60km/h, 4 out of 5 childen die. Hit at 30km/h, 19 out of 20 children survive*' (MTFTC, 1994, 12) in the United Kingdom.

Why it might be safer to ride a bicycle in Europe without a helmet than it is to ride with a helmet in Australia is a question that road authorities do not seem to want to try to comprehend. Making Australia so safe that cycling is safe without a helmet appears to be a suitable goal. 'Windscreen' research can only benefit from 'research and development' skills gained by experienced advocacy delegates to overseas cycling conferences but only if the 'partnerships' (Austroads, 1995, 7) ensure genuine participation and commitment to long term goals of healthy and safe transport.

leaders or followers ... agents for change?

As knowledgeable and experienced cyclists, cycling advocates have an important role in urban transport and town planning. It is increasingly recognised that current and previous 'expert' practices based on narrow specialisation produce benefits but also substantial disbenefits. A small country, Australia has current costs of road trauma exceeding $6 billion, the majority of which is not a benefit but a 'loss' although it is likely to appear as a 'product' in national economic assessments.

Increasing recognition of health effects of pollution, noise and lack of adequate and regular exercise confirms that previous expert solutions to urban transport and planning are inadequate (Roberts et al, 1995). Increasing concern about security in public transport and public places where walking is viewed as essential confirms current design and use of urban areas is no longer satisfying needs.

By design, by regulation or simply by providing such hostile conditions and such substandard urban environments that cyclists and pedestrians choose not to use them, exclusion of cyclists from many urban areas appears to be directly related to the apparent or perceived lack of security of such areas given that they are, in many cases, inaccessible to motorists.

Extensive experience in European and Asian urban areas shows that cycling and walking not only mix (McClintock, 1992, 31-33) but are mutually supportive. In addition, they are supportive of public transport and increased security in public places. Non-motorised vehicles are being recognised as so important to urban infrastructure funding and environmental outcomes that recent studies by major lending authorities support substantial protection and promotion of non-motorised vehicle amenity (World Bank, 1992; World Bank, 1996) to assist in reducing the unavoidable impacts of increased motor vehicle use including inequity, pollution and congestion.

As the extent and inevitability of environmental impacts and health outcomes of motor traffic are increasingly being recognised, consideration is also being given to sustainability issues. Inevitably, as it becomes more scarce, oil for fuelling motor vehicles will become increasingly more expensive. The relative wastage of fuel on individual personal convenience travel will be increasingly curtailed to ensure maximum longevity of fuel for industry and in particular, food production.

The cost of construction of bridges and tunnels with design lives of up to 100 years is both optimistic and wasteful, encouraging continued and increasingly profligate use of finite resources including fuel. There is little direct evidence of exactly when such scenarios will begin but it seems increasingly more likely to occur within a relatively short time, perhaps as little as 5 or 10 years (Fleay, 1995). This is much shorter than the design life of the car-based infrastructure being promoted and built in Australia. Walking and cycling will, however, continue as sustainable and equitable modes of transport deserving of safe conditions now to assist in maximising the use of these modes, thereby prolonging oil supplies and preserving urban amenity.

reduced trip length and public transport

If fuel is an increasingly scarce resource and congestion is increasingly emerging as unavoidable irrespective of the mode of transport, trip length reduction is an essential strategy in developing more sustainable human settlements. The sudden emergence and impending problems of excessive development to suit car dependence suggest that urban settlements should be more like the traditional villages of most cultures before cars allowed a very large increase in travel on a daily basis. Many urban, rural and farming based villages retain the form of a cohesive cluster of urban development including housing which recurs at relatively short spacing, rarely exceeding distances travelled comfortably by horse.

Recent urban settlements reflect the distance travelled by car or public transport judged by cost, convenience, time constraints or availability of facilities. Thus, public transport which continues to provide and therefore encourage extended trips is not a sustainable alternative to increasing car use. Public transport as an alternative to car use is a 'conventional urban myth' (Hillman, 1995) promoted by urban planning and transport engineering (e.g. Queensland Government, 1996) to allow current forms of car dependant urban development supported by freeways for more cars and buses (Yeates, 1996) to continue unchallenged.

Cycling and walking therefore remain severely effected by car and public transport based planning despite new forms of urban planning (Hedgcock and Hibbs, 1992, 75). Priority planning for cycling and walking are, however, fundamental to transportation needs if local sustainability goals are to be achieved through increasing the 'environmental sensitivity' (p77) of new forms of planning.

It is therefore not surprising that current transport engineering and urban planning promote public transport. Through projects such as "Building Better Cities" which do not include substantial government funding to provide for useful cycling and walking connectivity, current car dominated planning continues to provide public transport as an alternative to current commuter type trips thereby offering a very expensive, frequently less competitive alternative while continuing to fund motorways and freeways.

Assessing all trips rather than just commuter trips, up to three times more trips can be made by walking or by bicycle because most trips are within easy and convenient range of non-motorised transit (Hillman, 1995). Current policy in urban design therefore can be best assessed by the extent of commitment to cycling and walking rather than public transport facilities and conditions. Where cycling and walking are substantially ignored in favour of public transport (e.g. BCC,undated, 15; Queensland Government, 1996, 19, 33, 47, 66), urban form is unlikely to change and therefore environmental benefits cannot be achieved. Urban areas will therefore remain unhealthy and 'unsafe' because people do not walk or cycle (Hillman, 1995) and the real benefits of integrated public transport and non-motorised modes (CROW, 1993) will not be fully achieved. Urban areas will remain 'crushed' (MTFTC, 1995, 28) by the existing car dominance.

30 40 50 60 and 65

Review of the general urban speed limit has been severely constrained by road authorities and motorists organisations (MTFTC, 1995,iii). Continued promotion of the 'windscreen perspective' so dominates urban planning that various groups in the community such as those promoting separate bike paths, are now being encouraged to regard the road and street system as so dangerous that they should not even use it. These groups include the aged, those with various disabilities, cyclists, pedestrians and the young (e.g. BCC, 1996, 10). Perhaps this trend is best illustrated by a proposal by the South Australian Office of Road Safety to ban 'child cyclists' from streets in South Australia (The Advertiser, 21September1996,p4), a proposal strongly criticised by the Bicycle Institute of South Australia (press release,September1996). By blaming the victim, it continues a long history of bias favouring motor traffic rather than providing safe urban transit in safe urban environments (Main Roads Department, 1990, 142).

People choose to live in urban areas and seek to live their lives with equality and dignity. The road system has changed from being relatively balanced, equitable and safe in most urban areas. It is now increasingly more dangerous, unhealthy and inequitable, not only for the young but for the ageing. The complexity and reaction skills of urban driving have changed substantially since the 1950's. However, the broader needs of a 'greying population' are only being partly addressed (e.g. Dunne, 1993).

Despite awareness of combinations of speed with natural 'disabilities' such as eyesight and reaction (e.g. Wood and Troutbeck, 1994) and limited fields of vision (e.g. MTFTC, 1994, 12; FORS, 1993, 13; enfb,undated, 9; Nordrhein-Westfalen,undated; ETP, 1992, rear cover), no programme of general speed reduction, the common factor, has been considered desirable in Australia since the decision in 1974 to increase the urban speed limit to 60km/h in preference to reducing it to 50km/h. For vulnerable road users, the primary role of road safety has, until recent research (e.g. McLean, 1995), been to reduce the use of an increasingly more dangerous street and road system by educating the vulnerable groups not to use the roads and streets.

As compared with the reaction to the Hobart gun fatalities, a recent call by the Federal Transport Minister to reduce the annual road toll from approximately 2000 to 1500 confirms the road and transport industry is so entrenched that these fatalities are built into the decision making system as normal and expected occurrences rather than as indicators of failure of design, management and in particular, safety roles.

The transport and road industry does not pay the costs of the negative outcomes. Public transport is the only road and transport industry expected to demonstrate cost recovery under the 'user pays' rubric, which by excluding many environmental, health and social costs and benefits, ensures that road projects have massive unquestioned funding but public transport and non-motorised modes, relatively little, if any.

When cost benefit studies include the full cost of known and predictable costs of current transport and urban planning (e.g. CTC, 1993; Hillman, 1995), cycling and walking inevitably provide the best short and long term priority for funding. Curtailing current non-sustainable funding of road and urban public transport is easily achieved by full impact assessment and cost/benefit studies as now recognised, for example, in Britain following reports from the Royal Commission on Environmental Pollution and the Standing Advisory Committee on Trunk Road Assessment (Alarm UK,undated, 24) and in the U.S. following the Intermodal Surface Transportation Efficiency Act and Clean Air Act Amendments (e.g. Vuchic et al,undated, 82).

As a further benefit of a committed approach to ensuring a healthy and safe urban environment, public health costs can also be expected to reduce substantially as roads become sufficiently safe to walk and cycle (British Medical Association, 1992).

Australian urban traffic practice contrasts substantially with overseas best practice when safety, equity, amenity and convenience of all occupants of urban areas are considered. Now that groups such as the RTA and NSW Staysafe Committee are aware Australian urban speed limits are so much higher than desirable and are now aware of the advantages of a much lower urban speed limit, it is reasonable to expect that their views will support and be supported by the views of cyclists and pedestrians and that a general urban speed limit will be determined with these views included.

However, it is becoming clear from recent policy statements such as the 1996 Queensland Road Safety Action Plan that it is not intended to allow further consideration of a reduced general urban speed limit. Rather, Australian road authorities appear to have decided that, subject to their respective Transport Ministers approval, there should be a speed limit of 50km/h on residential streets rather than a general urban speed limit despite the need for the majority of urban roads and streets to have a 30 or at most, 40km/h speed limit (MTFTC, 1995, 14-17).

This is contrary to major research projects (e.g. MTFTC, 1995, 16) which raise major concerns about the safety of non-local roads and streets (FORS, 1994) and contrary to the expressed needs of cyclists and pedestrians for safe urban streets and roads (BFA, 1996). Australian road authorities remain unmoved by the evidence of overseas experience (e.g. Plowden and Hillman, 1996, 124-6) and the trauma costs of crashes in urban areas in Australia, preferring to marginally lower the speed limit only in residential streets which are at present, relatively safe (FORS, 1994) while increasing or not addressing the danger on non-local streets (Corben and Diamantopoulou, 1996).

Therefore, whether a cyclist on the open road, an elderly pedestrian choosing to take a constitutional walk to the local shops or a child cycling to school or playing in an urban street environment, the motorist's entitlement to drive too fast for the unexpected will not be substantially reduced. Accordingly, the right to drive too fast for the unexpected will continue to ensure that current discrimination in favour of fast motorised traffic (Roberts et al, 1995, 38) remains in all areas of urban Australia because cyclists and pedestrians have no part in the decision process.

Campaigns such as "Speed Kills" on the jerseys of Victorian football players or "Do you drive too fast for the unexpected?" can provide absolutely no guidance as to a safe speed for the unexpected, a decision beyond the skill of drivers (FORS, 1994, 42-43). Campaigns such as these are meaningless and symbolic unless realistic speed limits indicate and confirm appropriate sight distance, speed, reaction and braking distance for the expected "unexpected" urban situation.

As consistently shown in many places (e.g. Unley, 1996; Sammer, 1994), speeds of 30 or at maximum, 40km/h with very low traffic density appear to provide safety in urban areas with substantial cost benefits and without substantial cost disbenefits. 'Comparison between the proportion of journeys made by cycle in towns where cycling is well provided for and in other towns indicate a huge suppressed demand for cycling. A 20mph (30km/h) speed limit, properly enforced, would go a long way towards removing the present deterrents to cycling' (Plowden and Hillman, 1996, 124) as average peak hour congested traffic speeds seldom exceed this speed.

A general (default) urban speed limit of 30 or 40km/h is strongly supported, a view expressed by the Bicycle Federation and its members since the 1970's but ignored and seemingly, again to be ignored as traffic engineering interests seek to maintain the priority of increasing volumes and on non-residential streets, higher speed vehicles over pedestrians and cyclists in urban areas.

When all currently recognised needs and issues are assessed (e.g. see MTFTC, 1994, 9-11), urban areas requiring reduced speeds for safer, more convenient walking and cycling include all residential precincts, school precincts, CBD and urban commercial precincts, hospital, disabled and aged persons precincts together with existing speed zones and reduced speed advisory zones (e.g. see MTFTC, 1995,iv). If all these are integrated, there is little if any part of any Australian urban area in which 30km/h should not be applied as in many parts of Europe (Sammer, 1994; MTFTC, 1994, 10-11).

To avoid excessive signage, visual pollution, cost and confusion, 'the general urban limit should be the limit most suited to the most common form of road' (MTFTC, 1994, 14).

‘Residential’ streets and local distributors predominate in urban areas in Australia and this seems to be generally regarded as a long term desirable outcome in most urban areas. Therefore, 30 or 40km/h should be the general urban speed limit (MTFTC, 1994, 18; MTFTC, 1995, 16) confirming that Australian road safety practice now reflects European research and practice since the 1970's (MTFTC, 1994, 21) given that the extensive cost of local area traffic management far exceeds the costs of extensive campaigns supporting a reduction in the general urban speed limits and that the benefits will inevitably exceed the costs (p23; UnleyCC, 1996).

If this is so, the two essential questions to be considered before deciding the appropriate urban speed limit management strategy are firstly,

> why this approach has not been adopted to emphasise the road safety needs in urban areas, and secondly,
>
> who decided not to address these issues by proceeding with 50km/h only in residential streets and substantially avoiding the real issues of urban road safety, the needs for cyclists, pedestrians and motorists as already demonstrated overseas (e.g. Sammer, 1994).

The only practical strategy for providing legal guidance to motorists in urban areas is reduction of the general urban speed limit to 30km/h or as a politically pragmatic decision, 40km/h (e.g. see MTFTC, 1995, 16), if cyclists and pedestrians and motorists are to have a safe urban traffic and transport system and residents and visitors are to be ensured of a healthy urban environment.

Therefore, the only safe urban speed limit is one that is safe for pedestrians and cyclists as well as other users.

Unless allowed by signs to exceed the general urban speed limit, motorists exceeding that speed in urban areas can then take the full legal and moral responsibilities and consequences for 'driving too fast for the unexpected'.

On the evidence in both Australia and overseas, the safe urban speed limit for all people, young and old, is 30km/h in mixed traffic, because mixed traffic conditions cannot and should not, in general, be prevented in urban areas in Australia.

findings ...

1 Current urban speed limits are too high to allow safe use of urban areas by cyclists and pedestrians.

2 The major cause of death and severe injury in urban areas is high speed on non-local roads. Therefore reduced speed limits in residential areas will have little effect.

3 Reduced speed limits in residential streets is therefore not an acceptable alternative to reduction of the 60km/h general urban speed limit if improved cyclist and pedestrian safety is being sought.

4 Planning and road authorities have not taken and do not take into account the needs of pedestrians and cyclists in determining traffic measures.

5 No process exists which ensures cyclist and pedestrian needs are included in research, policy and implementation for road and street environments.

6 Current road and public transport projects without adequate cycling and pedestrian conditions continue to make cycling and walking less safe and less convenient therefore encouraging more road use.

... and proposals

7 The current General Urban Speed Limit be reduced to 30km/h.

8 Higher speed limits only be used where safe for cyclists and pedestrians or where adequate and frequent facilities allow separation.

9 Safety audit processes include mandatory facility planning for cyclist and pedestrian safety and be applied jointly by community based groups and road and urban planning authorities.

10 Local area traffic planning includes audits of major arterial type roads to review proposals to develop or expand major arterial roads in urban centres.

11 Urban transport needs be determined and addressed in priority commencing with walking then cycling then public transport then freight then private transport to encourage safe local trips, improve public health and preserve local amenity.

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Appendix 1
(CROW,1994,80-82)

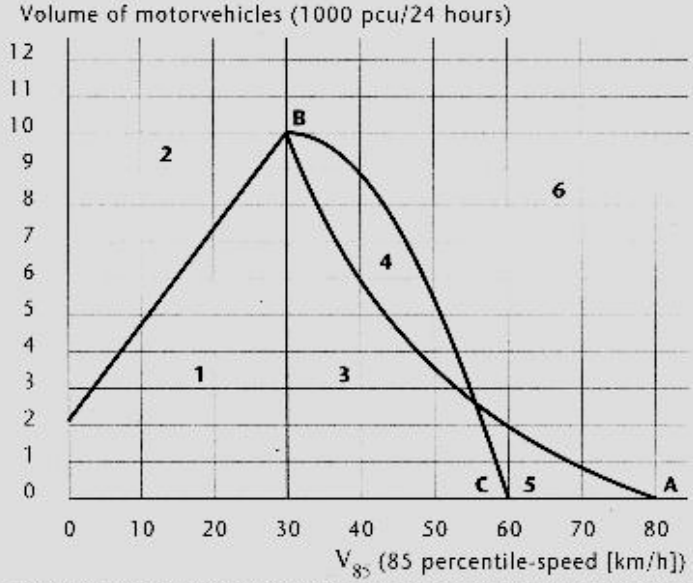

Figure 4.3 Amount of separation between cyclists and motor-vehicles with various speed-volume combinations.

Explanation of fig. 4.3

N.B.:	The horizontal axis of the graph gives the actual speeds of motorized traffic and not the legally permitted speeds or the design speeds!
Area 1	If the V_{85} (85 percentile-speed) of motorized traffic is lower than 30 km/h, a mixed profile is generally to be recommended. Cycle-lanes or cycle-tracks can possibly still be constructed for the sake of subjective safety or the continuity of the cycling-network. No cycle-tracks or cycle-lanes should be constructed within a 30 km/h-zone.
Area 2	Combinations of very low speeds and very high volumes hardly ever occur. Pronouncements about cycling-situations in this area are therefore of no relevance.
Area 3	In general, a road without cycle-lanes or cycle-tracks is acceptable. However, they may still be desirable, depending on other road and traffic features (RONA road-category VII and VIII, *design* speed 60 km/h; this is not equal to V_{85}).
Area 4	A cycle-lane or cycle-track is desirable.
Area 5	A cycle-track is desirable, but motorized traffic volumes are so low that a road of mixed profile is also acceptable. Cycle-lanes are not to be recommended.
Area 6	At these high speeds and motorized traffic volumes, cycle-tracks are always necessary.

Appendix 2 [articles submitted and published in *Australian Cyclist*]

Why 30km/h? May 1996

Road design and town planning provide the structure of our cities and towns. Whether through the trained professionals of today or the ad hoc construction which reflected the need for movement of people and goods in previous centuries, urban form is the outcome of transport and movement patterns between various places. Our cities and towns of today are no different.

What is different is the long distances travelled and the number of trips made. These are the outcome of car use and previously, public transport. With improvements to roads and to vehicles, such trips became longer and more convenient. To make such trips even more convenient, allowable vehicular speed has increased dramatically.

It is only some 100 years ago since cars began the rise to dominance. Early cars required a flagman to walk in front. Currently, cars so dominate the roads and streets that walking and cycling are regarded by road designers, town planners and other decision makers as so dangerous that cyclists and pedestrians have to be separated from the other road users or seemingly, ignored or banned altogether.

Such inequitable outcomes of town planning and road design are now being critically reviewed worldwide. Australia is no exception.

The BFA urban speed limit project is reviewing current Australian and overseas research, policy and planning with many interesting results.

In Australia, there is very little adequate research carried out to review the relative safety of the various modes of transport. For example, it has been shown that 47% of all accidents involving riders under the age of 18 occurred on a minor street (in Main Roads Department WA 1990 *Guidelines for Local Area Traffic Management* p.139). But what does this actually mean? Who decides how or if such information is used or even if it accurately reflects the real conditions out there? How many of those accidents involved the rider "falling off" the bike? Did any involve a collision with a moving car or is this simply assumed? Is cycling and walking safer than driving a car?

Therefore one question that must be asked is why there is such inadequate research information in respect of cyclists and pedestrians in Australia? It appears that cyclists and pedestrians interests have never been regarded as significant by road designers and town planners as current road and town planning outcomes demonstrate. Recent research certainly points in that direction also.

Some selected research from here and abroad

In an Adelaide study, 85% of 176 fatal pedestrian crashes occurred on non-local roads in urban areas. It is estimated that 75% less fatalities would occur if vehicle speeds were reduced by 20km/h in what are now 60km/h speed limit areas (Federal Office of Road Safety 1994 *Vehicle Travel Speeds and the Incidence of Fatal Pedestrian Crashes* p x).

A Bicycle Victoria study shows that in the period 1988-1994, 57 cyclists were killed and 2682 seriously injured in 60km/h zones while there were no fatalities and only 6 serious injuries in 40/50km/h zones in the same period (*Cyclist Trauma: The Facts* 1995 Report, Table 15).

In Graz in Austria, a two year trial of 50km/h on "priority roads" and 30km/h on all other roads resulted in a 12% reduction of accidents with injury, 24% reduction in serious injury, 17% reduction in pedestrian injury and a 14% reduction in injury to car users. Despite only a 4% reduction in cyclist injuries, 83% of cyclists strongly supported the reduced speed limit. General acceptance has been so high that in July 1994, the scheme was made permanent (Sammer, G 1994 *General 30kph speed limit in the city: The results of a model project in the city of Graz*).

It is clear that Australian road designers and town planners have known that the high urban speed limits, despite being legal, are dangerous for cyclists and pedestrians (Queensland Travelsafe Committee 1993 *Report on Pedestrian and Cyclist Safety* p.27). High urban speed limits have been and continue to be taken for granted because speed is unlikely to be reported as the cause of a crash if it is estimated that the vehicle speed was below, at or even slightly above the legal speed limit. Removal of zebra crossings is an example (p.24-25).

So little research has been carried out to determine how many cyclists and pedestrians are exposed to danger in various different locations that many other research projects are rendered relatively useless. For example, it is of little use finding that local streets are dangerous to children or cyclists (e.g. Main Roads Department WA 1990 *Guidelines for Local Area Traffic Management* p.139) if it is because these are the areas that are predominantly used by children or cyclists. Something has to be done to actually reduce the danger! What is the danger?

In Queensland, speed has been identified in a campaign which asks "Do you drive too fast for the unexpected?" (Queensland Transport). The campaign brochure provides the reasons why and the results. A car travelling at 60km/h takes at least 34m to stop. It is still travelling at 60km/h (in the reaction time) when a car travelling at 30km/h has stopped in a distance of 12m. At 65km/h vehicle travelling speeds, most child (and elderly) pedestrians in a crash situation will be killed yet at 30km/h only 1 out of 20 of them would be killed. Many of the others will not even be hit because the vehicle could stop or take avoiding action. Similar effects apply to cyclists hit by vehicles. Are cyclists "unexpected"?

Similar predictions were made by the Adelaide study (Federal Office of Road Safety 1994 *Vehicle Travel Speeds and the Incidence of Fatal Pedestrian Crashes* p.x). However, because more than 85% of the fatal pedestrian crashes occurred on non-local roads, lowering speed limits in local streets will have little effect on fatal pedestrian crashes (p.42) and similarly, will have little effect on cyclists who also inevitably have to cross or use non-local roads.

Interestingly, the *Childhood Pedestrian Injury Study* in Perth (Curtin University 1994), despite finding that injury risk by traffic volume was increased by the speed of the traffic (p.5), did not include traffic speed in the four factors that "contribute to a child's risk of pedestrian injury" (p.4). Is speed reduction not regarded as an option? Has speed reduction around schools been safer for school children?

Other questions which must therefore be asked are whether "excessive" speed in urban areas is a risk factor, why 50km/h and why 50km/h only on local or "residential" streets? What research has been used to support these decisions? Are cyclists and pedestrians interests still not significant to road designers and town planners?

In the Netherlands, 30km/h has been accepted as the appropriate speed limit for "safe" mixed traffic (CROW 1994 *Sign up for the bike: Design manual for a cycle-friendly infrastructure* p.79-82). Recent research in India has replicated the natural tendency for traffic to mix at speeds of up to 30km/h and to separate naturally at speeds above that (Tiwari,G et al 1995 *Lessons from Heterogeneous Traffic Flows for Planning Integrated Facilities*). Most cyclists will be familiar with the "pleasure" of cycling in lower speed traffic - the relative luxury of congestion.

The 40km/h trial at Unley in Adelaide demonstrates that reduced urban speed limits which are being sought in many communities in most if not all our major cities, will work in Australia without extensive and expensive re-engineering of urban streets if education and enforcement are increased, as shown in Graz (Sammer, G 1994 *General 30kph speed limit in the city: The results of a model project in the city of Graz).*

However, in Australia, most research continues to take only a car based approach. From this "windscreen perspective", it can easily be demonstrated that freeways are "the safest of road types" (Select Committee on Road Safety, Western Australian Legislative Assembly 1994 *Road crash causes and the extent of the problem in Western Australia* Second Report p.22). What significance is attributed to cyclists and pedestrians interests in this report in which cyclists appear not to be included in the referenced research (i.e. Figs 17 and 18)? In New South Wales and Queensland, recent proposals to "improve" roundabouts have completely failed to ensure the interests of cyclists and pedestrians are addressed.

A cyclists perspective ... not the "windscreen perspective"

The BFA urban speed limit project adopted a "cyclists perspective" rather than the "windscreen perspective". By seeking and publicising the conditions which are safe for cyclists and pedestrians (as well as motorists) and which already have been researched and perhaps adopted here or overseas, the BFA seeks to achieve appropriate speed limits in urban areas.

Surely when environmental and health issues are emerging influences on transport and town planning, it makes sense to try to avoid in excess of 85% of current fatalities inflicted upon pedestrians and cyclists by motorists while also saving many of the current motorist fatalities as a "bonus".

Lowering the current 60km/h General Urban Speed Limit is currently being considered by state governments (e.g. South Australia 50km/h and Queensland 50km/h only in "residential streets") and the federal government. The issue needs the interest, submissions and support of cyclists now.

Australian and overseas research and experience has shown that every 5km/h higher than 30km/h makes vulnerable road users much more vulnerable and "unexpected", a factor which is beyond the control of any driver in deciding what is a "reasonable" speed at which to travel in urban areas (Federal Office of Road Safety 1994 *Vehicle Travel Speeds and the Incidence of Fatal Pedestrian Crashes* p.43).

30km/h has been shown to make urban roads and streets safe for pedestrians, motorists and cyclists and encourage health promoting and environmentally sustainable forms of transport and urban planning. Accordingly, the BFA Urban Speed Limit Taskforce welcomes all submissions as cyclists seek to assist governments to make Australian roads and streets safer and more enjoyable for everyone.

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30km/h? In 'residential streets' ... or in 'urban areas'? July 1996

Recent correspondence and discussion about the '30km/h urban speed limit' has raised the very important issue of how to define the areas where the varying speed limits should be introduced.

Currently, most governments and their advisers appear comfortable with reducing the speed limit in residential streets. There are clearly many benefits in reducing the speed limits in 'residential streets'. However, residential streets are not the location of the major problems:- the serious injuries and fatalities.

Therefore, the 'big issue' requires the lowering of the speed limit in 'urban areas', that is, the areas where we live, work, shop, learn, play and the streets and roads we use to get between these places. Currently, most governments (and some cyclists) appear to be avoiding the reality that it is the roads and streets which have large numbers of high speed vehicles which are the real danger to pedestrians and cyclists. These are not necessarily 'residential' streets. In fact, most of them are not.

Speed reduction 'only' in residential streets in effect supports the continuance of the most dangerous areas of our cities and towns for cyclists and pedestrians. Many of the dangerous areas are actually residential streets which have 'become' high speed roads. There is no evidence that these roads will be 'defined' as 'residential' during 'zoning' of the lower speed areas. Most dangerous roads will remain unchanged.

How does the 'urban speed limit' work?

The urban speed limit is the normal standard speed limit we expect in towns and cities with no visible speed limit signs. Where necessary, higher and lower speeds can be implemented but must be indicated with extensive and repetitive signage. The present speed limit is 60km/h.

All urban areas should have a ***safe*** 'urban speed limit' which encourages safe conditions for cyclists and pedestrians using the streets and roads in urban areas. Many urban speed related crashes appear to remain unreported as speed related ... because the urban speed limit is 60km/h. It is not difficult to comprehend the legal problem facing traffic police reporting a vehicle involved in a crash for travelling below the speed limit. Such instances are more likely to be treated for example, as undue care rather than speed related. Therefore, 'crash' and traffic reports tend not to show 60km/h as too high for the safety of cyclists and pedestrians. Reports from 30 and 40km/h zones confirm these speed limits as safe.

By use of Safety Audits which require safe conditions for pedestrians and cyclists, roads which are safe for higher speed traffic or which provide special facilities (e.g. bike lanes or paths with safe road crossings) can very easily be signed. All other roads remain much safer for all users.

30 km/h ... the only safe urban speed limit

The BFA Cyclists Urban Speedlimit project has shown convincingly that, in general, the needs of pedestrians and cyclists have been and continue to be ignored by transport and town planners. As Ian Roberts succinctly notes: "... the very people to whom we should be able to turn for support, Road Safety professionals, offer us the least succour" (*Cyclist* August-September 1995). Why is this? Why has it occurred?

Every major "improvement" in "road safety" has resulted in an improvement in conditions which "improve" motoring. Safer cars, higher speed limits, wider roads, channelised intersections. Cars are now designed so that front/rear impacts are "safe" for the occupants. Recent evidence shows that side impacts are now a problem ... no doubt increased side impact resistance is a good thing. But what about an emphasis on **reducing or avoiding** impacts and their outcomes, not only for motorists but also for pedestrians and cyclists?

Recent discussions and research into the problems of bike lanes, intersections, roundabouts and pedestrian crossings have consistently demonstrated that road managers do not address the needs of pedestrians and cyclists as part of road design and management. On the road, the "experts" continue to ignore the vulnerable road users.

Current reports and submissions by road management experts confirm that excessive vehicle speed limits have rarely if ever been the subject of research yet excessive speed is indeed a major problem. Despite such programs as Queensland Transports "Do you drive too fast for the unexpected?" and the current debate about speed limits in urban areas, motoring interests remain dominant and the interests of cyclists and pedestrians are effectively excluded. How many cyclists groups have been actively involved in departmental policy making as part of the urban speed limit debate? How many have sought to be included but excluded?

By addressing the needs and problems of motorists and by excluding the interests of pedestrians and cyclists, Australian road managers have created what appears to be one of the most threatening and potentially dangerous road systems for cyclists and pedestrians in the world. Have cyclists and pedestrians been convinced that it can only be this way?

Are there better and safer alternatives? Have we been conned by the bias of Australian "experts"? Should the speed limit be reduced to a safe limit?

Some good news ...

The 1974 decision to adopt 60 km/h rather than 50 km/h is, 22 years later, being recognised as unfortunate. Most other comparable countries have 50 km/h. However, we could also benefit from current research and practice rather than simply correcting a decision 22 years too late.

Many cities (e.g. Graz, Austria) and other urban authorities (e.g. Nordrhein-Westfalen, Germany) have accepted that "50 km/h is too much" (enfb, undated) and are now extolling the many virtues of "area wide" 30 km/h in urban areas given that 40% less crashes occur in these 30 km/h zones compared with the 50 km/h limit previously in place.

These outcomes have been well known and well researched in the Netherlands where the criteria for incompatibility are "the speed and intensity of the motor traffic ... The danger on the road is not caused by cyclists, but by cars". With 85% of traffic speed less than 30 km/h, all modes of transport can be mixed (CROW, 1993, 139).

It is very clear from the CROW research and experience that urban traffic speed is the critical issue, a factor well recognised and regularly addressed in the literature of many diverse cycling advocates in Australia since at least the mid 1970's (e.g. Bicycle Institute of Victoria, 1977).

It appears that traffic intensity and speed have now increased to such an extent that improved car and road design cannot address the increasing number of pedestrians being killed or injured other than by prohibition. If non-local streets are responsible for 85% of pedestrian fatalities in urban areas as demonstrated in Adelaide (FORS, 1994), how many more "residential" streets can be allowed to become high speed arterial roads? Surely there are more options than increasingly smaller cells bounded by increasingly more high traffic thoroughfares (FORS, 1990, 80).

The bigger picture ...

If only we had received a dollar for every time the "image" of cycling has been used in town and transport planning reports, health promotions and environment reports!

This "healthy" image of cycling and walking is strongly embedded. It confirms inevitable directions for urban planning in Australia as practiced in many parts of Europe and in some parts in the USA.

Many diverse groups seek much lower speed limits in various sectors of urban areas:- resident action groups, some local authorities, air quality experts concerned about the effects of rapid acceleration/deceleration of trucks and cars, groups concerned about the safety of school buses and precincts, groups seeking higher relative efficiency of public transport and non-motorised transport, most cyclists and pedestrians ... the list is almost endless. These groups cover almost the entire urban population!

The big questions ...

What is the future "picture" of urban areas of Australia's cities and towns? Is it more of the same? More high speed roads, more need to use a car?

Is the future demonstrated by projects such as the recent "improvements" to Campsie, a major Sydney strip shopping centre with a railway station and some 200 buses each day? Through traffic has been accommodated on terms that ensure shoppers parking and pedestrian amenity and safety is also addressed. Although no specific provision was made for cycling, observations suggest the much slower traffic and more regular flow are indicative of future urban centres improved for pedestrians rather than for more high speed traffic - convenient congestion.

If these projects are possible, why are they not more common? Review of much of the literature suggests that there are in fact many such pilot projects including many specifically addressing cycling facilities. Most appear to be responses to "problems" defined by those wishing the problems would disappear! Often they are responses to policy changes (a new local authority bicycle plan) which threaten the traditional role of those expected to deliver the policy (the local authority traffic engineer).

Many projects are poorly funded and even more are poorly researched and executed. Debate about the merits of bike lanes in Australia demonstrates that almost any proposition which involves change can be shown to be "risky". Obviously, bike lanes are dangerous with traffic in adjacent lanes travelling at up to 50 km/h faster. But are they "better" than travelling in front of the traffic? No? Should the speed limit in the adjoining lanes be reduced as part of an integrated urban environmental policy to reduce air pollution and noise, improve public transit competitiveness and improve safety for all road users? Who decides?

Review of research into cycling and pedestrian safety has shown that motorists "needs" dominate the research. It is very clear however, that speed of vehicles is an important issue although often excluded due to the apparent need to distinguish the cause of crashes (does "excessive" speed cause crashes?) from the outcome (increased speed causes more damage).

From the perspective of pedestrians (and of cyclists), speed is both a perceived and a real threat (FORS, 1994).

Should cyclists avoid the speed issue by promoting off road facilities? Or should we advocate that road managers address the issue by accepting that it is the speed of the traffic which is the problem, a problem which can be "easily" and "economically" addressed? As most cyclists recognise, most roads are ideal for cycling ... if there are not too many cars travelling too fast and too close for comfort ... speed and intensity!

Roles for cycling advocates ...

The debate about urban speed limits therefore needs informed debate!

It is clear from review of previous submissions and reports from cycling groups and from the experts that while speed has been recognised as a "problem" for cyclists and pedestrians, it has been too easily relegated to the "too hard basket".

However, it is also clear that many of the "dangerous" road designs which cause most debate (roundabouts, road crossings and intersections, bike lanes) are the result of correct engineering decisions based on current high urban traffic speeds! By not addressing the safe speed issue, roads are designed to be more dangerous for cyclists, pedestrians ... and motorists!

Currently for example, senior Brisbane City Council Councillors are advocating 50 km/h in "residential" streets with an increase in the speed limit on arterial roads. Council has just extended peak hour parking restrictions to 7pm to improve peak hour traffic flow. Is this indicative of support for safer commuting by cyclists and pedestrians or is it indicative of support for more high speed arterial traffic?

Fortunately, some NSW Staysafe Committee members have recently visited parts of Europe where 30 km/h has been adopted and where 50 km/h has been described "as too fast by European experts" (The Telegraph, 14 July 1996). However, the inspiration gained from such visits can too easily be diluted in the face of "experts" arguments that such outcomes are not wanted or cannot be achieved here.

Why 30 km/h ... and how?

Overseas experience has shown that reductions in the urban speed limit have improved urban conditions in terms of pollution, noise, local services access, public transport access, cycling and walking. Corresponding economic, health and safety benefits have also accrued.

After adopting 50 km/h, many European urban authorities have now adopted such extensive "area wide" 30 km/h zones that the "normal" urban speed is accepted as 30 km/h. Prevalent cyclists and pedestrians have become traffic speed managers. Higher speeds are allowed ... as a "bonus" when conditions and use suit. The important issue is however the assessment and acceptance of the benefits.

Currently, our urban speed limit is the highest in the world, a factor which hides the cost of the effects. There is little Australian evidence because FORS and other road safety authorities do not publicise crash outcomes for 40 km/h speed zones which where available, do show the benefits.

Based on current experience, acceptance that the current road environment is in fact relatively dangerous, not only for cyclists and pedestrians but also for motorists would appear a reasonable proposition. Based on the benefits of much lower speed environments in other places, adoption of such speed limits would also seem to be a reasonable proposition.

The evidence appears to point toward the inevitability of ultimately adopting the 30 km/h urban speed limit as average urban traffic speeds decrease below this figure, in many cases already well below it now. Should cyclists wait another 22 years for CROW standard cycling?

Cyclists have everything to gain from advocating adoption of 30 km/h as the safe urban speed limit. When adopted, cyclists and pedestrians will benefit from the specific design of road networks and transport planning which will incorporate safe facilities for cycling and walking. No longer will "fast" cyclists and "slow" pedestrians be forced into conflict on shared paths. Cyclists belong on safe road networks in slower speed traffic! Safe not only for cyclists but also for pedestrians.

Many areas are already intrinsically safe and, once the safe urban speed limit is introduced, will meet the requirements, resulting in much reduced need for specific cycling and pedestrian facilities, which can be implemented as necessary. Areas or introduced, will meet the requirements, resulting in much reduced need for specific cycling and pedestrian facilities, which can be implemented as necessary. Areas or roads that need special treatment will follow the examples from the Netherlands and many other parts of Europe where higher speeds are provided for traffic when safe alternatives are available for cyclists and pedestrians. Only then will people have a safe choice between the various optimum modes of transport - a choice which can be provided irrespective of urban density, climate and topography.

The current high urban speed limit is futile, dangerous and inequitable. Urban roads and streets are only safe when they are safe for cyclists and pedestrians! 30 km/h has been shown to make streets and roads safe! Cyclists should at least consider and promote the benefits.

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