

"Zero Road Toll ... a dream, a realistic vision ... or a challenge?"

**24th Australasian Transport Research Forum
Hobart**

17- 20 April 2001

**Michael Yeates
Convenor
Public Transport Alliance**

7 Marston Avenue Indooroopilly 4068
Phone +61 7 3371 9355 Fax +61 7 3371 8039

Abstract:

Few if any industries tolerate such high fatality and injury counts as road transport. Rates of death and injury have been substantially reduced yet road transport remains a very dangerous activity. Reductions in fatality and injury have been achieved by behavioural strategies (wearing seatbelts, reduced blood alcohol content) and engineering strategies (safer vehicles and road environments) while maintaining or improving convenience for motorised road users.

Road safety and engineering responses to the high fatality and injury counts have not only failed to address the needs of non-motorised road users, but arguably have increased the risks of fatality and injury, risks not fully reflected in road crash data because, for non-motorised road users, road safety has succeeded in reducing exposure to risk. When relative "safety + convenience" of the various motorised and non-motorised modes is assessed, not just road safety, not surprisingly, people prefer a car for typical short trips such as to school or shops.

Those who set standards know that exposure of non-motorised road users of all ages and abilities is dangerous and by not providing convenience, reduce exposure. Their role and experience may therefore increase rather than reduce risks.

Assessing relative "safety + convenience" for all relevant modes and taking account of policy directions to increase mode shares of walking, cycling and public transport ensures exposure of non-motorised modes can no longer be avoided. By taking into account the "vulnerability" of non-motorised road users, those setting design and operational standards for road use must make explicit the risks for non-motorised road users and provide safe and convenient conditions for them. Providing safe, easy and convenient transport for non-motorised road users inherently requires road environments be safe for all users, a zero road toll, or completely segregated, which is neither affordable nor achievable.

Footnote: The John H Taplin Prize is awarded for the best paper submitted at the annual Australasian Transport Research Forum and at ATRF 2001 in Hobart, was awarded to Michael Yeates. The program, abstracts and proceedings of ATRF 2001 can be viewed at www.transport.tas.gov.au/atrf.

Introduction

Road travel and transport is potentially very dangerous as can be seen from daily news reports. However, as it does not have to be that way, it could be very safe. This paper suggests that by emphasising the safety and convenience of all potential road users, if necessary, by constraining or altering the relative priority previously and currently given these users by travel and transport systems designers and managers, improved safety and convenience can be achieved for all road users. Evidence suggests however that achieving this is not so much a technical design or management issue but rather a political or perhaps, an educational issue.

While rates of death and injury have been substantially reduced, road travel and transport remains very dangerous. Reductions in fatality and injury have been achieved by behavioural strategies (wearing seatbelts, reduced blood alcohol content) and engineering strategies (safer vehicles and road environments) while primarily maintaining or improving convenience for motorised road users. In so doing, the road environment has been increasingly made more dangerous and less convenient for non-motorised road users and even for some groups of motorised road users. Not only has this resulted in an apparent increase in the fatality and injury rates of the non-motorised road users, it has also resulted in an apparent reduction in use by potential non-motorised road users, which both leads to and supports the continuation of current design and management favouring motorised road users. Road safety education further reinforces design and management by encouraging reduced risk taking in a road environment where it is demonstrably unsafe for non-motorised road users to travel.

Rather than adopting standard practices to ensure the needs for safety and convenience of non-motorised road users are met, for example road safety audits based on their needs, road safety and engineering responses to the high fatality and injury counts have not only failed to address the needs of non-motorised road users, but arguably have increased the threat of fatality and injury, threats not fully reflected in road crash data because, for non-motorised road users, current road safety strategies have discouraged use, thereby reducing exposure to risk. If relative "safety + convenience" (Yeates, 2000a) of the various motorised and non-motorised mode choices is assessed, not surprisingly given the very high relative "safety + convenience" for motorised traffic, people prefer to use a car even for typical short local trips such as to public transport, school or shops because the relative "safety + convenience" for other modes is usually very low.

Assessing relative "safety + convenience" for all relevant modes while reflecting policies to increase walking, cycling and public transport mode shares ensures exposure of non-motorised modes can no longer be avoided. By including the "vulnerability" of non-motorised road users, those setting design and operational standards for road use must make explicit the risks for non-motorised road users and provide "safe + convenient" conditions for them. Safe, easy and convenient travel for non-motorised road users inherently requires road environments be safe for all users. Hence, a zero road toll, is not a dream. It is a vision but it is also an achievable challenge as this paper confirms.

The physical and policy context

Before addressing the question whether a zero road toll should be viewed as a vision or a dream, the various physical and policy contexts must first be addressed to analyse the extent to which the idea of a zero road toll is influenced by current and previous practices which in themselves make such an idea appear more of a dream than a vision. It should not be forgotten that not long ago, both cars and trains required a person waving a red flag and ringing a bell to accompany such vehicles when they travelled along or crossed roads. This of course was in an era when concern for pedestrian safety and convenience had priority over trains and cars. While the bell and flag have in most cases been superseded, for example by traffic lights, it is the relative priority of people walking and cycling which has subsequently been substantially reduced relative to the priority of motorised traffic. This however is not an essential or inevitable outcome as is well demonstrated by its reversibility for example in extensive traffic calmed or low speed urban areas and pedestrian precincts in Europe and some

examples in Australia. It is an issue of design and management and of policy and where and when to apply it.

In principal, then, whether in urban areas or otherwise, if provision for people walking and cycling is always made in a manner which provides adequately for them, the road system can be both safe and convenient for all potential road users. The question of a zero road toll is then a question of how dangerous or how safe can or should designers and managers of the road system allow the various elements of the road system to be. It is a design, management and policy question whether an annual road toll of 2000, 1500, 1000, 500 or zero is acceptable or not. How this is achieved is then a technical and management issue. Arguably however, the current situation in Australia where design, management and policy accepts that a road toll of 1500 is acceptable in effect may ensure that, despite attempts to reduce the toll, the design and management of roads will remain sufficiently dangerous that the road toll will continue at or about that level.

The recent *National Road Safety Strategy 2001-2010* (Australian Transport Council, undated) for example seeks to reduce the fatality rate per 100000 population by 40%, yet in so doing accepts the residual road toll. Arguably, while an incremental approach to policy is always enticing to those implementing such policy, the effect and outcomes of such policy is to ensure current practice continues, albeit with some arguably significant changes. The policy weakness however, is that incremental policy of this type allows selective implementation which inherently responds to political pressure. Thus as it is clear walking and cycling are inherently very safe, they therefore might be viewed as a very useful and economical means to achieve at best, a zero road toll, or at least, the fatality rate reduction sought by the *National Road Safety Strategy 2001-2010* by justifying the implementation of design and management policy to achieve much increased use and much safer travel by these modes especially but not only in urban areas. Analysis of the *Strategy* and accompanying *National Road Safety Action Plan 2001 and 2002* (Australian Transport Council, undated) suggests this most unlikely. In practice, and has occurred previously, the idea of promoting a zero road toll appears to be supported in principle but be challenged by and be a challenge to, current practice.

In both urban and non-urban settings, there are many situations where the road system is already relatively safe for all road users with the exception of those not complying with legal or behavioural constraints or expectations. Frequently, it is these latter groups which lead to exaggerated perceptions of danger, risk or threat, as for example with the concerns of many people about cycling in or near fast traffic, their reluctance to cross roads or allow children to walk or cycle to school.

Under such circumstances, community perceptions can be inadvertently, implicitly or explicitly manipulated. One example is Queensland Transport's *Do you drive too fast for the unexpected?* campaign where for example, the presence of cyclists, animals, children and elderly people which arguably should be expected, may be construed as unexpected by those not aware or supportive of these groups being expected or legitimate road users. Another example is the current Queensland Transport *Share the road* campaign which aims to encourage better interaction between motorists and cyclists. To date, such campaigns have failed to make explicit those situations which cyclists regard as normal but motorists may view as either unexpected or confrontational for example "blocking a lane" and not cycling as close as possible to the left. Another example is the nation- wide trend to remove "zebra" type pedestrian crossings and replace them with refuge type crossings, thus reducing the priority of pedestrians rather than ensuring it. Another example is the increasing concern about the driving capability and the crash vulnerability of an increasingly ageing population focusing on the problem but not useful alternative solutions for those effected. A final example is the reluctance or refusal by some state and local road authorities but the endorsement by others of wide shoulders or wide (kerbside or single) lanes on major roads as a means whereby the various users including people walking or cycling can be accommodated under both normal and emergency conditions.

Against a policy background which includes concerns about air pollution, noise, health impacts of travel and travel constraints, "greenhouse" gas production and safety for all, a policy which ensures those of all ages and abilities who might like to walk, cycle or use a mobility aid can in fact do so with both safety and convenience, appears not only reasonable but also inherently acceptable. Such outcomes can be achieved either by "sharing the road" or by complete segregation. While the latter is appropriate in some situations, generically it is not practical, affordable or achievable in practice. Thus as wide shoulders may not be the first choice of users, they should be "normal" and always with an adjacent off-road footpath for people of all ages and abilities whether walking, cycling or using a mobility aid. Wide shoulders or wide lanes should always be provided if "sharing the road" is deemed unacceptable unless the footpath is suitable for equivalent styles of, usually, high speed cycling without any threat to other potential users of the footpath. In this example, the needs of all potential users are met at a relatively equivalent level of service best assessed by the relative "safety + convenience" for all users. Level of service is therefore not subject to reduction in quality due, for example, to low current demand. It is an optimum, relatively comparable level of "safety + convenience" in order to encourage maximum use by those for whom it is useful. A road system designed and managed accordingly will be able to be "shared" by all.

If such a road network is accepted and developed, even incrementally, the measure of successful implementation is not "safety" based on a reduction of fatalities and injuries but rather, a measure of "safety + convenience" based on both reduction in fatalities and injuries and increasing use by users of all ages and abilities, in particular, those currently constrained by fear or design and those using modes preferred by policy. Thus recent reduction in local street speed limits to 50km/h in NSW and in Southeast Queensland for example may result in reduced fatalities and injuries on those streets. But to achieve other policy goals, this must be accompanied by a substantial increase in walking, cycling and public transport trips that result from an increased relative "safety + convenience" for example to school by walking or cycling rather than by car.

If the increased trips do not occur, or a decrease occurs, a strategy reducing speed limits in local streets is clearly not beneficial to all users and, while adding constraints to some eg motorists, may not have reduced existing constraints for others eg young children cycling to school or elderly people walking. Experience in Europe with *Safe routes to schools* (Andersen, 1997) for example has demonstrated such outcomes are achievable yet in Australia, despite "children and young people (having) a high involvement in road crashes, particularly when they are walking or riding a bicycle", SRTS primarily aims to reduce the incidence and severity of injuries (Rose, 2000) rather than increase the use of walking and cycling.

However, as Rose notes "(i)f the objectives of SRTS programs broaden to include health and environmental dimensions, there is a need for further work to identify the level of infrastructure needed to encourage more safe walking and cycling to school, and to examine the broader constraints which may limit the reductions in motor vehicle access that could be achieved." (Rose, 2000,15). Clearly, in Australia, issues such as promoting substantial increases in cycling and walking to school, including health and environmental outcomes, addressing how this may be achieved and whether motor vehicle priority can be further constrained are yet to be included in SRTS. These are core issues for SRTS in Europe which have led to the success of SRTS (Andersen, 1997) and its influence on road design and management more widely.

The SRTS example above suggests that integration of various often diverse and sometimes apparently contradictory policy is essential and that single issue policy responses may be more likely to be unsuccessful or counterproductive. If increased use of walking, cycling and public transport by people of all ages is sought by policy, then success can be measured by the increases in those uses without increasing the fatality and serious injury rate. Concern about road safety must therefore not result in either a reduction in use by modes preferred by policy or in an increase in fatality or injury rate. As has

been suggested above, segregation is mostly unachievable generically so "sharing the road" is inevitable. Thus, both the physical and the policy context must support both increased use by the non-motorised "vulnerable" modes including access to and by public transport, and wherever necessary, "sharing the road" accompanied by a reduction in the priority given motorised traffic. Current road safety programs which emphasise risk avoidance and the current danger of roads may only constrain achieving such goals.

The role of "road safety"

Current road safety programs including through formal education, address the unsafety of the road system rather than the safety, in particular for non-motorised road users. As the formal education process is concurrent with an age when children can only be independent by using non-motorised modes, they are heavily influenced by this experience, both in their own experience and by their observation of others. Thus not only does current road safety education influence the trip behaviour of young people, constrained trips or dependence on cars for trips threaten older childrens physical and intellectual education and development (Cunningham et al, 1996) while the behaviour of parents and other role models is very important both as exemplars and as potential trainers of children in safe road practices (Elliott et al, 2000).

However, if safe road practices are constrained by current road use and promoted by current road safety programs, such practices are inevitably socially reproductive, that is, they reproduce rather than challenge current behaviours and practices. Thus those who believe, based on experience or established policy, that walking and cycling should have greater priority and through experience, have greater skill in "sharing the road" may exhibit behaviour or seek changes in current design or management policy which to the less informed may represent both a challenge to current behaviour and provide a bad example. People walking or cycling who exhibit a more assertive behaviour, even when only endeavouring to assert their rights, may be and frequently are viewed as either provocative or unreasonable if not confrontational. It is not therefore surprising that a spokesperson for cyclists should observe "the very people to whom we should be able to turn for support, Road Safety professionals, offer us the least succour" (Bicycle Federation of Australia, 1996, 21).

The failure of professionals and consultants to be aware of current needs and best practice for people walking, cycling or using mobility aids (Yeates, 2000a; McClintock, 2000) becomes very clear when road designers and managers continue to provide new roads and manage existing roads in a manner which increases or fails to reduce the danger and perceived threat to these road users and those who might use the road using these modes if the road environment were less threatening or designed for all (Yeates, 2000a) or if not for all, to better include for the needs of those currently not included such as those with access disability and cyclists of all ages and abilities (Yeates, 1999).

From the perspective of the non-motorised road user, designers and managers appear not only to exclude these groups and their needs, but in so doing, appear to avoid policies which appear to require their inclusion eg *Australia Cycling: The National Cycling Strategy* (Austroads, 1999), various anti-discrimination legislation and policies regarding overcoming access disability, and many and various standards, policies, strategies and guidelines at both state and national level of government. For people walking, it was the Pedestrian Council of Australia which sought and developed *The Australian Pedestrian Charter* (PCA, 2000) in order to ensure walking was included in urban design and road and traffic planning and policy in the absence of explicit government policy on walking.

Again from the perspective of the non-motorised road user, road safety appears to have the effect, if not the role, of ensuring and promoting the priority of dangerous motorised traffic while encouraging the non-motorised road user to avoid conflict with motorised traffic and providing advice on how to do so. The effect however is to increase the priority and dominance of the motorised traffic by

discouraging those who might otherwise be road users - the young, the elderly, those with access disability, cyclists and increasingly, even older drivers. Thus those who need an environment of "gentle mobility" (Sammer, 1997) for "safe and convenient" mobility are being encouraged by road safety programs and policy to not undertake such trips. But by not taking the trips, the apparent need for "gentle mobility" is reduced thus reducing pressure on designers and managers to change current road design and management strategies.

Such campaigns make the non-motorised road user modes appear more safe by reducing demand and exposure and if successful, reduce crash casualties. Reduced use of these modes indicates either a preference for other modes or a reluctance to continue using the current or previous modes. As most developed areas whether urban or otherwise developed prior to and therefore without cars, walking and cycling provided "safe + convenient" modes for short to medium length trips eg up to 10-20km. However, the success of campaigns based on the dangers of walking and cycling combined with a reduction in demand and in crash casualties has assisted in promoting the priority of motorised traffic even in local areas where walking, cycling or using a mobility aid can or could be both safe and convenient, often more so than using a car.

The priority of motorised traffic is best exemplified by current debate about whether the speed limit in "local" or "residential" streets should remain at 60km/h or be reduced to 50km/h (eg in NSW and Southeast Queensland) or 40km/h (as in Unley in Adelaide, South Australia) while virtually ignoring the "safety + convenience" needs of people of all ages and abilities who might walk or cycle or use a mobility aid or in some cases drive a car to or in such areas. However, the authorities and experts (Yeates, 2000b) appear to prefer to consider the priority needs of high speed through traffic and motorists in such areas. By emphasising the priority of motorised traffic and through lack of experience of alternatives, those who promote current road safety ignore the successful experience of others eg with reduced speed limits (Sammer, 1997) and ignore the needs of those whose needs are not met (Yeates, 1999), yet, by including their needs in design and management processes, these needs could be, and have been, met (Yeates, 2000a).

There is no reason why individual members of these "vulnerable" groups should be at risk from or threatened by traffic if the road system is designed and managed to include their needs for "safety + convenience". In practice, this is the policy adopted in the Netherlands and other places where urban speed limits are 50km/h on main roads and 30km/h the remainder, where the default urban speed limit is 25mph (40km/h) as in the State of New Jersey in the USA or in Graz, Austria where the default speed limit is 30km/h with roads signed with higher speeds (Sammer, 1997). With a low default speed limit, all other speed environments should be subject to a design "safety + convenience" audit prior to determining higher posted speed limits.

Since 1996, the Bicycle Federation of Australia (BFA, 1996) has promoted the idea that, as in Graz, the urban default speed limit in Australia should be as low as 30 or 40km/h with all other roads subject to a safety and design audit which includes for the "safety + convenience" needs of cyclists, pedestrians and people with mobility disabilities including elderly car drivers, before setting and signing the speed limit applicable to the specific section of road. This is, at least in principle, a logical conclusion of the use of safety and design audit processes as promoted by Australian road authorities (eg Austroads). However, contrary to this view, groups representing engineering and road safety professionals and experts continue to promote the application of a 50km/h general urban speed limit, "predominantly on local roads" (Australian College of Road Safety, 2000) despite evidence that speeds higher than 50km/h are too fast on many sections of most current main roads and speeds higher than 30-40km/h are too high in residential streets if "vulnerable" road users needs for "safety + convenience" are included.

Given such expert support for 50km/h in local streets and higher speeds on main roads, it is not surprising that people who walk or cycle are viewed from a road safety perspective, as a problem for traffic and road safety designers and managers. It is not surprising either that pedestrians and cyclists are disproportionately over-represented in crash casualties and especially in the case of cyclists when there are so few cyclist fatalities. As roads have been made safer for motorists, and cars and buses have been made increasingly safe for their occupants, the road toll for the number of crashes has been reduced significantly despite very significant increases in the number of motorists and motorised trips.

At the same time, non-motorised road users have been increasingly more at risk or threatened by faster and bigger vehicles, by much denser traffic and by reduction or non-provision of facilities needed to ensure relative equity with motorists from a "safety + convenience" perspective. Not surprisingly, the risk and threat of such traffic as promoted by road safety programs aimed at young children, the elderly and cyclists, has discouraged many existing or previous and potential non-motorised road users, increasingly so at a time when government policy at all levels appears to support increased use of these modes. Clearly, it is the role of road safety to promote equity of "safety + convenience" for all preferred modes and especially, the non-motorised road users because they are, and have been made, more "vulnerable" by policy, road design and management by road authorities including those responsible for road safety.

Increased "safety + convenience" for all users in practice

The lack of knowledge of experts has been raised previously. It remains a serious impediment when consultants and professionals seek to provide facilities now which will be in place in 20 or more years time when, if targets for mode shifts are achieved, the mix of traffic should be very different. The problem is simple. The designers and managers are not producing road environments which will suit the future traffic mix because they continue to provide road environments which suit previous and current needs. Thus not only do current non-motorised road users remain at risk, but contrary to the targets to change mode share, those who might try or might like to try the "new" modes, by definition are likely to be lacking in experience, and therefore even more "vulnerable". It is the failure of those who prepare and espouse policy yet fail to provide a mechanism if not requirement to implement the policy, who, usually being road authorities, have the ability to both bring about and to constrain change. Most people fear change yet progress can only occur with change. The converse however is not the case as change is not necessarily progress. A new policy or strategy that fails to begin to achieve change is not progress and is often counter-productive by raising expectations.

Too often, rather than endorse cycling or walking by providing a facility or suitable conditions, road authorities cite other reasons for not doing so, despite the plethora of opportunities available. While many of the necessary facilities and conditions are well documented, in principle if not in detail, in various standards, manuals, guidelines such as those produced by Austroads, most road authorities and their consultants and professionals choose not to include such facilities or conditions. Too often it appears, the experience of such people is limited to recreational cycling on bike paths or roads in quiet periods such as weekends or holidays while many admit their experience is limited to cycling when a child. For those who are experienced cyclists, it appears there is a reluctance to bridge the knowledge gap for fear of being too supportive of cyclists or pedestrians, yet often this is the role, of advocate within government, that is expected of these experts by the politicians, the advocates and pressure groups and the wider community.

The needs for "safety + convenience" are well known and well documented yet mostly are only provided for motorised traffic and transport as inherently, in most urban settings, the potential volume and diversity of non-motorised road users inevitably requires a constraint on motorised traffic. While initially feared and avoided by road authorities and politicians, there are many successful outcomes, so

many that it becomes clear that personal opinions and current practice pre-determine many debates and investigations. Successful implementation therefore often appears to be the result of utilising a "window of opportunity" rather than implementing a credible, considered and well developed proposal. While this has provided a large number of "good outcomes" for others to follow, reasons for not so doing, continue to emerge. In practice therefore, policy is inevitably very conservative.

For those seeking adequate if not state-of-the-art outcomes, policy is more often a handicap which constrains achieving and implementing what is needed to achieve both safety and convenience for any individual road user. If "safety + convenience" for individuals can be achieved, it is not unreasonable, given that the annual cost of road crashes is currently more than \$15 billion (Australian Transport Council, 2000), to then aim for a policy which produces urban environments which are both healthy and safe and in particular, road environments which are both safe and convenient for all potential road users (Yeates, 2000a). In such a setting, the idea of a zero road toll would not only be a vision, it would be a challenge, a challenge which would be achieved by integration of health, environmental and economic goals in road design and management.

Zero road toll ... why not?

While Australia has achieved considerable success in reducing fatality rates per 1000000 population, it has been far less successful if compared with other countries. Parker (2000) suggests that "the Dutch peak death rate was 24.7 deaths per 100000 population in 1972 and the Australian peak death rate was 30.4 in 1970. By 1998 the rate was down to 7.5 in the Netherlands and 9.5 in Australia. The death rates for motorists are similar but the pedestrian death rate per million kilometres walked is five times higher in Australia and the death rate per million kilometres cycled is twice as high." It can be postulated that this is a direct outcome of the fact that people are encouraged by road design and management to walk or cycle more and use cars less in and between developed areas in the Netherlands.

Dutch urban design and traffic management utilises a philosophy they call "sustainable road safety" to describe a system of integrated urban design that will ensure ongoing improvements as more areas are treated. The principle is simple. It aims to reduce the exposure of all road users "to injurious mechanical forces in collisions that produce death or crippling injuries. (It) recognises the vulnerability of non-motorised road users and gives priority to their safety needs." (Parker, 2000). This approach results in the 50km/h default speed limit on urban roads and 30km/h in other areas with the 30km/h areas so numerous that effectively, the default limit is 30km/h, as in Graz where the "gentle mobility" policy included making the default speed limit 30km/h in part in recognition of it being the speed limit on around 75% of all roads (Sammer, 1997).

This approach is not limited to the Netherlands and Austria but is increasingly applied more generally throughout urban areas in most European countries. There is extensive pressure in the UK including a "20mph (30km/h) for London" campaign. In Australia, there are many areas where 40km/h or less has been successfully implemented using local area traffic control devices to manage speed. It is increasingly being recognised that 40km/h can be successfully applied as a speed limit (eg Unley in Adelaide, areas of Sydney and Brisbane) to achieve safety, convenience and amenity goals with very high levels of local community support. There are many more local communities seeking 40km/h but they are prevented by government agencies and current road management guidelines (eg various different versions of the Manual of Uniform Traffic Control Devices). The major difference between European and US implementation and Australian implementation is one of intent. According to Corben (in Parker, 2000):-

they (the Dutch) are providing more pedestrian crossings and accepting that 'the car' is no longer sacred ... designating appropriate road function, while important in managing all types of road traffic, could be especially effective in improving pedestrian safety ... they will be upgrading main roads that

tend towards a flow function and downgrading main roads with mixed flow and access functions.
(Corben, 1998)

In practice, the major principle of successfully implementing improved road safety without further reducing or constraining walking and cycling appears to be successful integration of urban design and traffic planning and management with local knowledge implemented through local agencies such as local government. In a recent project with elderly pedestrians in Unley, Adelaide (Couch et al, 2000), participants recognised the connection between the 40km/h speed limit and pedestrian safety, viewing them as integral despite the project targeting older pedestrian behaviour. This project also demonstrates the apparently inherent tendency of experts and researchers to treat people in a way they feel is "patronising" despite the high level of community awareness of both problems and solutions (Couch et al, 2000) which experts and researchers appear to ignore or under-value, again apparently due to adoption of inherently patronising assumptions about community knowledge and skill (Yeates, 2000b). Yet clearly, if implementation is to reflect local need, it is local knowledge and need which must be included in the implementation processes (Yeates, 1998; Yeates, 2000b) if necessary by adopting "an activist mode ... (which in this case) led to an acceleration of the installation of an engineering treatment" (Couch et al, 2000,73). This project provides a useful example of the problem of local communities gaining implementation of facilities or changes in conditions which they view as necessary from a local perspective but which in almost all cases, requires a significant change in established policy, leading to the often repeated "nothing will be done until somebody is killed".

However, if the object is to ensure that "nobody is killed", a version of the Swedish *Vision Zero*, a means is needed for ensuring that high risk areas are identified and, rather than being rebutted, are accepted and a series of steps taken to address the issue. Typically with pedestrian and cycling "problems" in Australia, the first step is currently either to do nothing (eg too difficult, unlikely to recur, alternatives exist, too expensive, etc) or to reduce or eliminate the problem by constraining the pedestrians or cyclists (eg by fences, barriers, chicanes, overpasses, underpasses, etc) suggesting car dominance. It is rare for the Dutch approach, constraining traffic, to occur (eg warning signs, local speed restrictions, increased priority by installing more crossings or bike lanes, etc).

Two clear examples of the continued dominance of car priority and reluctance of road authorities to engage with and allow implementation of much higher priority for people walking and cycling involve the otherwise exemplary processes which have successfully created the opportunity to "share the main street". The first is the ongoing reluctance of road authorities to allow closely spaced, pedestrian priority crossings even in "main streets" and the second is the reluctance to include positive endorsement of cyclists using the road (eg symbols, bike lanes, warning signs etc), even in cases where local laws have been used to ban cyclists from footpaths. Both of these are opposed by policies which are clearly quite the opposite of the Dutch approach referred to above, despite the "main street" design environment being very suitable and the need for such facilities, necessary. Recent submissions (Cyclists Urban Speedlimit Taskforce, 2000a) to road authorities (eg RTA) and road safety committees (eg NSW Staysafe Committee) have failed to have these matters addressed and restrictions reduced. Although supported by the apparent goal of "share the road" campaigns, use of symbols to identify what Brisbane City Council calls "Bicycle Friendly Zones" has also been rejected by the RTA despite submissions from local authorities and cycling advocates (CUST, 2000b).

Contrary to the above, as most road safety authorities are supportive of reduced road crash casualties, it would appear that the idea of *Vision Zero* should not be opposed by them. The Swedish campaign material includes emotive appeals featuring a young girl as well as extensive explanatory material showing how the concept of matching street design to local community need can be implemented. The challenge to Australian road safety authorities appears to be a reluctance to target such a goal. The concern appears to be whether it is too unrealistic and whether it can be achieved.

These concerns fail to address the explicit and potentially implicit effects that celebrating a reduction to 1500 fatalities per annum may have. Accepting fatalities not only makes them inevitable, it also allows for the continuation of current road design and management despite this being known to be dangerous. This allows road authorities to avoid the needs of those at most risk and in particular, the non-motorised road users. It is therefore not surprising that road authorities resist local community knowledge of danger until somebody is killed. Even when there is a fatality, the idea that 1500 will also be killed allows each incident to be viewed as an "accident" when, although rarely deliberate, most so-called "accidents" are very predictable, especially in urban areas.

Such "accidents" are so predictable, usually regularly reported by local community knowledge, based on use and from numerous injury crashes and reported near-misses, that road authorities can target high risk sites with campaigns such as "People have been killed trying to cross the road here" (Plowman and Dray, 2000) by threatening pedestrians rather than by reducing the risk by reducing the priority given traffic, for example by reducing the speed limit on major arterial roads through high pedestrian and cyclist activity areas from 60km/h to 40km/h, not only for the benefit of pedestrians, but to encourage walking and access for those with an access disability, in accordance with the many other strategies and policies from which agencies such as road authorities could choose. Even with the Southeast Queensland 50km/h speed limit, it is very rare for main road traffic through strip shopping centres to have reduced priority as is indicated by reducing the speed limit from 60km/h despite the opportunity being available to local authorities.

Thus despite the difficulties for cyclists avoiding car doors being opened and the higher risk due to much greater pedestrian presence, through traffic continues to dominate policy and therefore, by policy, to threaten people walking or cycling. Despite the acknowledged complexity of driving at 50km/h or more through such areas, speed limits remain far higher than is indicated safe by experience in Europe and by crash outcomes in Australia, yet because traffic speed and dominance are dominant concerns, interventions cannot include speed restrictions and are restricted to experimental alternatives such as painted crossings at traffic lights (Corben et al, 2000) in "main streets" rather than regular pedestrian priority crossings which would clearly reduce through traffic priority, and in so doing, perhaps assist in achieving other goals, such as those sought by traffic demand management encouraging different or reduced local and through traffic travel and consideration if not regular use of alternative modes including walking and cycling locally to avoid increasing traffic and parking congestion.

Zero road toll ... a challenge, not a dream or a vision

By taking a strong position to eliminate fatalities and crippling injuries, the Dutch have shown the way to provide an integrated approach to urban design and traffic and transport planning and management they describe as "sustainable" meaning ongoing as distinct from but inclusive of, targeted campaigns. In so doing, it can now be argued that it has been necessary for them to introduce what may be regarded in many places including Australia, as "draconian" measures, yet arguably, to achieve the "sustainable road safety" and maintain the convenience for travel, but not necessarily by car, in such a relatively short time is remarkable. It is only a little over 20 years ago that cycling advocates and those concerned about the need for children to be able to walk or cycle safely were campaigning with "50 is too fast" and "Stop the child murder" (BFA, 1996) yet in that period, not only has much of urban Netherlands now been made safe for walking and cycling, but many countries have followed the example. It is now commonplace for urban areas to be either 30km/h or seeking it, much as many areas in Australia want areas of 40km/h and have readily accepted 50km/h where introduced.

However, the goals for such projects vary widely. In Europe, they form part of integrated national policy to reduce pollution and noise, to make urban form more efficient and to improve the urban economy by reducing unsustainable impacts such as road crashes (Yeates, 1998). Promotion of

walking and cycling including accessibility and mobility by bus, ferry and train are seen as inevitable and inherent in successfully achieving such goals. That these modes should be so safe and convenient that these factors alone encourage growth in their use is viewed as natural. That further restrictions on car traffic and constraints on freight movement are also required is also viewed as normal. People of all ages and abilities benefit and the cost of road crashes is substantially reduced. Under such conditions as have recently been created, it seems natural that nobody should be killed during travel, especially in urban areas.

It is not surprising therefore that the idea of *Vision Zero*, that nobody is killed, should be a natural second phase given both the demonstrated success in the Netherlands, and where adopted, often with local variations, elsewhere as in Germany, Scandinavia, Switzerland for example, success also.

Given the success of the "gentle mobility" campaign in Graz which features safe access for all as a key component of the strategy, the idea that a whole city might have a 30km/h speed limit has been shown to be both successful and acceptable, again with substantial increases in other-than-car modes of travel and with substantial reductions in fatalities and serious injuries. The economic, social and environmental goals of these countries suggest that travel and transport can be "sustainable" but to do so, must not only achieve much increased use of other-than-car modes but also must achieve much reduced crash casualties of a serious nature. Although not well documented, it seems likely that due to increased exposure, minor injuries in Graz have increased as major injury and fatality has decreased. While in high speed traffic conditions, this would be of great concern due to the likelihood of high fatality risk, in a road environment such as that of Graz, it is regarded as part of everyday life, not unlike a sporting injury.

In Australia, the goals of road authorities and road safety authorities appear very different to those described above although specific "trial projects" contrary to current practice exist. These "trial projects" provide exemplary experience for those who might wish to further develop such ideas and, at the same time, illustrate the reluctance of the majority of authorities whether state or national to develop genuinely national "uniform" policy and guidance in support of "new" practices and in the case of local government, implementation of interventions on a case by case basis to respond to local concerns and to develop and demonstrate best practice while so doing.

While encouragement of walking and cycling increasingly appears in policy, it rarely appears in practice. It remains very difficult for advocates or local community interests to successfully achieve outcomes which meet their needs yet examples such as Unley's 40km/h speed limit suggest that, although by no means accepted by road authorities, integration of road safety for all road users can be experimentally developed if local authorities work with, rather than resist or ignore, local communities where demand is obvious. Similarly in this case, rather than adopting approaches which lead to community members feeling that authorities are being "patronising" or tokenistic, state authorities, in this case TransportSA, can explore methods for working with communities to develop and increase support for the integrated approaches demonstrated by European agencies. However, where authorities use patronising "research" projects or "old" policy to defend current road design and management against local community proposals to improve safety and convenience, it is hardly surprising that community groups adopt an "activist mode" and become overtly political and critical in public for there is little other option given by such authorities.

The value of *Vision Zero* or a similar concept in Australia lies in making explicit the fact that current and previous road design and management is primarily responsible for road crashes, in particular those which are able to be reduced or avoided, if necessary by reducing the priority of motorised traffic. Australia has not adopted this approach, the Dutch approach. Instead, continued dominance of motorised traffic has been chosen even to the extent of adopting and promoting 50km/h in local and residential streets when European experience and experience in Australia supports speed limits of 30-

40km/h, not only in local streets but in high use pedestrian and cycling areas if people of all ages and abilities are to be encouraged to walk and cycle more as limited examples eg Fremantle CBD in Western Australia and Unley's 40km/h show they will.

However, because these exemplary projects remain very small "islands" in a road network of 60km/h and faster traffic, and because facilities and conditions are not provided for the safe and convenient use of people who might walk, cycle or use public transport more often, the results are exemplary although not spectacular. It is relevant to note here again that walking and cycling problems usually result in negative interventions because, where it is safe and convenient for pedestrians and cyclists of all ages and abilities to use the road system, bans on footpath cycling would be supported by conditions (eg low speed) or facilities (eg bike lanes) on the adjacent road, not only suitable for any cyclist, but provided in such a way that almost all cyclists could and would choose to use them. In much the same way, the "problem" of pedestrians not crossing at provided locations would be resolved if many more crossings were provided, not only to suit the safety and convenience of those who wish to cross but also to reinforce that there are many areas where pedestrians and cyclists should have much higher priority. School, shopping and public transport precincts are one example and bus stops and bike lanes on main roads another.

While Australian policy supports increased walking, cycling and access for those with an access disability, it is the explicit reasons this is not happening that are important. Why the existing road system is not rapidly, albeit necessarily incrementally, modified and why new roads are not promoted and designed to demonstrate not only how to achieve, but success in achieving, much increased walking, cycling and public transport use and a widening range and increasing number of non-motorised road users. Why providing for safety and convenience for people of all ages and abilities walking and cycling is not a requirement for all road projects whether new or alterations. Why road authorities resist or rebut requests for improved safety and convenience from local communities. Why safe routes to schools do not include health and environmental impacts or seek to increase cycling and walking and to reduce use of cars for access to school. Why strip shopping centres have 60km/h traffic and very limited opportunities for pedestrians to cross. Why bus stops on main roads and especially multiple lane main roads with 60km/h and often higher speed limits do not have pedestrian crossings as an integrated requirement to allow passengers as well as local people walking or cycling to cross the road with safety and convenience. Finally, why it is even new roads and developments rarely have walking and cycling explicitly provided with adequate safety and convenience.

The reason appears to be that unlike the Dutch, Australian road authorities and road safety authorities require through traffic remains dominant. This requires sufficient dominance and in particular traffic speed to ensure road safety campaigns appear rational when encouraging pedestrians to realise that they are at great risk when crossing roads, that cyclists are at great risk when cycling in 60km/h traffic without suitable facilities (ie symbols, bike lanes, wide kerb lanes as standard), that bus passengers are at great risk trying to cross main roads to or from bus stops and that children are exposed to very dangerous roads, so dangerous that they and the elderly should not try to cross them, and in the case of the elderly, should even consider not driving on them.

To conclude addressing the role for the concept of *Vision Zero*, it is clearly not a dream as exemplars exist. It is a vision until it is accepted. Primarily, it is clear it challenges current road design and management. Experience here and elsewhere confirms that adopting a policy that aims for and achieves minimum fatality and crippling injury from road crashes, requires either complete separation or "sharing the road". As the former is extremely expensive and fails to induce modal shifts unless road expansion, capacity and/or priority are also constrained, sharing the road is essential. By assessing and providing "safety + convenience" for all modes, every road can be a safely shared road. With *Vision Zero*, safety for all is increased substantially on every road by design.

References

Andersen, T (1997) Safe routes to school in Odense, Denmark, pp267-274 of Tolley, R (ed) *The Greening of Urban Transport: Planning for walking and cycling in western cities* (2nd edition) Chichester: Wiley

Australian College of Road Safety (2000) letter to Hon P Batchelor, Minister for Transport, Victoria, dated 2 February 2000 on behalf of and signed by representatives of Australian College of Road Safety, Australian Institute of Traffic Planning and Management, Institute of Public Works Engineering, National Committee on Transport of the Institution of Engineers Australia, Institution of Transportation Engineers [Australia and New Zealand Section]

Australian Transport Council (undated) *National Road Safety Strategy 2001-2010* Canberra: Australian Transport Safety Bureau

Australian Transport Council (undated) *National Road Safety Action Plan 2001 and 2002* Canberra: Australian Transport Safety Bureau

Austrroads (1999) *Australia Cycling : The National Cycling Strategy 1999-2004* Sydney: Austrroads

Bicycle Federation of Australia (1996) *Towards a safe urban speed limit: Report of the Cyclists' Urban Speedlimit Taskforce* Adelaide: Bicycle Federation of Australia

Corben, B (1998) Opportunities for applying European philosophies and practices to improve pedestrian safety in Victoria, pp207-216 of *Proceedings of the Australian College of Road Safety and Road Safety Committee, Parliament of Victoria, Conference on Pedestrian Safety* Melbourne

Corben, B, Triggs, T, Diamantopolou, K and Wilson, N (2000) Coloured surfacing of pedestrian crosswalks at traffic signals pp75-80 of *Proceedings of Road Safety, Policing and Education Conference* Brisbane

Couch, M, McCutcheon, A, Cirocco, B (2000) Older pedestrians: Moving from a high recognition of problems to an effective local response, pp69-74 of *Proceedings of Road Safety, Policing and Education Conference* Brisbane

Cunningham, C, Jones, M and Barlow, M (1996) *Town planning and children: A case study of Lismore, New South Wales, Australia* Armidale: Department of Geography and Planning, University of New England

Cyclists Urban Speedlimit Taskforce (2000a) *Making space for cyclists ... a matter of speed?* Brisbane: CUST

Cyclists Urban Speedlimit Taskforce (2000b) *Making space for cyclists by sharing the road ... Brisbane City Council's "Bicycle Friendly Zones"* prepared for the Safe Cycling Symposium, National Road Safety Conference, 2000 Brisbane: CUST

Elliott, B, Adams, J, and Ivett, L (2000) Road safety education and training for very young children, pp183-191 of *Proceedings of Road Safety, Policing and Education Conference* Brisbane

McClintock, H (2000) Professional training needs for sustainable transport: a case study of those responsible for planning for walking & cycling in the UK, pp26-30 in *World Transport Policy & Practice* 9 (3)

Parker, A (2000) The Dutch model for making walking and cycling safer pp81-86 of *Proceedings of Road Safety, Policing and Education Conference* Brisbane

Pedestrian Council of Australia (2000) *The Australian Pedestrian Charter* Sydney: PCA

Plowman, B and Dray, R (2000) Pedestrian crash risk in Queensland: Trends and strategic directions for interventions pp65-68 of *Proceedings of Road Safety, Policing and Education Conference* Brisbane

Rose, G (2000) "Safe Routes to School" implementation in Australia in *Road & Transport Research* 9 (3), 3-15

Sammer, G (1997) A general 30km/h speed limit in the city: a model project in Graz, Austria, pp385-389 of Tolley, R (ed) *The Greening of Urban Transport: Planning for walking and cycling in western cities* (2nd edition) Chichester: Wiley

Yeates, M (2000a) Road safety : for all road users? pp87-92 of *Proceedings of Road Safety, Policing and Education Conference* Brisbane

Yeates, M (2000b) Politicised technical advice ... the death of professional credibility? pp211-219 of *Proceedings of the Transportation 2000 AITPM International Conference* Gold Coast : Australian Institute of Traffic Planning and Management

Yeates, M (1999) Integrating urban design: meeting the needs of people with access disabilities ... and cyclists, pp 544-549 of *Proceedings of Velo-City Conference 1999* Graz

Yeates, M (1998) Getting it right: but who and what do we ask? pp985-1000 of *Papers of the Australasian Transport Forum* Sydney