Title : **Road safety : for all road users?**

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Abstract :

Australia has an enviable record in road crash trauma reduction. Strategies promoting behavioural change eg wearing seatbelts and avoidance of alcohol have been significant. Success has been based on safer cars and safer road environments. The number of vehicles in use has increased. The number of crash victims has decreased.

One group of road users may not share this success. Previously classified as "vulnerable" road users, non-motorised road users are people in transit; people with various access disabilities, walking, cycling or using movement devices. Increasing numbers of vehicles operating in road environments made safer for occupants of vehicles has increased risk to non-motorised road users.

As governments, for health, environmental and economic reasons, increasingly encourage walking and cycling including to public transport, road safety should ensure non-motorised road users can use road and transit systems safely, easily and conveniently.

Road safety strategies and transport opportunities should assess "safety + convenience", not just road safety, from the perspective of all road users of all ages and abilities.

Introduction :

A review of road safety literature or reports in Australia presents a picture of success with current annual fatalities on the roads now approximately half of the maximum annual number ever recorded. However, exposure data is very scarce if not non-existent. This is especially true for those who are mobile but without motorised vehicles. This group, previously classified as "vulnerable", but for the purposes of assessment, more correctly described as "non-motorised" road users, comprises people in transit including people with various access disabilities, people walking, people cycling or people using movement devices such as roller blades, skateboards, and most recently returned, scooters in various forms and configurations.

In fact, the non-motorised road user (NMRU) is "potentially" by far the most populous component of the population, "potentially" only because many of the trips are not counted in current research and exposure data. Trips may be short eg from car to workplace or to shop, on footpaths or on private land, or on public land but not specifically on roads. However, people who are NMRUs are very prevalent. They are ubiquitous (1), or at least, in urban areas in particular, they ought to be. If not, where are they and why are they not "seen" in the research and travel data?

One reason frequently provided is the difficultly of actually measuring the trips and classifying and assessing the trip types. However, as with most methodological difficulties, it is often useful to utilise "quick and dirty" techniques to begin to understand the nature of the problem and to quantify its scope and scale as such techniques often give sufficient accuracy to provide "indicators", if not specific measures. Thus if people cite "fear of traffic" as a reason for not cycling or for not letting children walk or cycle to school or for not using public transport, it may not be necessary to quantify the problem but rather, to assess its validity as an indicator of users needs. This paper aims to explore and utilise the concept of indicators of needs as an alternative to orthodox statistical analyses.

The paper therefore explores road safety from the perspective of the various road users and their needs. It examines a number of scenarios which seek to illustrate a widening gap between community expectations and resolution of often complex issues by "experts". Given that governments, for health, environmental and economic reasons, increasingly encourage walking and cycling including to public transport, it is suggested that the idea of road safety and its application should ensure non-motorised road users can use road and transit systems safely, easily and conveniently if these goals are to be met.

In order to achieve such outcomes, it is suggested that road safety strategies and transport opportunities should assess "safety + convenience", not just road safety, and that the assessments should always be undertaken from the perspective of all road users of all ages and abilities, if not by processes which include these interests and ensure their needs are met.

The needs of all road users :

While the road network is only part of the transport network, in most Australian urban areas it has become the dominant one. The process has been described by Manning (2) for example who shows how the road network has changed. Arguably however, it has not only changed in the neutral sense but literally and deliberately, it has been changed from a network accommodating people walking or riding animals or animal drawn vehicles to a network which to all practical purposes, excludes such uses. Hence current government promotion, for health, environmental and economic reasons, which increasingly encourages walking and cycling including to public transport, may be and perhaps, arguably, is, opposed to current behaviours previously endorsed by the changes in use of the road networks these various modes are now encouraged to share (3). Similarly, while legal and political directives exist which require that transport be accessible to those with access disabilities broadly defined, a rudimentary assessment of current facilities and conditions suggests that a complete re-assessment of the urban structure and services provided is essential and can only be satisfactorily undertaken from a "cradle to grave" or "whole of life" perspective for all users (4).

A review of current road safety material suggests that road safety aims to advise, if not educate, people that roads are dangerous and that motorised traffic has priority. This commences with early childhood material and ends with programs such as "Crossing the road's a challenge too" (5) which compares crossing a road with abseiling. While the comparison may indeed be valid, materials which posit the road network as dangerous may, and arguably do, act to discourage use. Indeed, in some cases as in current debates about and campaigns aimed at elderly drivers, this is clearly the intention. But if the road network is dangerous for pedestrians whether young or elderly and for elderly drivers, two "indicator" questions emerge. The first asks if it is dangerous for these quite large and important groups of the population, what else has been or could be done. The second asks, if it is dangerous for these groups, how dangerous is it for others eg inexperienced cyclists, novice motorists, those with temporary or permanent access disability or incapacity. Is the reason why crashes continue to occur because road system design and management retains the danger? As Julius Sumner-Miller asked, "why is it so?"

One clear reason is that, as Manning (2) has suggested, the road system is designed and managed to operate that way. It is a deliberate political and technical decision that the road network should operate that way. The road rules that govern how the network is used and managed and the design "rules" that govern how the network is designed and operated are deliberate political and technical decisions.

From this perspective, if Brindle (1) is correct, and people walking and cycling ought to be ubiquitous in urban areas, are the reasons they are not so a measure of failure to address their needs? Is the extent to which they are present a measure of the success of current technical and political decisions in ensuring their presence? If Engwicht (6) is correct in suggesting that where conditions suit people of all ages walking and cycling, we will find people with access disabilities able to enjoy urban life. If there are few people with access disabilities visible in urban areas, are the areas suitable for people of all ages and abilities or are all or most people of all ages and abilities forced to rely on use of a car because safe access and convenience, assessed by the individual, are either inadequate or denied?

But what about motorised users?

While current government promotion of walking, cycling and public transport (the so-called "green modes" of transport) aims to encourage more use of these modes, motorised users have not been forgotten. Seemingly paradoxically, governments, while seeking to encourage more use of the "green modes", continue to ensure that levels of service for motorised users remain high by building more roads to avoid congestion and by seeking to provide separated or segregated facilities for the various modes. Even for cycling, it has long been recognised that providing a completely separated or segregated cycling network would be impractical and expensive (7) and in any case, operationally problematic in that separation of people walking and especially, those with an access disability, and people cycling, while ideal, has proved unworkable (8).

Thus a recent UK report (9) suggests that "in the context of commitments to encourage cycling and walking, it is important that new facilities are positive in their effect, and attract new users." Suggesting current acceptance of shared facilities is based on assumptions of there being no alternative, the report notes that cycling can in fact be carried out on the road network and that there are very few circumstances where a shared use facility should be used rather than a facility (eg bike lane) or improved conditions (eg lower speed) on urban roads. If provisions for people walking or cycling both on and off road are sufficiently enhanced to encourage use by motorists instead of their car, improving such infrastructure improves conditions for motorists who remain using their vehicles without expanding the road network, effectively breaking the supply-demand or "predict and provide" problem.

Much of the success of encouraging motorists to use other modes has occurred where it has been accepted it is a proportion of motorists who could use "green modes" rather than their car (and who are usually better off as a result) who "cause" much of the congestion and other forms of incapacity governments find politically difficult to resolve other than by building more roads for more traffic. Arguably however, if the conditions and facilities for the "green modes" are improved at a relatively faster rate than the expansion of road capacity, while promoting use of the "green modes" through individual marketing and promotion which can demonstrate how much better use of the "green modes" is for the individual (10), more funds can be made available for making the "green modes" better.

From a motorists perspective, however, what will make "green modes" sufficiently "better" that they will be tried and, secondly and most importantly, found to actually be "better" than car use such that continued use of the "green modes" increases because it is "better"? What criteria will be used to measure which modes or modes are "better"? Interestingly, "safety is a prime concern for existing and potential cyclists. Particular safety concerns include: conflicts between pedestrians and cyclists; higher speed traffic, heavy traffic volumes and poor driver attitudes; (and) poor road crossing arrangements" among others (11). Arguably then, whether people choose to use their car or the "green modes" is not just a question of safety, it is also a question of convenience irrespective of whether the conflicts and concerns are real or perceived. Promoting the "green modes" if these concerns and conflicts exist or are perceived to exist may harm rather than achieve increased use if, rather than seeking enjoyment from the "better" modes, those trying out these new modes are primarily cautious about and addressing prior concerns or conflicts. It is essential therefore for the gap between the rhetoric and the reality to be minimal. It is preferable if the experience turns out to be positive.

A gap between expectations and reality?

For the gap to be reduced, Gifford for example, argues it is "essential to embrace a customer orientation, to discover what customers value and will support" rather than have the infrastructure community ignore its customers (12). This analysis relates to users of infrastructure. The issue is potentially more important and more complex where infrastructure aims to encourage new users, eg in response to government policies, where the views of new users may conflict with established principles or experience well understood by current users but not understood or accepted by the infrastructure community or potential new users. These "customers" may have different and potentially opposed views. Children walking along or cycling on urban roads is such an example, yet, the evidence suggests that urban roads and streets can be safe for cycling (13) and that, in so doing, they will be considerably safer, if not safe, for people walking and for those with access disabilities (4).

However, as Gifford argues, perhaps the suppliers of infrastructure have failed to deliver acceptable outcomes which demonstrate understanding of these differences and resolve them by ensuring the various users needs are met. He suggests that "the deference to technical expertise that once shielded decisions from public challenge and scrutiny has eroded". While not easy, the obligation to meet community expectations and differences rests with the institutions and suppliers of infrastructure (12).

In practice, many parts of the road and street network are sufficiently safe, if not safe, for walking and cycling and for those with access disabilities if their presence is both expected and endorsed. Indicating such areas can reduce the gap between expectations and reality by indicating to the various users which areas they might choose to use in order to develop skills, competence and understanding before using areas suitable for those with more experience and skill.

A question of "safety + convenience" ?

Clearly however, while many areas are suitable ie sufficiently safe, they are frequently bounded by areas which are not, or perhaps, appear not to be, sufficiently safe. Suburban areas and inner city precincts may be suitable, but for useful travel, main roads act as barriers. In practice, people who are walking or cycling are rarely if ever provided with priority over through traffic at such locations, and where they are, as at pedestrian crossings, the priority is usually limited by time. The familiar problem of the elderly being unable to cross roads during the pedestrian crossing phase of traffic lights can result in people being stranded on traffic islands and dependent on other pedestrians to call up another pedestrian phase. Similarly, while cyclists are required to dismount to cross roads and pedestrians to press buttons to call crossing phases, only motorised traffic has these functions automated despite their being available for people walking or cycling.

Similarly, giving priority to traffic can both increase the lack of safety and the lack of convenience. Examples include the prohibition of frequent authorised pedestrian crossings in low speed shopping and school environments leading to non-compliant behaviours which may increase risk and danger, and, by virtue of the cost, expensive separated crossings, although inevitably infrequent and inconvenient, are preferred rather than, for example, slowing traffic or altering the priority.

Changes can therefore be refused based on cost of expensive but arguably unnecessary infrastructure. They can be refused based on current behaviour (eg the purported need for cultural change prior to changing road design ignores the needs of current pedestrians and cyclists) or old regulations (eg multiple pedestrian and/or cyclist priority crossings, raised zebra type crossings, and slow speed areas). Changes can be rejected on grounds of possible danger (eg not providing warning or advisory signs because they might prove dangerous or encourage more use) while ignoring the current use and utility of wide freeway or motorway shoulders for cyclists and others. The failure to provide for existing, let alone future increased use, by the "green modes" fails to support the policies promoting these modes.

Hence, aberrant or non-compliant behaviours frequently indicate a lack of convenience or priority provided by the relevant authorities, often despite requests and seemingly, opportunity. Examples include cyclists using footpaths to avoid being forced to cycle in high speed traffic or being held up by when turning left at traffic lights and various forms "jay walking" including walking or cycling against traffic lights in the absence of traffic. Arguably, if people of all ages and abilities are walking and cycling, most areas where this behaviour is encouraged should endorse such behaviours by increasing their priority and convenience. Similarly, if facilities or conditions can be modified easily and consistently to encourage desired behaviours, safety and convenience should be enhanced to avoid or reduce non-compliant or dangerous behaviours. If danger results from, for example, high speed traffic, and increased exposure is likely to reduce safety, reducing the danger at source eg by reducing traffic speed, is essential rather than restricting convenience eg by building a fence or other barrier, or by building an underpass or overpass if such facilities require more effort and inconvenience for some potential users or lead to aberrant or non-compliant behaviour or complete exclusion by others.

Current endorsement by road authorities of traffic speeds which are known to be too dangerous for non-motorised road users, and in many cases, therefore requiring extremely expensive infrastructure which cannot be economically be justified, remains a major ethical and credibility issue for those who design and supply infrastructure as has been previously addressed. Not only is such politicised technical decision making more exposed to public scrutiny (12), it also contributes to the continuing process of reducing the credibility of professional and technical advice (14), especially if expertise is expected to implement government policies such as increasing cycling (15) safely and conveniently.

So important and obvious is the combination "safety + convenience" that in Europe, whole town areas are not only planned with 30km/h residential and shared areas, but increasingly, they are being planned to prioritise walking and cycling routes. Thus, as in Houten in the Netherlands near Utrecht, motorised traffic not only gives way to cycling and walking traffic on all roads where they meet but motorised traffic is forced by the design of the road network to travel around rather than through the urban area. Houten, a town of some 40000 population, prides itself not only on having had no road fatality since 1987 but on a very high use of walking, cycling and disability access including to public transport, achievable only by reducing the "safety + convenience" for motorised traffic and increasing it for other modes by planning for it.

As Houten has demonstrated so clearly, if safety is a goal along with substantial shifts to the safe use of walking

and cycling, urban design must provide the environment and the transport system must provide the priority by ensuring not only are facilities provided, but they are safe and convenient to use, and that those using them have priority by policy and by design.

How safe… in conclusion?

Currently, expensive "symbolic" off-road infrastructure such as bike bridges and overpasses, are often connected directly to the road network. The road and off-road network is inevitably shared by people of all ages and abilities whether cyclists, pedestrians or people with access disabilities, and irrespective of their needs and service requirements. Many children are injured by cars on footpaths or in local roads and many cyclists are injured and some killed on bike paths. Reductions of speed limits in residential streets with minimal traffic are promoted as safety initiatives yet the speed limit of 50km/h is regarded as too high even for many main roads in Europe (16) while requests for 40km/h speed limits are prohibited by policy, manuals or design standards. With a genuine commitment to local safety and amenity, even "prohibited" strategies can be promoted and trialled as in suburban Adelaide given strong local and state government support (17) as exemplified by the 30km/h urban speed limit in the city of Graz in Austria and Sweden's *Vision Zero* which aims for a zero road toll, especially in urban areas.

The credibility of professionals has been reduced yet various forms of consultation provide the means, not for meeting the needs of the dominant users, but for meeting the needs of all road users (14). However to experience and assess these needs, the community needs exposure to exemplary experience such as that experienced elsewhere rather than basing its decision and consultation inputs on local experience and technical expertise which prevents responses to local needs. Trials such as those in Adelaide (17) and in urban areas throughout NSW (18) confirm that the ability to meet the diversity of needs is best addressed at the local level rather than by state level policy and prescriptive policy which lacks effective consultation and the opportunity and incentive for local "experiments". As Gifford notes, it is "essential to embrace a customer orientation, to discover what customers value and will support" rather than have the infrastructure community ignore its customers (12).

For the "experts", whether consultants, users, advocates, or infrastructure supply or management authorities, the diverse and opposed views exist and must not only be made explicit by consultation, but must be accommodated by provision of facilities and conditions which satisfy the expressed needs, no matter how diverse. In practice, this requires not just meeting with narrowly defined user groups but skill in integration of diverse ideas and needs. In practice, it requires assessing accessibility and convenience, not just for narrow user groups, but for all people of all ages and abilities and all modes. In practice, this requires assessing transport and access systems, not only from a safety view where making the system safe can encourage excluding those at risk, but by assessing "safety + convenience" for all users of all ages and abilities and by providing sufficient "safety + convenience" that success is measured not just by safety eg by a reduction in perceived threat, risk, injury and fatality, but by increased exposure, ie by increased use, and the extent and diversity of both use and users.

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