

***Early identification of repetitive high risk locations or "black spots" as an aid to reduction of road trauma***

***... the role of coronial investigations in reducing predictable injuries and fatalities***

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**Abstract:** Until they reach "epidemic" proportions, many events involving serious injury or death appear to be regarded as one-off "accidents" when to others, obvious causes can be seen. This paper suggests that, at the very least, the option for "others" to ensure that their view is considered is essential to early identification of commonalities and thus, possible causalities, which may otherwise be excluded unless subject to detailed analysis by expertise representing the "others" knowledge or interests. Using two generic sites ie swimming pools and roads as case studies, the paper raises the question as to how many one-off "accidents" need occur before a repetitive pattern is established. Swimming pools and roads have both public and private functions and are in general terms, accessible to everyone. In the case of pools however, the commonalities have been identified and various actions taken. In the case of roads however, it is argued that most "accidents" are not investigated or even reported and that, as only a very limited number result in investigations, most remain classified as one-off "accidents".

However, from the perspective of people who walk or cycle, most "near misses" and minor crashes identify incidents which could have been much more serious and hence are indicators of potential crash sites with serious consequences and requiring action including modification. The comparison between swimming pools and roads suggests that it may suit those who manage the roads if only the serious injuries and fatalities are investigated as including the "near misses" will show how dangerous the road system is. The coronial system, by ensuring "others" are welcomed into the investigatory system, can make the dangers more explicit, and thereby, arguably identify high risk locations or situations, establish commonalities and where appropriate causalities, and where repetitive or frequent, recommend action.

## **Introduction:**

Many people are involved in "near misses" on the road every day. So many occur that arguably, the fact that the road system is dangerous tends to be forgotten. Despite advertising for fast, safe new cars and road safety campaigns, the one inescapable problem remains that some 1500 people per year are killed in road crashes in Australia. Many of them are people either walking or cycling in urban areas. Many more are seriously injured while an even larger group, many unreported, are injured or threatened on the road. Few industries have such a bad safety record. However, we must celebrate worthwhile reductions when the road system appears to be much safer than it was. This paper views road safety from the perspective of people walking or cycling, people who use mobility aids and those who, for reasons temporary or permanent, have an access disability. This group has been described by the road safety industry as "vulnerable road users". In this paper, these people are described as "non-motorised road users" because, in most urban areas, they should not be more vulnerable than other road users.

Until they reach "epidemic" proportions, many events involving serious injury or death appear to be regarded as one-off "accidents" when to others, obvious causes can be seen. From an investigators perspective however, there are so many possible, potentially inter-related causes that each crash incident can almost be considered unique. This has led on the one hand to a crash analysis process with literally hundreds of potential combinations of causes such that many crashes may appear unique and hence are regarded as "accidents" ie because they are rare or lack commonality. These are of major concern in that the failure to establish commonality and frequency of occurrence will delay actions to reduce these crashes and crashes similar to them and reduces the experience gained by exposure of investigators to these crash types. However, on the other hand, and of equal concern, commonality will often be assumed for these same reasons but without necessarily undertaking the critical and detailed analysis to ensure that the causes attributed are in fact appropriate.

This paper aims to explore the effect of the investigatory processes including the coronial process on identifying causes of crashes earlier in order to introduce remedial actions or countermeasures earlier. It suggests that the users ie the potential victims, should have the opportunity to be represented informally and/or formally during both the investigatory and the coronial inquiry phases in order to better ensure that the views of users are incorporated in investigations and to detect and if present, reduce any risk of incorrect reporting based on views other than those of the users. This paper suggests that, at the very least, the option for "others" to ensure that their view is considered is essential to early identification of commonalities and thus, possible causalities, which may otherwise be excluded unless subject to detailed analysis by expertise representing the knowledge or interests of the "others".

## **One-off accidents?**

To move away from the road scene and to provide a setting for comparison with road safety, Queensland has a problem with swimming pool drownings. Clearly, it has a climate which encourages swimming. The convenience and entertainment and health benefits of a swimming pool at home are hard to deny. This is especially the case for children of all ages and abilities. Not surprisingly this has led to young children drowning in back yard pools. It is interesting to compare the response for pool safety to that of road safety for this "vulnerable user" group. It would appear that the commonality of causes in the case of pool drownings led to increased security around pools and to a much lesser level, education based on both improved pool safety and user education ie learning and reinforcing natural reactions which appear to be the response of young children in water. It has however been observed that many children simply find pool fences an easy climbing challenge while the failure to

undertake the latter may increase the risk should the former inadvertently fail eg if a gate is left open, the more so if supervision is reduced due to over-reliance on the fences.

In the case of a pool drowning where a fence exists, is this still an "accident"? Is it "inevitable" that children will be challenged by pool fences and therefore seek ways to get to the pool, whether through open gates or over the fence? As with road crashes, there is a tendency to rationalise the inevitable and describe it as an "accident" given that it is hardly "deliberate". This suggests that far more attention should be given to analysing those incidents which are described as "accidents" to ascertain whether they are more properly described as "inevitable" on a continuum from "accident to inevitable to deliberate". It seems that describing an event as an "accident" is a convenient way of avoiding difficult decisions including acceptance that currently accepted behaviours and countermeasures either may not be working or may even be contributing to the "accidents" as might be the case should the presence of a pool fence lead to reduced supervision. Does a pool drowning signify a failure of supervision? Does the required provision of a pool fence make reduced supervision "inevitable"? What other strategies might better address this complex set of problems?

Clearly, at this level of analysis, while individual incidents might be accidental, they might equally be regarded as inevitable or predictable. Only then however is it likely that the problem will be sufficiently regarded that the process of seeking and developing further strategies will be supported. Hence the value of independent scrutiny of incident analyses is to ensure that any "inevitability" is recorded officially and, in the process of investigation, acts as a means of ensuring that incidents are not regarded simply as "accidents". Swimming pools and roads have both public and private functions and are in general terms, accessible to everyone in that access whether legal, accidental or illegal cannot be prevented. It is useful therefore in the following sections of the paper to recall these two generic sites ie swimming pools and roads as case study settings, as the paper raises the question as to how many inevitable or predictable one-off "accidents" and "near misses" need occur before a predictable repetitive pattern and the need for countermeasures are established.

### **The one-off road accident**

In the case of Queensland swimming pools, it might be argued that most commonalities and causalities have been identified and various physical and behavioural actions taken. In the case of roads, it appears most "accidents" and "near misses" are not investigated or even reported. Hence, as only a very limited number result in investigations, most remain classified as one-off "accidents" or as infrequent incidents requiring irrefutable evidence or statistical or other validation before remedial or countermeasure actions will be undertaken.

Returning to the road and to the case of non-motorised road users in particular, it is common to hear expressions such as "nothing will be done until someone is killed" usually from people who are aware of the number of "near misses" at the same or similar locations. Arguably, in the case of site specific interventions, this is an almost inevitable outcome of current investigations. However, even if someone is killed, action may not occur if the event is considered an "accident". Take for example a recent fatality where the road design is clearly substandard in engineering terms. Specific submissions to the Attorney-General and the Office of the Coroner in regard to this "accident" resulted in the submission being forwarded to the Minister for Transport and Main Roads who advised that "a detailed analysis of existing data on cycle crashes and injuries with the aim of identifying generic and specific blackspots for cyclists" is being undertaken (correspondence 1 December 1999).

In this process, the specific engineering shortcomings of the specific crash site appear to have been ignored. Is this one fatality at a substandard location representative of a problem likely to

occur again if not addressed? How many more similar crashes need occur? Was the site identified by investigation or inquiry as substandard? If not, is it? If it is substandard, why was it not so identified? Once such a site is so identified, does this create a legal precedent for other sites which are similar or identical? Should design guidelines for such sites be changed? If so, when and by whom?

### **Investigation processes**

As noted above, many of the investigation processes may be subject to criticism from the user group perspective for failing to include the reality viewed by users. It appears common for the investigation findings to be criticised when the processes may be flawed. For example, it is very unclear and appears almost to be an individual decision whether third parties are given leave to appear before coroners, whether third party submissions may be made or if they are regarded as valid in the investigation and subsequent coronial processes. One informal but well-credentialed source reports that "the findings were no doubt flawed because of an inadequate investigation, the coroner's hostility and our inability to put the cyclist perspective. When we met the DPP afterwards and he finally listened to "x's" submissions, he agreed that it had been inadequately investigated and promised to invite "x" to put the cyclists perspective at future coronials." (personal communication)

Two reported incidents illustrate similar concerns as to whether the cyclists perspective is being adequately and equitably addressed.

*In two recent court decisions, drivers have been acquitted over separate incidents involving the deaths of cyclists, on the basis that the cyclists were partly to blame for what happened. In one case, a car hit a 12-year-old boy at night on a relatively quiet suburban street while on his way home from the shop. The driver of the car had a blood-alcohol reading of 0.098 and admitted to exceeding the 60km/h speed limit by 5-10km/h. The main issue seemed to be that witnesses had seen the boy riding erratically some time before the crash while he was riding to the shop. Despite no evidence of such behaviour immediately prior to the crash, defence claimed that the boy had been skylarking and that the motorist would not have been able to avoid the crash even if he was sober or travelling within the speed limit. The prosecutor stated that a prudent driver would have kept the boy under observation or slowed down.*

*In the other case, a racing cyclist was killed on a training ride while turning right at a signalised intersection on an arterial road. Again, the car driver admitted to exceeding the speed limit and was unable to stop when the signals changed. The court found that the cyclist had contributed to the crash by entering the intersection without being sure that it was safe to do so. (in *Australian Cyclist* December 1999,p52)*

As the investigation and coronial inquiry processes are closely related, it is clear from the above perspectives from a user perspective that the outcomes of the investigation and inquiry process suggest at best dissatisfaction and at worst a lack of credibility. While it may be argued the above are not representative examples, it appears that no study has been undertaken to test such assertions and that, even if it had been, the problem of the quality of the investigations would still remain given the apparently limited exposure of crash investigators to experience relevant to these types of incidents. Arguably then, to improve credibility and to increase the likelihood that remediation or countermeasures may be employed earlier, including a user perspective at both the investigation and the inquiry stages is essential. A process for so doing should therefore be agreed if necessary while at the individual level of specific "accidents", both investigators and coroners should welcome the specialist knowledge of users and their perspective on common causes of concern to them.

## **Commonalities and causalities**

Both the literature and more importantly, the anecdotal experience of the non-motorised road users and their various interest groups contains a wealth of material to legitimate the concerns expressed above. Examples include the apparent tolerance of the following common threats and causes of concern, threat, risk and injury:- "bull bars" and fittings including lights and brackets on them although apparently in contravention of Australian Design Rules while front mounted racks for carrying bicycles on buses are prohibited by ADR despite some 20000 in use in the USA; intersections where cyclists need to wait to turn right; motorists travelling left of edge lines; "squeeze points" ie deliberate narrowings of roads forcing cyclists into the traffic stream as at intersections and at pedestrian crossings and speed control devices (eg road narrowings in traffic calming schemes); failure to insist on the obligations of overtaking vehicles; the "didn't see" and "couldn't see" defences; pedestrians causing crashes on pedestrian crossings; children and cyclists and pedestrians generally causing "unexpected" incidents, near misses and crashes; and perhaps most commonly, "high speed" traffic.

It would appear that each of these is tolerated excessively yet each appears to constitute at best a favourable interpretation and at worst, tolerance of clear breaches of law, most notably, the imperative to avoid driving dangerously or in a manner causing bodily harm or death. However, where these concerns are accepted, the process is very useful as in the following example where a motorist, to avoid a cyclist travelling very slowly uphill, swerved into the oncoming traffic lane and collided with an oncoming motorist. The motorist sought to blame the cyclist. The matter was quickly dealt with by the court when it was suggested that the motorist must have been travelling too close to the cyclist or too fast for the circumstances.

While the motorist might not have "expected" the slow speed "wobble" inevitable for cyclists on steep hills, overtaking requires keeping clear of the vehicle being overtaken. This case underlines just how important it is to have the perspectives of the users available to the investigator, the coroner and later perhaps, other courts. A court unaware of the cyclists "expected" behaviour could easily take a different view. However, it remains to be seen if the responsibility, in this case of the overtaking vehicle(s), is increasingly restored in cases of cyclists hit from behind as although perhaps the most feared, this is a relatively uncommon "accident". However, every day, high risk "incidents" of this type occur on almost all roads yet, being unreported, road authorities continue to build and manage the road system as if these extremely prevalent incidents do not exist. Arguably, "squeeze points" are of this type as is failure to provide wide road shoulders. Yet squeeze points and roads without shoulders continue to be built without warning signs and strategies, apparently ignoring the benefits of improved safety and amenity, not just for cyclists, but for all road users, leaving it to cyclists to use campaigns such as "Give cyclists a metre" to raise motorists awareness.

## **Near misses**

As noted above, local knowledge of problem locations often results in campaigns based on "nothing will happen until someone is killed". Road safety and other campaigns frequently fuel such campaigns by implicitly if not explicitly blaming the potential victim. Examples include the emphasis on "stranger danger" now being revisited to promote the need for and reliance on supportive "good strangers"; the concern that roads are so unsafe that parents drive their children to and from school and thereby, both parents and schools seek not to encourage walking and cycling and arguably, discourage and threaten those walking or cycling; the emphasis on compulsory wearing of cycle helmets rather than on the health and safety benefits of walking and cycling to school; and the support for "high speed" limits rather than widely extended compulsory lower speed limits that are sufficiently accepted as safe for walking and cycling that increases in use of these modes reflect a reduction in serious injury.

However, in practice, it appears that the anecdotal reporting of "near misses" may actually assist in the success of road safety campaigns by emphasising the dangers of the road system to the novice or ill-informed non-motorised road user and thus, is effective by reducing the exposure of those who are or feel or are made to feel vulnerable. Thus as people report stereotypes of "near misses" such as pedestrians surprising motorists by walking out onto pedestrian crossings, cyclists not checking if it is safe to move through traffic lights (as with the fatality reported above), old drivers driving too slowly etc, current perceptions of those not stereotyped are reinforced. It is therefore not surprising that road safety campaigns can be seen to reflect a strong support for motorists in general and to reflect implicit if not explicit criticism and blame on the more marginalised non-motorised road user. In practice, these stereotypes can become conventional wisdom if not subjected to scrutiny. Hence while Queensland Transport cleverly asked "*Are you driving too fast for the unexpected?*", it is useful to ask whether the unexpected can be expected and whether the unexpected are in fact unexpected or "inevitable" and predictable and thus normal if not ubiquitous.

Arguably the reporting of "near misses" is notoriously difficult and perhaps unreliable while current processes for ensuring credibility and validity remain. Similarly, most minor "indicative" crashes and injuries are unreported. Hence the main value of knowing the number and types of "near misses" and unreported crashes lies in recognition and acceptance that many of these are actually high risk incidents with favourable outcomes. They are therefore indicators of locations or situations where crashes with serious or fatal consequences are "inevitable" and predictable under specific, although rare, circumstances, which too often are ascribed to "bad luck", "being in the wrong place at the wrong time" or "being an accident".

While "near misses" and unreported crashes are useful for advocates of change, arguably it is far more important for individual crash sites to be subject to wide ranging scrutiny including by the various perspectives that might influence and achieve an outcome. The outcome needs to be both credible to the various user groups and others involved and effective in ensuring that the specific findings can be addressed by remediation or intervention to reduce the likelihood of similar incidents recurring either at the specific site or elsewhere.

### **Common causality ... the problem of traffic speed**

One area of particular interest is the reported effect of speed of traffic on crash outcomes in urban areas. Australia with a national 60km/h default General Urban Speed Limit shares the world's highest urban speed limit and even where 50km/h in Queensland's 50km/h speed limit in Southeast Queensland, the effective speed limit remains at 60km/h. While it is implicitly argued that this is safe, it is the roads with higher speed limits where most serious crashes occur and where non-motorised road users are most vulnerable yet it is these roads where the 60km/h speed limit or higher remains. This is particularly important when, at all government levels, large increases in walking and cycling as transport including to and from public transport is being encouraged for example by the National Cycling Strategy (AUSTROADS,2000) and various state and local government transport plans and strategies. The additional trips will most likely be by the least experienced and novice users. Arguably, they are either the most vulnerable or the most threatened by or at risk in or crossing current local urban traffic travelling at speeds too high for the "unexpected". Their exposure must increase, a combination of considerable concern epidemiologically.

Of relevance to this paper is the problem which faces investigators and the coronial process when speed is clearly a common cause yet the speed limit is too fast for the "unexpected". In the report *Towards a safe urban speed limit* (Bicycle Federation of Australia,1996), it is argued that speed limits should be set at levels that are safe for all users, a view since supported by

those who confirm that motorists and other road users cannot expect the unexpected. Thus while 60-100km/h multilane freeways and urban motorways are not the place for young children and the elderly, they can be appropriately designed for experienced long distance commuting cyclists and arguably, in urban areas, should be designed for the safety and convenience of young children and the elderly. Similarly, residential streets, shopping areas, recreation and school precincts are the place for younger children, the elderly, people using access aids or walking or cycling and they and their "expected" behaviours clearly should not be "unexpected" in such areas. However, 50 and 60km/h speed limits continue to make these precincts threatening if not dangerous for all users as evidenced by most current road safety campaigns.

That is confirmed by the crashes and the fact that cycling and even walking is viewed as dangerous, so dangerous that the effect of road safety campaigns is to discourage walking and cycling because they are perceived as too dangerous rather than, as with "Safe routes to schools", to encourage their increased use by making the road system sufficiently safe for their use. Is excessive speed the common cause of most road crashes even when motorists are travelling below the speed limit? It appears not because rarely if ever is excessive speed but below the speed limit reported as a crash cause. Rather, as in child "run-outs", cyclists not being sufficiently responsible etc, it appears that the investigatory and inquiry processes and the legal process implicitly if not explicitly excuse motorists of their obligations. Does this occur because safe speed for all users is not an issue? Is the high speed of our urban speed limits effectively so common a cause that it is not even assessed and has therefore escaped analysis, thus not appearing as a common cause?

Overseas knowledge and experience can be a useful guide. In the Netherlands, elderly cyclists remain over-represented in casualties (*Safety in Road Traffic for Vulnerable Users*, European Conference of Ministers of Transport,2000). Does this mean that even in cycling friendly settings, the inherent medical vulnerability of the elderly is still not sufficiently addressed? Is the citywide 30km/h speed limit in the city of Graz in Austria a reason for the relative safety and convenience and therefore prevalence of walking and cycling including by both the young and the elderly? Is Sweden's vision of a zero road toll based on low speed urban roads and roads designed for safe use by all users more realistic than ours of celebrating the reduction to 1500 fatalities? While it would appear that indeed traffic speed is a concern, apparently in Australia, it is not sufficiently reported and accepted to ensure reductions in speed limits assist in providing safety and convenience for all road users.

## **Conclusions and recommendations**

This paper aimed to question the current investigation and inquiry process in regard to road crashes and in particular, following concerns expressed by various non-motorised road user groups, the potential role for early identification of repetitive high risk locations or "black spots" as an aid to reduction of road trauma. As the process already involves both the investigation and the inquiry phases, the role of coronial investigations in reducing predictable injuries and fatalities is viewed as extremely important to identifying specific conditions and situations commonly associated with or as causes of, crashes. Concern has however been expressed that the current processes do not appear to take into account the needs of various users who to various extents and for various reasons are or feel excluded from the current process.

It is argued that, while there are many "near misses" and unreported incidents and injuries which might in similar circumstances have had serious outcomes, these are only useful if accepted and recognised as evidence sufficient to lead to interventions and countermeasures. Most current methods for assessing the credibility and validity of such reports reject them hence these high risk incidents will continue to occur until sufficient occurrence yields an

accepted repetitive or epidemiological risk when action may be taken.

Comparison between swimming pools and roads and the respective safety campaigns suggests that, quite justifiably, it may suit those who manage the roads if only the serious injuries and fatalities are investigated as whether included or not, "near misses" show how dangerous the road system is and thus encourage safer behaviour including reduced exposure by those most at risk, the non-motorised road users. Australia's current road safety record may well depend on continuing to reduce such exposure including by not making the road system safer and more convenient, and hence more attractive, to non-motorised road users.

However, from the perspective of people who walk or cycle, most "near misses" and minor crashes identify incidents which could have been much more serious and hence are indicators of potential crash sites with serious consequences requiring action including modification.

If each crash is assessed in depth with all interested parties expressing their view and contributing to the investigation and inquiry processes, it is argued that the individual crash sites can identify the high risk factors earlier and reduce criticism of the current findings. It is therefore strongly recommended that all investigative and coronial processes regarding road crashes be exposed to public scrutiny by formally and informally encouraging and creating opportunities for submissions and appearances by user groups in order to enhance both the quality and the credibility of the findings and their application, where appropriate, more widely to reduce future injury and fatality risk. Granting of "standing" may be an appropriate means.

The coronial system, by ensuring "others" are welcomed into the investigatory system, can make the dangers more explicit, and thereby, by identifying high risk locations or situations, establish commonalities and where appropriate causalities, and where "inevitable", predictable, repetitive or frequent, recommend action with a greater expectation that the actions necessary to reduce future serious injuries and fatalities will be more timely and both specific and generic. While potentially likely to be of concern initially, a more inclusive approach is likely to engender increased understanding of and support for the findings and recommendations.