

Addressing the problem of vehicles crashing into utility poles on metropolitan & rural-urban roads in NSW

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Abstract

Utility poles contribute to more than 1600 road crashes each year in the metropolitan and rural-urban areas of NSW. In the period 2002 to 2006, NSW urban areas experienced 8,432 crashes involving utility poles, resulting in fatalities and injuries costing the community \$232 million per year.

There are high safety and community benefits to be gained by providing a more forgiving urban roadside environment. Roads and utility authorities have begun to address the safety issues posed by utility poles. The first step has focused on addressing future problems by ending poor installation practice. Other strategies include addressing critical locations (existing poles), utilising utility agency works programs, and addressing the utility pole problem as part of the NSW Roads & Traffic Authority's (RTA) development program.

Utility authorities' codes of practice and installation standards, development of RTA guidelines on better practice regarding utility pole installation, development of utility pole policy and technical guidelines for use in scoping RTA projects and education programs for RTA and utility authority staff has provided a foundation that is likely to produce, overall, better results for the community.

Key words

Utility poles, clear zone, forgiving roadside, partnership

Recognition and Analysis of the Problem

Utility poles link properties to telecommunications or power supply and are frequently installed in road reserves. This means that the poles are readily accessed for maintenance purposes. The installation of these poles has frequently been immediately behind the kerb and gutter on urban roads. This helps facilitate lighting of the road reserve and keeps the remainder of the footway, behind the kerb and gutter, free for the installation of other utility services.

The poles, in NSW, are usually made of timber and are generally greater than 300mm in diameter. They are installed with the aim of lasting many years with minimal maintenance or replacement. This results in a very sturdy object that is very close to the travel path of large numbers of fast moving vehicles. Some of these vehicles, for a number of reasons, often diverge from the frequently travelled path, which can result in an impact with one of these poles.

The result of having sturdy poles next to the kerb is often catastrophic with the death of the driver of the vehicle and sometimes others, including passengers, damage to the utility infrastructure and needing the attendance of numerous emergency personnel. If the incident results in injury, the long term recuperation and management of the injury can be extremely expensive. Overall, such an incident can be emotionally and financially traumatic.

A study undertaken by the RTA and based on RTA crash data and police crash reports for the years 2000-2001 identified specific types of roadside object impacted by vehicles in fatal crashes. As can be seen in Figure 1, utility poles figure prominently in fatal crashes. If those poles had not been impacted, fatalities for those two years would have been significantly less.

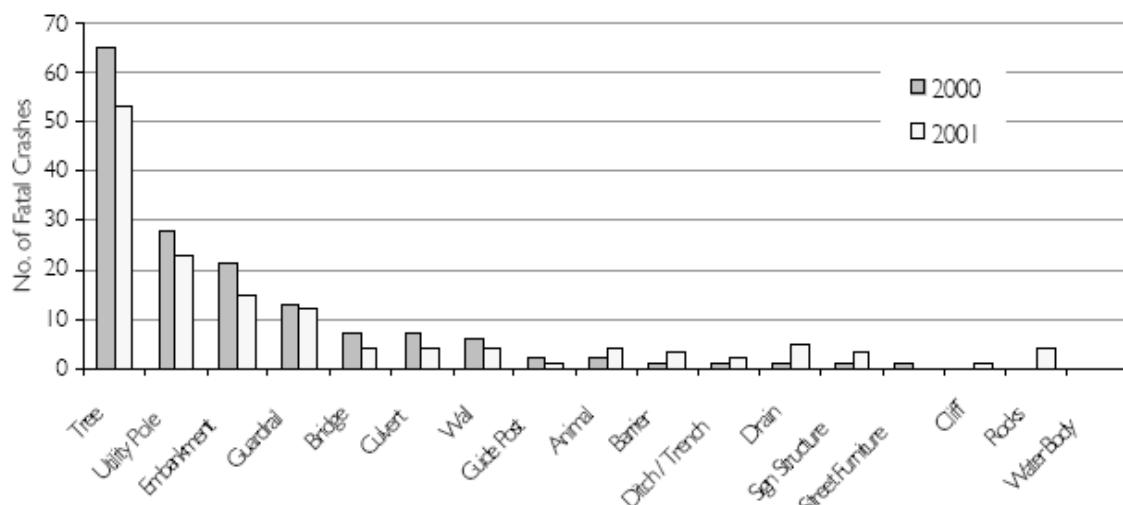


Figure 1: Crashes involving utility poles in urban NSW 2000-2001

Extent of Problem in NSW

Closer examination of more recent data from the NSW RTA's crash statistics has revealed the magnitude of the problem of vehicles crashing into utility poles on NSW metropolitan and rural-urban roads. In the five year period from 2002 to 2006, consequences of crashes into poles in these areas in NSW included:-

142 Fatal Crashes - resulting in 165 deaths (avge. 33 deaths per year)

3,843 Injury Crashes - resulting in 5,159 people being injured (avge. 1032 injuries per year)

In NSW over the five (5) year period from 2002 to 2006, road crashes resulted in 2614 deaths. That is, over 6% of road fatalities in metropolitan and rural-urban areas in NSW involved crashes into utility poles.

Utility pole crashes have consistently been a significant agent in single vehicle fatality crashes on urban roads in NSW.

Community Costs

Casualty (fatal and injury) crashes into utility poles in NSW have cost the community, on average, \$232 million per year over this five year period (based on \$1.732M per fatality and \$170K per casualty). There has also been an extra \$6.7M per year in vehicle property damage from pole crashes (based on \$7,500 per "property damage only" crash). However, this would be only a small portion of the total property damage as many crashes, including those into poles, are not reported. There may be conjecture about what a life or an injury is worth. However, whatever perspective is taken, these crashes cost the community an enormous amount, whether in financial terms or emotional trauma.

Pole Crashes by Type

Statistical research of crashes into utility poles conform with other research recently undertaken that examined off road crashes on urban roads in NSW. It found that a significant proportion of the crashes were of the type "Off road to the left".

Table 1: A selection of crashes involving utility poles in metropolitan and rural-urban areas of NSW 2002-2006

Crashes by type	Fatal		Injury		Towaway		No. of crashes	
	Number	%	Number	%	Number	%	Number	%
Off end of T-Junction	0	0%	26	1%	33	1%	59	1%
Off left on left-hand bend	21	19%	285	10%	361	11%	667	11%
Off left on right-hand bend	20	18%	368	13%	468	14%	855	14%
Off right on left-hand bend	16	14%	166	6%	231	7%	413	7%
Off right on right-hand bend	7	6%	143	5%	183	6%	333	5%
Off left on a straight	32	29%	1481	52%	1646	50%	3159	50%
Off right on a straight	15	13%	392	14%	378	11%	785	13%
Out of control on a bend	1	1%	4	0%	2	0%	7	0%
Out of control on a straight	0	0%	6	0%	2	0%	8	0%
TOTAL	112		2871		3304		6286	

As can be seen from Table 1, “Off left on a straight” crashes comprise 50% of the total, “Off left on a right-hand bend” crashes make up 14% and “Off left on left-hand bend” make up 11% of the total number of pole crashes. These three crash types, involving vehicles running off the left hand side of the road, make up 75% of the total.

With the left side of the road environment involved in such a large portion of crashes involving utility poles, and making up only a small part of the overall urban road network, any program of works to relocate hazardous poles should be initially focused on the left side of the carriageway to identify locations where the presence of utility poles should be addressed.

The high numbers of deaths and injuries resulting from crashes into utility poles and their high community costs indicate that there are very high safety and community benefits to be gained by providing a more forgiving roadside environment. This can be achieved by employing a risk management approach to the problem and either:

1. relocating utility poles as far from the road carriageway as possible, or
2. reducing the number of poles by combining utility services on one pole, or
3. putting the utility cables underground, or
4. reducing the severity of a pole impact collision by a number of activities such as providing a barrier around the pole or installing a frangible pole.

All of these actions would be expected to greatly reduce the frequency and severity of crashes involving utility poles.

Safe System Approach

The Safe Systems approach to road safety accepts that all road users will make mistakes at some time but this should not lead to death or serious injury. This Safe System approach is currently being promulgated by the NSW RTA in the design, construction, operation and maintenance of all roads in NSW. The Safe Systems approach to road safety concentrates on the three areas where roads and their users can be made safer:

- Safer Roads –all aspects of the road structure and its surrounds
- Safer People –all aspects of behavioural science
- Safer Vehicles –all aspects of vehicle safety

Making a road safe just doesn’t mean applying road design standards and practices and assuming that it will be safe. It requires a more holistic approach where the relationship of the road environment is more closely related to the crash performance to ensure an overall safely functioning transport system. This means that road safety practitioners, project managers and maintenance personnel need to work actively with other agencies across government and the community to implement evidence based strategies to improve road safety. It also means that the roads authority must have a good relationship with other

agencies with an interest in the road corridor and have a common understanding of the ramifications of the problem of vehicles crashing into utility poles.

The NSW RTA has developed a strategy in an attempt to address the problem of vehicles crashing into utility poles on NSW roads. This strategy seeks to:

1. Address future problems by stopping poor installation practices
2. Address critical locations (existing poles)
3. Utilise utility agency works programs
4. Address utility pole problem as part of RTA's development program

Addressing future problems by stopping poor installation practices

The need to provide a forgiving roadside environment has been recognised for a long time. The NSW RTA's Road Design Guide (RDG) identifies this in its discussion of the "Clear Zone". The Clear Zone is a concept used in road design fields. It is a measure used in the design of new road works as well as identification of problem areas on existing roads. The Clear Zone is the area that begins at the edge of each travelled lane and is available for emergency use by errant vehicles that run off the road. This zone includes any adjoining lane/s, road shoulders, verges and batters.

The RDG recognises that urban areas have specific problems created by utility poles. It is difficult to attend to all existing poles. They are expensive to relocate or to mitigate the likely crash impact outcomes.

Significant efforts are made to ensure that the appropriate speed related clear zone is provided, especially on new construction. In urban areas, footways can provide an adequate clear zone, provided utility poles, sign supports and heavy structures are kept to the rear of this area, placed underground or made frangible.

The following diagram from the RDG shows the Clear Zone.

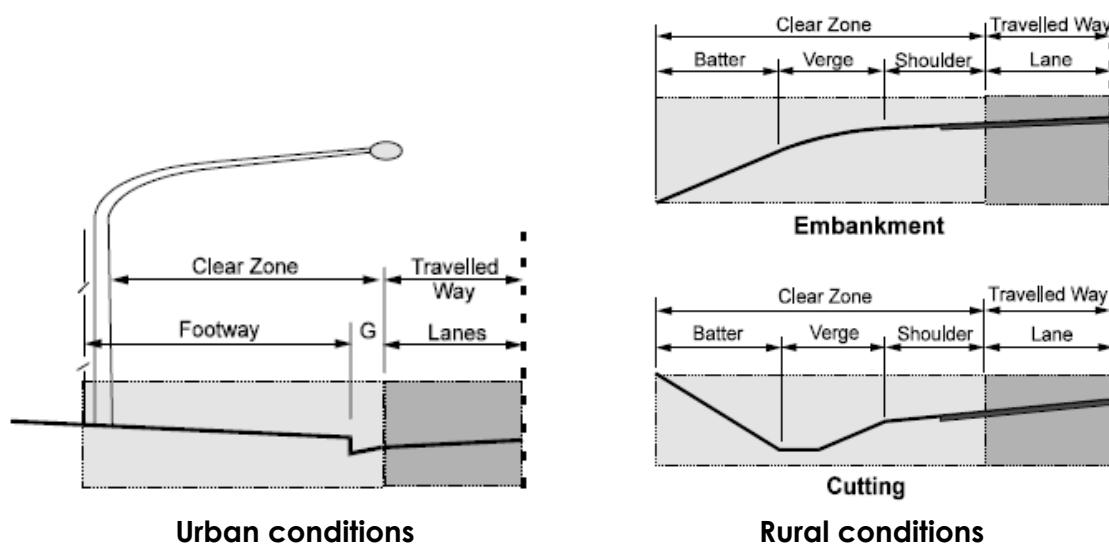


Figure 2: Clear Zone in rural and urban settings (Source: RTA Road Design Guide 2000)

Addressing critical locations (existing poles)

To address the existing utility pole crash problem, the RTA has implemented a hazardous pole identification and relocation program that aims to identify those sections of road that show high numbers of utility pole crashes. The program identifies the worst sites and then determines appropriate treatments that will help reduce the occurrence and alleviate the severity of the crashes that are occurring at these sites. Treatments may include the relocation of the pole, putting a number of services on one pole and removing the unnecessary pole/ s, removal of the pole by moving services underground and protection of the pole by correctly installing an appropriate barrier.

Improving guidelines for utility pole installation

The utility pole crash problem on NSW roads is also being addressed through an organisation of agencies called the Streets Opening Conference (SOC). The SOC is a group of representatives from organisations such as State and Local government road authorities and utility authorities such as those providing telecommunications or electricity that have an interest in underground services, poles and the like in road corridors. It has a secretariat managed by The Institute of Public Works Engineering Australia (www.ipwea.org.au). The SOC has a publication entitled "Guide to Codes & Practices for Streets Opening". It is a product of consulting and co-operating to address issues, many of which are conflicting. This document is used by State and Local government and utility authorities in their daily work practice.

The most recent edition of this publication was 2007. Partnering with the SOC has resulted in the inclusion, for the first time, the following extract in this publication:

REDUCING ROADSIDE HAZARDS

Utility poles that are positioned close to carriageways can present a roadside hazard as outlined in Sections of the Roads Act of NSW 1993. The extent of the hazard depends on vehicular volume, speed category, road geometry, visibility and other conditions.

For pole replacements and utility extensions in roadways dedicated before 1991, consideration should be given to assessing the risks of possible hazards presented by pole placements in the pre 1991 allocation.

In these cases the following alternatives should be investigated in the interests of road safety:

- Moving the poles back further from the kerb
- Erecting protective structures and signage
- Usage of frangible structures, where applicable
- Undergrounding of the services.

This acknowledges the acceptance, by a number of agencies, of the presence of a road safety problem caused by utility poles and recognises that action can and should be undertaken to overcome this problem.

A number of utility agencies have also changed their infrastructure installation guidelines and instructed their staff and contractors of the change.

The NSW RTA also provides a document entitled "Road Safety Implications of Utility Pole Placements" that can be used in the treatment of utility pole problem sites. It is available at the RTA web page:
<http://whome.rta.nsw.gov.au/roadsafety/downloads/utilitypoleplacement.pdf>

Next Steps

1. Liaison with utility authorities

There is a need for an ongoing working relationship between road and utility authorities that have infrastructure located within the roadway that pose a crash problem. This is relevant to Federal, State and Local government agencies. It is imperative that this relationship is operated at a level that ensures the relocation or protection of poles that are deemed to be dangerous. This is not just a road authority problem to be fixed after a crash event. This is a whole of community problem. The community must be provided with a more forgiving roadside environment and it must be recognised that utility poles cannot simply be dismissed as an occupational hazard for those driving within the transport corridor.

a. Utilise utility agency works programs

As it is a whole of community problem, all utility authorities must start looking toward their community obligations by addressing their pole implementation and maintenance programs.

As a first step, use has also been made of the utility authorities' condemned pole replacement program by bringing forward the replacement of poles identified as being in 'high risk' locations.

b. Opportunities for training

Scope exists for inter-agency learning workshops, so that the importance of the problem can be raised and solutions to the problem can be brought about.

2. NSW Roads & Traffic Authority

a. Addressing the utility pole problem as part of RTA's development program

The RTA's development program aims at providing new roads in developing areas or upgrading of existing roads. This can lead to the realignment of sections of road. It is generally an expensive exercise. The RTA utilises the Clear Zone in the upgrading of existing or design of new roads. However, it is not always possible to provide a Clear Zone wide enough to accommodate an errant vehicle. It is under such a situation that other mitigating measures are employed to try to overcome the problem of vehicles crashing into utility poles within the road environment. Such measures could include the use of frangible poles (especially for lighting structures), undergrounding of utility cables, erection of protective barriers and the provision of warning signs for high risk locations (as a short term measure until the problem can be rectified).

b. Monitoring of progress and development of further technical directions and guidelines

There is a need for further monitoring of statistics of road crashes involving utility poles to enable the road authority to:

- Identify the types and locations of crashes involving utility poles so that action can be taken to avoid further incidents at problem locations
- Identify progress and achievement in the reduction of fatalities and injuries resulting from road crashes involving utility poles
- Raise the awareness of the problem with relevant personnel
- Provide a basis for the development of technical directions to aid in the management of the problem

c. Training

The problem of road crashes involving utility poles must be brought to the attention of road authority traffic and safety and project development personnel so that it can be addressed in daily work practices.

Conclusion

Crashes where an errant vehicle has collided with a utility pole can result in the death of the occupant/ s of the vehicle and / or significant damage to the vehicle and the utility agency infrastructure. This type of incident results in the need for attendance by a number of emergency personnel such as Police, Ambulance and Fire Brigade. Such crashes frequently result in a death. If not, they can result in debilitating injury with significant ongoing expense to the family of the person/ s involved in the incident and the community.

There is a number of ways of dealing with existing utility poles within the road environment. There are also ways of ensuring new utility infrastructure is provided that will not be road safety problem in years to come. The NSW Centre for Road Safety is active in partnering with utility agencies and other road authorities, including local government bodies, to remove or protect utility poles. The key principles in addressing utility poles in the clear zone are:

- Moving the poles back further from the kerb
- Erecting protective structures and signage
- Usage of frangible structures, where applicable
- Undergrounding of the services.