

THE OFF ROAD TOLL – CHILDREN AT RISK IN DRIVEWAYS, YARDS AND CARPARKS

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PAPER SUMMARY

A substantial percentage of all child pedestrian deaths and injuries actually occur off road - typically in driveways, yards and car parks.

Such incidents are different in character to pedestrian casualties at normal traffic speeds and require specific research and interventions.

At the recommendation of the NSW Child Death Review Team the Motor Accidents Authority has established a broad based intersectoral steering committee to respond to this off road toll.

This paper reports on current knowledge and countermeasures regarding low speed off road child pedestrian accidents with a particular emphasis on aspects of interest to local government. These include public awareness of the hazard, advice about vehicle countermeasures and possible improvements to the design of residential developments.

INTRODUCTION

In 1999 the NSW Parliament's Child Death Review Team (CDRT) identified driveway fatalities involving young children as a particular area of concern and recommended that the Motor Accidents Authority (MAA) in conjunction with relevant agencies implement a number of recommendations in relation to this issue.

The CDRT Report found that 17 children died in these circumstances in NSW between 1996 and 1999. Figures from the Children's Hospital at Westmead indicate that between

November 1995 and February 2000 42 children were admitted to that hospital alone having been injured in similar circumstances (Holland, JA et al 2000 192).

In response to the recommendations of the CDRT the MAA established a broad based intersectoral steering committee comprising relevant stakeholder representation and commissioned Dr Michael Henderson to assist the project committee to develop a program to respond to this issue.

Dr Henderson's report (2000) recommended that several complementary measures be

developed in a multi disciplinary approach focusing on human behaviour, environmental design and modification to vehicle design and equipment, along with further relevant research.

THE PROBLEM

The driveway and yard are often viewed as safe areas for play with the potential risks for children, particularly from slow-moving vehicles, not well recognised by the community.

To date the occurrence of accidents in driveways has not been consistently reported, in part because there is no one agency responsible for the collection and reporting of data relating to motor vehicle accidents outside the road reserve, and possibly also because of the intensely tragic aspects of individual cases. Those researching the nature of such accidents must look to coroner's records, hospital separations, and, in one recent study ambulance responses to gather data.

An overview of research outcomes suggests that around 10% of all child pedestrian deaths and injuries occur 'off road' with 19 pedestrians under 6 years killed in NSW in off road motor vehicle accidents over the period 1995-2000. These off road accidents typically occur in driveways, yards and car parks.

For toddlers the proportion of fatalities is much higher, with nearly half of pedestrian deaths occurring off road.

Such incidents are different in character to pedestrian casualties at normal traffic speeds:

- Children under 3 are the most likely to be killed or injured in driveways
- Many of the young children who are not killed sustain severe injuries with 'drive over'

accidents typically involving head, chest and lower limb injuries

- The driver of the vehicle is usually a parent, family member or friend
- The vehicle is usually reversing very slowly.

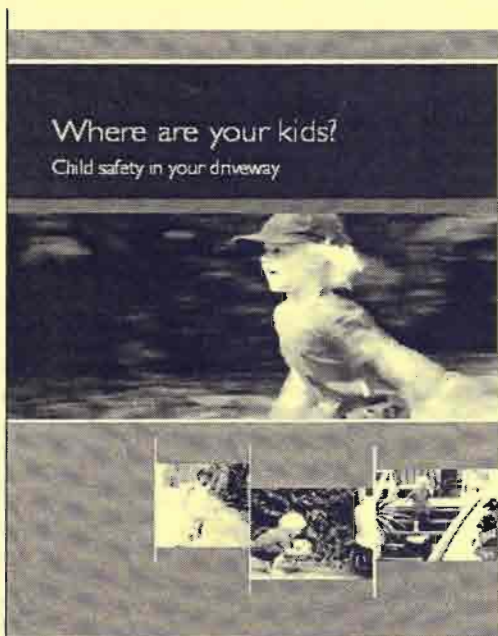
INTERVENTION

Opportunities for intervention to reduce this tragic toll reflect a multi faceted approach including improving behaviour, modifying the driveway environment, and, changes to motor vehicles.

Behaviour

In a study funded by the MAA, Dr Ann Williamson from the NSW Injury Risk Management Research Centre, considered driveway deaths as part of 'Analysis of motor vehicle related fatalities involving children under the age of 6 years'. Using coroner's records this study formally identified a key pattern associated with off road fatalities. Over half of all off road pedestrian fatal accidents and two thirds of all driveway accidents occurred when unsupervised children, left in a location thought by the parent or carer to be safe, found their way outside and into the path of a vehicle.

The report also indicated that this behaviour is likely to be linked to the developmental stage where children are increasingly mobile and curious and refining their ability to imitate. In some cases improved child mobility may also have caught the carer off-guard.



Through the steering committee the MAA is working with stakeholders to raise awareness of risks associated with driveways and to highlight the need for supervision. Specifically a brochure (pictured) has been produced and is being distributed statewide and MAA funded grants have been made available for local government, health or community agencies across NSW for community based activities. The NRMA Insurance Group has also produced a radio advertisement to raise awareness of driveway safety issues.

The Early Childhood Road Safety Education Program at Macquarie University, with the support of the RTA, has produced a number of poster and flyer style resources to raise the issue at Early Childhood Education Centres.

Environment

A New Zealand (Murphy et al, 2002) study aimed to describe the incidence and demographics of children injured by slow moving vehicles in Auckland driveways with data collected through interviews and 'on site' inspections.

Inspections at the accident scene highlighted that none of the driveways involving injury accidents had any fencing to separate them from the rest of the property. This study also noted that the family home was the most common site for such an accident followed by the home of the daytime carer. Rental properties were also over represented.

An MAA sponsored workshop to examine environmental options for reducing driveway risk concluded that it was relevant to draw attention to aspects including the:

- driveway gradient
- siting and design of the house in relation to the driveway
- interface between the driveway and the street
- creation of safe areas through the clear separation of designated vehicle manoeuvring routes/areas from child play areas.

In addition clever building design may facilitate the use of temporary measures such as child proof door locks and temporary fencing. It was also noted that encouraging forward movement of vehicles, rather than reversing, might contribute to a reduction of the risk of such accidents.

Standards New Zealand has developed Standard NZS 4102:1996 Safer House Design which includes recommendations with regard to the location and design of driveways. Smart Housing, an initiative of the Queensland Department of Housing, also includes recommendations for improved driveway safety. Opportunities for the preparation of similar standards or guidelines in NSW are currently being examined.

Vehicles

The vehicles involved in driveway child fatalities are more often 4 wheel drives or commercial vehicles, however family sedans are also involved.

Small children can be impossible to see from inside a vehicle especially if they are behind it.



In a study funded by the MAA, measurement of the rearward field of view for a range of popular passenger vehicles revealed most had a very poor view of objects the size of toddlers behind the vehicle. This was the case with conventional sedans as well as 4 wheel drives. The NRMA Insurance Group has conducted further testing and the results have been published on the NRMA website: nrma.com/reversing

The MAA study examined two vehicle related countermeasures that are intended to aid drivers: a proximity sensor that warns the driver when an object is behind the vehicle and visual aids such as video cameras. Theoretical analysis of proximity sensors shows that in order to be able to stop in time, the reversing speed in km/h should be no more than twice the detection distance in metres. Proximity sensors that are designed as a parking aid have a typical detection distance of 1.5m and so the maximum reversing speed is 3km/h. This is likely to be totally inadequate for typical driveways situations. With current technology, lengthening the detection distances is likely to result in too many false alarms. Video camera systems were found to be useful but wide-angle lenses and similar visual aids were found to be inadequate. Initial results suggest a combination of proximity sensors and video camera would provide the best

technical assistance to the driver. More information about these studies is available in Paine and others (2003).

It has been suggested that backup beepers, as fitted to some commercial vehicles, could be used to improve driveway safety. However, in research to determine preschool children's response to a commercial back-up warning alarm in a mock setting none responded appropriately to the alarm. There have also been reports of children being attracted to the sound of these alarms. This highlights that, while this type of device might assist older pedestrians to avoid reversing vehicles, it should not be characterized as a countermeasure for reducing driveway death and injury to preschoolers.

Building on the MAA work, the RTA is currently looking at the development of technical specifications for proximity sensors and video devices. In the meantime a consumer guide has been prepared and placed on the MAA website maa.nsw.gov.au to assist prospective purchasers of such equipment.

LOCAL GOVERNMENT

Local government is well placed to complement statewide initiatives with local activities designed to raise awareness of driveway safety issues and countermeasures in their communities.

Under the title 'Driveway Safety Project: A partnership to promote child road safety in the Ryde community' Ryde City Council with others including the Early Childhood Road Safety Education Program forged the way for community based projects working to refine driveway safety messages and produce and distribute a number of resources to raise awareness of identified issues.

In particular the project developed a practical demonstration of the limited vision of a driver of small children to the

rear of a vehicle. This demonstration kit, with four small models placed at a range of distances behind a vehicle, shows clearly that drivers cannot rely on rear vision to detect toddlers behind a car. This kit is now available for loan across the state.

MAA Driveway Safety Grants have recently been announced. This initiative has resulted in a range of local actions to promote driveway safety from library and health centre displays to letterbox drops of multi lingual driveway safety flyers. Some communities are paying special attention to reaching isolated families and driveway safety is also being linked to other events with a similar target audience for example occupant restraint fitting days.

One local project is focusing on driveway safety in a caravan park with consultations with residents to be conducted to identify issues and possible countermeasures.

Local government can also contribute by encouraging better designs of residential developments. These should endeavour to separate children's play areas from driveways and reduce the risk of young children accidentally straying into a danger area.

FUTURE DIRECTIONS

Work to progress appropriate environment and vehicle modifications is ongoing and important however such countermeasures cannot fully eliminate the risk in these circumstances and there will never be a substitute for careful supervision of young children.

To further promote awareness of the issues and countermeasures including supervision consideration is currently being given to the form of a broad based media campaign.

Further research is also being sponsored by the MAA. Specifically the Children's Hospital at Westmead is

conducting a three year prospective study of children injured in driveway accidents. The study will involve the completion of a comprehensive survey as well as a site visit to gather environmental data.

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NSW Health, Kidsafe (NSW), The Children's Hospital at Westmead, RTA, Early Childhood Road Safety Education Program at Macquarie University, NRMA Insurance Group, NRMA Motoring and Services, NSW Injury Risk Management Research Centre, Australian Transport Safety Bureau, Michael Henderson, Michael Paine and Hans Westerman.

* indicates available on MAA website

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