Reassessing the Function of Safety Barriers

Connell, D., Black, D. and Dal Nevo, R.
NSW Centre for Road Safety; Roads and Traffic Authority, NSW

INTRODUCTION

The RTA’s NSW Centre for Road Safety (CRS) has been tasked with improving road safety throughout the state. The “Safe Systems” approach has been adopted by the RTA. This concept accepts that drivers will make mistakes and that crashes will occur. However by providing forgiving roads, improved roadside environments and safer vehicles the severity of these crashes can be lowered, thus reducing road crash trauma.

When drivers make mistakes and vehicles leave the road, it is not always possible to provide ample clear zones to either correct their error or come to a stop safely. In situations where it has not been possible to design out a hazard, the use of safety barriers plays a significant role in providing a safer road environment.

There are a number of safety barrier types available for use. Deciding where and when to use a particular type of safety barrier is made more difficult by the limited information available about the performance of different barrier types and different products within those types. Amongst other criteria, performance includes both the ability of the barrier to redirect an errant vehicle in differing road environments and how safely it does so.

This presentation will focus mainly upon the use of wire rope safety barriers (WRSBs) and how the RTA’s NSW Centre for Road Safety together with Engineering Technology Branch (ETB) is undertaking research into new opportunities for its use. The presentation will revolve around footage from the crash testing program.

WHY RESEARCH SAFETY BARRIERS?

Typically, the only information available about safety barrier performance is that derived from the crash tests carried out by the manufacturer/supplier to demonstrate that their product passes a particular test standard.

Two such test standards are National Cooperative Highway Research Program (NCHRP) Report 350 [1] in the USA and in Europe, the European Committee for Standardization, EN1317 [2]. The scope of such testing is limited to straight sections of a barrier of unspecified length and on near to flat terrain, the use of a vehicle of unspecified make and an arbitrary type, mass, speed and impact angle. The requirements differ between the two test standards.

The limited data provided makes it difficult to derive standards for safety barrier usage and hence to improve road safety.

The RTA is using a multi faceted approach to resolve this dilemma. This is through:

- using targeted crash testing to derive predictions of performance in critical situations, simulating real world situations where crash severities are likely be high
- comparative crash testing between WRSB, Guardrail and Concrete safety barriers with different classes of vehicle impacting them
- observing and recording barrier deflection angles and timings
- conducting on-road trials and result analysis.
- analysing statewide crash data
- developing a future crash testing program to define which safety barriers should be used in certain situations

This approach is opening up new opportunities for the use of wire rope safety barriers as they are performing as well and often better than older barrier types.
CONCLUSION

The ability of a safety barrier to reduce the trauma for vehicle occupants when their vehicle impacts with the barrier is critical. The level of damage an impact with the barrier causes to the vehicle may be a secondary indicator in that the more damage there is to a vehicle, the higher the expectation of trauma to the vehicle occupants.

In reducing road trauma, the impact of a crash on vehicle occupants is of significant interest.

REFERENCES
