# DEVELOPING A CLEAR ZONE STRATEGY FOR THE DUKES HIGHWAY – A SAFETY PERSPECTIVE

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## INTRODUCTION

The Dukes Highway is some 190 km long, about one quarter of the 725 km road distance between Adelaide and Melbourne. It connects the South Eastern Highway, which is predominantly freeway or dual carriageway, out of Adelaide to the Western Highway from Melbourne and the Riddoch Highway in the State's South East (Figure 1).


**Figure 1**: Location of Dukes Highway

An Adelaide to Melbourne road corridor study identified a roadside hazards strategy as one of the highest priorities for the corridor.

Significant federal funds have been committed to the Dukes Highway over the next several years with reference to the Safe System framework as per the National Road Safety Strategy and supported by road trauma reduction targets in South Australia's Strategic Plan.

The roadside hazard treatment program will be one of the largest single roadside hazard projects yet undertaken in South Australia.

## DISCUSSION

The number of serious crashes occurring on the Dukes Highway has been a particular concern. Crashes resulting from a vehicle leaving the road have accounted for over 40% of casualties on the highway (Figure 2). Eighteen per cent of these were fatal.

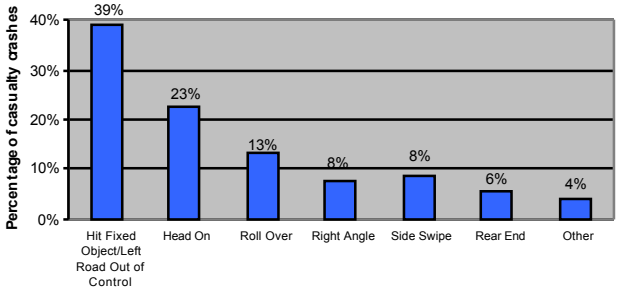


**Figure 2**: Crashes by crash type

Shoulder sealing, audio-tactile line marking and overtaking lanes have all been implemented over recent times and rest areas upgraded but the unforgiving roadsides remain an issue. Casualty crashes have reduced but fatal crashes have remained relatively static (Figure 3).

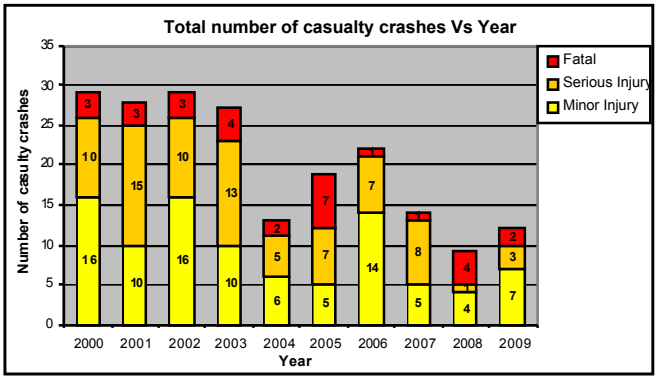


**Figure 3**: Casualty crashes by year

In response to rising community concerns following a series of fatal and serious crashes on the highway, a road safety summit was held at the town of Tintinara in November 2008.

The Dukes Highway carries significant volumes of traffic, a high percentage of heavy vehicles and is flanked by vegetation and trees on each side (Figure 4).

There were no specific departmental policies governing roadside clear zone widths or the use of safety barriers. Improving road safety and environmental protection of roadside vegetation are both subject to several State strategic plans. Potential treatments for roadsides include initially, considering increasing the clear zone width by relocating or removing hazards, followed by considering the installation of safety barriers to reduce crash severity.

**Figure 4**: Typical section of the Dukes Highway

Austroads [1] recommends a recoverable clear zone of 9 metres or more for high speed roads based on past studies and recommendations which should allow an estimated 80% of errant vehicles to recover before striking a hazard, provided that the clear zone is kept and maintained in a drivable state. Other research evidence suggests 85% of the safety benefits of a 9 metre clear zone will be captured within the first 6 metres [2]. Recent research (pending publication) has cast some doubt on the assumed efficacy of clear zone theory in the context of a Safe System approach to road safety, suggesting that safety barriers may be the best option for ameliorating left road crashes.

Evidence suggests that wire rope barrier can be expected to reduce casualty crashes by 90% and w-beam barrier by up to 50%. Barriers need clear space behind for deflection when hit. Wire rope barriers being more flexible require at least 0.5m more clear space behind than w-beam. Room also needs to be provided in front of barriers to cater for vehicle breakdown and the movement of over-width vehicles.

## PROCESS

To assist in determining the impact of creating an incremental clear zone, a pilot vegetation survey was carried out on a 60km section of the highway that is more heavily vegetated (Figure 5). Road reserves contain some of the last remaining areas of remnant native vegetation. Legislation provides protection and makes provision for an offsetting mechanism when vegetation removal is necessary, involving significant on-ground revegetation or monetary payment into the Native Vegetation Fund (NVF). By adopting narrower clear widths, particularly in locations with concentrations of high value vegetation, environmental impacts and costs may be minimised while still being able to reduce crash risk.

The vegetation survey was followed by cost estimates for on-ground revegetation or payment into the NVF plus ongoing vegetation control. The most likely scenario assumed was some combination of both, and more particularly for wider and more extensive clear zones. Therefore, for a 6m clear zone, and 100% payment into the NVF, the estimate is $40,000 per km. However, for a 9m clear zone and an assumption that clearing from 6m to 9m requires on-ground revegetation, the relative estimate is $280,000 per km.

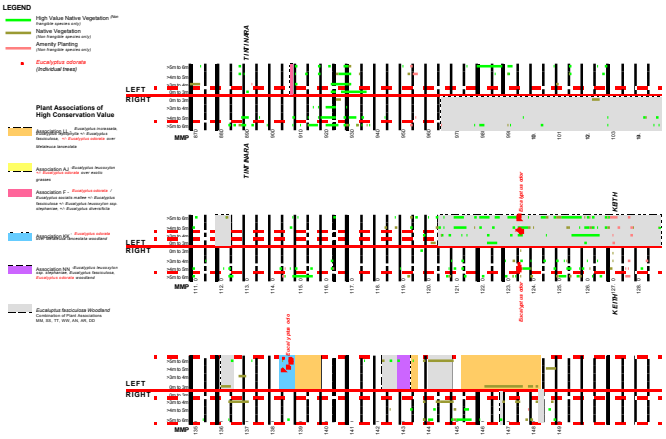


**Figure 5**: Pilot vegetation survey

Based on a brief assessment of possible vegetation removal or safety barrier requirements for the surveyed section, indications were that only a very marginal BCR could be achieved for vegetation removal alone to 5-6m width while the BCR for installation of barriers (with necessary vegetation removal) was likely to be greater than 1.

An internal consultation process, involving discussion papers and running over many months, has led to a preferred plan. A formal submission has been endorsed by the Native Vegetation Council.

## OUTCOMES

The final outcome proposes a target clear zone width of 5 to 6 metres (with payment to NVF) and flexible barrier protection on curves and at other high risk locations.

A Roadside Hazards Strategy is now being finalised for the Dukes Highway. This is being developed in conjunction with various options for traffic separation treatments, including narrow painted medians and wire rope median barrier to address cross centreline crashes.

It is likely that this work will influence Department for Transport, Energy and Infrastructure clear zone policy into the future.

## REFERENCES

1. Austroads, 'Guide to Road Design Part 6: Roadside Design, Safety and Barriers', Austroads Ltd, 2009 15.
2. S Levett, 'Retro-Fitting Road Safety to Existing Rural Roads', IPWEA NSW Conference, 2007.

**This extended abstract has NOT been peer reviewed.**