An Analysis of Run-Off Road Loss of Control Crash Types on Rural Roads

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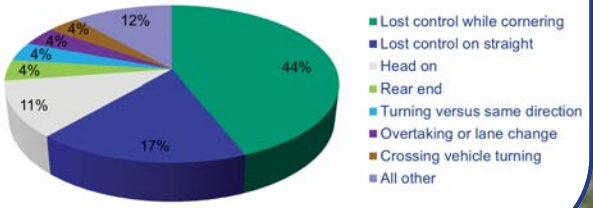
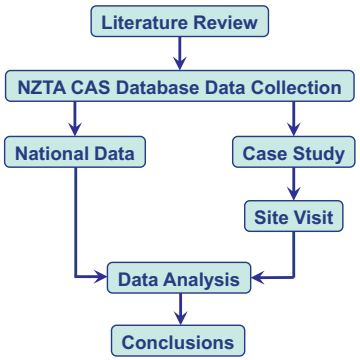
Introduction

Run-off road loss of control type crashes have been identified as a serious issue on New Zealand rural high speed roads. Loss of control crashes accounted for 61% of the total injury crashes on high speed New Zealand rural roads between 2006 and 2010. Vehicles that lose control are leaving the roadway and impacting with a variety of hazards that are located along rural roadsides. These hazards are causing severe injuries to the occupants of the vehicle resulting in significant social costs for the country.

Movement Classification of Injury Crashes on High Speed New Zealand Rural Roads between 2006-2010



Methodology

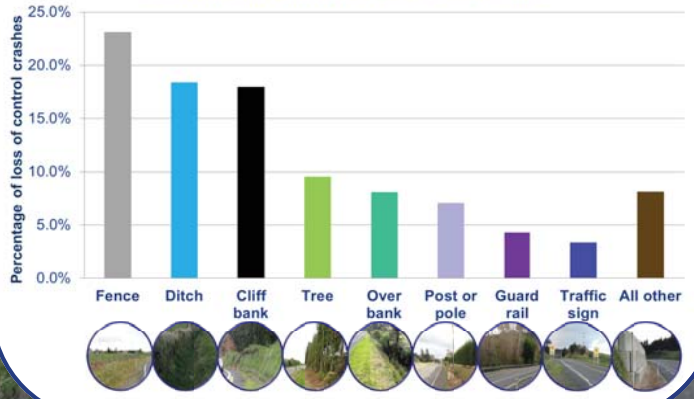


The New Zealand Crash Analysis System (CAS) was used to identify the issues that currently exist with run-off road loss of control crashes in terms of crash types, objects hit and injury severity. Potential crash sites were then located using CAS and analysis was performed to determine the suitability of these sites. Case study sites were chosen and the appropriate site specific crash data obtained. A site visit was conducted to obtain additional data and this was used in combination with CAS data to analyse run-off road loss of control crashes on New Zealand rural roads.

Objects Hit

The objects found at the roadside during site investigations were consistent with the types of objects that the CAS database recorded as being hit in run-off road loss of control crashes. The existence of these objects meant that only 3 of the 22 crash sites investigated met the recommended clear zone requirements set out by the New Zealand State Highway Geometric Design Manual (SHGDM).

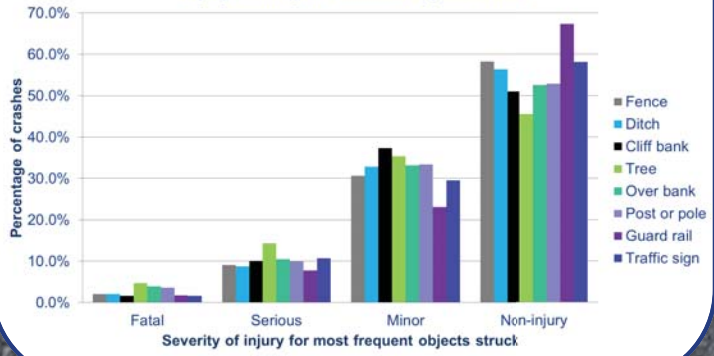
Objects Struck in Run-Off Road Loss of Control Type Crashes between 2006-2010 on New Zealand Rural Roads



Injury Severity

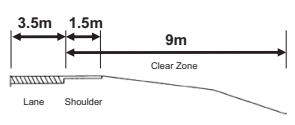
Removal of all objects at New Zealand road sides is not a cost effective option. Each type of object will have different injury implications if struck and so objects need to be assessed on a case by case basis to determine the benefits of removing an object in relation to the costs.

Injury Severity of Roadside Objects Struck



Clear Zone

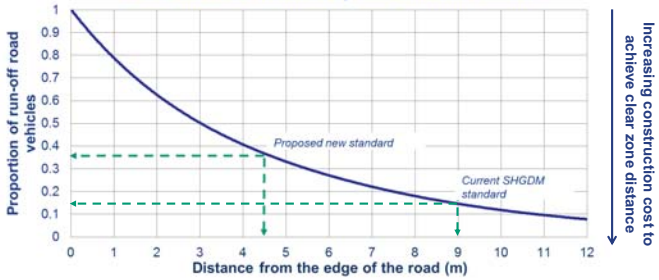
Current SHGDM clear zone standards are based on the American Association of State Highway and Transport Officials (AASHTO) standards. These standards advise the provision of 9 metre clear zones at the roadside for high volume state highways with reductions made for lower traffic volumes. Providing SHGDM clear zones was found to be an unfeasible option for a large proportion of the New Zealand rural road network due to the natural terrain and land ownership issues. The case study revealed that at some crash sites when it was not possible to meet the SHGDM standards, no effort was made to provide any clear zone at all.



Ideal clear zone according to SHGDM

Example of actual clear zone (SH2)

Lateral Distance Travelled by Run-Off Road Vehicles



Run-off road loss of control crashes are still reduced significantly from providing smaller clear zones despite not meeting the SHGDM standards. Decreasing the current SHGDM standards by a factor of 0.5 will make the clear zone distances far more realistic and achievable for New Zealand.

Conclusions

- Instead of using the AASHTO standards, NTZA should adopt standards that are 50% of these as they will be more suitable to the New Zealand road environment.
- Trees, posts, poles and traffic signs should be removed from within established rural road clear zones to minimise the risk of injury when a vehicle runs off the road.
- Guard rail should be used at high risk crash sites where the recommended clear zone cannot be provided, particularly where there is potential for “over bank” crashes.

Acknowledgments

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