The safety impacts and program benefits of Safe System Assessments

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Abstract

This paper provides results from a project that was intended to identify the estimated Fatal and Serious Injury (FSI) crash reductions application of from Safe System Assessments (SSAs). A sample of 85 SSAs were analysed based on data extracted from the SSA reports. SSAs were undertaken for three different design scenarios – normal designs, high Safe System alignment designs, and mid level planning Safe System designs. The results indicated that an additional 60-100% saving in Fatal and Serious Injury crashes can be achieved by applying Safe System principles via Safe System assessments.

Background

Despite around 15 years of the Safe System approach in Australia, there is still slow progress in embedding Safe System principles within infrastructure projects. Turner et al. (2016) developed a Safe System Assessment Framework, designed to help road agencies methodically and practically consider Safe System objectives in road infrastructure projects. Safe System Assessments (SSAs) are being conducted on VicRoads projects to determine the extent to which existing conditions and / or a proposed project align with Safe System principles, specifically with the objective to eliminate crashes that can result in fatal and serious injuries.

The purpose of this project was to determine the potential road safety benefits from SSAs. More specifically, the intention is to identify the estimated Fatal and Serious Injury (FSI) crash reductions from a program perspective (i.e. an amalgamation of various projects).

Method

A sample of 85 SSAs was analysed based on data extracted from the SSA reports. SSAs were undertaken, and FSI outcomes estimated for three different design scenarios – normal designs (original designs), high Safe System alignment designs (where Safe System principles have been applied as far as practically possible), and mid level planning Safe System designs (the design product at concept design / preliminary design stage).

Results and Conclusions

Key results from the assessment include that significant additional savings in FSI crashes can be achieved by applying Safe System principles via Safe System assessments. The results indicated that there could be expected to be a total estimated 2221 FSI crashes in the case studies based on no assumed improvement in safety (projected over a 20 year period). The estimated benefits for different types of design can be seen in Figure 1.

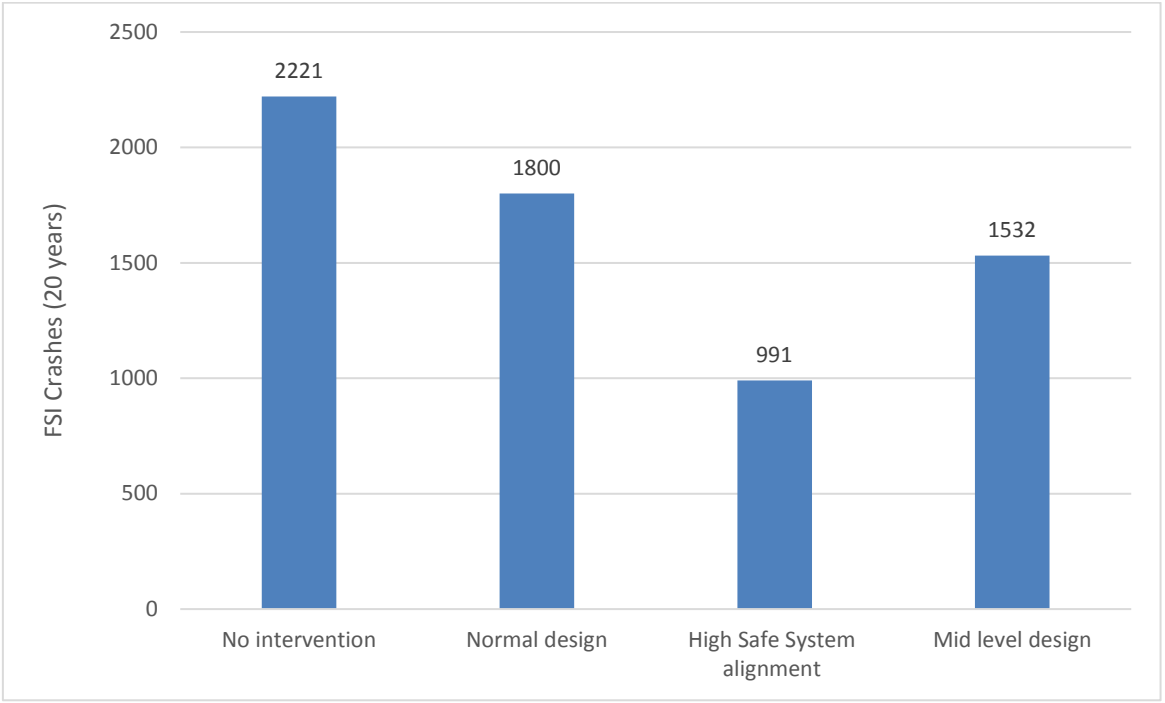

Figure 1. FSI estimates for different options

The greatest benefits for FSI crash improvement are from designs with high Safe System alignment, but there is still a substantial additional benefit (additional over and above normal design) for business case Safe System designs.

It was also identified that high Safe System alignment designs produce substantial benefits, but do not eliminate FSIs. Greater efforts are needed to achieve Safe System outcomes, including more substantive design, further innovation, and improvements in vehicle design and safety features. Given that the final mid level planning Safe System designs did not produce safety benefits as great as high Safe System alignment designs, methods have been identified to embed Safe System design principles into the business cycle Safe System designs. Methods are also required to ensure Safe System design elements are retained as part of detailed design as well as eventual construction to ensure that safety benefits are maximised.

A number of limitations were identified, but these generally led to more conservative estimates. This means that the true benefit of SSAs is likely to be greater than indicated above.

References

Turner, B, Jurewicz, C, Pratt, K, Corben, B & Wolley, J, 2016 Safe System Assessment Framework, AP-R509-16, Austroads, Sydney, NSW.