

# **An investigation into the safety benefits of Flag Lighting at New Zealand state highway intersections**

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This project aims to improve our understanding of how flag lighting (i.e. One to three lights at rural intersections) influences the number of night-time crashes. It is known that road lighting has significant safety benefits. Before and after studies both here and overseas indicate reductions in crashes of around 30% where route lighting has been improved. There is persuasive evidence from overseas that flag lighting is a legitimate and useful road safety tool but to date local information has been lacking.

The project used a database of state highway intersection crashes and intersection characteristics produced by the use of the CAS system of Police reported crashes matched to a number of databases containing road infrastructure and vehicle flow information. Statistical analyses were then carried out which suggested that the impact of flag lighting on crashes is only a little behind that of full lighting with both resulting in a reduction of the ratio of night crashes to day crashes of around 30%. Two flag lights gave a higher crash reduction than a single light at all types of intersection but particularly at crossroads. Adding further lights in excess of 2 rarely produced further crash reductions.

Rear end and hit object crashes benefited most from flag lighting. These crashes showed a 45% reduction in the night to day crash ratio. The presence of these types of crash in the crash record may be a pointer to the sites that would benefit most from flag lighting.

The flag lighting variables best indicating how flag lighting performance may be optimised were the number of luminaires per intersection and the total lumen package applied at flag lit intersections. The safety impact of the size of the total lumen package is related to the number of lights and their power.