Application of Spatial Analysis to Inform the Transport Accident Commission's Local Enhanced Enforcement Program

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Abstract

The Local Enhanced Enforcement Program, a grants program funded by the Transport Accident Commission, enables members of Victoria Police to apply for funding to target dangerous road user behaviour, such as speeding and drink driving, in their local areas. In a revamp of the program, a geospatial methodology was developed to identify parts of the road network where enforcement is likely to reduce road trauma. The results were displayed on a web mapping application assisting Victoria Police to plan and prioritise their enforcement activities. This new approach has enabled police members to quickly identify high-risk locations for local enforcement operations.

Background

Recognising the influence of police enforcement on road user behaviour, the Transport Accident Commission (TAC) invests in police enforcement activity. One example of this investment is the Local Enhanced Enforcement Program (LEEP). For over a decade, LEEP has encouraged Victoria Police members to submit applications for funding to conduct operations targeting road safety issues in their local areas, over and above their usual enforcement capacity.

Previously, applicants gathered their own data to provide evidence of a road safety issue. Feedback indicated this process was time consuming and at times difficult for those whose expertise lies in planning and deploying enforcement rather than data analysis.

In July 2016, the TAC launched a revamp of the LEEP. As part of this revamp, Abley Transportation Consultants developed a geospatial methodology and a web-based application to support police in identifying high-risk locations for targeting in LEEP funding applications.

Methodology

The first round of the revamped LEEP specifically targeted speeding on high-speed rural roads. This decision to initially focus on these roads was made because Victoria's *Towards Zero Strategy* highlighted rural roads as an area for action, due to their disproportionate levels of trauma.

The methodology to identify rural road corridors with a history of speed, high-severity crashes was based on ten years of injury crash data extracted from VicRoads' Road Crash Information System.

Using this data, each crash movement was assigned a killed or severely injured (KSI) probability in a high-speed environment. For example, it was estimated that a high-speed head-on crash results in 1.03 KSI compared to a rear end crash which results in 0.44 KSI. Using estimated KSI rather than actual KSI ensures that the approach is not wholly reactive.

A Victorian road dataset, excluding Melbourne, was segmented into corridors in GIS based on the road name, posted speed limit and hierarchy resulting in an average corridor length of 5km. Only corridors that matched the criteria given in Table 1 were analysed.

The road stereotype criteria were used to exclude motorways and other Safe Systems compliant roads where the proportion of KSI is expected to be lower than undivided roads.

Only crashes caused by speeding were used to inform the analysis. To estimate cause, speeding was assumed to be a causal factor in all overtaking and loss of control crashes. Furthermore, only crashes that occurred during clear weather conditions were included (Highway Safety Information Systems, 2010).

Table 1. Criteria for High-Speed Rural Roads Analysis

Attribute	Criteria
Road Hierarchy	Sub-Arterial or above
Road Stereotype	Undivided only
Speed Limit	≥ 80 km/h

A corridor risk value was calculated as the sum of the estimated KSI of all speed-related injury crashes along the corridor. This value was then moderated by the corridor length and used to rank corridors in terms of speeding risk. 'High' and 'Medium-High' risk corridors equated to 10 percent of Victoria's high-speed rural road network and targeted more than 50 percent of estimated KSI.

Application

Figure 1 shows a screenshot of the web application displaying the results of the high-speed rural roads analysis.

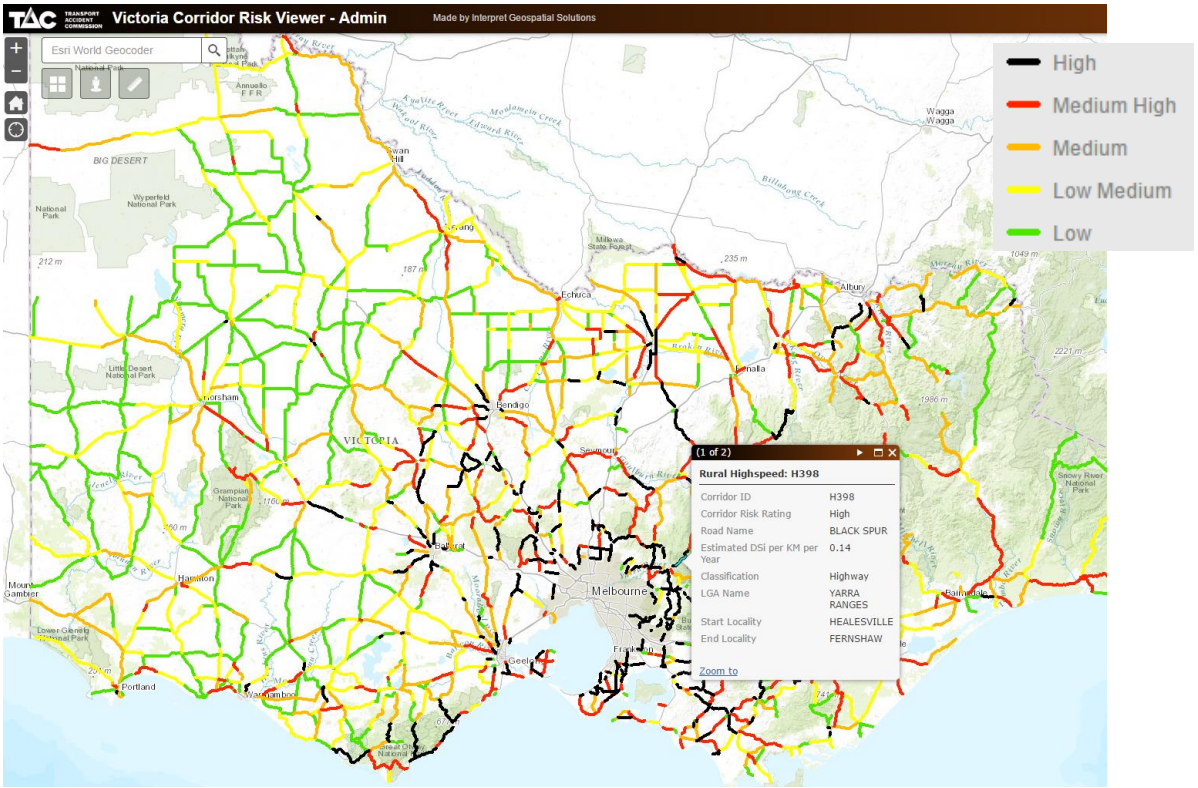

Figure 1. Screenshot of Web Application Showing High-Speed Rural Roads Analysis Results

Since the launch of the web application, the TAC has received over 220 applications to fund enforcement operations. Feedback from police indicates that the application is also being used to inform business-as-usual road policing. The web application provides the TAC and Victoria Police with a robust evidence base for local enforcement activity.

References

Highway Safety Information Systems. (2010). Development of a Speeding-Related Crash Typology – Summary Report. McLean, VA: Author.