Transverse line marking trial undertaken in the Adelaide Hills

Christopher Stokes, Jeremy Woolley

Centre for Automotive Safety Research, The University of Adelaide

Abstract

Transverse line marking has been used previously to reduce approach speeds before hazardous intersections. This treatment was selected for use at one approach leg of a hazardous intersection in the Adelaide Hills, South Australia. Speed measurements were taken over two-week periods before and after implementation of the treatment in July 2015, and again in 2016. Inconsistent results meant that it was unclear whether the treatment was effective at reducing traffic speeds. The results of this study highlight the importance of replicating treatments at multiple locations in order to garner robust results.

Background

While the use of line markings to warn motorists of hazards and encourage reduced speeds is not new (e.g. zig-zag markings prior to school zones in Australia), transverse line marking as a means of reducing speeds on approach to hazardous intersections from the major (right of way) road is a relatively new concept in Australia. The limited numbers of real-world and simulator trials undertaken in Australia and New Zealand have been somewhat successful in reducing intersection approach speeds (Charlton, 2003; Macaulay et al., 2004; Martindale & Urlich, 2010). Some studies showed that speed reductions were greatest at the start of the transverse line markings but dissipated before the end of the treatments. Experience in the United Kingdom, where transverse line marking is more commonly used, has shown the treatment as effective for reducing the number of crashes at intersections (Helliar-Symons, 1981).

Cudlee Creek trial

In July 2015, the Department for Planning, Transport and Infrastructure (DPTI) undertook the trial installation of transverse line marking at an intersection in Cudlee Creek, located in the Adelaide Hills in South Australia. Since 2008, five crashes, including four casualty crashes, have occurred at this location. All five involved a vehicle travelling westbound along Cudlee Creek Road (80 km/h speed limit) colliding with a vehicle turning right from Fox Creek Road (four crashes) or turning right from Cudlee Creek Road onto Fox Creek Road (one crash). As such, it was decided to trial the treatment along the westbound approach leg (Figure 1).

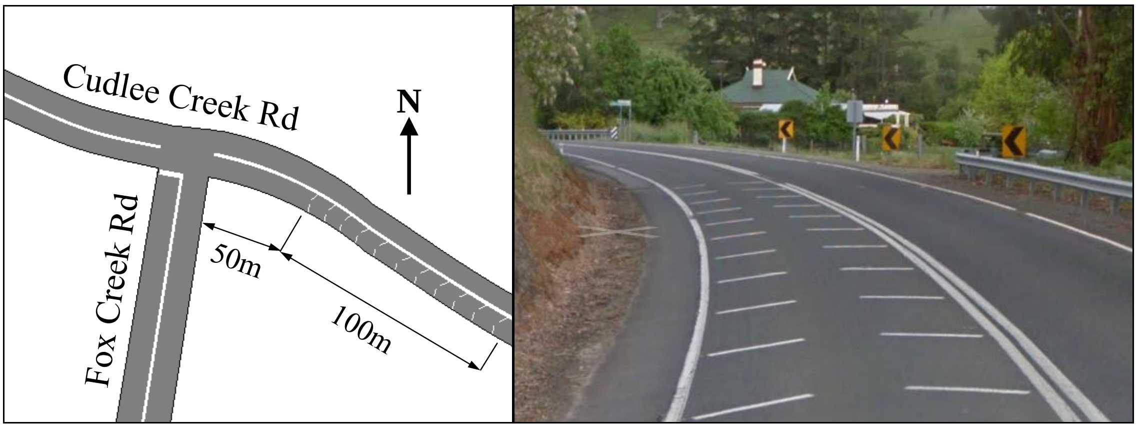

Figure 1. Illustration of transverse line marking (left) and photo of transverse line marking looking westbound along Cudlee Creek Rd (right)

Methodology

Speed measurements were taken over two-week long periods immediately before and after the transverse line markings were implemented, and again six months after implementation in February 2016. Measurements were taken along Cudlee Creek Road for both directions of travel 250m, 150m and 50m east of the intersection and 50m west of the intersection.

Results and discussion

Reductions in 85th percentile speed were observed 50m west, 50m east and 250m east of the intersection in the westbound direction. A very slight reduction in speed was seen 150m east of the intersection, where the treatment began. The greatest speed reduction was seen 50m before the intersection at the end of the treatment (2.0 km/h).

Reductions in 85th percentile speed were also observed in the eastbound direction and were comparable to those in the westbound direction. As no transverse line markings were implemented for eastbound traffic, these results suggest that speed reductions at the site were due to effects other than road user response to the transverse line marking.

Reductions in 85th percentile speeds six months after the installation of the transverse line marking were similar in magnitude in both the westbound and eastbound directions. The largest of these speed reductions was at a location where the transverse line marking was not visible (250m east the intersection). These results add further credence to the idea that speed reductions were not due to the installation of the transverse line marking.

Table 1. Speed measurement results (all speeds in km/h)

	Direction	**50m West**	**50m East**	**150m East**	**250m East**
85th percentile speed (before)	West	76.9	78.4	82.8	86.8
	East	81.6	78.7	86.7	86.8
85th percentile speed (after)	West	75.7	76.4	82.7	86.1
	East	81.2	77.6	86.5	85.6
85th percentile speed (6-month)	West	75.7	78.5	81.8	83.8
	East	78.5	79.3	85.2	83.3
Change in 85th percentile speed (before to immediately after)	West	-1.2	-2.0	-0.1	-0.7
	East	-0.4	-1.1	-0.2	-1.2
Change in 85th percentile speed (before to six months after)	West	-1.2	+0.1	-1.0	-3.0
	East	-3.1	+0.6	-1.5	-3.5

Conclusions

The results of this study suggest that 85th percentile speeds reduced after the installation of transverse line marking, but that this may not be a result of the installation. A major drawback of this study is that only one site was treated. For this reason, it is unknown whether the seeming lack of effectiveness of the treatment was site-specific or would be seen on a wider basis. The results of this study highlight the importance of replicating such treatments at multiple locations in order to garner robust results. This is especially important for treatments such as transverse line marking, where the magnitude of expected outcomes could be overshadowed by the effects of background conditions.

References

Charlton, S. (2003). Development of a road safety engineering modelling tool. Hamilton, New Zealand: The University of Waikato.

Helliar-Symons, R. (1981). Yellow bar experimental carriageway markings - accident study. Crowthorne, United Kingdom: Transport Research Laboratory.

Macaulay, J, Gunatillake, T, Tziotis, M, Fildes, B, Corben, B, & Newstead, S. (2004). On-road evaluation of perceptual countermeasures. Canberra, Australia: Australian Transport Safety Bureau.

Martindale, A, & Urlich, C. (2010). Effectiveness of transverse road markings on reducing vehicle speeds. Wellington, New Zealand: NZ Transport Agency.