How to change driver behaviour

Koala Vehicle Strike Fact sheet 3

Roads, cars and koala vehicle strike

Vehicle strike is one of the biggest impacts of roads on wildlife. Efforts to address this show that with proper planning and management wildlife vehicle strike is potentially manageable.

The NSW Koala Strategy (2018) recognises vehicle strike as a key threat to koalas in New South Wales. Approaches to reduce the number of koalas hit by vehicles include keeping wildlife off the road and changing driver behaviour.

Decisions on what strategy to implement will largely depend on balancing feasibility, budget, context of the vehicle strike location (e.g. urban or rural), type of road (e.g. minor or major), speed limit and likely effectiveness of the measure.

This fact sheet provides information about how driver behaviour can be changed by reducing vehicle speeds and/or increasing driver vigilance and therefore reducing wildlife roadkill. It is one in a series of four fact sheets about koala vehicle strike that include:

- Fact sheet 1: Wildlife vehicle strike and contributing factors
- Fact sheet 2: How to keep koalas off the road
- Fact sheet 4: How to record koala vehicle strike and monitor mitigation efforts.

Changing driver behaviour

To reduce koala vehicle strike, vehicle drivers have been encouraged to:

- slow down
- be more vigilant when driving through known koala areas and take note of roadside warning signs and seasonal signs
- be aware of pavement treatments and rumble strips
- take notice of speed limits.

These strategies have largely been unsuccessful, although most have not been subjected to well-designed trials. In general, measures aimed at changing driver behaviour should only be considered if exclusion of koalas from the roadway (see Fact sheet 2: How to keep koalas off the road) is not an option.

Vehicle speed

Studies demonstrate that lower vehicle speeds:

- reduce the incidence of wildlife vehicle strikes (Huijser et al. 2015; Winnett & Wheeler 2002; Glista et al. 2009; Jones 2000; Hobday & Minstrell 2008)
- reduce the severity of injuries to animals
- increase the likelihood of wildlife surviving the collision (Huijser et al. 2015; Dique et al. 2003; Biolink 2017).

Figure 1 Example of a static koala sign (a) and a dynamic koala vehicle-activated sign (b) installed in the Ballina Local Government Area. (Sandpiper Ecological)

Warning signs

Driver warning signs are the most common vehicle-strike mitigation measure (Huijser et al. 2015). Standard warning signs typically feature an image of a koala against a yellow background (Figure 1a). Signs can indicate seasonal speed reductions (i.e. August–December in Redlands, Qld) and advise night-time speed reductions (e.g. Tasmania). Standard signs can become increasingly ignored over time because drivers habituate to their presence (Huijser et al. 2015).

Enhanced or dynamic signs, such as vehicle-activated signs and variable message signs, are also used to warn drivers they are entering a koala zone (Figures 1b and 2). Drivers are more likely to notice these signs than standard static signs. Driver recall of dynamic signs is higher if a sign relates to a relatively short section of road and is targeted at a specific time of day or season (Huijser et al. 2015; Bond & Jones 2013; Collinson et al. 2019; Found & Boyce 2011; Sullivan et al. 2004).

An Australian study on koala vehicle strike and seasonal speed-limit signs reported marginal reductions in vehicle speeds and koala vehicle strikes (see Case study).

Overall, the impact of current signage is marginal to ineffective in causing drivers to slow down on roads in areas occupied by koalas.

Advantages of warning signs
Relatively low cost
Low maintenance
Easily relocated
Variable message signs may reduce likelihood of habituation
Vehicle-activated signs can record vehicle speed, which can help measure compliance
Disadvantages of warning signs
No demonstrated reduction in koala vehicle strike linked to installation of warning signs
Drivers become habituated to signs
Risk of vandalism

Figure 2 A constantly scrolling variable message sign installed in the Tweed Local Government Area (a), Photo: Sandpiper Ecological, and a mobile variable message sign in the Illawarra region (b). (David Chenery)

Case study: Koala speed zone trial

High numbers of koalas were being hit by vehicles in the Redlands Local Government Area (LGA) in south-east Queensland. Council implemented a seasonal speed-reduction trial using static signs (Figure 3). The 4-year trial reported:

- marginal reductions in vehicle speeds
- marginal reductions in koalas being hit
- koalas struck by vehicles on lower speed-limit roads had a greater chance of surviving (Dique et al. 2003).

Koalas hit on lower speed-limit roads in Lismore LGA also had a higher chance of survival (Biolink 2017).

Figure 3 A static sign used in a seasonal speed-reduction trial. (Deidre de Villiers)

Koala zone road surface marking

Koala zone road surface marking or painting is one method of highlighting a koala vehicle-strike hotspot for drivers. This strategy is used in combination with warning signs to encourage drivers to reduce speed and increase vigilance.

Koala zone road surface marking and a variable message sign were applied to a hotspot in the Tweed Local Government Area in 2015 and monitored for 2 years (Figure 4). The results showed a 12% increase in the number of drivers travelling at or below the speed limit after installation of the road treatment (S. Hetherington, Tweed Shire Council, pers. comm). Two fatal koala vehicle strikes occurred during the monitoring period. Unfortunately, no baseline monitoring of vehicle strike occurred before the road treatment, so it is unclear whether there was a reduction in the rate of vehicle strikes due to the treatment.

The combination of road surface marking and variable message signs may result in drivers reducing speed, but its impact on koala vehicle strike is inconclusive.

Advantages of road surface marking
Relatively low cost
Consistent branding of hotspots
Reinforces other treatments such as speed reduction signs, rumble strips
May help with driver compliance to speed limit
Disadvantages of road surface marking
No demonstrated reduction in koala vehicle strike linked to pavement marking
Requires periodic reapplication due to road wear

Figure 4 Koala zone road surface marking adjacent to a variable message sign installed in the Tweed Local Government Area. (Sandpiper Ecological)

Wireless identification activated signs

Wireless identification (WID)-activated signs are based on catching koalas that live near a vehicle strike hotspot and applying WID ear tags. If a tagged koala approaches the road, dataloggers detect the tag and activate nearby warning signs.

This approach is limited by:

- ensuring all koalas living in the area are tagged
- costs associated with monitoring roadside verges for koalas to capture and tag
- the possibility that tagged koalas sitting in roadside trees may constantly activate a nearby sign.

Furthermore, from the driver's perspective, there is no difference between dynamic signs that are activated at random intervals and those that are activated by nearby wildlife. The problem of driver habituation over time will likely be the same for both types of sign. WID-activated signs require much more intervention and cost for a similar result to standard dynamic signage.

This strategy may have a marginal effect on reducing driver speed and koala vehicle strike, but likely no more than a standard dynamic sign.

Advantages of WID-activated signs
Highly targeted to koalas
Dataloggers are effective in detecting WID tags
Disadvantages of WID-activated signs
Requires capture of local koalas (and recapture at end of WID battery life)
System only applies to tagged individuals
Activated sign feature of system yet to be trialled so effectiveness is unknown
Theft of data loggers
Expensive

Rumble strips

Rumble strips are raised rubber strips that cause a vehicle to vibrate with a loud noise as the tyres roll over the strips. The sound and vibration potentially alert wildlife and encourage drivers to slow down. Wildlife vehicle strike was substantially reduced on a remote road in north-west Tasmania fitted with a series of rumble strips compared to control roads that had no rumble strips (Lester 2015). Monitoring occurred for 3 months, so wildlife and driver habituation were not assessed.

Rumble strips are more appropriate in locations away from residential areas because of the noise they make. They are not safe for roads with speed limits over 60 kilometres/hour.

Advantages of rumble strips
Reduced wildlife vehicle strikes at a remote location in Tasmania
Relatively low cost
Disadvantages of rumble strips
Noise may disturb nearby residents
Drivers and/or nearby wildlife may habituate to the noise
May require periodic reapplication due to road wear

Other measures

Clearing roadside vegetation or adding street lighting may help increase the visibility of koalas and other wildlife approaching or crossing the road. The effectiveness of such measures in reducing vehicle strike is unknown.

Fixed and average speed cameras may help reduce vehicle speeds at koala vehicle strike hotspots. Speed cameras require approval from state agencies such as the NSW Roads and Maritime Services and NSW Police. Revenue generated from fines could be used for koala conservation (Biolink 2018).

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More information

Find out more about koalas on our Koala webpage.

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