

## THOUGHT LEADERSHIP

# Fitting Bull or Roo Bars: Net Gain or Loss?

*Dr. David Logan*

When it comes to road safety, the overall benefits of some measures are both obvious and supported by research. The potential for bruising or other minor injuries from a seatbelt in a crash is far outweighed, for example, by the seatbelt's ability to stop vehicle occupants heavily impacting the steering wheel or windscreen. Airbags could fit into the same category.

When it comes to the benefits, or otherwise, of fitting bull or roo bars to vehicles, the net benefit-loss equation is not so clear.

Many drivers and fleet managers who install bars on the front of vehicles believe it will prevent vehicle damage in collisions with animals, and protect the driver or passenger by preventing the animal flying through the windscreen.

For companies who work in regional and remote areas, where animal strikes are more likely, there may be operational reasons that make bull or roo bars a rational choice. But there is little data to show if animal collisions are common enough to warrant fitting bars.

Each year, around 100 deaths and 590 hospitalisations occur to drivers of passenger cars, utes and 4WDs on the roads of country New South Wales. Of these, animal impacts account for two deaths and 15 serious injuries, according to Monash University Accident Research Centre data for NSW between 2016 and 2018.

Figures from one major insurer indicate that so far in 2021, animal strikes accounted for 5 per cent of claim incidents (see Figure 1), while analysis from another major insurer of two large clients showed frequency of animal strike claims was around 1 per cent. There was an average of 55 claims per year over the six years from 2015 to 2020, at an average claim cost of about \$4,200 per claim (Figure 2).

The most common time of day for hitting animals is in the early morning and at dusk; claims are more common during winter, likely due to more hours of driving in darkness; and New South Wales, Victoria and Queensland account for the majority of claims.

However, there is little evidence that supports the effectiveness of bull or roo bars to protect vehicles from damage and occupants from injuries in a crash, and research shows bars create far worse crash injury outcomes for occupants of other vehicles and pedestrians. It is also likely bars increase damage caused to other vehicles in crashes, and could interfere with the operation of safety equipment, particularly airbags.

### *So, we asked a road safety expert...*

Dr **David Logan**, an expert in vehicle and crash dynamics from the Monash University Accident Research Centre, says it is possible bull or roo bars may prevent animals going up on the vehicle bonnet and through the windscreen, injuring vehicle occupants, but this has not yet been quantified.

"My understanding of how these bars work is they are most effective for pushing animals out of the way at very low speed – walking pace," David said.

"But if you hit an animal at highway speeds, whether it be a kangaroo or a cow, a bull or roo bar is not going to make a scrap of difference.

***"There's no way you can add a sufficiently strong structure that you can hit something anywhere from 20kg to 200kg and not damage the vehicle."***

"You're still going to have enough damage to the vehicle that it's going to need to be repaired and may be written off as well. There's no way you can add a sufficiently strong structure that you can hit something anywhere from 20kg up to 200kg and not damage the vehicle. The bar would need to be sitting half a metre to a metre in front of the vehicle."

## Are there any downsides to fitting bull or roo bars?

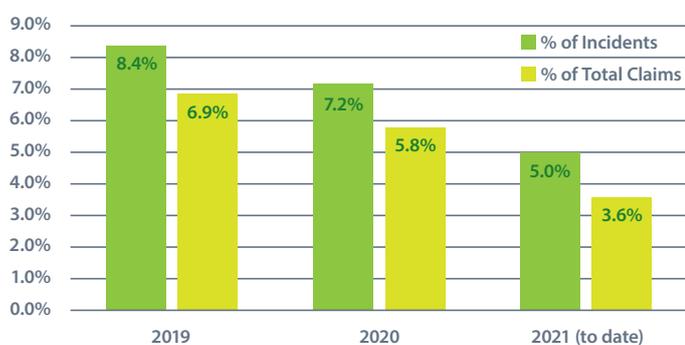
### For those inside the vehicle

Bars can influence how airbags deploy, and some companies work with vehicle manufacturers to ensure fitting a bar won't impact the tuning of a vehicle's airbag system. As David Logan explains, airbags rely on acceleration sensors to predict, within milliseconds of first contact, the point of peak acceleration in a crash, by which time the airbags need to be fully deployed.

"There is no point deploying the airbag after the acceleration's peaked because your head is already through the windscreen or you've already hit the steering wheel," he said.

"A bull or roo bar will change the profile of deceleration to the extent that the airbag system either may deploy late or may falsely predict that a crash is going to occur, and you end up having airbags deployed when they wouldn't otherwise be required, which has the potential to cause injuries."

Figure 1: Hitting Animals Crash Statistics



### For those outside the vehicle

Bull or roo bars have "substantial disadvantages" for pedestrians in an impact. Modern vehicle bonnets and front bumpers are designed to minimise leg and head injuries to pedestrians in a relatively low speed crash.

"When you put a bar in the way, you completely take away all the benefits of these designs," David Logan says. "You end up hitting a pedestrian with two or three rigid bars instead, sometimes with the uprights as well, so the outcomes for pedestrians are much worse."

Injury outcomes are also worse for occupants of the other vehicle in a side impact or 'T-bone' collision, such as an intersection crash. "Because once again you don't have that rounded frontal structure that interacts with the door of the other vehicle and usually in a side impact, if you're the driver and you're being hit on the driver's side, often your head will briefly come out the window if you are in an older vehicle without curtain airbags.

"If your head comes out the window and there's a bull or roo bar there, your head is going to contact that rigid bar, instead of a nice rounded impact-optimised bonnet or rounded frontal structure.

## Where does that leave us?

For companies or drivers operating in rural areas, there are several **measures** that can reduce the likelihood of an animal strike, including journey planning to avoid driving at dawn or dusk or, if that is unavoidable, drivers should slow down and scan the roadside ahead.

From a safety perspective, David Logan is unequivocal that bull or roo bars should not be fitted, and they should only be considered if there is an operational need based on experience *and* vehicles will not operate regularly where there is pedestrian activity.

Fitting accessories to a bar, like winches and spotlights, also create worse outcomes for pedestrians in a crash, and he also points out that modern safety systems, such as anti-lock brakes and Electronic Stability Control, make it more likely drivers can avoid animal collisions without losing control of the vehicle.

Figure 2: Hitting Animals Claim Statistics



"As a road safety researcher, my overall objective is to be driven by the evidence wherever possible," David Logan said. "If you have a particular vehicle that you're assigning to an employee and their job involves only driving around urban areas, the last thing you do is fit a bull or roo bar.

"Fleet owners know where their vehicles operate and, if they have an effective OH&S incident reporting system, they know how many animal impacts they've had.

"If they're going into country areas, and it depends on which state or territory you're operating in, and you have a history of crashes or injuries as a result of animal impacts, then perhaps you can consider fitting a bull or roo bar.

"But before you consider it, talk to your insurance company and find out whether it will reduce the likely size of your crash claims or lower your premiums. Premiums are related to repair costs and if repair costs are higher for vehicles fitted with bars, then just don't do it."