

Review - Motorcycle Crashes into Roadside Barriers: Stage 4: Protecting motorcyclists in collisions with roadside barriers- University of New South Wales 2015

The Motorcycle Safety Advisory Council (MSAC) awarded a contract to the University of New South Wales to study how motorcyclists impact road side barriers. The aim was to identify ways to reduce the injury risk of motorcyclists from these impacts.

The study related only to W-beam barriers and concrete barriers. For practical reasons wire rope barriers are unsuitable for use at the tight high risk curves where motorcycles are most likely to impact on barriers. The W-beam barrier is the barrier of choice at these locations.

The bad news for motorcyclists is that roadside barriers are by their nature road hazards and injuries are an inevitable part of their use. As such they are used only to protect road users from greater hazards. These include vehicles and fixed hazards like power poles, trees and ditches.

All the above hazards have greater potential impact risk than barriers of whatever type. Also barriers tend to hurt motorcyclists who hit them much more severely than occupants of cars which hit them. The message is, ride conservatively and make sure you never crash into a barrier or a fixed object.

The study used crash analyses and simulations of riders hitting barriers after detaching from their bikes to investigate the consequences of motorcyclists colliding with W-beam and concrete barriers. The W-beam barrier was considered with and without "rub-rails". The barrier posts are the most dangerous components of W-beam barriers. Rub-rails effectively close off the open space between the ground and the steel beam so that sliding motorcyclists cannot impact with the barrier post. Post protectors are typically padded foam enclosing the barrier post.

The study found that W-beam barriers without rub-rails may critically wound motorcyclists' chests with life threatening and fatal injuries also occurring to other body parts. This indicated a need for riders who travel on the open road open to wear body armour. W-beam barriers with rub-rails are generally more protective of motorcyclists than concrete barriers while concrete barriers were generally safer than W-beam barriers without rub-rails.

The authors assessed a high motorcycle risk corner on the winding Rimutaka Hill road north of Wellington. They found that if rub-rails were attached to the existing W-beam barrier motorcyclist injuries could reduce dramatically enough to be cost effective. This type of intervention may be worthwhile at other such dangerous sites.

However, the country would not be able to afford to place rub-rails at all location with W- beam barriers. If this very expensive program was implemented it would address only 2% of motor cycle fatalities and 0.5% of serious injuries. Thus elsewhere the hazard to motorcyclists of W-beam barriers would not reduce. It must be remembered that three quarters of motorcycle injury collisions with barriers occur away from severe curves.

Finally, it must be remembered that barriers with rub-rails remain, like all barriers hazardous. The simulations, all carried out at 100km/hr or lower still produced fatal injuries, serious injuries and many moderate injuries. At over 100km/hr we know the hazard rises steeply, no matter what sort of barrier is hit.

The study recommended further simulations on motorcyclists impacting barriers while still on their bikes and the extension of the study to wire rope barriers.

Also recommended was the addition of a crash test for motorcyclists impacting on the barrier in an upright posture while still on their motorcycle to the Australian/New Zealand Barrier Standard. The standard already contains a sliding crash test.