

Quad Bikes – why they should NOT be ridden on roads!

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Abstract

Quad bikes or All-Terrain Vehicles (ATVs) continue to be a leading cause of serious injuries and fatalities for many countries. Of particular concern are fatalities related to quad bike use on roads. This paper is aimed to identify features of quad bikes that make them dangerous for on-road use. The study demonstrated that the static stability and dynamic handling attributes of a quad bike make them unsuitable and unsafe for on-road use.

Background

The use of quad bikes, also known as All-Terrain Vehicles (ATVs), both for recreational and agricultural purposes continue to be a leading contributor to serious injuries and fatalities in Australia and many other countries of the world. In Australia and New Zealand, most of these fatalities occurred in the farming sector and in the majority of cases the vehicle rolled over (Grzebieta et al., 2015; Lower, Herde, & Fragar, 2012). In the United States of America (USA), fatalities are generally associated with the recreational use of quad bikes and incidents typically involved high speed impacts (Brandenburg, Brown, Archer, & Brandt, 2007; Topping & Garland, 2015).

Worldwide there is growing concern in regards to fatalities related to quad bike use on roads (Williams, Oesch, McCartt, Teoh, & Sims, 2014; Weintraub & Best, 2014; Grzebieta, Rechnitzer, McIntosh, Simmons, Mitchell, & Patton, 2014). Quad bike manufacturers specifically state that they are not designed for on-road use (Honda Australia Rider Training, 2012). Despite this, the European Union (EU) and most states in the USA permit the use of quad bikes on roads (Williams, Oesch, McCartt, Teoh, & Sims, 2014; Persson, 2013), and in Australia farmers are permitted to cross from one property to another. In the USA and Sweden it has been observed that on-road quad bike fatalities account for a higher percentage of the overall fatalities than off-road, 65 and 58 percent respectively (Williams, Oesch, McCartt, Teoh, & Sims, 2014; Persson, 2013). Also, in a recent study of 141 Australian quad bike fatalities, 11 percent occurred on public roads (Grzebieta, R., Rechnitzer, G., McIntosh, A., Simmons, K., Mitchell, R., Patton, D., 2014).

Method

The study firstly involved an analysis of YouTube videos to observe mechanisms that have caused quad bikes to lose control on hard surfaces including compacted dirt roads as well as sealed bitumen roads. The second study used the static stability and dynamic handling results of a recent Quad Bike Performance Project (QBPP) (Grzebieta R., Rechnitzer G., Simmons K. and McIntosh A.S., 2015). Quad bikes were assessed in regards to whether they are safe to travel at speeds allowed on public roads and whether they are capable of cornering (turning) safely on these roads. Simulations were also performed to determine whether it is safe for quad bikes to manoeuvre over speed humps.

Results

The analysis of YouTube videos provided evidence for quad bikes losing control on public roads at high speed and/or whilst cornering. Examining the dynamic handling ability of a quad bikes demonstrated that they should not be ridden at speeds over 40 km/h due to their oversteer/critical

43 speed handling characteristics. The static stability properties of quad bikes demonstrated that these
44 vehicles are quite restricted in the speeds at which they can safely manoeuvre corners. Their
45 cornering speed needs to be much slower than cars otherwise rollover occurs. The simulations
46 revealed that speeds humps approached at speeds higher than 10 km/h can displace the rider off the
47 seat and off the quad bike, thus creating a potentially dangerous situation.

48 **Conclusions**

49 The study indicates that quad bikes should not be ridden on public roads in Australia because of
50 their inherent stability and handling characteristics. Quad bikes are not safe to ride at even the
51 lowest speed limit of a public road in Australia (50 km/h). Quad bikes also need to slow down
52 significantly more than other road vehicles to safely manoeuvre corners and speed humps.

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