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Motorcycling in Victoria: Preliminary findings of the evaluation of the Community Education and Policing Project

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Abstract

The Community Policing and Education Project was launched by VicRoads and Victoria Police in 2009 to reduce the likelihood of motorcycle crashes through a combination of enforcement and education countermeasures. The Centre for Automotive Safety Research at the University of Adelaide was chosen to evaluate the effectiveness of the Project using a range of methods. These methods include a process evaluation, analysis of crash data, on-road speed surveys, an online survey of motorcyclists, and roadside traffic observation. This paper provides a brief summary of the first round of roadside observations of motorcyclists, the first on-road speed surveys, and the early results of the online survey. The first round of roadside observations were focused on some of the areas included in the education component, including the use of headlights, helmets, protective gear and high conspicuity clothing by motorcyclists, analysed by type of motorcycle. The on-road speed surveys were conducted on regional Victorian roads. The online survey included sections on rider demographics, motorcycle characteristics, riding history, offences, crashes, exposure to enforcement, perceived likelihood of detection, views on road infrastructure, and on-road behaviour. The results provide insights into the issues that are of concern to motorcyclists, as well as motorcycle riding patterns, riding behaviour and use of protective clothing.

Keywords

Motorcycle, evaluation, roadside observation, speed survey, questionnaire, behaviour, attitudes, protective clothing

Introduction

In recognition of the high relative involvement of motorcyclists in road crashes and associated trauma, the Victorian Government through the compulsory third party insurer in Victoria, the Transport Accident Commission (TAC), introduced a levy in 2002 that was added to the premiums paid at the time of registration of motorcycles with engine capacity above 125 cc. The funds are dedicated to projects for improving rider safety. This is done according to the Strategic Guide for Expenditure of the Motorcycle Safety Levy Funding, which was developed in consultation with the Victorian Motorcycle Advisory Council (VMAC) and motorcycle safety experts.

One project given approval for the use of levy funds is the Community Policing and Education Project, a joint initiative of VicRoads and Victoria Police to improve motorcycle safety through the integrated use of police-led education and traffic law enforcement. This program was launched in January 2009 and will run for two years. A full description of the program is available in an article by Shuey and Casey [1]. Briefly, the Project involves broadening of the scope of the usual activities of the Victoria Police, with educational activities being added to the more familiar enforcement-related programs. Enforcement programs within the Project target both drivers and riders, and are focused on high risk behaviours such as inappropriate speed, excessive speed, crossing double lines, failure to give way, changing lanes when unsafe, driver distraction (e.g. mobile phone use while driving) and driving or riding when impaired by alcohol and drugs. The educational component is being delivered to both drivers and riders, with the messages focused on awareness of the safety issues associated with motorcycle riding. Drivers are being encouraged to take time to look for motorcycles, give space to motorcycles and expect the unexpected. Riders are being encouraged to ride defensively, position themselves appropriately on the road and to make sure they can be seen. Particularly important is the emphasis on the use of conspicuous and protective clothing.

This complex Project involving statewide and regional resources being utilised for both education and enforcement requires a complex methodology to evaluate it. The methodology being used by CASR includes a process evaluation, analysis of crash data, on-road speed surveys, roadside traffic observation and an online survey of motorcyclists. This paper provides a brief summary of the baseline data collected in the speed surveys, traffic observation and online survey.

Method

On-road speed survey

As speed enforcement is a major component of the Community Policing and Education Project, it was necessary to analyse on-road travel speeds of motorcycles. One of the aims of the Project is to reduce the higher speeds at which motorcycles are ridden. Evidence of an associated decline in the speeds of motorcycles relative to other traffic will be an unambiguous indicator of the success of this part of the Project. Three waves of on-road speed surveys are being conducted, so that it will be possible to look at baseline data, data at a mid point and data from near the end of the Project. The on-road surveys are being delivered by a sub-contractor using MetroCount hardware.

Three regional locations, all with a speed limit of 100 km/h, were chosen for the surveys. These were:

- South Gippsland Highway, west of Caldermeade Rd
- Melba Highway, 1km north of Healesville-Kinglake Rd
- Maroondah Highway, between Hyde Park and Maddens Rds

Data collected for each vehicle included the number of axles, date, time, direction, travel speed, wheel base, headway and gap. In the first survey wave, all vehicles in both directions were individually recorded for a continuous one week period from 26 November 2009 to 2 December 2009. The sites chosen were not affected by road works, and the weather during the chosen week was dry. No special events occurred near the sites during the week of the surveys.

For each site, calculations were made for motorcycles and cars (cars or car derivatives not towing anything) of mean speed, median speed, 85th percentile speed, percentage travelling above the speed limit and percentage travelling more than 10 km/h above the speed limit. These were calculated using all vehicles and also separately using only vehicles with a free speed. The latter vehicles were identified using the indicator of a headway of four seconds or more.

Roadside traffic observations

Roadside traffic observations were conducted to observe some of the behaviours that were the focus of the Community Policing and Education Project. Behaviours amenable to roadside observation and which were chosen for this part of the evaluation were the hand-held mobile phone use of car drivers and the use of conspicuous and protective clothing by motorcyclists. If the Project were successful, one would expect reduced hand-held phone use by drivers and increased use of conspicuous and protective clothing by motorcyclists.

Two surveys in regional areas were planned, one year apart. Both of these are being conducted on weekends to ensure observation of recreational riders. Observations were made at intersections where vehicles would slow or stop so that a suitable period of time was available for observations to be made for all vehicles. The times and locations for the regional surveys were as follows:

- Intersection South Gippsland Highway and Sladen St, Cranbourne. Saturday 11:00am-12:30pm
- Junction Melba Highway and Maroondah Highway, Coldstream. Saturday 4:00-5:30pm.
- Intersection of Anderson St and Maroondah Highway, Lilydale. Sunday 9:00-10:30am.
- Intersection of Maroondah Highway and Goulburn Valley Highway, Alexandra. Sunday 12:30-2:00pm.
- Junction of Goulburn Valley Highway and Whatton Place, Yea. Sunday 3:00-4:30pm.

In metropolitan Melbourne, surveys were conducted two weeks prior to a dedicated Victoria Police commuter operation, on the two days directly after the operation, and three weeks after it. All three urban surveys were conducted on Thursdays and Fridays and during commuting hours. The times and locations for the metropolitan surveys are as follows:

- Intersection of Charles St and Cotham Rd, Kew. Thursday 7:00-9:00am.
- Intersection of Hoddle St and Victoria St. Thursday 4:30-6:30pm.
- Junction of Orrong Rd and Dandenong Rd. Friday 7:00-9:00am.

The variables chosen for mobile phone use were sex of driver and use of hand held mobile phone (yes/no). Drivers were only deemed to be or not to be using a mobile phone if the observer was definite. If there was any doubt, no data point was recorded. For motorcycle riders, the variables recorded were as follows:

- Type of motorcycle (scooter, trail, standard/naked, trike, cruiser, sports, touring, sports tourer)
- Headlights on or off
- Helmet use (full, open face, none)
- Conspicuity (high, low)
- Protection (full body, torso only, legs only, none)
- Pillion passenger (yes/no and if yes, helmet use of pillion, as above)

A rider's clothing was adjudged to be highly conspicuous if the helmet or torso colour was white or fitted with reflective material. Only the helmet and torso were used as indicators of conspicuity, as these were identified as protective in a study by Wells et al. [2]. When observing protective clothing, special effort was directed toward determining if jeans were likely to be Kevlar jeans or similar. If additional stitching was evident, such jeans were assessed to be 'protective'. Full body protection could be a full body suit or the combination of a protective jacket and protective pants. Sex of rider was not collected as full protective clothing and a helmet can mask the sex of a rider.

Two trained observers sat by the side of the road and recorded observations. Traffic was recorded using a mounted digital camera to provide a back-up source of information if necessary. The weather for all sets of observations was mild, with temperatures ranging between 15 and 20 degrees Celsius.

Online survey of Victorian motorcyclists

An online survey of Victorian motorcyclists was used to assess the possibility of changes in attitudes of motorcycle riders in response to the Community Policing and Education Project. As the ideal outcome of increased enforcement is an increase in the perceived likelihood of detection and a decrease in unsafe behaviours, both of these outcomes could be the basis for claiming a degree of success of the Project. The survey was designed to obtain self-reported data on these variables while also seeking other information relevant to motorcycle safety.

The survey was advertised using flyers included in motorcycle registration renewal notices mailed out by VicRoads. The items included in the questionnaire were determined on the basis of a literature review. The general sections of the questionnaire were: rider demographics, motorcycle details, riding history, riding offence history, rider crash history, recent exposure to enforcement, perceived likelihood of detection for riding offences, road infrastructure in Victoria, and attitudes and self-reported on-road behaviour.

Results

On-road speed surveys

Table 1 shows the vehicle count and speed measurements for motorcycles and cars of all three sites combined for the first on-road speed survey. The mean and median speeds for motorcyclists were above the speed limit and over a fifth of motorcyclists were exceeding the speed limit by 10 km/h or more, compared to less than seven percent of cars.

Table 1
Vehicle count and speed measurements for all sites combined

| Measurement | Motorcycles | Cars |
|-----------------------|-------------|---------|
| Number | 1,566 | 199,360 |
| Mean speed | 102.10 | 99.02 |
| Median speed | 102.60 | 99.80 |
| 85th percentile speed | 113.20 | 106.50 |
| % exceeding 100 km/h | 61.81 | 48.24 |
| % exceeding 110 km/h | 22.73 | 6.85 |

Figure 1 shows the speed distribution of cars and motorcycles for all three sites combined. There is a clear difference between the two distributions. In the middle of the distribution, between 80 and 120 km/h, motorcyclists recorded lower frequencies below the speed limit and higher frequencies above it.

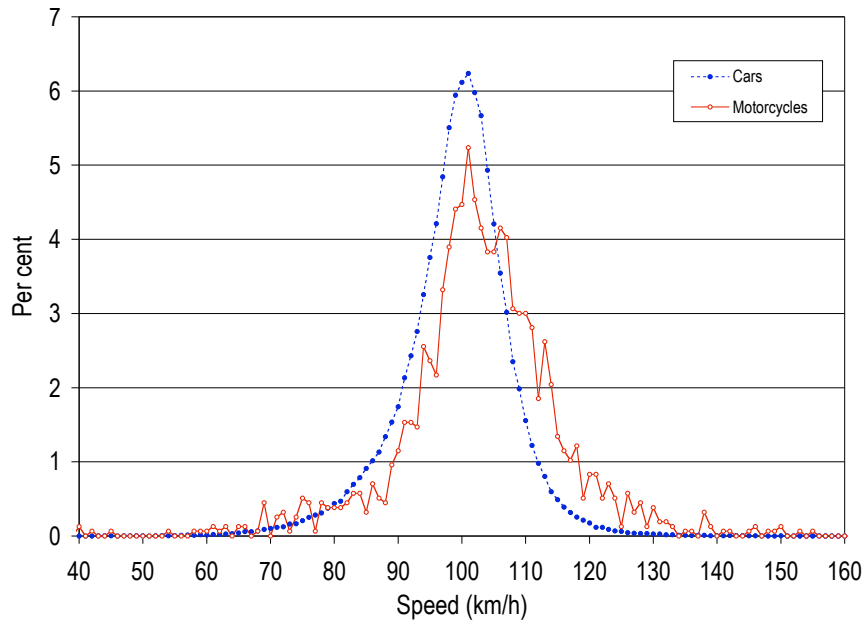


Figure 1: Speed distribution of combined sites for all vehicles

Table 2 shows the vehicle count and speed measurements for motorcycles and cars travelling at a free speed at all three sites combined. The overall pattern of results, with much higher speeds for motorcycles, is consistent whether you look at all vehicles or those travelling at a free speed. For the free speed vehicles, over two thirds of motorcycles were travelling above the speed limit and over a quarter were travelling more than 10 km/h above the speed limit. For cars, the comparison figures were just over a half and less than 10 percent, respectively.

Table 2
Vehicle count and free speed measurements for all sites combined

| Measurement | Motorcycles | Cars |
|-----------------------|-------------|---------|
| Number | 824 | 121,822 |
| Mean speed | 103.84 | 100.11 |
| Median speed | 104.00 | 100.50 |
| 85th percentile speed | 114.80 | 107.30 |
| % exceeding 100 km/h | 66.63 | 53.11 |
| % exceeding 110 km/h | 27.31 | 8.46 |

Figure 2 shows the free speed distribution of cars and motorcycles for all three sites combined. Again, in the middle section of the distribution (80 to 120 km/h), motorcycles recorded lower frequencies below the speed limit and higher frequencies above it.

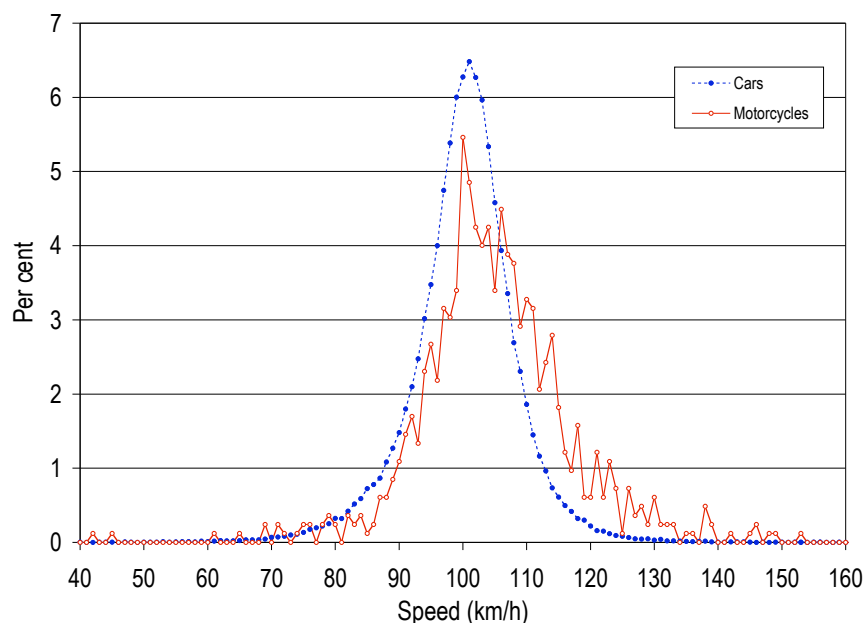


Figure 2: Speed distribution of combined sites for free speed vehicles

Roadside observations

Baseline roadside traffic observations were made of 173 motorcycles on a weekend in regional Victoria and 209 during commuting periods in metropolitan Melbourne. A brief summary is provided here of the results of these baseline observations.

Sports motorcycles were the most common in both sets of observations (38% regional, 35% metropolitan). Cruisers were more common in regional Victoria (27%), while scooters (27%) and standard/naked motorcycles (21%) were common in metropolitan Melbourne. There were few scooters in regional areas.

Headlight use was very high but slightly lower in regional Victoria (90% regional, 98% metropolitan). The high rates of headlight use are probably due to the automatic operation of headlights on most motorcycles.

Full face helmets were favoured by most riders (75% regional, 85% metropolitan) and especially the riders of sports motorcycles (100% regional, 99% metropolitan). Riders of cruisers, however, showed a clear preference for open face helmets (75% regional, 56% metropolitan), and over 30 percent of riders of scooters observed in the metropolitan area used open face helmets.

In both sets of observations, around three quarters of riders wore low conspicuity clothing. In the metropolitan area, riders of scooters were the most likely to be conspicuous (around 40%). Riders of cruisers tended to wear all black, with a total of only two riders out of 64 being judged to be highly conspicuous.

Full body protection was far more likely in regional Victoria than metropolitan Melbourne (46% regional, 17% metropolitan). Sports motorcycle riders, for example, wore full protection in 71 percent of cases in regional Victoria but in only 25 percent in metropolitan Melbourne. Riders of cruisers tended to have protection for their upper body only (73% regional, 69% metropolitan). Over 30 percent of scooter riders had no protection and only eight percent had full protection.

Pillion riders were extremely rare among commuting motorcyclists in Melbourne (1.9%), while 13 percent of motorcycles on weekends in regional Victoria were carrying a pillion. All pillions in regional areas, except those on cruisers, were wearing full-face helmets.

Hand held mobile phone use was at very low levels among the drivers of cars observed. In regional Victoria, only 1.4 percent of drivers were using one when observed, while the proportion in metropolitan areas was only 0.4 percent.

Online survey of motorcyclists

The initial results of the online survey of motorcyclists is based on 551 responses registered between 1 December, 2009 and 16 March, 2010. A brief summary of some of the findings is provided here.

The respondents were mostly male, as expected, and the age range was very wide (18 to 82 years of age), with a mean of 45. The most common motorcycles ridden were sports/sports tourers, followed by standard/naked motorcycles and cruisers. This seems consistent with the frequencies for motorcycles recorded in the roadside observations. There was a wide range of engine capacities for the motorcycles owned by the survey respondents, with 16 percent 250cc or below.

Over 90 percent of the riders had a full licence. The majority of motorcycle owners reported using their motorcycle for leisure. However, the number of trips undertaken for the purpose of commuting was greater than the number of leisure trips.

In terms of the key outcome variables, we are most interested in perceptions of police presence, encounters with police, perceived likelihood of detection for different offences and self-reported riding behaviour. Approximately 37 percent of riders reported having encountered police enforcement in the past 12 months but few had been spoken to by police about safe riding practices and protective clothing.

There did appear to be some recognition of increased police presence, with over a quarter of riders saying there were more police on the roads in the past year, 13 percent claiming police were booking more riders, and a fifth reporting that the risk of apprehension by police was greater. In terms of the perceived risk of detection for specific offences, the highest risk of being detected was associated with not wearing a helmet and with speeding. Those offences for which a low perceived risk of detection was reported included overtaking on a double line, illegal parking and using an emergency lane.

With regard to self-reported behaviour, 90 percent reported always using daytime headlights. This is most probably related to the automatic light operation on most motorcycles. Fewer riders, however, reported using bright or conspicuous clothing, with half 'never' or 'rarely' using it. In terms of protective clothing, 82 percent reported always wearing protection for the upper body and 50 percent for the lower body. The results for body armour revealed dichotomous responses: 32 percent said they always wear body armour and 28 percent said they never do.

Riders were asked for the frequency with which they engaged in four specific dangerous riding behaviours. Riding above the speed limit was the most commonly reported dangerous behaviour, with 15 percent of riders reporting doing it 'often' and two percent 'always'. Riding tired and misjudging speed when negotiating a bend were equally common (around a quarter of riders doing it at least sometimes), while very few riders reported riding when affected by alcohol or drugs.

Discussion

The Community Policing and Education Project, being run by Victoria Police in conjunction with VicRoads, is a program aimed at reducing motorcycle trauma through a combination of enforcement and education. CASR is evaluating the program using a process evaluation, analysis of crash and offence data, traffic speed surveys, roadside observations, and an online survey of motorcyclists. This paper provides a brief summary of the baseline data collected for the latter three components of the evaluation.

The traffic speed surveys, conducted at three sites with a speed limit of 100 km/h, have produced very clear results indicating that motorcyclists in regional Victoria travel at higher speeds than other traffic. Whether all speeds were included or only free travelling speeds (vehicles with a headway of 4 seconds or more), motorcycles had a higher mean, median and 85th percentile speed, were more likely to be travelling in excess of the speed limit, and more likely to be travelling more than 10 km/h above the speed limit.

This is a troubling finding, given the common involvement of excessive speed in serious and fatal crashes. Johnston, Brooks and Savage [3] analysed ten years of fatality and serious injury data in Australia and found that speed was a contributor to 70 percent of single vehicle motorcycle crashes and that the speed of the motorcycle was a contributor to 41 percent of multiple vehicle collisions.

Overall, the roadside observations of motorcyclists in Victoria revealed that protective clothing is worn most often by riders of sports motorcycles but less commonly by riders of scooters. The latter riders also prefer open face to full-face helmets. Riders of cruisers similarly prefer open face helmets. Across motorcyclists in general, protection of the upper body is worn more commonly than protection of the lower body. Ratings of conspicuity were more often low than high, with riders of cruisers particularly likely to be wearing inconspicuous clothing. Limitations of this study include the inability to stop and inspect the clothing to determine its quality, and the small sample sizes for some of the individual motorcycle types.

The results of the roadside observations are very similar to those of the only other recent Australian study of its type, that by Wishart, Watson and Rowden [4]. This study involved observations of recreational and commuting riders in Brisbane and Canberra, using a similar methodology to the current study. The findings were that the majority of riders wore protection of the upper body but far fewer protected the lower body. There were marked differences in rates of protective gear between recreational and commuting riders, largely due to the lower levels of protective clothing worn by riders of scooters. Scooter riders also differed from others in favouring open face rather than full-face helmets [4].

These two studies, taken together, demonstrate the need for greater promotion of protective gear for the lower body. As noted by de Rome on page 8 of her Good Gear Guide, "Most riders wear a jacket and helmet but are less likely to protect their legs, although it is the legs that are most likely to be injured in a crash" [5]. These two studies both point to reluctance on the part of scooter riders to wear protective gear or full-face helmets. As Wishart et al. note, this could be due to the lower perceived danger of shorter trips and lower speeds associated with commuting, compared to recreational rides, and could also be related to the lack of facilities at workplaces for changing attire [4]. Although convincing scooter riders to wear more protective gear will run counter to the benefits in terms of convenience of this mode of transport, the injury savings are likely to be substantial if the popularity of scooters continues to grow.

The present study differed from the Wishart et al. study in also considering conspicuity of the riders. Conspicuity was more often rated as being low than high, especially among riders of cruisers. For all riders, there could be considerable gains in increasing the conspicuity of their apparel. In particular, white helmets and retroreflective vests or jackets would greatly increase their likelihood of being seen by other road users. As demonstrated in a study by Wells et al., crash risk for motorcyclists decreases with the wearing of a light coloured helmet, and light coloured or reflective clothing on the upper body [2].

The online survey produced responses that were consistent with the observed findings in the other study components. Motorcyclists, when asked about illegal behaviours, were more likely to self-report riding above the speed limit than riding when tired, misjudging speed when negotiating a bend, or riding when affected by alcohol or drugs. A study by Clarke et al. in the UK used the same set of questions and also found that exceeding the speed limit was self-reported by motorcyclists more than the other risky behaviours [6].

When asked about the use of conspicuous and protective clothing, the results of the online survey mirrored those of the roadside observations, except that the figures in the online survey were marginally more positive than those obtained from the observations. The majority of riders responding to the online survey reported wearing protective clothing for the upper body but only half reported protecting their lower body. Half reported rarely or never using conspicuous clothing. The marginally lower rates of protective clothing observed at the roadside, compared to self-reported data in the survey, could be due to a lower number of survey responses by scooter riders (5% of the sample), who are relatively unlikely to wear protective clothing.

Conclusions

A number of challenges are apparent for increasing the safety of motorcycling in Victoria. Many riders continue to exceed the speed limit; many fail to wear adequate protective clothing, particularly of the legs; and the majority of riders wear inconspicuous helmets and clothing. The speed surveys will be repeated twice in 2010 to ascertain if there have been any changes in the speeding behaviour of motorcyclists across the period of the Project. Similarly, follow-up roadside observations and ongoing monitoring and analysis of the online survey will be used to ascertain exposure to police activities and to gauge any changes in motorcyclists' behaviour and attitudes through 2010.

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