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1 Identifying and Characterising Crashes of Returning Riders – A New Approach

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5 Abstract

6 Surveys have identified that many older motorcyclists are returning riders but it is difficult to draw
7 conclusions about their crash risk because of discrepancies in definitions and the inability to
8 identify returning riders in official crash databases. Analyses of NSW crash data were undertaken in
9 which returning riders were defined as aged 25 and over, holding a full licence 10 years prior to the
10 crash, and not the registered operator of one or more motorcycles during the 5-10 years prior to the
11 crash. Based on this definition, there were 472 riders in casualty crashes in 2005-09 who were
12 returning riders (5.5% of riders aged 25 and over in casualty crashes) and the characteristics of their
13 crashes were similar to those involving continuing riders. In contrast, crashes of new riders were
14 more likely to have characteristics suggestive of relatively more riding in urban areas, probably for
15 transport rather than recreation. More work is recommended to assess the validity of the definition
16 to allow a better understanding of the effects of long periods away from riding on riding skills and
17 crash risk.

18 Introduction

19 There has been an upward trend in fatal and serious injury crashes among older motorcyclists
20 (ARTD Consultants, 2011; Johnston, Brooks & Savage, 2008), leading to the perception that the
21 ‘returning rider’ could be an issue. This pattern of increasing crashes among older motorcyclists has
22 been observed over the last two decades in Australia (Johnston, Brooks & Savage, 2008) and other
23 developed countries including the United States (NHTSA, 2012) and the United Kingdom (Jamson
24 & Chorlton, 2009). The increase in reported crashes among older riders has generally been
25 associated with increases in the median age of motorcycle owners and motorcycle licence holders,
26 as well as overall increases in motorcycle registrations (and usage).

27 Motorcyclists who are returning to riding following an extended break may be at greater risk of
28 crashing because of limited recent riding experience. This concern has been expressed by
29 authorities and other key stakeholders both locally and internationally (Mulvihill & Haworth, 2006;
30 Symmons, Mulvihill, & Collins, 2011). There are two types of factors that have been claimed to
31 potentially contribute to a greater crash risk of returning riders. The first is a deterioration in
32 motorcycle handling skills resulting from lack of practice and the second is changes in motorcycle
33 design and performance over time leading to unfamiliarity with the motorcycle. The authors
34 consider it possible that the first probably develops over a shorter period than the second, because
35 evolution in motorcycle design occurs over decades. However, returning riders may suffer the same
36 phenomenon of increased crash risk with a new style of motorcycle that is found even with
37 continuing riders (Haworth, Smith, Brumen & Pronk, 1997). Returning riders may also have
38 attitudes and behaviours which contribute to crash risk (Mulvihill & Symmons, 2010).

39 The research reported here was commissioned by the then Roads and Traffic Authority of NSW
40 (RTA) in 2011 to understand if ‘returning riders’ is a potential motorcycle crash risk category. The
41 paper focuses on the methods used to identify and characterise returning riders, and because of
42 space limitations, the reader is referred to other sources for more detailed comparisons of the safety
43 of new, continuing and returned riders (Jamson, Chorlton & Connor, 2005; Mulvihill & Haworth,
44 2006; Mulvihill & Symmons, 2010; Symmons, Mulvihill, & Collins, 2011).

45 ***Previous approaches to defining and identifying returning riders***

46 While the term ‘returning rider’ was used for this research, a variety of other terms has been used in
47 the literature, including ‘returned rider’, ‘born again rider’, ‘born again biker’ and ‘BAMBI’ (born
48 again middle-aged biker).

49 In the older rider literature, returning riders are often compared to ‘new’ and ‘continuing’ riders.
50 New riders are generally defined as those who hold a learner or provisional licence or have held an
51 open licence for only a small number of years. Continuing riders are generally defined as those
52 who have held a licence and ridden for a long period of years without a substantial break.

53 Those who are currently riding regularly are sometimes referred to as ‘active’ riders, in contrast to
54 those who hold a licence but have not ridden regularly in the recent past, who are commonly termed
55 ‘dormant’ riders. Dormant riders have the potential to become returning riders in the future. Active
56 riders may cease riding in the future, either temporarily (thereby becoming dormant and potential
57 returning riders) or permanently.

58 Conceptually, a returning rider is someone who was an active rider in the past, who then became a
59 dormant rider for a period of time and recently became an active rider again.

60 Thus, returning riders are a subset of active riders. Haworth, Mulvihill and Symmons (2002)
61 defined ‘riders’ to be those motorcycle licence holders who reported they had ridden in the previous
62 12 months. ‘Non-riders’ (equivalent to dormant riders) were those licence holders who reported
63 that they had not ridden in the previous 12 months. In a later survey, Mulvihill and Haworth (2006)
64 used a wider definition of active riders by including all those respondents who had ridden in
65 Australia in the last 5 years. More recent research commissioned by the Queensland department of
66 Transport and Main Roads (TMR) defined active riders as those who both held a licence and
67 currently were the registered owner of a motorcycle (n=103,014) (ARTD Consultants, 2011).
68 There were many more individuals who held a licence but were not the registered owner of a
69 motorcycle (n=581,446) and a similar number who were the registered owner of a motorcycle but
70 did not have a motorcycle licence (n=132,372).

71 Returning riders may not necessarily be older riders. Depending on the definition used, a ‘returning
72 rider’ may be aged below 30 or even 25 years if (for example) they had ridden for a few years after
73 obtaining a licence, ceased riding for 1 or more years, then resumed riding in the last year or so.
74 The definition of an ‘older rider’ appears to differ across jurisdictions. VicRoads commissioned
75 research in which older riders were defined as those over 30 years of age (Haworth, Mulvihill &
76 Symmons, 2002). In that survey, returning riders had to have obtained their licence prior to 1995,
77 resulting in a minimum age of about 33 years. In research commissioned by the Motor Accidents
78 Authority of NSW (Mulvihill & Haworth, 2006), the minimum age for inclusion in the survey was
79 specified as 25 years. However, the recent study of older riders in Queensland focused on those
80 aged 45 years and over (ARTD Consultants, 2011). Given that the median age of newly licensed
81 motorcyclists is about 33 years (Haworth, Rowden, Wishart, Buckley & Greig, 2012), it seems
82 sensible to have a definition of older riders that does not comprise the vast bulk of rider numbers.

83 Most of the earlier research has used survey methodologies in which riders are asked about their
84 riding history and the definitions reflect these methodologies. For example, Haworth, Mulvihill and
85 Symmons (2002, p.14) described returned riders as ‘riders who have held licences for many years
86 but have only returned to riding recently’. They were identified in the survey responses as riders
87 who obtained their licence prior to 1995 and who agreed with the statement that ‘I rode regularly
88 when I first got my licence and then didn’t ride much for while and now have taken up riding
89 again’. Their report also contains definitions of continuing and new riders.

90 In their report to the Motor Accidents Authority on crashes of returned riders, Mulvihill and
91 Haworth (2006) classified returned riders as those who agreed with the statement 'I have held a
92 licence for many years, but have only returned to riding recently'.

93 A more quantitative definition of returned riders was used by Symmons and Mulvihill (2010) in an
94 on-line survey. Respondents were classified as returned riders if they obtained their permit or
95 licence 'more than five years ago, rode for a while, then stopped riding for at least a year, then took
96 it up again within the last three years'.

97 Symmons, Mulvihill and Collins (2011) had possibly the strictest criteria for returning riders in
98 their on-road study. Returning riders had to have returned to riding within the last six months after
99 having stopped riding for a period of five or more years, having ridden at least 20,000 km prior to
100 the break and no more than 500 km following their return.

101 A longer absence from riding was stipulated in research conducted in the UK (Jamson & Chorlton,
102 2009). This study defined returning riders as 'those who returned to riding from 1990 onwards
103 having taken a break of 10 years or more' (p. 338). The maximum time spent riding or distance
104 travelled since returning to riding was not specified, but the required break of 10 years minimum
105 serves to ensure that returned riders would be over 25 years of age and mostly over 30 years.

106 While they did not use a specific term, the evaluation of the Scottish Bikesafe program (Ormston et
107 al., 2003) described a group of participants who reported that they 'had returned to riding in the last
108 five years after a break in riding of a year or more'.

109 Two reports from the United Kingdom provide some limited information on returning riders, but
110 neither offers an explicit definition of returning or returned riders (Sexton, Baughan, Elliott, &
111 Maycock, 2004; Sexton, Hamilton, Baughan, Stradling, & Broughton, 2006). Survey questions used
112 in these research projects asked if participants had had a break from riding of more than 1 year,
113 suggesting that this was one of the measures used to identify returning riders. One of these reports
114 shows that of those who had ceased riding for more than a year, the majority (70%) had ceased
115 riding for five years or more, suggesting that a longer than 1 year timeframe for not riding is
116 possibly more appropriate. A recent US telephone survey of motorcycle riders asked respondents if
117 they had taken a break from riding of 2 years or more, though the time spent riding or the distance
118 travelled since returning to riding was not reported (McCartt, Blunar, Teoh, & Strouse, 2011).

119 *Developing an operational definition of returning riders to allow their identification in crash* 120 *databases*

121 Most of the returning rider research has used survey methodologies where motorcyclists were
122 directly asked if they are currently riding and when they have ridden in the past. This is clearly not
123 possible using official crash, licensing and registration databases, so proxy measures for riding
124 activity must be used.

125 As noted in the earlier section, a returning rider can be conceptually defined as someone who was
126 an active rider in the past, who then became a dormant rider for a period of time and recently
127 became an active rider again. The only proxy for active riding in the official databases is being the
128 owner of a registered motorcycle. Christie and Newland (2006) support this approach and note that
129 the ratio of licence holders to registered motorcycles is greater than two to one in Victoria and
130 almost four to one in NSW. It is acknowledged that this is an imperfect proxy variable, in that
131 some people might continue to own a registered motorcycle while not riding and that some people
132 might ride a motorcycle that is registered to someone else (and not own a registered motorcycle).
133 Queensland data suggests that more than half of motorcycle registrations are held by individuals
134 who do not hold a motorcycle licence (ARTD Consultants, 2011).

135 In terms that relate to official databases, a returning rider can be operationally defined as someone
136 who obtained a motorcycle licence and owned a registered motorcycle in the past, who then did not
137 own a registered motorcycle for a period of time, and then recently owned a registered motorcycle
138 again.

139 No studies were found which examined the number of returning riders or their crash characteristics
140 from official databases. The majority of the reported studies used self-reported crash involvement
141 and a small number assessed riding skills on roads or closed courses. Thus, the preliminary
142 analyses proposed for this study are a valuable first step in determining whether this is a feasible
143 and valuable approach.

144 The research reviewed earlier provides little guidance on the choice of how long the period of not
145 owning a motorcycle needs to be to result in deterioration in riders' skills and familiarity with the
146 motorcycle. The periods of non-riding used in the definitions of returned riders varied from at least
147 a year to five or more years.

148 The research similarly provides little guidance on how long the period should be from when riding
149 recommences, or alternatively the distance travelled since returning to riding. The literature varies
150 from 'no more than 500 km' (which cannot be established in official databases) to 'within the last
151 three years'. Many studies provide no measure of this period. One practical consideration in using
152 the operational definition to identify returning rider crashes is to have a period that is long enough
153 for a sufficient number of crashes to have occurred to allow meaningful statistical analyses.

154 The other issue is whether the crash period should be fixed (e.g. the last five years) or whether it
155 should be rider-specific, relating to when the rider most recently changed from being a non-owner
156 of a registered motorcycle to be an owner of a registered motorcycle. While the second approach
157 probably provides a more valid sample of returning riders, the former is a simpler approach for that
158 was chosen for this study. The second approach may be an option for future research.

159 **Method**

160 An operational definition of returning riders was developed to allow returning riders to be identified
161 by analysing NSW crash, licensing and registration data. The approach below attempts to link the
162 time periods to when each crash occurred on an individual basis. Thus returning riders in crashes in
163 NSW in 2005-2009 are defined as:

164 *those who are aged 25 and over, held a full NSW motorcycle licence 10 years prior to the*
165 *crash, and were not the registered operator of a motorcycle during the period 5-10 years*
166 *prior to the crash.*

167 One example of a rider thus defined in the data as 'returning' is one who crashed in 2009 at 35
168 years of age, was first fully licensed in NSW in 1994 at 20 years of age, and was not the (NSW)
169 registered operator of a motorcycle between 1999 and 2006.

170 Continuing riders are defined as:

171 *those who are aged 25 and over, and held a full NSW motorcycle licence at the time of the*
172 *crash and were not identified as returning riders by the data analysis*

173 New riders are defined as:

174 *those who are aged 25 and over, and held a NSW learner or provisional motorcycle licence*
175 *at the time of the crash*

176 There was a remaining group of riders who were classified as “other riders”. They comprised:
 177 *those who are aged 25 and over, with a non-NSW motorcycle licence or*
 178 *unlicensed/expired/disqualified*

179 The “other riders” are a mixture of a high risk group of riders who are not legally permitted to ride
 180 and riders who happen to have crashed in NSW while holding a licence from interstate or overseas.
 181 Clearly, members of this group are, in reality, a mixture of returning, continued and new riders, but
 182 the available data would not allow this allocation to occur.

183 The definitions above applied in the manner described in Table 1 identified 472 (5.5%) returning,
 184 5,800 (65.1%) continuing, 709 (8.0%) new and 1,928 (21.6%) other riders aged 25 and over in
 185 crashes in NSW in 2005-2009. The greatest attrition in numbers of fully licensed riders in crashes
 186 occurred in step 4 in which customers who have obtained L, P or full motorcycle licence in the 10
 187 years prior to the crash were excluded. The licensing data base had records for 5,674 fully licensed
 188 riders in crashes, but the step 4 requirement excluded 4,323 of these riders (who later became
 189 classified as continuing riders), leaving only 1,351 riders. If the step 4 requirement was less
 190 onerous, (for example, if it was 5 years prior to the crash rather than 10), then fewer riders would
 191 have been excluded and the consequent number of returning riders identified by the process would
 192 have been greater.

193 The step 5 requirement that excluded customers who were the registered operator of one or more
 194 motorcycles at any time during the period 5-10 years prior to the crash removed an additional 879
 195 riders, leaving 472. This was the criterion for establishing a period in which the rider was
 196 “dormant”. If the rider had been the registered operator of one or more motorcycles at, say 8 years
 197 prior to the crash, then had not ridden until perhaps the year of the crash, then they would not have
 198 been identified as a returning rider (and would have been classified as a continuing rider).

199 ***Table 1. Steps involved in identification of returning riders from NSW crash, licensing and***
 200 ***registration data.***

201	Step 1. Create a master data file (File 1) that contains all motorcycle riders in fatal and injury
202	crashes in NSW 2005-2009 who are aged 25 and over – keep copy for later analyses
203	(N=8909)
204	Step 2. Create a subset (File 2) of the master data file that includes riders with full NSW
205	motorcycle licence only (N=5983)
206	Step 3. Match the customer numbers in File 2 with the licensing database (309 did not match)
207	Step 4. Make File 3 by excluding customers who have obtained L, P or full motorcycle licence in
208	the 10 years prior to the crash (1351 were left)
209	Step 5. Make File 4 by excluding customers who were the registered operator of one or more
210	motorcycles at any time during the period 5-10 years prior to the crash (879 excluded,
211	leaving 472)
212	Step 6. Match the customer numbers in File 4 back to File 1 and label these customers as
213	‘returning riders’. Call the variable ‘type of rider’ if this is appropriate.
214	Step 7. Label the motorcycle riders in File 1 who had an L or P licence at the time of the crash as
215	‘new riders’
216	Step 8. Label the motorcycle riders in File 1 who had a full licence at the time of the crash but are
217	not ‘returning riders’ as ‘continuing riders’.
218	Step 9. Label the motorcycle riders in File 1 who were non-NSW riders or
219	Unlicensed/Expired/Disqualified as ‘other riders’.

220 The examination of the number of riders excluded at each stage of the analysis to identify returning
221 riders suggests that some returning riders were “missed” and that this may have resulted in an
222 underestimate of the number of returning riders in crashes. It is also likely that some riders were
223 identified as returning riders who, in reality, would better have been classified as continuing riders
224 because they had significant time riding prior to their crash (and so are likely to have restored their
225 skill levels).

226 **Results**

227 *Characteristics of returning rider crashes*

228 Table 2 summarises the characteristics of the casualty crashes of the returning, continuing, new and
229 other riders aged 25 and over identified from the crash, licensing and registration databases. About
230 42% of returning riders were in single vehicle crashes, about 66% on weekdays, about 61% in
231 metropolitan areas and three-quarters in low speed zones (less than 70 km/h). In general, the
232 returning riders were involved in very similar crashes to those of continuing riders in terms of
233 number of vehicles involved, time of day and weekday/weekend, metropolitan/country and speed
234 zone. In contrast, new riders had relatively more multiple vehicle crashes, on weekdays, in
235 metropolitan areas and in lower speed zones. Together, this suggests that new riders were riding
236 more in urban areas. The higher percentages of “other” riders in single vehicle, country and high
237 speed zone crashes probably reflects that this group includes riders licensed interstate who are more
238 likely to be involved in crashes in border regions, which are country areas.

239 *Characteristics of returning riders in crashes*

240 Table 3 compares the characteristics of the returning, continuing, new and other riders aged 25 and
241 over in casualty crashes. There were 12 returning riders killed in crashes, comprising 2.5% of
242 returning riders killed and injured. Returning riders comprised 4.6% of motorcycle riders aged 25
243 and over who were killed in crashes from 2005-2009. It should be noted that a different definition
244 of returning riders would have led to a different percentage.

245 Almost 60% of returning riders involved in casualty crashes were aged 25 to 39, with almost 40%
246 aged 40 to 59. Less than 3% were aged 60 and over. Continuing riders were somewhat older on
247 average than returning riders and new riders were much younger (more than 80% aged 25-39).
248 “Other” riders were more likely to be aged 60+ (18.2%) than returning, continuing or new riders in
249 crashes. The higher proportion of returning riders than continuing riders in the 25-39 year age
250 group contradicts the findings of the studies of self-reported crash involvement, which generally
251 report that returning riders are older on average than continuing and new riders. It is possible that
252 the method used here to identify returning riders in the crash database was less likely to exclude 25-
253 39 year old riders according to the criterion that they had been the registered operator of one or
254 more motorcycles in the period 5-10 years before the crash, because some of the 25-39 year olds
255 would have been too young to have been licensed then. This needs further investigation in later
256 research.

257 Returning riders were less likely to be female than other riders (less than 5%). New riders were
258 most likely to be female (17.3%).

259 The NSW crash data includes a list of contributing factors to crashes. Information about these is
260 summarised in Table 4. Rider error and speeding were identified as each contributing to about a
261 quarter of returning rider crashes, similar to crashes of continuing riders. The contribution of
262 fatigue, alcohol, equipment and distraction were also similar for returning and continuing rider
263 crashes. New rider crashes were less likely to involve speeding and other rider crashes were more
264 likely to involve fatigue and alcohol.

265
266**Table 2. Returned, continuing, new and other riders aged 25 and over according to the characteristics of their motorcycle casualty crashes. NSW 2005-09**

Crash characteristic	Returning	Continuing	New	Other
	Number of riders (Percent)	Number of riders (Percent)	Number of riders (Percent)	Number of riders (Percent)
Single vehicle	197 (41.7)	2,479 (42.7)	256 (36.1)	934 (48.4)
Multiple vehicle	275 (58.3)	3,321 (57.3)	453 (63.9)	994 (51.6)
Weekday	310 (65.7)	3,750 (64.7)	508 (71.7)	1,222 (63.4)
Weekend	162 (34.3)	2,050 (35.3)	201 (28.3)	706 (36.6)
Metropolitan	287 (60.8)	3,412 (58.8)	532 (75.0)	996 (51.7)
Country	185 (39.2)	2,388 (41.2)	177 (25.0)	909 (48.3)
Speed zone (km/h)				
<70	354 (75.0)	4,516 (71.7)	597 (84.2)	1,395 (72.4)
70-90	62 (13.1)	742 (12.8)	64 (9.0)	203 (10.5)
100+	56 (11.9)	902 (15.6)	48 (6.8)	330 (17.1)

267

268 **Table 3. Characteristics of returned, continuing, new and other riders aged 25 and over riders in**
 269 **motorcycle casualty crashes. NSW 2005-09**

Rider characteristic	Returning	Continuing	New	Other
	Number of riders (percent)	Number of riders (percent)	Number of riders (percent)	Number of riders (percent)
Killed	12 (2.5)	188 (3.2)	12 (1.7)	47 (2.4)
Injured	460 (97.5)	5,612 (96.8)	697 (98.3)	1,881 (97.6)
25-39	275 (58.3)	2,718 (46.9)	588 (82.9)	966 (51.7)
40-59	184 (39.0)	2,615 (45.1)	93 (13.1)	582 (30.2)
60+	13 (2.8)	467 (8.1)	28 (3.9)	350 (18.2)
Male	449 (95.1)	5,384 (92.8)	586 (82.7)	1,648 (85.5)
Female	23 (4.9)	415 (7.2)	123 (17.3)	155 (8.0)
Unknown	0 (0.0)	1 (0.0)	0 (0.0)	125 (6.5)

270 **Table 4. Returned, continuing, new and other riders aged 25 and over according to factors**
 271 **identified as contributing to casualty crashes. NSW 2005-09.**
 272
 273

Contributing factor	Returning	Continuing	New	Other
Speeding	25.4%	24.7%	19.0%	27.4%
Fatigued	5.3%	6.2%	4.7%	10.3%
Alcohol	2.5%	3.0%	3.2%	10.0%
Equipment	1.5%	1.3%	1.7%	2.2%
Distraction	5.7%	4.6%	5.2%	5.4%
Rider error	26.7%	27.1%	26.5%	32.4%

274

275 Discussion and conclusions

276 In this research, operational definitions that could be used to identify returned, new and continuing
 277 riders were developed to allow their comparison in crash data. The existing research literature
 278 regarding returning riders is largely based on self-reported crash involvement collected by surveys

279 which are likely to reflect involvement in crashes of low severity (and not be necessarily predictive
280 of involvement in more serious crashes) and to reflect riders who respond to surveys, who may be
281 unrepresentative of riders at risk of crashing.

282 Preliminary analyses of NSW crash data were undertaken in which returning riders in crashes were
283 defined as those who are aged 25 and over, held a full licence 10 years prior to the crash, and were
284 not the registered operator of one or more motorcycles during the period 5-10 years prior to the
285 crash. These analyses identified 472 riders in casualty crashes in 2005-09 who were returning
286 riders, which corresponds to 5.5% of riders aged 25 and over in casualty crashes. In general, the
287 characteristics of crashes involving returning riders were similar to those involving continuing
288 riders. In contrast, crashes of new riders were more likely to have characteristics suggestive of
289 relatively more riding in urban areas, probably for transport rather than recreation.

290 ***Strengths and limitations of the approach***

291 The strength of this approach was that it enabled Police-reported casualty crashes of returning riders
292 across an entire state to be analysed. Thus information about a large number of relatively serious
293 crashes of returning riders was able to be examined, rather than the small number of such crashes
294 that would be identified by even a large survey of riders. Thus, it could be argued that the approach
295 taken is more useful for development of strategic policy for motorcycle safety regarding returning
296 riders than survey approaches.

297 The approach taken in this paper shares some of the limitations of survey approaches to
298 investigating returning rider safety in that the proportion of riders identified as returning riders is
299 fundamentally dependent on the definition of returning riders that is adopted. As noted earlier in
300 this paper, there is no strong theoretical basis for selecting the length of the period of non-riding, or
301 the length of time (or distance travelled) since returning to riding. If shorter periods of non-riding
302 or longer periods since returning to riding are chosen, then the proportion of riders identified as
303 returning will be larger. If the definition of returning riders was different, this might also result in a
304 different pattern of crashes.

305 The requirement in this study that a crashed rider had to not have been the registered operator of
306 one or more motorcycles during a period 5-10 years preceding the crash means that some returning
307 riders who had a period of non-riding (but still were the registered operator of a motorcycle) were
308 misclassified in the analysis as continuing riders. This is likely to have been one contributor to the
309 lower percentage of crashed riders classified as returning in the current study (5.5%) compared with
310 surveys which have reported that returning riders comprised between 17% of riders aged 25 and
311 over (mostly) in NSW (Mulvihill & Haworth, 2006) and 27% of riders aged 30 and over in Victoria
312 (Haworth, Mulvihill & Symmons, 2002). Neither of these surveys required that the returning riders
313 were not the registered owner of a motorcycle for a period before the crash.

314 Given the preliminary nature of the research reported here, the decision was made to use an
315 approach where the focus was on returning riders in crashes, rather than all returning riders. Thus,
316 the identification of returning riders commenced with the relatively constrained size of the crash
317 database, rather than the much larger licensing database. This reduced the resources needed for
318 analyses but meant that there was no information produced regarding non-crashed returning riders,
319 preventing calculation of crash rates or risks for returning riders. Simply, the research provided
320 information about the numbers and characteristics of crashes of returning riders, but not whether
321 returning riders are more or less likely to crash than new or continuing riders. Thus the research
322 reported here does little to address the debate in the literature regarding whether returning riders are
323 disproportionately involved in crashes compared with other riders of the same age who have
324 continued to ride without taking an extended break.

325 ***The contributing motorcycling crash factors associated with returning riders***

326 There are two types of factors that have been claimed to potentially contribute to a greater crash risk
327 of returning riders. The first is a deterioration in motorcycle handling skills resulting from lack of
328 practice and the second is changes in motorcycle design and performance over time leading to
329 unfamiliarity with the motorcycle. The variables which were analysed in the NSW crash data do not
330 allow the relative contribution of these two factors to be clearly assessed. For example, if the
331 percentage of crashes that were single vehicle was higher for returning riders than continuing riders,
332 this could reflect either of the two factors. Similarly, “rider error” as a recorded contributing factor
333 could also reflect either deterioration in skills or unfamiliarity with the motorcycle.

334 The countermeasures most often mentioned in the literature are those that involve rider training,
335 followed by limiting dormant riders’ ability to return to riding by changing the licensing system.
336 While the latter has been suggested in a range of jurisdictions, it has not been implemented
337 anywhere to the authors’ knowledge. There has been little evaluation of refresher courses for
338 returning riders and so it is not known whether they are a successful countermeasure in this context.

339 ***Further research requirements to inform the development of government policy and program***
340 ***options***

341 Research is needed to address the gaps in knowledge regarding the following matters:

- 342 • Patterns of riding and licensing of returning riders
- 343 • Effect of dormancy on riding skills
- 344 • Number and characteristics of returning riders
- 345 • Reach and effectiveness of refresher courses for returning riders

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351 **References**

- 352 ARTD Consultants. (2011). Older Motorcycle Rider Safety Final Report to Queensland Department
353 of Transport and Main Roads. Completed and Updated with Additional Survey Data.
- 354 Christie, R. & Newland, R. (2006). *Motorcyclist Fatality and Motorcycle Sales Patterns in*
355 *Australia: An Update*. Paper presented at the 2006 Australasian Road Safety Research,
356 Policing and Education Conference, 25-27 October, Gold Coast. Last accessed 27 June 2013
357 from <http://arsrpe.acrs.org.au/pdf/RS060045.pdf>
- 358 Haworth, N., Mulvihill, C. & Symmons, M. (2002). *Motorcycling after 30* (Report No. 192).
359 Melbourne: Monash University Accident Research Centre.
- 360 Haworth, N., Rowden, P., Wishart, D., Buckley, L. and Greig, K. (2012). Motorcycle Safety
361 Research Project. Interim Summary Report Research Deliverable 1: Investigate and develop
362 a pre-learner motorcycle licensing package. Report to Queensland Department of Transport
363 and Main Roads. Last accessed 26 June 2013 from

- 364 http://www.tmr.qld.gov.au/~media/Safety/Motorcycle%20safety/Carrsq%20research%20reports/Prelearner_motorcycle_licensing_package.pdf
365
- 366 Jamson, S., & Chorlton, K. (2009). The changing nature of motorcycling: Patterns of use and rider
367 characteristics. *Transportation Research Part F: Traffic Psychology and Behaviour*, 12(4),
368 335-346.
- 369 Jamson, S., Chorlton, K., & Connor, M. (2005). *The older motorcyclist* (Road safety research report
370 55). London: Department for Transport. Last accessed 27 June 2013 from
371 [http://www.roadsafetygb.org.uk/misc/fckeditorFiles/file/downloads/theoldermotorcyclistno55](http://www.roadsafetygb.org.uk/misc/fckeditorFiles/file/downloads/theoldermotorcyclistno55.pdf)
372 [.pdf](http://www.roadsafetygb.org.uk/misc/fckeditorFiles/file/downloads/theoldermotorcyclistno55.pdf)
- 373 Johnston, P., Brooks, C. & Savage, H. (2008). *Fatal and serious road crashes involving*
374 *motorcyclists*. Monograph 20. Canberra: Department of Infrastructure, Transport, Regional
375 Development and Local Government. Last accessed 27 June 2013 from
376 <http://www.infrastructure.gov.au/roads/safety/publications/2008/pdf/mono20.pdf>
- 377 McCart, A.T., Blonar, L., Teoh, E.R. & Strouse, L.M. (2011). Overview of motorcycling in the
378 United States: A national telephone survey. *Journal of Safety Research*, 42(3), 177-184.
- 379 Mulvihill, C. & Haworth, N. (2006). *Crashes of older riders – Characteristics and implications for*
380 *countermeasures*. Report to Motor Accidents Authority of NSW. Melbourne: Monash
381 University Accident Research Centre. Last accessed 27 June 2013 from
382 <http://www.maa.nsw.gov.au/default.aspx?MenuID=189&ContentID=170>
- 383 Mulvihill, C. & Symmons, M. (2010). *A comparison of rider attitudes and behaviours between*
384 *crash-involved and non crash-involved returned motorcyclists*. Paper presented at the 2010
385 Australasian Road Safety Research, Policing and Education Conference, 31 August – 3
386 September 2010, Canberra. Last accessed June 27 2013 from
387 <http://arsrpe.acrs.org.au/pdf/R2010846.pdf>
- 388 NHTSA. (2012). *Traffic Safety Facts. 2010 data. Motorcycles*. (DOT HS 811 639). Washington,
389 D.C.: National Highway Traffic Safety Administration. Last accessed 18 April 2013 from
390 <http://www-nrd.nhtsa.dot.gov/Pubs/811639.pdf>
- 391 Ormston, R., Dudleston, A., Pearson, S. & Stradling, S. (2003). *Evaluation of Bikesafe Scotland*
392 (Research Findings No.169/2003). Edinburgh: Scottish Executive Social Research. Last
393 accessed 27 June 2013 from <http://www.scotland.gov.uk/Resource/Doc/47133/0029639.pdf>
- 394 Sexton, B., Baughan, C., Elliott, M., & Maycock, G. (2004). *The accident risk of motorcyclists* (No.
395 TRL607). London: Department for Transport. Last accessed 26 June 2013 from
396 <http://www.network.mag-uk.org/documents/TRL607.pdf>
- 397 Sexton, B., Hamilton, K., Baughan, C., Stradling, S., & Broughton, P. (2006). *Risk and*
398 *motorcyclists in Scotland*. Edinburgh: Scottish Executive. Last accessed 26 June 2013 from
399 <http://www.scotland.gov.uk/Resource/Doc/130718/0031270.pdf>
- 400 Symmons, M., Mulvihill, C., & Collins, M. (2011). *On-road comparison of returned, continuing*
401 *and new motorcycle riders*. Paper presented at the 21st Canadian Multidisciplinary Road
402 Safety Conference, May 8-11, Halifax, Nova Scotia. Last accessed 25 June 2013 from
403 [http://www.carsp.ca/uploaded_files/fck/File/CMRSC%20Proceedings/2011_CMRS_CXXI_H](http://www.carsp.ca/uploaded_files/fck/File/CMRSC%20Proceedings/2011_CMRS_CXXI_Halifax/Presentations/1B%20Mark%20Symmons.pdf)
404 [alifax/Presentations/1B%20Mark%20Symmons.pdf](http://www.carsp.ca/uploaded_files/fck/File/CMRSC%20Proceedings/2011_CMRS_CXXI_Halifax/Presentations/1B%20Mark%20Symmons.pdf)