



2012 Motorcycle 'Lane Splitting' Intercept Survey California Office of Traffic Safety

Motorcycle Operator Responses Section

SAMPLE FRAME

The sample frame for the motorcycle portion of the study is show in Table 1 below. Overall, the 12 counties included in the sample frame were: San Bernardino, Ventura, San Diego, Orange, Riverside and Los Angeles for the Southern California and: San Francisco, Alameda, Contra Costa, San Mateo, Santa Clara and Sacramento for the Northern California region. The number of motorcycle licenses in the 12 counties, based on DMV records counts, included 70.2% of all motorcycle licenses in the State of California.

Overall, 560 motorcyclists were intercepted for the study, resulting in a confidence interval of +/- 4.14 at a confidence level of 95%.

Table 1. Sample frame and completed intercepts by county

MC	Counties	# MC license	% MC license of CA	% MC license of sample	# MC intercepts	% MC intercepts of total
SOUTH	San Bernardino	38,484	5.5%	7.8%	23	4.1%
	Ventura	21,253	3.0%	4.3%	26	4.6%
	San Diego	61,261	8.7%	12.4%	62	11.1%
	Orange	60,670	8.6%	12.3%	75	13.4%
	Riverside	37,882	5.4%	7.7%	72	12.9%
	LA	127,906	18.2%	26.0%	146	26.1%
NORTH	San Francisco	17,793	2.5%	3.6%	23	4.1%
	Alameda	27,616	3.9%	5.6%	35	6.3%
	Contra Costa	22,916	3.3%	4.7%	27	4.8%
	San Mateo	14,302	2.0%	2.9%	17	3.0%
	Santa Clara	32,226	4.6%	6.5%	29	5.2%
	Sacramento	30,221	4.3%	6.1%	25	4.5%
	Total included in sample	492,530				
	Total CA	701,812	70.2%	100.0%	560	100.0%

DEMOGRAPHICS

The demographic information collected from motorcycle riders included the respondent age and gender, both listed in Tables 2 and 3. Overall, the majority of motorcyclists were male (93.4%) and most of the respondents in the sample were between the ages of 25 and 54 years (75.0% of all respondents).

Table 2. Respondent age

Respondent age	Frequency	Percent
18-24	35	6.3%
25-34	118	21.1%
35-44	131	23.4%
45-54	171	30.5%
55-70	95	17.0%
70 or older	8	1.4%
Skip	2	0.4%
Total	560	100.0%

The median age range for motorcyclist in this study is between the ages of 35 to 44 years.

Table 3. Respondent Gender

Respondent Gender	Frequency	Percent
Male	523	93.4%
Female	37	6.6%
Total	560	100.0%

The distribution of age and gender of respondents is shown in Table 4.

Table 4. Respondent Age by Gender

Respondent Age	Male	Female	Total
18-24	30 85.7%	5 14.3%	35 100.0%
25-34	109 92.4%	9 7.6%	118 100.0%
35-44	125 95.4%	6 4.6%	131 100.0%
45-54	160 93.6%	11 6.4%	171 100.0%
55-70	89 93.7%	6 6.3%	95 100.0%
70 or older	8 100.0%	0 0.0%	8 100.0%
Skip	2 100.0%	0 0.0%	2 100.0%
Total	523	37	560

MOTORCYCLE USE

The predominant motorcycle is outlined in Table 5 below. The majority of all respondents stated to mainly use their motorcycle for pleasure riding on the weekend (45.9% of all valid responses, which exclude the “don’t know” and “asked to skip” responses.) Another 30.8% of responses were indicating motorcycle use for both commuting to work and pleasure riding on the weekends. Other specified responses, which accounted for 2.0% of all answers included “driving round town”, and four respondents were motorcycle messengers, using their motorcycle for work.

Table 5. Q1. What best describes how you use your motorcycle most of the time? You use it for...

Q1	Frequency	Percent
Pleasure riding on weekends	255	45.9%
Both commuting to work and pleasure riding on weekends	170	30.8%
Commuting to work	100	18.0%
Other specified	11	2.0%
Long-distance touring rides	10	1.6%
Sport	7	1.3%
Bar hopping	3	0.5%
Total	556	100.0%

Vehicle Miles Traveled

A total of 553 valid answers were collected for the questions on miles respondents ride their motorcycle on an average day. Answers ranged from 2 miles to 600 miles per day, with a mean mileage of 71.7 miles and a median of 50 miles per day. Seven respondents either did not know or asked to skip this question (see Table 6).

Table 6 Q3. Average miles riding per day

Total responses	553
Missing responses	7
Mean	71.7
Median	50.0
Minimum	2
Maximum	600

LANE SPLITTING ON FREEWAYS

Of all motorcyclists intercepted, 77.6% confirmed that they were lane splitting when riding on freeways (one respondent refused to answer, Table 7).

Table 7. Q4. Do you lane split on your motorcycle when riding on freeways?

Q4	Frequency	Percent
Yes	434	77.6%
No	125	22.4%
Total	559	100.0%

With respect to the frequency of lane splitting while riding on freeways, 49.6% of all motorcyclists surveyed stated to “always” or “often” lane split, while 50.4% “sometimes” or “rarely” lane split on freeways (see Table 8).

Table 8. Q5. How frequently do you lane split on freeways? Would you say...?

Q5	Frequency	Percent
Always	134	30.9%
Often	81	18.7%
Sometimes	162	37.4%
Rarely	56	12.9%
Total	433	100.0%

The distribution of gender by lane splitting behavior on freeways is shown in Table 9. Overall, 79.7% of all male riders stated to lane split on freeways, while only 48.6% of female motorcyclists did.

Table 9. Q4. Do you lane split on your motorcycle when riding on freeways?

Respondent Gender	Yes	No	Total
Male	416 79.7%	106 20.3%	522 100.0%
Female	18 48.6%	19 51.4%	37 100.0%
Total	434 77.6%	125 22.4%	559 100.0%

The difference in gender on lane splitting on freeways is significant ($p=0.00$), though the number of observations is very small.

The relationship between age and lane splitting behavior on freeways is shown in Table 10; the difference between age and lane splitting behavior on freeways is not significant.

Table 10. Q4. Do you lane split on your motorcycle when riding on freeways?

Respondent Age	Yes	No	Total
18-24	22 73.3%	8 26.7%	30 100.0%
25-34	95 88.0%	13 12.0%	108 100.0%
35-44	104 83.2%	21 16.8%	125 100.0%
45-54	124 77.5%	36 22.5%	160 100.0%
55-70	64 71.9%	25 28.1%	89 100.0%
70 or older	5 62.5%	3 37.5%	8 100.0%
Total	414 79.6%	106 20.4%	520 100.0%

Table 11. Q2. Frequencies on riding and lane split behavior on freeways

Q11	Yes	No	Total
6-7 days a week	166 86.0%	27 14.0%	193 100.0%
3-5 days a week	136 81.9%	30 18.1%	166 100.0%
1-2 times a week	104 72.2%	40 27.8%	144 100.0%
Less than once a week	24 46.2%	28 53.8%	52 100.0%
Total	430 77.5%	125 22.5%	555 100.0%

The lane splitting behavior on freeways by frequency of riding a motorcycle (Q2) is shown in Table 11. There is a significant difference between lane splitting behavior and the frequency of riding a motorcycle per week. Respondents who ride more frequently during a week report a higher rate of lane splitting on freeways ($p=0.00$).

CRASHES WHILE LANE SPLITTING ON FREEWAYS

Of all motorcyclists who lane split on freeways 11.7% reported to have been hit by a vehicle while lane splitting and 3.2% stated to have hit a vehicle (Table 12). Overall, 84.4% of all intercepted motorcyclists were never hit this nor did they hit a vehicle while lane splitting.

Table 12. Q6. Have you ever hit a vehicle or has a vehicle hit you while you were lane splitting on a freeway?

Q6	Frequency	Percent
Yes, vehicle hit me	51	11.7%
Yes, I hit vehicle	14	3.2%
No, never	367	84.4%
DK	2	0.5%
Skip	1	0.2%
Total	435	100.0%

Riders who never hit a vehicle nor were hit while lane splitting were asked the follow-up question Q6a about their experiences on nearly hitting a vehicle. Overall, 45.2% of all these respondents stated that they had nearly hit a vehicle while lane splitting, 2.7% of respondents did not know (Table 13).

Table 13. Q6a. Did you ever nearly hit a vehicle?

Q6a	Frequency	Percent
Yes	166	45.2%
No	191	52.0%
DK	10	2.7%
Total	357	100.0%

The follow-up question on the outcome of the hit of collision can be found in Table 14. The responses in Table 14 are summarized for respondents who have been hit by a vehicle or who did hit a vehicle while lane splitting on a freeway, combining the multiple answers provided.

Overall, 81 responses total from 66 unique respondents were included (and excluding respondents who asked to skip this question). Of all answers, 34.6% of motorcyclists stated to have “just hit a car mirror”, 11.1% reported minor injuries and 9.9% of all respondents stated to suffer severe injuries as a result of hitting a vehicle or being hit.

Table 14. Respondent who have been hit or did hit a vehicle while lane splitting: Q7. What damage was caused by that hit or collision (multiple choice)?

Q7- have been hit or did hit a vehicle while lane splitting (combined)	Frequency	Percent
Just hit car mirror	28	34.6%
I had minor injuries (scrapes/bruises)	9	11.1%
I had severe injuries (broken bones, lacerations, trauma)	8	9.9%
Scraped/hit side of car	6	7.4%
I hit car front bumper	1	1.2%
I was run over by car	1	1.2%
I hit one or more cars	2	2.5%
I was knocked down	6	7.4%
Other	20	24.7%
Total	81	100.0%

Selecting only the respondents who have been hit by a vehicle while lane splitting (61 responses from 51 unique cases total), the frequencies of answers on the damage caused by the hit or collision are listed in Table 15. A total of 29.5% of respondents answered that the resulting damage was “just hitting the car mirror”, 13.1% reported minor injuries while 8.2% reported severe injuries.

Table 15. Respondent who have been hit by a vehicle while lane splitting: Q7. What damage was caused by that hit or collision (multiple choice)?

Q7- have been hit by a vehicle while lane splitting	Frequency	Percent
Just hit car mirror	18	29.5%
I had minor injuries (scrapes/bruises)	8	13.1%
Scraped/hit side of car	5	8.2%
I had severe injuries (broken bones, lacerations, trauma)	5	8.2%
I hit car front bumper	1	1.6%
I was run over by car	1	1.6%
I hit one or more cars	2	3.3%
I was knocked down	6	9.8%
Other	15	24.6%
Total	61	100.0%

The 15 “other” responses given by motorcyclists as outcome to being hit by a vehicle included seven responses indicating: “minor damage to MC”, “major damage to vehicle” and five cases stating no damage at all.

Table 16 shows the frequencies of responses on the damages reported from motorcyclists who hit a vehicle (17 answers from 14 unique cases). Of those responses, 52.9% of the damages reported were “just hitting a car mirror” and 11.8% reported severe injuries as a result of the collision.

Table 16. Respondent who hit a vehicle while lane splitting: Q7. What damage was caused by that hit or collision (multiple choice)?

Q7- hit a vehicle while lane splitting	N	Percent
Just hit car mirror	9	52.9%
I had severe injuries (broken bones, lacerations, trauma)	2	11.8%
Scraped/hit side of car	1	5.9%
I had minor injuries (scrapes/bruises)	1	5.9%
Other	4	23.5%
Total	17	100.0%

The four “other” answers on damage caused by that hit or collision included: “major damage to MC”, “minor damage to MC”, “minor damage to vehicle” and no damage at all.

The description of the lane splitting behaviors on freeways in regards to speed are shown in Table 17. Based on the coded open-ended comments, the answer category “At all times” was added. The majority of all respondents, 64.4% only lane split on freeways when traffic is going less than 20 MPH, during stop and go or at a traffic standstill.

Table 17. Q8. What best describes your lane splitting on freeways? Would you say you lane split only when...?

Q8	Frequency	Percent
Traffic is at a standstill	67	15.7%
Traffic is stop-and-go	122	28.6%
Traffic is moving less than 20 MPH	86	20.1%
Traffic is moving less than 30 MPH	67	15.7%
Traffic is moving less than 40 MPH	21	4.9%
Traffic is moving less than 50 MPH	20	4.7%
Traffic is moving less than 60 MPH	10	2.3%
Traffic is moving less than 70 MPH	7	1.6%
Other	3	0.7%
At all times	24	5.6%
Total	427	100.0%

LANE SPLITTING ON ROADS OTHER THAN FREEWAYS

Of all respondents, 63.9% stated to lane split when riding a motorcycle on roads other than freeways (Table 18).

Table 18. Q9. Do you lane split on your motorcycle when riding on multiple lane roads other than freeways?

Q18	Frequency	Percent
Yes	356	63.9%
No	201	36.1%
Total	557	100.0%

A variable was computed to count the number of respondents who do both lane splitting on freeways and other roadways. The frequency of that computed variable is shown in Table 19 below. Of all respondents, 53.9% reported to lane split on both freeways and other roadways.

A total of 9.6% of all respondents stated to lane split on multiple lane (ML) roads only, and not on freeways and 23.6% of all motorcyclists stated to lane split on freeways only and 12.9% never lane split at all. (Note: the percentages differ to the Table 18 percentage which counts unique responses to lane splitting on regular roads, and which includes respondents who only lane split on roads and those lane splitting on surface roads and freeways).

Table 19. Lane split behavior by road types

Lane split behavior by road type	Frequency	Percent
Lane split on both freeways and roads	302	53.9%
Lane split on (ML) roads only	54	9.6%
Lane split on freeways only	132	23.6%
Never lane splitting	72	12.9%
Total	560	100.0%

Of the motorcyclists who lane split on roads other than freeways 38.8% reported to “always” or “often” lane split on roads, while 61.1% “sometimes” or “rarely” lane split on roads (Table 21).

Table 21. Q10. How frequently do you lane split on roads other than freeways? Would you say...?

Q10	Frequency	Percent
Always	80	22.5%
Often	58	16.3%
Sometimes	132	37.2%
Rarely	85	23.9%
Total	355	100.0%

Overall, 5.2% of motorcyclists (and 8.3% of those who lane split on roads), stated to have been hit by a vehicle and 0.7% (1.1% of lane splitters) hit a vehicle while lane splitting. A total of 90.6% of motorcyclists who lane split on all roads other than freeways, never hit a vehicle nor were hit while lane splitting (Table 22).

Table 22. Q11. Have you ever hit a vehicle or has a vehicle hit you while you were lane splitting on roads other than freeways?

Q11	Frequency	Percent
Yes, vehicle hit me	29	8.3%
Yes, I hit vehicle	4	1.1%
No, never	318	90.6%
Total	351	100.0%

Those who never experienced a hit or collision while lane splitting stated with 29.7% of responses that they did nearly hit a car while lane splitting (see also Table 23).

Table 23. Q11a. Did you ever nearly hit a vehicle?

Q11a	Frequency	Percent
Yes	91	29.7%
No	215	70.3%
Total	306	100.0%

Of the motorcyclists who hit or were nearly hit by a vehicle, the response frequencies of damages caused by that hit or collision are listed in Table 24, combining multiple choice answers given. A total of 20.0% only hit a car mirror followed by 14.3% scraping or hitting the side of the car, while 11.4% of motorcyclists reported severe injuries.

Separate tables for responses of motorcyclists who were hit by vehicle versus those who hit a vehicle were not computed due to the small number of answers.

Table 24. Q12. Frequencies of damages caused by hit/collision

Q12	Frequency	Percent
Just hit car mirror	7	20.0%
Scraped/hit side of car	5	14.3%
I had severe injuries (broken bones, lacerations, trauma)	4	11.4%
I had minor injuries (scrapes/bruises)	3	8.6%
I hit one or more cars	1	2.9%
I was knocked down	1	2.9%
Other	14	40.0%
Total	35	100.0%

Of the motorcyclists who lane split on roads other than freeways, 81.3% lane split only when traffic moves at 20 MPH or less (Table 25).

Table 25. Q13. Would you say you lane split only when...?

Q13	Frequency	Percent
traffic is at a standstill	113	32.9%
traffic is stop-and-go	108	31.5%
traffic is moving less than 20 MPH	58	16.9%
traffic is moving less than 30 MPH	21	6.1
traffic is moving less than 40 MPH	9	2.6
traffic is moving less than 50 MPH	8	2.3
Other	26	7.6%
Total	343	100.0%

The other specified answers given on lane splitting on non-freeways included “at all times” for 95.4% of all responses as well as “depending on traffic”, “whenever I feel like it” and similar (see also Table 26).

Table 26. Q13 other. Would you say you lane split only when...?

Q13 – other specified	Frequency	Percent
at all times	20	95.4%
at red lights to get in front	1	3.6%
dependent on traffic	1	0.2%
only at stop signs	1	0.2%
up to speed limit	1	0.2%
whenever I feel like it	2	0.4%
Total	26	100.0%

The response frequencies to the question of speed in general, when lane splitting, is shown in Table 27. The majority of answers, 42.1% of all respondents who lane split at all, stated to be about 10 miles per hour faster than the rest of the traffic when lane splitting, and 86.8% of all lane splitters stated a speed of 15 MPH or less while lane splitting on multiple lane roads other than freeways.

Table 27. Q14. How much faster than the rest of the traffic do you go when lane splitting?

Speed of MC while lane splitting	Frequency	Percent
about 5MPH faster than other traffic	115	24.1%
about 10MPH faster than other traffic	201	42.1%
about 15MPH faster than other traffic	98	20.5%
about 20MPH faster than other traffic	45	9.4%
about 30MPH faster than other traffic	5	1.0%
about 40MPH faster than other traffic	6	1.3%
about 50MPH faster than other traffic	2	0.4%

Speed of MC while lane splitting	Frequency	Percent
about 5MPH faster than other traffic	115	24.1%
about 10MPH faster than other traffic	201	42.1%
about 15MPH faster than other traffic	98	20.5%
Other	5	1.0%
Total	477	100.0%

The “other specified” answers provided on the speed of the motorcyclist when lane splitting in general was answered with “depending on situation” and similar.

A comparison of lane splitting behavior by street type and speed of the motorcyclist did not show any significant differences in both variables. The stated speed differential to traffic while lane splitting by road type can be seen in Table 28. Whether motorcyclist only lane split on freeways, only on roads or on both, did not result in a difference in speed differential.

Table 28. Q14. How much faster than the rest of the traffic do you go when lane splitting?

Speed while lane splitting by lane split behavior by road type	Lane split on both freeways and roads	Lane split on roads only	Lane split on freeways only	Total
about 5MPH faster than other traffic	58 19.7%	26 50.0%	31 23.8%	115 24.1%
about 10MPH faster than other traffic,	131 44.4%	18 34.6%	52 40.0%	201 42.1%
about 15MPH faster than other traffic	69 23.4%	5 9.6%	24 18.5%	98 20.5%
about 20MPH faster than other traffic	24 8.1%	3 5.8%	18 13.8%	45 9.4%
about 30MPH faster than other traffic	4 1.4%	0 0.0%	1 0.8%	5 1.0%
about 40MPH faster than other traffic	4 1.4%	0 .0%	2 1.5%	6 1.3%
about 50MPH faster than other traffic	1 0.3%	0 0.0%	1 0.8%	2 .4%
Other	4 1.4%	0 0.0%	1 0.8%	5 1.0%
Total	295 100.0%	52 100.0%	130 100.0%	477 100.0%

The answers to Q15 on the subjective most serious threat to motorcyclists when lane splitting can be found in Table 29. The following answer categories were added as a result of open-ended coding:

- Cars changing lanes
- Cars no signaling lane change
- Cars not paying attention
- Cars changing into carpool lanes
- Cars open doors

The most frequently mentioned answer was “drivers not looking in mirror”, which was given by 32.5% of all lane splitting motorcyclists. Another 30.0% mentioned “distracted drivers” and 10.1% mentioned “cars changing lanes” as the most serious threat to safety while lane splitting (Table 29).

Table 29. Q15. In your opinion, what is the MOST serious threat to your safety when lane splitting?

Q15	Frequency	Percent
Drivers not looking in mirror	155	32.5%
Distracted drivers	143	30.0%
Other	56	11.7%
Cars changing lanes	48	10.1%
Aggressive drivers	35	7.3%
Cars not signaling lane change	11	2.3%
Cars not paying attention	7	1.5%
Car’s open doors	7	1.5%
Narrow Lanes	5	1.0%
Cars changing into carpool lane	4	0.8%
Big trucks	3	0.6%
Poor road surface	2	0.4%
Drunk drivers	1	0.2%
Total	477	100.0%

A total of 11.7% of answers given were “other specified” answer listed in Table 30.

Table 30. Q15 other. In your opinion, what is the MOST serious threat to your safety when lane splitting – other specified comments?

Q15 - other	Frequency	Percent
	504	90.0%
Cars not knowing that lane splitting is ok	1	0.2%
Crowding of lanes	1	0.2%
Death	2	0.4%
Depends on the traffic	1	0.2%
Drivers cutting MC off	3	0.5%

Q15 - other	Frequency	Percent
	504	90.0%
Cars not knowing that lane splitting is ok	1	0.2%
Crowding of lanes	1	0.2%
Drivers not letting mc in	1	0.2%
Edited	2	0.4%
Everything	1	0.2%
Getting hit/injured in general.	4	0.7%
Illegal lane change by cars	3	0.5%
Myself	9	1.6%
None	1	0.2%
Not having a separate lane for bikers like in other states w/ a physical barrier	1	0.2%
Other cars	19	3.4%
Other MCs lane splitting	1	0.2%
Pedestrians jaywalking	1	0.2%
People that hate me	1	0.2%
Visibility of road for MC	4	0.7%
Total	560	100.0%

All lane splitting motorcyclists intercepted were also asked if they have ever received a traffic ticket or citation while lane splitting, the results of which can be found in Table 31. A total of 4.1% of lane splitting riders did receive a ticket, 3.6% of the entire sample of motorcyclists.

Table 31. Q16. Have you ever received at traffic ticket or citation while lane splitting

Q16	Frequency	Percent
Yes	20	3.6%
No	468	83.6%
Total	488	87.1%
DK	2	0.4%
System	70	12.5%
Total	72	12.9%
Total	560	100.0%

The type of violation received while lane splitting is listed in Table 32 and included: “speeding” in 63.2% of all cases (2.1% of entire group of motorcyclists), “misuse of lane” (0.5% of entire sample) and “failure to signal lane change” (0.2% of entire sample).

Table 32. Q17. What was the violation?

Q17	Frequency	Percent
Speeding	12	63.2%
Misuse of lanes	3	15.8%
Failure to signal lane change	1	5.3%
Other	3	15.8%
Total	19	100.0%

Other violations received while lane splitting were “reckless driving” and “unsafe driving” (see Table 33).

The final question of the intercept asked if motorcyclists ever experienced a vehicle trying to prevent them from lane splitting; the results can be found in Table 33. Overall, 67.2% of all respondents (and excluding “don’t know” and “asked to skip” responses) mentioned that they had experienced this.

Table 33. Q18. Has a vehicle driver ever tried to prevent you from passing while you were lane splitting?

Q18	Frequency	Percent
Yes	320	67.2%
No	156	32.8%
Total	476	100.0%