



MOTORCYCLE LANE SHARE STUDY AMONG CALIFORNIA MOTORCYCLISTS AND DRIVERS 2012

DRAFT METHODOLOGICAL AND ANALYSIS REPORT

Conducted on Behalf Of

The California Office of Traffic Safety

The Safe Transportation Research and Education Center -
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I. INTRODUCTION

This methodological report describes Ewald & Wasserman Research Consultants' (E&W) survey research and data collection methods instituted for the first wave of the California Motorcycle Lane Share study among motorcyclists and drivers conducted on behalf of the California Office of Traffic Safety (OTS) and the Safe Transportation Research and Education Center (SafeTREC) at the University of California, Berkeley. The study objective was a statewide statistically representative study with California drivers and California motorcyclists regarding their behavior and opinions on motorcycle lane sharing on freeways and other multiple lane roadways.

The research effort consisted of 733 completed surveys with vehicle drivers and 560 intercept surveys with motorcycle riders for a total of 1,293 completed intercepts. All intercepts were conducted in twelve California counties; out of those counties 35 cities were selected based on population density and within the selected cities a total of 148 sites were included in the sample frame. The target sites included mostly fueling stations but comprised recreational area sites and driving destinations within a 5-mile radius of the target sites to include as many motorcyclists as possible.

The overall purpose of the study was to collect statistically representative data of California drivers and motorcycle riders, age 18 and older, who drove or rode to the targeted site during the data collection period. The intercept collected information about respondents' perceptions on motorcycle lane sharing, its perceived legality and risks as well as personal driving behaviors and frequencies.

II. METHODS

■ A. Sample Methodology and Sample Site Selection

Overall, 12 counties were included in the sample frame based on the number of motorcycle licenses and vehicle drivers licenses.

The 12 counties included 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 (see also Table 1 below). 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. Table 1 also shows the final number of intercepts with motorcycle riders by county, with Los Angeles resulting in 26.1% of all intercepts (and 26.0% of all motorcycle licenses) to San Mateo with 3.0% of all completed intercepts (and 2.9% of licenses in the sample frame).

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	# completes	% of completes
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 sample		492,530			
Total CA		701,812	70.2%	100.0%	560	100.0%

The sample frame for the vehicle driver segment of the Lane Share Study was the same as for the motorcycle rides, both groups were surveyed at the same locations. Table 2 shows the distribution of

drivers' licenses among the 12 selected counties. The number of motorcycle licenses based on DMV records counts, included 77.1% of all vehicle drivers' licenses in the State of California.

Overall, 733 vehicle drivers were intercepted for the study, resulting in a confidence interval of +/- 3.62 at a confidence level of 95%.

Table 2. Sample frame vehicle drivers and completed intercepts by county

AUTO	Counties	# Auto licenses in CA	% Auto license of CA	% Auto license in sample	# completes	% of completes
SOUTH	San Bernardino	1,006,183	4.9%	6.4%	42	5.7%
	Ventura	489,283	2.4%	3.1%	21	2.9%
	San Diego	1,751,350	8.5%	11.1%	83	11.3%
	Orange	1,795,537	8.8%	11.4%	85	11.6%
	Riverside	1,020,498	5.0%	6.5%	40	5.5%
	LA	5,526,082	26.9%	35.0%	239	32.6%
NORTH	San Francisco	355,388	1.7%	2.2%	17	2.3%
	Alameda	861,942	4.2%	5.5%	49	6.7%
	Contra Costa	618,972	3.0%	3.9%	25	3.4%
	San Mateo	527,303	2.6%	3.3%	21	2.9%
	Santa Clara	1,093,363	5.3%	6.9%	71	9.7%
	Sacramento	761,772	3.7%	4.8%	40	5.5%
	Total sample	15,807,673				
Total CA	20,507,384	77.1%	100.0%	733	100.0%	

■ B. Interview Locations, Times, and Duration

The data collection was implemented on Friday, March 23, 2012, through Saturday April 7, 2012 and included all weekday and weekend days.

Two separate teams were trained and dispatched to cover all 148 sites included in the sample frame. The Southern California team conducted the intercept surveys in the following counties: Ventura, San Bernardino, Los Angeles, San Diego, Orange and Riverside. The Northern California team covered: San Francisco, Alameda, Santa Clara, Contra Costa and Sacramento. The teams were instructed to be in the field locations during daylight hours only during periods without rain and not for longer than a six-hour time frame to conduct the intercept surveys.

A master grid of all locations within a team's respective list of counties was provided to the respective team leader and included per location five selected gas/fueling stations (or equivalent), labeled "cluster"

ranked in the order of #1 to #5. The protocol for the data collection was to approach the first site #1 of a cluster to determine if the business was still in operation and if the site would generate sufficient vehicle and motorcycle traffic to conduct intercepts. All business sites that were closed, or had less than 10 vehicle drivers or less than 4 motorcycle riders visiting per hour, were excluded from the sample frame and the data collection team moved to the second site in their cluster. Upon eligibility of the site, the station manager or similar person was asked for permission to conduct intercepts on their premises. If permission was granted, the intercept commenced, in cases of refusal, the team moved to the next defined site.

If the team visited all of the pre-selected locations without viable options, they were instructed to consult with the E&W project manager to obtain the next site location to visit, which was selected based on available substitute areas within a one-mile radius and then communicated to the field team.

■ C. Staff Training

Training procedures and pilot test of observation form

E&W conducted a pilot test of the intercept form prior to the start of the actual data collection to determine and narrow down the possible answering options of questions and to ensure the understandability of the used terminology. As a result of the pilot test, the answering options for four intercept questions were updated and a single description for lane sharing behavior was defined. The final version of the intercept survey can be found in appendix A for the vehicle driver and appendix B for the motorcyclists.

Both northern and southern California field teams were trained in the last week of March 19, 2012. The training included a question-by-question review of the intercept form and role-play with team leader to become familiar with the flow of the survey instrument. The formal training was followed by a closely supervised on-site visit and a 45 to 60 minute round of test intercepts in various locations in downtown San Francisco, Santa Monica and downtown San Diego.

Frequently asked questions (FAQs) were provided to all interviewers for reference in answering commonly asked questions. Letters to fueling station managers or supervising managers were reviewed prior to starting in the field.

Field data collection

The team leader for each group was responsible for coordinating directly with the E&W Project Manager about scheduling, carpooling, mapping, transfer of materials, and other study-related matters. Team members were encouraged to carpool as much as possible and to complete the location visits in the most effective and well-coordinated approach.

Upon arriving at a location, the team leader was instructed to first introduce the team to the fueling station manager or personnel before commencing any data collection. With the consent of the management, the team began to approach respondents, implementing the methodology of approaching every motorcyclist age 18 or older who rode to the location and every third driver of a vehicle 18 years of age or older who drove to the location. The intercept survey was conducted in English and Spanish, and the bilingual field staff had a translated intercept form for data collection. The team members were instructed to additionally tally the number of people who were approached and who, after being read the introduction to participate, declined the survey or did not speak English or Spanish.

■ D. Response and Refusal Rates

The Table 3 below show the response and refusal rates by county. Overall, 1,293 surveys were completed with vehicle drivers and motorcycle riders, a total of 513 respondents refused to participate, and 196 respondents did not speak English or Spanish and were therefore not qualified for the study. The eligible refusal rate (Refusals/Total) for all counties in the sample range from 5.0% in San Mateo to 44.9% in San Bernardino county, with an average refusal rate of 26.0%.

Table 3. Refusal rates by county

County	Completes	Refusals	Total	Not qualified	Eligible Refusal Rate
San Francisco	40	25	65	0	38.5%
Alameda	84	26	110	0	23.6%
Santa Clara	100	36	136	1	26.5%
Contra Costa	52	10	62	1	16.1%
Sacramento	65	10	75	1	13.3%
San Mateo	38	2	40	0	5.0%
Los Angeles	385	156	541	54	28.8%
Riverside	112	27	139	1	19.4%
San Bernardino	65	53	118	41	44.9%
Orange	160	33	193	42	17.1%
San Diego	145	57	202	54	28.2%
Ventura	47	20	67	1	29.9%
Total	1,293	455	1,748	196	26.0%

III. RESULTS

■ A. Motorcyclists Intercept Results

Respondent demographics

The demographic information collected from motorcycle riders included the respondent age and gender, both listed in Tables 4 and 5. 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 4. 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 5. 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 6.

Table 6. 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 use is outlined in Table 7, below. The majority of all respondents stated they 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 7. Q1. What best describes how you use your motorcycle most of the time? You use it for...

Q1	Frequency	Valid 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 related to the number of 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 8).

Table 8. Q3. Average miles riding per day

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

Lane splitting of freeways

Of all motorcyclists intercepted, 77.6% confirmed that they were lane splitting when riding on freeways (one respondent refused to answer, Table 9).

Table 9. 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 10).

Table 10. 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 created region variable “Southern CA” included the Counties of: San Bernardino, Ventura, San Diego, Orange, Riverside and LA. “Northern CA” comprised the counties of San Francisco, Alameda, Contra Costa, San Mateo, Santa Clara and Sacramento (see also Table 1). The incidence of motorcyclists’ lane splitting on freeways by northern or southern California region is shown in Table 10a and there are no significant differences between regions.

Table 10a. Lane splitting on CA freeways by CA region

Lane splitting	Northern CA	Southern CA	Total
Yes	120 76.9%	314 77.9%	434 77.6%
No	36 23.1%	89 22.1%	125 22.4%
Total	156 100.0%	403 100.0%	559 100.0%

The frequency of motorcyclists' lane splitting by California region is shown in Table 10b, with a comparable distribution between Northern and Southern California drivers. There is no significant difference in the distribution of the frequency of lane splitting on freeways between motorcyclists in northern versus southern California.

Table 10b. Frequency of lane splitting on CA freeways by CA region

Frequency of lane splitting	Northern CA	Southern CA	Total
Always	28 23.3%	106 33.9%	134 30.9%
Often	25 20.8%	56 17.9%	81 18.7%
Sometimes	54 45.0%	108 34.5%	162 37.4%
Rarely	13 10.8%	43 13.7%	56 12.9%
Total	120 100.0%	313 100.0%	433 100.0%

The distribution of gender by lane splitting behavior on freeways is shown in Table 11. Overall, 79.7% of all male riders stated to lane split on freeways, while only 48.6% of female motorcyclists did.

Table 11. 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 12; the difference between age and lane splitting behavior on freeways is not significant.

Table 12. 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 13. Q2. Frequencies of riding and lane split behavior on freeways

Frequency of riding	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 13. 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).

Accidents while lane splitting of 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 14). Overall, 84.4% of all intercepted motorcyclists were never hit nor did they hit a vehicle while lane splitting.

Table 14. 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 15).

Table 15. 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 16. The responses in Table 16 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 16. Respondents 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 17. 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 17. Respondents 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 18 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 18. 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 19. 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 19. 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 20).

Table 20. 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%

The incidence of motorcyclists' lane splitting on multiple lane roads other than freeways by northern or southern California region is shown in Table 20a and there are no significant differences between both regions.

Table 20a. Lane splitting on CA multiple lane roads by CA region

Lane splitting	Northern CA	Southern CA	Total
Yes	107	249	356
	69.0%	61.9%	63.9%
No	48	153	201
	31.0%	38.1%	36.1%
Total	155	402	557
	100.0%	100.0%	100.0%

The frequency of motorcyclists' lane splitting on multiple lane roadways by California region is shown in Table 20b, with a comparable distribution between Northern and Southern California drivers. There is no significant difference in the distribution of the frequency of lane splitting between motorcyclists in northern versus the southern California region.

Table 20b. Frequency of lane splitting on CA multiple lane roads by CA region

Frequency of lane splitting	Northern CA	Southern CA	Total
Always	19 17.8%	61 24.6%	80 22.5%
Often	16 15.0%	42 16.9%	58 16.3%
Sometimes	40 37.4%	92 37.1%	132 37.2%
Rarely	32 29.9%	53 21.4%	85 23.9%
Total	107 100.0%	248 100.0%	355 100.0%

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 21 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 who lane split on surface roads and freeways).

Table 21. 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%

Table 22 shows the lane splitting behavior by road type distribution among the age groups. There is no significant difference in the lane splitting behavior by age groups but a slight percentage increase of respondents who never lane splitting the older the respondent.

Table 22. Respondent Age by lane split behavior by road types

Respondent Age	Lane Split on Both Freeways and Roads	Lane Split on Roads Only	Lane Split on Freeways Only	Never Lane Splitting	Total
18-24	20 57.1%	5 14.3%	4 11.4%	6 17.1%	35 100.0%
25-34	75 63.6%	13 11.0%	23 19.5%	7 5.9%	118 100.0%
35-44	70 53.4%	9 6.9%	37 28.2%	15 11.5%	131 100.0%
45-54	85 49.7%	18 10.5%	46 26.9%	22 12.9%	171 100.0%
55-70	47 49.5%	9 9.5%	20 21.1%	19 20.0%	95 100.0%
70 or older	3 37.5%	0 .0%	2 25.0%	3 37.5%	8 100.0%
Total	300 53.8%	54 9.7%	132 23.7%	72 12.9%	558 100.0%

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 23).

Table 23. 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 24).

Accidents while lane splitting of roads other than freeways

Table 24. 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 25).

Table 25. 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 26, 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 26. 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%

Differential speed while lane splitting

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 27).

Table 27. 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 28).

Table 28. 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 29. 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 66.2% of all lane splitters stated a speed of 10 MPH or less while lane splitting on multiple lane roads other than freeways. A total of 32.6% of motorcyclists ride 15MH or faster when lane splitting.

Table 29. Q14. How much faster than the rest of the traffic do you go when lane splitting?

Q14	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%
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 30. Whether motorcyclist only lane split on freeways, only on roads or on both, did not result in a difference in speed differential.

Table 30. 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%

Perceived threats while lane splitting and violations

The answers to Q15 on the subjective most serious threat to motorcyclists when lane splitting can be found in Table 31. The following answer categories were added as a result of open-ended coding:

- Cars changing lanes
- Cars not signaling lane change
- Cars not paying attention
- Cars changing into carpool lanes
- Car’s 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 31).

Table 31. 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 32.

Table 32. Q15 other. In your opinion, what is the MOST serious threat to your safety when lane splitting – other specified comments?

Q15 - other	Frequency	Percent
(no "other" mentioned)	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%
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 33. A total of 4.1% of lane splitting riders did receive a ticket, 3.6% of the entire sample of motorcyclists.

Table 33. Q16. Have you ever received a traffic ticket or citation while lane splitting?

Q16	Frequency	Percent
Yes	20	0.4%
No	468	99.6%
Total	488	100.0%

The type of violation received while lane splitting is listed in Table 34 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 34. 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 3X?).
[where is this table?]

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 35. Overall, 67.2% of all respondents (and excluding “don’t know” and “asked to skip” responses) mentioned that they had experienced this.

Table 35. 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%

■ B. Vehicle Driver Intercept Results

Respondent demographics

The demographic information collected from vehicle drivers included the respondent age and gender, both listed in Tables 2 and 3 respectively. Overall, more male (63.4%) than female (36.6%) vehicle drivers were intercepted for this study.

Table 36. Respondent age

Respondent Age	Frequency	Percent
18-24	127	17.5%
25-34	174	24.0%
35-44	183	25.2%
45-54	113	15.6%
55-70	108	14.9%
70 or older	20	2.8%
Total	733	100.0%

The median age range for all vehicle drivers in this study is between the ages of 35 and 44 years.

Table 37. Respondent Gender

Respondent Gender	Frequency	Percent
Male	465	63.4%
Female	268	36.6%
Total	733	100.0%

The distribution of age and gender of respondents is shown in Table 38. The distribution of age by the gender variable is comparable and there is no significant difference in the percentage distribution.

Table 38. Respondent Age by Gender

Respondent Age	Male	Female	Total
18-24	73	54	127
	57.5%	42.5%	100.0%
25-34	116	58	174
	66.7%	33.3%	100.0%
35-44	115	68	183
	62.8%	37.2%	100.0%
45-54	74	39	113
	65.5%	34.5%	100.0%
55-70	66	42	108
	61.1%	38.9%	100.0%
70 or older	14	6	20
	70.0%	30.0%	100.0%
Total	458	267	725
	63.2%	36.8%	100.0%

The driving frequencies of all respondents is shown in Table 39, indicating that the majority of drivers, 61.6% drive almost every day on a freeway in California. The distribution between male and female drivers is comparable and there are no statistical differences between driving frequency and genders.

Table 39. Driving frequency on CA freeways (Q1) by gender

About how often would you say you drive on a freeway in CA	Male	Female	Total
6-7 days a week	302 65.1%	148 55.4%	450 61.6%
3-5 days a week	91 19.6%	55 20.6%	146 20.0%
1-2 times a week	55 11.9%	42 15.7%	97 13.3%
Less than once a week	16 3.4%	22 8.2%	38 5.2%
Total	464 100.0%	267 100.0%	731 100.0%

The created region variable “Southern CA” included the Counties of: San Bernardino, Ventura, San Diego, Orange, Riverside and LA. “Northern CA” comprised the counties of San Francisco, Alameda, Contra Costa, San Mateo, Santa Clara and Sacramento (see also Table 1.) The driving frequency of drivers by California region is shown in Table 39a, with a comparable distribution between Northern and Southern California drivers.

Table 39a. Driving frequency on CA freeways by CA region

About how often would you say you drive on a freeway in CA	Northern CA	Southern CA	Total
6-7 days a week	127 57.0%	323 63.6%	450 61.6%
3-5 days a week	55 24.7%	91 17.9%	146 20.0%
1-2 times a week	34 15.2%	63 12.4%	97 13.3%
Less than once a week	7 3.1%	31 6.1%	38 5.2%
Total	223 100.0%	508 100.0%	731 100.0%

Observations and perceptions on lane splitting on freeways

The number of observations of motorcyclists’ lane splitting on freeways in an average week is shown in Table 40. The number of lane-splitting MCs observed by drivers ranged from “zero” to 210 per week, with

a median number of five (5) observations; 28 respondents did not know and one refused the answer (equals the 29 missing responses noted in Table 6). Overall, 24 respondents, or 3.2% of all surveyed drivers, never observed a motorcycle lane splitting on a freeway.

Table 40. Q2. Lane splitting MCs observed on freeways

Total responses	704
Missing responses	29
Mean	9.75
Median	5.0
Minimum	0
Maximum	210

The next intercept question asked vehicle drivers if they believe lane splitting for motorcycles on freeways to be legal or not. The frequencies of responses are shown in Table 41, with 52.9% of all vehicle drivers stating “yes”, that lane splitting for motorcycles on freeways is legal, while 36.7% did not think it to be legal, 9.8% of all respondents did not know.

Table 41. Q3. Do you think it is legal for motorcycles to lane split on freeways?

Legal to lane split freeways	Frequency	Percent
Yes	388	52.9%
No	269	36.7%
DK	72	9.8%
Skip	4	0.5%
Total	733	100.0%

Table 42 shows the cross-tabulation of frequency of driving on a freeway in California and the perception of lane splitting for motorcycles on freeways begin legal or not. Overall, vehicle drivers who drive more frequently also state that lane splitting for MCs is legal on freeways (weak significance at $p=0.27$).

Table 42. Frequency of driving of freeway and perception of legality for motorcycles to lane split on freeways?

Frequency of driving and perception of lane splitting	Legal for MCs to lane split freeways		Total
	Yes	No	
6-7 days a week	250 61.1%	159 38.9%	409 100.0%
3-5 days a week	78 59.5%	53 40.5%	131 100.0%
1-2 times a week	51 58.0%	37 42.0%	88 100.0%
Less than once a week	9 32.1%	19 67.9%	28 100.0%
Total	388 59.1%	268 40.9%	656 100.0%

Table 43 shows the relationship between age of respondent and the perception if it is legal to lane split on freeways. There is (weak) significant difference between age of vehicle driver and the positive answer of lane splitting being legal. About less than half of the youngest driver group, 44.5% of the 18-24 year olds and half of the oldest, 50.0% of the 70 years and older driver group believe that lane splitting for motorcycles is legal, while 60.7% to 65.7% of the other age groups affirmed this.

Table 43. Perception of legality for motorcycles to lane split on freeways and age

Respondent age	Do you think it is legal for motorcycles to lane split on freeways		Total
	Yes	No	
18-24	49 44.5%	61 55.5%	110 100.0%
25-34	101 62.0%	62 38.0%	163 100.0%
35-44	99 60.7%	64 39.3%	163 100.0%
45-54	69 65.7%	36 34.3%	105 100.0%
55-70	62 63.3%	36 36.7%	98 100.0%
70 or older	6 50.0%	6 50.0%	12 100.0%
Total	386 59.3%	265 40.7%	651 100.0%

Of all vehicle drivers surveyed, 86.8% stated to have experienced a motorcyclist lane splitting between the vehicle they were in and another vehicle while driving on a freeway, while 13.2% of drivers did not (Table 44).

Table 44. Q4. Have you ever had a motorcyclist lane splitting between the vehicle you were in and another vehicle?

Q4	Frequency	Percent
Yes	634	86.8%
No	96	13.2%
Total	730	100.0%

A further breakdown between frequency of driving and having experienced a motorcycle lane splitting on freeways is shown in Table 45. The more frequent the driving of freeways, the higher the percentage of having experienced a motorcycle lane splitting and the less often a respondent drove the less frequently they encountered motorcycles lane splitting (significant and $p=0.00$).

Table 45. Motorcyclist lane splitting between the vehicle you were in and another vehicle and frequency of driving on freeway

About how often would you say you drive on a freeway in CA?	Have you ever had a motorcyclist lane splitting between the vehicle you?		Total
	Yes	No	
6-7 days a week	407 91.1%	40 8.9%	447 100.0%
3-5 days a week	128 87.7%	18 12.3%	146 100.0%
1-2 times a week	77 79.4%	20 20.6%	97 100.0%
Less than once a week	21 55.3%	17 44.7%	38 100.0%
Total	633 87.0%	95 13.0%	728 100.0%

Accidents with motorcyclists while lane splitting on freeways

All vehicle drivers who had observed a motorcycle lane splitting on a freeway were asked if they ever hit a MC or if they have ever been hit by a lane splitting MC. Table 46 shows that 5.3% of all respondents stated to have been hit by a motorcycle that was lane splitting on freeway, 94.7% did not.

Table 46. Q5. Have you ever hit a motorcycle or has a motorcycle hit you while driving on a freeway?

Q5	Frequency	Percent
Yes, MC hit me/my car	34	5.3%
No, never	604	94.7%
Total	638	100.0%

Vehicle drivers who were never hit by nor hit a motorcycle that was lane splitting were asked the follow-up question Q5a about their experiences on nearly being hit by a motorcycle.

Overall, 34.6% of these respondents stated that they had been nearly hit or nearly hit a motorcyclist who was lane splitting on a freeway, while 65.4% did not.

Table 47. Q5a. Did a motorcycle ever nearly hit you?

Q5a	Frequency	Percent
Yes	196	34.6%
No	371	65.4%
Total	567	100.0%

The follow-up question for a total of 34 vehicle drivers on the outcome of the hit or collision for respondents who stated to have been hit by a motorcycle while lane splitting on a freeway allowed for multiple responses, the combined results of which can be found in Table 48.

Overall, 34 answers from 34 unique respondents were included. Of all answers given, 58.8% of drivers stated that the MC “just hit the car mirror”, 26.5% reported their vehicle being scraped or the side being hit. The remaining 14.7% of “other specified” from five respondents included: “MC hit back bumper” or “nothing happened”.

Table 48. Q6. What damage was caused by that hit or collision?

Q6	Frequency	Percent
Just hit car mirror	20	58.8%
Scraped/hit side of car	9	26.5%
Other	5	14.7%
Total	34	100.0%

All vehicle drivers were also asked if they ever witnessed a collision involving a lane splitting motorcycle on a freeway, and 19.1% of respondents stated that they did (see Table 49).

Table 49. Q7. Have you ever witnessed a collision that involved a motorcycle that was lane splitting on a freeway?

Q7	Frequency	Percent
Yes	139	19.1%
No	587	80.9%
Total	726	100.0%

Observations and perceptions on lane splitting on multiple lane roads

The number of observations of motorcyclists’ lane splitting on multiple lane roads in an average week is shown in Table 50. The number of lane splitting MCs observed ranged from “zero” to 250 per week, with a median number of three observations and a mean of 5.37 motorcyclists per week; 55 respondents did not know and one refused the answer. A total of 101 respondents (13.8% of all 733 drivers surveyed) had never observed a motorcycle lane splitting on a multiple lane road.

Table 50. Q8. Lane splitting MCs observed on multiple lane roads

Total responses	677
Missing responses	56
Mean	5.37
Median	3.0
Minimum	0
Maximum	250

Of all the drivers who ever observed a motorcycle lane splitting on a multiple lane road, a total of 69.4% confirmed that they had a motorcycle lane splitting between their and another vehicle.

Table 51. Q9. Thinking about driving on roads other than freeways have you ever had a motorcyclist lane splitting between the vehicle you were in and another vehicle?

Q9	Frequency	Percent
Yes	495	69.4%
No	218	30.6%
Total	733	100.0%

Accidents with motorcyclists while lane splitting on multiple lane roads

Respondents who did observe a motorcyclist lane splitting on a multiple lane road were additionally asked if they were ever hit by a motorcycle, the answers to which can be found in Table 52. Overall, only 1.6% of all drivers (eight answers in total) confirmed that they were hit by a lane splitting motorcyclist, while 98.4% were never hit.

Table 52. Q10. Have you ever hit a motorcycle or has a motorcycle hit you that was lane splitting on roads other than freeways

Q10	Frequency	Percent
Yes, MC hit me/my car	8	1.6%
No, never	497	98.4%
Total	515	100.0%

Drivers who were never hit by a motorcycle lane splitting on multiple lane roads were asked if they were nearly hit by a motorcycle, and 24.9% of respondents confirmed this, while 75.1% were never even nearly hit by a motorcycle lane splitting (see Table 53).

Table 53. Q10a. Were you ever nearly hit by a motorcycle?

Q10a	Frequency	Percent
Yes	118	24.9%
No	355	75.1%
Total	497	100.0%

The damage caused to vehicles by lane splitting motorcycles on multiple lane roads is shown in Table 54. A total of 18 answers were collected, 50.0% of which were: “scraped/hit side of car” and 37.5% stated the damage was “just hitting the car mirror”.

Table 54. Q11. What damage was caused by that hit or collision?

Q11	Frequency	Percent
Just hit my car mirror	3	37.5%
Scraped/hit side of car	4	50.0%
Other	1	12.5%
Total	18	100.0

All vehicle drivers were asked if they ever witnessed a collision that involved a MC that was lane splitting on a multiple lane road, and 16.0% reported that they did witness this, 84.0% did not (Table 55).

Table 55. Q12. Have you ever witnessed a collision that involved a motorcycle that was lane splitting on roads other than freeways?

Q12	Frequency	Percent
Yes	115	16.0
No	602	84.0
Total	717	100.0

Table 56 shows the comparison of perception of lane splitting being legal on freeways and on multiple lane roads. Overall, a larger proportion of drivers believe that lane splitting on freeways is legal (52.9%) while on multiple lane roads more drivers believe lane splitting to be illegal (45.3%). A large segment of drivers (9.8% and 12.7% respectively) do not know if lane splitting is legal on freeways or other roads.

Table 56. Q3+Q13. Do you think it is legal for motorcycles to lane split on freeways / multiple lane roads?

Q3 + Q13	Legal to lane split freeways	Legal to lane split on multiple lane roads
Yes	52.9%	41.5%
No	36.7%	45.3%
DK	9.8%	12.7%
Skip	0.5%	0.5%
Total	100.0%	100.0%

The comparison of the respondents' age and the perception of lane splitting on multiple lane roads being legal is shown in Table 57. Similar to the comparison with lane splitting on freeways there is (weak) significant difference between age of vehicle driver and the positive answer of multiple lane roads lane splitting on being legal. About 36.0% of the youngest (18-24) and 25.0% of the oldest (70 and older) driver groups believe that lane splitting on multiple lane roads is legal, while between 46.6% and 53.5% of the other age groups believe lane splitting to be legal (p=0.02).

Table 57. Cross-tabulation of respondent age and perception of legality of lane splitting on multiple lane roads

Age	Do you think it is legal for motorcycles to lane split on roads other than freeways		Total
	Yes	No	
18-24	40 36.0%	71 64.0%	111 100.0%
25-34	86 53.1%	76 46.9%	162 100.0%
35-44	76 50.0%	76 50.0%	152 100.0%
45-54	54 53.5%	47 46.5%	101 100.0%
55-70	41 46.6%	47 53.4%	88 100.0%
70 or older	4 25.0%	12 75.0%	16 100.0%
Total	301 47.8%	329 52.2%	630 100.0%

Approval / disapproval of lane splitting

Overall, 36.6% of all vehicle drivers “strongly approve” or “somewhat approve” of lane splitting in general, while the majority of 63.4% “somewhat disapprove” or “strongly disapprove” of it (Table 58).

Table 58. Q14. How would rate your approval or disapproval of lane splitting

Q14	Frequency	Percent
Strongly approve	60	8.3%
Somewhat approve	204	28.3%
Somewhat disapprove	188	26.1%
Strongly disapprove	268	37.2%
Total	733	100.0

Table 59 shows the frequencies of the created variable “Approval” based on the positive or negative response to questions 14 (above) and the cross-tabulation with respondent gender. There is a significant difference between male and female drivers in the approval rate of lane splitting with male respondents showing a higher rate of approval (41.9%) compared to females (25.7%, p=0.00).

Table 59. Approval or disapproval of lane splitting by gender

Approval by gender	Approval	Disapproval	Total
Male	195	270	465
	41.9%	58.1%	100.0%
Female	69	199	268
	25.7%	74.3%	100.0%
Total	264	469	733
	36.0%	64.0%	100.0%

There is no significant difference in approval rates among different age groups.

Question 15 asked drivers to state why they approve or disapprove of lane splitting in a multiple choice question. The additionally collected open-ended comments were coded and the following four answering categories were added:

- Why not/no problem with it/no opinion
- MC’s choice, their own risk
- Because they fit
- As long as it is safe

The approval of lane splitting and the reason(s) given for approval or disapproval are shown in Table 60. The majority of drivers who disapprove, stated that lane splitting “is unsafe” (77.0%), that lane splitting “scares me they might crash” (19.7%) followed by the response “might cause me to have an accident” (13.2%). Of the drivers who approve of lane splitting, 27.3% of answers given were “help traffic congestion”, “it is safe” (16.8%) followed by “it is legal” by 13.7%.

Table 60. Approval of lane splitting by reason for approval/disapproval

Q15	Approval	Disapproval
It is illegal	6 2.3%	21 4.6%
It is unsafe	25 9.8%	355 77.0%
It is unfair they get ahead of me	1 0.4%	17 3.7%
It startles/surprises me	13 5.1%	54 11.7%
It scares me they might crash	13 5.1%	91 19.7%
They ride too fast	8 3.1%	28 6.1%
Might cause me to have an accident	8 3.1%	61 13.2%
It is legal	35 13.7%	2 0.4%
It is safe	43 16.8%	3 0.7%
Help traffic congestion	70 27.3%	8 1.7%
Other	14 5.5%	9 2.0%
Why not/no problem with it/no opinion	22 8.6%	9 2.0%
MC's choice, their own risk	16 6.3%	2 0.4%
Because they fit	6 2.3%	0 0.0%
As long as it is safe	24 9.4%	2 0.4%
Total	256	461

* Percentages add up to more than 100% due to multiple choice answers

An additional variable was created to combine the positive and negative answers to the lane splitting questions on both freeways and other multiple lane roads, the combination of which can be found in Table 61. A total of 34.2% of all vehicle drivers stated that it is legal for motorcycles on both freeways and multiple lane roads to lane split, while 29.2% believed both to be illegal. Another 13.2% believed lane splitting to be legal on freeways but illegal on other roads, 5.6% believed the opposite.

Table 61. Perception of legality of lane splitting on both freeways and multiple lane roads

Perception of legality	Frequency	Percent
Both legal	251	34.2%
Both illegal	214	29.2%
FWY legal - Road illegal	97	13.2%
FWY illegal - Road legal	41	5.6%
Both DK	38	5.2%
FWY legal	39	5.3%
Road legal	12	1.6%
FWY illegal	21	2.9%
Road illegal	20	2.7%
Total	733	100.0%

The cross-tabulation of the approval of lane splitting variable and the perception of legality of lane splitting is shown in Table 62. The difference between the perception of lane splitting being legal and the approval of lane splitting shows a higher approval rate among drivers who believe lane splitting to be legal. Drivers who believe lane splitting to be illegal, also have a higher rate of disapproval of lane splitting (significant at $p=0.00$).

Table 62. Approval or disapproval of lane splitting by perception of legality of lane splitting

Perception of legality	Approval of lane splitting		Total
	Approval	Disapproval	
Both legal	150	101	251
	56.8%	21.5%	34.2%
Both illegal	22	192	214
	8.3%	40.9%	29.2%
FWY legal - Road illegal	45	52	97
	17.0%	11.1%	13.2%
FWY illegal - Road legal	17	24	41
	6.4%	5.1%	5.6%
Both DK	3	35	38
	1.1%	7.5%	5.2%
FWY legal	12	27	39
	4.5%	5.8%	5.3%
Road Legal	8	4	12
	3.0%	0.9%	1.6%
FWY illegal	5	16	21
	1.9%	3.4%	2.9%
Road illegal	2	18	20
	0.8%	3.8%	2.7%
Total	264	469	733
	100.0%	100.0%	100.0%

The approval rating of lane splitting by the region of Northern and Southern California is shown in Table 62a. There are no significant differences in the approval rate of lane splitting between northern and southern California.

Table 62a. Approval or disapproval of lane splitting by California region

California Region	Approval of lane splitting		Total
	Approval	Disapproval	
Northern CA	89	134	223
	39.9%	60.1%	100.0%
Southern CA	175	335	510
	34.3%	65.7%	100.0%
Total	264	469	733
	36.0%	64.0%	100.0%

The perception of the legality of lane splitting on freeways and or multiple lane roads (by the created perception of legality variable) by California region is shown in Table 62b. The distribution of responses is similar in both regions.

Table 62b. CA region variable by perception of legality of lane splitting

Perception of legality	Geographic Region		Total
	Northern CA	Southern CA	
Both legal	70	181	251
	31.4%	35.5%	34.2%
Both illegal	54	160	214
	24.2%	31.4%	29.2%
FWY legal - Road illegal	37	60	97
	16.6%	11.8%	13.2%
FWY illegal - Road legal	14	27	41
	6.3%	5.3%	5.6%
Both DK	10	28	38
	4.5%	5.5%	5.2%
FWY legal	18	21	39
	8.1%	4.1%	5.3%
Road Legal	6	6	12
	2.7%	1.2%	1.6%
FWY illegal	5	16	21
	2.2%	3.1%	2.9%
Road illegal	9	11	20
	4.0%	2.2%	2.7%
Total	223	510	733
	30.4%	69.6%	100.0%

Table 62c shows the distribution of the perception of legality variable by California county; there are no significant differences in the perception of lane splitting being legal by road type.

Table 62c. Perception of legality of lane splitting by California County

County	Both LEGAL	Both ILLEGAL	FWY legal - Road illegal	FWY illegal - Road legal	Both DK	FWY legal	Road Legal	FWY illegal	Road illegal	Total
Orange	35 41.2%	26 30.6%	12 14.1%	3 3.5%	3 3.5%	3 3.5%	1 1.2%	2 2.4%	0 .0%	85 100.0%
LA	87 36.4%	82 34.3%	23 9.6%	11 4.6%	13 5.4%	6 2.5%	3 1.3%	8 3.3%	6 2.5%	239 100.0%
San Bernardino	14 33.3%	15 35.7%	6 14.3%	3 7.1%	1 2.4%	1 2.4%	0 .0%	1 2.4%	1 2.4%	42 100.0%
Ventura	9 42.9%	1 4.8%	2 9.5%	1 4.8%	2 9.5%	3 14.3%	2 9.5%	1 4.8%	0 .0%	21 100.0%
San Diego	23 27.7%	25 30.1%	12 14.5%	7 8.4%	5 6.0%	4 4.8%	0 .0%	3 3.6%	4 4.8%	83 100.0%
Riverside	13 32.5%	11 27.5%	5 12.5%	2 5.0%	4 10.0%	4 10.0%	0 .0%	1 2.5%	0 .0%	40 100.0%
San Francisco	10 58.8%	3 17.6%	1 5.9%	1 5.9%	2 11.8%	0 .0%	0 .0%	0 .0%	0 .0%	17 100.0%
Alameda	14 28.6%	14 28.6%	9 18.4%	3 6.1%	2 4.1%	1 2.0%	3 6.1%	1 2.0%	2 4.1%	49 100.0%
Contra Costa	8 32.0%	8 32.0%	4 16.0%	3 12.0%	2 8.0%	0 .0%	0 .0%	0 .0%	0 .0%	25 100.0%
Sacramento	9 22.5%	8 20.0%	8 20.0%	3 7.5%	1 2.5%	6 15.0%	2 5.0%	2 5.0%	1 2.5%	40 100.0%
San Mateo	11 52.4%	2 9.5%	3 14.3%	0 .0%	1 4.8%	2 9.5%	0 .0%	1 4.8%	1 4.8%	21 100.0%
Santa Clara	18 25.4%	19 26.8%	12 16.9%	4 5.6%	2 2.8%	9 12.7%	1 1.4%	1 1.4%	5 7.0%	71 100.0%
Total	251 34.2%	214 29.2%	97 13.2%	41 5.6%	38 5.2%	39 5.3%	12 1.6%	21 2.9%	20 2.7%	733 100.0%

The rate of approval by California County is displayed in Table 62d. The approval rates range from 25.0% in Riverside to 81.0% in San Mateo County, a difference that is significant (p=0.00).

Table 62d. CA County by perception of legality of lane splitting

County	Approval of lane splitting		Total
	Approval	Disapproval	
Orange	31	54	85
	36.5%	63.5%	100.0%
LA	77	162	239
	32.2%	67.8%	100.0%
San Bernardino	12	30	42
	28.6%	71.4%	100.0%
Ventura	12	9	21
	57.1%	42.9%	100.0%
San Diego	33	50	83
	39.8%	60.2%	100.0%
Riverside	10	30	40
	25.0%	75.0%	100.0%
San Francisco	7	10	17
	41.2%	58.8%	100.0%
Alameda	21	28	49
	42.9%	57.1%	100.0%
Contra Costa	12	13	25
	48.0%	52.0%	100.0%
Sacramento	11	29	40
	27.5%	72.5%	100.0%
San Mateo	17	4	21
	81.0%	19.0%	100.0%
Santa Clara	21	50	71
	29.6%	70.4%	100.0%
Total	264	469	733
	36.0%	64.0%	100.0%

Preventing motorcycles from lane splitting

All drivers were also asked if they ever prevented a motorcyclist from lane splitting, and the response summary can be found in Table 63. Of all drivers surveyed, 7.3% stated that they had tried to prevent a

motorcycle from lane splitting. Table 64 shows the responses from drivers why they tried to prevent a motorcyclist of lane splitting.

Table 63. Q16. Have you ever tried preventing a motorcycle that was lane splitting from passing you?

Q 16	Frequency	Valid Percent
Yes	53	7.3%
No	669	92.7%
Total	722	100.0

Table 64. Q17. Why did you try to prevent the motorcyclist from lane splitting?

Q17	N	Percent of responses
It is illegal	3	7.7%
It is unsafe	17	43.6%
It is unfair they get ahead of me	9	23.1%
It startles/surprises me	2	5.1%
It scares me they might crash	3	7.7%
They ride too fast	3	7.7%
Might cause me to have an accident	13	33.3%
Total	50	128.2%

The cross-tabulation of approval of lane splitting by having attempted to prevent motorcyclist from lane splitting is shown in Table 65. The difference between approvers and non-approvers in blocking motorcyclists from lane splitting is significant ($p=0.03$), indicating that those driver who disapprove prevent motorcyclists from lane splitting more frequently (9.5% versus 3.5% of approvers).

Table 65. Approval of lane splitting by having prevented MC from lane splitting

Q16	Approval of lane splitting		Total
	Approval	Disapproval	
Yes	9	44	53
	3.5%	9.5%	7.3%
No	249	420	669
	96.5%	90.5%	92.7%
Total	258	464	722
	100.0%	100.0%	100.0%

There is no statistically significant difference between male and female drivers and the frequency of preventing MCs from lane splitting, nor is there between the age of drivers and this behavior.

A further investigation of the question of having tried to prevent a motorcycle from lane splitting and the county where the intercept was conducted showed that of all respondents who engaged in this behavior, drivers in San Francisco had the highest rate of blocking motorcyclists with 23.5% of all respondents, followed by Los Angeles county with 10.9% of all drivers. [Note that the number of observations by county are small] (Table 66.)

Table 66, Preventing MC from lane splitting by county

County	Have you ever tried preventing a MC that was lane splitting from passing you		Total
	Yes	No	
Orange	4 4.8%	80 95.2%	84 100.0%
LA	26 10.9%	212 89.1%	238 100.0%
San Bernardino	2 4.9%	39 95.1%	41 100.0%
Ventura	0 0.0%	21 100.0%	21 100.0%
San Diego	4 4.9%	78 95.1%	82 100.0%
Riverside	3 7.5%	37 92.5%	40 100.0%
San Francisco	4 23.5%	13 76.5%	17 100.0%
Alameda	5 11.9%	37 88.1%	42 100.0%
Contra Costa	1 4.0%	24 96.0%	25 100.0%
Sacramento	2 5.0%	38 95.0%	40 100.0%
San Mateo	0 0.0%	21 100.0%	21 100.0%
Santa Clara	2 2.8%	69 97.2%	71 100.0%
Total	53 7.3%	669 92.7%	722 100.0%

Appendix A– Intercept Form Vehicle Drivers

Appendix B– Intercept Form Motorcycle Riders

Appendix C-- Letter of Confirmation