



MOTORCYCLE LANE-SHARE STUDY AMONG CALIFORNIA MOTORCYCLISTS AND DRIVERS 2013 & COMPARISON TO 2012 DATA

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 analysis and methodological report describes Ewald & Wasserman Research Consultants' (E&W) survey research data collection methods and results for the second wave of the Motorcycle Lane-Share Study among Motorcyclists and Drivers in California. The study was 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. This is the second wave of an intercept study initiated in 2012 and designed to collect information for a statewide statistically representative study of California drivers and California motorcyclists regarding their behavior and opinions on motorcycle lane-sharing on freeways and other multiple-lane roadways.

The 2013 data collection effort consisted of completed intercept surveys with 1,020 vehicle drivers and 713 motorcycle (MC) riders for a total of 1,733 completed surveys. In total, 12 California counties were included in the sample frame based on the number of motorcycle licenses and vehicle driver's licenses. Out of those counties, a total 35 cities were selected, with the city selection based on population density. Within the 35 cities, a total 340 distinct geographic sites were included in the sample frame—nine to 10 sites within each city area. The target sites were mostly fueling stations, but also included areas and driving destinations within a 5-mile radius of the initial target sites to include as many motorcyclists as possible.

The 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 in March and April of 2013. The anonymous survey collected information on respondents' opinions on motorcycle lane-sharing, its perceived legality and risks, as well as personal driving perceptions and behaviors.

II. METHODS

■ A. Sample Methodology and Sample Site Selection

The 12 counties included in the study were: San Bernardino, Ventura, San Diego, Orange, Riverside, and Los Angeles for Southern California; and San Francisco, Alameda, Contra Costa, San Mateo, Santa Clara, and Sacramento for Northern California (Table M1). The number of motorcycle licenses in the 12 counties based on 2011/2012 DMV records accounted for 70.2% of all motorcycle licenses in the State of California. Table M1 also shows the number of intercepts with motorcycle riders by county, ranging from Los Angeles with 22.4% of all intercepts (26.0% of all motorcycle licenses in the selected sample frame) to Ventura with 3.1% of all completed intercepts (4.3% of all licenses in the sample frame).

Overall, 713 motorcyclists were intercepted for the study, resulting in an overall confidence interval of +/- 3.67 at a confidence level of 95%.

Table M1. Sample frame motorcycle riders and completed intercepts by county

MC	Counties	% MC license of CA	% MC license of sample	# completes	% of completes
SOUTH	San Bernardino	5.5%	7.8%	25	3.5%
	Ventura	3.0%	4.3%	22	3.1%
	San Diego	8.7%	12.4%	99	13.9%
	Orange	8.6%	12.3%	78	10.9%
	Riverside	5.4%	7.7%	53	7.4%
	Los Angeles	18.2%	26.0%	160	22.4%
NORTH	San Francisco	2.5%	3.6%	27	3.8%
	Alameda	3.9%	5.6%	35	4.9%
	Contra Costa	3.3%	4.7%	58	8.1%
	San Mateo	2.0%	2.9%	68	9.5%
	Santa Clara	4.6%	6.5%	45	6.3%
	Sacramento	4.3%	6.1%	43	6.0%
	Total CA		70.2%	100.0%	713

The sample frame for the vehicle driver segment of the Lane Share Study was the same as for the motorcycle riders; both groups were surveyed at the same locations. Table M2 shows the distribution of driver's licenses among the 12 selected counties. The number of driver's licenses in the selected counties based on DMV records counts encompassed 77.1% of all vehicle driver's licenses in the State of California. Overall, 24.8% of all driver intercepts were completed in the county of Los Angeles, where 26.9% of all California driver's licenses are issued.

Overall, 1,020 vehicle drivers were intercepted for the study, resulting in an overall confidence interval of +/- 3.07 at a confidence level of 95%.

Table M2. Sample frame vehicle drivers and completed intercepts by county

AUTO	Counties	% Auto license of CA	% Auto license in sample	# completes	% of completes
SOUTH	San Bernardino	4.9%	6.4%	42	4.1%
	Ventura	2.4%	3.1%	28	2.7%
	San Diego	8.5%	11.1%	220	21.6%
	Orange	8.8%	11.4%	81	7.9%
	Riverside	5.0%	6.5%	46	4.5%
	Los Angeles	26.9%	35.0%	253	24.8%
NORTH	San Francisco	1.7%	2.2%	52	5.1%
	Alameda	4.2%	5.5%	69	6.8%
	Contra Costa	3.0%	3.9%	81	7.9%
	San Mateo	2.6%	3.3%	47	4.6%
	Santa Clara	5.3%	6.9%	66	6.5%
	Sacramento	3.7%	4.8%	35	3.4%
Total CA		77.1%	100.0%	1,020	100.0%

■ B. Interview Locations, Times, and Duration

The data collection was implemented from Friday, March 22, 2013, through Sunday April 7, 2013, and included weekdays and weekend days.

Three geographically separate field teams were trained and dispatched to cover all 340 sites included in the sample frame; these sites were identical to the ones visited in the study’s previous wave. The two Southern California teams conducted the intercept surveys in the following counties: Ventura, San Bernardino, Los Angeles and in San Diego, Orange, and Riverside. The Northern California team covered: San Francisco, Alameda, Santa Clara, Contra Costa, and Sacramento counties. The teams were instructed to be at 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.

The master grid of all pre-determined locations within a team’s respective counties was provided to each team leader and included “site clusters” of four or five selected gas/fueling stations (or equivalent) per location ranked in the order to be visited from #1 to #5. The protocol for the data collection assumed the team approach the first site (#1) within a cluster to determine if the business was still in operation and 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 (#2) 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 pre-selected locations without viable options, they consulted the E&W Project Manager to obtain the next site to visit, based on available substitute areas within an up to five-mile radius.

■ C. Staff Training

Training procedures and pilot test of observation form

All California field teams were trained during the week of March 19, 2012, on sites in San Francisco, Santa Monica, and San Diego. The training included a question-by-question review of the intercept form and role-playing with the team leader to become familiar with the flow of the intercept survey instrument. The formal training was followed by a closely supervised on-site visit and a 45- to 60-minute round of test intercepts at various locations within the training area. Frequently asked questions (FAQs) were provided to all interviewers. Letters to fueling station managers or supervising managers were reviewed prior to distribution in the field (Appendix C). The final version of the intercept surveys can be found in Appendix A (for vehicle drivers) and Appendix B (for motorcyclists).

Field data collection

The team leader of each group was responsible for coordinating directly with the E&W Project Manager regarding scheduling, carpooling, mapping, transfer of materials, and other study-related matters. Team members were encouraged to carpool to the extent possible.

On location, the team leader first introduced the team to the fueling station manager or personnel before beginning the data collection. With the consent of management, the team began approaching respondents to conduct the intercept survey, which took on average 4.5 minutes to complete. The methodology implemented included the intercept of every motorcyclist age 18 or older who rode to the location and every third vehicle driver 18 years of age or older who drove to the location. The intercept survey was conducted in both English and Spanish, and the bilingual field staff had a translated intercept form for Spanish-speaking drivers and motorcycle riders. The team's responsibility also included tallying 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

Table M3, shows the response and refusal rates for both vehicle drivers and motorcyclists by county. Overall, 1,753 surveys were completed with both groups. A total 539 respondents refused to participate, and 94 respondents did not speak English or Spanish and were therefore not qualified for the study. The eligible refusal rate (Refusals/(Total - Not qualified)) for all counties in the sample ranged from 15.4% in Santa Clara to 30.9% in Riverside County, with a average refusal rate of eligible respondents of 24.5%.

Table M3. Total refusal rates by county

County	Completes	Refusals	Total	Not qualified (language)	Eligible Refusal Rate
San Francisco	69	28	97	4	30.1%
Alameda	118	37	155	3	24.3%
Santa Clara	137	23	160	11	15.4%
Contra Costa	106	31	137	15	25.4%
Sacramento	75	21	96	1	22.1%
San Mateo	68	19	87	3	22.6%
Los Angeles	492	125	617	38	21.6%
Riverside	86	38	124	1	30.9%
San Bernardino	84	22	106	7	22.2%
Orange	166	51	217	2	23.7%
San Diego	303	124	427	9	29.7%
Ventura	49	20	69	0	29.0%
Total	1,753	539	2,292	94	24.5%

III. RESULTS

■ A. Motorcyclist Intercept Results

Notes:

- The total number of observations listed in this report excludes the “do not know” answers as well as refusals. The totals in the tables are therefore at times lower than the total number of completes. The percentages for 2012 have been recalculated to exclude these answers to allow comparison with the 2013 data.
- In the 2013 wave of data collection, some motorcycle intercepts were completed at additional locations outside of gas stations and the total 16 surveys from these sites were tested for any significant difference from the rest of the data. No differences were detected, and the surveys were therefore included.
- Due to rounding to one decimal point, some percentages presented do not always add up to the exact full number. Some 2012 data tables were re-calculated to add up to exactly 100% for data comparison.

Respondent demographics

The demographic information collected from motorcycle riders included the respondent age and gender, which are shown in Tables M4 and M5, respectively. The majority of motorcyclists were between the ages of 35 and 70 (70.7% of all respondents).

Table M4. Respondent Age

Respondent age	Frequency	Percent 2013	Percent 2012
18-24	54	7.6%	6.3%
25-34	142	20.0%	21.1%
35-44	143	20.1%	23.5%
45-54	203	28.6%	30.6%
55-70	156	22.0%	17.0%
70 or older	12	1.7%	1.4%
Total	710	100.0%	100.0

The gender distribution of motorcycle riders is shown in Table M5, with a large majority of riders being male (93.7%), similar to the 2012 data (93.4% male).

Table M5. Respondent Gender

Respondent Gender	Frequency	Percent 2013	Percent 2012
Male	668	93.7%	93.4%
Female	45	6.3%	6.6%
Total	713	100.0%	100.0%

The distribution of age and gender of respondents is shown in Table M6. There are no significant differences in the gender distribution among the age groups.

Table M6. Respondent Age by Gender

Age/gender	Male	Female	Total
18-24	96.3%	3.7%	100.0%
25-34	91.5%	8.5%	100.0%
35-44	93.7%	6.3%	100.0%
45-54	91.1%	8.9%	100.0%
55-70	97.4%	2.6%	100.0%
70 or older	100.0%	0.0%	100.0%

Motorcycle use

The principal reason for motorcycle use is outlined in Table M7, below. The majority of respondents mainly use their motorcycle for pleasure riding on the weekend, with 49.4% of all valid responses. Another 31.1% indicated motorcycle use for both commuting to work and pleasure riding on the weekends, and 15.0% of respondents solely commute to work on their motorcycle. Long-distance touring rides accounted for 2.4% of all answers, and “other specified answers” (1.8%) included: recreation, sport, and similar. This usage patterns is comparable to the 2012 data.

Table M7. Q1. “What best describes how you use your motorcycle most of the time?” and 2012 comparison

Q1	Frequency	Percent 2013	Percent 2012
Pleasure riding on weekends	350	49.4%	45.9%
Both commuting to work and pleasure riding on weekends	220	31.1%	30.8%
Commuting to work	106	15.0%	18.0%
Long-distance touring rides	17	2.4%	1.6%
Other specified	13	1.8%	2.0%
Bar hopping	2	0.3%	0.5%
Total	708	100.0%	100.0%

Table M8 shows the frequency of motorcycle use, with the majority of respondents, 62.9%, riding between three (3) and seven (7) days a week.

Table M8. Q2. “About how often would you say you ride your motorcycle?” and 2012 comparison

Q2	Frequency	Percent 2013	Percent 2012
6-7 days a week	211	29.7%	34.8%
3-5 days a week	236	33.2%	25.9%
1-2 times a week	224	31.5%	29.9%
Less than once a week	39	5.5%	9.4%
Total	710	100.0%	100.0%

Motorcycle miles traveled

Question 3 of the intercept asked for the number of miles respondents ride their motorcycle on an average day. A total 704 answers ranged from 3 to 1,000 miles per day (compared to 553 responses of 2 miles to 600 miles per day in 2012), with a mean mileage of 84.35 miles and a median of 60 miles per day (Table M9).

Table M9. Q3. Average miles riding per day and 2012 comparison

Total responses	2013	2012
Number responses	704	553
Missing responses	9	7
Mean	84.35	71.7
Median	60.0	50.0
Minimum	3	2
Maximum	1,000	600

Lane-splitting on freeways

Of all motorcyclists intercepted, 81.9% stated that they lane-split when riding on freeways compared to 77.6% in 2012, an increase of 4.3%, which is (weakly) significant in a two-tailed comparison at $p=0.03$ (see Table M10).

Table M10. Q4. “Do you lane-split on your motorcycle when riding on freeways?” and 2012 comparison

Q4	Frequency	Percent 2013	Percent 2012	Difference 2013-2012
Yes	584	81.9%	77.6%	+4.3%
No	129	18.1%	22.4%	-4.3%
Total	713	100.0%	100.0%	--

With respect to the frequency of lane-splitting while riding on freeways, 53.3% of respondents stated to “always” or “often” lane-split, compared to 49.6% of all motorcyclists surveyed in 2012 (see Table M11). There are no significant differences in the lane-splitting frequency between 2012 and 2013.

Table M11. Q5. “How frequently do you lane-split on freeways?” and 2012 comparison

Q5	Frequency	Percent 2013	Percent 2012
Always	204	35.4%	30.9%
Often	177	17.9%	18.7%
Sometimes	103	30.7%	37.5%
Rarely	93	16.1%	12.9%
Total	577	100.0%	100.0%

The incidence of motorcyclists lane-splitting on freeways by region is shown in Table M12; there are no significant differences between regions. However, the difference between 2012 and 2013 in Northern California—an increase of 6.4%—is significant at $p=0.00$.

Table M12. Lane-splitting on CA freeways by region and 2012 comparison

Lane-splitting	Percent 2013	Percent 2012	Difference 2013-2012
Northern CA	83.3%	76.9%	+6.4
Southern CA	81.0%	77.9%	+3.1%

The distribution of gender by lane-splitting behavior on freeways is shown in Table M13. Overall, 82.0% of all male riders stated to lane split on freeways and 80.0% of female motorcyclists did. The comparison to 2012 is insufficient, since only very few female respondents in this year’s wave answered this question, resulting in a sample size too small for comparison.

Table M13. Q4. “Do you lane-split on your motorcycle when riding on freeways?” by gender and 2012 comparison

Gender/Lane split	Percent 2013	Percent 2012
Male	82.0%	79.7%
Female	80.0%	48.6%
Total	81.9%	77.6%

Table M14 shows the cross-tabulation of motorcyclist age and lane-splitting on freeways, ranging from 41.7% of those 70 years or older to 86.7% of 35-44 year-olds. The differences among age groups is significant ($p=0.00$), with younger and older motorcyclists being less likely to lane-split on freeways compared to 35-44 year old riders.

Table M14. Q4. “Do you lane-split on your motorcycle when riding on freeways?” by age and 2012 comparison

Age/Lane split	Percent 2013	Percent 2012
18-24	77.8%	73.3%
25-34	83.1%	88.0%
35-44	86.7%	83.2%
45-54	81.3%	77.5%
55-70	81.4%	71.9%
70 or older	41.7%	62.5%

Table M15 shows the frequency of riding and lane-splitting on freeways in the 2013 and 2012 data. Overall, the majority of respondents who lane-split on freeways ride their motorcycle at least 1-2 times a week (34.3%) and only 4.8% of rider who ride less than one a week lane-split on freeways (significant at $p=0.00$).

Table M15. Q4. “Do you lane-split on your motorcycle when riding on freeways?” by frequency of riding

Frequency ride/Lane split	Percent 2013	Percent 2012
6-7 days a week	32.2%	34.8%
3-5 days a week	28.7%	29.9%
1-2 times a week	34.3%	25.9%
Less than once a week	4.8%	9.4%
Total	100.0%	100.0%

Accidents with vehicles while lane-splitting of freeways

Of all motorcyclists who lane-split on freeways, 8.6% reported to have been hit by a vehicle while lane-splitting and 4.0% stated to have hit a vehicle (Table M16). The difference to the 2012 percentages is not significant.

Table M16. Q6. “Have you ever hit a vehicle or has a vehicle hit you while you were lane-splitting on a freeway?” and 2012 comparison

Q6	Percent 2013	Percent 2012
Yes, vehicle hit me	8.6%	11.8%
Yes, I hit vehicle	4.0%	3.2%
No, never	87.5%	85.0%
Total	100.0%	100.0%

Riders who stated to have never hit a vehicle nor were hit while lane-splitting were asked the follow-up question, Q6a, about their experiences of nearly hitting a vehicle. A total 34.4% of these respondents stated that they had nearly hit a vehicle while lane-splitting, compared to 46.5% in 2012—a difference of 12.1% which is significant at p=0.00 (Table M17).

Table M17. Q6a. “Did you ever nearly hit a vehicle?” and 2012 comparison

Q6a	Percent 2013	Percent 2012	Difference 2013-2012
Yes	34.4%	46.5%	-12.1%
No	65.5%	53.5%	+12.0%
Total	100.0	100.0%	--

The follow-up question Q7 on the damage caused by a collision can be found in Table M18. The responses are summarized for respondents who have been hit by a vehicle or who hit a vehicle while lane-splitting on a freeway, combining the multiple answers provided. Overall, 78 responses from 64 unique respondents were included (excluding respondents who asked to skip this question). A total 46.2% of motorcyclists hit a car mirror, 12.8% reported minor injuries, and 7.7% suffered severe injuries as a result of hitting a vehicle or being hit. The differences to the 2012 data are not significant.

A total of 10 “other” responses given by motorcyclists included a range of physical damage to either the motorcycle or the vehicle.

Table M18. 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) and 2012 comparison

Q7. Damage caused (combined)	Percent 2013	Percent 2012
Just hit car mirror	46.2%	34.6%
I had minor injuries (scrapes/bruises)	12.8%	11.1%
I had severe injuries (broken bones, lacerations, trauma)	7.7%	9.9%
Scraped/hit side of car	11.5%	7.4%
I hit car front bumper	2.6%	1.2%
I was run over by car	0.0%	1.2%
I hit one or more cars	0.0%	2.5%
I was knocked down	6.4%	7.4%
Other	12.8%	24.7%
Total	100.0%	100.0%

Table M19 shows the details of lane-splitting behavior on freeways in regard to speed, with the added coding of “At all times” based on open-ended comments. The majority 62.3% of all respondents only lane-split at speeds below 20MPH or when traffic is at a standstill, compared to 64.4% in 2012. There is no significant difference to the 2012 data. Other specified answers included indications of lane-splitting at higher speeds or any speed under the speed limit.

Table M19. Q8. “What best describes your lane-splitting on freeways? Would you say you lane-split only when...?” and 2012 comparison

Q8	Percent 2013	Percent 2012
Traffic is at a standstill	15.6%	15.7%
Traffic is stop-and-go	21.5%	28.6%
Traffic is moving less than 20 MPH	25.2%	20.1%
Traffic is moving less than 30 MPH	14.8%	15.7%
Traffic is moving less than 40 MPH	8.2%	4.9%
Traffic is moving less than 50 MPH	4.5%	4.7%
Traffic is moving less than 60 MPH	2.8%	2.3%
Traffic is moving less than 70 MPH	3.6%	1.6%
Other	1.6%	0.7%
At all times	2.3%	5.6%
Total	100.0%	100.0%

Lane-splitting on roads other than freeways

Of all respondents, 61.1% stated to lane-split when riding a motorcycle on roads other than freeways (Table M20), a similar percentage compared to 2012.

Table M20. Q9. “Do you lane-split on your motorcycle when riding on multiple-lane roads other than freeways?” and 2012 comparison

Q9	Percent 2013	Percent 2012
Yes	61.1%	63.9%
No	38.9%	36.1%
Total	100.0%	100.0%

The incidence of motorcyclists lane-splitting on multiple-lane roads other than freeways defined by northern or southern California region is shown in Table M21. There are no significant differences between regions (and no differences to 2012 data, not shown).

Table M21. Lane-splitting on CA multiple-lane roads by region

Lane-splitting	Northern CA	Southern CA	Total
Yes	60.5%	61.5%	61.1%
No	39.5%	38.5%	38.9%
Total	100.0%	100.0%	100.0%

A variable was computed to count the number of respondents who lane-split on both freeways and multiple-lane roadways, only on freeways, or only on multiple-lane roads. The frequency of that variable is shown in Table M22. Of all respondents, 54.6% reported to lane-split on both freeways and other roadways, 27.2% lane-split on freeways only, while 11.6% never lane split. There are no significant differences to the 2012 results in lane-splitting behavior.

Table M22. Lane-split behavior by road types and 2012 comparison

Lane split behavior by road type	Percent 2013	Percent 2012
Lane-split on both freeways and roads	54.6%	53.9%
Lane-split on freeways only	27.2%	23.6%
Never lane-split	11.6%	12.9%
Lane-split on multiple-lane roads only	6.6%	9.6%
Total	100.0%	100.0%

Table M23 shows the lane-splitting behavior by road type distributed among the age groups. Similar to the significant differences among lane-splitting on freeways by age groups, the comparison of the lane-split variable by road type and age is also significant ($p=0.00$). The younger the respondent, the more frequently they lane-split on both freeways and other multiple-lane roads (64.8% of all respondents between 18 and 34), while respondents 45 and older more frequently lane-split on freeways only.

Table M23. Respondent age by lane-split behavior and road types

Respondent Age	Never Lane-Split	Lane-Split on Freeways and Roads	Lane-Split on Freeways Only	Lane-Split on Roads Only	Total
18-24	11.1%	64.8%	13.0%	11.1%	100.0%
25-34	11.3%	64.8%	18.3%	5.6%	100.0%
35-44	7.7%	60.8%	25.9%	5.6%	100.0%
45-54	11.8%	47.3%	33.5%	7.4%	100.0%
55-70	13.5%	45.5%	35.9%	5.1%	100.0%
70 or older	41.7%	41.7%	0.0%	16.7%	100.0%
Total	11.7%	54.4%	27.3%	6.6%	100.0%

The frequency of lane-splitting on multiple-lane roadways is shown in Table M24, with a comparable distribution to the 2012 data. Of the motorcyclists who lane-split on roads other than freeways, 44.2% reported to “always” or “often” lane-split on roads, while 55.7% “sometimes” or “rarely” did.

Table M24. Q10. “How frequently do you lane-split on roads other than freeways?” and 2012 comparison

Q10	Percent 2013	Percent 2012
Always	25.3%	22.5%
Often	18.9%	16.3%
Sometimes	35.7%	37.2%
Rarely	20.0%	23.9%
Total	100.0%	100.0%

Accidents with vehicles while lane-splitting on roads other than freeways

In total, 7.4% of motorcyclists who lane-split on roads stated to have been hit by a vehicle while 1.2% have hit a vehicle. Overall, 91.5% of motorcyclists who lane-split on all roads other than freeways never hit a vehicle nor were hit by a vehicle (Table M25). There is no significant difference to the 2012 data.

Table M25. Q11. “Have you ever hit a vehicle or has a vehicle hit you while you were lane-splitting on roads other than freeways?” and 2012 comparison

Q11	Percent 2013	Percent 2012
Yes, vehicle hit me	7.4%	8.3%
Yes, I hit vehicle	1.2%	1.1%
No, never	91.5%	90.6%
Total	100.0%	100.0%

Of motorcyclist who never experienced a hit or collision while lane-splitting on roads other than freeways, 23.3% of respondents stated that they have nearly hit a car while lane-splitting (Table M26), similar to 2012.

Table M26. Q11a. “Did you ever nearly hit a vehicle?” and 2012 comparison

Q11a	Percent 2013	Percent 2012
Yes	23.3%	29.7%
No	76.7%	70.3%
Total	100.0%	100.0%

Motorcyclists who hit or who were hit by a vehicle stated the damages for Q12, the results of which are listed in Table M27. These results are the combination of multiple-choice answers given and are outlined in comparison with the 2012 data. A total 31.6% stated to have hit a car mirror, followed by 13.2% scraping or hitting the side of the car, 13.2% were knocked down, while 7.9% of motorcyclists reported minor injuries, and 5.3% reported severe injuries. Other specified answers included various physical damage to either vehicle or motorcycle.

There are no significant differences in the answer to the 2012 results.

Table M27. Q12. Frequencies of damages caused by hit/collision and 2012 comparison and 2012 comparison

Q12	Percent 2013	Percent 2012
Just hit car mirror	31.6%	20.0%
Scraped/hit side of car	13.2%	14.3%
I had severe injuries (broken bones, lacerations, trauma)	5.3%	11.4%
I had minor injuries (scrapes/bruises)	7.9%	8.6%
I hit one or more cars	0.0%	2.9%
I was knocked down	13.2%	2.9%
I hit front bumper	2.6%	0.0%
Other	26.3%	40.0%
Total	100.0%	100.0%

Speed of traffic while lane-splitting

Of all motorcyclists who lane-split on roads other than freeways, 87.7% lane-split when traffic moves at a speed of 30MPH or less, compared to 87.4% of respondents in 2012 (Table M28). An additional 7.0% lane-split when traffic is moving less than 40 or 50 MPH compared to 4.9% in 2012 (difference is not significant).

Of the other specified answers given on lane-splitting on non-freeways (5.3% or 22 answers), six of those answers stated to “always” lane-split on roads, while the other responses indicated various speed ranges, any speed while staying under speed limit, and similar.

Table M28. Q13. “Would you say you lane-split only when...?” and 2012 comparison

Q13	Percent 2013	Percent 2012
traffic is at a standstill	36.1%	32.9%
traffic is stop-and-go	23.2%	31.5%
traffic is moving less than 20 MPH	19.4%	16.9%
traffic is moving less than 30 MPH	9.0%	6.1%
traffic is moving less than 40 MPH	3.0%	2.6%
traffic is moving less than 50 MPH	4.0%	2.3%
Other	5.3%	7.6%
Total	100.0%	100.0%

Speed differential while lane-splitting

The answers to the question of the speed differential in general when lane-splitting is shown in Table M29. The majority of responses, 44.1%, rode about 10 miles per hour faster than the rest of the traffic when lane-splitting, with a total 70.7% of all lane-splitters stating a speed of 10 MPH or less. The remaining 29.3% riders rode more than 10 MPH faster than the rest of traffic while lane-splitting, compared to 33.8% in 2012. The combined decrease of 3.4% of riders going faster than 10MPH than the rest of traffic while lane-splitting is significant at p=0.00.

“Other” answers included, “always,” “when it is safe,” and similar, which could not be grouped into the existing answering options.

Table M29. Q14. “How much faster than the rest of the traffic do you go when lane-splitting?” and 2012 comparison

Q14	Percent 2013	Percent 2012	Difference 2013-2012
about 5MPH faster than other traffic	26.6%	24.1%	+2.5%
about 10MPH faster than other traffic	44.1%	42.1%	+2.0%
about 15MPH faster than other traffic	15.0%	20.5%	-5.5%
about 20MPH faster than other traffic	10.0%	9.4%	+0.6%
about 30MPH faster than other traffic	2.5%	1.1%	+1.4%
about 40MPH faster than other traffic	1.0%	1.3%	-0.3%
about 50MPH faster than other traffic	0.8%	0.4%	+0.4%
Other	0.0%	1.1%	-1.1%
Total	100.0%	100.0%	

The comparison of lane-splitting behavior by street type and speed of the motorcyclist is shown in Table M30. The differences among the lane-splitting speed on freeways, other roads, and both freeways and roads are significant at p=0.00. The comparison to the 2012 data (gray shaded headers) does not show any significant change in the differential speed by lane-splitting road type.

Table M30. Q14. “How much faster than the rest of the traffic do you go when lane-splitting?” and comparison to 2012 data (shaded gray)

Speed while lane-splitting by lane-split behavior by road type	Lane-split on freeways and roads 2013	Lane-split on freeways and roads 2012	Lane-split on freeways only 2013	Lane-split on freeways only 2012	Lane-split on roads only 2013	Lane-split on roads only 2012
about 5MPH faster...	21.4%	19.7%	28.6%	23.8%	62.2%	50.0%
about 10MPH faster...	45.4%	44.4%	45.1%	40.0%	28.9%	34.6%
about 15MPH faster...	15.6%	23.4%	16.5%	18.5%	4.4%	9.6%
about 20MPH faster...	12.4%	8.1%	6.6%	13.8%	4.4%	5.8%
about 30MPH faster...	3.2%	1.4%	1.6%	0.8%	0.0%	0.0%
about 40MPH faster...	1.1%	1.4%	1.1%	1.5%	0.0%	.0%
about 50MPH faster...	1.1%	0.3%	0.5%	0.8%	0.0%	0.0%
Other	0.0%	1.4%	0.0%	0.8%	0.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

An additional variable was created to make an assumption on the riders’ actual average speed while lane-splitting to evaluate the average speed while lane-splitting by road type. The supposition was made that the actual speed equals the stated differential speed from Q14 (e.g., “about 5MPH faster than other traffic” was coded as 5MPH while lane-splitting). This variable calculation in cross-tabulation with the lane-splitting variable resulted in an average speed differential of 11.55MPH overall and an average speed ranging from 7.56MPH for riders who only lane-split on roads to 12.32MPH for speeds of motorcyclists lane-splitting on roads and freeways (Table M31).

In summary, riders who split on all road types do so at a higher average speed differential (12.32MPH faster than other traffic) than riders who split only on freeways (10.93MPH faster than other traffic) and riders who split only on roads (7.56MPH faster than other traffic).

Table M31. Differential speed calculation

	Lane-split on freeways and roads	Lane-split on freeways only	Lane-split on roads only	Total
Differential speed average in MPH	12.32	10.93	7.56	11.55

Perceived threats while lane-splitting and traffic violations

The answers to Q15 on the question of “most serious threat to motorcyclists when lane-splitting” can be found in Table M32, with the following answer categories added as a result of open-ended coding:

- Cars changing lanes
- Cars not signaling lane change
- Cars’ open doors

The most frequently mentioned serious threat to motorcyclists was “drivers not looking in mirror/drivers not seeing MCs”, which was given by 33.1% of all lane-splitting motorcyclists, similar to the 2012 data. A total 25.6% mentioned “distracted drivers,” which included cell phone use and texting as the distraction,

and 12.0% stated aggressive drivers as the most serious threat. The small changes in the perception of most serious threat to motorcyclists between 2013 and 2012 are not significant.

The other specified answers given to Q15 included “other drivers,” motorcyclist not paying attention, being cut off, merging lanes, and similar.

Table M32. Q15. “In your opinion, what is the MOST serious threat to your safety when lane-splitting?” and 2012 comparison

Q15	Percent 2013	Percent 2012
Drivers not looking in mirror (not seeing MC)	33.1%	32.5%
Distracted drivers (cells or texting)	25.6%	30.0%
Other	13.3%	11.7%
Cars changing lanes	6.3%	10.1%
Aggressive drivers	12.0%	7.3%
Cars not signaling lane change	3.4%	2.3%
Cars not paying attention	0.0%	1.5%
Car’s open doors	1.8%	1.5%
Narrow Lanes	1.5%	1.0%
Cars changing into carpool lane	0.0%	0.8%
Big trucks	1.6%	0.6%
Poor road surface	1.0%	0.4%
Drunk drivers	0.5%	0.2%
Total	100.0%	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 M33. Of all motorcyclists, 2.1% of lane-splitting riders did receive a ticket, compared to 0.4% in 2012. That difference shows a (weak) significance at $p=0.04$.

Table M33. Q16. “Have you ever received at traffic ticket or citation while lane-splitting?” and 2012 comparison

Q16	Percent 2013	Percent 2012	Difference 2013-2012
Yes	2.1%	0.4%	+1.7%
No	97.9%	99.6%	-1.7%
Total	100.0%	100.0%	--

Table M34 lists the violations received while lane-splitting, which are for a total of 13 respondents who received a ticket and included: “speeding” in 23.1% of all violations, “misuse of lanes” in 23.1%, and “failure to signal lane change” in 15.4%.

Other violations received (and combined in “Other specified” in Table M34) while lane-splitting were “crossing double-yellow line,” “unsafe operation,” and a ticket for lane-splitting in Nevada.

Table M34. Q17. “What was the violation?” and 2012 comparison

Q17	Percent 2013	Percent 2012
Speeding	23.1%	63.2%
Misuse of lanes	23.1%	15.8%
Failure to signal lane change	15.4%	5.3%
Other specified	38.5%	15.8%
Total	100.0%	100.0%

The intercept also asked if motorcyclists ever experienced a vehicle trying to prevent them from lane-splitting; the results can be found in Table M35. Overall, 73.5% of all respondents mentioned that they had experienced being prevented from lane-splitting, an increase of 6.3% from 2012 (not significant).

Table M35. Q18. “Has a vehicle driver ever tried to prevent you from passing while you were lane-splitting?” and 2012 comparison

Q18	Percent 2013	Percent 2012
Yes	73.5%	67.2%
No	26.5%	32.8%
Total	100.0%	100.0%

Motorcycle rider training class and motorcycle endorsement

A question added to the 2013 intercept was about motorcycle training classes; the results are listed in Table M36. Of all surveyed motorcyclists, 58.5% had taken a motorcycle rider training class..

Table M36. Q19. “Have you taken a motorcycle rider training class?”

Q19	Frequency	Percent
Yes	415	58.5%
No	294	41.5%
Total	709	100.0%

The final question of the intercept asked if respondents have a valid motorcycle endorsement. Table M27 shows the results, indicating that 92.2% of all riders to have a valid motorcycle endorsement.

Table M37. Q21. “Do you have a valid motorcycle endorsement?”

Q21	Frequency	Percent
Yes	652	92.2%
No	55	7.8%
Total	707	100.0%

■ B. Vehicle Driver Intercept Results

Respondent demographics

Tables V1 and V2 show the age and gender demographic information collected from a total of 1,020 vehicle drivers. The median age range for all vehicle drivers in this study is between 35 and 44 years (as answered by 1,013 drivers).

Table V1. Respondent Age

Respondent Age	Frequency	Percent
18-24	184	18.2%
25-34	266	26.3%
35-44	212	20.9%
45-54	180	17.8%
55-70	148	14.6%
70 or older	23	2.3%
Total	1,013	100.0%

As show in Table V2, more male (66.2%) than female (33.8%) vehicle drivers were intercepted, comparable to the gender ratio in 2012.

Table V2. Respondent Gender

Respondent Gender	Frequency	Percent 2013	Percent 2012
Male	675	66.2%	63.4%
Female	345	33.8%	36.6%
Total	1,020	100.0%	100.0%

The distribution of age and gender of vehicle drivers intercepted is outlined in Table V3. The distribution is comparable and there is no significant difference among the age groups.

Table V3. Respondent Age by Gender

Respondent Age	Male	Female	Total
18-24	63.0%	37.0%	100.0%
25-34	64.7%	35.3%	100.0%
35-44	64.6%	35.4%	100.0%
45-54	67.8%	32.2%	100.0%
55-70	70.3%	29.7%	100.0%
70 or older	82.6%	17.4%	100.0%

The driving frequency by California region is shown in Table V4, with a comparable distribution between Northern and Southern California drivers.

Table V4. Driving frequency on CA freeways by region

How often would you say you drive on freeway in CA	Northern CA	Southern CA	Total
6-7 days a week	30.6%	69.4%	100.0%
3-5 days a week	36.8%	63.2%	100.0%
1-2 times a week	40.9%	59.1%	100.0%
Less than once a week	45.9%	54.1%	100.0%
Total	34.4%	65.6%	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 V5. The number of lane-splitting MCs observed by drivers ranged from “zero” to 120 per week, with a median number of five (5) observed motorcycles lane-splitting. The mean and median number of observations did not change significantly between 2012 and 2013.

Table V5. Q2. Lane-splitting MCs observed on freeways and 2012 comparison

	2013	2012
Total responses	991	704
Missing responses	29	29
Mean	9.64	9.75
Median	5.0	5.0
Minimum	0	0
Maximum	120	210

The next intercept question asked vehicle drivers if they believe lane-splitting for motorcycles on freeways to be legal. The frequencies of responses are shown in Table V6, with 55.5% of all vehicle drivers stating that lane-splitting for motorcycles on freeways is legal, while 35.6% did not think it to be legal. The remaining 9.0% respondents did not know. Overall, there has not been a significant change in perception between 2012 and 2013.

Table V6. Q3. “Do you think it is legal for motorcycles to lane-split on freeways?” and 2012 comparison

Legal to lane-split freeways	Percentage 2013	Percentage 2012
Yes	55.5%	52.2%
No	35.6%	36.9%
Don’t know	9.0%	9.9%
Total	100.0%	100.0%

Table V7 shows the cross-tabulated frequency of driving on California freeways and the perceived legality of lane-splitting for motorcycles on freeways, with a comparison to the 2012 data. Comparable to 2012 the results show that respondents who drive more frequently also stated that lane-splitting for MCs is legal on freeways more frequently, though the differences are not significant, nor is the comparison to the 2012 data.

Table V7. Frequency of driving of freeway and perception of legality for motorcycles to lane-split on freeways and 2012 comparison

Frequency driving and perception of lane-splitting	Legal for MCs to lane-split freeways	
	2013	2012
6-7 days a week	62.9%	61.1%
3-5 days a week	61.3%	59.5%
1-2 times a week	52.5%	58.0%
Less than once a week	57.7%	32.1%
Total	60.9%	59.1%

Table V8 shows the relationship between the respondent’s age and the perceived legality of lane-splitting on freeways. There is no significant difference between the vehicle driver’s age and the positive answer of lane-splitting being legal. But in comparison to 2012, a slightly larger proportion of respondents do believe it is legal for motorcycles to lane-split on freeways. For the group of 18-24-year-olds, 53.7% believed lane-splitting to be legal, compared to 44.5% in 2012; an increase of 9.2% (though not significant between years nor between age groups).

Table V8. Perception of legality for motorcycles to lane-split on freeways and age and 2012 comparison

Respondent age	Legal for MCs to lane-split freeways	
	2013	2012
18-24	53.7%	44.5%
25-34	58.6%	62.0%
35-44	67.4%	60.7%
45-54	59.1%	65.7%
55-70	67.2%	63.3%
70 or older	63.2%	50.0%
Total	60.9%	59.3%

A total 88.0% of all vehicle drivers experienced a motorcyclist lane-splitting between the vehicle they were in and another vehicle while on a freeway, compared to a similar 86.8% in 2012 (Table V9).

Table V9. Q4. “Have you ever had a motorcyclist lane-splitting between the vehicle you were in and another vehicle?” and 2012 comparison

Q4	Percentage 2013	Percentage 2012
Yes	88.0%	86.8%
No	12.0%	13.2%
Total	100.0%	100.0%

Accidents with lane-splitting motorcyclists while on freeways

Intercepted vehicle drivers who observed a motorcycle lane-splitting on a freeway were asked if they ever hit a motorcyclist or if they have been hit by a lane-splitting motorcyclist. The results in Table V10 show that a total 3.0% of all drivers stated to have hit or been hit by a motorcycle that was lane-splitting on freeway, compared to 5.3% in 2012. This 2.3% reduction is slightly significant ($p=0.02$), though the number of observations is small.

Table V10. Q5. “Have you ever hit a motorcycle or has a motorcycle hit you while driving on a freeway?” and 2012 comparison

Q5	Percentage 2013	Percentage 2012	Difference 2013-2012
Yes, MC hit me/my car & I hit motorcycle	3.0%	5.3%	-2.3%
No, never	97.0%	94.7%	+2.3%
Total	100.0%	100.0%	--

Vehicle drivers who were never been hit by nor hit a motorcycle that was lane-splitting were asked a follow-up question about their experiences on nearly being hit by a motorcycle (see Table V11). A total 28.3% of respondents stated that they had nearly been hit or nearly hit a motorcyclist who was lane-splitting on a freeway, compared to 34.6% in 2012. This 6.3% reduction of “nearly-hits” is slightly significant at $p=0.01$.

Table V11. Q5a. “Were you ever nearly hit by a motorcycle?” [on freeway] and 2012 comparison

Q5a	Percentage 2013	Percentage 2012	Difference 2013-
Yes	28.3%	34.6%	-6.3%
No	71.7%	65.4%	+6.3%
Total	100.0%	100.0%	--

The follow-up question for vehicle drivers who stated to have hit or been hit by a motorcycle lane-splitting on a freeway asked about damages caused by that collision and allowed for multiple responses, the combined results of which can be found in Table V12.

Overall, 28 answers from 27 unique respondents were included. Of all answers given, 57.1% of drivers stated that the motorcycle “just hit the car mirror” and 25.0% reported their vehicle was scraped or the side was hit. The other damages mentioned included broken tires and motorcyclists falling onto the vehicle. These findings are similar to the 2012 data results.

Table V12. Q6. “What damage was caused by that hit or collision?” and 2012 comparison

Q6	Percentage 2013	Percentage 2012
Just hit car mirror	57.1%	58.8%
Scraped/hit side of car	25.0%	26.5%
MC hit my front bumper	3.6%	0.0%
I knocked down MC	3.6%	0.0%
Other	10.7%	14.7%
Total	100.0%	100.0%

Vehicle drivers were also asked if they ever witnessed a collision involving a lane-splitting motorcycle on a freeway, and 17.3% of respondents stated that they did, compared to 19.1% in 2012 (Table V13, difference is not significant).

Table V13. Q7. “Have you ever witnessed a collision that involved a motorcycle that was lane-splitting on a freeway?” and 2012 comparison

Q7	Percentage 2013	Percentage 2012
Yes	17.3%	19.1%
No	82.7	80.9%
Total	100.0%	100.0%

Observations and perceptions on lane-splitting on multiple-lane roads

All vehicle drivers were asked to state the number of motorcyclists they observe lane-splitting on multiple-lane roads in an average week; the results are shown in Table V14. The number of lane-splitting motorcyclists observed ranged from “zero” to 150 per week, with a median number of two observations and a mean of 5.83 motorcyclists per week. These results are comparable to 2012 data.

Table V14. Q8. Lane-splitting MCs observed on multiple-lane roads and 2012 comparison

	Percentage 2013	Percentage 2012
Total responses	978	677
Missing responses	42	56
Mean	5.83	5.37
Median	2.0	3.0
Minimum	0	0
Maximum	150	250

All drivers were asked if they ever observed a motorcycle lane-splitting on a multiple-lane road and 68.7% confirmed this, similar to the 69.4% of respondents in 2012.

Table V15. Q9. “Thinking about driving on a multiple lane road - have you ever had a motorcyclist lane-splitting between the vehicle you were in and another vehicle?” and 2012 comparison

Q9	Percentage 2013	Percentage 2012
Yes	68.7%	69.4%
No	31.3%	30.6%
Total	100.0%	100.0%

Accidents with lane-splitting motorcyclists while on multiple-lane roads

Respondents who observed a motorcyclist lane-splitting on a multiple-lane road were asked if they have ever hit or if their car was ever hit by a lane-splitting motorcycle; the responses can be found in Table V16. Overall, only 1.9% of all drivers (13 responses in total) confirmed that they were hit by a lane-splitting motorcyclist, similar to the 1.6% of respondents in 2012.

Table V16. Q10. “Have you ever hit a motorcycle or has a motorcycle hit you that was lane-splitting on roads other than freeways?” and 2012 comparison

Q10	Percentage 2013	Percentage 2012
Yes, MC hit me/my car	1.9%	1.6%
No, never	98.1%	98.4%
Total	100.0%	100.0%

Drivers who were never hit by a lane-splitting motorcycle on a multiple-lane road were asked if they were ever nearly hit by a motorcycle, and 25.0% of respondents confirmed this, comparable to the 24.9% of drivers in 2012 (see Table V17).

Table V17. Q10a. “Were you ever nearly hit by a motorcycle?” and 2012 comparison

Q10a	Percentage 2013	Percentage 2012
Yes	25.0%	24.9%
No	75.0%	75.1%
Total	100.0%	100.0%

The stated damage caused to vehicles by lane-splitting motorcycles on multiple-lane roads is shown in Table V18, with a combined total of 17 answers. Overall, 35.3% of drivers mentioned “scraped/hit side of car,” 23.5% stated the motorcycle “just hit the car mirror,” and 23.5% noted no damage. The other specified answers included “dent my bumper” and “totaled car”.

Table V18. Q11. “What damage was caused by that hit or collision?” and 2012 comparison

Q11	Percentage 2013	Percentage 2012
Just hit my car mirror	23.5%	37.5%
Scraped/hit side of car	35.3%	50.0%
MC had minor injuries (scrapes/bruises)	5.9%	0.0%
Other	11.8%	12.5%
None	23.5%	0.0%
Total	100.0%	100.0%

Vehicle drivers were asked if they ever witnessed a collision that involved a MC that was lane-splitting on a multiple-lane road, and 13.2% reported that they did, compared to 16.0% in 2012. The slight decrease of 2.8% between 2013 and 2012 is not significant (Table V19).

Table V19. Q12. “Have you ever witnessed a collision that involved a motorcycle that was lane-splitting on roads other than freeways?” and 2012 comparison

Q12	Percentage 2013	Percentage 2012
Yes	13.2%	16.0%
No	86.8%	84.0%
Total	100.0%	100.0%

Table V20 shows the perception of lane-splitting being legal on multiple-lane roads. Overall, and similarly to 2012, a slightly larger proportion of drivers believe that lane-splitting on multiple-lane roads is illegal (45.9%). There is a slight increase in the number of drivers who believe lane-splitting on multiple-lane roads is legal, from 41.7% in 2012 to 44.0% in 2013, though that increase is not significant. Overall, 10.0% of all drivers did not know if lane-splitting is legal on multiple-lane roads.

Table V20. Q13. “Do you think it is legal for motorcycles to lane-split on multiple-lane roads?” and 2012 comparison

Q13	Percentage 2013	Percentage 2012
Yes	44.0%	41.7%
No	45.9%	45.5%
Don’t know	10.0%	12.8%
Total	100.0%	100.0%

Approval/disapproval of lane-splitting

Overall, 36.6% of all vehicle drivers “strongly approve” or “somewhat approve” of lane-splitting in general, the same percentage as in 2012. The majority of 63.4% “somewhat disapprove” or “strongly disapprove” of it (Table V21).

Table V21. Q14. “How would rate your approval or disapproval of lane-splitting” and 2012 comparison

Q14	Percentage 2013	Percentage 2012
Strongly approve	9.2%	8.3%
Somewhat approve	27.4%	28.3%
Somewhat disapprove	24.9%	26.1%
Strongly disapprove	38.5%	37.3%
Total	100.0%	100.0%

Table V22 shows the frequencies of the created variable “Approval of lane splitting” based on the grouped positive or negative response to Q14 (above) together with the cross-tabulation of the respondent’s gender for both waves of data collection. In both 2012 and 2013, there were significant differences between male and female drivers in the approval rate of lane-splitting, with male respondents showing a higher rate of approval (41.9% in 2012 and 42.8% in 2013) compared to females (p=0.00 for both 2012 and 2013). There are no differences in approval rates between 2012 and 2013.

Table V22. Approval or disapproval of lane-splitting by gender

Gender	Approval 2012	Disapproval 2012	Total
Male	41.9%	58.1%	100.0%
Female	25.7%	74.3%	100.0%
Total	36.0%	64.0%	100.0%
Gender	Approval 2013	Disapproval 2013	Total
Male	42.8%	57.2%	100.0%
Female	24.3%	75.7%	100.0%
Total	36.5%	63.5%	100.0%

There is no significant difference among the age groups in their approval of lane splitting (table not shown).

Question 15 asked drivers to state why they approve or disapprove of lane-splitting in a multiple choice format. Open-ended comments were coded and the following three answering categories were added:

- Saves gas;
- Safe only when traffic stopped or at slow speed;
- Approval if rider is careful/lane splitting when safe.

Note: The answering option “It is unfair they get ahead of me” was amended with the addition of “same rules for auto and MCs.” The answering option “might cause me to have an accident” includes “might cause me (or others) to have an accident.”

The majority of respondents who disapprove of lane-splitting believe it is unsafe (57.5%). Of respondents who approve of lane-splitting, only 8.4% consider it unsafe and 15.8% consider it safe (Table V23). A total 19.1% of drivers approve of lane-splitting because it helps traffic congestions; of those disapproving, only

0.5% stated this as a reason. The “other” reasons for approval included: sometimes riding a motorcycle him/herself, because they fit (in-between cars), because it is necessary for the engine, or respondents had no opinion or did not care. Specified “other” reasons for disapproval included: motorcycles are hard to see, because of experience with accidents, and others.

Table V23. Approval of lane-splitting by reason for approval/disapproval

Approval by reason	Approval	Disapproval
It is illegal	2.0%	1.6%
It is unsafe	8.4%	57.5%
It is unfair they get ahead of me/same rules for both auto and MCs	0.4%	4.4%
It startles/surprises me	1.5%	6.9%
It scares me they might crash	2.9%	8.0%
They ride too fast	2.0%	3.2%
Might cause me (or others) to have an accident	1.1%	9.7%
It is legal	7.7%	0.2%
It is safe	15.8%	0.2%
Helps traffic congestion	19.1%	0.5%
Other	30.8%	6.8%
Saves gas	2.0%	0.0%
Safe only when traffic stopped or at slow speed	2.4%	0.5%
Approval if rider is careful/lane splitting when safe	4.0%	0.5%
Total	100.0%	100.0%

An additional variable was created to combine the answers regarding lane-splitting legality on freeways and other multiple-lane roads, which can be found in Table V24. A total 36.6% of all vehicle drivers stated that they believe it is legal for motorcycles to lane-split on both freeways and multiple-lane roads, compared to 34.2% of drivers in 2012; 28.9% believed both to be illegal, compared to 29.2% in 2012. A total 3.9% of respondents did not know whether lane-splitting on freeways or roads is legal, compared to 5.2% in 2012. The slight differences in the perception of legality between 2012 and 2013 are not significant.

Table V24. Perception of legality of lane-splitting on both freeways and multiple-lane roads and 2012 comparison

Perception of legality	Percentage 2013	Percentage 2012
Both legal	36.6%	34.2%
Both illegal	28.9%	29.2%
FWY legal - Road illegal	14.0%	13.2%
FWY illegal - Road legal	5.1%	5.6%
Both - do not know	3.9%	5.2%
FWY legal	4.8%	5.3%
Road legal	2.3%	1.6%
FWY illegal	1.5%	2.9%
Road illegal	2.9%	2.7%
Total	100.0%	100.0%

The cross-tabulation of the approval of lane-splitting and the perception of legality is shown in Table V25. The table shows that the majority of those who approve of lane-splitting believe it is a legal activity; of all drivers who approve of lane-splitting, 57.0% also stated it to be legal. Drivers who believe lane-splitting to be illegal also have a higher rate of disapproval, 39.4%, the differences being significant at p=0.00. There is no significant difference to the 2012 approval rates.

Table V25. Approval or disapproval of lane-splitting by perception of legality of lane-splitting and 2012 comparison

Perception of legality	Approval 2013	Disapproval 2013	Approval 2012	Disapproval 2012
Both legal	57.0%	25.5%	56.8%	21.5%
Both illegal	10.9%	39.4%	8.3%	40.9%
FWY legal - Road illegal	17.3%	12.0%	17.0%	11.1%
FWY illegal - Road legal	4.5%	5.6%	6.4%	5.1%
Both - do not know	2.2%	4.6%	1.1%	7.5%
FWY legal	3.6%	5.1%	4.5%	5.8%
Road Legal	3.6%	1.6%	3.0%	0.9%
FWY illegal	0.0%	2.1%	1.9%	3.4%
Road illegal	0.8%	4.0%	0.8%	3.8%
Total	100.0%	100.0%	100.0%	100.0%

The approval rating of lane-splitting by the regions of Northern and Southern California is shown in Table V26. There are no significant differences in the approval between the two regions in 2012 or 2013.

Table V26. Approval or disapproval of lane-splitting by California region and 2012 comparison

Region	Approval 2013	Approval 2012
Northern CA	37.6%	39.9%
Southern CA	35.9%	34.3%
Total	36.5%	36.0%

The perceived legality of lane-splitting on freeways and/or multiple-lane roads (by the perception of legality variable) cross-tabulated by California region is shown in Table V27. The distribution of responses between both regions shows that 41.0% of Northern Californian respondents believe lane-splitting to be legal on both freeways and other multiple-lane roads, compared to only 34.3% of Southern California drivers. This difference in perception between regions is significant at $p=0.00$.

Table V27. CA region variable by perception of legality of lane-splitting and 2012 comparison

Perception of legality	2013		2012	
	Northern CA	Southern CA	Northern CA	Southern CA
Both legal	41.0%	34.3%	31.4%	35.5%
Both illegal	25.2%	30.8%	24.2%	31.4%
FWY legal - Road illegal	14.3%	13.8%	16.6%	11.8%
FWY illegal - Road legal	6.0%	4.6%	6.3%	5.3%
Both DK	5.2%	3.3%	4.5%	5.5%
FWY legal	5.2%	4.6%	8.1%	4.1%
Road Legal	0.6%	3.1%	2.7%	1.2%
FWY illegal	1.7%	1.3%	2.2%	3.1%
Road illegal	0.9%	4.0%	4.0%	2.2%
Total	100.0%	100.0%	100.0%	100.0%

Table V28 shows the distribution of the perception of legality variable by California county. The answer “both legal” was given by 19.0% of all respondents in San Bernardino and 53.6% of respondents in Ventura County. The frequency of the answer “both illegal” showed an inverse relationship between those two counties. These differences in perception by county are significant at $p=0.00$ though the absolute number of observations is very small.

Table V28. 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
San Bernardino	19.0%	42.9%	21.4%	7.1%	4.8%	2.4%	2.4%	0.0%	0.0%	100.0%
Ventura	53.6%	0.0%	14.3%	7.1%	10.7%	0.0%	3.6%	7.1%	3.6%	100.0%
San Diego	34.5%	36.4%	12.3%	5.9%	0.5%	3.6%	1.4%	0.9%	4.5%	100.0%
Orange	38.3%	39.5%	7.4%	3.7%	1.2%	4.9%	4.9%	0.0%	0.0%	100.0%
Riverside	30.4%	21.7%	21.7%	8.7%	6.5%	4.3%	0.0%	2.2%	4.3%	100.0%
Los Angeles	33.9%	26.3%	14.3%	2.4%	4.8%	6.4%	4.8%	1.6%	5.6%	100.0%
San Francisco	40.4%	23.1%	17.3%	9.6%	3.8%	0.0%	1.9%	3.8%	0.0%	100.0%
Alameda	34.8%	31.9%	15.9%	4.3%	1.4%	8.7%	0.0%	2.9%	0.0%	100.0%
Contra Costa	45.7%	25.9%	8.6%	6.2%	8.6%	4.9%	0.0%	0.0%	0.0%	100.0%
San Mateo	42.6%	23.4%	8.5%	6.4%	8.5%	4.3%	2.1%	2.1%	2.1%	100.0%
Santa Clara	38.5%	26.2%	20.0%	6.2%	4.6%	1.5%	0.0%	1.5%	1.5%	100.0%
Sacramento	45.7%	14.3%	17.1%	2.9%	2.9%	14.3%	0.0%	0.0%	2.9%	100.0%

The rate of approval of lane-splitting by California county is displayed in Table V29. The approval rates ranged from 26.1% in San Mateo to 52.9% in Sacramento. The disapproval rates ranged from 48.0% in Ventura to 73.9% in San Mateo. The differences between counties are not significant.

Table V29. CA County by approval of legality of lane-splitting and 2012 comparison

County	Approval of lane-splitting 2013		Approval of lane-splitting 2012		Total
	Approval	Disapproval	Approval	Disapproval	
Orange	37.5%	62.5%	36.5%	63.5%	100.0%
Los Angeles	36.8%	63.2%	32.2%	67.8%	100.0%
San Bernardino	26.8%	73.2%	28.6%	71.4%	100.0%
Ventura	52.0%	48.0%	57.1%	42.9%	100.0%
San Diego	35.5%	64.5%	39.8%	60.2%	100.0%
Riverside	30.4%	69.6%	25.0%	75.0%	100.0%
San Francisco	27.5%	72.5%	41.2%	58.8%	100.0%
Alameda	41.8%	58.2%	42.9%	57.1%	100.0%
Contra Costa	42.5%	57.5%	48.0%	52.0%	100.0%
Sacramento	52.9%	47.1%	27.5%	72.5%	100.0%
San Mateo	26.1%	73.9%	81.0%	19.0%	100.0%
Santa Clara	35.5%	64.5%	29.6%	70.4%	100.0%

Preventing motorcycles from lane-splitting

Vehicle drivers were also surveyed on if they ever prevented a motorcyclist from lane-splitting. The responses are illustrated in Table V30. Of all drivers, 6.4% stated that they tried to prevent a motorcycle from lane spitting, compared to 7.3% in last year’s intercept (difference is not significant).

Table V30. Q16. “Have you ever tried preventing a motorcycle that was lane-splitting from passing you?” and 2012 comparison

Q16	Percentage 2013	Percentage 2012
Yes	6.4%	7.3%
No	93.6%	92.7%
Total	100.0%	100.0%

Table V31 shows the stated rationale from drivers on why they tried to prevent a motorcyclist from lane-splitting with a comparison to the 2012 data. A total 17.4% of drivers stated being afraid of causing an accident as a reason, followed by 14.5% indicating that lane-splitting is unsafe. The other specified answers included a range of opinions and various motivations. The overall distribution of responses is similar to 2012.

Table V31. Q17. “Why did you try to prevent the motorcyclist from lane-splitting?” and 2012 comparison

Q17	Percentage 2013	Percentage 2012
It is illegal	2.9%	4.5%
It is unsafe	14.5%	25.4%
It is unfair they get ahead of	11.6%	13.4%
It startles/surprises me	7.2%	3.0%
It scares me they might	7.2%	4.5%
They ride too fast	7.2%	4.5%
Might cause me to have an	17.4%	19.4%
Other	31.9%	25.4%
Total	100.0%	100.0%

The cross-tabulation of approval of lane-splitting by having attempted to prevent motorcyclists from the action is shown in Table V32. The difference between approvers and non-approvers in blocking motorcyclists from lane-splitting is significant ($p=0.01$), indicating that those drivers who disapprove prevent motorcyclists from lane-splitting more frequently (4.0% of those who approve versus 8.1% of those who disapprove compared to 3.5% of approvers versus 9.5% of disapprovers in 2012 – note that number of observations is very small).

Table V32. Approval of lane-splitting by having prevented MC from lane-splitting and 2012 comparison

Prevented MC from lane-splitting	2012		Difference 2013-2012	2012	
	Approval	Disapproval		Approval	Disapproval
Yes	4.0%	8.1%	-4.1%	3.5%	9.5%
No	96.0%	91.9%	+4.1%	96.5%	90.5%
Total	100.0%	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 a measurable difference in the age of drivers and this behavior (no tables shown).

VEHICLE SURVEY

Hi, my name is _____ I am doing a brief survey on safety issues for the Office of Traffic Safety and UC Berkeley. It will take a few minutes and will help traffic safety researchers learn more about the opinions of CA drivers on lane splitting. This is completely anonymous and you can skip any question you do not want to answer.

First, are you over 18 years old?
[if NO – do not proceed]

1 Yes

1 About how often would you say you drive on a freeway in CA?

1 6-7 days a week 2 3-5 days a week
3 1-2 times a week 4 Less than once a week
10 DK 33 Skip

FOR THE PURPOSE OF THIS SURVEY, THE TERM "LANE SPLITTING" MEANS A MOTORCYCLIST RIDING BETWEEN TWO LANES OF SLOWER MOVING OR STOPPED TRAFFIC HEADING IN THE SAME DIRECTION.

2 Thinking about driving on a freeway – and not any other street, how many motorcycles do you see lane splitting in an average week?

_____ (# of events/week)
333 DK 333 Skip

3 Do you think it is LEGAL for motorcycles to lane split on freeways?

1 Yes 2 No
33 DK 33 Skip

4 Again, thinking about driving on a freeway - have you ever had a motorcyclist lane splitting between the vehicle you were in and another vehicle?

1 Yes 2 No (GO TO Q7)
33 DK 33 Skip

5 Have you ever hit a motorcycle OR has a motorcycle hit you that was lane splitting on a freeway?

3 No, never –
5a. Were you ever nearly hit by a motorcycle?
1 Yes (GO TO Q7) 2 No (GO TO Q7)
1 Yes, motorcycle hit me/my car 2 Yes, I hit motorcycle
33 DK 33 Skip

6 What damage was caused by that hit or collision?
(DO not read - Select All)

1 Just hit my car minor
2 Scraped / hit side of car
3 MC had severe injuries (broken bones, lacerations, trauma)
4 MC had minor injuries (scrapes / bruises)
5 MC hit my front bumper
6 I ran over the motorcyclist
7 MC hit one or more cars
8 I knocked down the motorcyclist
9 Other _____
10 None 33 DK 33 Skip

7 Have you ever witnessed a collision that involved a motorcycle that was lane splitting on a freeway?
(Not just any collision)

1 Yes 2 No
33 DK 33 Skip

NOW I AM GOING TO ASK YOU ABOUT ROADS OTHER THAN FREEWAYS THAT HAVE MULTIPLE LANES GOING IN THE SAME DIRECTION.

8 Thinking about driving on a multiple lane road, not a freeway, how many motorcycles do you see lane splitting in an average week?

_____ (# of events/week)
333 DK 333 Skip

9 And thinking about driving on a multiple lane road - have you ever had a motorcyclist lane splitting between the vehicle you were in and another vehicle?

1 Yes 2 No (GO TO Q12)
33 DK 33 Skip

10 Have you ever hit a motorcycle OR has a motorcycle hit you that was lane splitting on a road other than a freeway?

3 No, never –
10a. Were you ever nearly hit by a motorcycle?
1 Yes (GO TO Q12) 2 No (GO TO Q12)
1 Yes, motorcycle hit me/my car 2 Yes, I hit motorcycle
33 DK 33 Skip

11 What damage was caused by that hit or collision?
(DO not read - Select All)

1 Just hit my mirror
2 Scraped / hit side of car
3 MC died
4 MC had severe injuries (broken bones, lacerations, trauma)
5 MC had minor injuries (scrapes / bruises)
6 Hit my front bumper
7 I ran over the motorcyclist
8 Hit one or more cars
9 I knocked down the motorcyclist
10 Other _____
11 None 33 DK 33 Skip

12 Have you ever witnessed a collision that involved a motorcycle that was lane splitting on a multiple lane road other than a freeway?
(Not just any collision)

1 Yes 2 No
33 DK 33 Skip

13 Do you think it is LEGAL for motorcycles to lane split on multiple lane roads other than freeways?

- 1 Yes
2 No
3 DK Skip

14 Overall, how would rate your approval or disapproval of lane splitting? Would you say you...

- 1 Strongly approve
2 Somewhat approve
3 Somewhat disapprove
4 Strongly disapprove
5 DK Skip

15 Why do you say that? (DO not read - Select All)

- 1 It is illegal
2 It is unsafe
3 It is unfair they get ahead of me
4 It startles/surprises me
5 It scares me they might crash
6 They ride too fast
7 Might cause me to have an accident
8 It is legal
9 It is safe
10 Help traffic congestion
11 Other _____
12 DK Skip

16 Have you ever tried preventing a motorcycle that was lane splitting from passing you?

- 1 Yes
2 No (GO TO Q 18)
3 DK Skip

17 Why did you try to prevent the motorcycle from lane splitting? (DO not read - Select All)

- 1 It is illegal
2 It is unsafe
3 It is unfair they get ahead of me
4 It startles / surprises me
5 It scares me they might crash
6 They ride too fast
7 Might cause me to have an accident
8 Other _____
9 DK Skip

18 And lastly, for statistical purposes, please stop me when I get to your age range: Are you between?

- 1 18-24
2 25-34
3 35-44
4 45-54
5 55-70
6 70 or older
7 Skip

Thank you very much for your time. Those are all the questions.

FOR E&W STAFF TO FILL OUT:

Date: _____

Interviewer: _____

Time: 7 / 8 / 9 / 10 / 11 / 12 / 1 / 2 / 3 / 4 / 5 / 6 AM/PM

Location: _____

Respondent's gender: (DO NOT ASK) 1 M 2 F

MOTORCYCLE SURVEY

Hi, my name is _____ I am doing a brief survey on safety issues for the Office of Traffic Safety and UC Berkeley. It will take a few minutes and will help traffic safety researchers learn more about the opinions of CA drivers on lane splitting. This is completely anonymous and you can skip any question you do not want to answer.

First, are you over 18 years old?
{If NO – do not proceed}

1 Yes

1 What best describes how you use your motorcycle MOST of the time? *(DO not read - Select ONE)*

- 1 Commuting to work
- 2 Pleasure riding on weekends
- 3 Both commuting to work and pleasure riding on weekends
- 4 Long-distance touring rides
- 5 Bar hopping
- 6 Other _____
- 88 DK 99 Skip

2 About how often would you say you ride your motorcycle?

- 1 6-7 days a week
- 2 1-2 times a week
- 3 3-5 days a week
- 4 Less than once a week
- 88 DK 99 Skip

3 On an average day about how many miles do you ride your motorcycle?

_____ (number of miles / range)
88 DK 99 Skip

FOR THE PURPOSE OF THIS SURVEY, THE TERM "LANE SPLITTING" MEANS A MOTORCYCLIST RIDING BETWEEN TWO LANES OF SLOWER MOVING OR STOPPED TRAFFIC HEADING IN THE SAME DIRECTION.

4 Do you lane split on your motorcycle when riding on freeways?

- 1 Yes
- 2 No **(GO TO Q9)**
- 88 DK 99 Skip

5 How frequently do you lane split on freeways? Would you say...

- 1 Always
- 2 Often
- 3 Sometimes
- 4 Rarely
- 88 DK 99 Skip

6 Have you ever hit a vehicle or has a vehicle hit you while you were lane splitting on a freeway?

- 3 No, never –
- 6a. Did you ever nearly hit a vehicle?
- 1 Yes **(GO TO Q8)**
- 2 No **(GO TO Q8)**
- 1 Yes, vehicle hit me
- 2 Yes, I hit vehicle
- 88 DK 99 Skip

7 What damage was caused by that hit or collision?
(DO not read - Select All)

- 1 Just hit car mirror
- 2 Scraped/hit side of car
- 3 I had severe injuries (broken bones, lacerations, trauma)
- 4 I had minor injuries (scrapes / bruises)
- 5 I hit car front bumper
- 6 I was run over by car
- 7 I hit one or more cars
- 8 I was knocked down
- 9 Other _____
- 10 None
- 88 DK 99 Skip

8 What best describes your lane splitting on freeways? Would you say you lane split only when... *(Select ONE)*

- 1 traffic is at a standstill
- 2 traffic is stop-and-go
- 3 traffic is moving less than 20 MPH
- 4 traffic is moving less than 30 MPH
- 5 traffic is moving less than 40 MPH
- 6 traffic is moving less than 50 MPH
- 7 traffic is moving less than 60 MPH
- 8 traffic is moving less than 70 MPH
- 9 Other _____
- 88 DK 99 Skip

NOW I AM GOING TO ASK YOU ABOUT ROADS OTHER THAN FREEWAYS THAT HAVE MULTIPLE LANES GOING IN THE SAME DIRECTION.

9 Do you lane split on your motorcycle when riding on multiple lane roads other than freeways?

- 1 Yes
- 2 No **(GO TO Q14 when Q4=1 else go to Q19)**
- 88 DK 99 Skip

10 How frequently do you lane split on roads other than freeways? Would you say...

- 1 Always
- 2 Often
- 3 Sometimes
- 4 Rarely
- 88 DK 99 Skip

11 Have you ever hit a vehicle or has a vehicle hit you while you were lane splitting on a multiple lane road other than a freeway?

- 3 No, never –
11a. Did you ever nearly hit a vehicle?
1 Yes (GO TO Q 13) 2 No (GO TO Q 13)
1 Yes, vehicle hit me / my car 2 Yes, I hit vehicle

12 What damage was caused by that hit or collision? (DO not read - Select All)

- 1 Just hit car mirror
2 Scraped/hit side of car
3 I had severe injuries (broken bones, lacerations, trauma)
4 I had minor injuries (scrapes / bruises)
5 I hit car front bumper
6 I was run over by car
7 I hit one or more cars
8 I was knocked down
9 Other _____
10 None
88 DK 99 Skip

13 What best describes your lane splitting on roads other than freeways? Would you say you lane split only when... (Select ONE)

- 1 traffic is at a standstill
2 traffic is stop-and-go
3 traffic is moving less than 20 MPH
4 traffic is moving less than 30 MPH
5 traffic is moving less than 40 MPH
6 traffic is moving less than 50 MPH
7 Other _____
88 DK 99 Skip

14 If you had to guess, when lane splitting – how much faster (in general) than the rest of the traffic do you go? Would you say you go about...

- 5MPH -- 10MPH -- 15MPH -- 20MPH -- 30MPH -- 40MPH -- 50MPH
faster than other traffic
8 DK 99 Skip

15 In your opinion, what is the MOST serious threat to your safety when lane splitting? (DO not read - Select ONE)

- 1 Distracted Drivers (cells or texting)
2 Drivers not looking in mirror (drivers don't see me)
3 Aggressive drivers
4 Drunk drivers
5 Big trucks
6 Poor road surface
7 Narrow Lanes
8 Other _____
88 DK 99 Skip

16 Have you ever received a traffic ticket or citation while lane splitting?

- 1 Yes 2 No (GO TO Q18)
88 DK 99 Skip

17 What was the violation?

- 1 Speeding
2 Following too closely
3 Mis-use of lanes
4 Failure to signal lane change
5 Other _____
88 DK 99 Skip

18 Has a vehicle driver ever tried to prevent you from passing while you were lane splitting?

- 1 Yes 2 No
88 DK 99 Skip

19 Finally, have you taken a motorcycle rider training class?

- 1 Yes 2 No (GO TO Q21)
88 DK 99 Skip

20 Who provided the class?

- 1 Name of Organization _____
88 DK 99 Skip

21 One more question, and remember that your response is anonymous: Do you have a valid motorcycle endorsement?

- 1 Yes 2 No
88 DK 99 Skip

22 And lastly, for statistical purposes, please stop me when I get to your age range: Are you between?

- 1 18-24
2 25-34
3 35-44
4 45-54
5 55-70
6 70 or older
7 Skip

Thank you very much for your time. Those are all the questions.

FOR E&W STAFF TO FILL OUT:

Date: _____

Interviewer: _____

Time: 7 / 8 / 9 / 10 / 11 / 12 / 1 / 2 / 3 / 4 / 5 / 6 AM/PM

Location: _____

Respondent's gender: (DO NOT ASK) 1 M 2 F

Appendix C-- Letter of Confirmation

UNIVERSITY OF CALIFORNIA, BERKELEY

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Phone: (510) 642-0566 Fax: (510) 643-9922

March/April 2013

Dear Fueling Station Manager:

The purpose of this letter is to tell you about a public safety survey being conducted by the University of California, Berkeley Safe Transportation Research and Education Center and the California Office of Traffic Safety on motorcyclists and lane splitting. The survey will take less than five minutes and will help traffic safety researchers learn more about the opinions of CA automobile drivers and motorcyclists on this topic. The results of the study will provide the State with ideas for making the roads of California safer.

We are working with Ewald & Wasserman Research Consultants, a survey research firm in San Francisco. We have selected this location to conduct the surveys because it is in a well-travelled geographic area of the state. The trained interviewers who are conducting the surveys at your location will be courteous of your customers, and will not interfere with business conduct. They will complete the surveys within a few days. Additionally, customers will be allowed to stop answering questions at any point they want, and all responses will be anonymous.

If you have any questions about the research study, please call Jill Cooper at 510-643-4259.

Thank you in advance for your cooperation and your participation in this study.

Sincerely,

Handwritten signature of David R. Ragland in black ink.

David R. Ragland, Ph.D.
Professor, UC Berkeley School of
Public Health

Handwritten signature of Christopher J. Murphy in black ink.

Christopher J. Murphy
Director
California Office of Traffic Safety