

A Division on the Road: The Safety and Legalization of Lane Splitting


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Gavin Max Gerber
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Signature  _____ Date 12 May 2022
Gavin Max Gerber

Approved  _____ Date 10 May 2022
Richard Jacques, Department of Engineering and Society

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It is easy to recognize the significance and practicality of paved roads in the United States. They connect communities with different socioeconomic status and cultural values. They escort ambulances with flashing lights and blaring sirens to hospitals that can help. They make sure the Amazon package arrives on time. They also pose one of the most unrecognized dangers in the United States. Motor vehicle crashes rank 12th in the leading causes of death (Heron, 2021), yet millions of Americans start their ignitions every day. Each motorist faces a different risk depending on their vehicle. In multi-vehicle accidents, truckers are usually the most protected due to the immense weight of their rigs. Passenger cars are significantly lighter but are justified on the road with ever-improving safety features. Motorcycles are the lightest, smallest and least safe with fatalities 29 times more likely than in passenger cars (NHTSA, 2021). Data suggests 58.97% of those fatalities occur in multi-vehicle accidents (NSC, n.d.). One proposed strategy to reduce these statistics and offer motorcyclists a more practical experience on the road is lane splitting.

Lane splitting has almost no consistency in terminology or definition across different individuals, organizations and even governments. It is often referred to as filtering, lane sharing, white-lining or stripe-riding. The basic concept, as seen in Figure 1, is when motorcyclists advance through traffic by riding along the border between two lanes rather than inside the confines of one lane. To be feasible, both lanes must have the same direction of traffic.

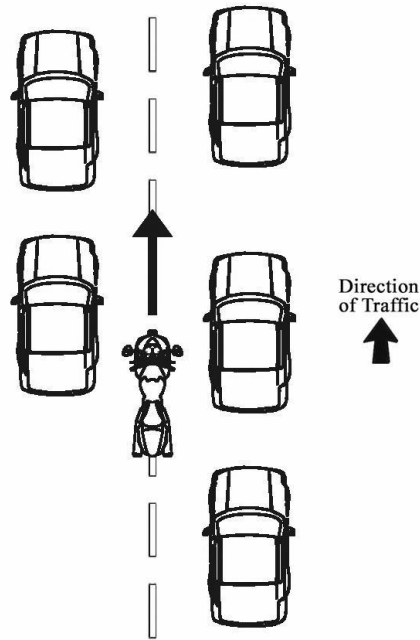


Figure 1. Depiction of Lane Splitting (created by author)

When discussing lane splitting in the United States, it is hard not to mention the state of California. California is arguably the nucleus of this riding technique, storing all the history of motorcyclists' battle for the road. Initially, lane splitting in California was not explicitly legal or illegal. Lawsuits from lane splitting accidents could swing either way; riders had no available resources on safe lane splitting behavior and other motorists on the road did not know how to handle seeing a motorcycle beside their wing mirror. That was until the California Highway Patrol (CHP), a state law enforcement agency, took a stance and endorsed lane splitting. Figure 2 shows a brochure of guidelines that the CHP published and distributed in 2014 to advise safe lane splitting practice. The suggestions include a threshold for maximum speed, consideration of the surrounding environment and individual dependence on the rider's competence and alertness.

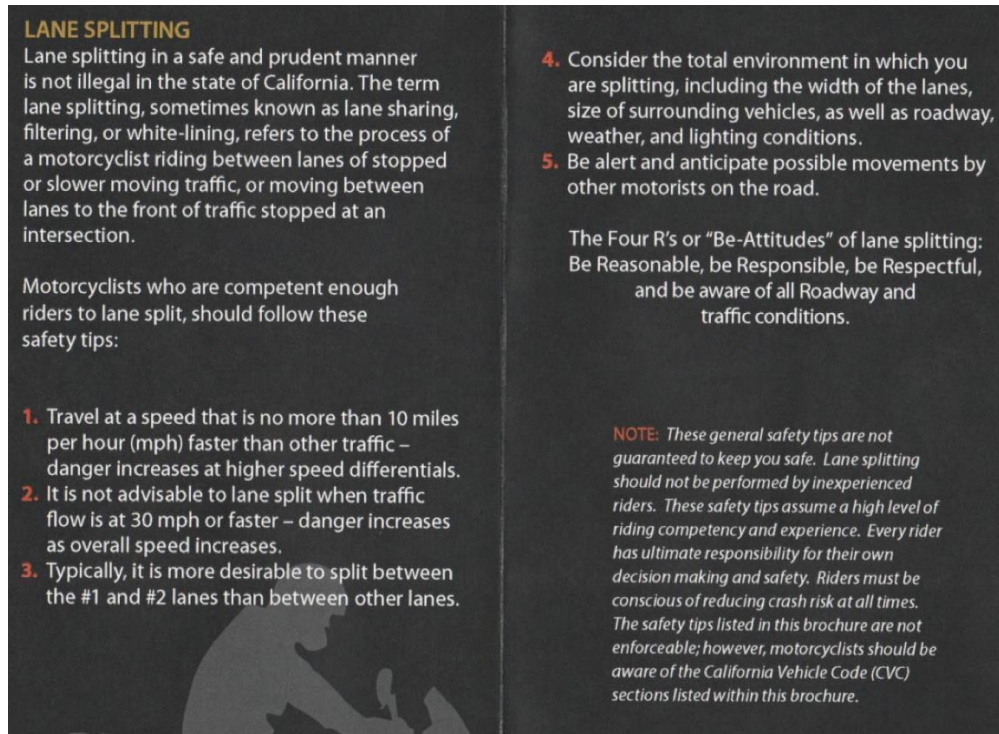


Figure 2. Brochure of the California Highway Patrol's Guidelines for Lane Splitting (CHP, 2014)

On the other side of the brochure, the CHP directed a message at other motorists and vehicles on the road. The CHP clarified that lane splitting is not illegal when done safely and that other motorists “should not take it upon themselves to discourage motorcyclists from lane splitting” (CHP, 2014). To emphasize this, the CHP referenced a few laws that motorists might violate if they prevent a rider from advancing between lanes. 22400 CVC declared that it is illegal to intentionally block or impede a motorcyclist in a way that could cause harm to the rider. Similarly, 22517 CVC indicated it is illegal to open a vehicle door to impede a motorcyclist. This brochure solidified the CHP’s stance on lane splitting and encouraged other motorists to allow the riding technique. Their stance was met with opposition.

In response to the published guidelines on safe practice, a former California state employee named Kenneth Mandler introduced a reason to reject lane splitting. Mandler

argued that the CHP had “exceeded its authority by recommending lane splitting” (Fleming, 2014). Mandler believed a government agency could not advise a practice that was not officially legal in the state legislature. After hearing the opposition, the Office of Administrative Law had the CHP remove their guidelines. Mandler’s efforts also resulted in the removal of any mention of lane splitting in the California Department of Motor Vehicles’ online and printed literature. The removal of guidelines and terminology from California state documentation was a reminder to the country that lane splitting was not legal and should not be supported.

For motorcyclists, the CHP-Mandler battle was lost, but the war was far from over. Discussions on lane splitting became increasingly relevant as the motorcycle community started to divide and individual riders voiced their stance. Even community forums on websites of aftermarket parts vendors became hotspots for debate. Advocates would argue that “with all the distracted drivers nowadays I would feel a ton safer filtering traffic” (Pederson, 2015). Conversely, opponents believed “wide, heavy, rarely ridden bikes [lane splitting] are an accident waiting to happen” (Pederson, 2015). Online discussions repeatedly went back and forth but kept the subject relevant.

In May of 2015, a study by the Safe Transportation Research and Education Center of the University of California Berkeley analyzed data from the California Enhanced Motorcycle Collision Project. The data consisted of 5,969 motorcyclists, 55 with unknown lane splitting status, who were involved in traffic collisions between June 2012 and August 2013. Thomas Rice, Lara Troszak and Taryn Erhardt found that lane splitting riders in California were less likely to be rear-ended than non-lane splitting

riders but were more likely to rear-end other vehicles (results shown in Table 1). It is worth noting that only 4.3% of the total collisions involved rear-end collisions.

Table 1. Chance of Rear-End Collisions for Motorcyclists (Rice et al., 2015)

	Non-Lane Splitting Riders	Lane Splitting Riders	Difference
Rear-Ended by Another Vehicle	4.6%	2.6%	2%
Rear-End Another Vehicle	15.7%	38.4%	22.7%

The study also validated lane splitting advocates’ perspective on safety benefits. The findings in Table 2 indicate that lane splitting reduces the chances of any injury in collisions with other vehicles. When factoring in speed, Rice et al. ultimately concluded that lane splitting did not increase the risk of injury to motorcyclists when traffic was moving at 50 MPH or less and motorcycle riders did not exceed the speed of traffic by 15 MPH (Yang, 2015). This was strong, quantitative evidence for advocates of lane splitting. Not shortly after, “The University of California Berkeley” was all over newspapers and riding magazines. Advocates exploited this research to argue their case and push for official legalization of lane splitting.

Table 2. Chance of Injury for Motorcyclists in Collisions (Rice et al., 2015)

	Non-Lane Splitting Riders	Lane Splitting Riders	Difference
Head Injury	16.8%	9.0%	7.8%
Neck Injury	8.9%	7.4%	1.5%
Torso Injury	28.6%	19.0%	9.6%
Extremity Injury	65.9%	59.5%	6.4%

Fatal Injury	3.0%	1.2%	1.8%
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One year later, in 2016, California officially recognized lane splitting and added it to their Vehicle Code. This marked the point of legality and made California the first state in the United States to legalize lane splitting. Bill AB 51 granted the CHP the authority to reestablish the guidelines for safe lane splitting practice that Mandler previously had removed. The guidelines are similar to the previous version, but with a notable addition. Not only do they officially state that lane splitting is legal, but the guidelines advise “drivers in the far-left lane [to] move to the left of their lane to give motorcyclists ample room to pass” (CHP, n.d.). The CHP officially recommended other motorists to drive differently around motorcyclists and provide them with an opportunity to advance through traffic. Driving behavior around motorcycle riders in California was now radically different than in the other forty-nine states.

The battle for the road in California resulted in a blossoming motorcycle community. Riders advanced through slow-moving Los Angeles traffic as the rest of the nation witnessed history. For years, no other states followed in California’s footsteps. However, more recently, the riding technique has spread across the west coast as seen in Figure 3.

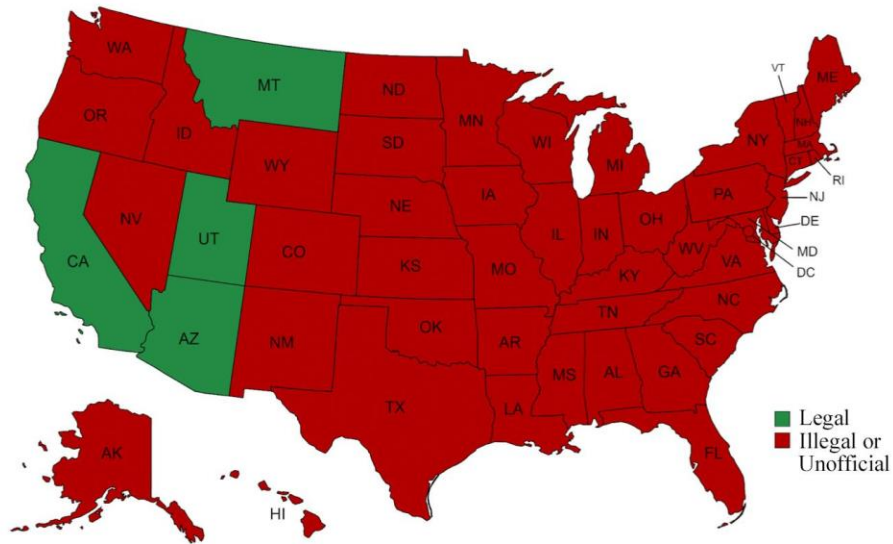


Figure 3. Legality of Lane Splitting in the United States as of April 2022 (created by author)

In May of 2019, Utah became the second state to legalize lane splitting. The Utah Department of Public Safety (Utah DPS) officially refers to this practice as “lane filtering”. While California leaves lane splitting opportunities and safety judgment up to the rider, Utah specifies when and how lane splitting can be done (Utah DPS, 2019). Legal lane splitting in Utah is dependent on the road and status of traffic. There are three pieces of criteria. First, the road must have two or more adjacent lanes in the same direction of traffic. Second, the speed limit of the road must be 45 MPH or less. This implies that lane splitting on freeways is not legal. Third, all surrounding traffic must be at a stop. If this criterion is satisfied, a motorcycle may advance through traffic at a maximum speed of 15 MPH. The Utah DPS emphasizes that, “lane filtering is NOT the same as California’s lane splitting” (Utah DPS News, 2019).

In March of 2021, Montana followed Utah in creating an adaptation of California’s lane splitting. In Montana, a motorcyclist may engage in “lane filtering”

when traveling under 20 MPH and not exceeding the speed of surrounding traffic by 10 MPH (Montana Code Annotated, 2021).

Arizona is set to become the fourth state to legalize lane splitting. Arizona passed Senate Bill 1273 early in 2022 after data from the Arizona Department of Transportation indicated 30% of all motorcycle crashes in 2020, including eleven out of 106 fatalities, were the result of rear-end collisions (Rider Magazine, 2022). The bill was pushed by Senator Tyler Pace, an avid motorcycle rider, and is expected to be effective in September of 2022. Arizona’s lane splitting law is modeled off of Utah’s and permits lane splitting on roads where the speed limit is 45 MPH or less and the rider travels at 15 MPH or less. After California kickstarted the legalization, each following state has referenced existing interpretations of lane splitting.

These four states will serve as models for the rest of the country as their annual crash reports become available. As of now, it is too early to evaluate the safety of lane splitting in Arizona and Montana but Utah and California have a few years of collision data. Table 3 shows motorcycle related crash statistics taken from the Utah DPS. While the number of crashes, injuries and fatalities involving motorcycles remains fairly constant between 2017 and 2021, the likelihood of a rider fatality decreased 61.1% after legalization in 2019. In other words, motorcyclists in Utah were 61.1% less likely to die on the road with lane splitting as an option.

Table 3. Annual Statistics of Crashes Involving Motorcycles in Utah (Utah DPS, 2017-2021)

*Total Fatalities include but are not limited to motorcyclists.

	Crashes	Injuries	Total Fatalities*	Motorcyclist Fatalities
2017	1,102	1,033	40	38

2018	1,037	960	47	47
2019	1,021	933	35	32
2020	1,077	1,018	45	20
2021	1,162	1,094	41	13

Collision data from California, shown in Table 4, revealed that lane splitting had different effects in the Golden State. Despite the 9.3% decrease in motorcyclist fatalities between 2018 and 2019, California averaged 4.8% more fatal crashes after legalization in 2016. This increase could be associated with California’s growing population and two-wheel community but regardless, the effects of lane splitting in California were vastly different from what Utah experienced. The contrasting results could be due to California having 661,500 more registered motorcycles than Utah (Carlier, 2022) or the states’ different adaptations of lane splitting.

Table 4. Annual Motorcyclist Fatalities in California (State of California, 2017; California OTS, n.d.)

	2013	2014	2015	2016	2017	2018	2019
Fatal Crashes	467	517	504	569	566	523	474

While quantitative data shines light on the safety implications, there are other aspects of lane splitting that cannot be accurately shown with numbers. Lane splitting introduces a multitude of practicality benefits. When traffic is halted, motorcyclists are not. Advancing past dozens of stopped cars offers significant time savings when commuting. It is believed that the practicality of legal lane splitting makes motorcycling more attractive to the average commuter and “might encourage more people to choose to ride motorcycles, further reducing the number of cars on the road” (Pederson, 2015).

Lane splitting has an obvious positive impact on traffic congestion. When a motorcyclist leaves their lane to split, their previous position opens up and allows rear traffic to move forward. For warmer climates lane splitting allows riders wearing thick, protective gear to avoid sitting still in traffic on hot summer days. These benefits show that a purely quantitative analysis cannot accurately evaluate lane splitting.

Similarly, there is a major flaw with lane splitting that is better shown with experience rather than data. Riders in Montana report that although lane splitting is now legal, the riding tactic has been met with opposition on the road. Motorcyclist Tyler Tenderich claims other motorists have responded to lane splitting by honking, opening doors and even swerving to impede or discourage the legal riding technique (Anderson, 2022). Additionally the Missoula Police, a city police department in Montana, have received calls questioning the driving behavior and its legality. Confusion about the legality of lane splitting can instigate aggressive reactions from other motorists and cause dangerous situations, especially in states where helmets are not required for motorcyclists.

Confusion also arises in the discussion of lane splitting as various individuals, organizations and government agencies have different definitions of the same action. There is almost no consistency in terminology when describing lane splitting. ABC Fox Montana reporter Maria Anderson acknowledges the confusion by stating, “lane filtering is not the same as lane splitting” (Anderson, 2022). Confusion on the legality and terminology of lane splitting makes this riding technique much harder to introduce to society and the roads.

Throughout this research, it has become clear that motorcycle lane splitting is not just a bill on paper or a situational solution to traffic congestion. Lane splitting is a sociotechnical system that affects everyone on the road through entitlement of space. It changes the flow of traffic, the safety of motorcycle riders, state reports on collision data, the driving behavior of motorists and their perceptions of motorcyclists on the road. Like any system's design, lane splitting is far from perfection but effective developments in its early age can help it become a system needless for repair. The following suggestions created by the author are included to propose a strong infrastructure for lane splitting's implementation in the United States.

First, there must be universal terminology when describing lane splitting. The lack of consistency has been shown to create confusion in discussions and applications of lane splitting. The words "lane splitting", "white lining", "stripe riding" and "lane sharing" were all encountered during this research. For simplicity, these terms need to be distinguished and defined. Figure 4 presents a clear distinction and definition of each term. Lane splitting refers to when a vehicle drives directly between two lanes. White lining and stripe riding refer to the same action but should not be used in official documentation. (Lane) filtering refers to when a vehicle bounces between lanes before enough time has elapsed for the vehicle to establish itself in a specific lane. Finally, lane sharing occurs when two or more vehicles, likely both motorcycles, are positioned next to each other in the same lane. This proposed terminology will create a universal language to easily discuss different driving behaviors. It offers consistency and will eliminate any confusion on whether the same action is being discussed.

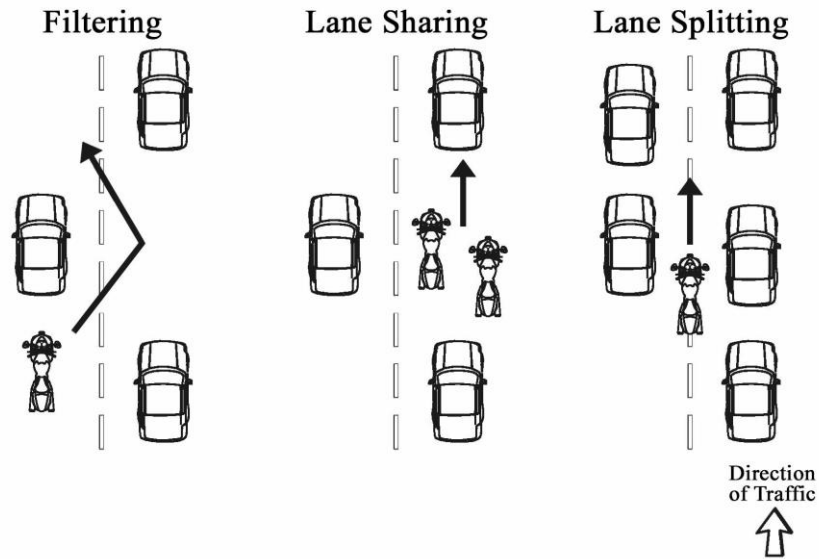


Figure 4. Proposed Terminology and Corresponding Definitions (created by author)

Second, lane splitting legislature must have restrictions to be deemed a safe practice and be fair for other motorists on the road. While California does not specify when and how lane splitting can be done, the collision data from Utah indicated that specific restrictions on lane splitting can make it a safe system while retaining the practicality. If other states in the country adopt lane splitting into their legislature in the future, it should be done with certain specifications. The specifications should include details on what the surrounding environment must be and how the motorcyclist may proceed to lane split. As an example, this could impose a maximum speed limit for lane splitting and a requirement to flash hazard lights or wear reflective clothing while performing the action. Restrictions on lane splitting would not entitle motorcyclists to lane split whenever they want and instead would help other motorists on the road understand the legality of the action.

Finally, lane splitting should only be introduced with educational opportunities for other users of the road. The aggressive reactions to lane splitting seen in Montana

could have been avoided if there was more outreach to let the public know that it is a legal action. The legalization could be announced via radio stations, billboards, newspapers and other means of advertising. If other motorists on the road are made aware of the acceptance of lane splitting, they are more likely to welcome it the first time they witness it.

These three suggestions aim to provide a structure for how lane splitting can be effectively implemented as a sociotechnical system in the United States. If done correctly, lane splitting can offer motorcyclists a more practical experience on the road while not increasing the danger. With legalization in only four states in the last six years, lane splitting is still very new and is expected to be adopted by more in the future. Now more than ever is the design of this system important to ensure safety and satisfaction for all users of United States roads.

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