

Motorcycle Lane Splitting

A literature review

By

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Abstract

This report condenses the observations and conclusions from several recent studies conducted by government, industry, and private researchers. The potential risks and benefits of lane splitting and filtering for motorcycles in traffic were evaluated along with the available data on adoption and education of the public. Examination reveals that lane splitting at lower speeds significantly reduces the risk of crash and injury to motorcyclists with no increase in risk to other vehicle traffic. Further studies indicate that concerns regarding adoption of lane splitting in areas where it was previously banned are unfounded, and that existing strategies for educating the public about changes to the law are sufficient. As a result of these collective conclusions, this paper recommends that lane splitting be legalized for motorcycles riding in slow moving or stopped traffic.

Introduction

Lane splitting refers to the practice of riding between lanes in slow moving traffic. It is often confused with filtering, which refers to riding between lanes in stopped traffic. Both lane splitting and filtering are legal in much of Europe, some parts of Australia, and California, although they are not legal anywhere else in the United States. Of Californians surveyed, 63% of drivers oppose the practice of lane splitting, with 49% of drivers opposed due to safety concerns.^[6] Prominent safety concerns include the narrow spaces between cars, as well as the risk of motorcycles being sideswiped by cars making sudden lane changes. Proponents of lane splitting claim the nimble nature of the motorcycles allow them to safely move between lanes where they have increased visibility,^[6] more easily avoid collisions, and can potentially recover from side impacts using the motorcycle's natural stability when in motion.^[7] Until recently little research was available regarding the safety of lane splitting beyond anecdotal observation by motorcyclists and drivers. Over the last several years, however, a variety of studies have been published using data collected by a variety of sources including the California Highway Patrol (CHP), traffic cameras, and the California Enhanced Motorcycle Collision Data Project.

Filtering Demographics and Behaviors

Car drivers commonly express the concern that allowing motorcycles to split lanes will encourage thrill-seeking motorcyclists to engage in reckless behavior. However, studies reporting on the demographics of riders most likely to engage in lane splitting indicate that compared to non-lane splitting motorcyclists, lane splitting motorcyclists are:

- More likely to be weekday commuters^{[2][3]}
- More likely to be obeying the speed limit^[2]
- More likely to wear a full face helmet as opposed to an open faced or novelty helmet^[2]
- 65% less likely to be under the influence of alcohol^[2]

- More likely to be properly licensed^[2]
- Less likely to be carrying a passenger ^[2]

Additional research on the behavior of lane splitting motorcyclists in California indicates that most ride no more than 15 mph faster than the surrounding traffic^{[2][3]} and that they are less likely to split lanes as traffic speeds increase. Of motorcyclists who split lanes on the highway, 91% exceed the speed of traffic by 15 miles per hour or less and 80% only split lanes when traffic is moving at less than 40 mph.^{[2][5]} The studies suggest most lane splitting motorcyclists are commuters riding responsibly.

Effects on Crashes and Injuries

In the United States motorcycles are just 3% of registered vehicles, yet they represent 13% of vehicle fatalities. One contributing factor to this disparity is rear-impact collisions, which the National Highway Traffic Safety Administration reports as the most common type of crash for all vehicles in the U.S. The incidence of motorcycle rear-impact deaths is higher for motorcycles than for cars. However, California is an anomaly among the states given its unusually low rate of rear-end collisions among registered motorcyclists and lower rate of fatalities resulting from rear end collisions, despite California having a higher rate of total vehicle deaths per capita than the United States as a whole.^[7] Several studies attribute this disparity to the legality of lane splitting in California, as lane splitting motorcyclists in California are 43% less likely to be rear ended by another vehicle. ^{[2][7]} Three independent studies from 2011 through 2015 demonstrate that lane splitting motorcyclists in California are less likely to be involved in a crash than non-lane splitting motorcyclists.^{[2][5][7]}

Similar safety benefits have been seen in research conducted in Europe as well; a 2009 study in Europe shows motorcycles are seven times more likely to be hit while stopped compared to crashing while splitting.^[10] A 2010 Oregon Department of Transportation literature review concludes that lane splitting crashes are rare even in areas where lane splitting is legal and widely practiced.^[6] Furthermore, when crashes do occur while lane splitting, the injuries are far less severe with:

- 60% fewer fatal injuries ^[2]
- 47% fewer head injuries ^[2]
- 34% fewer torso injuries ^[2]
- 9% fewer extremity injuries ^[2]

The data clearly refutes the idea that lane splitting is unsafe. Lane splitting is significantly safer than waiting in traffic when practiced at a reasonable speed. Although this conclusion may be a surprise to some, several plausible hypotheses explain the results. The reduction in the rate of crashes may be attributed to increased visibility of motorcycles in vehicles' side view mirrors,^[6] or possibly it is easier for a rider to stay upright when they are sideswiped compared to when they are rear-ended due to the motorcycle's inherent stability while moving.^[7] Another explanation is that a moving motorcycle can more easily avoid an incoming threat compared to a motorcycle stopped in traffic.^{[7][8]} The reduced injury rate may be a result of the lower impact

forces experienced by the motorcyclist during sideswipe impacts compared to the impact force during rear-impact collisions.^[7]

Other Effects

Several other effects are noted in various studies. Motorcyclists in areas where lane splitting is legal gain improved travel time consistency. Law enforcement agencies may also benefit from lane splitting, as motorcycle-based officers can more safely and quickly reach their destinations. Drivers in cars may benefit from lane splitting as well according to simulations conducted by Mobility & Transport Leuven; shifting 10% of commuters from driving cars to lane splitting on motorcycles reduces traffic time losses by 40% and reduces total greenhouse gas emissions by 6%.^[4]

Adoption and Education

One of the major concerns with lane splitting, particularly among states considering legalizing the practice, is “violation of driver expectation,” or inability of drivers to predict motorcycle action when lane splitting is occurring.^[6] In order to better understand the real-world effects of lane splitting before its legalization, a controlled trial was conducted in New South Wales, Australia, where lane splitting was still illegal at the time of the study. For an eight week period, filtering past stopped traffic only was legalized for a heavily congested 0.5 square mile area in Sydney. During the trial there was no increase in crashes due to motorcyclists filtering through stopped traffic and reduced travel times were observed. Although not officially part of the trial, motorcyclists were observed splitting lanes in slow moving traffic, with no crashes observed during the trial period.^[1] This study provides strong evidence that lane splitting can be safely adopted.

Education of drivers may be a problem even in areas where lane splitting is legal. In a 2014 study conducted in California, only 60.7% of drivers believed lane splitting was legal on freeways. The same study includes data about the most effective methods for educating drivers on the legal status of lane splitting. Most drivers indicate that they get the bulk of their information on the legality of lane splitting from TV advertisements and the internet. Motorcyclists, on the other hand, get most of their information on the legality of lane splitting from highway billboards.^[3] Historically, the California Highway Patrol (CHP) distributed pamphlets containing guidelines for safe lane splitting. Included in those guidelines were recommendations that lane splitting be restricted to splitting the two leftmost lanes, exceeding the speed of traffic by no more than 10 miles per hour, and only when traffic is moving no faster than 30 miles per hour.^[9] A recent study of crashes in California indicates that lane splitting is safest when the motorcyclist is riding at less than 50 miles per hour and no more than 15 miles per hour faster than the speed of traffic, and that splitting quickly becomes more dangerous above these speeds.^[2] This study supports the guidelines recommended by the CHP, and makes a good starting point for the adoption and regulation of lane splitting by other states.

Conclusion

The studies unanimously assert that lane splitting is safer than riding in slow moving or stopped traffic as it reduces the frequency of motorcycle crashes in traffic and significantly reduces the severity of injuries received in those crashes. Lane splitting is practiced mostly by responsible riders who rely on their bikes for commuting purposes, and it reduces traffic and greenhouse gas emissions. Given these facts and the ease with which drivers have adapted to lane splitting in the past, legalizing lane splitting in more states is a logical step forward in roadway safety.

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