

SKIDEMARKS

MARCH 2013 – VOLUME 15, NUMBER 1

Lane Splitting: Convenience or Curse?



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CALIFORNIA ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS

THE BOARD BEAT

Greetings, I hope this edition of the CAARS newsletter finds you ready for summer. The rain has stopped, the flowers are blooming and vacation is just around the corner. As the Old Motor Cops say "away with the leather jacket, I'm ready for short sleeves".

As you may have heard Chris Kauderer our Board of Directors Chairman is recovering from a kidney transplant. Shari, Chris's wife, says the transplant team said everything went well and Chris is expected to be up and around in the next few weeks. At this time, 04-11-13, Chris cannot have visitors due to his condition. I know I speak for all of us when I say let's wish Chris a speedy recovery.

Our association bylaws provide for situations when the chairman is unable to conduct the duties of his position (Article III Sect G.2). Due to Chris's medical condition he has asked Jahna Beard, the Vice Chair, to assume the duties of the Chair. So until Chris has recovered to the point that he can resume his role as Chairman of the Board, Jahna will be our acting Chairwoman.

Our Fall Conference is tentatively set for October 24, 25 and 26, 2013. The location will be in Anaheim or Long Beach. As soon as the contract with the hotel is executed and the location is set, it will be announced. The topic for the conference is commercial vehicle collision investigation. I have been asked to co-chair the conference. I have contacted several speakers and have received some tentative interest. If you have any specific aspects of commercial vehicles you would like to see covered or you have an idea for a speaker, please send me an e-mail at wfocha@comcast.net or give me a call at 707-477-5977.

CAARS has changed how you renew your membership. It is all handled on-line on the CAARS website. You will not receive anything in the mail reminding you to renew your membership.

On April 19, 2013 a group of CAARS members will be conducting a second set of motorcycle slide tests. We plan to build on the data that we collected during our last set of slide tests conducted for the 2012 conference. The CAARS members at the Roseville PD have opened their EVOG track to us. Motorcycles have been gathered from throughout northern California. Our plan is to conduct as many tests as we can before we run out of daylight. Lou Peck who spoke at the Fall Conference in S. Lake Tahoe is coming out from the east coast to participate in our testing. As is always any members who want to participate in the testing are welcome.

That's it for now. I will see you whenever sound-minded people gather to crash things in the interest of science.

Respectfully submitted,

Bill Focha

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Letter from the editor

Dear CAARS members,

Being actually somewhat new to CAARS and to accident reconstruction as a field, I did not wind up taking the ACTAR exam until 31 October preceding the CAARS annual conference in South Lake Tahoe. Luckily, I passed, so am now the proud holder of ACTAR Accreditation #2619. "Luckily" is a funny word to use, and perhaps I passed by a wide margin. But while the experience is fresh in my mind, it's useful to say a few things about this exam. Namely, there is too much luck involved in passing it or failing it, in my humble opinion.

I see two specific problems:

1. The measuring of angles of post-crash trajectories is very sensitive to error.
2. Problems with this sensitive measurement cascade downstream in the analysis during the exam so that one wrong answer leads to many wrong answers and possible failure of the exam.



Yes, I know that there is a tolerance around the angle when taking the exam ($\pm 4^\circ$), but often the skidmarks leading away from the point of impact are somewhat ambiguous. What I do in private practice to measure these angles is to do it electronically, with tracing software to measure the angles as precisely as possible. When taking the practice exams and working problems in the preparation material from Vic Craig, I scanned his images in and used my tracing software to precisely measure the angles. I found that often I was in disagreement with his measurements of the angles. When there was a discrepancy in his results and my results, it was usually traceable back to these sensitive angle measurements. Prior to the exam I'd worked quite a few problems but realized that there was this lurking pitfall that I could do nothing more about. Luckily, I did my angle measurements within the tolerance established and passed the exam.

The second flaw is one that you can lay at the feet of ACTAR. Tests need to be designed so that one mistake isn't counted as a number of mistakes. I deal with this problem all the time as a university professor. It is really unavoidable when writing exams, and, generally, what I do is not count answers automatically incorrect if the input information is flawed. If the student's procedure is correct but the answer is wrong because the inputs used were incorrect, I give him/her credit for the problem. This takes extra time to grade the exams, but I think that it is more fair to the students.

A well-designed test tries to limit this dependency, so that the input to one problem does not depend on the output from a previous problem. The ACTAR exam I took did not meet the standard of independence of problem results that I use when writing quizzes, tests, and exams at Cal Poly-SLO. So I think that there were some unlucky individuals who didn't get the angle measurements precisely enough, who missed one problem, which caused them to have three or four counted wrong, and this meant for them the difference between passing and failing. ACTAR needs to address this problem and write better-designed exams.

This issue contains a review of the first-quarter CAARS training on momentum analysis in crashes. I want to have an issue that covers the history of Toyota's unintended acceleration problems and the current status of that, since there has been recent news. But the lane-splitting controversy exploded recently in several California newspapers. There was also a presentation on this at the 2012 CAARS annual conference that caused quite a stir, so it seemed more apropos to make way for this.

As always, your ideas and contributions and feedback are invited and welcomed.

Best wishes,
Frank Owen
editor@ca2rs.com



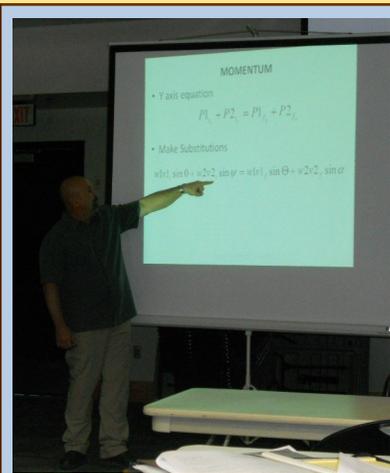
First-quarter training

Roseville Police Department, 31 January, Roseville, California

Momentum Analysis in Accident Reconstruction

CAARS first-quarter training covered momentum analysis in vehicle collisions. It was held 31 January to a packed session at the Roseville Police Department and then again 11 February at the Automobile Club of Southern California in Gardena. The training seminars were put on by Dean Reichenberg and Bob Snook of Reichenberg & Snook – Reconstruction Specialists, LLC, Elk Grove, CA.

Momentum analysis is basic to accident reconstruction, so it makes sense to revisit it regularly as a refresher for experienced reconstructionists and to demonstrate it to members new to the field. The seminar began with a review of the basics—the science as well as all of the standard formulae used in a momentum analysis. Dean and Bob did some role playing at the start to show what type of questions a prosecutor and then a defense attorney might pose to an expert witness regarding momentum analysis.



Dean Reichenberg explains momentum analysis ...

The roles of mass and velocity were explained as the constituents of momentum. Momentum's nature as a vector quantity was also explained. Impulse was described as well as its action along the principal direction of force (PDOF). The Principle of the Conservation of Linear Momentum was explained and how this is applied in a collision between two vehicles.

Bob and Dean began with simple examples, one-dimensional problems, and showed how momentum analysis is applied. The three phases of a collision—just before, during, and just after were laid out. Then the presentation moved on to more complicated two-dimension problems, where the complications of vector operations becomes evident.

The presentation was hands-on, built around a single, detailed example. *Vehicle 1 (V-1) is traveling eastward (0°) and collides with vehicle 2 (V-2), which is travelling in a direction 20° west of north (110°) from the east-oriented x-axis. Post-crash skidmarks indicate that V-1 has a post-collision speed of 25 fps at 60° north of east, and V-2 has a post-collision speed of 35 fps 20° north of east. What are the pre-collision speeds of both vehicles?*

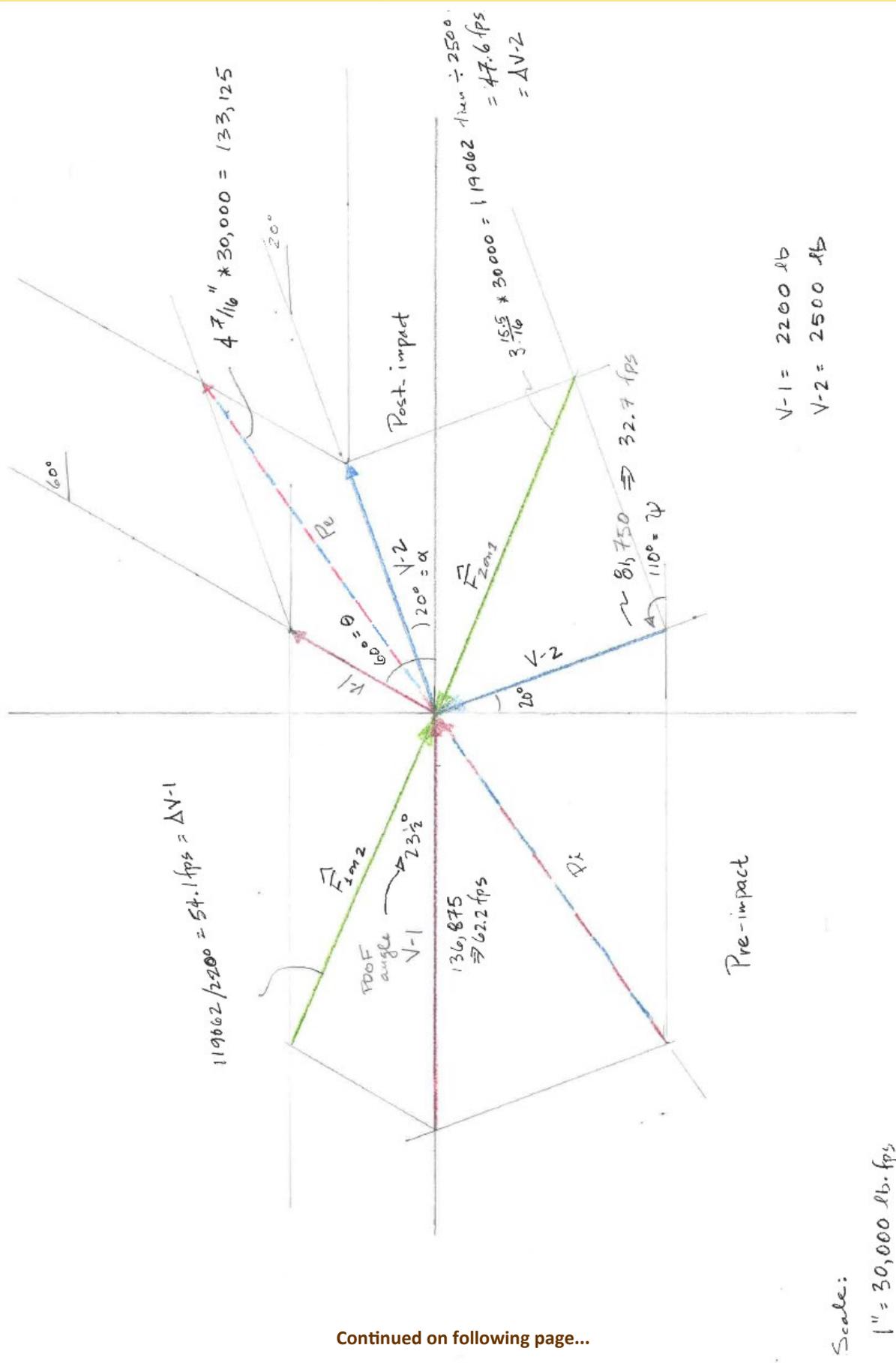
The solution procedure was graphical. Participants were given 11X17 sheets of paper marked with coordinate x- and y-axes. A scale was selected (1" = 30,000 lb-fps), and participants were directed step-by-step how to construct a momentum diagram of the crash. This allowed participants to check their intermediate calculations and correct any errors in measurement or calculation at every stage.

My (Frank Owen's) solution to this exercise is shown on the following page.



...to a rapt audience In Roseville.

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A second example was presented, but there was not enough time to finish this exercise, so it was left as a take-home exercise.

Vehicle 1 is travelling eastward and collides with vehicle 2, which is travelling 10° west of south (260°). It is determined from skidmark analysis that the post-collision velocity of V-1 is 28 fps @ 285° (CCW from east), and the post-collision velocity of V-2 is 31 fps @ 340° . V1 weighs 4500 lb, and V2 weighs 4000 lb. Find the initial speeds of both vehicles, the PDOF, and the Δv 's for each vehicle.

I had written a paper about a year and a half ago on momentum diagrams. The seminar got me to thinking again about this and in some different ways. So I went back and revised and expanded this paper based on what I took home from the seminar. It's available at www.aoengr.com/AccidentReconstruction/Momentum.Diagram.pdf. I also just gave my undergraduate Dynamics students a quiz problem in this same area. It can be seen at www.aoengr.com/AccidentReconstruction/Quiz2W13Prb2GraphicalSoln.pdf.

Also see this quarter's "Technical Corner" (page 17) for an explanation of a problem with the arctangent calculation that leads to misleading results when calculating the PDOF.

So many thanks to Dean and Bob for their interesting, informative presentation for this quarter's training.

CAARS second-quarter training

The 2013 second-quarter training will cover time/distance calculations. Some case studies will be presented. This will take place during the first part of June and will be put on by Jahna Beard and Mike Allision. The specifics on when and where the training will take place are still being worked out as of the publication of this newsletter. Watch for notification via email from CAARS. Once the dates and places are set, you may go to the Events page at www.ca2rs.com to register for the training.

While you are on the website, update your profile. Also, some have not yet renewed their membership. That may also be done on the website.

Northern California

To be announced...

Southern California

To be announced...

Upcoming ACTAR Examination Dates and Locations

May 2013

7 May– Seattle, WA, sponsor: WATAI. New applications must be received by 7 March. Exam registration cut-off date is 7 April, 2013. Held at Seattle Police Department, Airport Way Center.

12 May – Las Vegas, NV, sponsor: ACTAR. New applications must be received by 12 March. Exam registration cut-off date is 12 April, 2013. Held before [ARC-CSI Conference](#) – Palace Station Casino.

There are other tests offered in other parts of the country. Please go to ACTAR test website listed below for these dates.

All test dates above subject to new testing regulations, which prohibit the use of electronic devices for testing.

Go to www.actar.org/test.html for additional information.



THIS QUARTER'S FEATURE

Lane splitting: convenience or curse

Editor's note: The topic of lane splitting came up in November at the CAARS annual conference, where Steve Guderian gave a presentation on it which raised quite a few questions and some skepticism. (See December's newsletter.) Since then the topic has come up in several California newspapers, where it has also generated strong positive and negative opinions.

L.A. TIMES – 19 JANUARY 2013

On two wheels, it's all open road

By Doug Smith

For the motorcyclist zipping between gridlocked cars on the freeway, traffic is always light. And besides, one says, he's performing a public service.

The first question my well-meaning acquaintances ask is, "Do you take that thing on the freeway?"

Since that thing is a 1.2-liter engine on two wheels and a 600-pound body, that's actually a rather silly question.

But I know it's only a warm-up for what's really on their minds:

"Are you one of those who cut in between cars?"

Yes, I am.

And I'm aware — even without the disapproving tone of the question — of the emotions I raise when you see me in the rear view mirror, or worse, become aware of my presence as I cross the plane of your windshield: momentary panic, then relief, and last, outrage.

Also, let's not forget jealousy. Once I pass, I know you continue watching me move inexorably out of sight while you wait for the car in front of you to move another few feet.

So why do I do it when I know it scares and angers you?

I won't argue, as many of my motorcycle comrades do, that the practice we call lane splitting is for our safety. Helmets and headlights are for safety. Lane splitting is for beating traffic.

I base my defense on social and philosophical arguments which I'll get to shortly.

First I'd like to reassure you that, no matter how much you may fear it, you will not swerve your car sideways and hit me. By the time I invade your space, I've been studying your driving from four cars back. I know if you're on your cellphone or putting on your makeup. I know if you're following too close or lagging behind. I know if you hug to the left or right, or weave.

If you're the worst kind of driver, the one who trudges along at your own slow pace locked mirror-to-mirror with the car beside you, I've been cursing you for as long as it takes you to wake from your reverie and hit the gas, giving me the few feet of separation I need to tip my handlebars around your side view mirror.

It takes me about a half second to make my move. Once I do, you can't react fast enough to hit me.

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You might argue that I'm an outlaw at heart. In fact, unlike the rest of the 50 states, California does not prohibit lane splitting, making our state more aligned with most of the Third World — don't groan — and also the premier cities of Europe.

On its website, the California Highway Patrol states that lane splitting is not illegal but must be practiced safely — use the space between the one and two lanes, keep speed below 30 mph, and so forth.

Every motorcyclist, the CHP adds, has "ultimate responsibility" for his or her own safety. That's a precept I can embrace wholeheartedly: As long as I'm riding between you I'm totally in command of my own destiny. In contrast, following in line behind you leaves me at the mercy of the unknown motorist behind me.

And between lanes, I see the L.A. freeways as no car-bound motorist can. I see space everywhere.

There are actually two independent freeway systems occupying the same roadway. One is filled by cars and the other is entirely empty. No matter how dense the traffic, morning or night, most of the freeway remains free for the taking to those whose vehicles are small enough to ply the creases between cars.

Am I wrong to take that space?

I would argue that I am serving all commuters — and consequently all society — by using the pavement that automobiles can't. I'm subtracting one 4,000-pound box from the endless line of boxes keeping each other from getting where they are going.

The small price in psychic discomfort less fortunate four-wheeled commuters pay for my service could easily be palliated by a road trip to say, Paris, where the culture of the super freeway has evolved to afford the motorcycle an exalted place.

On Boulevard Périphérique, the perpetually gridlocked 22-mile loop that circumnavigates the city, motorcycles own the space between the number one and number two lanes. If my sudden appearance in your mirror rattles you, you have no idea how panicked you'd feel on seeing a phalanx of 20 or 30 Ducatis, BMWs, Yamahas and Hondas charging from the rear at twice your speed. So many commuters ride rather than drive that they create their own traffic pattern, bunching up in formations that whoosh by slower moving cars every 30 seconds or so.

Etiquette known only to the French requires motorists in the number one lane to stay left — keeping their mirrors inches from the concrete divider — and those in the number two lane to stay right. Ignorant Americans, who by habit aim for the center of the lane, soon learn of their impropriety from a barrage of gestures that can be understood in any language.

I know it's unmanly, at best, to hold up the French as a model for how Americans should act. But I'll stick my neck out and say Los Angeles would be a better city if a thousand, or ten thousand, commuters gave up their cars for motorcycles.

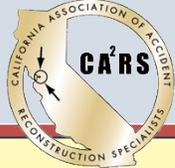
Given my belief that we are a city of uncommonly polite drivers, I'll part with this advice:

When you see me drawing near, don't jerk your steering wheel to get out of my way. You'll only scare everyone around you unnecessarily.

If you want to show solidarity, just hold your course and be sure you're a little in front or a little behind the car beside you.

I'll be gone before you know it.

doug.smith@latimes.com



LETTERS TO THE EDITOR – L.A. TIMES – 25 JANUARY 2013

Divided on lane splitters

In his justification for motorcycle "lane splitting," Doug Smith writes as if all motorcyclists are supremely careful drivers. He ignores the numerous hazards this practice poses to automobile drivers.

If Smith wants to take his chances of becoming road kill, he might want to consider the consequences to drivers who are unable to see motorcycles in their blind spots. Motorists who end up harming lane splitters have to live the rest of their lives knowing they changed or even ended a precious life through little fault of their own.

Lawmakers must take a serious look at the number of accidents and fatalities resulting from this practice of beating traffic. Automobile drivers who weave through traffic can be cited for reckless driving; motorcyclists should suffer the same consequence to protect everyone's safety.

Lucie Bava
Cheviot Hills

Thanks to Smith for his piece. Rarely does a short column change my mind about something, but he did. I had believed lane splitting was and should be illegal, but Smith's defense of the practice was compelling.

In addition to the benefit of using unused pavement, the tandem benefits of lower fuel consumption and less air pollution are ones for which we should all be grateful. Going forward, I'll try to heed Smith's driving advice and will offer a respectful salute rather than a New York salute to lane splitters.

Dan Brooks
Santa Barbara

L.A. TIMES – 28 JANUARY 2013

Revved up about motorcycles zooming between cars

by Doug Smith

Defending motorcyclists who navigate the space between cars hits a nerve among motorists eager for a reasoned conversation on improving life on L.A.'s freeways.

During his nearly 40 years as a columnist for this newspaper, my late father occasionally tweaked his readers — quite disingenuously — by belittling his cat, knowing the slur would stir invective so passionate and erudite that he could fill another column without having to do much writing of his own.

I had no intention of employing that device when I recently wrote — quite sincerely — in defense of motorcyclists who navigate the space between cars to get ahead on crowded freeways.

To be sure, I knew some motorists would object out of fear of hitting a rider, or annoyed by the intrusion on their space. I was prepared to shrug them off because, I thought, my opinion was based on logic, experience and the law.

How fragile is the hard shell of reason! Among the emails that flooded my inbox, those that left me most humbled were from motorists who mostly agreed with me. But they were hurt by my admonishment that they should not move

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slightly out of my way.

Specifically, I wrote: "If you want to show solidarity, just hold your course and be sure you're a little in front or a little behind the car beside you."

Joe Edward of Beverly Hills was insulted. "Moving over, even briefly, gives you more room and I, maybe mistakenly, thought it shows courtesy," he wrote. "I thought it was the olive branch between those on four and two wheels, and is confirmed when I get the two-fingered 'thank you' wag from cyclists. When that happens, just for a moment, LA free-ways are a nicer place and, yes, to the late Rodney King, we can all just get along.... But now you say NOT to move over? Ok. Forget the olive branch. Forget wanting to get along. It's on!"

I certainly never intended to turn plowshares into swords. And I'd like to think that if Joe knew me personally he'd see I'm not like the name he called me at the end of his email.

But I do apologize. I was myopic when I wrote, "Hold your course." The comment was aimed at drivers who turn their wheels sharply when surprised by a motorcycle. I appreciate drivers who ease slightly left or right, giving me the room to slide by comfortably, but more important letting me know they too are attuned to their surroundings.

And yes, I always give them the wave and momentarily feel better about humanity.

As you may have noticed, motorcyclists also give each other the two-finger salute when passing, a mutual acknowledgment of our membership in a minority that embraces the fun and physics of vehicular transportation along with its practical benefits.

The wave is also a silent bond between boomers like me and gen-whatevers who wear red mohawks on their helmets and wouldn't notice me under any other circumstances.

My aggressiveness in standing up for our somewhat outcast status surprised and pleased many fellow riders.

"Doug! You are the bomb!!!" wrote Arlene Battishill, who produces a line of head-turning women's motorcycle apparel and rides a Kawasaki. "I nearly screamed out loud.... Man oh man, I could just kiss you right now!"

Yes, we can be an exuberant bunch, inebriate of air, as Emily Dickinson so nicely put it. I can't deny that a few respondents castigated me for being irrational and self-aggrandizing, predicted my untimely demise or, worse, implied that such might be the due reward for my impudence.

I think my cat-baiting father would have gotten a sly smile from the reaction of an anonymous trucker who asked, "Ever heard of a CB?"

"I know when one of you guys is coming for miles," he wrote, warning that outside my state I could become "road pizza" for riding like a Californian. He claimed to have seen semis "run bikes off in the grass more than once."

To my surprise, though, the critiques that hit home were also from fellow motorcyclists.

Some noted the bad behavior of "squids," those hyper riders who weave back and forth on screaming "crotch rockets." No wonder the "cagers," those dull people imprisoned in their cars, are up in arms.

David Lasher, who makes a continuous video of his commute from Northridge to Santa Monica, sent me a clip of his own crash when a car veered into his lane seemingly in contradiction of my assertion that a motorist cannot swerve fast enough to hit me as I pass by.

Lasher followed the cowboy mantra and got right back on a replacement Suzuki. Another, John Greenwood, told me of

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his "deal with God" never to ride again after one bad day ended 20 great years of riding.

By carefully parsing these scary stories, I can show that none directly refute the thesis that motorcycles are safer between lanes than in them, assuming a few guidelines are followed. Lasher, for example, conceded that he shouldn't have been lane-splitting in the HOV transition zone. [Some materials](#) I got from [motorcycle safety experts](#) convinced me further.

douq.smith@latimes.com

...AND THEN THERE WAS THIS 7 FEBRUARY 2013 IN THE L.A. TIMES

Older motorcyclists suffer greater injury in crashes, study says



A recent Brown University study concludes that older motorcycle riders are more prone to severe injury than younger adults. (Mario Villafuerte / Getty Images)

As more older Americans take up motorcycling -- or return to it after a decades-long hiatus -- one thing is becoming clearer to emergency room physicians: When graying riders go down, they go down hard.

A Brown University study published Wednesday in the journal Injury Prevention, found that bikers age 60 and over were 2 1/2 times more likely to wind up in an emergency room with severe injuries than were riders in their 20s and 30s.

Middle-aged riders fared somewhat better, but were still 66% more likely to sustain serious injury than were younger bikers.

See [full article](#).

SACRAMENTO BEE – 11 FEBRUARY 2013

CHP posts rules for motorcycle lane-splitting

SACRAMENTO, Calif. (AP) - The California Highway Patrol has created the first written guidelines on motorcycle "lane-splitting," the maneuver by which cyclists pass vehicles  in adjacent lanes by driving between them.

The Sacramento Bee reported Monday that California is the only state that allows lane-splitting. Until now, there have never been safety guidelines for the polarizing practice that often pits motorcycles against cars and trucks.

The guidelines say motorcyclists can ride between two cars if there is room, but only at speeds no more than 10 miles-per-hour faster than the vehicles they're passing.

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The rules also say that motorcyclists should not attempt the move at full freeway speeds, or in any traffic going faster than 30 mph.

The guidelines come as the number of motorcyclists in California have risen, as well as the number of motorcycle crashes.

EDITORIAL – SACRAMENTO BEE, 12 FEBRUARY 2013

Can't we all share the highway safely?

By Foon Rhee



For me, one of the most unnerving parts of driving in California is when motorcycles rocket past, inches away, in between lanes on the freeway.

While lane-splitting is legal – California is the only state that allows it – the law is murky. So it's about time that state officials have come up with some common-sense rules of the road.

Under the first-ever written guidelines on lane-splitting, motorcyclists should go no more than 10 mph faster than other traffic and not do so when traffic is going 30 mph or faster. Also, it's advised to go between the lanes farthest to the left and to avoid the maneuver near onramps and exits.

The combined impact? Bikers would go no faster than 39 mph when lane-splitting. As anyone who ventures on highways knows, some are going much faster than that when they speed past long lines of stopped cars.

Sgt. Mark Pope of the California Highway Patrol says the guidelines are meant only to educate the driving public. Since they're not in the law, violating them won't mean a ticket. Since they're entirely voluntary, they will only make a difference if motorcyclists actually follow them.

Vehicle drivers are also part of the safety equation. The California Office of Traffic Safety, which also worked on the guidelines, admonishes motorists that it is illegal to intentionally impede a motorcycle and that they "should not take it upon themselves to discourage motorcyclists from lane-splitting."

As The Bee's Tony Bizjak reported, 7 percent of drivers in a recent survey said they have tried to block a lane-splitting cycle; only 53 percent knew lane-splitting was legal, if done "in a safe and prudent manner."

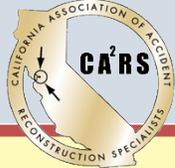
Motorcyclists are the ones who are at most risk. There were 414 motorcycle fatalities in California in 2011, a 15 percent increase from 2010. Deaths had dropped dramatically in 2009 after 11 years of increases.

The state has contracted with UC Berkeley researchers to study all collisions involving motorcycles, including whether motorcyclists are wearing helmets, drinking or lane-splitting. The yearlong study is just starting. Depending on the findings, more safety measures could be recommended.

Many motorcyclists won't be happy even with these voluntary guidelines. In the survey, 87 percent said they lane-split. They say that it protects them from being rear-ended by cars, and that many motorcycle engines can quickly overheat if they have to idle in traffic.

I know this because when I wrote about this subject in California Forum in November 2010, I received some irate emails and got flamed on blogs. One motorcyclist challenged me to take a ride with him; I took a pass.

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At the risk of more angry responses, I think these guidelines are a good start – and I bet a lot of drivers agree.

The goal is to make our highways safer for everyone, motorcyclists included. There shouldn't be any argument about that.

LETTER TO THE EDITOR – SACRAMENTO BEE – 13 FEBRUARY 2013

Lane splitting can be safe

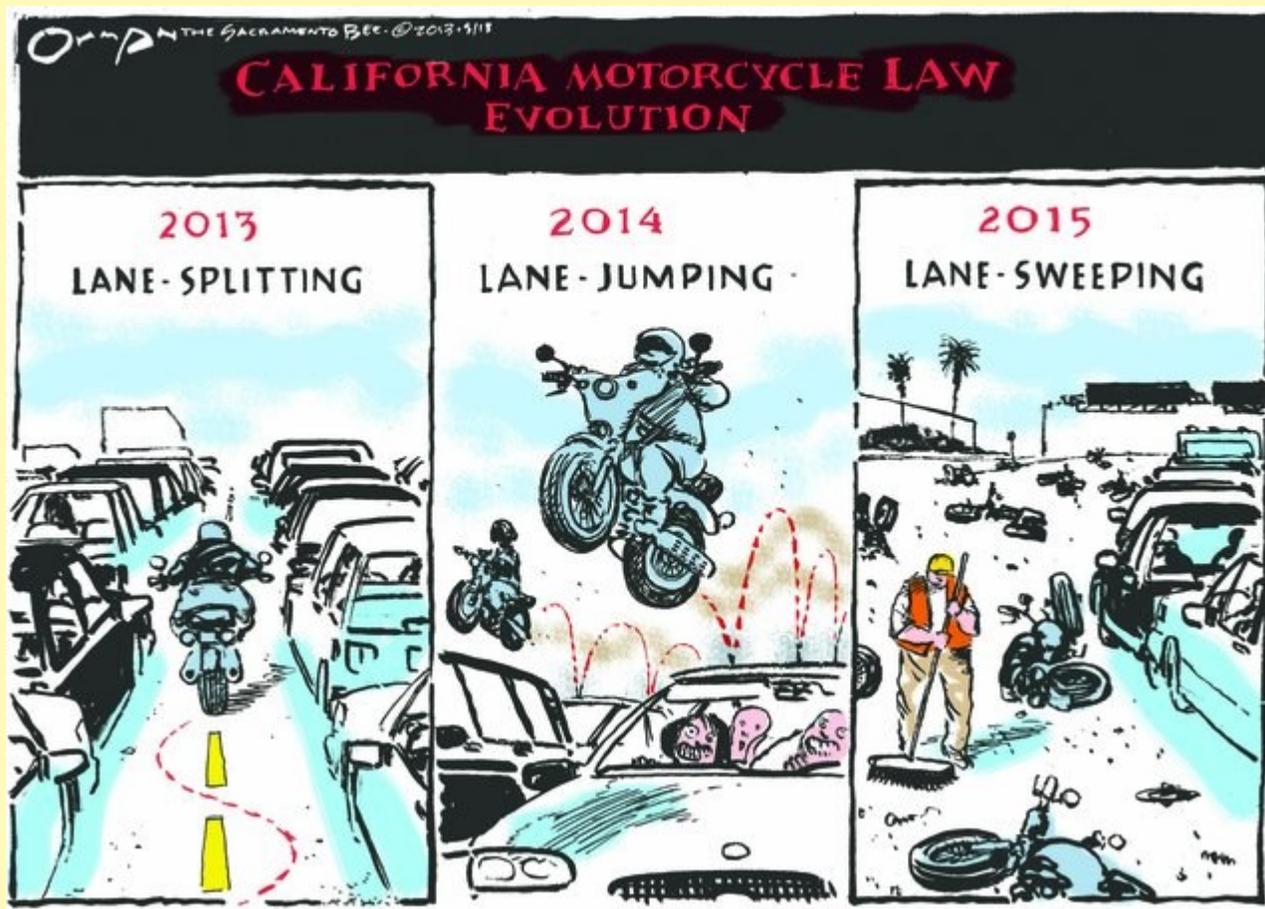
Associated Editor Foon Rhee has no doubt been exposed to misbehaving motorcyclists.

But please don't paint all motorcyclists as bad actors based on a few or on personal bias. A misbehaving car poses more of a threat to his safety than motorcycles.

The new rules are common sense guidelines everyone I know who rides already observes. I don't know what highways he ventures on but I have never witnessed a motorcycle splitting a row of stopped cars going much faster than 39 mph.

Maybe he meant passing on the right. If so, he again, as in his last lane-splitting editorial, uses facts pertaining to the broader issue of motorcycle safety.

-- Chris Kephart, Orangevale



Sacramento Bee – 13 February 2013



LETTER TO THE EDITOR – SACRAMENTO BEE, 13 FEBRUARY 2013

Ohman missed the point about lane-splitting

That was a disgusting cartoon.

The article about lane splitting a few days ago was a great way to educate drivers and riders. But to jump to the conclusion that it would cause more accidents misses the whole point of the issue. Letting motorists know the facts could only lead to safer travel. Jack Ohman missed the point.

-- Gary Wheaton, Carmichael

LETTER TO THE EDITOR – SACRAMENTO BEE, 14 FEBRUARY 2013

If safety is the goal, focus on lane-splitting is misguided

I am disappointed with the editorial pursuit of motorcycle lane-splitting after the California Highway Patrol reaffirmed it as safe and legal when performed prudently.

The editorial notebook appears unsatisfied with the CHP review, skewing public opinion with rider death statistics as though they were related to lane-splitting, instead of factually as rider-fault, single vehicle accidents. Then, the intellectually insulting cartoon stated that if lane-splitting is OK in 2013, lane-jumping would be acceptable in 2014 and there would be freeway mayhem by 2015. If the agenda is reducing the increase in motorcyclist deaths in recent years, the focus should be on rider training. Instead, The Bee pursues, with bias, an issue of petty irritation to motorists.

-- Brian Davy, Lincoln

FRESNO BEE, 15 FEBRUARY 2013

CHP clarifies rules for motorcycles splitting lanes

Lane splitting is a maneuver that motorcyclists love but some car drivers loathe.

For the first time, the California Highway Patrol is issuing guidelines for the practice, which allows two-wheeled vehicles to share traffic lanes with cars and pass slower traffic under certain conditions.

Until recently, lane splitting -- sometimes called lane sharing -- was only a gray area in the state's vehicle code; the CHP acknowledged it only by saying it was legal if it was practiced in a "safe and prudent" manner.

Few, if any, other states allow it. And many drivers just plain don't like it: "It's dangerous and they shouldn't be doing it," Bob Smittcamp said last week at Fig Garden Village.

Now, the CHP's website document elaborates its do's and don'ts. The CHP discourages actions such as moving through stalled traffic at high speeds or lane splitting when traffic is moving at 30 mph or faster. Instead, motorcyclists are encouraged to keep their speed no more than 10 mph faster than the flow of traffic and be aware of the limitations of their motorcycle and themselves.

The guidelines are written for auto and truck drivers as well, reminding them of the legality and warning motorists not "to take it upon themselves to discourage motorcyclists from lane splitting." Drivers are also warned that block-

Continued on following page...



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ing a motorcyclist in "a way that could cause harm to the rider is illegal."

Anyone who has ever been caught in a traffic jam on the Bay Bridge or the I-5 in LA has witnessed the extremes of lane splitting, when some motorcycles roar past stalled traffic at speeds of 50 mph or more. It's that type of riding that the guidelines discourage. Fresno police motorcycle Sgt. Richard Tucker said there is not enough time for a motorcyclist to perceive and react to danger under those conditions. He also pointed out that officers can cite motorcyclists for unsafe riding.

Tucker said police motorcyclists use the maneuver but added that riders need to be aware of the risks.

"I think the exposure (to danger) depends on the individual. It's all about skill." Tucker is an avid motorcyclist who rides his own Harley-Davidson when not at work on his police BMW. He said the CHP guidelines "are really on point."

Some motorcyclists feel that lane splitting can be safer than sitting in the middle of a traffic lane because it greatly reduces the risk of a rear-end collision from an inattentive driver -- one of a rider's worst fears. Others point out that motorcycles are not built to idle for long periods of time in a traffic jam because the engines are more prone to overheating than automobiles -- especially during 100-degree summer days in the central San Joaquin Valley.

Motorcyclists asked about lane splitting seemed to agree on the "safe and prudent" points of the CHP guidelines. "I'm for it when it's safe," said T.J. Turner, who said some "crotch cycles," a reference to Japanese sport motorcycles, take it too far.

Bill Fulmer said he only splits to the front of traffic when cars are stopped, not when vehicles are moving. "If someone shifts lanes, you're done," he said.

It's also known to anger some automobile drivers. In a still-unsolved case of road rage in Fresno in September 2010, off-duty CHP Sgt. Lincoln McKenna was run down by the driver of a Toyota Tundra pickup after McKenna split to the front of a traffic lane on Herndon Avenue at Palm Avenue. He lost a leg in the collision. Despite a months-long effort by police to find the driver, he remains at large.

While not condoning acts of road rage, several Fresno-area drivers who were asked about the practice this week expressed frustration with lane splitters.

"I don't understand how it's possible for two vehicles to occupy the same lane," Chris Sander said. "It's dangerous."

Wilda Glenn said the noise of passing motorcyclists is irksome.

"I don't like it," she said. "They've scared me a number of times."

Editor's note: This article also contains a video from a helmet-cam of a motorcyclist lane-splitting in Fresno. Additionally the article contains a number of interesting responses on-line. See [full article](#).



A motorcyclist "splits" – or rides between –lanes during the afternoon commute Tuesday on Highway 99 in Sacramento, passing slower vehicles in a maneuver that's legal in California.



More stories on lane splitting:

[HELL FOR LEATHER MAGAZINE, 18 JANUARY 2013](#)

Flashback Friday: How to lane split

[Lane splitting](#) is the single best about riding motorcycles. There is something magical about being able to go wherever you want regardless of traffic conditions, getting there fast and without spending a ton of money on gas. If you lane split on your commute to and from work and save an hour per day, you'll get back over a week of your life every year. Would you rather sit in a car, being frustrated and wishing you were somewhere else, or cruise home stress-free on a motorcycle in 1/3 of the time? Here's how.

See [full article](#).

[VENTURA COUNTY STAR, 11 FEBRUARY 2013](#)

California officials release written guidelines on motorcycle lane-splitting

See [full article](#).

[ORANGE COUNTY REGISTER, 14 FEBRUARY 2013](#)

CHP has suggestions for safer lane-splitting

See [full article](#).

[NEWS 24/680, 23 FEBRUARY 2013](#)

Lane-splitting biker retaliates

See [full article](#).

Other resources on lane-splitting

[Motorcycle lane share study among California motorcyclists and drivers 2012 – Draft methodological and analysis report](#)

This report was published in May 2012 for The California Office of Traffic Safety and The Safe Transportation Research and Education Center—University of California, Berkeley

[NOLO – Motorcycle accidents: lane splitting](#)

This popular “law for all” Internet site weighs in on lane splitting, discussing who is at fault when an accident occurs when a motorcyclist is lane splitting.

[CHP lane splitting guidelines](#)

These guidelines were published “to dispel misinformation”, according to Todd Kovaletz, public information officer for the Santa Ana bureau of the CHP. “There are no new laws, simply clarification for what is already out there.”

[Quick guide](#)

[Expanded version](#)



TECHNICAL CORNER

PDOF calculation problem with arctangent function in a calculator

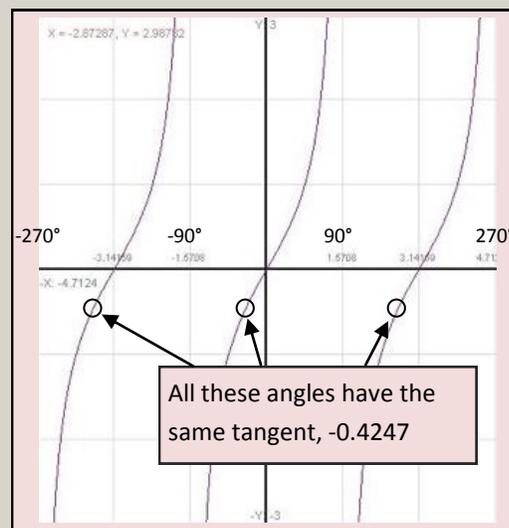
By Frank Owen, Alpha Omega Engineering, Inc., San Luis Obispo, California

During the Q1 CAARS training in Roseville a problem arose when calculating the principal direction of force (PDOF) in a collision. The direction of the impulse of V-2 on V-1 was calculated using the formula

$$v1\text{ PDOF} = \tan^{-1}\left(\frac{v1_f \sin \theta}{v1_f \cos \theta - v1_i}\right) = \tan^{-1}\left(\frac{14.8\text{ mph}}{-34.8\text{ mph}}\right) = \tan^{-1}(-0.4247)$$

This places θ between 90° and 180° , since the numerator is positive (the y part) and the denominator is negative (the x part). Yet when you calculate this result, you get $\theta = -23.04^\circ$. Why?

The problem lies in a curious characteristic of the tangent function and in how the arctangent ($\tan^{-1}()$) is programmed in most calculators and computer software. If you plot the tangent function over a large enough range of angles, you'll see that it repeats every 180° (see figure). The arctangent function is a request to the computer or calculator to deliver to you the angle whose tangent value you provide, in the above case -0.4247 . The problem is, there are more



than one angle with

this tangent. If you take $\tan(-23.04)$ you get -0.4247 . If you take $\tan(156.96)$ you get -0.4247 . So the programmers of the calculator or the computer software had to decide on an algorithm for $\tan^{-1}()$ to return one angle, even though there is more than one answer. What they've decided on for the most part seems to have been to stay on the middle branch of the tangent curve—i.e., to return angles between -90° and $+90^\circ$. If the true answer lies outside that range, you have to add or subtract 180° or a multiple of 180° to get the true angle.

So in the case in question, the reconstruction analyst needs to have a general idea of what the directions of all the vectors are. Then, having this awareness of the foibles of the arctangent function, you can adjust the result by $\pm 180^\circ$ to get the answer that is reasonable. Add 180° to -23.04° gives the correct answer, 156.96° , in this case.

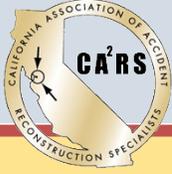


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Attachment: XYZAd.jpg

Meet the Member column

Editor's note: I would very much like to continue this column in future newsletter issues. This quarter, no one responded to my request to be the subject of it, however, a request sent out semi-randomly to about a dozen members. Any member who would be willing to tell his or her story about his/her involvement in accident reconstruction, please let me know at editor@ca2rs.com. I will help you put the article together. The membership will benefit by hearing the stories that others in the organization are willing to tell.