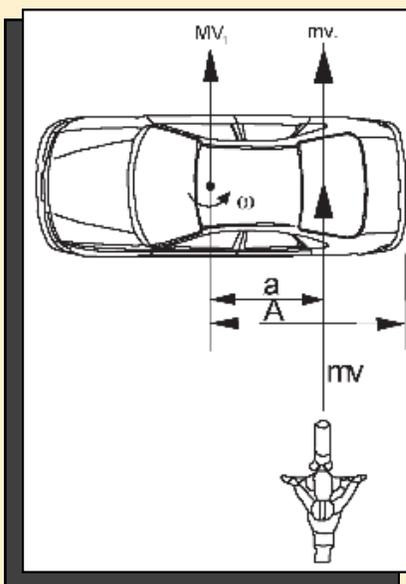


CALIFORNIA ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS

SKIDEMARKS

DECEMBER 2012 – VOLUME 14, NUMBER 4

Motorcycle Collision Reconstruction and Investigation – CAARS Annual Conference Report



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CAARS first quarter training

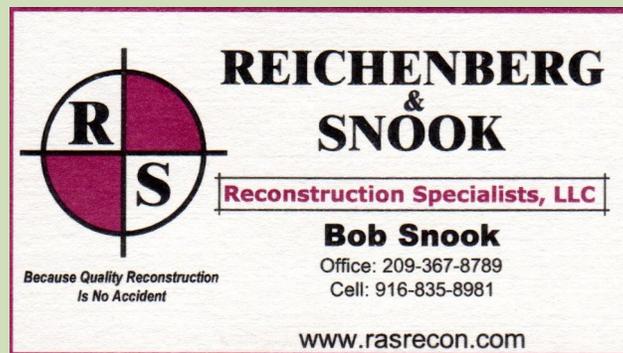
The 2013 first quarterly training is all set: Bob Snook and Dean Reichenberg (see below) will be presenting a momentum refresher. You may go to the Events page at www.ca2rs.com to register for the event. While you are on the website, update your profile. Also, some have not yet renewed their membership. That may also be done on the website.

Northern California

31 January 2013, 8 AM - 5 PM
Roseville Police Department
1051 Junction Blvd, Mark White Room
Roseville, CA 95678

Southern California

11 February 2013
Automobile Club of Southern California
16920 South Figueroa Street
Gardena, CA 90248



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Letter from the editor

Dear CAARS members,

This issue includes extensive coverage of the CAARS Annual Conference, which was held 1-3 November in South Lake Tahoe, California. There were many, varied presentations on motorcycle collision reconstruction and investigation. Judging by the sharply increased number of members attending, the organization is getting back on its feet after several lean years.

Also with this issue the “Meet the member” feature appears for the first time. This column is meant to have us all get to know each other better. I haven’t been a CAARS member all that long, so I try to meet members every chance I get at our training seminars and conferences. It’s been a regular happening that I start talking with someone and then find out that, here again, there is another interesting member to meet.



I asked fellow engineer Benn Karne if he would submit to being interviewed, and he agreed. He went over the top and provided me with a case study of an interesting car/bicycle crash case that he got involved with at some point in his accident reconstruction career. So he’s sort of set a gold standard here for the next “Meet the member” to try to follow. If you are interested and willing to be interviewed for this column, please let me know.

Also, as I’ve said again and again, this is not my newsletter; it’s the organization’s newsletter. So, as always, feedback is welcomed. It was very gratifying to me to hear a several members tell me at the annual conference that they read and like the newsletter. It’s hard for me to assess the newsletter without feedback. And with Benn writing up an interesting case study, it also occurred to me that others might have their own cases whose story they might be willing to tell. So even if you do not want to be met by the members, we can all benefit by sharing each others experiences. If you have an interesting story to tell, the rest of us would surely like to hear it. It shouldn’t be too long: 1½-2 pages total with pictures.

This issue has also lots of story descriptions and links to articles on driver-assistance systems and also, once again, driverless vehicles. Both are hot topics right now, and I’ve included links on these to articles I’ve come across in the German engineering press. Lots of interest, activity, research, and development in this area in Europe right now. Then I had promised an analysis of the auto/ped accident staged at the CAARS Q3 training seminar. It’s here too.

With all this to print, the newsletter has grown a couple of pages to 20. The Board of Directors recently decided to end the printing of the newsletter. So it doesn’t seem to me to be necessary to limit the size of it anymore. If there are good things to print, then let it grow.

Another big change discussed and approved at the annual conference was to put the newsletter up on the open web for the entire accident reconstruction community to see. I think this is a good idea, as it will increase the profile of the organization. This should also be increased incentive for members to advertise in the newsletter. Look at the new, on-line method for doing this on the last page. I welcome submissions of members’ ad copy.

Best wishes,

Frank Owen

editor@ca2rs.com

Conference Report

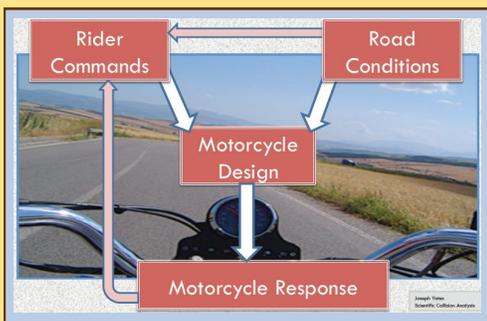
2012 CAARS Annual Conference, 1-3 November, South Lake Tahoe, California

Motorcycle Collision Reconstruction and Investigation

This year's annual conference took place 1-3 November at the Embassy Suites Hotel in South Lake Tahoe, California. The topic was Motorcycle Collision Investigation and Reconstruction. The conference featured several nationally known speakers in this field. Ninety-six memberships and three vendors were present, which is the best turnout since 2007. Several speakers made the trip from the East Coast, and because of the rampaging of Superstorm Sandy, it was not clear until the last minute whether or not they would be able to make it. In the end, though, all were able to come and present.

Speakers were Joseph Yates (Scientific Collision Analysis), Louis Peck (S.D. Lyons Automotive Forensics), Steve Guderian (Motorcycle Safety Consulting), Wade Bartlett (Mechanical Forensic Engineering Services), Jeff Muttart (Crash Safety Research Group), and Chris Kauderer (Kauderer & Associates).

Motorcycle Handling and Stability



Joe Yates got the conference going by laying down an introduction for understanding issues involved in motorcycle handling. He described first the rider/machine combination and how this system reacts with its driving environment. Motorcycle controls were presented. Joe then gave a long discussion about how a motorcycle and rider interact with the road, including rolling and reacting to various road conditions. Counter-steer to enter a turn was explained. The different types of motorcycles were presented. Joe then talked about instability and three handling problems: capsizing, wobble, and weave. He showed several interesting videos showing these phenomena. Two different crash modes were explained: 1) the "low-side" capsize, in which the

rider lays the motorcycle down when the rear wheel starts to slide out in a turn and 2) the "high-side" fall, where the rear wheel starts to slide but then the rider slows, so the rear wheel grips, the motorcycle comes up abruptly, and the driver is thrown up and often in front of the now sliding motorcycle. Tips when investigating a motorcycle accident scene were offered. Joe also talked a bit about trikes.

Motorcycle Inspection for Collision Reconstruction

The next speaker was Louis Peck, a young mechanical engineer from Massachusetts, who races motorcycles and is involved in motorcycle accident reconstruction with S.D. Lyons, Inc. He covered some basics too but then focused on what to look for when inspecting a motorcycle that had been involved in a crash. Louis discussed motorcycle VINs, shift pattern, gear position, tires (including skid and scuff markings), brakes (including ABS systems on bikes), the drive system, evidence of sliding, crush damage, and then general damage analysis. He also discussed the need to investigate recalls on accident bikes.



Motorcycle Sliding Friction

Louis then held a presentation on sliding friction of motorcycles that have been laid down. He started out with a video of a motorcycle that was laid down on a freeway and continued to slide a very long distance. He gave a history of the measurement of sliding friction, starting in the 1980s and continuing up until the present day. Another conference presenter, Wade Bartlett has been involved in measuring the friction factors of downed motorcycles since the early 2000s. Louis presented at length his current research,

Continued on following page...

which involves outfitting bikes at a Massachusetts race track with a small Qstarz GPS lap timer, which can track the motion of the motorcycle after it is laid down. He showed several examples of crashes, which had been recorded with an onboard video camera. He showed the accompanying speed history captured by the lap timer. There were several examples that were more complicated than just the motorcycle sliding on a single, flat surface. There was an example of a pavement/grass slide, for example, as well as an example that involved braking, sliding, flying through the air, and then sliding on grass. Drag factors measured were between 0.35 and 0.5.

Helmets

Steve Guderian then gave a short presentation on helmets. He explained that the test mandated by the Federal Motor Vehicle Safety Standard 218 for helmets consists of dropping a helmet only 4.5 feet to measure the result of such an impact. He pointed out that if he were to fall down on his Harley while sitting at a stop, he would exceed the severity of the test.



Crush Energy and Speed from Damage



Wade Bartlett (Mechanical Forensics, Rochester, NH) gave a presentation on crush damage, starting with a general introduction to crush analysis and then focusing specifically on motorcycle/car collisions. The standard collision is a motorcycle T-boning a car. Wade had analyzed a number of such crashes and talked about the inconsistency of results in such collisions. This is because different automobiles have different stiffnesses, and even on a single car, these vary, depending on where the car is hit. Motorcycle damage and stiffness in a crash were also covered. Often crush damage on a motorcycle is assessed by the change in the wheelbase of a bike in a crash. The trouble is that once the front wheel encounters the main body of the bike, the stiffness goes way up, and there is little crush after that.

Motorcycle Braking

Wade also made a presentation on motorcycle braking. Unlike automobiles, the motorcyclist normally has control over front vs. rear braking. This leads to more choices for the rider, and how this plays out in an emergency stopping situation was discussed. Wade also talked about ABS systems, linked/integrated braking, and combined braking systems, all of which have relatively recently appeared on motorcycles. He explained also skid mark evidence with motorcycles, given different braking scenarios.

Alternative Speed Technics

Bartlett then continued with a discussion of various principles of physics for determining collision speeds of vehicles involved in a crash, specifically when one is a motorcycle. The huge weight disparity of the motorcycle makes it particularly sensitive to slight changes in crash measurements. Wade discussed, with examples, Conservation of Linear Momentum, Conservation of Angular Momentum, and then discussed the different methodologies of a number of researchers.

Motorcycle Rider Research

Much of the second day of the conference was devoted to human factors in motorcycle riding and crashing. The presenter was Jeff Muttart of the Arabella Human Performance Lab at the University of Massachusetts in Amherst. And a good deal of the presentation involved testing done by several of the presenters together at a yet-to-be-built subdivision in Bullhead City, Arizona. Jeff used an eye tracker to monitor glance behavior when riding a motorcycle on a two-mile route on this subdivision's streets. Thirty-two riders were involved—young and old, male and female, experienced and novice riders. During the tests riders were presented with several emergency scenarios—full braking to a stop, obstacle avoidance, time to start braking—and the reactions of each rider were measured. Jeff presented the results. It was surprising to see how much time riders actually spend not looking at the road, even when there is little to see on the side of the road, as was the case in this desert setting. Jeff showed several videos with the eye tracking



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data superimposed on them to show where the rider was looking. He then talked about perception-response time in some detail. A left-turn accident scenario was presented along with the glance pattern associated with this for the motorcycle rider making the turn. Muttart later ran similar tests on a course on public streets in Massachusetts, a much more complex route than the Bullhead City route. He compared the results of these two completely different routes.

Motorcycle Sliding Friction Tests

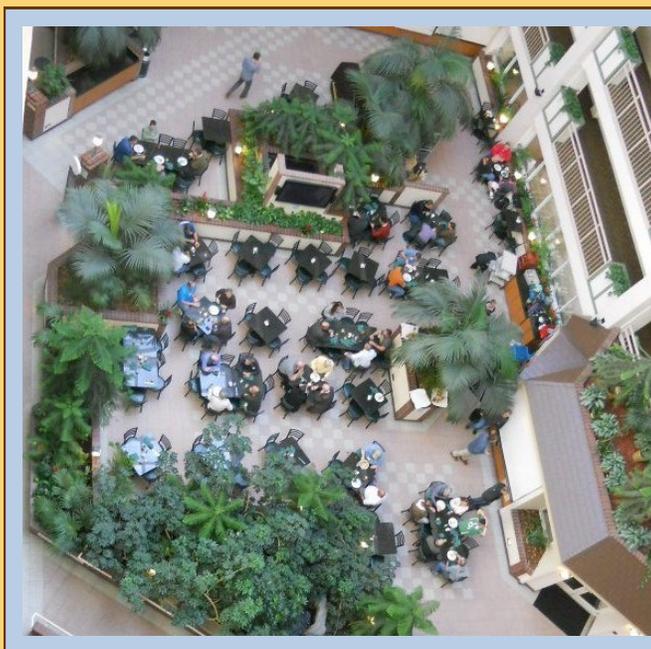
CAARS president Chris Kauderer presented results from slide tests to determine drag coefficients conducted near Sacramento. Motorcycles were donated by local junkyards. A drop rig was developed to release the motorcycle at speed after locking the front wheel against rotation. Chris showed a number of videos and presented the results of these tests. He also noted that he hopes to conduct more tests of this sort in the near future.

Lane Sharing

Steve Guderian gave a presentation on motorcycle lane sharing that was provocative. Lane sharing is the practice of motorcycle riders continuing up alongside cars in a traffic jam. Guderian claimed that this actually reduces accidents, since the biggest danger in a traffic jam on a freeway is that vehicles coming up from behind will slam into vehicles stopped at the back of the traffic jam. If motorcycle riders proceed on up through the traffic, then they will remove themselves from this danger. This logic elicited some skepticism and many questions. Steve talked about the law in California, where lane sharing is not outlawed, and compared the fatality statistics for motorcyclists in California with those statistics in a number of other southern states. They are lower in California, and Steve seemed to be making the argument that this was because of lane sharing. Someone pointed out that all the other states in Steve's comparison did not have helmet laws; perhaps that was the reason behind the difference in fatality statistics. Then Steve seemed to put into question the efficacy of helmet laws in reducing fatalities for motorcyclists. It was a lively discussion.

Conference Synopsis

In sum, the conference was a big success with many interesting presenters and presentations, with active participation by the membership in all sessions. The numbers were up from the most recent years with 99 attendees, up from the 60s last year.





CALIFORNIA ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS

General Meeting of the Membership

The annual meeting of the membership was held in South Lake Tahoe. Several actions were taken and several important changes in CAARS operation were explained to the members.

Chris Kauderer was re-elected Chairperson and Jahna Beard Vice Chair. Kevin Cassidy will continue as Membership Chairman. Also a new Liaison to the ACTAR Board was announced, Ken Heichman. The Board of Directors remains the same except that Bill Focha will replace David Heinbaugh, who is stepping down for personal reasons. These positions are listed in the box at the bottom of page 2 of this newsletter.



The new website (www.ca2rs.com) was explained to the members. We have moved the hosting of our website from the ARC Network to Wild Apricot, a service that specializes in hosting websites for non-profits. This was done to have greater control over the website and to make it more useful to the membership. The move, however, does not affect the relationship members have with the ARC Network. For instance members can still get a subscription to Collision magazine and the ARC Network at a discounted rate.

It was explained to members that they could choose their own privacy settings on the website to share or hide their personal info. There was some discussion of the Terms of Service agreement with Wild Apricot. There is a provision in the contract that Wild Apricot can sell the list of CAARS contacts to marketers. But it was then pointed out that Wild Apricot has never availed itself of this provision and that it's standard language in such Terms of Service contracts.

Mike Allison manages the new CA2RS Facebook site (<https://www.facebook.com/CA2RS?fref=ts> or from inside Facebook, search for "ca2rs"), and he gave a description of its use. It is intended primarily to mirror the website, so that members who have Facebook accounts can receive notifications of upcoming events via Facebook. If you look at the website, however, you will see that there are some other items there that might make it worth your while to get a Facebook account—like some review of the annual conference and a link to a horrifying YouTube video of crashes captured on dash cams in Russia.

I (Frank Owen) brought up the issue of putting the newsletter on the open web, i.e. not having it viewable only by members. I've been thinking about this for a while, and my rationale is that hiding it represents a big lost opportunity for CAARS in increasing the

Continued on following page...

Upcoming ACTAR Examination Dates and Locations

January 2013

25 January – Springfield, MO – See www.actar.com/test.html

February 2013

13 February – Orillia, Ontario, Canada – See www.actar.com/test.html

March 2013

4 March – Golden, CO, sponsor: CSP. New applications must be received by 4 January. Exam registration cut-off date is 4 February. Held at CSP Academy, 15055 S Golden Rd.

22 March – Natick, MA – See www.actar.com/test.html

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



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organization's profile in the accident reconstruction community nationwide and, indeed, internationally. I think it might also provide a bigger incentive to advertise in the newsletter, which means additional revenue for CA2RS and perhaps reduced costs for CA2RS-sponsored events. The Board was reluctant to do this with the reasoning that it's a benefit of membership, and if you don't pay the membership dues, you shouldn't have access to the newsletter. But after open discussion, it was moved, seconded, and approved unanimously to move the newsletter out to the open web.

Chris Kauderer also promised to do a better job of getting the BOD minutes written up and posted to the CAARS website.

Ken Heichman was introduced as the new CAARS ACTAR Liaison. The ACTAR BOD meets in the spring. It was announced that 18 CEUs would be offered for attendance at the annual conference.

CAARS NEW ACTAR LIAISON

Ken Heichman

From 1984 to 1987 I worked for the Santa Barbara Police Department as a patrol officer. I handled traffic collisions as part of my beat assignment and took an interest in the math and physics behind the collisions. I started taking classes in accident investigation and reconstruction and received my ACTAR long-term accreditation in 1992. I worked for the El Dorado County Sheriff's Office until 1996 and continue to work in the civil reconstruction field.

I got my feet wet last month, proctoring the ACTAR exam offered the day before the CAARS conference. I have not attended an ACTAR board meeting, but plan to attend the April 2013 meeting in Denver. I will know more about my liaison duties at that time and will report back to the members on the meeting details and what I will plan to do in the liaison position. I look forward to this position and hope to be a benefit to all the ACTAR accredited members.

In the news...

DANGEROUS LOS ANGELES

L.A. drivers have high rate of fatal pedestrian, cyclist crashes

Los Angeles isn't known as a city for walking. Maybe there is a good reason — it's too dangerous.

Drivers in Los Angeles kill pedestrians and bicyclists at a significantly higher rate than drivers nationally, according to a study by the University of Michigan Transportation Research Institute.

In Los Angeles, pedestrians accounted for about a third of all traffic fatalities, or nearly triple the national average of 11.4%. About 3% of the fatalities were bicyclists. That compares with 1.7% nationally.

"This is a matter of exposure," said Michael Sivak, a professor at the institute and a study coauthor along with Shan Bao. "When you look at large urban areas you have a wider mix of road users."

"You can look at the kinds of crashes in which the city is overrepresented and say that those are the areas that safety and traffic officials should pay more attention to," Sivak said.

About 20% of all trips in Los Angeles County are on foot or by bike, but less than 1%



An LAPD officer works at the scene of a fatal auto-versus-pedestrian accident on Beverly Boulevard in June 2011. Los Angeles drivers have high rate of fatal pedestrian accidents, according to a University of Michigan study. (Ricardo DeAratnha / Los Angeles Times)

Continued on following page...



In the news (continued)...

of transportation funding in the county goes to improvements for pedestrians and bicyclists, said Eric Bruins, planning and policy director for the Los Angeles County Bicycle Coalition.

"If we want to get serious about traffic safety, we need to get serious about funding equity so we can build infrastructure that allows people to walk and bike safely around their communities," he said. "Our current metrics value automobile throughput over traffic safety."

See [full article](#).

DANGEROUS LOS ANGELES, TAKE TWO

L.A. streets endanger bicyclists

A study from the University of Michigan Transportation Research Institute has caused a stir among local bike riders, revealing that 2.8 percent of fatal crash victims in Los Angeles are bicyclists - nearly double the percentage killed by cars nationally.



Stan's Monrovia breakfast ride group pedals a 25 mile ride from Monrovia to Alhambra on Friday morning, Oct. 12, 2012. (SGVN/ Staff photo by Watchara Phomicinda)

The study's high rate of bike crashes, combined with Gov. Jerry Brown's decision to veto a bill that would have required a three-foot buffer between cars and bikers, struck a nerve with many San Gabriel Valley cyclers who have experienced the risks first hand.

South Pasadena resident and retired neurosurgeon Bill Sherman said he was "sideswiped" by a car in South Pasadena last week while trying to make a left turn. This was his second crash, he said, and he's not surprised. "Drivers don't look for bikes and we almost are invisible," Sherman said. "I think when you talk to bike riders, everybody has had an accident or been threatened with an accident."

And Sherman isn't alone. Two bikers were injured in car collisions in La Canada Flintridge in September, a man on a bicycle was killed when a train hit him in Norwalk in September and a 70-year-old bicyclist was hit by a bus in Baldwin Park in August.

The latest incident was Monday in Inglewood, when Los Angeles County sheriff's deputies struck and killed a man on a bicycle they said they thought had a gun.

See [full article](#).

FORGET THROTTLE-BY-WIRE

Nissan to introduce steer-by-wire in 2013 Infiniti

In the next 12 months, Infiniti, a Nissan brand, will deliver steer-by-wire cars; cars that employ an electronic, not mechanical, connection between the steering wheel and the front wheels. There will also be a camera-based straight-line stability system to help keep the car dead-center in the lane, effectively the next step in lane departure warning and lane keep assist. The Infinitis will have backup mechanical steering to avoid steer-into-ditch moments should steer-by-wire go haywire. Infiniti says the system allows for faster driver inputs and better road surface feedback, although it also says the system "insulates the vehicle from unnecessary road-generated disturbances." That terminology may give pause to serious drivers who don't like the lack of road feel from some current power steering systems.

See [full article](#).

In the news (continued)...

EDITORIAL FROM THE CHICAGO SUN-TIMES



New driver Brandi Eadie, 16, looks down at her cellphone to read a text message as she drives through a rubber-cone course in Seattle in January 2010 to demonstrate the dangers of using a phone while driving. | AP file photo

Texting and driving: dumb and dumber

Nearly everyone knows it's dumb. Nearly everyone knows it's dangerous.

And most of us probably know it's illegal in Illinois.

Yet, we continue to text and drive.

More reminders every day, and in every way possible, are clearly in order.

Last Wednesday was one of those days. As part of a national initiative spearheaded by AT&T, Gov. Pat Quinn and Secretary of State Jesse White urged Illinois drivers to take a pledge to never text and drive again. AT&T, as part of its "It Can Wait" campaign, also enlisted Chicago Bulls player Derrick Rose to star in a public service announcement.

It's just the latest effort to try to snap us out of cellphone-induced haze. Public agencies in Illinois have been at this a while already, ticketing law-breakers, posting reminders on electronic highway signs, and even posting the number of highway deaths. That tally, of course, is regularly updated.

What other reminder could we possibly need?

LETTER TO EDITOR FROM CHICAGO TRIBUNE

(Editor: An editorial in the Chicago Tribune elicited this response. Unfortunately this editorial is no longer available on-line.)

The Sept. 26 editorial "6 letters; Texting and driving? Stop it" again discusses the dangers of distracted driving. According to the U.S. Department of Transportation, 5,474 people were killed on U.S. roadways and an estimated 448,000 were injured in motor vehicle crashes that involved distracted driving in 2009. The agency says there are three main types of distraction: taking your eyes off the road, taking your hands off the wheel and taking your mind off what you're doing. Texting is the most problematic because it combines all three distractions simultaneously. We must adopt a no-tolerance attitude on this issue.

— Dr. Charles Nozicka, medical director, Pediatric Emergency Medicine, Advocate Condell Medical Center, clinical associate professor of emergency medicine, Rosalind Franklin University, Libertyville



Chicago Tribune

BUT THEN THERE'S TECHNOLOGY TO FIGHT TECHNOLOGY

Can't stop texting and driving? These apps can help

Texting and driving?

It's against the law in 39 states — including California — but that hasn't stopped many of us from reaching for the phone while we're on the road. About 100,000 people are texting and driving at any given moment, according to a study by the National Highway Traffic Safety Administration. And more than 1 million accidents this year have been caused by distracted drivers, many of them while texting.

Still, the chime of a new text message is enticing and the urge to look at it is almost Pavlovian.

See [full article](#).



In the news (continued)...

NYC tried to bill dead man for damage to police car that killed him

Late last month, Laverne Dobbinson received a letter, addressed to her son, from a law firm notifying him that it had been retained by the City of New York to collect money for damages to a police car.

If the letter, which demanded that he pay \$710 within 10 days, was pro forma, the circumstances surrounding how the damage occurred were most certainly not.

The police car was damaged after a chase that ended when it collided with Ms. Dobbinson's son, Tamon Robinson, denting the front of the car and killing him.

See [full article](#).

New driver-assistance technology

MANDATORY SAFETY TECHNOLOGY

NTSB urges safety technologies be made standard

The government should require automakers to make the latest collision-prevention technologies standard equipment on all new cars and trucks, a move that could reduce fatal highway accidents by more than half, federal accident investigators said Wednesday.

The technologies include lane-departure warning, forward-collision warning, adaptive cruise control, automatic braking, and electronic stability control. They are available on many vehicles already, although some are limited primarily to higher-end models. The National Transportation Safety Board said they should be required on all vehicles, despite the auto industry's concern that doing so could add thousands of dollars to the cost of a car.

See [full article](#).

FROM THE L.A. TIMES

Computerized brakes saved thousands of lives

The National Highway and Traffic Safety Administration is considering requiring new models of buses and large commercial trucks to have computerized braking systems after a study released Friday showed such technology has saved thousands of lives in smaller vehicles.

The electronic stability control braking systems help drivers maintain control when their rear tires begin to spin out or when their front wheels start to lock and the motorists can't steer. The braking systems apparently prevent many motorists from driving off the road.

The report, which studied crashes from 2008 to 2010, estimates that more than 2,200 drivers were saved from fatal accidents.

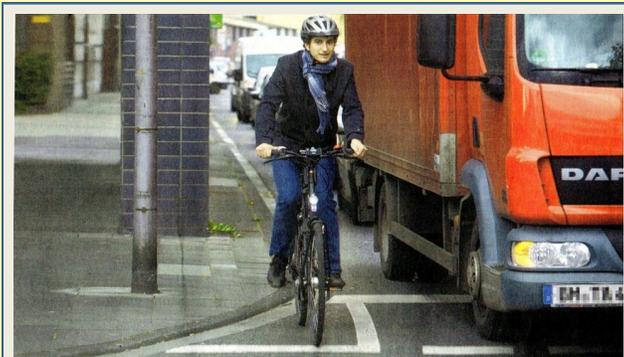
"These numbers send a clear message about the technology's life-saving potential," U.S. Department of Transportation Secretary Ray LaHood said in a news statement.

See [full article](#).

New driver-assistance technology (continued)...

DRIVER-ASSISTANCE TECHNOLOGY FROM GERMANY

Truck right-turn assistant can save lives



Dangerous situation: Right-turning trucks represent one of the most accident-prone situations for collisions with bicyclists and pedestrians. (Photo: VDI Nachrichten)

AUTOMOTIVE ELECTRONICS: *Over 50 bicyclists and pedestrians in Germany lose their lives each year in collisions with right-turning trucks. This is reason that auto and automotive manufacturers have for a long time worked on electronic assistants. The technology is there, but up to now, there is no such assistant in series vehicles. The buyers of big trucks are reluctant to accept the higher costs.*

The 47-year-old bicyclist was doing everything right as she was under way the 24th of May 2012 in Mindelheim. In spite of this she was the victim of a severe accident: she rode straight ahead, but a delivery truck wanted to turn right, and the driver didn't see her. In the collision she fell under the wheels and was run

over. Luckily the truck caught her "only" in the legs. With severe injuries she had to be flown by helicopter to a hospital.

She survived the accident—in contrast to 50 other cyclists annually in Germany. For them this confrontation ends fatally. Right-turning trucks represent one of the most dangerous accident situations for cyclists and pedestrians on the one hand and for trucks on the other.

See [full article](#).

PEDESTRIAN PROTECTION FROM SWEDEN

Pedestrians should in the future come out better in traffic accidents

AUTOMOBILE: *The safety of pedestrians is being taken ever more seriously by automobile manufacturers. Diverse component manufacturers are working on solutions that will in the future better protect the weaker participants in traffic circulation. The leader in this is Swedish manufacturer Volvo with its special external airbag.*

The automobile industry has worked for decades on the active and passive safety of their cars. For some time now, however, criticism has increased over the fact that a vehicle's passengers are well protected, yet little has been done to protect other participants in traffic circulation. Particularly pedestrians and two-wheeled vehicle drivers are protected too little. In 2011 15% of traffic fatalities in Germany were pedestrians.

See [full article](#).



Protection for the head: In Volvo's crash-test center in Gothenburg the results of a auto/ped crash is clear. The head of the pedestrian is protected with an external airbag that is fired by sensors on the front of the vehicle. Severe injuries then are limited to the legs. (Photo: Volvo)

New driver assistance technology (continued)...

.MORE TRUCK DRIVER ASSISTANCE SYSTEMS FROM GERMANY

Driver assistants climb into the truck cab

Without them there is hardly an automobile on the street: The electronic passenger, who supports the driver in emergency situations and helps make driving more relaxed. Assistance systems in every imaginable form populate in great numbers the options lists. Ever more often manufacturers of trucks and delivery vehicles entice buyers with electronic helpers—from emergency braking systems to emergency swerving systems. Up through yesterday manufacturers and component manufacturers exhibited at the largest worldwide trade show in Hannover (the IAA show for heavy vehicles) what they have to offer for mobility, transport, and logistics.

It's not just in well-equipped automobiles that ever more often the electronics grabs the driver under the shoulders. Also in the cabs of big trucks and delivery vehicles one finds ever more often such assistants. But the motivation to put this technology in trucks and delivery vans is different from that for chic private cars.

A common motivation for the acceptance of driver-assistance systems is safety: All want to arrive safely at their destination, the private driver as much as the captain of the land ship.

Also, driver assistance that implements a fuel-saving driving style is desired in both driving regimes. But with big trucks and smaller delivery trucks and vans, there is a good deal more pressure to drive economically. "There are above all three motives for adding driver-assistance systems to big trucks," says an expert in truck transport. "They are efficiency, efficiency, and once again efficiency."

See [full story](#).

Driverless cars: new developments

AUTONOMOUS CARS COMING TO CALIFORNIA ROADS

Brown signs bill regulating self-driving cars in California

Gov. Jerry Brown signed a bill that would allow self-driving cars on California's roads.

Brown signed the bill Tuesday at a ceremony at Google's headquarters in Mountain View, Calif.

"We are looking at science fiction becoming reality in a self-driving car," Brown said.

Tech giant Google Inc., Caltech and other organizations have been working to develop such vehicles, which use radar, video cameras and lasers to navigate roads and stay safe in traffic without human assistance. Google has said computer-controlled cars should eventually drive more safely than humans.

"These vehicles have the potential to avoid accidents.... We can save lives, create jobs and reduce congestion," said Google co-founder Sergey Brin. "I expect that self-driving cars will be far safer than human-driven cars."

Brin said autonomous cars could be functional and safe for operation on public streets within a handful of years.

See [full story](#).



The "Google car". (Photo: Google)



Driverless cars: new developments (continued)...

ASSISTED-DRIVING TECHNOLOGY

With driverless cars, Volvo seeks injury-free cars by 2020

It's a Titanic-like claim (you know, the "unsinkable ship"), but one that, if it comes true, could have major safety implications for drivers.

Volvo believes that with the driverless car technology it's developing, we could see virtually zero car deaths, at least in cars with the technology, *The Wall Street Journal* reports:

The 85-year-old company believes it can produce an accident free vehicle in just seven years. "Our vision is that no one is killed or injured in a new Volvo by 2020," said Anders Eugensson, Volvo's head of government affairs. [...]

See [full story](#).

NHTSA HEAD DISCUSSES DRIVERLESS CARS

Government to examine technology for automated cars

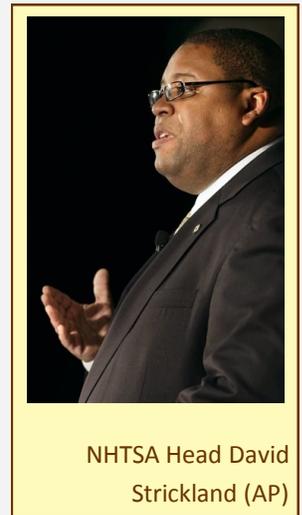
As Google has worked on a fully self-driving car, some automakers have already employed autonomous safety features that are reducing crashes

Having a hard time parallel parking? Press a button on a touch screen and let the car park itself.

Want to stay a safe distance from the car ahead while traveling 65 mph? Switch on adaptive cruise control and let a radar-linked computer handle the accelerator, slowing and speeding your vehicle to keep pace.

The assisted-driving technologies that just a few years ago seemed so futuristic are already here, bringing the auto industry one step closer to a George Jetson-like world where drivers may no longer have to drive.

See [full story](#).



NHTSA Head David Strickland (AP)

SWARMS OF CARS

Toyota tests cars that communicate with each other

SUSONO, Japan - Toyota Motor Corp. is testing car safety systems that allow vehicles to communicate with each other and with the roads they are on in a just completed facility in Japan the size of three baseball stadiums.

The cars at the Intelligent Transport System site receive information from sensors and transmitters installed on the streets to minimize the risk of accidents in situations such as missing a red traffic light, cars advancing from blind spots and pedestrians crossing the street. The system also tests cars that transmit such information to each other.

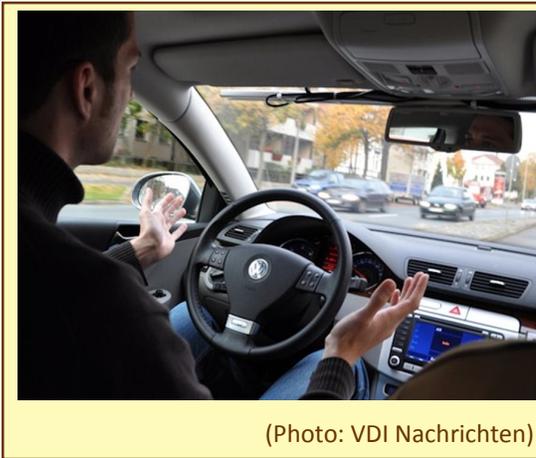
The 3.5 hectare test site looks much like the artificial roads at driving schools, except bigger, and is in a corner of the Japanese automaker's technology center near Mount Fuji in Shizuoka Prefecture, central Japan.

See [full story](#).



Toyota Lexus LS stops automatically in front of a dummy. (Photo: AP)

Driverless cars: new developments (continued)...



(Photo: VDI Nachrichten)

THE GERMANS ARE WORKING ON THIS TOO

Please switch to autopilot!

Futurama: It's not just at Google but also in the German automobile industry there is an intensive effort under way to introduce autonomous driving. The way forward is plastered with technical and legal hurdles. But in traffic jams one day soon, a driver will be able to activate the autopilot.

Historians of technical history will one day fight about when the automobile truly lived up to its name. A self-driving car is a thing of the present, if what is meant by that is that one doesn't have to get out and push it. But the way to a fully automatic automobile, that is one that drives itself, is being taken by the automobile industry in only tentative steps.

See [full story](#).

Impaired driving

DRUGS TRUMP ALCOHOL

More Californians driving high than drunk on weekends, study says

California officials are warning against "drugged driving" after a statewide survey found drugs that can affect driving in one of every seven weekend nighttime motorists -- nearly twice the number of those with alcohol in their system.

The survey results, announced Monday by the California Office of Traffic Safety, found that 14% of drivers surveyed tested positive for driving under the influence of impairing drugs -- both illegal and prescription -- while 7.3% of drivers tested positive for driving with alcohol in their system.

"These results reinforce our belief that driving after consuming potentially impairing drugs is a serious and growing problem," Christopher J. Murphy, director of the Office of Traffic Safety, said in a statement.

See [full story](#).



(Photo: L.A. Times)

DROWSY DRIVING

Push to prosecute drowsy driving may hinge on its definition

Roadside signs around the country have long warned drivers not to doze off behind the wheel with gentle catchphrases like "You Snooze, You Lose" and "Drive Alert, Arrive Alive."

Now the campaign against so-called drowsy driving is moving to the courtroom, with law enforcement officials increasingly pushing to hold sleepy drivers criminally accountable when they cause fatal crashes.

In the most high-profile case to date, Bronx jurors have been wrestling this week with a difficult and subjective question: just how tired is too tired to drive?

See [full story](#).



CALIFORNIA ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS

MEET THE MEMBER

Benn Karne

(Editor: This month we inaugurate this new column, whose main purpose is to have CAARS members get to know each other better. If you want to be featured in a future newsletter, please write me at editor@ca2rs.com.)

CAARS editor: How long have you been a CAARS member?

I believe I first joined CAARS in 1999, shortly after completing Rudy Degger's Advanced Accident Reconstruction class. I had the sense that I was the first non-police officer to take these POST courses--most of us engineer types in AR work typically went to the SAE or NUTI (Northwestern University) courses.

CAARS editor: How long have you been involved in accident reconstruction?

I took on my first AR case in the early 1990's. I had been working on my own as an engineering consultant for several years, mostly in the bio-tech field with automated chemistry machines, but also a range of design and development projects from ophthalmic surgery equipment to heavy industrial process lines. I even worked as a licensed contractor for awhile before devoting my main efforts to reconstruction work in the early 2000s.

CAARS editor: In the wide variety of specialties that comprise the science of accident reconstruction, where do you think your strong points are?

I've been a gearhead since before I was a teenager (and that was indeed a long time ago). When I was in elementary school my dad bought an old Model A pickup. By the time I was 14 I had successfully converted it from the old "hope-and-pray" all-mechanical brakes to hydraulic brakes. Because of similar experience with virtually every mechanical component on various cars, I am in demand in particular for mechanical inspections of light vehicles, and teach a half-day course on Mechanics for Accident Reconstructionists. I've also welcomed the chance to work on unusual problems that have included determining whether non-contact road-rage incidents occurred as claimed, assessing the steering/tracking characteristics of tourist trams, and investigating whether a design defect or assembly fault was responsible for a patio chair collapse.

CAARS editor: Are you involved in other related activities not strictly within accident reconstruction (forensic engineering, other legal or police activities, for example)?

Before the kids and mortgage came along, I roadraced a Corvette, and one year garnered an invitation to the SCCA national runoffs. I still occasionally autocross an old street-legal 'vette at Bay Area venues. I've witnessed the 24 hours of Le Mans and am the co-producer of an award-winning documentary about the hundreds of amateurs who work all year to run their unique creations at Speed Week on the Bonneville Salt Flats (www.BonnevilleWideOpen.com). My son and I are rebuilding an old BMW roller-crank motorcycle.



CAARS editor: Do you have any special stories to relate in your activities as an accident reconstructionist that might interest the membership? These might not just be cases you've worked on but might include also surprising things you've learned in the practice of accident reconstruction or something you encountered along the way to becoming an accident reconstructionist.

Continued on following page...



CALIFORNIA ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS

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The more I've learned, the more ignorant I feel because I also know more about the potential for nuances and interpretation that take yet more wisdom and understanding to fully comprehend. One of the big lessons of my AR work has been to keep an open mind. Many times I've thought one thing about an incident (especially after talking to an attorney and before seeing the evidence!) and concluded something quite different. The more physical evidence the better--humans have many good features, but a video-graphic memory with built-in speed calculator is not usually one of them. Of course, even physical evidence can be misinterpreted (see sidebar article "A case study in misinterpreted evidence").

CAARS editor: How has accident reconstruction impacted your everyday life? Do you drive slower than you would, were you not an accident reconstructionist, for example? Do you no longer ride motorcycles or bicycles, for example? Do you wear a helmet when you ride a bicycle, for example?

The main influence on my driving has been to increase "the gap" in front of me, and generally to drive more defensively. I've pretty much limited any driving at 10/10ths to autocrosses (and I prefer to have a full cage around me when driving hard). I often find myself adjusting the headrests in other's cars and admonishing people about wearing seatbelts too high, etc. Good coroners' photos will make you a believer in the proper use of safety equipment.

CAARS editor: What other activities are you involved in outside of accident reconstruction?

I'm a strong believer in travel, and I'm not waiting for retirement. My wife and I have crisscrossed most of North America on extended driving trips as well as much of Europe. This last summer we went on a fantastic photo safari in Tanzania, seeing dozens of amazing animals in their native habitat, as well as getting a sense of how many of the world's people get by on a dollar a day. Amongst cosmic phenomena, I've been blessed to witness three beautiful total solar eclipses in the U.S., Baja California, and Hungary, and am hoping to check out the Aurora Borealis in the next year or two. In Oakland I moderate our neighborhood listserv and am fortunate to have most of my extended family close by.



CAARS editor: Is there something you would like CA2RS to

do in the future that it is not doing now? Suggestions for improving the organization.

CAARS has sponsored a lot of wonderful training over the years. I'd like to see more investigation of specific AR problems, such as comparing ped throw distances with and without braking, and comparing crush coefficients at various speeds for the exact same car model.

(Editor's note: For more, see Benn's AR website at www.KarneEngineering.com.)

ANALYSIS BY BENN KARNE

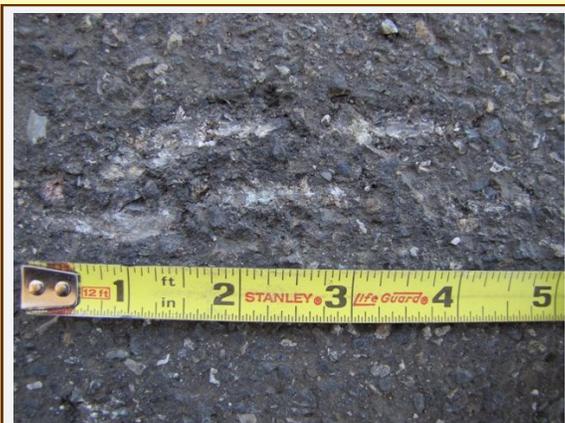
A case study in misinterpreted evidence

At dusk an elderly driver had rear-ended and killed a bicyclist on a two-lane freeway frontage road. The driver was being charged with manslaughter, largely based on roadway "evidence" that showed the bicyclist had been hit on the marked shoulder, and not in the driving lane. A pair of rather deep grooves in the shoulder were purported to be from

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where the bike rear rim had been loaded at impact and dug into the pavement. Further, the TCR diagram had been drawn to show a curve before the POI to help “explain” how the driver had gone off the road and struck the bicyclist.



Roadway gouges incorrectly attributed to car/bike collision.

But the location and length of the skid marks (which were straight and well in the driving lane), the bicyclist throw distance (which correlated almost exactly with the speed-from-skid I calculated), the locations of the helmet visor and other light-weight parts (likely near the POI), the actual road configuration (curve after the POI), and all parts of the totally fragmented aluminum rim (none of which had abrasions on the perimeter) pointed to the driver being well within his lane, driving at the speed limit, and far downstream of the supposed “rim grooves” in the shoulder pavement.

The grooves in the pavement were almost certainly from unrelated heavy equipment; indeed I tested a heavily loaded rim (one corner of a car’s weight fully on it)

against pavement and could not achieve any significant pavement grooves (see photos). Because the DA’s case was so tied to what I considered a discredited assessment, I was very surprised they pursued it to trial.

Now the analysis for me became one of “why didn’t the driver see the cyclist?” rather than driving carelessly out of his lane. Unfortunately, there was insufficient funding to perform testing with exemplar vehicles under similar dusk lighting and traffic conditions, but those conditions were certainly a reasonable explanation for why the driver did not see the bicyclist. There was ample reason to believe that the adjacent highway at rush-hour provided additional visual noise to obscure the bicyclist. Indeed the driver



Exemplar rim mounted onto car tire for loaded drag/abrasion test.

said he saw the bicyclist’s rear light, but didn’t recognize what or where it was until it was too late. As human factors and visibility expert Jeff Muttart will be glad to tell you, “seeing is not perceiving.”

I was totally successful in convincing the jury that the grooves in the pavement were unrelated, and that the driver was operating the vehicle in his lane at the speed limit. BUT, the

jury concocted their own theory that a rear-view-hanging handicap placard blocked his view (it didn’t), and that he was thus responsible for driving with an obscured field of view. And so he was convicted, based on a theory that neither prosecution nor defense had, as far as I know, even mentioned. Another lesson learned: “The outcome of litigation is always uncertain.”



Rim segment outer edges lacking abrasion.



Gouges made by bike rim on test car.



TECHNICAL CORNER

Vehicle/Pedestrian collisions—analysis of CAARS Q3 auto/ped case

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

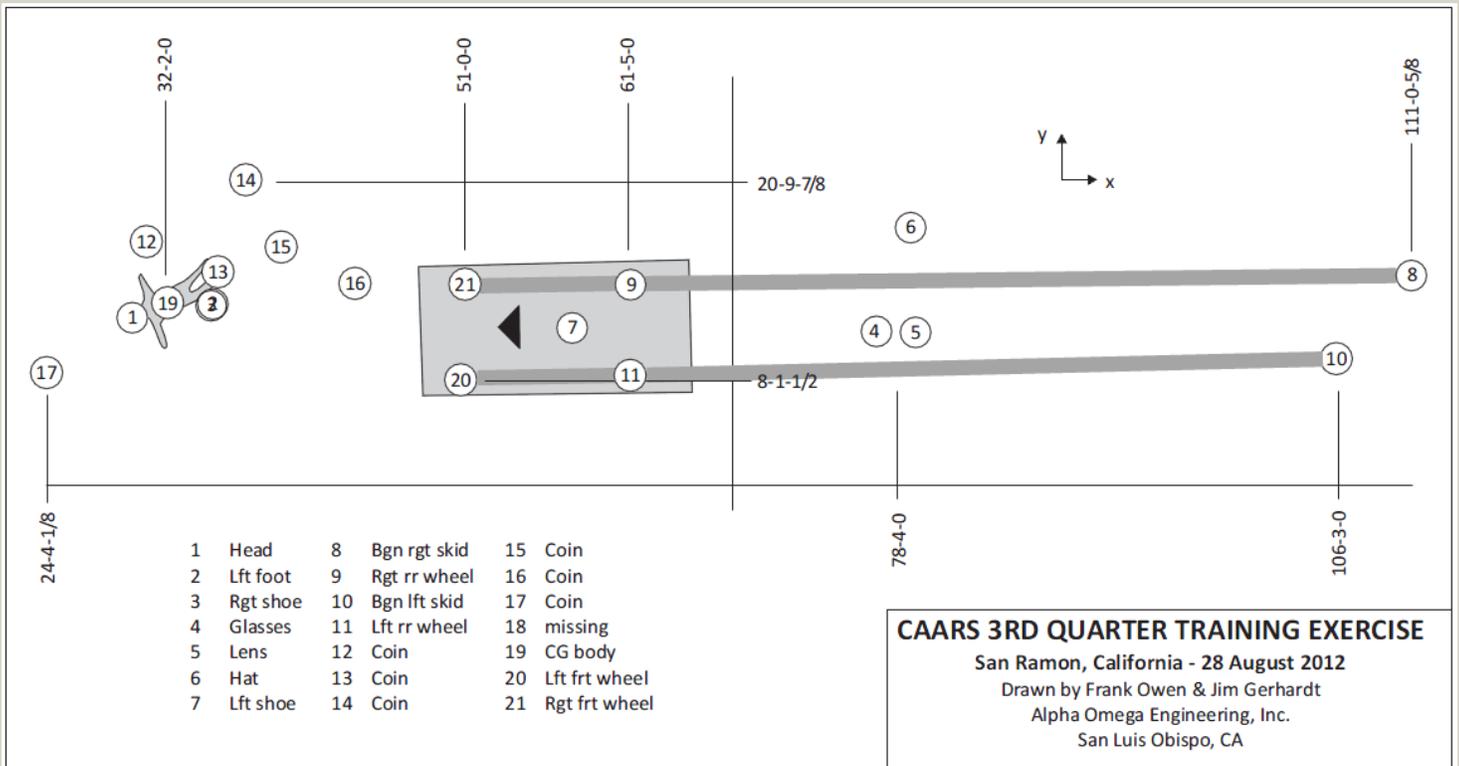
CAARS's third quarter training was written up in the last newsletter. It took place in San Ramon on 28 September and 30 September in Orange. My partner, Jim Gerhardt, and I measured and documented the crash scene in Northern California and analyzed that crash. Our full analysis can be found at my [Alpha Omega Engineering website](#). A synopsis follows.

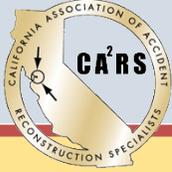
Our results vary in a small degree from those reported at the conference, but not by any substantial amount. We used a drag factor of 0.7, which was what was measured in skid tests at the accident scene. From skid marks on the scene, the bullet vehicle skid about 60 ft to a stop. Using the skid-to-stop formula, the speed at the start of the skid was 35.5 mph. The point of impact with the pedestrian was taken to be roughly in the middle of the debris field consisting of a hat, glasses, and a single eyeglass lens at about 78 ft in the coordinate system set up for the scene. Thus the car skid about 31 ft prior to impact and 29 ft after impact. Using, again the skid-to-stop formula, this gives an impact speed of about 25 mph.

To confirm this, impact speed was also calculated using pedestrian throw distance. Here, as Rudy Degger said at the seminar, there are a number of suggested formulae to apply. We used the new Intech formula, the new Intech wrap formula, the Searle max/min estimations, and a hybrid wrap model in Brach & Brach, then took the average. They gave respectively, 25.7, 27.6, 28.33, and 28.7 mph, all of which compare reasonably well with the skid-to-stop formula. Including the skid-to-stop result and taking the average, we came up with a collision speed of 27.0 mph.

Further analysis, assuming a nominal reaction time of 1 second and a latent braking phase of 0.2 seconds gives a speed -at-perception time of 37.0 mph. The maximum speed that the car could have had at the time of perception of the

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CALIFORNIA ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS

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Your ad will reach the general, accident-reconstruction public. Our publication is posted on-line at the CAARS website, accessible by all. Submitting an ad is a two-step process.

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1. Make payment to CAARS Treasurer, 4627 Ferme Place, Suite 100, Davis, CA 95618.

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Sample email

To: editor@ca2rs.com

CC: treasurer@ca2rs.com

Subject: CA2RS newsletter ad for XYZ Accident Reconstruction Experts, Inc.

Please run my ad in the CAARS newsletter as follows:

Size: Half page

Number of issues: 4

Start date: March 2015

Please note that I have attached my ad copy to fit the ad space and that I have made payment to the CAARS treasurer.

Attachment: XYZAd.jpg

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pedestrian and still have avoided the collision was just 10.0 mph. So the jerk shouldn't have been going 37 mph in a parking lot. The car travelled 90.3 ft after perception before hitting the pedestrian. If the pedestrian was walking at 2.5 mph perpendicular to the car trajectory, he would have covered about 13 ft from the time of perception of the driver to the point of impact.

