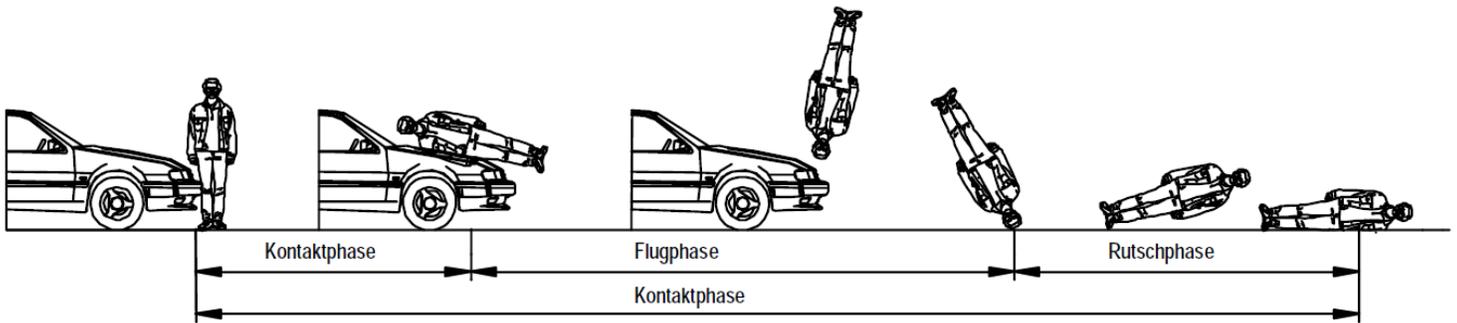


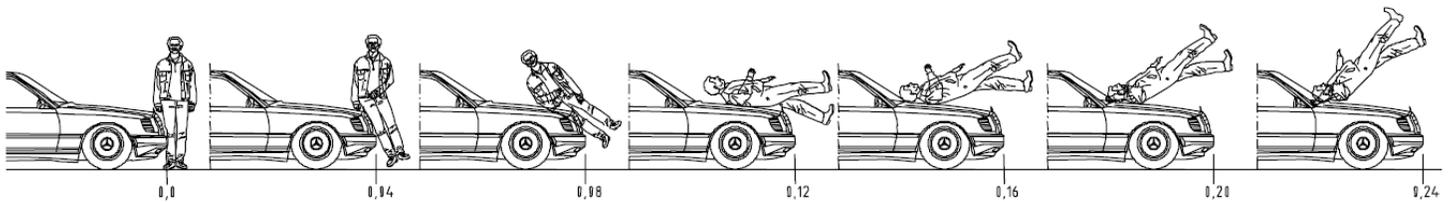
CALIFORNIA ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS

SKIDEMARKS

SEPTEMBER 2012 – VOLUME 14, NUMBER 3



Vehicle/Pedestrian Collisions



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CALIFORNIA ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS

THE BOARD BEAT

Dear CAARS members,

We on the CAARS Board of Directors are happy and excited to offer new resources to the membership.

NEW WEBSITE

The Board of Directors of the California Association of Accident Reconstruction Specialists is pleased to announce the re-launch of the CA2RS Website at <http://www.ca2rs.com>. We expect this redesigned website will enhance communication within the organization with more timely information and increased efficiency.

New Features

Blog – This feature will allow us to publish articles, news and information of importance to the membership. The blog is in the secure, members-only area of the site.

Forum – Members can create topics of interest to the membership that allow ongoing discussion. This is also in the secure, members-only area of the site.

Online Applications and Renewals – Pay your fees online through a PayPal secured website. Membership is renewed annually, automatically, with email notifications of pending and completed renewals. No surprises.

Member Profiles – Login using your email address and your old password. If you can't remember your password, you can request a new password immediately. Each member has a profile that is completely under his/her control. Only members can see other member information. Each member can choose to completely hide their information or decide to share all of it. Each profile includes a member photo and an individual photo gallery. Default privacy settings are the same as the previous website.

Events - Special event and quarterly training information is as close as the click of a mouse. You will be able to RSVP right at the website. Guests can pay their attendance fees as well. Training materials for quarterly training sessions will also be posted here.

We hope you will login today and check it all out. While you are there, make sure your profile, contact information and email are up-to-date.

FACEBOOK

Parallel to the website CAARS has set up a Facebook site. To get to it, go to Facebook and simply search for "California Association of Accident Reconstruction Specialists". If you just search for "CAARS", you will get all sort of distracting hits that are not connected with CAARS as we know it. This group does not have "friends" in the conventional Facebook sense. The Facebook site just mirrors the website and thus is just for the convenience of CAARS members with Facebook accounts.

CAARS BOARD OF DIRECTORS ELECTIONS

There are three positions open on the Board. Standing for election to these positions are Chris Kauderer (re-election to President), Sean Shimada, and Bill Focha. See the following page for bios for these three candidates. The election will take place at the CAARS annual conference in South Lake Tahoe, 1-3 November.

MEMBERSHIP RENEWAL

It is now possible to renew your membership on-line.

There may be some growing pains associated with the modernization of our communication channels. Please don't hesitate to contact the Board if you have problems with the new system.

Thank you,

The CAARS Board of Directors

CAARS CONTACTS

CHAIRPERSON

Chris Kauderer

chairperson@ca2rs.com

VICE CHAIR

Jahna Beard

vice-chair@ca2rs.com

TREASURER

Nichole Hanley

treasurer@ca2rs.com

MEMBERSHIP

Kevin Cassidy

membership@ca2rs.com

LIAISON TO ACTAR

Jincy Pace

actar@ca2rs.com

NEWSLETTER

Frank Owen

editor@ca2rs.com

CAARS DIRECTORS

Mike Allison

David Cameron

John Crews

David Heinbaugh

Sean Shimada



CALIFORNIA ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS

My name is Chris Kauderer and I am hoping to be re-elected as Chairman of the CAARS Board of Directors.

I have been a member of CAARS since 1999 and have served on the Board of Directors for many years as Director-at-Large, Vice-Chairman, and during the past 2 years as Chairman. I have watched the organization grow from a small group to our current membership of over 300. Certainly there have been growing pains along the way. During these past 2 years there has been quite a few changes within the CAARS Organization. We have a new Treasurer, a new Newsletter Editor, a New Liaison to the ACTAR BOD. We released a new website which provides many new features including on-line registration. Throughout all of the change, I believe the Organization has stayed true to its main mission, or objective, which is to provide quality training in the field of Accident Investigation and Reconstruction.

I am proud of where the CAARS Organization stands today. There are still some improvements that I believe can be made. Hopefully, we can get those accomplished in the near future. I realize it is impossible to keep all 300+ members of the Organization happy with each and every decision the CAARS BOD makes. However, if re-elected as Chairman, I promise to lead the Organization in a direction which I believe is in the best interest of the Organization as we move forward.



Chris Kauderer



Sean Shimada received his BS degree from the College of Letters & Science with an emphasis in biomechanics from the UC Davis in 1992. He continued his education at Cal State Sacramento where he received an MS degree from the School of Health and Human Services in 1994. His emphasis at Cal State Sacramento was in the field of exercise physiology and biomechanics. He received his PhD from the School of Health and Rehabilitation Sciences from the University of Pittsburgh in 1998, and a second MS degree in Bioengineering from the university in 2000. Both of Dr. Shimada's degrees from the University of Pittsburgh were in the area of biomechanics. Currently he is the President of Biomechanical Consultants of California, a forensic biomechanics and engineering firm based out of Davis, California. His primary area of consulting and research is focused on identifying, determining the likelihood, and prevention of injury. Dr. Shimada has authored four book chapters, nearly 20 peer-reviewed journal publications, over 20 peer-reviewed conference proceedings, and multiple abstracts in the biomechanics, medical, and engineering field.

My name is Bill Focha. I am running for one of the director's at large positions on the CA2RS Board of Directors. I have been a member of CA2RS since 1996. I am retired from the Sonoma County Sheriff's Office and the Oakland Police Department. During my 24 years in law enforcement I worked for 21 years as a traffic investigator. I am currently the owner of North Coast Truck Inspections, a commercial vehicle inspection and service company.

I was on the CA2RS Board of Directors from 2003-2005. I enjoyed the time I spent on the board. I co-chaired the 2004 conference in Santa Rosa. I coordinated the crash tests of the motorcycles that are the foundation for CA2RS motorcycle formula. I have also been involved in most if not all testing that CA2RS has done since I joined the organization. I am currently on the CA2RS Training Committee.

I will bring to the board a willingness work with the other members of the board to keep CA2RS at the forefront of the collision investigation organizations. Having been a Union representative for many years I understand budgets and the problems associated with the ever shrinking department training budget. I will work diligently to provide the finest training to our members while keeping cost at a minimum.

I will be available to the members and attentive to their needs, with respect to the organization. I look forward to serving on the Board.



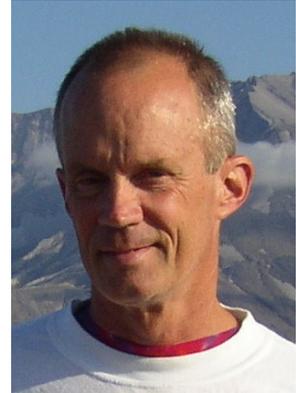
Bill Focha



Letter from the Editor

Dear CAARS members,

The focus of this newsletter is vehicle/pedestrian collisions, which the membership has indicated is a high-interest topic. In this newsletter you will find the third-quarter training review, where a hands-on reconstruction exercise was staged with help from Kent Boots and Rudy Degger. Also I've assembled some links that are apropos to this theme. And in my technical corner I've included a synopsis of this topic. There are a great number of such collisions, so under "In the news..." I've included links to several recent news items covering cases in California. One case, where a bicyclist hit and fatally injured a pedestrian in San Francisco's Castro District, elicited quite a storm of reaction, so I've included a more detailed look at that incident.



This has been a busy summer for me. I traveled to Germany to team-teach a course on Automotive Mechatronics with my Munich colleague Dr. Markus Krug. While there I had the opportunity to visit another summer program that Cal Poly students participate in. It's a three-week program offered in Berlin, Dresden, and Karlsruhe. Unbeknownst to me was that Dresden happens to be the center of accident reconstruction and automotive safety systems research in Germany. In Dresden I had the opportunity to meet several colleagues who are involved in accident reconstruction and research pertinent to this field. We did some hand-on testing with EDRs and high-speed cameras and had a look inside research going on in accident reconstruction and safety systems at the Dresden University of Applied Sciences and at the Technical University of Dresden.

Back in Munich I took the opportunity to meet a colleague, Prof. Hans Bäumlner, who specializes in this field. He offers several courses in this area, and it is possible that we may transplant some of his work for a course in Accident Reconstruction at Cal Poly-SLO. This trip is detailed further in the "International" column this quarter.

Last, Tim Neuman, my predecessor as newsletter editor, suggested that I have a theme or focus for each newsletter. I've thought about this and have come up with this list:

- ◆ Any quarterly training topic could also be a newsletter theme for the current issue of the newsletter, like the auto/ped theme for this newsletter.
- ◆ I'd like to do a newsletter on electronic throttles and the problems that have been associated with them.
- ◆ Distracted driving and all the new technology that's being built into vehicles nowadays
- ◆ Autonomous vehicles and driverless cars
- ◆ I'd like to have a newsletter that focuses on legal issues, like admissibility of evidence and of animations too. This comes up occasionally in quarterly training sessions, so it'd be nice to organize it and put it down on paper, in a newsletter.
- ◆ Do a newsletter focusing on ACTAR maybe with suggestions on how to study for it, testimonials from people who've taken the test, etc.
- ◆ Software for accident reconstruction.

If you have topics you would like to suggest, I'm open to suggestions. Of if you like especially any of these topics, please let me know. This newsletter is to inform and educate the membership. So it will improve if members make known their wishes.

Best wishes,

Frank Owen

editor@ca2rs.com



CALIFORNIA ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS

Q3 Training Review

by Frank Owen

Third-quarter CAARS training for Northern California took place 28 August at the San Ramon Police Department. Forty-four CAARS members attended the seminar. It focused on vehicle/pedestrian collisions and was presented by Kent Boots (<http://www.factualdiagrams.com/aboutus.html>) and Rudy Degger (<http://www.rudydegger.com/>). A collision between a car and a pedestrian was staged, and the crash scene was measured and documented by class participants. The same seminar was held 30 August for Southern California CAARS members at the Orange County Sheriff Training Facility in Orange.

CAARS business

Dave Cameron announced that the new CAARS website is up and running (see The Board Beat on instructions for accessing this). There is also a Facebook presence for CAARS. This actually mirrors the website and is convenient simply as a notification mechanism for new postings on the website for members with Facebook accounts. The CAARS Facebook site now has about 50 “friends”.

For this year’s board positions, there are three openings. Chris Kauderer, Dave Heinbaugh, Sean Shimada, and Bill Focha were nominated to fill these open spots.

It was announced that members can now pay their membership dues on-line, on the website.

The annual CAARS Conference in South Lake Tahoe 1-3 November was announced. Its focus will be accident reconstruction for motorcycle collisions and will feature some nationally known experts. Jeff Muttart will discuss human factors in motorcycle accidents. Louis Peck has done a great deal of work in determining drag factors for a downed, sliding motorcycle. Wade Bartlett will present analyses of motorcycle crush tests. Steve Guderian is a motorcycle safety expert.

Auto/Ped training

The order of events was as follows. Boots gave an introduction into auto/ped collisions. He and others had staged an auto/ped crash in a parking lot at the San Ramon Fire Department early in the morning. After this initial presentation of principles involved in analyzing an auto/ped crash, seminar participants visited the crash site, where they measured and documented it. An afternoon session followed, led by Rudy Degger, in which the “accident” was analyzed and results were given to see if they complied with the known, measured values of speed and location of the area of impact (AOI).

Boot’s presentation

Kent emphasized the importance of locating the AOI and how this is much more difficult in an auto/ped crash than it is in a crash involving two vehicles. He also mentioned that the *throw distance*, the distance from the AOI to the final resting position of the pedestrian, is an important parameter for determining the speed of the vehicle at impact. Skid marks from braking were used with the standard skid formula ($d = s^2 / (30f)$) to determine the speed of the vehicle at the start of skidding. The difficulty of estimating perception/reaction time was mentioned. Also discussed was the importance of the *debris field* left by the pedestrian--glasses, coins, shoes, etc. Sometimes this debris field can be mapped out, and, when looked at as a whole, it diverges from a point, namely the point of impact between the vehicle and the pedestrian. Kent recommended Jerry Eubank’s book on determining the AOI (<http://www.amazon.com/Pedestrian-Accident-Reconstruction-Litigation-Eubanks/dp/0913875252>).



Crash scene

Continued next page...

Q3 Training Review (continued)

Measuring and documenting the crash scene

At the crash scene participants came upon a crash dummy that had been hit in a frontal collision by a 1998 Ford Lincoln Executive



Skid marks from full braking prior to collision

Town Car. A number of objects were strewn about the area too--coins, shoes, an eyeglass frame, and an eyeglass lens that had been flung free. A baseline had been set up parallel to the direction of travel of the car. Participants measured the locations of all crash components--car location, skid marks, pedestrian location, location of all objects in the debris field--with either simple tape measures or using a total station. The objective was to note everything to be able to make a drawing of the accident scene and then to perform an analysis and reconstruction of the crash. The precise AOI was not obvious, as is usual in an auto/ped accident. The front of the car showed no appreciable damage, though there were telltale signs of the collision just to the right of the centerline of the car. One participant had the brilliant idea of using this lateral position and the skid marks, along with a polarizing lens, to try to find a shoe scuff mark that would identify the point of impact with the pedestrian. He purportedly found a scuff mark.

Degger's analysis

After the crash scene documentation and some analysis, Rudy led the group through an analysis of what had been measured and found at the crash scene and how one goes about determining the AOI, the car's speed at the start of skidding, and the car's probable speed at the point of initial impact with the pedestrian. Prior to the staging of the crash, Rudy and Kent had run skid tests with a Vericom and a shot marker to determine the drag factor for the fully braking car. They came up with a factor of about 0.7, which complies well with accepted values in the accident reconstruction world. A number of different methods and formulae were presented to place the AOI. Rudy explained that they should all be used in conjunction with one another and their results compared. For the throw distance there are a number of proposed formulae. Rudy recommended the *Intech formula* from Dr. Amrit Toor (see <http://papers.sae.org/2002-01-0550>) and also the *Searle formula* (see <http://jneades.com/Downloads/Pedestrian%20throw.pdf>).

Further discussion of other methods and models for auto/ped collisions followed, including a two-phase impact model used when the impact force of the vehicle hits the pedestrian up near his/her center of mass. This happens when an adult is struck by a larger vehicle, like a truck, or when a child is struck by a car. In this case, the pedestrian does not rotate over the front of the vehicle. He/She is projected forward without rotation.

The two presentations by Kent and Rudy will be uploaded to the CAARS website along with videos showing the skid tests and the dummy crash tests.

(Editor: Since I was a participant in this seminar, I hope also to include an analysis of this simulated crash in the next newsletter.)



Collision marks on dummy's legs line up with bumper height of car



CALIFORNIA ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS

Upcoming ACTAR Examination Dates and Locations

October 2012

31 October - South Lake Tahoe, California, sponsor: CAARS. New applications must have been submitted by 31 August. Exam registration cut-off date is 30 September. Held before the CAARS Annual Conference.

November 2012

No exam offered.

December 2012

11 December - Blythewood, South Carolina, sponsor: SCHP. New applications must be received by 11 October. Exam registration cut-off date is 11 November. Held at SCHP, 10311 Wilson Blvd.

All test dates above subject to new testing regulations, which prohibit the use of electronic devices for testing
Go to www.actar.org for additional information

UPCOMING EVENT

2012 CAARS Annual Conference

1-3 November (Thursday-Saturday) – South Lake Tahoe, CA

Motorcycle Collision Reconstruction and Investigation

Motorcycle crash tests, motorcycle glance patterns, motorcycle rider braking behavior, motorcycle slide data, motorcycle inspections.

Speakers include: Jeff Muttart, Wade Bartlett, Louis Peck, and Steve Guderian

Embassy Suites Lake Tahoe–Hotel and Ski Resort

4130 Lake Tahoe Blvd.

South Lake Tahoe, CA 96150

(530) 544 5400



[Map and directions](#)

Conference registration includes: All sessions, printed materials in a conference notebook, CD of conference materials, lunch and afternoon snack on Thursday and Friday, and discounted hotel room rates at the Embassy Suites Lake Tahoe Resort.

Note: Hotel guests will receive a complimentary full breakfast and a hosted cocktail reception each evening.

Travel: If you fly into the Reno/Tahoe International Airport - The South Tahoe Express Shuttle makes 10 trips to the hotel daily. The cost is \$49 round trip. For reservations call 866-898-2463 or visit www.southtahoexpress.com.

See [2012 CA2RS Conference Brochure.pdf](#)

Register at <http://www.regonline.com/builder/site/Default.aspx?EventID=1125676>



IN THE NEWS

Pedestrian in Castro Bike Collision Dies, Cyclist Gets Hit with Felony Manslaughter

SAN FRANCISCO (KCBS/BCN)— A pedestrian who was struck by a bicyclist in San Francisco's Castro District last week has died, authorities said Wednesday. The bicyclist may face charges in his death...

Chris Bucchere, 36, allegedly struck 71-year-old Sutchi Hui at Market and Castro streets shortly before 8:10 a.m. on March 29, 2012. Witnesses reported that Bucchere, who was traveling south on Castro Street, might have run a red light before striking Hui, according to police.

Ed. - Bucchere elicited a lot of anger from the public when he made the following post to a cycling blog in San Francisco:

"I couldn't see a line through the crowd and I couldn't stop, so I laid it down and just plowed through the crowded crosswalk in the least-populated place I could find."



Map: CBS-SF 5

"In a nutshell, blammo."

"I remember seeing a RIVER of blood on the asphalt, but it wasn't mine. I really hope he ends up OK."

"The moral of this little story" is that everyone should remember to wear a helmet, he wrote in unprintable shorthand before Hui died. The original post, which has since been scrubbed from the Internet, was dedicated to "my late helmet. She died in heroic fashion today as my head slammed into the tarmac. May she die knowing that because she committed the ultimate sacrifice, her rider can live on and ride on."

See <http://sanfrancisco.cbslocal.com/2012/04/04/pedestrian-in-castro-bike-collision-dies-cyclist-may-face-charges/>

And <http://www.sfexaminer.com/local/transportation/2012/04/bicycle-groups-condemn-reckless-behavior-following-posts-about-fatal-cr>

And http://blogs.sfweekly.com/thesnitch/2012/06/chris_bucchere_cyclist_who_kil.php

But an editorial in the San Francisco Examiner pointed out that cars kill and maim pedestrians much more often than bicycles do:

...On one level, we understand why the story of a bicyclist killing someone in the heart of one of The City's most famous neighborhoods — and then posting comments about it in an online forum — makes for such good copy. It's just so exotic.

But another word for exotic is rare. Bicyclists just don't hit people very often; according to The City's Department of Public Health, cars hit people 811 times in 2010, while bicyclists hit people just 18 times. And when they do, they don't have the momentum to do the same level of damage.

...A bicyclist who kills someone is, quite simply, an outlier. Bicyclists can be rude — they certainly ride through red lights or on the sidewalk and are rarely punished, in part because on the scale of criminality, this is fairly minor. But the one thing they almost never do is kill someone.

For the full editorial: <http://www.sfexaminer.com/opinion/editorials/2012/04/rare-pedestrian-deaths-exploited-bicycle-foes#ixzz25A2Vkp02>

INTERNATIONAL

Accident Reconstruction and Research in Germany

by Frank Owen, CAARS newsletter editor

About 30 engineering students engaged in two different courses on Automotive Mechatronics in Germany this past summer. One course, a three-week course through Cal Poly-SLO's partner university in Karlsruhe, is structured so that students spend a week each in Berlin, Dresden, and Karlsruhe. Dresden happens to be the center of accident reconstruction and safety systems research in Germany, so some time was spent introducing the group to this field during the Dresden module. Three researchers and practitioners made very interesting presentations and staged hands-on exercises for the participating students.



Dr.-Ing. Michael Weyde stages braking test with van-full of international students, including two from Cal Poly-SLO, in Dresden.

Dr.-Ing. Michael Weyde (www.unfallgutachter.de) gave a general presentation on accident reconstruction in Germany. It is a highly regulated field, and the number of experts in Germany is quite small. After his general introduction, Weyde discussed event data recorders (EDR), their ins and outs. This was followed by actual acceleration and braking tests performed with a van specially outfitted with several EDRs. Tests were run, captured with high-speed cameras, and then their results were analyzed. A student drove the van-full of students during the tests, something that would never be allowed in this country. This was brought

home to me the next day at the Dresden Traffic Operations Center. I stood by as a student drove a 600,000 Euro (\$750,000) hybrid bus around, again full of students. The head of the center was beside me telling the student driver, "Go faster!"

The Dresden presentations also included one by Dr.-Ing. Lars Hannawald, the leader of the Traffic Accident Research Center (www.vufo.de) at the Technical University of Dresden.

The director of the Dresden phase of this course, Prof. Dr. Toralf Trautmann (<http://www.htw-dresden.de/fakultaet-maschinenbauverfahrenstechnik/personen/professoren/fahrzeugtechnik/prof-dr-rer-nat-toralf-trautmann.html>) showed me also a vehicle he has developed at the Dresden University of Applied Sciences that has a forward-looking radar, used to recognize obstacles and then respond appropriately to avoid a collision. Prof. Trautmann leads a group that uses 1/5th-scale model cars to research and develop driver assistance systems (<http://www.isupia.de/>).

Back in Munich I took the opportunity to meet Dr.-Ing. Hans Bäumler (<http://www.prof-baeumler.de/>). He teaches several courses in accident evaluation and reconstruction at the Munich University of Applied Sciences (MUAS). It has been in my mind lately to start a course in Accident Reconstruction at Cal Poly-SLO. Prof. Bäumler generously shared with me his notes, which might serve as a basis for such a course and also for future cross-cultural collaboration with Cal Poly in this field.

I had already found out, through my involvement with the MUAS, that the field of accident reconstruction is highly developed in Germany, and that there is a great deal of good literature on the subject that has not made it into the English-language world. Examples of this are case studies that appear in a pair of books published by the Society for Technical Investigation (www.gtue.de/sixcms/detail.php?template=home). I've re-analyzed and expanded on several of these cases and put the results up at www.aoengr.com/AccidentReconstruction/AccidentReconstruction.html under "Examples", in English, of course. One case study is an auto/pedestrian collision.



In the news...

NEW CRASH TEST HAS 25% OVERLAP

Many cars fail new crash test that focuses on front corner

Of the 11 luxury sedans examined, only 3 pass—not inspiring hope that others are better

Results of a new crash test that focused on luxury cars are raising worries that most vehicles may not be able to provide protection from serious injuries in a common accident.

Such fancy nameplates as Audi, Mercedes and Lexus all earned "poor" ratings in a test that simulated what happens when the front corner of a sedan hits another vehicle or an object such as a tree or pole, according to the Insurance Institute for Highway Safety.

The photo at right shows a BMW 328i crashing into a rigid barrier at 40 mph with 25% overlap, the standard for the new test. This car received a marginal rating. One of the problems is obvious: the wheel is pushed into the driver's compartment rather than being torn away by the crash.



Photo: Insurance Institute for Highway Safety

See <http://articles.latimes.com/2012/aug/13/business/la-fi-autos-luxury-crash-test-20120814>

DISTRACTED DRIVING

'Hands-free' texting while driving gets OK from Gov. Jerry Brown

Three years after the state banned motorists from texting while driving, Gov. Jerry Brown on Friday approved an exception to the rule in recognition of improved voice-operated technology.

Brown announced Friday he has signed 18 bills into law, including AB 1526, which allows drivers to dictate, send or listen to text-based communications as long as they do so using technology specifically designed to allow voice-operated and hands-free operation.

Assemblyman Jeff Mill (R-Corona) introduced the measure to extend the same "hands-free" exception to texting that already exists for using a cellphone while driving.

See <http://latimesblogs.latimes.com/california-politics/2012/07/jerry-brown-hands-free-texting-driving.html>

No DRIVING

Tech-driven teens forego driver's seat

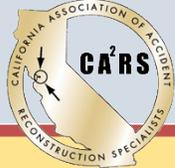
Teenagers talking about speeding these days are more likely to be referring to their phone and Internet connections than cars.

The more time young people spend connecting through texting, email, Facebook and other social media sites, the less interest they have in driving, according to researchers at the University of Michigan Transportation Research Institute.

"We found that the percentage of young drivers was inversely related to the proportion of Internet users. Virtual contact, through electronic means, reduces the need for actual contact," said Michael Sivack, a professor at the institute.

See <http://www.aoengr.com/AccidentReconstruction/120824TechDrivenTeens.pdf>

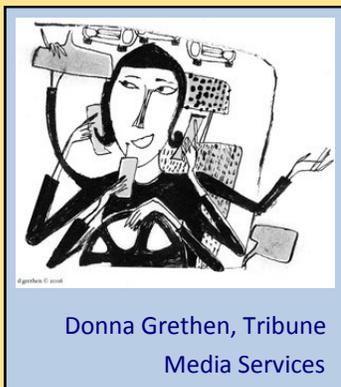
See also <http://pjmedia.com/lifestyle/2012/04/19/why-dont-teens-want-to-drive-anymore/>



In the news (continued)...

DISTRACTED DRIVING

Bill would increase fines for using cellphones while driving



Donna Grethen, Tribune
Media Services

The cellphone bill is sent to the governor.

SACRAMENTO — State lawmakers sent two road-related proposals to the governor Tuesday, one that would hike fines for Californians who use a cellphone while driving and another that would exempt hybrid drivers from toll charges in car-pool lanes.

The cellphone bill, SB 1310 by state Sen. Joe Simitian (D-Palo Alto), would increase the current fine for driving while using a hands-on phone or text messaging from \$20 to \$30 for a first offense, and from \$50 to \$60 for a subsequent offense.

See <http://www.latimes.com/news/local/la-me-legislature-20120829,0,420795.story>

TRAGIC ACCIDENT OUTCOME IN LOS ANGELES

Effort to help at crash scene turned tragic

Trying to save others, two women died in water electrified by a toppled light pole.

Irma Zamora's husband urged her not to get out of the car as they approached the scene of a spectacular traffic crash in Los Angeles' Valley Village neighborhood. But as he pulled over to call 911, she rushed out anyway, eager to help.

A sport utility vehicle had just careened through the intersection of Magnolia Boulevard and Ben Avenue, shearing off a concrete light standard and knocking over a fire hydrant before coming to rest on a front lawn.

Water spewed skyward from the broken hydrant and quickly pooled in the intersection.

Zamora ran toward the wrecked SUV and stepped into an electrified pool of water. She was immediately electrocuted, killed by what firefighters estimate was 480 volts of electricity.

See <http://articles.latimes.com/2012/aug/24/local/la-me-0824-electrocution-20120824>

TOYOTA'S SEEMINGLY ENDLESS ELECTRONIC THROTTLE PROBLEMS

Sen. Grassley questions Toyota sudden acceleration probe

Sen. Charles E. Grassley says NHTSA's probe may have erroneously ruled out Toyota's electronic throttle control system as a cause.

WASHINGTON — A U.S. senator has raised concerns about a government investigation of sudden unintended acceleration problems in Toyota vehicles, saying the probe might have erroneously ruled out the company's electronic throttle control system as a cause.

Sen. Charles E. Grassley (R-Iowa) said whistle-blowers recently have provided his office with information suggesting that the investigation by the National Highway Traffic Safety Administration, with the help of NASA engineers, "may have been too narrow."

See <http://articles.latimes.com/2012/jul/13/business/la-fi-toyota-probe-20120713>



In the news (continued)...

RETURNING SERVICE MEMBERS HAVE PROBLEMS WITH DRIVING AT HOME

Survive the Homecoming

As America's service members return home, they are finding new, potentially fatal, risks on domestic roadways.

When a car swerved in front of Brad Hammond's vehicle and cut him off, he expected the driver to trigger a trunkload of explosives in a suicide attack. Hammond's split-second instinct was to reach for his weapon. Only the former U.S. Army specialist was no longer stationed in Mosul or Tal Afar, Iraq. He was at home, in Denver, and there was no threat — or gun. Instead, Hammond's wife was sitting in the passenger seat, reminding him that they were safe.

But old habits die hard. Deployed troops quickly learn to drive unpredictably — on the wrong side of the road, through traffic signals, as fast as 14,000-pound Humvees can go — to avoid potential threats, such as improvised explosive devices, which have been one of the primary causes of U.S. casualties in Iraq and Afghanistan. For Hammond, who often drove a 19-ton, eight-wheeled Stryker Combat Vehicle with a top speed of barely 62 mph, it also meant ramming other vehicles out of the way and forcing his way through traffic. "My driving style and the way we were taught was to be purely 100% aggressive," Hammond says.

These lessons can be hard to unlearn. With their experiences fresh in their minds, some recently returned servicemen and women struggle with typical road-safety practices, such as stopping for stop signs, wearing seat belts or even driving in their own lane. Because in a war zone, those actions could get you killed.

See https://www.usaa.com/inet/pages/usaamag_advice_military_surviving_homecoming

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In the news (continued)...

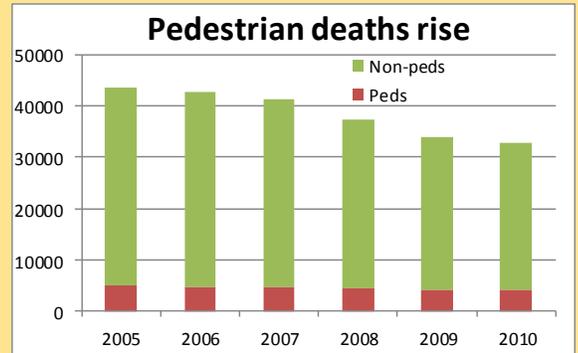
NHTSA REACTS TO RISING PEDESTRIAN FATALITIES

Pedestrian deaths rise; NHTSA rules planned

Pedestrian fatalities in car crashes are on the rise again after five years of decline. But automakers say expected vehicle design rules are not the only way to reverse the trend.

Nearly 4,300 people died when hit by cars in 2010, according to National Highway Traffic Safety Administration data out today. That's a 4% increase from 2009 and puts pressure on government regulators to address the safety of walkers and joggers in an increasingly urbanized America. About 75% of pedestrian deaths were in urban areas.

NHTSA hosts a meeting next month to help finalize a global safety standard that includes proposed changes to the design of hoods and bumpers so they absorb more of the impact when cars collide with people. NHTSA is expected to propose similar safety rules that would closely align the U.S. with those in Europe and Asia.



See <http://www.usatoday.com/money/autos/story/2012-08-02/pedestrian-safety/56812148/1>

PEDESTRIAN-FRIENDLY MERCEDES

Car review: 2013 Mercedes SL550 is pedestrian-friendly excellence

Exterior of the 2013 Mercedes-Benz SL550 makes pedestrian-safety styling concessions.



Photo: Mercedes-Benz

If Europeans didn't walk so darn much, the 2013 Mercedes-Benz SL550 might be a better-looking car. Clearly they don't appreciate the convenience of a 90-second drive to Gelson's for a carton of soy milk that we Angelenos take for granted.

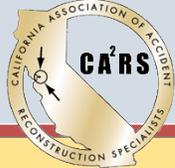
Their ambulatory prowess means new vehicles must meet specific crash regulations, designed to reduce the likelihood of serious injury or death if a pedestrian gets hit by a wayward Beamer or Benz.

These mandates have thrown a wrench into the aesthetic evolution of numerous automakers' vehicles, since the rules place very tangible requirements on the design of a car's front end. This collateral damage is regrettably conspicuous on this latest version of Mercedes' iconic two-seater.

But at least this all-new SL is one of the best road-trip cars that money can buy. (Piles of money, actually, considering its base price is about \$106,000.)

The 2013 SL's shape ends previous versions' evolution toward a sleeker profile. The car now sports a blunt, upright front bumper and grille. This moves the impact zone higher to reduce knee and ankle injuries to pedestrians.

See <http://articles.latimes.com/2012/jul/12/business/la-fi-autos-mercedes-sl550-review-20120712>



In the news (continued)...

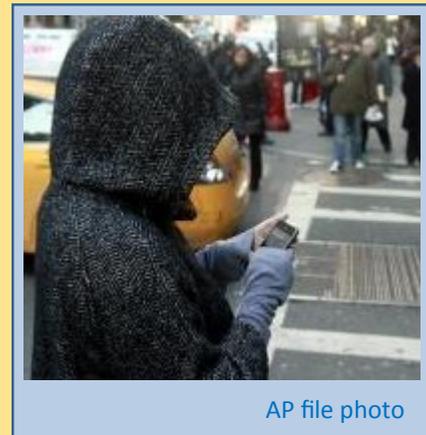
DISTRACTED WALKING

'Distracted walking' endangers teens

A new study suggests "distracted walking" is taking a toll on teenagers as the number of pedestrian injuries soars among 16- to 19-year-olds even as it drops among nearly every other age group.

The findings, out today from Safe Kids Worldwide, a non-profit organization based in Washington, D.C., that pushes to prevent unintentional childhood injuries, found that the number of teens injured in pedestrian accidents rose 25% in the five-year period from 2006 to 2010, compared with 2001-05.

"We have distracted drivers who may be hitting pedestrians in the street, but we also have distracted pedestrians who are walking in front of cars."



AP file photo

See <http://www.usatoday.com/news/nation/story/2012-08-30/teen-cellphone-injuries-pedestrian/57414454/1>

NEW TECHNOLOGY

Cameras are Cyclists' 'Black Boxes' in Accidents

The little devices worn by cyclists are providing evidence in road-sharing cases

WASHINGTON — When Evan Wilder went flying onto the pavement during his bicycle commute one morning here, he didn't have time to notice the license plate of the pickup truck that had sideswiped him after its driver hurled a curse at him. Nor did a witness driving another car.

But the video camera Mr. Wilder had strapped to his head caught the whole episode. After watching a recording of the incident later, Mr. Wilder gave the license plate number to the police and a suspect was eventually charged with leaving the scene of an accident.

"Without the video, we wouldn't know who did it," said Mr. Wilder, 33, who was bruised and scraped in the crash

See [http://www.nytimes.com/2012/07/21/technology/bicyclists-using-cameras-to-capture-accidents.html?
_r=1&adxnnl=1&adxnnlx=1346306868-zjzcOyaBjpbEPE9Kb+J0sQ](http://www.nytimes.com/2012/07/21/technology/bicyclists-using-cameras-to-capture-accidents.html?_r=1&adxnnl=1&adxnnlx=1346306868-zjzcOyaBjpbEPE9Kb+J0sQ)

OLD NEWS—FAMOUS CALIFORNIA PEDESTRIAN-INJURY CASE

86-year-old plows into Santa Monica Farmers Market killing 10

Abstract of NTSB report: On July 16, 2003, a 1992 Buick LeSabre was westbound on Arizona Avenue, approaching the intersection of Fourth Street, in Santa Monica, California. A 2003 Mercedes Benz S430 sedan was stopped on Arizona Avenue at the intersection for pedestrians in a crosswalk on Fourth Street. The Buick struck the Mercedes, continued through the intersection, and drove through a farmers' market, striking pedestrians and vendor displays before coming to rest. As a result of the accident, 10 people were fatally injured, and 63 people received injuries ranging from minor to serious. The Buick driver and both Mercedes occupants were uninjured.

NTSB report: <http://www.nts.gov/doclib/reports/2004/HAR0404.pdf>

See also <http://articles.latimes.com/2008/may/22/local/me-market22>



In the news (continued)...

DEJA VU

Police: 100-year-old driver hits 11 pedestrians near L.A. school

LOS ANGELES — The screams of women and children didn't cause a 100-year-old driver to stop, witnesses said, as he backed his large, powder blue Cadillac onto a sidewalk across from an elementary school and hit 11 people, including nine children.

So people began pounding on his windows screaming for him to stop, a witness said.

Alma Solache said she was buying her children an after-school snack Wednesday just before the accident outside a South Los Angeles school.

"He was not paying attention," said Solache, 24, adding that it was at least two or three seconds before the vehicle halted and people began pulling children out from beneath the car.

Four of the children were in critical condition when firefighters arrived but they were stabilized and were in serious condition at a hospital, city fire Capt. Jaime Moore said. Everyone was expected to survive, he said.

See <http://www.duluthnewtribune.com/event/article/id/241658/group/homepage/>

AND THIS...

100-year-old driver's car examined after he hits 14 people

Los Angeles police are examining the car of a 100-year-old man who plowed into more than a dozen people in South Los Angeles on Wednesday.

Officials said they will be looking for any data or mechanical issues related to the car and also talk to witnesses.

The detective said the investigation into the accident was just beginning and may take weeks. But he said a key focus for investigators will be Carter's claim that his brakes may have failed, causing him to strike the pedestrians.

"That's a primary issue for us right now, because the gentleman made the assertion that he had some kind of mechanical failure," Meneses said.

See <http://latimesblogs.latimes.com/lanow/2012/08/100-year-old-driver-car-examined.html>

A VERY SAD CASE

Cal Poly skateboarder dies after collision with pickup

A 22-year-old student from Sonoma County collided with a truck Wednesday in SLO

A 22-year-old Cal Poly student who suffered serious injuries while skateboarding died Thursday, according to San Luis Obispo police.

Jacob Van Staaveren, a Cal Poly senior, was injured about 4:40 p.m. Wednesday as he was riding a skateboard south on Grove Street, according to San Luis Obispo police.

Witnesses told police Van Staaveren failed to halt at a stop sign at Mill Street, and "flew through the intersection" into the path of an eastbound Chevy Silverado truck driven by 43-year-old San Luis Obispo resident Gilberto Baltazar.

See <http://www.sanluisobispo.com/2012/08/30/2206618/cal-poly-skateboarder-dies.html>



BOOK REVIEW – *From the desk of Joseph E. Badger*

Forensic Analysis of Seat Belts, 2nd Edition

After 14 years in law enforcement, Donald J. Felicella left the Sunrise, Florida PD in the late '90s and entered the private sector with his father, Don A. Felicella. In 2003, Donald J. wrote *Forensic Analysis of Seat Belts*. Kinetic Energy Press, Salem, Oregon, published it.

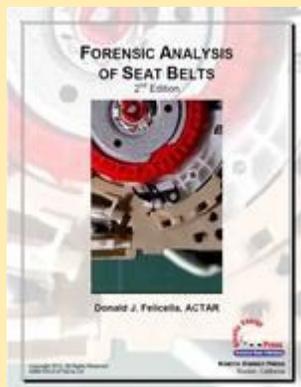
The younger Felicella has since revised and expanded the original with larger, full-color photos and charts. 49 new color photographs, 9 new figures, 7 new graphs, and added some new equations.

He also updated the chapters on Interior Vehicle Documentation and Injury Correlation. There are nearly 50 additional pages of information.

The new publication contains up-to-date lists of all seat belt related product recalls and technical service bulletins going back to 1988!

Inside the back cover of the 183-page book is a CD-ROM of the publication that gives the user full searchable access to the text, illustrations and charts.

This new edition is printed in an 8.5" by 11" format with heavy card-stock covers (front & rear) and is bound with GBC® comb binding. This format allows the printed page to lay completely flat.



I asked Mr. Felicella how he came to write the book and why. He offered, "I was drawn to accident investigation early on in my law enforcement career; I liked the fact that the investigator would work a crash from the scene to the completion and the technical aspect also intrigued me. Early on in my accident training (mid 1980's) I was amazed that something with such a basic design was one of the most effective devices preventing an occupant from injury and death.

"With that, I started researching various aspects regarding seat belts, how they worked, and advancements in technology, and evidence found on them. Over the years I ended up with boxes of research papers, test results, and cases dealing with seat belts. I was teaching Traffic Homicide Investigation at the local police academy and I would always get positive feedback from students about the seat belt topic and information I provided to them, so I decided to write a book. At the time I started the book project there were no other books dealing exclusively with the topic of seat belts."

As to how long it took to write the book, he said, "... it kind of evolved over a few years."

As to the beginnings of the seat belt (or one word seatbelt – which is also correct), the name Sir George Cayley, 6th Baronet probably doesn't ring a bell. He is credited with inventing the seatbelt back in the 20th century for people in airplanes so they wouldn't fly through the window should their aircraft come to a sudden stop – like against the side of a mountain. But if you really want to know the "History of Seat Belts" read Chapter One of Donald Felicella's book which provides the historical development of seat belts between 1855 and 2012.

Chapter Ten provides all the recalls and technical service bulletins from 1988 to the present (as of April 18, 2012).

Chapters between One and Ten deal with occupant kinematics, inspection of seatbelt systems, and injury correlation, interior and exterior vehicle documentation plus the malfunctions, problems and litigation claims.

The book is available for sale online for \$59 (plus \$4 shipping and handling) at www.kineticenergypress.com or from Kinetic Energy Press, 2351 Sunset Blvd., Suite #170-562, Rocklin, CA 95765. (Telephone 916-770-9475.)

Forensic Analysis of Seat Belts, 2nd Edition is for anyone involved in accident (read: crash) investigation, reconstruction and/or litigation. It contains 163 photos and charts in crystal clear resolution illustrating precisely what is important in seat belt analysis - plus a complete guide to forensic examination and analysis of seat belt systems.

They published the photographs in black and white to keep the cost down; however, if you would like to see the pictures in fantastic color, buy the \$109 version (\$4 shipping and handling). You may view a sample page of the color version at http://www.kineticenergypress.com/images/FASB_sample.pdf.

For questions about his book – or about seatbelts in general, contact Mr. Felicella at fcenginc@aol.com.

About the reviewer: *Joseph E. Badger is an internationally known accident reconstruction consultant and a frequent contributor to accident reconstruction periodicals. You may reach Mr. Badger by writing to 4210 Woodlyn Dr., Bloomington, IN 47403 or by email: ljebadger1@comcast.net.*



TECHNICAL CORNER

Vehicle/Pedestrian Collisions

The Ins and Outs of Collisions Involving Pedestrians

By Frank Owen, Professor of Mechanical Engineering, Cal Poly – SLO

Ped/Auto collisions are different from two-vehicle crashes because of the widely different masses of the two colliding masses. The vehicle is so massive compared with the pedestrian, that often it is difficult to locate the point or area of impact (AOI). The vehicle mass overwhelms the pedestrian mass, so that the latter does little to change the vehicle's path or velocity. In a vehicle-to-vehicle crash, often the impact point can be determined from gouges in the roadway or by an abrupt change in the skid marks of the two vehicles as each affects the other. The crash scene investigator needs to turn up the sensitivity of his/her investigation to pick up barely perceptible evidence, such as shoe scuff marks, threads or dye patches left by a pedestrian's contact with the pavement, or hats or glasses, shaken loose by the collision. All these small, subtle pieces of evidence form a *debris field*, whose configuration should also be looked at as a whole.

The intentions and actions of the involved parties should also be examined. Often assignment of blame revolves around the two questions

- 1) Did the pedestrian dart out in front of the vehicle so quickly that the driver had no chance to respond?
- 2) Was the vehicle going excessively fast so that the pedestrian did not see it until it was upon him/her?

Was it dark (often the case)? If so, was the pedestrian wearing dark clothing? In fact, even in daylight, the contrast between the pedestrian's clothing and the background is very important in triggering the driver's braking reaction. Was the pedestrian a child or an old person (unhappily, too often the case)? They are disproportionately victims of ped/auto accidents. Did the accident occur at an intersection or not? What was the orientation of the pedestrian relative to the car? Can this be determined from the injuries of the pedestrian? Did the pedestrian wind up behind the vehicle or in front of the vehicle? Did the pedestrian cause damage to the car? Did the pedestrian impact the vehicle's windshield?

Were there skid marks left from braking? A generally accepted model for auto/ped collision avoidance is that the driver 1) sees the pedestrian, after a little delay 2) the driver reacts and starts to brake, and this eventually develops into 3) full braking. The difficulty is that the vehicle can strike the pedestrian prior to 1), 2), or 3) or even after 3). Placing the AOI allows the reconstructionists to calculate possible impact speeds with the pedestrian. Placing the occurrence of the impact on a timeline with the above three events is important for determining the impact speed.

The pedestrian kinematics after impact depend on the height of his/her center of mass and the frontal shape of the vehicle. If the pedestrian is struck by a car's bumper on his/her legs, the car will then rotate the pedestrian so that he/she lands somewhat flat on the hood of the car. His/Her head may impact the windshield (see the lower drawing on the front cover of this newsletter). This is called the *wrap model*. If the car is going fast enough, the pedestrian may then be launched over the top of the car and wind up behind the vehicle. If the pedestrian is hit by a vehicle with a high profile, it will push him/her straight ahead without any wrapping. If the pedestrian is struck by a vehicle with a high profile, he/she may then wind up wrapping under the front of the vehicle and being run over by the vehicle.

Though skid marks often do not show signs of deflection caused by the pedestrian, there is one case where they sometimes do show the impact. If the vehicle has a low profile and the pedestrian wraps and lands on the hood while the vehicle is skidding, sometimes the skid marks show a thickening where the pedestrian's weight is loaded onto the hood. This can be used as one way to determine the AOI.

One method for determining the AOI or the impact speed is to use the *throw distance*. This is the distance between the impact point and the final resting place of the pedestrian. It is a function of the impact speed. So if the impact speed is known, the throw distance can be calculated, and the AOI can be fixed relative to the end position of the pedestrian. Of if the throw distance is known, the impact speed can be calculated. There are a number of such relationships. Two given by Rudy Degger at the Q3 CAARS training seminar are the *Intech formula* and the *Searles formula*. The Intech formula is

Continued on following page...



CALIFORNIA ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS

Vehicle/Pedestrian Collisions (continued)

attributed to Amrit Tour. It is

$$d = 9.84 \cdot V^{0.57} \quad \text{where } d \text{ is distance in feet if } V \text{ is given in mph}$$

or

$$d = 3.106 \cdot V^{0.57} \quad \text{where } d \text{ is distance in meters if } V \text{ is given in kph}$$

The Searle formula is actually two formulae that calculate a minimum and a maximum impact speed, given a throw distance. They are

Minimum speed:

$$V_{\min} = \sqrt{\frac{30 \cdot d \cdot f}{1 + f^2}}$$

Maximum speed:

$$V_{\max} = \sqrt{30 \cdot d \cdot f}$$

where d is the throw distance in feet, and f is the unitless friction factor. Searles used values of f between 0.66 and 0.7.

There are many other such formulae, most developed from experimental data. These can be quite different from the two presented above. One common relationship relates throw distance not to velocity but rather to the deceleration rate of the vehicle. Another relationship includes also the *throw angle*, that is the angle at which the pedestrian is launched by the vehicle. This is often unknown. And even worse, is this how a struck pedestrian even leaves the vehicle, as a projectile launched forward at an angle? Another method of separation between the pedestrian and the vehicle is that the pedestrian lands on the hood, perhaps impacts the windshield, and the car brakes. Since the drag factor for the car is greater than the drag factor for the person on the hood of the car, the person slides forward off the front of the car, hits the ground, and then slides, rolls, or tumbles along the pavement to a stop. So it is somewhat confusing which formula to use. Probably prudent is to use a number of formulae and compare the results. If a formula yields a prediction of impact velocity or throw distance that deviates from other formulae, ask why. Look to see the recommended conditions for the use of a particular formula to see if it is being mis-applied. Such comparative analyses and calculations will deepen your understanding of what happened in a particular situation.

Links related to auto/ped collisions

Eubanks, Hill, Casteel, [Pedestrian Accident Reconstruction and Litigation](#), \$72.27 at www.amazon.com:

<http://www.amazon.com/Pedestrian-Accident-Reconstruction-Litigation-Eubanks/dp/0913875252>

Intech Engineering Ltd (Toor, Araszewski, Johal, Overgaard et al.), "Revision and Validation of Vehicle/Pedestrian Collision Analysis Method", SAE International:

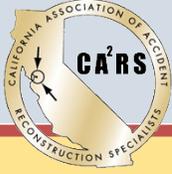
<http://papers.sae.org/2002-01-0550>

Searle, "The Trajectories of Pedestrians, Motorcycles, Motorcyclists, etc., Following a Road Accident", SAE International, 1983:

<http://papers.sae.org/831622>

Searle, "The Physics of Throw Distance in Accident Reconstruction", SAE International, 1993:

<http://papers.sae.org/930659>



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