CALIFORNIA ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS

SKIDMARKS

MANAGING DRIVER SAFETY

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Board Beat

General: Hello all!! It is time again to mark your calendars for the Fall CAARS Conference. This year, the conference will be held from October 20 though 22 in southern California. There will be an ACTAR exam on Wednesday, October 19, 2011. We will again be at the lovely Sheraton Anaheim next to Disneyland (pictured below left). This location has always received great reviews from the membership and many members bring the family for non-stop fun at Disneyland. The CAARS staff has worked diligently to secure speakers for this year's conference. For additional information, see the conference preview on Page 21.

Quarterly Training: The second quarterly training was Basic Motor Vehicle Inspections, presented by Kenneth Zion of Automotive Collision Consultants. The Santa Clara County Valley Transportation Authority hosted the Northern California session on Thursday, April 7, and a total of 42 attendees were present. Eleven attendees were ACTAR accredited and a new member was added to the membership. The City of Fontana Police Department was gracious enough to host the Southern California session on Wednesday, May 18, and involved a total of 62 attendees. Of these, five were ACTAR accredited and two were new additions to our membership. We would like to thank both of our hosts for allowing CAARS to use their facilities. For more information on the training, see the training review on page 5. A Quarterly Training Note/Reminder: Please remember to RSVP as early as possible for quarterly training dates. Snacks, drinks, and seating are all dependent on correct numbers for each training session. Also, if you RSVP and later realize you can't make it, please let us know as well so we can adjust supplies accordingly.

ACTAR Testing: As of May 1, 2011, ACTAR implemented a change to their testing policy regarding the use of electronic devices. No longer will laptop computers and accident reconstruction software be allowed — it's back to calculators, pen and paper (or an abacus, for some). As a result, only specific calculators will be allowed. Go to the ACTAR website (actar.org) for further information and a list of permitted calculators. FOr a detailed explanation of recent changes to the ACTAR policies and procedures, please read the review by CAARS ACTAR Liaison Jiny Pace, which starts on Page 3.

Wind-up: In closing, if there is anything the CAARS Board of Directors can do to improve our organization, please let us know!!!

— *Dave Cameron*, CAARS BOD

Sheraton Anaheim

Downtown Disney

ACTAR UPDATE

Courtesy of Jincy Pace, Liaison to ACTAR

General

For the ACTAR test that CAARS hosted at the 2010 annual conference, 13 people took the theory portion and 13 people took the practical portion. Five people passed the theory portion, and five people passed the practical portion. For the ACTAR test that CAARS hosted on April 30, 2011, in San Jose, we had 16 people signed up to take the test. Read on — the following changes were effective as of March 6, 2011:

CEUs

Effective March 6, ACTAR CEUs will be awarded on a 1:1 basis. This means that if you are attending a class that is listed as 40 hours, and the actual contact hours of that class is 40 hours, you will receive 40 CEUs. The key to this is contact hours. The CEU committee is requiring that anyone applying for CEUs must also submit a course schedule. It can be a simple schedule that lists the daily start time, daily end time, and a basic breakdown of course topics. For example, a five day class that starts at 8 am and ends at 5 pm each day (9 hours, minus the assumed 1 hour for lunch, making it 8 hours per day) will be 8 hours or 8 CEUs per day, which totals 40 CEUs for the class. Needless to say, the number of CEUs totally depends on the schedule provided by the course provider, organization, or student. If the schedule says that the students are in class for only 7 hours, that is what the CEUs will be based on.

This new way of calculating CEUs will give our training sessions and conferences more CEUs. Generally, our training sessions have been getting 6 CEUs based on the previous method of calculation. Now, assuming that the session starts at 8 am and ends at 5 pm (and the schedule reflects this), we will get 8 CEUs. The same goes for our conference. This is a great thing for our organization and our members. One note, there is NO retroactivity for this new policy. The new calculation will apply to any applications received on/after the effective date (regardless of when the training occurred). If there are any "on-going" training curricula that have received CEUs, that organization needs to re-submit the required materials to have their CEUs reevaluated. Any problems, concerns, or questions regarding this from either members, organizations or instructors can be directed to the CEU committee (which consists of me, Scott Skinner, or Pat Riedlinger). In other words, please don't attack Greg Vandenberg, as he is merely the implementor of the policy that we created.

Also along with the updated CEU calculation, there is a new CEU award for college courses taken. One semester credit hour/unit is equal to 15 CEUs, and one quarter credit hour/unit is equal to 10 CEUs. Therefore, if you took a college physics class at San Jose State, and the class was 4 credits (semester system), then you would get 60 CEUs for the class. This is a HUGE improvement over the previous calculation method which basically gave you one CEU per credit unit. Let's face it...a semester-long class is worth a heck of a lot more than just 4 CEUs, which your average one-day training session easily beats.

For those of you who are teaching classes, and want to get CEUs for it, that has also changed slightly. You will get the same 1:1 CEU exchange, however, you can only get a maximum of 20 CEUs per 5-year (renewal) period for teaching.

For those of you who are writers, your peer-reviewed papers no longer have a cap of 5 CEUs per paper.

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CAARS DIRECTORS

The committee will evaluate the paper and award the CEUs based on the complexity of the paper and research involved, which could mean that your paper is worth more than 5 CEUs. Once again, you can only get a maximum of 20 CEUs per renewal period in this manner.

ACTAR Governing Board of Directors (GBOD)

The GBOD has been capped at 24 participating organizations. What this means is that the Board can consist of a maximum of 24 participating (voting) organizations. No other organizations will be added to the GBOD. If any organizations would like to join ACTAR, they can join as Affiliated Organizations, which gives them all of the same benefits as a participating organization, but they are non-voting members and are responsible for paying their own expenses to the annual meeting (if they choose to attend). If an opening becomes available on the GBOD, the replacement participating organization will come from the affiliated organizations. Certain criteria has been established for any organization that would like to become a participating or affiliated member. They are as follows:

i. Organizations must be not-for-profit/public entity

ii. At minimum, some members of the organization must be active in the field of AR and would benefit from ACTAR accreditation

iii. An organization's participation on the GBOD must be solely for the fostering and improving the accreditation process for current/prospective members

Additionally, the GBOD has determined that a method of removing a participating member organization "for cause" must be established. Up until now, we have had no real reason to look at this issue, but as we continue to grow as an organization, it is inevitable that a participating member organization may need to be removed. The committee assigned this question will establish exactly what can qualify for cause and the procedures to remove said member. Two requirements were immediately identified and can be expected to become permanent:

1. A participating organization representative (or alternate) must attend every annual GBOD meeting

2. All participating/affiliated organizations must OFFER to host an ACTAR exam at least once per year

Needless to say, CAARS complies with both of these already — so it will require no change on our part.

On The Horizon

The ever-present question of when ACTAR members will be able to access their CEUs via the Internet still has the same answer—soon—we hope. This endeavor has been stymied by various other "more important" issues that have arisen over the past year (or two). Greg Vandenberg (the Administrator) desperately wants to get this thing launched, and his hope is that it can go online this summer. Now, I recognize that this is the equivalent of a building contractor telling you that the job will be done in two weeks, but unfortunately that is what we have. There really is no realistic way to move the project faster. As I get more, I will tell you.

There were some ideas put forth that would provide incentives to organizations to increase the number of people taking the ACTAR test by providing some small reimbursements associated with giving the test. Those ideas are still in the beginning phases, so it is not really appropriate to go into them yet. Rest assured ACTAR is looking for more ways to make being a participating member that much more profitable.

There will be a method to apply to ACTAR electronically that will be going online this year. The exact date of when this happens is a function of when the application form can be changed to reflect the necessary information needed by the application review committee. Additionally, there is a push (and a very strong one at that) to begin using PayPal for all monetary transactions (application fees, renewal fees, CEU fees, etc). While the exact date for these items is not clear, the Board mandated that it must be done before the next meeting. Until then, please remember that Joel Salinas is still our alternate ACTAR representative and I am always available for ACTAR-related concerns at ACTAR@ca2rs.com.

—JINCY

Training Review

Vehicle Inspection & Analysis for Repair & Fraud, Spring 2011 CAARS Training (Northern California)
Valley Transportation Authority, San Jose — April 7,2011
Courtesy of Benn Karne

Dr. Kenneth Zion's easy manner and sense of humor is apparent almost from the time he begins speaking, making for an enjoyable as well as informative training day. The topics covered started with the basic types of chassis and bumper construction, damage modes, and evidence of previous damage. From the analysis of paint to the type of frame straightening machines in the field, Dr. Zion gave us a good overview of the issues facing the investigator. He also had a good handout and discussion of how to retrieve and store samples of paint (and other materials), with one of his main points to get as much substrate as possible with the paint transfer, and not just the paint transfer itself. A brief foray into the realm of electronics showed what types of information are available from airbag, power train, and body control modules, and what type of equipment is required to retrieve the information.

A problem I'm often presented with from insurers is whether a vehicle was really parked when the damage occurred, so I was very pleased to see Dr. Zion present numerous examples from his direct experience. Scrape patterns (including engine fan contact with radiator or shrouds), lamp analysis, and seat belt usage all play into assembling these puzzles.

Several times during the day, Dr. Zion showed how careful attention to vehicle identification numbers (the VIN) revealed fraudulent documentation of vehicles. A discussion of "unintended acceleration" and/or faulty brakes was accompanied by a number of examples caused or exacerbated by floor mat problems or just confused drivers. His tips on what to look for in these situations were sometimes common-sense (e.g., dirt on back of the brake pedal not "cleaned" by contact with the carpet), but will be useful on future cases. I also enjoyed his perfect pictures of a tire failure due to inadequate air pressure.

Although Dr. Zion often suggested we might want to sleep through portions of his presentation, his good pacing, humorous presentation, and interesting case studies made that very unlikely. I enjoyed his presentation some years ago to CAARS, and this one was even better. Thank you to Bruce Turner, who arranged the facilities and snacks. Also, I thank Kent Boots, who arranged for Dr. Zion to make the presentation for us, and only wish I could see the expanded version Dr. Zion provided the SoCal folks.

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CAARS member Benn Karne, of Karne Engineering in Oakland, has over 10 years of experience in traffic accident reconstruction and failure analysis, and 30 years of experience in mechanical engineering across a variety of industries. He is both ACTAR certified and a registered professional engineer. He performs accident reconstruction and analysis, provides expert testimony, and teaches in the field of accident reconstruction. His website is www.karneengineering.com.

New Technology – Driving Connected Vehicle Innovation

Vehicles

Connected vehicles communicate with other vehicles, the roadway infrastructure, and sometimes even the world at large, through wireless communications. Much like your cellular phone communicates with the world, connected vehicles use parts of the electromagnetic spectrum to communicate. They give and receive information that improves vehicle safety, reduces traffic congestion, and enhances personal convenience.

The hardware that supports this communication inside your vehicle, commonly referred to as on-board equipment (OBE), can come from at least two different sources. You might carry it with you and bring it along when you enter your vehicle. These so-called "nomadic devices" generally give and receive a signal anywhere you take them, if you have sufficient coverage. Nomadic devices include cellular phones, personal digital assistants (PDAs), laptop computers, handheld e-mail readers, and so on. Over time, these devices will tend to converge into single devices with multiple functionality, all set to operate according to your personal preferences. Imagine your phone, MP3 player, PDA, and e-mail device all in one piece that docks into your vehicle, automatically loading your personal preferences for receiving directions, real-time traffic updates, and more. On-board equipment can also be built right in your car, much like your in-dash stereo system or OnStar.

For drivers and passengers, connected vehicle technology promises many useful applications. In the safety area, these include lane departure warnings, blind-spot warnings, automated braking when needed to avoid a crash, route guidance, and more. Beyond safety, applications could include early notification of vehicle maintenance needs, remote engine diagnostics, payment of tolls without stopping, and receipt of traveler information. Passengers could even use their laptops to use the Internet while en route.

Connected Vehicles

Imagine: a vehicle approaches a green traffic light. Meanwhile, a second vehicle runs a red light and enters the intersection, putting the first vehicle in danger. Because these are connected vehicles, however, the system alerts the first vehicle not to enter the intersection, despite the green light, and a crash is avoided. See this link for an animation of this concept.

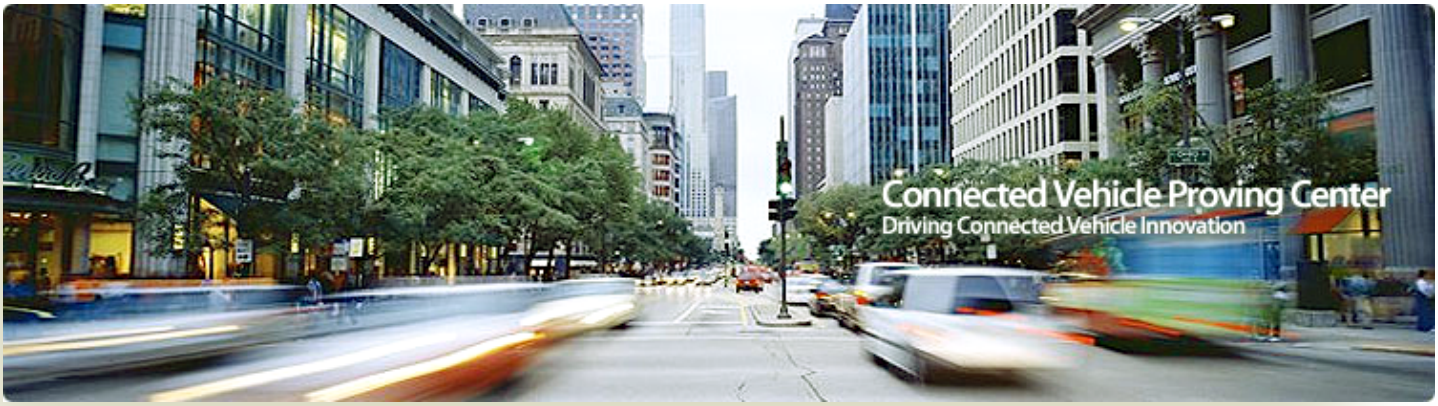
Infostructure

Currently, several communication protocols are competing for a slice of the vehicle communication pie. Cellular technology and future-generations of it (such as 3G) are an obvious entry into this market. In addition, the U.S. Federal Communications Commission has dedicated a block of spectrum at 5.9 GHz for transportation applications. This spectrum supports Dedicated Short Range Communication (DSRC) and Wireless Access in a Vehicular Environment (WAVE). These technologies operate over a range of about 300 meters and offer several highly desirable characteristics for safety applications, including high reliability and very fast transmission time.

DSRC and WAVE are not the only options for connected vehicles, however. Cellular voice and data networks are pervasive through the U.S. and beyond, and connected vehicles can use these communication channels, too, especially for applications that do not require instantaneous transmission times. Next generation cellular networks, sometimes referred to as 3G (for third generation) and eventually 4G (fourth generation) will make digital cellular

even more powerful for connected vehicle applications. Furthermore, communities and business across the U.S. are building WiFi networks to support mobile computing, and connected vehicles are capable of linking with these channels, too.

Other technologies are also coming along, such as WiMAX, and these also offer advantages, such as longer range. Satellite communication channels are also a future possibility. Already, we use satellites to obtain geographic and spatial data from the global positioning system (GPS), and new satellite technologies, including an updated GPS network, are on the horizon.



Infrastructure

Historically, vehicles and the roadways have been designed and built without much contact between the automotive industry and transportation agencies. While this separation has generally worked, it has also resulted in some negative outcomes: 42,500 traffic deaths per year in the U.S. and billions of dollars in lost time and fuel due to congestion. We can begin to make significant reductions in these numbers by taking advantage of new technology that allows vehicles and the roadside to communicate with one another.

This communication between vehicles and infrastructure offers numerous advantages to traffic managers. With this communication link in place, vehicles can serve as traffic probes, communicating their speed and location to traffic operations centers so that traffic can be routed around backups and congestion. Furthermore, traffic managers can respond more quickly to crashes and other traffic incidents. This can save lives and allow roads and highways to resort to normal flow more quickly.

The road and highway infrastructure consists of many obvious features: pavement, bridges, signs, culverts, overpasses, traffic lights, guard rails, and so on. Increasingly, it also consists of smart technology that monitors bridge health, weighs trucks as they pass by, collects tolls, and more. This new, digitally enabled infrastructure offers transportation system managers with better data on road conditions, weather information, and other factors that influence maintenance and repair decisions. This will allow them to manage the roads more cost effectively, making better use of our tax dollars.

www.cvpc.com Connected Vehicle Proving Center, The University of Michigan—Dearborn

In the News

Underride guards on big rigs often fail in crashes; Institute petitions government for new standard

ARLINGTON, VA — New crash tests and analysis by the Insurance Institute for Highway Safety demonstrate that underride guards on tractor-trailers can fail in relatively low-speed crashes — with deadly consequences. The Institute is petitioning the federal government to require stronger underride guards that will remain in place during a crash and to mandate guards for more large trucks and trailers.

Rear guards are the main countermeasure for reducing underride deaths and injuries when a passenger vehicle crashes into the back of a tractor-trailer. In 2009, 70 percent of the 3,163 people who died in all large truck crashes were occupants of cars or other passenger vehicles. Underride makes death or serious injury more likely since the upper part of the passenger vehicle's occupant compartment typically crushes as the truck body intrudes into the vehicle safety cage.

"Cars' front-end structures are designed to manage a tremendous amount of crash energy in a way that minimizes injuries for their occupants," says Adrian Lund, Institute president. "Hitting the back of a large truck is a game changer. You might be riding in a vehicle that earns top marks in frontal crash tests, but if the truck's underride guard fails — or isn't there at all — your chances of walking away from even a relatively low-speed crash aren't good.

"The Institute has studied the underride crash problem for more than 30 years, including mid-1970s crash tests demonstrating how then-current guards were ineffective in preventing underride.

In the latest study the Institute analyzed case files from the Large Truck Crash Causation Study, a federal database of roughly 1,000 real-world crashes in 2001-03, to identify crash patterns leading to rear underride of heavy trucks and semi-trailers with and without guards. Underride was a common outcome of the 115 crashes involving a passenger vehicle striking the back of a heavy truck or semi-trailer. Only 22 percent of the crashes didn't involve underride or had only negligible underride, a finding in line with prior studies. In 23 of the 28 cases in which someone in the passenger vehicle died, there was severe or catastrophic underride damage, meaning the entire front end or more of the vehicle slid beneath the truck.

The National Highway Traffic Safety Administration (NHTSA) has estimated that about 423 people in passenger vehicles die each year when their vehicles strike the backs of large trucks. More than 5,000 passenger vehicle occupants are injured.

Crash tests: The study raised questions about how and why guards failed and at what speeds, so the Institute conducted crash tests evaluating three semi-trailer rear guards complying with US rules. Two of the trailers also are certified to Canadian requirements, which are more stringent than the United States when it comes to strength and energy absorption. The tests involved crashing a 2010 Chevrolet Malibu into the rear of parked trailers.

The goal wasn't to evaluate the Malibu's crashworthiness. The midsize sedan is an Institute TOP SAFETY PICK and earns a 5-star safety rating in NHTSA's New Car Assessment Program.

"The aim was to see if some underride guards perform better than others and to identify what crash speeds and configurations produce different types of failure," Lund says. "Damage to the cars in some of these tests was so devastating that it's hard to watch the footage without wincing. If these had been real-world crashes there would be no survivors."

INSURANCE INSTITUTE FOR HIGHWAY SAFETY

In The News

Decapitation is a serious threat in underrides. In 3 of the crash tests the heads of the dummies in the car made contact with either the intruding trailer or the car's hood after it tore free and pushed into the occupant compartment. One such test involved a Hyundai trailer whose underride guard bent forward, sheared its attachment bolts, and broke after the Malibu hit it in the center rear at 35 mph. This was the weakest guard tested. The trailer was manufactured by Hyundai Translead.

In contrast, a Wabash trailer outfitted with a guard certified to Canadian specifications successfully prevented underride of the Malibu's passenger compartment in a center-rear test at 35 mph. The trailer was made by Wabash National Corp. Its guard was the strongest of the three evaluated.

"Strong attachments kept the Wabash guard in place so it could engage the Malibu, allowing the car's structure to absorb and manage the crash energy," Lund says. "In the real world, this would be a survivable crash."

Offset tests: The Institute also ran tests with overlaps of 50 percent and 30 percent to find out what happens when a car hits the trailer with only part of its front instead of head-on.

In a 35 mph test with a 50 percent overlap, the guard on a Vanguard trailer allowed severe underride. The trailer was made by Vanguard National Trailer Corp., and the guard is certified to US and Canadian standards. In contrast, the Wabash trailer's guard successfully prevented underride in the same test. The outcome for the Wabash was different when the overlap was reduced to 30 percent. The struck end of the guard bent forward, and there was severe underride.

In The News

This is how a car looks after a 35 mph full-width crash into the rear of a Hyundai trailer with a weak underride guard.

This is a car after a 35 mph full-width crash into a Wabash trailer with a strong guard. The occupant compartment is intact.

This test shows that even the strongest guard left as much as half of the rear of the trailer vulnerable to severe underride. The guard only worked as intended when the striking car engaged the center.

Offset tests stress guards' unsupported outboard ends. The vertical frame supports that attach guards to their trailer chassis are closer to guards' centers than ends. Preventing underride in narrow overlap crashes like these might mean devising a new way of attaching guards to trailers to utilize the side rails, in addition to requiring manufacturers to conduct compliance tests with guards on trailers.

"Under current certification standards, the trailer, underride guard, bolts, and welding don't have to be tested as a whole system," Lund says. "That's a big part of the problem. Some manufacturers do test guards on the trailer. We think all guards should be evaluated this way. At the least, all rear guards should be as strong as the best one we tested."

Another problem is that regulatory gaps allow many heavy trucks to forgo guards altogether. When they are present on exempt trucks, guards don't have to meet 1996 rules for strength or energy absorption.

"Underride standards haven't kept pace with improvements in passenger vehicle crashworthiness," Lund says. "Absent regulation, there's little incentive for manufacturers to improve underride countermeasures, so we hope NHTSA will move quickly on our petition."

http://www.iihs.org/news/rss/pr030111.html

SEVERE UNDERRIDE was the result of this 35 mph, 50 percent overlap crash test with a Vanguard trailer.

NO UNDERRIDE resulted when the car struck the back of the Wabash trailer in the same overlap test at 35 mph.

More on the Cover Story — Red Light Q&A

Q1 Why do we need red light cameras?

Red light runners cause hundreds of deaths and tens of thousands of injuries each year. In 2009, 676 people were killed and an estimated 130,000 were injured in crashes that involved red light running. About half of the deaths in red light running crashes are pedestrians, bicyclists, and occupants in other vehicles who are hit by the red light runners. An Institute study of urban crashes found that those involving drivers who ran red lights, stop signs and other traffic controls were the most common type of crash (22 percent). Injuries occurred in 39 percent of the crashes in which motorists ran traffic controls. Enforcement is the key to getting people to comply with a law, but communities don't have the resources to allow police to patrol intersections as often as would be needed to ticket all motorists who run red lights. Studies have shown that the presence of cameras reduces red light running.

Q2 How often do drivers run red lights?

A study conducted during several months at five busy intersections in Fairfax, Virginia, prior to the use of red light cameras found that, on average, a motorist ran a red light every 20 minutes at each intersection. During peak travel times, red light running was more frequent. Analysis of red light violation data from 19 intersections without red light cameras in 4 states found that 1,775 violations occurred over 554 hours, for a violation rate of 3.2 per hour per intersection. In a 2010 telephone survey by the AAA Foundation for Traffic Safety, 93 percent of drivers said it's unacceptable to go through a red light if it's possible to stop safely, but one-third reported doing so in the past 30 days.

Q3 What safety benefits do red light cameras provide?

A 2011 Institute study comparing large cities with red light cameras to those without found the devices reduced the fatal red light running crash rate by 24 percent and the rate of all types of fatal crashes at signalized intersections by 17 percent. Previous research has shown that cameras substantially reduce red light violations and crashes. Studies by the Institute and others have found reductions ranging from 40 to 96 percent after the introduction of cameras. Institute studies in Fairfax, Virginia, and Oxnard, California, found that in addition to the decrease in red light running at camera-equipped sites, the effect carried over to signalized intersections not equipped with red light cameras, indicating community-wide changes in driver behavior.

In Oxnard, significant citywide crash reductions followed the introduction of red light cameras, and injury crashes at intersections with traffic signals were reduced by 29 percent. Front-into-side collisions — the crash type most closely associated with red light running — at these intersections declined by 32 percent overall, and front-into-side crashes involving injuries fell 68 percent. An Institute review of international red light camera studies concluded that cameras lower red light violations by 40-50 percent and reduce injury crashes by 25-30 percent.

Q4 Can anything else be done to reduce the number of red light running crashes?

Signalized intersections can be replaced altogether by roundabouts, which have dramatically fewer injury crashes. However, it's not feasible to replace every traffic light with a roundabout, and not every intersection is appropriate for a roundabout. Better enforcement of traffic signals using cameras is a solution that can quickly be implemented on a large scale.

Q5 Isn't conventional police enforcement sufficient?

Police can't be everywhere at once, and red light cameras allow officers to focus on other enforcement needs. Moreover, enforcing traffic laws in dense urban areas by traditional means poses special difficulties for police, who in most cases must follow a violating vehicle through a red light to stop it. This can endanger motorists and pedestrians as well as officers. Traffic stops in urban areas also can exacerbate traffic congestion. (Source: iihs.org/research)

For additional questions, answers, source data, and further information, click here.

STOP! Is it possible to design a better stop sign?

By Tom Vanderbilt — Posted on Slate http://www.slate.com/id/2254863/ on Tuesday, May 25, 2010, at 12:32 PM EST —

In an internet parody called "Internet parody" a designer is given a corporate gig with a simple brief: to design a new stop sign. "We're seeing reports that people don't know what to do at an intersection," he is told, and from there it descends in an absurd spiral of tweaks and redesigns, with the designer's creative vision cast against the slow strangulation of groupthink. While the video is a hilarious send-up of the corporate design process, its premise—that designing an effective stop sign is actually a simple task—couldn't be farther from the truth.

In reality, the design of the stop sign, however seemingly settled, is not necessarily ideal. In 1998, for example, there were more than 700,000 crashes at intersections marked—or "controlled," as engineers say—by stop signs. More than 3,000 of these were fatal. Laura Bush's new biography, Speaking From the Heart, highlights the stop sign's role in the fatal crash she caused in high school: She drove through an intersection marked by a stop sign, striking the car of a good friend and killing him. She notes, among other factors, that the stop sign was too small (current signs are larger, and mounted higher, among other changes).

We don't know what the fatality numbers would look like if modern stop signs were replaced by something else or taken out altogether, but the fact that the sign is at least indirectly implicated in several thousand deaths and hundreds of thousands of injuries every year suggests that traffic engineers should at least look into improving, or replacing, the device.

Indeed, Gary Lauder, a Silicon Valley entrepreneur, was just the latest to propose a redesign of the stop sign during a recent and much-discussed TED presentation. Using the example of a three-way intersection in which a minor road ended in a "T" at a major road, with stop signs all the way around, Lauder calculated that the stopping led to a collective yearly loss in fuel and time valued at roughly $112,000. Why not just use a yield sign on the minor approach? Well, at certain times of the day a queue backs up there, and cars have trouble making the turn. So Lauder proposed a hybrid "stop-yield" sign, simply labeled "Take Turns," paired with the instruction: "If cars are waiting please stop and alternate."

More on the viability of Lauder's design in a moment. But first it's worth considering how we got the sign we have now. Like many forms of traffic instruction, the stop sign has murky origins. It was adapted from railway controls but without rigorous scientific testing. As Kenneth Todd has pointed out, "the traffic control system developed piecemeal. [W]hen large numbers of automobiles burst on the scene early in the century, political pressures, guesswork, and panic measures served as substitutes for scientific expertise." Indeed, historian Clay McShane writes that in 1914, "Detroit Police Sergeant Harry Jackson cut the corners off a square sign to create an easily recognized octagonal shape for first red stop sign or 'boulevard' stop." (The signs were controversial: McShane notes that "Illinois courts briefly ruled stop signs illegal in 1922 as a violation of the rights of individuals to cross streets.") By 1927, a rough standardization of the sign was set in place by the American Association of State Highway Officials. An octagonal shape, with red letters on a yellow background. It wasn't until nearly three decades later that the current design—white letters on a red background—was settled upon, in a 1954 supplement to the Manual of Uniform Traffic Control Devices, the operative rulebook for traffic engineers. Is the current design as good as it could be? There are two ways to think about that problem. We must ask: Do drivers see stop signs? And, more importantly, what do they do when they see them?

For nearly a century, it seems, drivers have been ignoring stop signs. In a 1934 study published in the Journal of Social Psychology, for example, F.H. Allport examined driver behavior at an intersection with a stop sign with approaching cross traffic. A majority (75.5 percent) of drivers came to a full stop—no surprise given the imminent danger. But what about in

cases where no cross-traffic was visible? Would people still stop? A 1968 study in Berkeley, California, published in Law & Society Review, found that just 14 percent of drivers brought their cars to a full stop "without being forced to do so by cross traffic" (the so-called "California roll" was the norm).

No one has more doggedly pursued the question of stop-sign compliance than John Trinkaus, who conducted an annual stopping survey at the same intersection for nine straight years in the 1970s and '80s, finding a creeping decline. In his culminating 1997 masterwork, "Stop Sign Compliance: A Final Look," Trinkaus revisits his old intersection and finds that the percentage of people making a full stop had dropped from 37 percent in 1979 to a mere 3 percent.

Why did this happen? There are several ways to read the data (and they are not necessarily mutually exclusive). On the one hand, traffic is a social environment, and authors like Robert Putnam in Bowling Alone, or Jean Twenge in Generation Me, have argued that stop sign scofflawism is one minor indicator, among many, of a larger societal shift: a decline of civility and reciprocity, a lesser willingness to follow social rules. The argument is that a society marked by increased self-regard (and hence less regard for others), has neither the inclination nor the situational awareness required to accommodate others, whether by signaling one's intentions, stopping for pedestrians in a crosswalk, or heeding the familiar red octagon. On the other hand, traffic engineers have long known that excessive signage declines in effectiveness. This points to something of a Catch-22. Residents of a neighborhood may complain about drivers speeding down their street and petition the city to install stop signs. But stop signs are not a safety device as such, nor a traffic-calming device: They exist to assign right of way. Faced with more stop signs, some studies have shown, drivers may actually drive faster to make up time lost for stopping at (or really, slowing through) the intersection; the more signs installed, the lower the compliance.

John Staddon, a professor of psychology at Duke University, notes another problem: "The overabundance of stop signs teaches drivers to be less observant of cross traffic and to exercise less judgment when driving—instead, they look for signs and drive according to what the signs tell them to do." He reserves particular opprobrium for the four-way stop. The rules of engagement are somewhat informal—most drivers take it to be "first in, first out." What if two drivers arrive at the same time? Traffic laws state the driver to the right has the right of way (good luck with that). If four cars arrive simultaneously—well, it's best that they do not. "Remind me," asks Staddon, "aside from bewildering the driver, what's the point of stopping traffic in all four directions?" The four way stop, he argues, "weakens the force of all stop signs by muddling the main question drivers need to answer, namely: Which road has priority?" (One thing four-way stops have in their favor, however, is a superior safety record to two-way stops—and to traffic signals, for that matter).

Which brings us back to Lauder's suggested "Take Turns" sign. In the rarefied TED air, where the world is being saved and the old certainties boldly challenged by 15-minute PowerPoints, the idea seems sensible and perhaps even inspired. But the world of traffic is a more complicated place. For one, given the lack of compliance at stop signs, what's to ensure proper behavior in a less clearly demarcated situation? What if three cars approach simultaneously? What if a driver approaching fast on the main road assumes that his speed gives him priority, while the entering driver thinks the fact that he's pulled up to the new sign first gives him priority? (The costs estimated by Lauder in lost wages and fuel are vastly less than the costs of a fatal crash). And what should cars do if pedestrians are present? Lauder is right about the futility of that intersection, but wrong in his solution: If the money saved could indeed buy the adjacent property, then the best solution would be to simply install the safest and most smoothly flowing solution of all: A roundabout.

STOP! Is it possible to design a better stop sign?

(Continued)

Of course, there are plenty of intersections in America that are "uncontrolled." In Portland and Seattle, for example, local neighborhoods are filled with any number of four-way intersections without any signs. And somehow drivers continue to negotiate these intersections safely, year after year, in the absence of clear instruction.

If traffic volumes rise above a certain threshold or a crash pattern evolves, other measures are taken—a roundabout may be built, traffic-calming measures deployed, or signage installed. And it is these latter cases, when some form of signage is required, that brings us to the question: Does the stop sign need to be reformed? Actually, the "stopping occasion," as the viral parody put it, has been tinkered with quite a bit. Engineers have sought to remedy visibility and compliance problems by adding any number of add-on accessories to the stop sign, among them "stop lines" painted on the road, rumble strips in advance of the stop, or flashing red lights on top of signs. One study tested a stop sign beneath which were posted a pair of LED eyes, roving back and forth—the idea was a meant as a reminder to look both ways. The study reported a reduction in "right-angle conflicts"—the most dangerous thing about intersections—though this may have merely been a novelty effect.

Interestingly, eyes were more effective than a "look both ways" text add-on. But what if the sign is not visible to begin with—what if it's obscured by a low-hanging branch or a double-parked truck? That's the thinking behind a new stop sign treatment being tested in Nye County, Nevada. Called "Drivers Alert," it attaches a secondary stop sign to the back of the stop sign across the intersection, giving the driver two chances to see the sign. It also graphically advises whether cross traffic is meant to stop or not, a fix that others have suggested. (Some engineers have proposed making stop signs at two-way stops orange, to immediately distinguish them from four-way stops.) Whether this effort is superfluous given existing visibility-reinforcing treatments (e.g., the stop bar) or, per Staddon, simply gives the dumbed-down driver more things to look at apart from what's happening on the road itself is open for debate.

The proposed solution also raises the interesting question of how we see (or do not see) stop signs. In large part, we see stop signs because they tend to exist where we expect them to exist (trouble begins when our "expectancy" is violated). But in crashes, the largest problem is not visibility but driver behavior—drivers either do not come to a full stop or pull out too close to an approaching car (one study found that only 17 percent of crashes at stop-sign controlled intersections involved drivers who "blew" the sign). In this regard trying to improve driver behavior through better signage is as futile as fighting illiteracy with better fonts.

Tom Vanderbilt

Underlined/color text linked to original files. To proceed to link, left click on the mouse while pressing control. For additional articles by Tom Vanderbilt, visit www.howwedrive.com.

CALIFORNIA ASSOCIATION OF ACCIDENT RECONSTRUCTION SPECIALISTS

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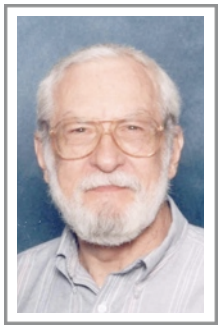
Book Review

Fundamentals of Forensic Mapping

Courtesy of Joseph Badger



Mick Capman, founder of the Great Lakes Accident Reconstruction Society and better known as the Grandfather of Forensic Mapping, evidently was the driving force behind the latest book to come down the pike for accident (crash) reconstructionists. Kent Boots and Joel Salinas put their heads together to put together an exhausting 233-page essay titled Fundamentals of Forensic Mapping. (I can call Mick the Grandfather of Forensic Mapping since he and a colleague "first coined the term 'Forensic Mapping System' while driving to IPTM/Special Problems in 1992-93." Says so, right on page six.)

Of that coined term, Capman said, "Forensic Mapping has been officially tagged by myself as our trademark (USTMO) since the early 90's ... only in an effort to 'protect' the term from use by those outside public safety (engineers, surveyors, and others from the dark side) and private recon folks. No way, no how could I stand by and let what Forensic Mapping means/stands for, in law enforcement, and see it 'claimed' by folks outside our discipline."

Mick wrote the book's "Forward." And don't look at me like that, I know it's a Foreword, but Mick is bigger than I am and he can spell it anyway he wants.

I asked Mick to comment on the Boots & Salinas book. He offered: "Kent Boots and his partner Joel, co-authors of Fundamentals of Forensic Mapping, have strived, as I have, to keep it simple by penning a good read that fills the need for an unbiased, fair and all encompassing read on the complexities involved with combining 21st Century theodolite technology, with the deliverable being a precise to-scale diagram. Kent and Joel's book should be in the library of every agency using Forensic Mapping technology, along side their copy of the Skills Handbook of Forensic Mapping.

The folks who published the book have a website, www.kineticenergypress.com where you can read about this book as well as others. If you purchase the book online, the cost is $65 plus $4 s&h or $6 if you want it sent by Priority Mail.

Let me tell you about the first-of-its-kind book. It is both a "How-To" book and an encyclopedic reference work. According to the publisher's website, "This new publication, the first comprehensive text published on the subject of Forensic Mapping, provides a refreshing overview of the topic and a detailed discussion of the ingredients that combine together for effective and successful mapping of complex scenes."

It covers specifically "three main software manufacturers who have developed software specific to crash and crime scene investigation; The CAD Zone, MapScenes, and Visual Statement. Each of these companies has developed both diagramming software and data collection software. Versions of the various programs current at the time the book was written are the only ones being covered, not older versions."

Probably the neatest thing about the book is not the printed text but the CD-ROM that comes with it that allows you to search the entire text. Although the CD-ROM has 17 different files (including an Adobe reader if you don't have one on your computer), one of those files called Fundamentals of Forensic Mapping.pdf has the entire 233-page book in one handy place. You can copy and paste both text and pictures for inclusion in a report.

Or use the document's search feature to find that elusive section you wanted to reread (a feature I used more than once to write this review).

Although the 8½ x 11 book itself is easy to carry around (it has a soft cover), I think you will enjoy the CD-ROM version largely because the pictures are in fantastic color. (The publisher naturally chose black and white photos for the print version to keep the cost down.)

Upcoming ACTAR Examination Dates and Locations

A U G U S T 2 0 1 1

Sunday, August 21: Alymer West, Ontario, Canada, at the Ontario Police College. Sponsored by CATAIR. New Applications must be received by June 21, 2011. Exam Registration Cutoff Date: July 21, 2011.

S E P T E M B E R 2 0 1 1

Friday, September 16: Bend, Oregon, at the Bend Fire Training Facility. Sponsored by the Oregon State Patrol. New Applications must be received by July 16, 2011. Exam Registration Cutoff Date: August 16, 2011.

Sunday, September 18: Bloomington, Illinois, before the IATAI Conference. Sponsored by IATAI. New Applications must be received by July 18, 2011. Exam Registration Cutoff Date: August 18, 2011.

Monday, September 26: State College, Pennsylvania, prior to the PSP Reconstruction Seminar. Sponsored by PSP. New Applications must be received by July 26, 2011. Exam Registration Cutoff Date: August 26, 2011.

O C T O B E R 2 0 1 1

Wednesday, October 4: Harrisburg, Pennsylvania, in conjunction with the Joint Conference. Sponsored by NATARI. New Applications must be received by August 4, 2011. Exam Registration Cutoff Date: September 4, 2011.

Monday, October 17: Seattle, Washington, in conjunction with the Fall WATAI Conference. Sponsored by WATAI. New Applications must be received by August 17, 2011. Exam Registration Cutoff Date: September 17, 2011.

Wednesday, October 19: Anaheim, California, in conjunction with the Fall CAARS Conference. Sponsored by CAARS. New Applications must be received by August 19, 2011. Exam Registration Cutoff Date: September 19, 2011.

ALL TEST DATES ABOVE SUBJECT TO NEW TESTING REGULATIONS, WHICH PROHIBIT THE USE OF ELECTRONIC DEVICES FOR TESTING. THIS NEW POLICY WENT INTO EFFECT MAY 1, 2011.

GO TO www.ACTAR.org FOR ADDITIONAL INFORMATION.

from the bookshelf

There are over 50 words and terms defined in the Glossary, in case you forgot what EDMI stands for or you want to know exactly what a Theodolite is.

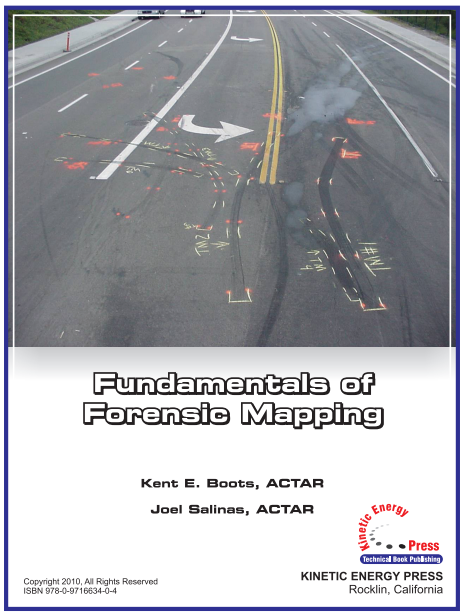
Should you be just starting out to do forensic mapping of crash—and interior crime—scenes, Fundamentals of Forensic Mapping is a must-read; however, I suspect old-timers who have been around the transit and laser plummet a few times will have a few a-ha moments reading it, too.

I asked the authors why they wanted to write the book in the first place. They responded:

(Boots) "Many people in the accident reconstruction and crime scene investigation industries do not know what Forensic Mapping is. Too many times the term 'surveying' is used in conjunction with the use of a total station in crash and crime scene documentation. There are plenty of books on surveying but there was not a single book on Forensic Mapping. I felt it was time that a book be written on Forensic Mapping and was excited about the possibility it would be the first one. I teach Forensic Mapping on a somewhat regular basis. PowerPoint presentations are nice during a lecture but they don't make good reference sources after a class. I wanted to be able to give my students a textbook they could use to reference during the class and—more importantly—after the class."

(Salinas) "As a Forensic Mapping instructor, I had a first-hand opportunity to see what students and officers were lacking and what problems they encountered in the field while mapping both crash and crime scenes. I don't think that any instructional course could cover in detail what was covered in the book. Certainly not in a 40-hour training class. A lot of what I wrote about was first hand experience regarding problems that came up as well as ideas that I developed for making mapping of certain scenes easier. If you take a look at the trouble shooting chapter, these are all situations I encountered first hand."

Book Review, continued



I asked the authors what they expected the reader to get out of the book. They replied:

(Boots) "The reader will hopefully gain a better insight as to the theory and concept behind how a total station works; many training courses do not include this information. They will also learn the basics and gain valuable insight into how to apply the concepts out in the field. It was written as a 'how-to' book regarding the practical application of the equipment out in the field. The reader will benefit from our combined years of experience and techniques we have discovered. It is also a reference book in that all of the components and many of their options are described. This will be helpful to the reader if they need to make any equipment purchases or upgrades to existing equipment. The reader would definitely need to attend a class, and we even indicate in the book in more than one place that the book is not intended to be a substitute for formal training. Most survey supply companies provide 1-3 days of training. This basically teaches the user how to set up the instrument and take a few shots. The surveyor teaching the class usually doesn't know anything about Forensic Mapping."

(Salinas) "What I wanted to accomplish is to have the book serve as a resource for anyone with basic training in the field of FM. For someone who has received no training my hopes were that they could pick up the book and get a basic understanding of the equipment, the various software packages, and make an informed decision when it came time to get started in the right direction.

"I have heard stories of law enforcement agencies buying equipment from a survey shop without consulting others. The survey shop provides basic training in how to operate the equipment with no application to the forensic market.

"This book is not meant to replace any instruction material put out by the manufacturer. If anyone has ever tried reading the instruction manual that came with their Total Station, they would realize that it is geared toward the surveyor who has an understanding of survey practices. The field of Forensic Mapping, although it uses similar equipment as a surveyor, is completely different in a lot of respects."

If you have any questions about the book—or forensic mapping in general—feel free to contact either author by e-mail. (Boots at kent@factualdiagrams.com; Salinas at joelsalinas@sbcglobal.net.)

If you go to the website (see above), you will find a list of the "Topics Covered by this Book." Not printed in the published text, but included on the CD-ROM are 13 appendices, including: Court Citations where expert or specialized testimony was permitted by crash/crime investigators on the use of total station technology for diagramming (mapping) crash or crime scenes; a Forensic Mapping Worksheet; mFX Quick Start Reference Guide; and more. (The book has 25 references to "mFX" and I wasn't sure what that acronym meant. Mick Capman provided an explanation: "Visual Statement uses 'mFX' to mean their MOBILE diagramming software, that installs on most Windows-based external data collectors (TDS Recon & Nomad, for example)."

To contact the publishers, you may call Kinetic Energy Press in Rocklin, California, at 916-770-9475, or send an e-mail to: readme@KineticEnergyPress.com. Order online at www.kineticenergypress.com.

Joseph E. Badger is an internationally known accident reconstructionist who has had over 100 articles published in such periodicals as Law and Order magazine, Accident Reconstruction Journal, Accident Investigation Quarterly, and others.

Recent Case Decision

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9th Circuit Court of Appeals Issues Favorable Red Light Safety Camera Opinion

Press Release Source: American Traffic Solutions On Friday April 1, 2011, 7:19 pm EDT

SCOTTSDALE, Ariz., April 1, 2011 /PRNewswire/ — The United States Court of Appeals for the 9th Circuit has issued a unanimous opinion validating the legality of service contracts between cities and safety camera companies.

ATS applauds the 9th Circuit's ruling, which affirms widely recognized industry standards relating to "cost neutrality" in municipal contracts with cities. The Court also upheld the fine amounts assessed by cities for safety camera violations. The ruling (No. 10-35222 decided March 31, 2011) is a ground-breaking decision on photo enforcement programs with national implications.

"Cost neutrality" allows cities to delay payment of fixed service fees until their revenue exceeds fee obligations. The 9th Circuit held that even if cost neutrality "alter[s] the timing of fee payments in accordance with monthly revenue fluctuations," cost neutrality does not unlawfully "base the amount of fees upon a portion of the revenue generated" (emphasis in original). In addition, the Court determined that fee provisions calling for supplemental fees in exchange for supplemental work are "permissible because they constitute compensation . . .based . . . upon the value of the . . . services provided or rendered in support of the system." Finally, the Court also rejected the violators' argument that the fine amount assessed exceeded statutory limits.

"This decision effectively settles questions regarding the legality of cost neutrality provisions in contracts for photo-enforcement programs. The ruling also confirms what our U.S. clients and hundreds of communities nationally have long argued," said George Hittner, ATS' General Counsel. "Photo-enforcement is a legal, successfully-proven tool that assists communities in improving public safety on local roadways. This is the fourth time in two years a federal appeals court has ruled in favor of camera safety programs; providing further confidence to our customers that these programs are legal, constitutional and in compliance with federal and state law."

Although the ruling interprets Washington law, many states have similar statutes and as a result, the ruling has broad application across the country. ATS worked with outside counsel Stoel Rives, L.L.P., a Northwest-based national law firm, to secure this decision.

About American Traffic Solutions:

ATS is proud to be the market leader in Road Safety Camera installations in North America. ATS has more than 2,600 installed Intersection and Speed Safety Cameras serving more than 30 million people. We have contracts in 240 communities in 22 states and Washington, D.C., including: Fort Worth, Kansas City, Los Angeles, Memphis, Miami, Nassau County (NY), New York City, Orlando, Philadelphia, Seattle and St. Louis. ATS also offers PlatePass, an automated electronic toll payment service that enables rental vehicle customers to use high-speed, cashless electronic toll lanes. ATS is a privately-owned, U.S. corporation. For more information, please visit: www.atsol.com or www.PlatePass.com.

Trea$ury Report

Balance as of May 15, 2011 — $22,783.64

June 1, 2010, through May 15, 2011

Income:

Advertising — $315.00
Conference — $3,482.41
Membership — $19,050.00
Magazines — $144.00

Expenses:

Quarterly Training, 2011 YTD — $3,344.17
Administrative — $3,600.00
Board Meetings — $475.78
Banking Fees and Taxes — $200.00
Magazine Subscriptions — $144.00

Red Light Cameras...Last Thought

Per the Insurance Institute for Highway Safety, over 100 cities in California utilize red light cameras. Like other government policies and programs, camera enforcement requires acceptance and support among the public as well as elected leaders. Some opponents of automated enforcement raise the "big brother" issue to stir up disapproval, and voters in a few cities have rejected cameras.

Still, acceptance of cameras always has been strong. A 2000 Institute survey conducted in ten US cities, five with red light cameras and five without, found more than 75 percent of drivers supported the cameras. A 2002 nationwide survey sponsored by the National Highway Traffic Safety Administration also found favor among 75 percent of drivers.

In a survey by the Virginia Transportation Research Council at six locations in the state, almost two of three respondents supported red light cameras.

Still seems like many people go with the sign to the left, though...

the CORNER

TRAINING

Q3 Third Quarter Training

CRASH RECONSTRUCTION CASE STUDIES

Presented by Peter H. Rast, Collision Forensics
& Michael Allison, ARI Investigations

Northern — July 20, 2011
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Roseville, CA 95678

Southern — August 3, 2011
Jessie Turner Community Center
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Fontana, CA 92336

Please RSVP to training@CA2RS.com so we can accomodate all attendees appropriately

2011 Fall Conference Preview

The CAARS Fall Conference will once again be held at the Sheraton in Anaheim!!!

ACTAR Examination — Wednesday, October 19

Conference Sessions — Thursday, October 20 to Saturday, October 22

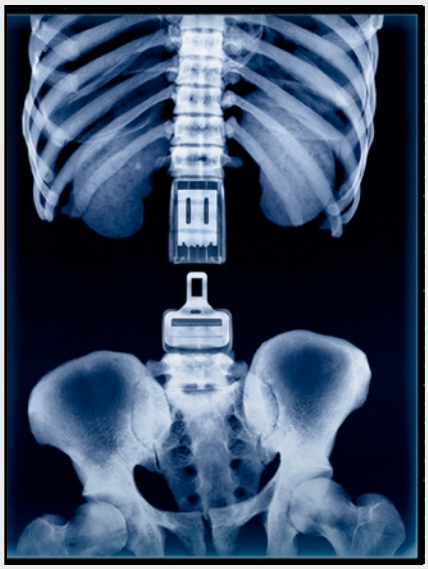
Topics — Air Bag Fundamentals, CDR Technology Updates, Forensic Testing & Analysis of Seat Belts, Child Restraint Systems, Air Bag & Seat Belt Injuries

Speakers Include — Dr. Richard Robertson *(Biomechanical Consulting)*, Rick Suarez *(Rick Suarez Consulting)*, Kent Boots *(FactualDiagrams.com)*, Kurt Weiss *(Automotive Safety Research, Inc.)*, and Karen Haverkamp *(Riverside Police Department)*

Registration Fees —

Received on or before August 15, 2011:	$275 Member / $350 Non-member
Received August 15 to September 4:	$325 Member / $400 Non-member
Received September 5 to September 30:	$375 Member / $450 Non-member
Received October 1 to conference date:	$450

Vendor Fees —
Received on or before September 4 — $275
Received on or after September 5 — $325



Be sure to join us for a great conference!!

Q4 Conference Preview

For additional information, please visit the CAARS website or contact training@ca2rs.com. Online resgistration coming soon!!

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