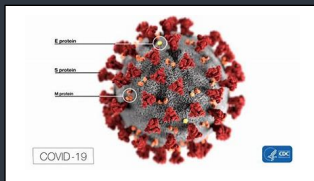


EVOLUTION

McKinzie & Associates Accident Reconstruction Services is being rebranded as the **Post-Crash Group**.

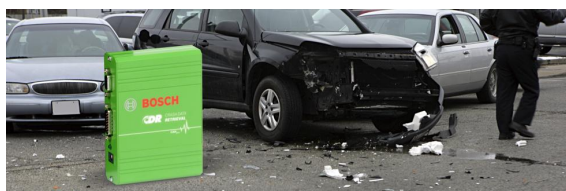
As part of this new operation we have upgraded our CAT service with new communication software.

Considering the Covid-19 pandemic,



we have secured exemptions as an essential business under Executive Order 20-16 for field operations ([KEFF 100 Connect: |N/A|, KEFF 200 Distribute: |N/A|, KEFF 300 Manage: |05|11|19 KEFF 400 Supply: |N/A|]) such as emergency site examinations and vehicle autopsies to ensure critical physical evidence isn't lost. We are required all CDC and OSHA appropriate safety protocols as recommended by the Kansas KEFF office. Calls to our office will be forwarded to our satellite work stations while we alternate staff at the office in Overland Park.

Reconstructionists
Overland Park, KS.
Kris Keberlein
Curt Haberlach
Springfield MO.
Brian Reeves



Electronic Data Recorders

Let's look at a data source commonly used in the field of motor vehicle crash reconstruction, the Airbag Control Module (ACM). The ACM is known by several names: The Black Box, EDR, RCM, SDM, etc. A closer look at this data source is necessary to explain what information it provides, how to use the data, how it too relates to the driver, and how to link this data to the event you are examining.

The ACM is just an electronic monitoring device inside light trucks and passenger vehicles. The purpose of this module is to monitor the telemetry of the vehicle then make decisions on whether the airbags in the vehicle need to be deployed and at what rate. Sounds simple enough, well not really. As in life, to make a good sound decision on ever changing environments one needs data, lots of it and the ability to process the data. The data everyone is interested in is, *SPEED* of the vehicle. While this is important it is not the only or most important information. The *speed* listed in the report is actually the *Indicated Speed*. In other words, a number determined by the vehicle speed sensor and displayed in the instrument panel. Why should I be concerned with this?

A short story will explain. Say you are in a pickup truck. The streets are wet. You are in a hurry, so you hit the accelerator pedal a little harder than normal and you spin the wheels. The vehicle is not moving; however, the rear tires are spinning, and they indicate you're moving at the 58 MPH in a 30 zone. While this is an over simplified example, when you get hit and the EDR indicates you are 18 over the limit, it's going to be a bad day if you don't understand limitations.

Since speed is not always the best data, what other data is available? The reports generated can contain information concerning the accelerator pedal, brake pedal, engine speed (RPM), ABS, ASC activity, steering angle, transmission gear, seat belt usage, the driver's seat position, presence and size of front seat passengers, and the change in velocity the vehicle experienced.



This issue

EDR In's and Outs P.1

ACTAR P.2

Forensic Mapping methods P.3

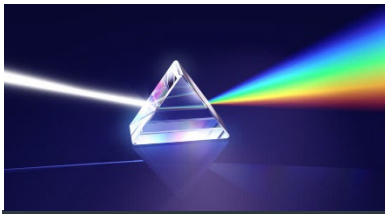
Trends & New Software P.4

While this is not an exhaustive list of data most vehicle manufactures gather, it explains there is more to these reports than just how fast was the vehicle going. You must be aware the data can be incorrect and is a supplement to a complete reconstruction and not a replacement. It can provide quick guidance if the data is vetted.

The data from these reports is not stand-alone. In other words, the data must be examined in the light of the rest of the world. It must be compared to the information from the scene. Does the road surface support the type of event recorded? Also, compared to the damage sustained by all vehicles involved in the event or series of events. Thoroughness of gathering additional information regarding the event is the key to strengthen the conclusions rendered from the data contained in the ACM.

What the vehicle was doing is only part of the story. The operator of the vehicle is a key component in the investigation. The ACM can also give indications of the operator's actions. Brake switch activated may not mean 100% braking. Was the ABS or ASC system activated? At what point during the sequence of events did the operator start to brake? These are just a few scenarios which show how viewing all the information is necessary to gain a better understanding of the event.

When considering reliability of the data, it is equally important to look at the totality of the data. By taking everything into account a clearer picture can be developed of the environment. When examining all aspects, there can be warning signs that some or all the information is suspect. Without training and experience in using this data those warning signs can be missed. Resulting in an improper conclusion of fact based on information that was improperly weighted.



Elements of a Reconstruction

Highway Geometry

The design of our modern highways is among the best in the world. The “as built” highway is what we utilize as we move about. Documenting the condition of the highway as close to the time of the crash as possible is important.

Mechanical Factors

While not a common cause of crashes, we examine operability of mechanical components to determine contribution to the cause if any.

Atmospheric Conditions

Weather affects all aspects of the transportation system, from traction to visibility.

Human Factors

Human factors is an established science that uses many disciplines (such as anatomy, physiology, physics and biomechanics) to understand how people perform under different circumstances. We study human factors as it relates to the planned travel and execution of vehicle control in our transportation system.



POST-CRASH GROUP

In 1985, the National Highway Traffic Safety Administration (NHTSA) provided a grant to develop national guidelines for the standardization of training in the field of traffic accident reconstruction. A task force of accident Reconstructionists, engineers, police officers, educators and attorneys met and developed a report entitled Minimum Training Criteria for Police Traffic Accident Recons. In that report, the task force addressed certification of individuals in the field and recommended that “a certification board be formed” to accredit investigators and Reconstructionists. Five years later, eleven professional accident reconstruction associations with world-wide representation met to explore the possibility of forming an internationally recognized accreditation program open to both public and private accident Reconstructionists. The [Accreditation Commission for Traffic Accident Reconstruction \(ACTAR\)](#) was the result of that coalition. The Governing Board of Directors is comprised of one representative from each participating organization. The GBOD includes police officers, engineers, educators and private consultants all working in the field of traffic accident investigation and within the United States and Canada. Today the board is comprised of 25 organizations from the US and Australia. While ACTAR’s original mission publicly remains the same, testing for minimum standards 35 years ago may no longer be sufficient.

ACTAR

What is it and why?

by Steve McKinzie ∞

My experience with ACTAR began in the early 90’s and I earned my accreditation in 1993. There is no college degree available for accident reconstruction and there is no certification available from any governmental organization. ACTAR is a self-governing **PAYGO (Pay As You GO)** private organization. In 1993 as a member of the Illinois Association of Technical Accident Investigators I was solicited to represent IATAI by filling a seat on the ACTAR Board of Directors. Immediately after filling that seat, I was selected to fill two positions. 1 as Chair of the Special Operations Committee and with much larger time requirements as Chair of the Continuing Education Units committee. For six years I approved virtually every CEU application submitted for accredited individuals from across the world. As the 35-year-old organization struggled from a shoe box organization to serving over 3500 ACTAR accounts, a decision was made to modernize the application, renewal and CEU process to a custom software operated through a web portal. The selection process by the board was to hire the daughter of the previous ACTAR chairman to develop the electronic process. After nearly two years a new system had not been launched. Under threat of litigation the contract was settled with payment being made for an unfinished product. In the interest of service, I volunteered to manage the development of the project.

The multistage application process was moved to a fully online application with features allowing the applicant score to be easily managed while working toward the approval. While the testing process is still an in-person event, all aspects of test management is now electronic. Once an individual is accredited their account now tallies their CEU’s and provides notices of status toward accreditation renewal. The CEU process starts with a course being submitted for assessment of credit hours according to ACTAR policy. Course instructors, both private and public apply to have their courses evaluated for training hours. Group applications are another category of CEU applications as training is offered by the member organizations. All the CEU operations were included in the new ACTAR online management system.

The ACTAR CEU Chair is responsible for the day to day operation and management of course scores. After the CEU committee had individually scored a course. The committee Chair would post the results or personally evaluate the course curriculum to decide conflicts and determine the number of CEU’s it would be awarded pursuant to policy. Additional tasks are associated to recommending policy change and evaluation of published papers both peer reviewed and published. In future ACTAR articles you’ll learn the system, accreditation cost and adjudication of complaints.

Forensic Mapping Methods?

by Steve McKinzie ∞

Total Station



The Sokkia iX1005 is a fully robotic electronic total station that is coupled with a SHC5000 data collector. Points of geometry can be captured about as fast as a person can walk. As we examine the approach path of each vehicle, we document roadway evidence and highway geometry. This data is used to create maps from which distances, angles and elevation changes are determined. The post impact movement of principle objects in the event are key to determining how and then why the collision occurred. We have a range with this instrument of over a mile and accurate to about .2 inches at 1000 ft.

Laser Scanner



The Topcon GLS 2000 is a trusted laser scanner used mainly in construction and BIM (Building Information and Modeling). Selectable laser modes from Class 3R to Class 1M provide complete eye safety. The multiple lens array system quickly switches focal length settings. The auto temperature adjustment provides consistent accuracy throughout the workday. Precise Scan Technology controls signal processing including wave form for the ultimate in precise data. We deploy this technology in dangerous locations or to model involved vehicles.

UAS Photogrammetry



The Microdrones MD1000dg is a commercial grade heavy lift UAS remotely piloted aircraft. In this configuration the payload is a Sony Sony RX1R II 42.4 Mg digital camera. You may have heard that RTK and PPK are the best aerial mapping technologies. That's because they were – back in the 80s and 90s. Today, direct georeferencing is the most advanced technology available. We deploy this aircraft in unique cases when evidence collection demands this high level of accuracy and it provides graphic images that are unmatched in aerial mapping, unless you own a predator. All members of the Post-Crash Group are certified FAA pilots for UAS operations.

In-Put ACE

The POST-CRASH GROUP supports multiple formats of video data.

Every case has the potential to be captured by video. Whether moving or stationary the original video data is critical to secure. A cell phone video of a computer screen playing the original only has metadata from the cell phone, not the original. The **original video** metadata coupled with **roadway geometry** makes a time distance analysis solid evidence and a meaningful demonstrative to the trier of fact..

EDR data from

commercial vehicles are supported from Caterpillar, Cummins, Detroit, Navistar Paccar Mack and Volvo

BOSCH [Crash Data Retrieval](#)

System Its important to remember all vehicle data imaged should be reread before final determination of a case.

The current version is 19.3 See a list of all supported vehicles at https://www.boschdiagnostics.com/cdr/sites/cdr/files/CDR_v19.3_Vehicle_Coverage_List_R1_0_0.pdf

All electronic data must be obtained in compliance with the 2015 driver privacy act.

You may request this vehicle authorization

This Quarter's Q&A Technology Tip

Q: How long does roadway evidence last?

A: by Curt Haberlach π

It depends. Roadway evidence is generally divided into two categories, long and short lived. Long lived, includes the physical scars such as gouges, chops and grooves. Short lived includes tire friction marks, tire imprints (such as in mud and grass), scratches, fluid stains and debris fields including broken glass, vehicle parts and contents. Physical scars that are often found after major collisions, can frequently be found until the road is resurfaced. In collisions involving smaller and slower vehicles, fluid stains and a debris field may be all that was created.

They will likely be cleaned up when the vehicles are removed. The amount of time tire friction marks will last, varies greatly depending on the composition of the road surface, amount of traffic traveling over them, weather conditions and the original prominence of the mark. Photographs at the time of the on-scene investigation are critical because they may be the only chance reconstructionist will ever have to see what and where the evidence was.

Our deployment protocol is governed by time. If a case is opened **within ten days of occurrence**, we consider this an urgent matter. Beyond ten days it is usually an advantage to have scene photographs in hand during our site visit. It's a good rule to obtain police photographs quickly, if you lean none were taken. **Don't go to bed without acting.**

Chat a question to us at <http://www.rsmck.com/LiveChat.html>



Professional Development

A dedicated support staff keeps The POST CRASH TEAM moving.

Upcoming topics

- Reading a Crash Report Diagram
 - When geometry doesn't match witnesses
- How and when should I activate the CAT, (Catastrophic Accident Team)
 - -<http://www.rsmck.com/cat.html>
 - 877-851-5831 OPT 2 and ONLY 2
- GNSS, when it is reliable?
- Pit Masters
 - Our relaxation

The POST-CRASH GROUP also supports Tesla, Hyundai and Kia in all supported years.

Post-Crash Issue 02 April 2020



16012 Metcalf, Ste 300
Overland Park KS 66085

4319 South National #279
Springfield, MO 65810

877-851-5831 ph
913-851-5831 fax
www.rsmck.com
www.csimapping.com



POST-CRASH
GROUP