CLM CLAIMS & LITIGATION MANAGEMENT ALLIANCE™

ADVANCING ETHICS, COOPERATION AND EDUCATION

CLM 2015 Transportation Conference
June 18-19, 2015 in Omaha, NE

You've Just Been Notified of a Serious Collision, Now What?

I. Transportation

Transportation involves the process of three primary components: the drivers, the vehicles, and the environment. How these components interact with each other enables us to get from place to place. Collisions are a result of 1, 2, or 3 of these components failing to work properly. Understanding how these components interacted will help you to best evaluate your claims. It is important to be aware of the time-critical facts and information that is available after a collision.

II. Vehicles

"Black Box" Data

"Black Box" Data is the often used laymen's term to describe event-data recorders. While the "black box" devices within passenger vehicles and commercial vehicles are quite different from each other, both of their event-data recorders can contain extremely valuable data such as second-by-second inputs for speed, throttle position, brake status, and more.

Passenger Vehicles

The device that most often contains collision related data within passenger vehicles is the airbag control module. Generally, these devices record certain data when triggered by events. An "event" is considered a significant movement of the vehicle that exceeds a certain threshold. An event does not necessarily mean that the airbags have deployed, rather it means that the airbag control module needed to evaluate the situation and determine if the airbags should or should not deploy. The majority of modules are capable of recording data during deployment events and non-deployment events. The data is typically captured for five seconds prior to impact. A portion of an exemplar data download can be seen in Figure 1.

Pre-Crash Data -5 to 0 sec [2 samples/sec] (Event Record 1)

(the most recent sampled values are recorded prior to the event)

Time Stamp (sec)	Speed, Vehicle Indicated (MPH [km/h])	Engine Throttle, % full	Service Brake (On, Off)
-5.0	27 [44]	18	Off
-4.5	28 [45]	21	Off
-4.0	28 [45]	20	Off
-3.5	29 [46]	19	Off
-3.0	29 [46]	15	Off
-2.5	29 [46]	2	Off
-2.0	29 [46]	0	Off
-1.5	29 [46]	0	Off
-1.0	28 [45]	0	Off
-0.5	27 [44]	0	Off
0.0	27 [44]	3	Off

Figure 1 Exemplar section of a Crash Data Retrieval Report

Acura, Audi, Bentley, BMW, Buick, Cadillac, Chevrolet, Chrysler, Dodge, Fiat, Ford, Geo, GMC, Honda, Hummer, Infiniti, Isuzu, Jeep, Lamborghini, Lancia, Lexus, Lincoln, Maserati, Mazda, Mercedes-Benz, Mercury, MINI, Mitsubishi, Nissan, Oldsmobile, Pontiac, RAM, Rolls-Royce, Saab, Saturn, Scion, smart, Suzuki, Toyota, Volkswagen, and Volvo among others have all manufactured at least some vehicles that are capable of containing collision related data. Please refer to the attached Event-Data Recorders (EDR) List for a complete listing of vehicles by year, make, and model.

In addition to the airbag control modules, certain Ford vehicles contain a downloadable powertrain control module and certain General Motors vehicles contain a downloadable rollover sensor. For the purposes of collision data collection, both of these devices work in a similar fashion as airbag control modules.

This data can be accessed using the Crash Data Retrieval software and module.

Commercial Vehicles

The device that most often contains collision related data within commercial vehicles is the electronic control module. The event-data recorders for commercial vehicles work vastly different than a passenger vehicle's airbag control module. The basis for the difference is that heavy vehicles are typically not equipped with airbag control modules and there is significantly less of a necessity to have an airbag within a heavy vehicle since the forces experienced by the occupants of a collision within a heavy vehicle are

generally extremely less than that of a passenger vehicle. Therefore, the triggers for recording event data must also be different.

The most common captured event data information is generally categorized as a Sudden Deceleration. Vehicles capable of recording sudden deceleration data have set deceleration trigger values that when met indicate to the module to save that data. Deceleration triggers are a change in speed of the vehicle of typically between 7 to 10 mph over one second. The data is captured for over a minute prior to the trigger and usually 15 seconds after the trigger. A portion of an exemplar data download can be seen in Figure 2. Note that this vehicle experienced a change in speed of 13 mph from traveling 26 mph at Time 0 and then traveling 13 mph at Time 1.

Time (Seconds)	Vehicle Speed (mph)	Engine Speed (rpm)	Engine Load (%)	Throttle (%)	Brake Status	Clutch Status
-9	18	1070	0.0	34.0	-	On
-8	19	1166	68.4	67.0	-	On
-7	20	1235	66.1	66.3	-	On
-6	21	1316	67.1	63.5	-	On
-5	22	1365	36.8	56.8	-	On
-4	23	1435	52.6	64.3	-	On
-3	24	1516	51.8	63.5	-	On
-2	25	1331	0.0	0.0	-	On
-1	26	1184	35.8	52.8	-	On
0	26	1066	0.0	0.0	On	-
Time (Seconds)	**Vehicle Speed (mph)**	**Engine Speed (rpm)**	**Engine Load (%)**	**Throttle (%)**	**Brake Status**	**Clutch Status**
1	13	601	0.0	0.0	On	On
2	5	606	0.0	0.0	On	On

Figure 2 Exemplar section of an electronic control module download report

In addition to sudden deceleration data, some engines store a Last Stop Record. As the name implies, this data consists of the movement leading up to the vehicle's latest stop. If a sudden deceleration occurred during the vehicle's last movement, a sudden deceleration record and the last stop record will be the same data. However, if a sudden deceleration was not triggered during a collision event, the last stop record could be the only source of collision related data for a vehicle. The last stop record could then be overwritten if the vehicle were to be driven again. **Therefore, last stop record data is extremely volatile and the vehicle must not be driven after an incident for this data to be captured.** Common occurrences that result in the loss of last stop records include pulling the vehicle off to the side of the road after coming to rest, driving the vehicle onto a tow truck, and moving the vehicle into a parking spot after being towed.

Data availability among commercial vehicles depends on the year and engine manufacturer. Caterpillar, Cummins, Detroit Diesel, International/Maxxforce, Mack, Mercedes, Paccar, and Volvo engines are all capable of recording event data. Please

refer to the attached EDR List for data availability based on year and engine manufacturer.

This data can be accessed by using engine manufacturer specific software.

Global Positioning System (GPS) Data

Many fleets employ the use of GPS data systems to track their vehicles. This data can also serve the purpose of containing data that could assist in a collision reconstruction. Often, GPS data will provide the latitude and longitude of a vehicle for certain points in time; and it can also contain a speed for the vehicle at those moments as well. Even if a speed data point is not provided by the system, the GPS positioning data can be utilized to solve for a speed by analyzing the distance traveled during the segment of time between points. Systems such as the PeopleNet Monitor Systems are tied into the vehicle's Electronic Control Module (ECM) and recognize an event such that it will also record second-by-second GPS data for an event in addition to the second-by-second ECM data for an event.

Passenger vehicle GPS systems such as TomTom or Garmin can also contain data recording the location and movement of a vehicle. The data availability varies, but can typically be accessed by simply plugging the device into a computer.

Onboard Computers

Systems such as XRS and PeopleNet provide ease of recording non-collision related data and fleet tracking such as driver logs and vehicle location. Additionally, these systems can provide event-data recorder information which combines the data collected from the ECM and the systems' GPS positioning. Therefore, these reports are capable of not only providing speed, brake status, throttle position, etc. data from the ECM, but it also provides location data for users to know exactly where a vehicle was located during the data points provided.

Mechanical Inspections

When a driver rear-ends someone, runs a stop sign, or otherwise fails to decelerate to avoid a collision, it is common for the driver of that vehicle to claim that the brakes were not working properly. Police regularly perform Department of Transportation (DOT) inspections that involve mechanical inspections, regardless of whether there has been any claimed issues with the brakes. A mechanical inspection of a vehicle prior to vehicle repairs or salvaging of a vehicle, can provide valuable information in the event of an alleged vehicle malfunction.

Knowing how a vehicle was moved after an incident can also be an important piece of information when evaluating a mechanical defect. Understanding questions such as - Was the vehicle driven from the scene? Did the vehicle continue to be driven after the

incident? Was the vehicle towed? What did the tow truck driver need to do to the vehicle in order for it to be towed? – can also be a source of valuable information.

Vehicle Damage

The damage profile of a vehicle can serve multiple purposes. Primarily, it is utilized to understand the impact orientation. Additionally, the depth and direction of the crush damage can be used by a collision reconstructionist to perform a crush analysis to assist with a collision reconstruction.

III. Environment

The evidence available at a scene of a collision can by crucial for determining how a crash occurred.

Collision Evidence

Gouges, debris, and tire marks can be used to indicate an area of impact. Post-impact evidence includes final rest positions as well as gouges, tire marks, or furrows leading to final rest positions. Pre-impact evidence can consist of pre-impact braking marks. Each of these categories of evidence are utilized by a collision reconstructionist to analyze a crash. All of this evidence is most prevalent immediately after a crash. While deep gouges may remain for an indeterminate amount of time, other types of evidence are much more temporary such as tire marks, debris, and police paint.

Other Pre-Impact Factors

To appropriately analyze a crash, it is important to understand all of the information presented to the drivers prior to the collision. This includes the presence of sight obstructions or if the drivers were traveling through a construction zone. These conditions may have contributed to a collision, however, they may also be temporary and unable to be analyzed if not documented within a timely manner.

Sources of Scene Documentation

Photographs and measurements are the most common methods to properly document a scene. Even if a reconstructionist is not involved in an incident until significant time has passed, a few photographs at the scene can still be utilized to map out an entire scene through the use of tools such as photogrammetry.

More and more prevalent as time progresses is the presence of surveillance cameras. Typical owners of potential surveillance cameras are business owners of state departments of transportation. Even if a video does not show an actual impact, but just shows a few moments of one of the vehicles prior to the collision event, that video can be

very important. Often, these videos are overwritten within a short period of time, and thus requests for this source of information must be made soon after a collision.

IV. Drivers

The drivers comprise the third component of the transportation system. There are several records that pertain to the drivers that should be considered for collecting or requesting should be done. Drug and alcohol testing is available to be performed after a collision – and many companies require it to be done following any incident. Police officers often take statements from the drivers and witnesses of a collision. When requesting police data, it is important to also request any statements that were taken by the police in addition to the police report. Statements are sometimes hand-written by an investigating officer and then only summarized in a police report. Those statements can then also be available if specifically requested.

Cell phone data can provide information regarding usage in the time leading up to a collision. Call records and text records can be compared to a collision time to indicate possible use which would have contributed to a driver distraction. Cell phone data usage can sometimes also be collected to indicate if the phone was being used for internet purposes prior to a crash.