

Why do you need a good forensic expert?

When you are in an accident, it is natural to trust that the “authorities”, the police, the firefighters, the paramedics and others, will piece together what happened. It is typical to think of these fine folks as highly trained, objective and experienced observers. It is normal to trust that they have all kinds of advanced tools and knowledge above and beyond laypeople. With all the shows that are on TV so many nights of the week, from CSI Miami, to NCIS, to several flavors of Law & Order, we the public can begin to feel that when an accident happens, the authorities access databases and information, and are able to really know why it happened. Sadly, this is not the case. When you are in an accident that is not your fault, it may take some real forensic science to prove your innocence. With real science performed by those that have superior knowledge and tools, the conclusions of a police report implicating can be overturned.

Very few police officers have a working knowledge of the incredibly sophisticated and wonderful mathematical techniques that are required to effectively analyze an accident scene. Most law enforcement officials have never taken a class in dynamics or statics, couldn't tell you the difference between kinematic analysis and finite element analysis, or the relationship between kinetic energy and potential energy. Very few of those that write crime scene or accident scene reports can tell you the definition of cross sectional moment of inertia or mass moment of inertia, yet these concepts are necessary to truly ascertain what makes a physical body move the way it does or break when it is stressed. These officials can tell you how things end up in a crime or accident scene but they can't tell you how they got there. Law enforcement officials in most cases deserve the heroic status that they enjoy but as a rule they are not given the training required to perform forensic analysis.

Law enforcement officials do not have the right analysis tools to effectively perform accident analysis. When you are watching a crime show and you see investigators suddenly access a 3-D model of a building that you can see through, then they zoom in on a location and their computer makes the noise “deedle-deedle-deedle”, this is pure fantasy. Although it is very possible to create a 3-D model of a building or street scene and zoom in on a portion, it takes many hours of hard and detailed work and computer aided design tools that law enforcement departments all across the land generally do not have. There is no central database anywhere which contains this type of information. When a building is built here in the US, for the most part, the plans for that building are submitted to municipalities and in some cases may be archived but they aren't scanned into any database that is accessible in any electronic way, and they are certainly not available in 3-D. When a 3-D model of a building is required, a forensic investigator has to make an effort to obtain the blueprints which will probably be in paper format and go

on-site to make actual measurements. Once this information is obtained the expert has to laboriously input it into a very sophisticated program by hand.

In order to be effective, a good forensic expert must have the specialized knowledge and tools required to analyze all things physical. They must have a formal degree in mechanical engineering or physics. He or she must have the experience required to perform a kinematic analysis, a stress analysis and time and motion study. Access to and fluency with highly sophisticated computer aided simulation tools are needed because hand calculations only get one so far. These tools, that in many cases cost tens of thousands of dollars to purchase, take a very long time to master and must be continually practiced.

A good forensic expert must have access to all the information pertinent to an event. Skid and scuff marks, deflections, angles, and damage must be measured. It's best to collect their own evidence and not base their conclusions on what others have collected. Therefore, an optimal scenario gets the expert on the scene as soon after it happens as possible.

Perhaps the most important skill a good forensic expert possesses is the ability to communicate with laypeople. The information and science behind even a simple accident is truly complex. Those who study the science of how things move and break take many years of formal training to learn their craft, then spend years out in the field before they are truly ready. And all this is wasted if they can't effectively communicate their conclusions in a way that is convincing. Anyone these days can download models of various automobiles and perform a cheap animation but if you get these folks on a witness stand, they can do your case more harm than good. In order to be convincing, especially under the harsh scrutiny of opposing council, an expert witness has to know the science cold, using various layperson-friendly analogies, and explain all that there is to know in a non-threatening, highly impactful way.

A good forensic expert has to know the tricks used to disqualify good science. Opposing council, unable to dispute a sound examination, may attack in other ways. They will ask a bunch of questions irrelevant to the analysis but through tone of voice and other methods will make them seem important. For example, they may ask, "Exactly how long did it take you to write this report?", "Why on page 12 did you use the word 'concise'?", "Did you visit the site and take these pictures yourself?". Opposing council will ask you to perform calculations and drawings on a white board right there on the spot without

advance notice. This is very difficult for most folks to do in general, but the good forensic expert is prepared to do so and preferably without looking at a textbook.

A good forensic expert must anticipate attacks. Opposing council will ask for the invoices that you have sent to the customer to try to gain an advantage. They will try to make it seem like the money involved in a case somehow influences the science that is being performed. They will ask, "Who helped you with the report"? If you had portions of the report done by someone else they will ask for the credentials of that person and if they don't have a high level of education they will argue that the report be thrown out. They will ask for every e-mail sent between you and the client, looking for evidence that the client somehow influenced the findings. Opposing council will ask that you submit a copy of everything that you used to reach your conclusion. If you haven't read all the depositions they will make a note of it. A good forensic engineer knows the "gotchas".

A good forensic expert not only has the expertise to find out the truth, but also can testify effectively under pressure . . . You need both skills.

We all have good reasons to thank and respect those that protect us on a daily basis. Cops, fire fighters, paramedics all play a heroic role in our modern society. However, with state and local budgets stretched thinly and the lack of specific training in the field of forensic reconstruction that our public servants receive, forensic experts serve an important role. When it's important to find out how things happened, call a forensic expert as soon as possible. Don't leave a litigation to chance and the conclusions of whoever happened to arrive on the scene that day. Let a forensic expert find the real truth.