CLM Claims & Litigation Management Alliance
ADVANCING ETHICS, COOPERATION AND EDUCATION

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Accident Investigation and Litigation: Working with Human Factors Experts

I. Minimizing Claims and Preparing for Litigation – The Proactive approach

Not surprisingly, when many of us involved in the claims and litigation process think about our trade, we generally focus on what to do *after* we have an incident or accident. This approach wastes time and effort, and puts us at a disadvantage.

We believe that a more comprehensive view of loss and claims will not only allow for smoother handling of claims and litigation, but may actually help to minimize the number of accidents in general as well as the number of accidents that subsequently become large claims or lawsuits. In this first section of our session, we will cover how companies, insurers, and law firms can work together to reach these goals.

A. What can you do proactively?

When deciding what you can do proactively minimize accidents, it is helpful to look to lessons learned from previous accidents and lawsuits.

- What went well?
- What did not go so well?
- What do you wish you had in place before that incident?
- Did your personnel respond as you needed in the time that you needed either through proper action or necessary inaction?

Below are a few specific thoughts and examples.

B. Personnel training

The next step in the proactive protection process is employee training. Incidents and accidents will happen; that is unavoidable. However, the more detailed and thorough a paper trail you can establish for each of your drivers, the better suited you will be to defend against claims. Proper and comprehensive training can help defend against negligent employment claims. Think about how your training program will look to a jury or opposing counsel. Was it thorough? Was it recurrent? Are drivers being comprehensively and consistently trained and reviewed? Is the training properly documented?

C. Policy writing and design

Most, if not all, organizations have some form of driving policy. This applies not only to companies with commercial drivers, but also those with office-based staff. A well written policy that goes beyond standard boiler-plate language will help keep drivers out of high-risk situations and can be used to evidence appropriate controls in the event of an accident.

D. Policy enforcement

If you have a policy, then it is vital that you enforce it. As such, policies must be drafted so that they are enforceable. If your current policies cannot be enforced, consider revising them.

E. Utilizing Human Factors experts

On the proactive side, there are many ways in which Human Factors experts can be leveraged to benefit your organization. With expertise in the comprehension of instructions and warnings, as well as comprehension and efficacy of training, Human Factors experts can help review, revise and generate training programs and policy updates to increase their effectiveness and employee compliance. Additionally, Human Factors experts can help evaluate and restructure the safety culture of your organization.

II. Accident, Claims and Litigation Response and Strategy

A. Rapid response to accident

While proactive processes are effective for preventing accidents, accidents will inevitably occur. Post-accident response is critical to the claims mitigation process. A post-accident action plan must be in place so that the appropriate responders are deployed. As part of the initial response to an accident, it is important to have suitable investigators available so that these individuals can collect and preserve evidence; gather information; interview witnesses; and retain legal counsel. Being prepared with the appropriate policies, processes and rapid response team can mean the difference between a successful resolution and a significant loss.

B. How to identify types of experts

There are many different types of experts that can assist in a typical motor vehicle accident, but three of the most common experts are vehicle Accident Reconstructionists, Biomechanics Engineers and Human Factors experts. A Vehicle Engineer or Accident Reconstructionist analyzes physics, vehicle dynamics, speed and vehicle positions. A Biomechanist analyzes kinematics, body positioning, body movement, body contact, injury pattern, injury mechanics and vehicle speeds. Finally, a Human Factors scientist or engineer analyzes sight lines, attention/distraction issues, cognitive behavior, perceptions, reactions, and vision of the drivers. Obviously, these are oversimplifications of complex fields and there are numerous other types of experts that you may want or need. It is always good to contact colleagues and experts whom you trust and discuss with them how they might approach a case as well.

C. Get counsel involved early.

For accidents involving substantial injuries or damage, it is vital to immediately involve outside counsel. Outside counsel is experienced in identifying what information and evidence will be critical to the investigation of the accident and the defense of any claim. Outside counsel also can identify the appropriate experts that should be involved in the investigation of the accident. Importantly, engaging counsel early in the investigation process preserves evidence, establishes work product and attorney-client privilege, and helps generate a full and accurate analysis of the accident.

D. Get experts involved early

Retaining experts as part of your accident response allows for better and more comprehensive analysis of liability and causation. Evidence quickly disappears – the best information is most readily available within hours of the accident. Providing experts with fresh evidence can assist in mitigating exposure. Engaging experts immediately after a loss occurs better enables all parties to evaluate evidence in order to ascertain the specifics of what occurred. Fresh evidence is better evidence, and it often results in minimizing the cost of analysis, maximizes the effectiveness of the analysis and potentially recognizes facts which others may have overlooked.

II. The Human Factors of Driving and Driver Behavior

Human capabilities, limitations, and behaviors contribute significantly to accident causation and the reporting of evidence surrounding accidents. Cognitive, perceptual, and performance characteristics of humans lead to analyzable trends and patterns of behaviors that can either increase or decrease the safety of any interaction between a human and a product, environment, or system. Human Factors scientists and engineers are uniquely qualified to analyze the behavioral traits and capabilities of humans in a variety of roles (e.g., operators, pedestrians, drivers, eyewitnesses) and to provide a scientific foundation on which to base our understanding of human cognition, perception, and behavior.

Human Factors scientists investigate human performance issues relating to visual and auditory perception, reaction time, eyewitness memory, hindsight bias, attention, distraction, and fatigue. Furthermore, physical aspects of the environment (e.g., lighting, background noise, and weather) and characteristics of the operator (e.g., age, strength, experience, size) are integral human factors considerations in accident investigations. This allows the analysis of a given accident and evaluation of the human performance issues and behaviors that may have contributed to accident causation. The reliability of human memory and retrospective reporting in the gathering of fact-based evidence can also be assessed.

A. Perception response time and accident avoidance ability

Often, an individual must perceive a hazard and produce an appropriate response to avoid an accident or injury. The time it takes to do so, known as the perception-response time (PRT), is typically broken down into four stages: detection, identification, decision, and response.[1] During the detection stage, the driver initially perceives "something" in the environment. This can involve seeing an object in their path of travel or hearing a noise somewhere in the distance. Once the object is detected, the driver must determine whether it represents a hazard. Next, the driver must decide what to do, if anything. If the driver perceives the object as a hazard, some action to avoid the hazard might be taken (e.g., accelerating, braking, swerving). After the decision has been made to take some action, the driver must initiate and carry out that action. While it is difficult to calculate precisely the temporal duration of each stage, based on decades of research it is possible to estimate PRTs for various accident scenarios.[2]

[1] Olson & Farber, 2003

[2] Olson & Farber, 2003; Green, 2000

The stages of the PRT cycle rely on sensory, motor, and cognitive processes and though some of these actions seem virtually automatic, they can be disrupted under certain environmental conditions. Depending on the circumstances, a driver's PRT can range from one second (for a highly visible, expected hazard) to five seconds or more (for an unexpected, less conspicuous hazard).[3] Factors that may affect PRT include conspicuity, number of response alternatives, and driver expectancy. When PRT increases, the available time to avoid a potential accident is decreased, thereby increasing the risk of an accident.

Both the driver's PRT and the physical stopping capabilities of the vehicle contribute to one's ability to stop in an emergency situation. The critical stopping distance is defined as the distance a vehicle travels during the driver's PRT plus the distance required to bring the vehicle to a stop (i.e., braking distance). Braking distance is a function of vehicle dynamics (e.g., the vehicle's speed, and the friction between the tires and the roadway). For large trucks, braking distance is increased by an inherent lag in vehicle response to driver braking, which can be on the order of about 0.5 seconds.[4] Critical stopping distance is simply the sum of the distance traveled during PRT and braking. This metric is a tool commonly employed by Human Factors scientists to evaluate driver behavior in emergency situations. Specifically, estimating critical stopping distance provides insight for addressing the question: Could a reasonable driver have avoided this accident, given the circumstantial, environmental, and physical conditions at the time?

B. Visibility, cues and conspicuity

Readily detectable objects in the visual field are said to be "conspicuous." "Conspicuity is defined as those characteristics of an object or condition that determine the likelihood that it will come to the attention of an observer who does not expect it to be there."[5] An object can be considered to have a high degree of conspicuity if it stands out against its backdrop or surroundings and would likely be detected by a reasonably attentive person in sufficient time to take any necessary action.[6] Conspicuity is affected by a number of visual characteristics, including color, pattern, shading, texture, brightness, contrast, uniqueness, size and location differences between an object, and the background against which it is viewed. The presence of flashing lights also increases the conspicuity of an object. Objects tend to be more conspicuous if they are significantly brighter than their background, are bright in color, are different than any other objects or light sources in close proximity, and/or are closer to the

[3] Olson & Farber, 2003
[4] Bayan et al., 2009
[5] Olson & Farber, 2003; p. 215
[6] Olson & Farber, 2003

center of a person's field of view.[7] However, the likelihood that an object will be detected depends not only on the characteristics of the object, but also on the characteristics of the observer: for example, an observer's expectations and experience will influence how easily an object is detected and identified,[8] and objects or situations which violate an observer's expectations are likely to be detected more slowly than expected objects or situations.

In general, visual capabilities and conspicuity decrease at night.[9] Although conspicuity of lights increases at night, due to increased contrast with surrounding darkness, dark or unlit conditions generally reduce detectability of both expected and unexpected objects. For example, Wood et al.[10] found low average detection rates for roadside pedestrians in dark environments up to the point that drivers passed the pedestrians, even when drivers knew they would be encountering pedestrians. Measures to increase conspicuity under low light conditions include increasing reflectiveness of unlit objects through such means as white and/or red retroreflective tape. As lighter objects, such as light-colored clothing on pedestrians, are generally more visible than dark objects at night.[11] Scientific studies on test tracks have found that the reduction in detection distances of lighter colored vehicles, at night, did not reach statistical significance when compared to the detection distances for darker colored vehicles.[12] The conspicuity of reflective surfaces can also be reduced by visual clutter, a condition in which several retroreflective surfaces exist in the same location and overlap or group to the point that the objects are no longer distinct to an observer.[13]

C. Low-light visibility

Despite the fact that most of the miles driven in vehicles are during daylight hours, the majority of vehicular accidents occur at night. This is due to obvious reasons, such as decreased conspicuity of road hazards or pedestrians, but also due to physical and cognitive limitations of human perception and performance. It is important to evaluate and quantify human capabilities and limitations in perception and response, taking into account variables such as headlight illumination, driver expectancy for a hazard, driver fatigue and visibility of a hazard. Using various software tools the likelihood that a particular hazard could have been perceived with sufficient time for a driver to avoid an accident can be assessed.

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[7] Olson & Farber, 2003
[8] e.g., Cole & Hughes, 1984
[9] Olson & Farber, 2003
[10] Wood et al., 2005
[11] e.g., Muttart et al., 2013
[12] e.g. Curry et al., 2007
[13] Olson & Farber, 2003

Further there are methods available to photographically capture and reproduce accurate pictures of low-illumination scenes. This technique--which has been empirically validated, published, and admitted in both state and Federal court--provides unique opportunity to display calibrated photographs that accurately exhibit the visibility characteristics afforded to a person at a dimly lit accident scene. By adjusting camera placement, camera settings and removing distortions introduced by the display medium (e.g., a monitor or printer), we are able to produce photographic representations of the scene that closely replicate the perceptual experience of an on-scene observer.

D. Driver distraction

More and more driving is becoming a secondary task for drivers operating an automobile. The increasing numbers, types and availability of in-vehicle technologies including, but not limited to, cell phones, Bluetooth accessories, MP3 players, DVD players, GPS systems and other infotainment devices are vying for drivers' attention and taking it away from the roadway and control of the vehicle. This means the task of "driving" is changing and understanding human behavior behind the wheel is becoming ever more complex, yet relevant to evaluating the causes of a collision or other driving incident.

It is important to note that even in-vehicle technologies intended to assist drivers (e.g., backup cameras, park assist, GPS, collision warning avoidance, brake assist, LED changeable dashboards) may also come with some distraction, but location and interaction design can be utilized to minimize the distractions and optimize the benefits of these new technologies.

Additionally, driver distraction is more than just "eyes off the road" or "hands off the wheel." Driver distraction is often discussed along three modalities: visual (eyes off the road), manual (hands off the wheel) and cognitive (mentally off the task of driving). All too often the cognitive component of driver distraction is overlooked or misunderstood. It is important in the context of loss prevention, claims and litigation for the cognitive component of driver distraction to be taken into account.