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TWO-WHEELED TROUBLE

Determining Fair Liability in a Bicycle Accident Investigation

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Published June 22, 2009

While many bicycle mishaps result in nothing more than a scraped elbow, others can result in claims with significant damages from serious injuries and lost wages. It is not uncommon to have damages in the hundreds of thousands, even into the millions of dollars.

Such damages obviously reflect a significant exposure to a carrier and justify a comprehensive bicycle accident investigation to identify causative factors and assist in establishing fault. Causative factors that typically come to light in a bicycle accident claim include cyclist and driver behavior, bicycle component or frame failures, maintenance issues, assembly issues, and the lack of proper safety equipment, like a helmet. Each of these points will be discussed in the context of the cyclist being the claimant.

ACCIDENT RECONSTRUCTION

Accident reconstruction of a vehicular-bicycle accident assesses the causative factors, including whether or not the vehicle and bicycle were being operated in accordance with the rules and laws of the roads. An accident reconstruction expert typically will use the physical evidence available to determine the speeds of the vehicle and bicycle, the visibility of the driver and cyclist, and whether both the driver and the cyclist had enough time to perceive and react to an impending accident.

If skid marks are present, vehicle speeds can in part be determined by an analysis.

This analysis is based on the fundamental physics and engineering principle that the length of skid marks is related to the speed of the vehicle. The longer the skid marks, the faster the vehicle's initial speed. Vehicle speeds determined by skid marks estimate the speed at the time of braking. If the point of impact can be determined, then the vehicle speed at impact can be estimated.

Vehicle speeds at impact also can be estimated by analyzing the distance the cyclist is thrown after impact. If skid marks are not present, the throw analysis is generally the only method to establish the vehicle

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speed at impact. During a frontal impact, the bicycle and cyclist will be thrown forward from the point of impact and eventually come to rest. The throw distance is largely a function of the vehicle's speed, but also depends on the type of vehicle, location of impact, size and height of the cyclist, and orientation of the bicycle.

Generally, vehicles with a lowprofile front-end tend to scoop the cyclist up, vaulting them onto the hood or even over the roof. Vehicles with a blunt front end, such as large pickup, will push the cyclist forward. Small children can even be run over and dragged by a vehicle. The expert can also use the damage pattern, including the head impact location on the windshield, to make general estimates of the speed of impact.

While most might think that a collision between a bicycle and vehicle to be the most common type of bicycle accident, they account for only 17 percent of bicycle mishaps. The majority of bicycle mishaps are actually non-vehicle related. The causative factors for these bicycle falls include loss of control, malfunctioning components (such as brakes or derailleur), bicycle frame or component failure, and non-vehicular collisions with other bicycles, pedestrians, or dogs. Regardless of the type of bicycle mishap, an accident reconstruction expert can assist in evaluating the causative factors.

RIDER BEHAVIOR

Even in vehicle-bicycle collisions in which the driver of an automobile was cited, there are instances where an analysis can show that the cyclist's riding behavior significantly contributed to an accident. Assessing cyclist riding behavior generally requires an expert qualified in the area of bicycle safety.

The expert's analysis involves evaluating the cyclist's behavior in the context of accepted and recognized safe riding practices, such as those promoted by the League of American Bicyclists. For example, let's say a cyclist passed a vehicle on the right at a high rate of speed and stayed to the right as they approached an intersection with a left turning car. The cyclist collided with the rear of the left-turning vehicle. The driver of the vehicle was cited for failure to yield since there was no evidence that the cyclist executed any evasive maneuvers.

The reconstruction analysis showed that the driver of the left-turning car was more than halfway through the turn at the time when the cyclist passed the car on the right. Consequently, the cyclist was hidden from the left-turning driver's view up the road as they started into the turn. An analysis of the cyclist's riding behavior showed that it was not consistent with safe riding practices. The cyclist passed on the right at a high rate of speed, did not exercise a reasonable degree of caution as he approached the intersection, and did not execute evasive maneuvers by swerving or braking, which he could have safely done to avoid the accident.

Additionally, the cyclist did not move toward the center of the lane after passing the vehicle. This is commonly referred to as "taking the lane" and is an accepted (and legal) safe riding practice when riding with the speed of traffic. This maneuver could have resulted in the cyclist avoiding the accident. The jury found the cyclist 70 percent liable for the accident.

Bicycle fit is another aspect of rider behavior that may be a causative factor in bicycle mishaps. Bicycles that are too small or too big for the cyclist's body dimensions can result in instability. The latter case typically involves a child who is given too large a bicycle so that she can grow into it. Unfortunately, it is rather common for a child riding too large a bicycle to become unstable and fall while she is stopping or starting. The bicycle shop or retailer selling the bicycle needs to ensure that it is adequately sized for the child.

In many cases, a significant amount of time will have passed after the bike was purchased before the expert is able to evaluate the sizing. If such a scenario arises, an expert can conduct an anthropometric analysis to estimate the child's size at the time the bicycle was purchased to determine if the shop or retailer sold an appropriately sized product to the customer.

BICYCLE FRAME AND COMPONENT FAILURE

Bicycle frame or bicycle component failures can undoubtedly result in bicycle mishaps. For instance, a front fork failure can cause a cyclist to go over the handle bars. A chain that snaps can cause a cyclist to lose control and fall. The question in these claims is whether or not the bicycle was being used beyond its design limits, or if it had a design or manufacturing defect. Product defects may offer opportunities for subrogation against the manufacturer. Examples of manufacturing defect can include inferior materials or improper welding. These types of claims likely will require an engineering expert to reconstruct the accident and evaluate the potential for a product defect. The expert the must also consider the bicycle's maintenance and assembly at the bicycle shop, since an over-tightened bolt can cause a part to fail below the design loads.

Inadequate maintenance and bicycle assembly may be a causative factor in vehicular collisions as well as non-vehicular falls. A bicycle expert can assess whether the bicycle and its components were maintained and assembled in acco dance with accepted practices.

For example, inadequate brake maintenance can lead to poor braking performance in a panic stop, resulting in a cyclist's inability to avoid a collision with a car. An over-tightened handlebar bolt can cause the handlebar to prematurely fail, resulting in a mishap. In these types of claims, the bicycle's maintenance should be evaluated to see if it was completed by the claimant or by a bicycle shop. If the claimant does his own maintenance, this needs to be documented with a statement. If the maintenance is performed by an independent bicycle shop or sporting goods retailer, they should have records of any maintenance performed on the bicycle.

For claims regarding assembly, the larger sporting good retailers should have build tags to document that the bicycle was assembled in accordance to the manufacturer's specifications and accepted practices. These build tags are critical for showing that the bicycle left the store in good operating condition.

BICYCLE HELMETS

A claim for head or brain injuries for situations in which the cyclist was not wearing a helmet may offer the possibility of proffering a helmet defense. In other words, would the cyclist have received the head injuries if he was wearing a helmet? In order for the expert to proffer a helmet defense, he must assess the following factors:

- Crash forces;
- Location of impact on helmet;
- Retention system;
- Helmet position; and
- Helmet fit.

Research has shown that helmet use can offer a protective effect even in the presence of a collision with a vehicle — as long as the crash forces do not exceed the design tolerance of the helmet. In accordance with design standards, bicycle helmets are designed to protect against serious head injuries from a fall of 6.5 feet onto a flat surface. The location of impact is critical because only a portion of the helmet that is defined by the helmet standard is tested for compliance. Based on the test area and the medical records, the expert can assess whether the helmet's protective area would have provided coverage to the area of impact on the head. The helmet's retention system must also demonstrate structural integrity. Lastly, the expert must assess the helmet's position and fit on the cyclist. For example, a helmet worn tilted backwards will expose the forehead to potential injury. If the evidence supports a helmet defense, the expert can essentially only provide a biomechanical opinion that the injuries would have been mitigated.